MAUAO

Crime Prevention through Environmental Design Audit & Injury Prevention through Environmental Design & Universal Access Assessment
Prepared for Tauranga City Council

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1.0 Scope

Boffa Miskell Ltd and Caylx Design has been engaged by Tauranga City Council to prepare a Crime Prevention through Environmental Design Assessment and Injury Prevention through Environmental Design and Universal Accessibility Audit for Mauao – Mt. Maunganui. The assessment is based on the existing environment and information gathered during site visits and meetings with Tauranga City Council Staff.

This report provides recommendations for the design and management of the reserve and future research that is required. The assessment is a technical review of the reserve and its walking tracks and included a site audit.

This audit is based on the "**Crime Prevention through Environmental Design**" (CPTED) principles, as used by the South Australian Attorney General's Crime Prevention Unit (2001) and the National Guidelines for Crime Prevention Through Environmental Design in New Zealand, prepared by the Ministry of Justice (November 2005).

The overarching principles of **barrier-free** public spaces is that these spaces are adapted to fulfil the needs of all people, providing independence, convenience and safety to everyone whether they be a child, parent with a pram, an elderly person, someone with a temporary injury or someone permanently physically disabled or visually impaired. The achievement of barrier free environments is all about inclusive design.

Inclusive design **includes consideration of Injury Prevention through Environmental Design (IPTED**) and **Universal Access** and is an important component of the design process.

2.0 Context

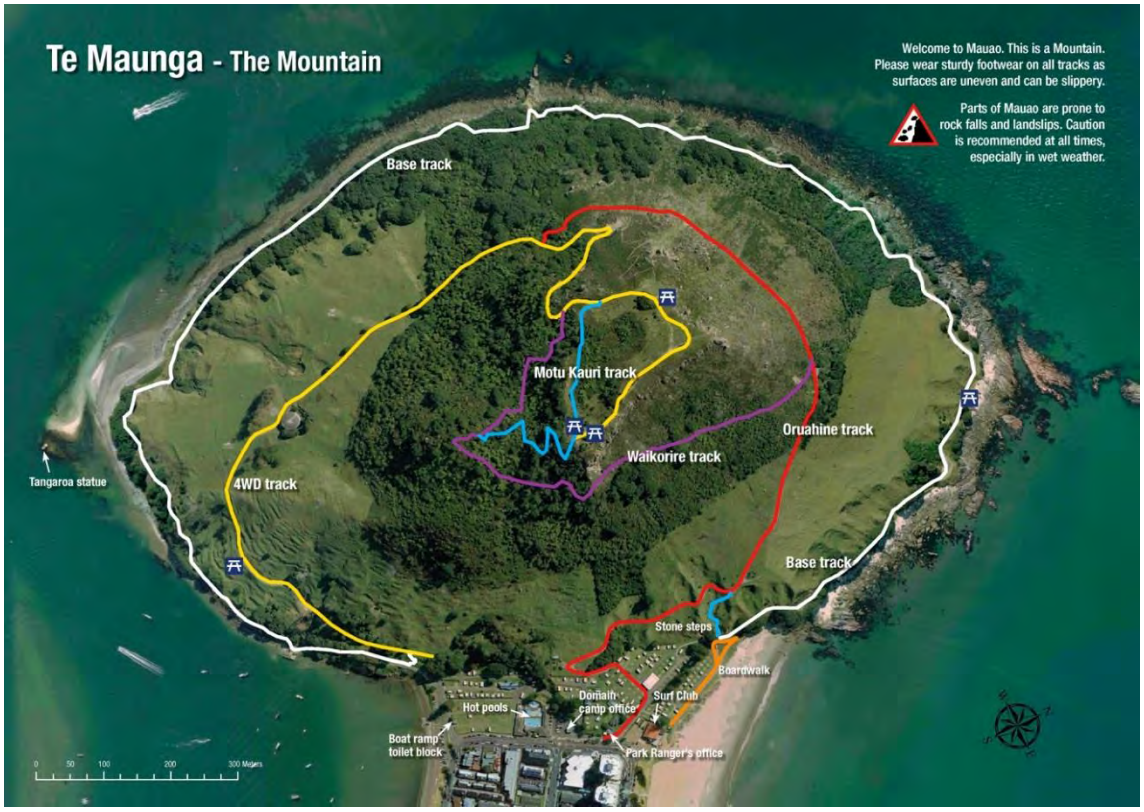
Mauao is a reserve that provides a hub of recreational activities for Mount Maunganui. Current facilities include numerous walking tracks:

- Base track
- 4WD track
- Motu Kauri track
- Waikorire track
- Oruahine track

The scope of the CPTED audit is to look at Mauao itself and the public's ability to safely use tracks at all hours. The issues and recommendations within this report will then assist both Council and iwi in the immediate and long term to create positive change and use upon Mauao.

The CPTED, IPTED and Universal Access assessments have been undertaken in the context of a coastal bush reserve. The expectations of urban environments are not applied to Mauao and regard has been given to the coastal landscape character of the mountain. Application of urban

environmental standards are not considered appropriate for this reserve and the recommendations are set against standards and methods applicable to bush environments.



3.0 Part A – Crime Prevention Through Environmental Design

4.0 What is CPTED?

4.1 What is CPTED?

Crime Prevention through Environmental Design (CPTED) has emerged as one of the most commonly used and currently effective approaches to reducing opportunities for crime. The way we design our urban spaces can significantly influence the opportunities for crime and level of fear people may feel.

There are four key principles considered within CPTED:

1. **Surveillance** - people are present and can see what is going on;
2. **Access management** - methods are used to attract people and vehicles to some places and restrict them from others;
3. **Territorial reinforcement** - clear boundaries encourage community 'ownership' of the space;
4. **Quality environments** - good quality well maintained spaces that attract people and support surveillance.

Each of the above principles have been considered in depth and the methods of assessment applied, as detailed in the National Guidelines for CPTED prepared by the Ministry of Justice (November 2005).

The four principles lead onto the identification of seven qualities that characterise well defined and safe spaces. The CPTED audit checklist developed for this audit has been based upon these qualities:

1. **Access:** Safe Movement and Connections. Places with well-defined routes, spaces and entrances that provide for convenient and safe movement without compromising security.
2. **Surveillance and Sightlines**: See and be seen. Places where public spaces are overlooked, and clear sightlines and good lighting provide maximum visibility.
3. **Layout:** Clear and Logical Orientation. Places laid out to maximise safety and help with orientation and way finding.
4. **Activity Mix:** Eyes on the Street. Promoting a compatible mix of uses and increased use of public space.
5. **Sense of Ownership:** Showing a space is cared for. Places that promote a sense of ownership, respect, territorial responsibility and community.
6. **Quality Environments**: Well designed, managed and maintained environment. Spaces designed with management and maintenance in mind to discourage crime and promote community safety in the present and future.

Physical Protection: Inclusion of well-designed security features and elements such as security cameras and physical barriers.

There are further principles and methods that are applied within the above qualities including:

- Lighting
- Entrapment Spots
- Signage
- Movement Predictors
- Landscape treatment
- Land use mix / activity generation
- Maintenance and Management

CPTED is not a 'fix all' method of removing crime from an area, however the focus of CPTED is to minimise opportunistic crime. This is achieved through "*manipulating the physical environment to produce behavioural effects that will reduce the incidence and fear of crime, thereby improving the quality of life. These behavioural effects can be accomplished by reducing the propensity of the physical environment to support criminal behaviour."*[1]

4.2 Method

The preparation of this assessment is based on information gathered from site visits, meetings with Mauao's Park Ranger and further information provided by Tauranga City Council.

The assessment is based against the National Guidelines for Crime Prevention through Environmental Design.

The purpose of this assessment is to review the current space within the CPTED framework. It is not the purpose of this assessment to resolve wider CPTED issues arising in the wider area. However, it takes into account the context of the wider area and considers these in the recommendations.

National and international audit principles have been applied for the CPTED audit.

[1] Crowe (2000, p35)

4.3 Findings and Recommendations

4.3.1 **Base Track**

4.3.1.1 Access

Access from the Mt Maunganui main beach end of the base track provides modern wide steps and a wheelchair ramp (Figure 1). At the top of these steps are entry gates that are in place to contain Mauao's stock. These gates also prevent or deter any unwanted use by cyclists or motorcyclists.

Along the entirety of the base track the fine chipped gravel surface provides a wide, safe, minimal slip surface that is both easy to maintain and is in keeping with Mauao's 'nature walk' character. This surface also creates loud footfall noise, assisting in an awareness of another's presence in the user's vicinity (Figure 3).

Access to the number of small beaches below the base track at the base of Mauao is generally informal, with people wandering down the banks. The limited number of formalised access points, usually steps, are in open areas. (Figure 5).

Users of the base track are accessing 'maintenance only' tracks as well as closed tracks, even after the placement of barriers and other best efforts by the Park Ranger and contractors (Figure 12).

Stock gates along the track to contain the sheep create a bottleneck area and a difficult 'escape route' in case of any untoward situation (Figure 16).

Generally the base track is a well-defined and marked route that contains good sightlines. However understanding of the distance the user has travelled or has to go along the base track is not communicated, to assist in the user's choice to continue on or return at a certain point.

Recommendations for Base Track

- **Upgrade some of the informal tracks to formalise alternative routes for escaping. Include marking of the track destination.**
- **Improve and maintain the grade of the track to allow for quality access for wheelchairs and strollers.**
- **Remove stock gates from the base track, by fencing stock away from the base track area.**
- **Include 'inlays' into the base track informing distance travelled out of the total distance for both directions, i.e. 2.5km/3.5km or 1.0km to go.**

4.3.1.2 Surveillance and Sightlines

Due to the nature of the Mauao tracks, they are away from any of the urban areas that could provide passive surveillance. Although there is none of this static form of passive surveillance, the level of use of the base track at any given time of the day and night remarkably provides a high level of surveillance. As the busiest track on Mauao, moving along the base track at any given time throughout the day it is likely that users would come across other users at least every 1 minute on average; a high instance of passive surveillance.

At the main entrances there are no CCTV cameras monitoring those entering and exiting the base track. Other cameras associated with the campground are sited at the entrance near the Mount Hot Pools. In the past, neighbouring businesses CCTV has been used in attempts to implicate those partaking in crimes on Mauao. However, on a number of occasions this has been unsuccessful in determining the culprits.

Sightlines along the base track are mostly clear, with good distance of visibility ahead on the track, down to the beaches and rocks beneath the track, and looking up to Mauao's summit. Vegetation tends to be the main hindrance to any sightlines that aren't clear (Figure 38).

The return wall on the public toilets on the edge of the campground at the Pilot Bay entrance of the track creates a place to hide (Figure 46).

4.3.1.3 Layout

The layout of the base track is straightforward, following the edge of the base of Mauao with two main entry and exit points; one at the northern end of Mt Maunganui beach and the other at the northern end of Pilot Bay(Figure 1 and 43).

The base track is rather isolated from any of the other tracks on Mauao, meeting other tracks only at the two entrances at Mt Maunganui beach and Pilot Bay. This lack of any formalised alternative escape routes is seen as a potential issue. It is recognised that this absence of alternative routes is largely due to non-traversable slopes between the base track and other tracks, however some non-formalised tracks have been formed from use. These are seen as opportunities to provide alternative escape routes for added safety to the user (Figure 40). However, the inclusion of signage to assist with wayfinding is not provided.

Recommendations for Base Track

- **Clear any vegetation that is significantly hindering sightlines.**
- **Clear vegetation from within 1m either side of the base track to reduce arson risk and also improve access and visibility.**
- **Include CCTV cameras at public toilets and at top of timber stairs or at Mount Maunganui Surf Club Building. Link to Council monitoring and include signage to advise CCTV is operating.**
- **Demolish return wall on public toilets to remove places for hiding and vandalism**.

- **Install seats at more regular intervals along the track, particularly along the western section of the track.**
- **Relocate main information signs for better visibility and utilisation by the public**.

The track is located often at the edge of steep edges that drop to the shoreline. Views out to sea are gained whilst also minimising opportunities for hiding spots (Figure 17).

In recent times there have been efforts to clear vegetation from within 1m on either side of the base track and border with mountain flax to reduce opportunities for arson. There are still areas that have vegetation within 1m either side of the track, with considerable amounts of dead leaf matter that can be easily lit close to the base track.

Seats are placed at regular intervals along the base track, providing places to rest which adds passive surveillance opportunities in specific locations along the track (Figure 8).

Main information signs are not in optimum locations for viewing by users. More centralised and consolidated signs will assist in clear 'gateways' and knowledge sharing for track users (Figure 42).

4.3.1.4 Activity Mix

There is limited opportunity for activity mix along the tracks of Mauao. This is due to the prioritisation of safety for the users. If cyclists were to use the track, for example, it could cause collisions and falls, particularly in the narrower sections of the track. Large Crossfit groups were using the tracks, running with equipment. Conflicts have been addressed and dealt with immediately.

- **Improve signage about users permitted on track**

4.3.1.5 Sense of Ownership

It is evident along the entirety of the base track that it is well maintained and cared for. Damage and deterioration is remedied quickly and this results in a strong sense of ownership and thus greater respect of the track and its facilities.

Information signs can further convey the 'status' of Mauao and strengthen community engagement in the 'ownership' and caring for Mauao, in turn reducing the risk of vandalism.

- **Include awareness of Mauao's cultural importance with signage.**

4.3.1.6 Quality Environments

The base track is a well-designed, managed and maintained environment. It is constructed of quality materials that increase safety for users and the track is vigilantly maintained and has, in recent times, undergone significant upgrades.

Vegetation in too close proximity to the track, forming an arson risk, or blocking sightlines, would be one of the biggest issues, along with some of the deteriorating furniture (Figure 22). Well looked after areas draw respect from users, reducing vandalism and crime and provide an added sense of safety.

- **Install more descriptive signs for closed tracks.**
- **Consider making signage more concise and informative to get the key messages out to users.**
- **Upgrade deteriorating furniture to reduce tendency of vandalism.**
- **Continue vigilant maintenance of the track as is currently undertaken, keeping the track in good quality for safe use.**

4.3.1.7 Physical Protection

At the main entrances there are no CCTV cameras monitoring those entering and exiting the base track. In the past, neighbouring businesses CCTV has been used in attempts to implicate those partaking in crimes on Mauao, however on a number of occasions this has been unsuccessful in determining the culprits.

Mauao is open 24 hours, 7 days a week and consequently is never closed. This means that gates are not locked to pedestrians wanting to enter the base track. However at the main entrances there are locked gates to prevent unauthorised vehicular access.

Exposed clay cliff faces to the inside of the track are subject to intentional gouging, particularly to chisel names into the clay (Figure 6). Over time this significantly recedes the cliff face and causes instability. In one instance recently a costly stone retaining wall had to be installed to prevent collapse partly caused by this intentional gouging of the cliff face.

- **Install CCTV cameras at each of the entrances to better monitor those entering the track. CCTV cameras are recommended to be installed upon the Surf Life Saving Club at the Mt Maunganui beach entrance, and upon the public toilets at the Pilot Bay entrance.**
- **Look at cost effective and site sensitive solutions to inhibit the ability to gouge out at risk cliff faces.**

4.3.2 **4WD Track**

4.3.2.1 Access

Access at the base of the 4WD track, located at the Pilot Bay side of Mauao includes both pedestrian and 4WD access. Pedestrian access is up steps and through a gate, located next to the 4WD access which is through a farm gate that is locked at all times. 4WD access is restricted to authorised persons only (Figure 47).

Along the first half of the 4WD track is open farmed land with no fences at the edge of the track. This provides good potential for escape in untoward situations (Figure 48). However there is no marking of where exit points are.

Because the track has to accommodate vehicles the width is consistently wide, making access straightforward, even at busy periods.

Leading up to the hairpin corner of the track access to the outside edge of the track has been stopped through the installation of hand railing. This was installed after a landslip revealed the steepness and instability of this edge (Figure 51).

Users accessing areas off the track is an issue, particularly at and near the summit where people try to attain a better view (Figure 57). These areas that are accessed are often extremely precarious and dangerous. For the most part, quality use of mountain flax edging reduces access to dangerous areas whilst providing visual amenity (Figure 55).

4.3.2.2 Surveillance and Sightlines

There is no formal surveillance of the 4WD track, however the popularity of the 4WD track by users provides ample transient passive surveillance for safe use of the track.

Much of the track has clear sightlines out of the track, with the first half of the track surrounded by farm land and the top of the track in clearings at the summit (Figure 53). The track width provides clear visibility along the track for good knowledge of others located in the near vicinity.

Maintaining low vegetation or clear stemmed and low undergrowth within the first 5m of the track edge assists with clear open feel and sightlines along the track.

4.3.2.3 Layout

The layout of the 4WD track allows for quality use by both pedestrian users and vehicles. The width of the track means that in the bush sections of the track vegetation

Recommendations for 4WD Track

- **Assess options for alternative, less formal escape routes from the track, particularly linking to the base track. Provide markers to assist informal wayfinding across the field to stiles.**
- **Use the technique of edging the track with mountain flax, near the summit in particular, to prevent users from straying from the track and accessing dangerous vantage points for views. This technique has been proven effective on Mauao in reducing this issue, whilst providing visual amenity and is in keeping with iwi's wishes of minimal built elements.**
- **Assess areas for additional furniture installation, particularly nearer the steeper, more strenuous sections of the track.**

can be at the borders without hindering sightlines, resulting in a safe environment for users whilst maintaining the desired 'nature trail' sense.

Seats and benches are relatively frequent along the track, however more could be installed, particularly along the steeper sections of the track to provide areas for rest.

- **Increase signage to indicate users location and distance from entry and exit points.**

4.3.2.4 Activity Mix

The 4WD track is used by both pedestrians and authorised vehicles. Pedestrian access is for recreation, where vehicular access is for predominantly maintenance and on occasion for paragliders and special circumstances.

There are no real issues with this activity mix as it is not frequent and only momentary. There are also minimal issues with runners and walkers using the same track as the width of the track provides ample room for passing.

4.3.2.5 Sense of Ownership

The sense of ownership is most evident where vehicular gates are locked at all times and can only be unlocked by authorised persons. This provides a sense of safety for users of the track as it emits the sense that the track is controlled.

- **Keep all elements of the track well maintained to convey the sense of ownership, deterring vandalism.**

4.3.2.6 Quality Environments

The 4WD track is for the most part well maintained with quality ground material used for safety and slip reduction. At points, particularly where the grade is at its steepest, there is wear and gouging of the ground, creating hazards for users. If areas are seen to be not as well maintained as other areas they tend to attract vandalism.

Furniture along the 4WD track tends to be quite aged. This can attract vandalism as areas seen as not maintained are prime targets for vandals (Figure 54).

- **Replace aged furniture to portray that all of Mauao is well maintained and cared for.**

4.3.2.7 Physical Protection

The locking of the vehicular access gates at all times provides good security for any unauthorised vehicular access.

The water reservoir along the track amongst the farm land is subject to graffiti and vandalism on occasion. The current remedy is to paint over any graffiti at the first instance (Figure 49). Although remedying, this is not a more permanent and lasting solution.

- **Vegetate around the water reservoir to create a screen and barrier for anyone intending on vandalising it. This solution also provides amenity value to the area.**

4.3.3 Motu Kauri Track

4.3.3.1 Access

A short set of steps marks the access to the Motu Kauri track from the 4WD track, ascending to Mauao's summit (Figure 63).

The track is rather narrow and runs through vegetation that is closely located to the track (Figure 62).

Connecting to the Waikorire track there is a series of winding, steep steps through bush (Figure 59).

Access is strenuous with the track predominantly steep and winding with an abundance of steps.

4.3.3.2 Surveillance and Sightlines

There is no formal surveillance of the Motu Kauri track, however, the number of users provides ample transient passive surveillance for safe use of the track. Even as one of the lesser used tracks on Mauao, you would expect to come across other users every 2-3 minutes on average at any given time throughout the day.

Sightlines are often limited along the Motu Kauri track due to its winding nature, narrow tracks and vegetation lining the edge of the track.

4.3.3.3 Layout

The track connects the 4WD track to the Waikorire track, forming a quality connection in the overall scheme of Mauao's tracks. This layout results in added safety by connecting the short, more secluded Motu Kauri track to the more frequented tracks.

4.3.3.4 Activity Mix

Along such a narrow track issues can arise between walkers and runners sharing the track as the ability to pass is lesser. This is amplified with the large number of steps and the winding form in which they are configured.

4.3.3.5 Sense of Ownership

The sense of ownership along the Motu Kauri track is conveyed through its maintenance. The ground material is well kept with few bare patches. Some issues could be seen with the maintenance of some of the older steps which have excess build-up of material.

Some areas through the more densely bush covered areas are less maintained. This however strengthens the bush track atmosphere and doesn't present any real CPTED issue as the track is still clearly defined, which provides that sense of ownership.

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4.3.3.9 Quality Environments

The Motu Kauri track, although short, contains a quite significant number of steps that need special attention for maintenance to keep high safety standards.

Because of the lower use of the Motu Kauri track the ground material wears slower and is in good condition.

4.3.3.10 Physical Protection

Along the track there are very few opportunities for vandalism. This low potential of vandalism, coupled with frequent use, has deterred vandalism from occurring along the Motu Kauri track.

Recommendations for Motu Kauri Track

- **Maintain vegetation close to the track to ensure best possible visibility while maintaining the bush track atmosphere. This would include crown-lifting, leaf litter clearance as well as removal and trimming of shrubs and lower lying vegetation.**
- **Increase signage to indicate users location and distance from entry and exit points.**
- **Maintain steps by removing any excess material and levelling the tread. Ensure that all wood is structurally sound and not rotting, if so, replace.**

4.3.4 Waikorire Track

4.3.4.1 Access

The Waikorire track links to both the 4WD track and the Oruahine track. The junction between the Waikorire track and the Oruahine track is marked with a wide set of steps (Figure 64).

Access up Waikorire track from Oruahine track is via a constant combination of steps and landings, ascending steeply (Figure 68). The steps end where the junction between the Waikorire track and the Motu Kauri track is located. Between this junction and meeting the 4WD track, the track is relatively flat.

There are no real informal routes off the Waikorire track due to the steep grade to either side of the track, as well as dense vegetation.

4.3.4.2 Surveillance and Sightlines

Quality surveillance is maintained through the high user numbers along the Waikorire track, where it would be rare to not come across other users every other minute on average, at any time throughout the day. This high frequency of use provides ample passive surveillance along the entirety of the track.

Sightlines up the track are good along the whole length, with the track consisting of long straight sections for the most part and the track being of a good width.

The elevation of the track is above most vegetation, providing strong sightlines out of the track also (Figure 65).

4.3.4.3 Layout

The Waikorire track links to both the 4WD track and the Oruahine track at each end, as well as the Motu Kauri track. These links to other tracks results in a good layout for options to escape untoward situations.

The current side track to a lookout contains limited signage and is confusing. Information regarding its length and no exit status should be included.

Rest areas, particularly seats, are quite sparse in relation to the severity of steepness of the track, which results in a greater need to rest at shorter intervals.

The track's location running above steeply sloping terrain reduces opportunities for hiding, providing a safe environment for users.

Understanding distance to escape on each track option is important.

Recommendations for Waikorire Track

- **Include signage for No exit lookout track, including distance and destination**
- **Markers of distance travelled and distance to exit along each track.**
- **Install signs indicating correct etiquette for passing.**

4.3.4.4 Activity Mix

The Waikorire track is highly popular with experienced runners due to the challenge of the high number of steps and steep grade of the track. This presents issues for passing when sharing with walkers as the track narrows at points.

4.3.4.5 Sense of Ownership

The Waikorire track is very well maintained with steps of high quality and ground material replenished. This vigilance with maintenance shows that the track is cared for, reducing vandalism by conveying the knowledge that issues are remedied and, in turn, the higher quality of the track, the higher frequency of use.

- **Include information signs to convey knowledge and awareness.**

4.3.4.6 Quality Environments

The steps are very well maintained and constructed with a good slope away from the edge for improved safety.

The ground material has a good cover along the entirety of the track and is well maintained, reducing chances of slipping.

Rest areas, particularly seats, are quite sparse in relation to the severity of steepness of the track, which results in a greater need to rest at shorter intervals.

- **Assess opportunities to install more frequent rest points for users, particularly around the steps section. These can be in the form of seats or less formal leaning areas.**

4.3.4.7 Physical Protection

Due to the high quality and vigilant maintenance of the track there is very little instances of vandalism. There are signs of minimal graffiti on the bridge, however it appears old. The minimal use of built elements aids in the reduction of vandalism as it provides less opportunities to damage property.

4.3.1 Oruahine Track

4.3.1.1 Access

The access point of the Oruahine track is located next to the Park Ranger's office on Adams Avenue and leads into the campground.

Access leading up to the junction with the Waikorire track is a relatively gentle grade with a wide track. However, from the stone steps up to the junction the ground material is a GAP 40 chip, a much larger chip than used on the rest of the tracks. This results in a much higher frequency of slipping as the larger chip moves more freely (Figure 75).

The track terminates when it meets the 4WD track. It also meets the beginning of the Waikorire track. This connection to multiple tracks allows for safer access and opportunities to exit in untoward situations.

On the lower section of the track there are informal tracks that connect to the base track through farm land. These provide added escape routes and options (Figure 76).

The upper section of the track consists of stairs that cascade down through a short section of bush (Figure 80) and down an area on the cliff edge which the track skirts (Figure 79).

4.3.1.2 Surveillance and Sightlines

Surveillance is good along the whole track, with a high number of users on the Oruahine track drawn in by the gentler grade and good views that it provides.

Sightlines are extremely clear along the entirety of the Oruahine track. Initially the cleared farm land provides for expansive views both up the track and out over the water and surrounding landscape. On the upper track the track perches on sheer cliffs, resulting in unobstructed views out over the water and no vegetation obstruction of sightlines looking down the track.

4.3.1.3 Layout

The layout of the track allows for added safety as it provides quality visibility up the track as well as around it.

Seating and rest areas along the track are infrequent and this could pose an issue where a user that is over tired could reach the stairs at the top of the Oruahine track and could fall due to tired legs. With more seating would come more opportunities for static passive surveillance of the area by those resting.

Recommendations for Oruahine Track

- **Replace the GAP 40 section of the track with the same finer grade gravel as is used successfully on the remainder of the track.**
- **Markers to provide indication of informal routes.**
- **Assess areas to provide rest areas along the track. This creates areas where static passive surveillance of the track can occur.**

4.3.1.4 Activity Mix

The Oruahine track is popular with both runners and walkers due to the good grade and quality views that it provides. The track is amply wide for passing along the lower section, however the upper section of the track, once the track skirts the cliff face, narrows and poses a risk when passing (Figure 79).

4.3.1.5 Sense of Ownership

With the track being so well maintained, coupled with it passing the Park Ranger's office, through the campground and farm land, it provides a good sense of ownership and a feeling of presence along the track. This presence gives an added sense of safety and deters any vandalism or other criminal activity.

4.3.1.6 Quality Environments

Oruahine track is well maintained with good borders of vegetation around the cliff edge sections to define the edge as well as quality constructed steps and well maintained gravel.

The GAP 40 gravel between the stone steps and the junction with the Waikorire track is the only real issue in regard to the quality of the environment.

4.3.1.7 Physical Protection

Due to the minimal amount of constructed elements physical protection is not required. With high user numbers, passive surveillance hinders any opportunities of wrong-doing along the track.

- **Install signs indicating correct etiquette for passing.**

5.0 Part B – IPTED and Universal Access Assessment

6.0 Introduction

The overarching principles of barrier-free public spaces is that these spaces are adapted to fulfil the needs of all people, providing independence, convenience and safety to everyone, whether they be a child, parent with a pram an elderly person, someone with a temporary injury or someone permanently physically disabled or visually impaired. The achievement of barrier-free environments is all about inclusive design.

Inclusive design includes consideration of injury prevention through environmental design (IPTED) and universal access and is an important component of the design process. Tauranga City Council, with its range of highly public spaces, has a strong emphasis on a barrier-free approach ensuring best practice in IPTED and universal access within its projects.

Barrier-free and inclusive design is well detailed and guided by standards within the urban and built environment. Such provisions within open space and outdoor recreation areas (without buildings) are less structured and open to wider sets of interpretation than in the urban setting.

Setting policy on the ambitions of a barrier-free approach within the Mauao Management Plan in relation to these considerations will ensure that any design development going forward is appropriate in terms of accessibility and matches the particular environment and character of the historic Reserve, allowing the area to be enjoyed by a wide range of people.

6.1 Accessible Journeys

Universal access design aims to meet the environmental needs of all users, regardless of age or ability. Universal access design aims to:

- Improve the usability of the built environment
- Promote safety and well-being for everyone
- Enable independent use of the built environment
- Ensure that no-one is excluded from use of the built environment of physical barriers

For public spaces to be fully accessible there must be an accessible route. An accessible route is defined in NZBC D1 as an access route usable by people with disabilities. It shall be a continuous route that can be negotiated unaided by a wheel chair user, and people using a walking device or guide dog.

The principles of an accessible route in outdoor open spaces generally recognises that not all areas will be accessible, but that there should be at least one route that allows visitors with limited accessibility to gain an experience of the open space they are visiting.

7.0 IPTED and Universal Access Methodology

There are a range of design approaches for assessment for IPTED and universal access, but a key issue is ensuring that the evaluation and consideration of these issues occurs at a local level and is appropriate to the context of the project. This requires an examination of the particular issues that might arise in the local area (in this case Mauao and its wider coastal context) and an analysis of past issues that might influence the design.

Effective IPTED and universal access evaluation includes anticipating the issues or behaviours of people and then responding through the design interventions or approaches to minimise or eliminate those potential issues. IPTED can work at a very physical level but also psychological level. As such, some design approaches will respond to the creation of a sense of well-being to users. This component is one that becomes particularly important in public spaces where it is often a perception which can dictate the level and type of use a space might trigger.

Maintenance is inherently incorporated into the considerations for IPTED. Ease and type of maintenance can have a strong influence.

The methodology undertaken for this IPTED and universal access report was as follows:

- Independent evaluation of IPTED and universal access to ensure integration and consideration of these principles at outset.
- Preliminary briefing from client and review of current situation on the ground, including full field assessment in conjunction with CPTED expert and detailed mapping of site and identified considerations and issues.
- Desk-top analysis of relevant documentation and data including track usage and user profiles.
- Identification of key policy and design responses and/or recommendations related to IPTED and universal access that may arise through the assessment.

Considerations have included; lighting, sightlines, movement predictors, management, maintenance, signage and maps. Assessment of the IPTED and universal access components of the project referenced and were guided by the Injury Prevention Strategy. Universal access was also considered with reference to NZS 4121:2001 and barrier free streetscape elements. Any specific requirements that may have been identified through the consultation phase and/or with key experts such as Blind Foundation, Barrier Free and local Council officers, Mauao Trust Board and Iwi were also considered as part of the assessment.

References: The following key documents have been referenced in this assessment; NZS 4121:2001 and barrier free streetscape elements and Injury Prevention Strategy, SNZ HB 8630:2004 tracks and outdoor visitor structures and the Injury Prevention Strategy.

8.0 Purpose of this Assessment

This assessment has been undertaken in order to provide an overview of the current IPTED and universal access status of Mauao (in particular its publicly accessible tracks) and to provide recommendations for the achievement of the most appropriate levels of barrier-free design for Mauao.

8.1 Local Context

Tauranga City Council has developed a range of strategies that inform this assessment. Ones that contain visions, goals and actions of relevance to this barrier-free assessment are outlined below.

The Age-friendly City Strategy (2013 – 2023) has a vision to enable people to live independently and participate in all aspects of community and city life as they age, and the vision of particular relevance to this assessment provides for accessible public spaces and buildings to enable active use by all. Goal 7 in the Strategy provides for outdoor spaces and buildings to be accessible and encourage active use and enjoyment of older people. Action 7.10 Plan and create safe and secure public spaces, including better definition of edges and good visibility, particularly at entrance points. 7.11 Improve the accessibility of streets, parks and public buildings. 7.12 Continue to improve footpaths and walkways – review surface conditions.

The Disability Strategy (2001) has a vision that aims to reduce the barriers faced by people with impairments so that they can reach their full potential and be recognised as valued members of the community. It is a long term plan for the City to optimise inclusion, opportunity and independence for people living with impairments. There are two goals of particular relevance to the assessment of barrier-free design at Mauao; that people are able to move about the city easily and safely without being limited by the environment and Council facilities, and services can be accessed and enjoyed by all people. In addition there are some specific actions which inform this assessment: Action 1.9, progressively incorporate standard accessibility symbols across all Council facilities and information. Action 1.12, provide information on accessibility at parks and reserves. Action 2.15, investigate resting and seating locations across the City.

The Open Space Strategy (2006) has a section which discusses accessibility of open space in Tauranga City with the goal of the community being aware of and having good access to the open space network. The ability to access, use and enjoy Tauranga's open space is recognised as a major contributor to people's quality of life.

The Sports and Active Living Strategy (2012) has a vision to have "more people more active more often". Of particular relevance to this assessment is Goal 6 that provides for the environment (built and open space) to encourage and motivate people to be active in their daily lives.

8.2 Strategic Context

This assessment references the New Zealand Disability Strategy. New Zealand Standards must be considered in any new project and in any refurbishment, development or change to public spaces. The Standards that apply to public spaces, and therefore inform this assessment, include:

- NZ Standard 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities
- AS 1428.1_2001 – Design for Access and Mobility – Part 1 General Requirements for Access – New Building Work
- AS 1428.2_1992 – Design for Access and Mobility – Part 2 Enhanced and Additional Requirements – Buildings and Facilities
- AS 1428.3_1992 – Design for Access and Mobility – Part 3 Requirements for Children and Adolescents with Physical Disabilities
- ASNZS 36612 1994 – Slip Resistance of Pedestrian Surfaces – Part 2_Reduction of Slip Hazards

The Barrier-Free New Zealand Trust is a charitable trust with the aim to facilitate and encourage solutions for the provision of Universal Access for all people. It oversees the display of the International Symbol of Access (ISA).

There are some particular sections of the New Zealand Standards that have informed this assessment and the compliance analysis undertaken for Mauao. These include those outlined under Section 13 in NZ Standard 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities. It should be noted that these standards are designed predominantly for highly urban environments and therefore need to be considered in light of the more natural open space situation being assessed.

13.1.1 Accessways

All accessways shall be at least 1200 mm wide, have a maximum crossfall of 1 in 50 and shall as nearly as is reasonably practicable conform to the requirements of an accessible route.

13.2.1 General

For an accessway to be usable by people with disabilities it shall be free from hazards or obstructions.

13.2.2 Overhead obstructions

Hanging signs, lights, awnings, and similar objects shall have a minimum clearance of 2000 mm above the ground or finished floor level of the accessible route, accessway or usable area.

13.2.3 Permanent and temporary obstructions

Objects fixed permanently to the ground or to the side of an accessway e.g. telephone booths or outdoor furniture, including temporary obstructions such as display stands, billboards, sandwich boards etc. shall:

a. Not intrude into or obstruct the 1200 mm clear accessway;
b. Have a feature within 150 mm of the ground that will be detectable by a person using a white cane;
c. Be colour contrasted to the surroundings.

9.0 General Overview

Mauao is an Historic Reserve that has a high degree of public access and is used by an array of visitors daily with differing abilities, including elderly, those with physical disabilities, visually impaired and young children and parents with prams. This high use, particularly of the tracks, means that injury prevention and universal access is an important consideration in establishing the most appropriate way the public should be informed and guided to use the open space of the Reserve.

The character of Mauao, despite its location adjacent to an urban town centre is one of natural wildness. It is an landscape of outstanding natural character and has high cultural significance. It is this character that is likely to attract many of the visitors. Assessment of the Reserve in terms of IPTED and universal access has therefore been undertaken with this character in consideration. Addressing potential issues without consideration of the particular natural character of the site could easily lead to a negative impact on this character. This assessment therefore acknowledges that the level of accessibility should be consistent with the retention of a relatively informal, wild and natural character.

10.0 Site Context

The following section references a range of tracks that are currently located and sign-posted at Mauao. The official formed tracks referred to are Base track, Oruahine track, Motu Kauri track, 4WD track, Stone steps and the Waikorire track. In addition to these tracks there are some informal desire lines that are used on a regular basis by visitors to Mauao. These are generally located within the open grazed areas and provide 'short cuts' between particular points. These informal tracks will be referenced in this report as desire line tracks.

The assessment for injury prevention and universal access has focused predominantly on the public track system and associated facilities such as steps to beach areas and seats/picnic tables, as these are the areas frequented by most visitors.

The landform of Mauao is that of a remnant volcanic lava dome. This means that the site is steep and rocky in many places and the strong coastal processes that influence the edges of this dome have facilitated coastal erosion and steep edges to the Base track.

Visitors that choose to leave the formal track routes (particularly on the steeper grades) are likely to encounter potential for injury. There are loose rocks and steep drop offs, often in areas quite near the tracks. It is recognised that this potential cannot be avoided. Ensuring that visitors are informed of the environmental conditions they will encounter so they can make the right decisions about how they use and experience Mauao is therefore an important aspect of the injury prevention approach.

10.1 Types of Injury

There are no formal records of the public injuries that have occurred on Mauao. Contractor injury information is kept on the Council Vault system. Discussions with the Park Ranger for Mauao indicates that many of the lower level injuries are not reported. However, of the injuries that have been reported, the majority are slips and trips, in particular slips into the drainage channels at the edges of pathways. This can sometimes be caused by the number of people on the narrower tracks (trying to pass each other on edges of tracks due to impatience).

There have been a number of heart attacks on the Waikorire track in particular. The steep steps and the number of steps without any break places a lot of strain on those using that track. There are about 3 – 6 people per year who suffer heart attacks on Mauao.

10.2 User Groups

There are a high percentage of users of Mauao that are over sixty years of age and they use all the tracks.

The Base track is used by pushchairs and wheelchairs and both can get right around the track.

The track data for Mauao shows that there are high numbers of visitors that use all the tracks. The majority of use is on the Base track, but there are also significant numbers that proceed up the various tracks to the top of Mauao.

Wheelchair and pushchair use has increased with the improvements undertaken to the quality of the Base track. Visually impaired usage has also increased with a number of visually impaired visitors using both the Base track and other tracks. Capping tactiles have been put on the top of some steps to assist these visitors.

Mauao is not closed off during the evening, so there are a significant number of users that are on the Reserve late at night (up to 11pm or later) and in the early morning.

It is estimated that 70-80% of visitors use the good quality tracks on Mauao, with a small number of people going off the tracks and forming their own routes around the Reserve.

Paragliders and hand gliders use the site and gain access via the 4wd track. They have a highly controlled system in place for how they use the site, with safety procedures in place.

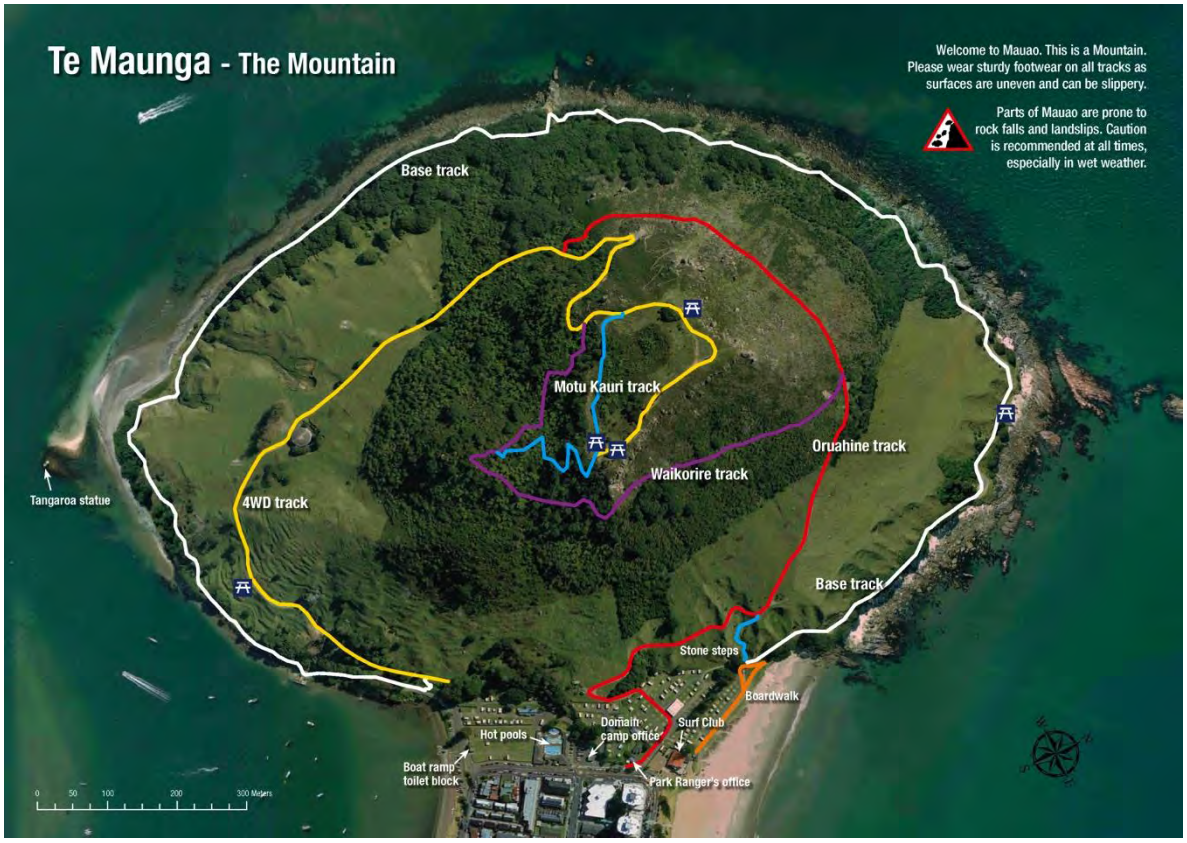


Figure 1 – Aerial photograph showing current track locations and names

10.3 Complaints

The main complaints received from users at Mauao relate to people ignoring the signs and bringing dogs and bikes onto the Reserve.

10.4 Maintenance Contract

There is a contract for walkways maintenance for the tracks on Mauao. The Base track has a high standard of maintenance requirement in the contract with the other tracks being slightly less than high standard.

There are rock stability checks that occur twice yearly. A laser point measurement checks the potential for movement. Currently the stability of rock on Mauao is good.

10.5 Emergency Protocols

Cell phone coverage at Mauao has improved and now covers the majority of the site. This cell phone coverage means that users have quick access to call emergency services in the event of an accident or incident. Due to them being the first responders to Mauao the life guards train on Mauao to ensure they know the quickest routes to get to patients. The fires service also use training on Mauao for site specific technique training.

In an emergency situation the responders use a relay system with radios to ensure coverage around the whole of the Reserve. The close proximity of the life guards means that on a 111 call from Mauao, the life guards are contacted immediately. They have small 4x4 vehicles which can access the site and are usually the first responders to any incident on Mauao.

The 4wd track has full access to the summit of Mauao for emergency and track maintenance.

In times of high swells, contractors are put to stand on site at entrances to tell visitors of the high swell situation and to avoid edges and to use the site with caution. This situation only occurs in excessively high seas.

10.6 Event Conflicts

There are a limited number of events held at Mauao during the year. These events are generally of a recreational nature, ie. Running races such as King and Queen of the Mountain. These events can cause conflicts with general users as they occur while general visitors might be on the tracks. Particularly on narrow tracks, the speed of those racing can cause conflicts with those using tracks for more leisurely walks.

There are limited times when track closures occur on Mauao – such as when there have been rock falls or serious incidents. Even with signage and gates being locked, visitors tend to ignore the closures and will find their way onto the Reserve. This highlights the difficulty that would be encountered if any formal closing off of the Reserve for events were to be undertaken. As the site is so popular and with high numbers, visitors expect access.

11.0 Mauao Universal Access and IPTED Analysis and Considerations

The following section provides an overview of the universal access and IPTED situation at Mauao under the relevant key issues of the Barrier Free Checklist developed by the Barrier-free Trust. Each area of consideration outlines the current situation, any issues or concerns, and highlights any possible improvements and/or recommendations appropriate to each issue.

11.1 Accessible Route

There is one track on Mauao that is promoted as an accessible route, that is the Base Track. The Base Track is 1.2m wide at its narrowest points (approximately two locations) and is on average 2m wide (and in some places up to 2.5m wide). The width of the track has been determined in part by the topography of the site and natural rock protrusions or seaward edges that reduce track width. The 1.2m minimum width means that the Base Track adheres to the Building Code requirements and in most locations exceeds these.

Discussions with s 7(2)(a) - Privacy confirm that the Base Track has been assessed by the Tauranga Disability Awareness Group. This group (led by s 7(2)(a) - Privacy from CCS Disability Action) identified a range of problem spots along the Base Track that impeded good accessibility. These problem areas were then fixed under both track maintenance and capital works. Particular issues that were remedied included widening of the track in certain locations and reduction of steepness of the track in particularly steep areas to facilitate better wheelchair access.

There is only one location on the Base track where the grade of the track is greater than 1:12 and is mostly able to be traversed by wheelchairs or with assistance from someone to push up the incline.

Figure 2 – image showing entry ramp leading from boardwalk

An accessible route is also important for visually impaired users. The main aim of a visually impaired accessible route is to provide a clear zone where movement can occur with a strong guiding edge. The natural mountain side of the Base

Recommendations

- **That Base Track is the only track on Mauao to be identified as having a fully accessible route.**
- **That if the trial drainage cover is successful, it be implemented progressively throughout the accessible route track system (Base Track) to ensure this track provides a safe route for visually impaired away from the seaward edge of the track.**
- **That no areas of the Base track are less than 1.2m in width.**

track provides a good edge that provides such guidance and keeps visually impaired users away from the steeper edges on the seaward side of the track. Currently the only impediment to this being a good accessible route from this perspective is the occasional holes on this side of the track that provide for track drainage. These could be a trip hazard to general users also.

There is a trial underway which is looking to cover these drainage holes on the Base track with a grate. The trial seems currently to be working. If this system was able to be put in place at all these locations around the Base track then a high quality accessible route would be achievable.

Figures 3, 4 and 5 Drainage holes on inward side of Base track and trial drainage cover

Due to Mauao being grazed, there are a number of gate entries along the Base track that prevent sheep escaping and which also prevent cycles and small vehicle access. These

currently provide relatively easy access by pushing of the gate. There is a rural character to these gates which is appropriate to the site.

Figure 6 – Example of entry gate

11.2 Projections

Projections are objects that protrude into the track or accessible route in such a way that users might not see them (particularly visually impaired) and therefore walk into them, causing possible injury. On the tracks at Mauao the main projections are those on the Base track and are the large pohutukawa tree branches that occasionally cross over the track. These, although creating projections, are a significant component of the character of this track and provide shade and visual amenity for users of the track.

The current track maintenance ensures that any dead branches are removed and any protrusions from the branches that might be particularly dangerous. In general these projections are high over the track and/or are large and highly visible.

It is not considered necessary to do anything other than the current maintenance for these.

On some of the other tracks, the timber edges of steps project out into the track area and could cause a trip hazard – these could be easily fixed by removal of the projecting timber at the end of the steps.

Figures 7 and 8 – Examples of pohutukawa branch projections over track

Figure 9 – Example of timber end of step protruding out into track corner

Recommendations

- **That the current approach to bush track maintenance and pohutukawa trimming on Base track be continued to ensure that projections are minimised and maintained to ensure reduction of possible injury.**

The vegetation on the tracks surrounded by bush is well maintained and is kept clear of the track while still maintaining a bush character to the track and doesn't create any projection issues.

Figure 10 – Example of bush track with good clearance of vegetation and visibility

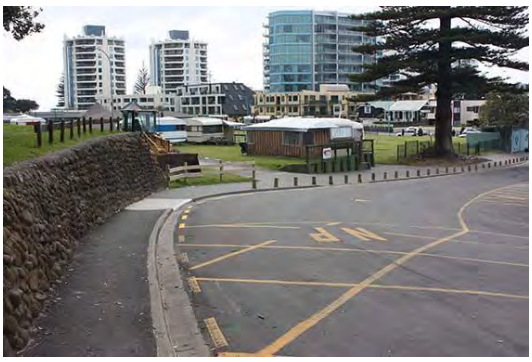
11.3 Ramps

There is one ramp on Mauao located at the northern entry point. It is a continuation of the timber boardwalk that extends along the beach front to the east of Mauao. This boardwalk meets the Building Code requirements

11.4 Entrances

There are two main entry points for access to Mauao. Both these entry points are fully accessible. The entries have an inconsistent approach to signage currently (refer to signage section 6.11). At the entry adjacent to the boat ramp, the addition of a new footpath has ensured a safe route is provided that avoids use of the road. People still use the road also as a movement zone, however if traffic movements are busy there is a safe option with the footpath adjacent.

The road which then forms the main entry pathway is only used by local fishermen with permits to fish and launch from the other jetty. As such the traffic movements are low and not likely to be a major conflict with visitors using the road as a footpath.



Figures 11 and 12 – Example of visitors using road as pathway entry at boat ramp entry and footpath extension at boat ramp to avoid boat ramp carpark area

11.5 Public Facilities

The public facilities located on Mauao consist of seats and picnic tables. The seats on the Base track have a rural timber character in keeping with the overall character of the site and are simple in design. Some new seats have been put in place that have a highly urban character and detract from the character of Mauao. Picnic tables are limited on Mauao as eating is not generally encouraged as an activity on the site. Informal use for picnics does occur but there is a pack in / pack out policy so there are no rubbish bins provided, thus reducing the use of the site for picnicking. Generally users are focused on walking and other recreational activities.

Figure 13 and 14 – Examples of timber seat at sides of track to allow for rest (Base track and Motu Kauri track)

Recommendations:

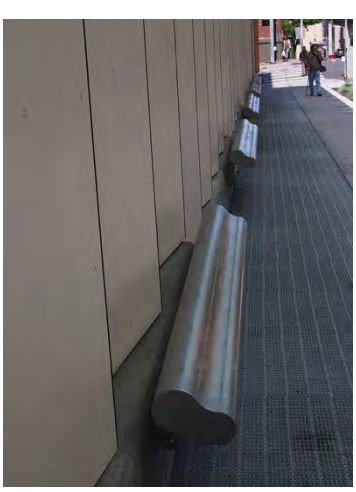
- **That the furniture for Mauao be consistent and of timber which is left to naturally weather.**
- **That rest seating is provided at regular intervals along Base track and at appropriate locations where space allows on other tracks.**

11.6 Stairs

The Waikorire, Motu Kauri, Stone steps and Oruahine track all have steps to address the steep incline of the track in certain locations.

The step construction is good with solid defined edges and generally good stepping distances and riser heights. The surface is non-slip gravel.

The track with the longest run of steps is the Waikorire. This is also the track that has the most heart attack incidents. There is currently little opportunity for rest on this track as it is narrow in parts. Provision of a seat would mean that people using the seat might create a trip hazard with legs protruding out onto the walkway. However, it is considered important that some form of formalised rest option be considered on this track where the main step run occurs. The option of developing a timber seat leaner at the edge of the track might address this issue – providing a trigger for people who are tired on the steps to rest and catch their breath while minimising the space required. The image below is a highly urban leaner design, but something similar could be developed from a timber construction and provided at appropriate locations on the inward side of the steps.



Figures 15 and 16 – Example of urban seat leaners (people remain slightly standing) and steps at Waikorire track

Recommendations:

- **That investigation of seat leaners at appropriate locations on Waikorire track be put in place to allow resting during ascent of the stairs that is out of the movement zone of the track.**

11.7 Warning Systems

There are some steps where tactile warnings have been put in place for visually impaired users, as identified by the CCS advisory group that visited the site. It is not considered necessary for any additional controls be put in place at this stage as it would detract significantly from the character of the track and assessment of the usability of the site indicates that at this stage they are not required.

11.8 Visibility Factors

The tracks all have good sightlines and are kept open and clear of protrusions which means visibility on the tracks is good. The seaward edge of some of the Base track is very steep and in some locations the edge definition due to the narrowing of the track (due to geological form) is less visible than on other parts of the track. In these locations currently a simple timber edge has been put in place. This is located to ensure it angles out from the track so that it does not become a trip hazard. This approach creates a visible edge to these locations and a slight height difference that creates a shadow, further emphasising the edge situation.

Figure 17 – Example of timber edge definition on Base track

There are locations on the track (in particular along the Oruahine track and at the summit, where steep edges to the seaward side of the track create potential safety issues. Placing physical barrier structures in these locations would affect the character of the site. However some way of delineating the edge clearly to prevent accidentally movement off the track is considered beneficial.

In a number of locations this has been achieved with the use of Phormium cookianum plantings – which provide a low (up

Recommendations:

- **That the current timber board edging at steep and narrow locations of the tracks be used to delineate edges as and when required.**
- **That Phormium cookianum continue to be used and maintained as an informal and soft edge treatment to tracks with steep sides in preference to handrails or other barrier structures.**

to about 1m) and dense edge to the track that prevents users from dropping off the edge of the track. It also provides a good visual clue to the edge of the track without impacting on views.

Figures 18 and 19 – Examples of use of Phormium cookianum to delineate edges of tracks with steep drops on seaward side

11.9 Surface Finishes

The tracks at Mauao all have a good surface finish and quality. There has been recent major renovations of the tracks and steps and a consistent approach to the surface material has provided an appropriate track amenity that links well with the character of the site while also providing a good level of non-slip surfacing.

The track is constructed of a Gap40 base with an overlay of fine gravel. If the Gap40 becomes visible this is used as a trigger for track maintenance. In certain locations it is important also to remove the excess fine gravel to prevent slipping. The track surface material provides an excellent non-slip surface in winter, but as it dries in the summer the gravel can be slightly more slippery, hence maintenance of any excess surface gravel and the prevention of Gap40 (which creates a more slippery rolling surface) is addressed.

The other benefit of the gravel surface is that with the high user numbers the gravel creates a sound which warns users of other people coming up behind them – thus assisting with the shared use management of the tracks and also safety.

Due to the character of the site and the benefit of an audible track, even with the high use of the Base track it is not recommended to put in place any form of hard surface such as concrete or tarseal.

Recommendations:

- **That the current track maintenance levels and material be retained to ensure a high quality non-slip surface that allows users to hear people approaching from behind (for both safety and injury prevention reasons).**
- **That Phormium cookianum continue to be used and maintained as an informal and soft edge treatment to tracks with steep sides in preference to handrails or other barrier structures.**

11.10 Signs

Providing the right information to users is a critical aspect to barrier-free design. Signage becomes the main opportunity to provide clear indications to users of the environmental conditions they are about to encounter and their ability to judge accessibility according to their own abilities.

The current interpretive entry signs at Mauao are difficult to read and not very accessible to users (one at the boardwalk entry has been removed). These main entry signs provide the key opportunity to provide simple and clear information about the tracks and environment visitors are about to enter. This is particularly important for non-local users who are not familiar with the site.

In addition to the main entry information signage, there is an opportunity to provide additional track wayfinding at key locations to ensure users know what options are available to them, and key information such as time and difficulty (refer to section 6.11).

Figures 20 and 21 – Example of current track directional and time signage and entry signage at Boat ramp

As the images show, there is a lot of information and text on the tracks information signage. It is recommended that the amount of information is rationalised and focuses on the grading level of the track.

Figures 22 and 23 – Example of main interpretive entry sign and track information sign at boardwalk entry

Recommendations:

- **That a wayfinding strategy is developed that includes improved communication to users of Mauao (both local and visitor) to ensure users can assess adequately the range of track options available.**
- **That the website and brochure information on Mauao be updated to include the details of track grading.**

11.11 Track Information and Grading System

Where grades vary, are confusing or are poorly understood, it can act as a deterrent to people undertaking walks, particularly to less confident and able walkers. The lack of an agreed grading system (which addresses signage, track rating and degree of difficulty) limits the accessibility and use of walking tracks for recreation and physical activity.

Mauao currently has little information for users on the level of difficulty of the varying tracks accessible to the public. The Department of Conservation has begun in places to adopt the track grading system promoted by the Parks Forum and in use throughout Australia as an industry guide, providing consistent information to users on track grade and difficulty.

The intention of the grading system is to develop a voluntary uniform walking track grading system. The Australian walking track grading system is a technique for uniformly grading walking tracks and communicating that grade to the walking public. Its aim is to reassure entry level walkers, particularly the disabled or people walking with children, that a particular track is suitable for their skill level. The system uses a difficulty scale from one to five as follows;

- Grade One is suitable for the disabled with assistance
- Grade Two is suitable for families with young children
- Grade Three is recommended for people with some bushwalking experience
- Grade Four is recommended for experienced bushwalkers, and
- Grade Five is recommended for very experienced bushwalkers

As identified in the Australian document, track grading is a way to inform people about the features of a walking track so they can gauge whether a particular walking track is suitable for them. It can also assist in the marketing and promotion of walking as a leisure activity.

The track is graded in two ways; there is a technical grading of the walk (in Australia using a series of questions based on the Australian Standard 2156.1-2001 walking tracks – classification and signage, then a plain English language description that describes the walk to the public is developed.

The Department of Conservation has developed a similar grading system as follows:

- Easy access short walk: suitable for people of all abilities, wheelchairs and children's buggies
- Short Walk: well formed, easy walking for up to an hour
- Walking Track: well-formed easy walks from a few minutes to a day
- Great Walk or Easy Tramping Track: generally well formed track for comfortable overnight tramping/ hiking trips
- Tramping Track: mostly unformed but have track directional markers, poles or cairns
- Route: unformed, suitable only for people with high level backcountry skills and experience

11.12 Proposed Track Grading for Accessibility at Mauao

Given the popularity and number of users of the tracks at Mauao and the varied capabilities of these users, it recommended that a track grading system be introduced into the overall wayfinding for Mauao. Given the Department of Conservation use of the Australian track grading system it is considered that using this system will provide a relatively consistent and robust approach to determining the track grading.

The key to grading a walk is to describe it so that a person doing the walk gets a good idea of what to expect. This means:

- Walks should be described as they actually are; and
- A walk gets its grading from its hardest component.

Therefore a walk will often have components that are easier than the walk's ultimate grade.

The application of the Australian Walking Track Grading System is a two-step process.

Step 1 – Technical grading of a walk

The person grading the walk uses technical descriptors, based on *AS 2156.1 Walking Tracks – Classification and Signage*, to determine the walk's level of difficulty.

Step 2 – Translating the technical grading into a plain English grading

Using the 'Walking Track Grading System Decision Matrix for the public' the technical grading information is translated into plain English.

The Australian grading system recommends a range of information to provide to users to ensure that they understand clearly the type of track and its accessibility. This information should be provided at the start of the track and on any electronic or hard copy advertising or brochure information about Mauao.

For Mauao, it is recommended to use the full range of information for the track grading as outlined in the table below.

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Symbol					
Distance	Distance to complete walk. x km.	Distance to complete walk. xx km.	Distance to complete walk. xx km.	Distance to complete walk. xx km.	Distance to complete walk. xx km.
Gradient	Flat.	Gentle hills.	Short steep hills.	Very steep.	Very steep and difficult.
Quality of path	Well formed track.	Formed track.	Formed track, some obstacles.	Rough track, many obstacles.	Rough unformed track.
Quality of markings	Clearly sign posted.	Clearly sign posted.	Sign posted.	Limited signage.	No directional signage.
Experience required	No experience required.	No experience required.	Some bushwalking experience required.	Experienced bushwalkers.	Very experienced bushwalkers.

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Time	High and low estimate of time needed to complete track (eg 1.5-2hrs).	High and low estimate of time needed to complete track (eg 1.5-2hrs).	Time needed to complete track (hours/days).	Time needed to complete track (hours/days).	Time needed to complete track (hours/days).
Steps	No steps.	Occasional steps.	Many steps.	N/A	N/A

For further information on the Australian Walking Track Grading System please visit **http://www.dse.vic.gov.au/walking.**

A preliminary assessment of Mauao indicates that there will only be 3 grades of track – from 1 – 3. For all tracks it is recommended that the additional information on whether the track has stairs be included.

11.12.1 Base Track

Assessed at Grade 1

11.12.2 Oruahine Track

Assessed at Grade 2

11.12.3 Waikorire Track

Assessed at Grade 3

11.12.4 Motu Kauri Track

Assessed at Grade 3

11.12.5 4WD Track

Assessed at Grade 2

11.12.6 Stone Steps

Assessed at Grade 2

11.12.7 Desire Line Tracks

Assessed at Grade 3

12.0 IPTED and Universal Access Field Assessment Sheet

The following checklist asks key questions - responses to which will provide an indication of the level of IPTED and Universal access compliance of particular design components relevant to Mauao Reserve. This checklist forms the basis for a detailed assessment of compliance. The checklist is formulated as a series of questions which respond to the key areas of consideration for IPTED and Universal access. Response Options are: Y= yes (complies with requirements), N+no (does not comply), NA= not applicable to this open space environment

Item	Issue	Consideration	Yes	No	N/A	Comment
1.0		Do public spaces, in particular, have good visibility?	Y			Excellent sightlines on all tracks
2.0	Lighting	Is there lighting to be provided if the paths or spaces are not used at night?		N		Not appropriate to provide lighting and people who use in low light or at night generally bring their own lights
3.0	Quality Environments/ Ownership, Maintenance, and Management	Does the design provide territorial reinforcement through design features? *(eg. Clear delineation of public vs private areas with change in paving material or other means)*			N/A	
		Does the design allow for easy maintenance? *(eg. Seat designs have gaps between components which allow easy water-blasting for rubbish removal)*	Y			
		Are there signs and information to guide people on how to report maintenance?		N		This provision should be included on the new proposed entry signs
		Are rubbish bins or associated maintenance objects such as water taps located appropriately?			n/a	Pack in and pack out policy for the site that is generally adhered to well by users.
		Does the design create a usable, easily maintained space which will engender care and ownership?	Y			
4.0	Signs and Information	Are signs visible and legible? NB: ensure that signage should include a mix of capital and lower case letters *(eg. British motorway standard signage as they are graphically easier to read).*	Y			Current signs are text heavy and although legible have too much information and not enough information on level of accessibility. Some signs are well located, others could be better located and it is recommended to undertake a review of sign locations.
		Are there clear signs to indicate where disability parking is available?	Y			No maps are provided on the entry track signs – it is recommended to include mapping with distances and times to remove need for text heavy signage.
		Are signs conveying messages clearly?		N		
		Is information adequate?		N		

Item	Issue	Consideration	Yes	No	N/A	Comment
		Are sign strategically located to allow for maximum visibility?		N		
		Are signs well maintained?	Y			
		Are maps provided		N		
		Are signs displaying hours of operation?			n/a	
5.	Physical Elements/Street Scape/Carparks	Is all street furniture located so as not to protrude into key movement areas of footpaths and/or desire lines in public open spaces?	Y			
		Are pavement widths appropriate to accommodate wheelchairs, prams, mobility scooters?	Y			For the accessible track – Base track
		Are kerb crossings at a grade that allows easy movement across them?			n/a	
		Will the pavement and surface materials ensure low chance of trip hazard *(eg. won't easily move and create trip hazards)?*	Y			
		Are multi-use walkways designed to provide enough space and identification to reduce chance of conflict?	Y			
6.	Access	Are there ramps and/or level entrances provided	Y			
		Is there an easy transition from footpath to road?	Y			
		Is there clear identification of crossing locations that are safe?	Y			
		Are there tactile ground surface indicators (TGSI) at all crossing locations and at key edges?		N		TGSI are located at key step areas
		Is there a consistent approach to style and type of TGSI being used throughout the Town Centre?	Y			
		Have traffic management processes been located to optimise pedestrian movement along key routes and promote safe access?	Y			Addition of new footpath and boat ramp and closing of road entry to wharf to only official fishing boat users has provided this.
		Is there adequate access for emergency vehicles?	Y			Good emergency access via 4wd track and Base track has access for 4wd quad bikes from surf club.
		Are there handrails at stairs/ramps and to their full length and on both sides and at an appropriate height?		N		It is not appropriate to provide handrails on the steps due to the natural character of the site and need to reduce physical structures. Planting is used as edge delineation and in key danger areas simple steel pole balustrading is used.
		Are changes in level clearly identified and designed to ensure clear readability and use?	Y			

Item	Issue	Consideration	Yes	No	N/A	Comment
		Are there any unexpected changes in gradient?		N		Base track has been re-levelled to keep a relatively consistent grade without any abrupt changes in level.
7.	Physical Protection/safety	Are any barriers, including fencing, gates, bollards etc, designed to minimise any negative impact or perception?	Y			
		Is there security cameras integrated into the design?		N		
8.	Accessible Journeys and Macro Desire Lines	Are there appropriate locations for resting along journeys? (eg. Seats located on stairway landings, or at mid-points along journey	Y			
		Are there clear and accessible routes (along clearly identified desire lines)	Y			
		Are accessible routes following the most obvious desire lines for pedestrian and public movement?	Y			
		Are there clear sightlines along journey routes?	Y			
9.	Materials	Do all horizontal surface materials meet the minimum code for slip resistance?	Y			
		Where horizontal surfaces are on a slope greater than 3% do the materials chosen exceed the minimum code for slip resistance to ensure minimisation of slipping, particularly in wet conditions?	Y			
		Are surface finishes combined to minimise sound or reverberation?		N		The use of subtle sound from the gravel surface is considered beneficial to address shared space use of the track and is of low level sound so will not create conflict
		Do any grates or gaps have a width dimension of 12mm or less?	Y			
		Have materials been chosen that are easy to maintain	Y			
		Has timber been incorporated or treated to ensure removal of slip potential?	Y			Mesh has been used where required to increase slip resistance.
		Is there anti-slip nosing on all step edges?		N		Gravel creates a non-slip surface to steps thus reducing need for non-slip nosing.
		Have materials for seats and other street furniture with tactile nature been chosen to minimise potential for injury such as cuts, abrasions?	Y			
		Do all materials meet required NZ Standards?	Y			
		Are soft landscapes components designed and placed to ensure they do not create obstructions or impede movement or create trip hazards?	Y			Trimming of vegetation has been carried out well to ensure good sightlines and reduced projections into movement routes.

13.0 Summary

The current open space environment of Mauao has a good level of compliance in relation to IPTED and universal access. Despite its wilderness character the track system is well defined and the accessible route provided at the Base track is of good quality and still retains a sense of the character of the overall site, thus giving users of this track an experience consistent with the overall character of Mauao.

14.0 Recommendations

The following recommendations outline both statements of intent in relation to universal access and barrier-free design for Mauao, and also a range of recommended policies and actions that will assist in providing optimal universal access and injury prevention approaches appropriate to the particular character of Mauao.

a. That it is recognised that Mauao is a unique open space environment with a particular natural character that will influence the level and style of accessibility.
b. That Base Track is the only track on Mauao to be identified as having a fully accessible route.
c. That a wayfinding strategy is developed that includes improved communication to users of Mauao (both local and visitor) to ensure users can assess adequately the range of track options available.
d. That associated with the wayfinding strategy a track grading system with standard symbols and plain English text is implemented to ensure users can assess which tracks are most appropriate to their skill levels. It is recommended that additional information on whether the track has stairs be included.
e. That if the trial drainage cover is successful, it be implemented progressively throughout the accessible route track system (Base Track) to ensure this track provides a safe route for visually impaired away from the seaward edge of the track.
f. That the website and brochure information on Mauao be updated to include the details of track grading.
g. That the current track maintenance levels and material be retained to ensure a high quality non-slip surface that allows users to hear people approaching from behind (for both safety and injury prevention reasons).
h. That no areas of the Base track are less than 1.2m in width.
i. That some timber seat leaners be incorporated into appropriate locations on edge of steps of Waikorire track to provide respite for those using the track who may be fatigued and to ensure they are guided to the inward side of the track away from main travel routes.
j. That Phormium cookianum continue to be used and maintained as an informal and soft edge treatment to tracks with steep sides in preference to handrails or other barrier structures.
k. That investigation of seat leaners at appropriate locations on Waikorire track be put in place to allow resting during ascent of the stairs that is out of the movement zone of the track.

l. That rest seating is provided at regular intervals along Base track and at appropriate locations where space allows on other tracks.
m. That the current timber board edging at steep and narrow locations of the tracks be used to delineate edges as and when required.

Appendix 1: Site Photographs

Base Track

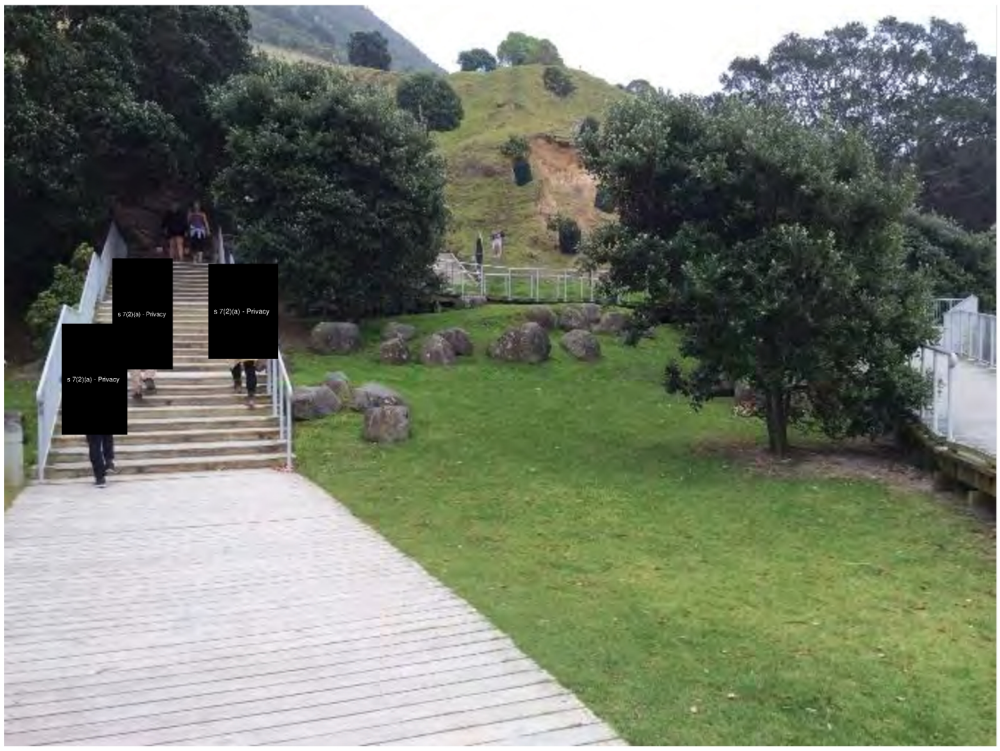


Figure 1: Access from the Mt Maunganui beach end of the base track provides modern, wide steps as well as a wheelchair ramp. At the top of these steps are entry gates that are in place to contain Mauao's sheep herd. These gates also prevent or deter any unwanted use by cyclists or motorcyclists.

Figure 2: Vehicular and pedestrian gate at the entry to the campground from Mauao's base track. These gates are installed to keep the sheep stock contained. The vehicular gate is only unlocked in emergency cases.

Figure 3: Along the entirety of the base track the fine chipped gravel on earth provides an appropriately safe, minimal slip surface that is easy to maintain. This surface also creates loud footfall noise, resulting in a good awareness of other's presence in the user's vicinity.

Figure 4: Pohutukawa Grove along the base track provides the 'nature walk' atmosphere whilst still maintaining good sightlines and access.

Figure 5: Formal access to Shelly beach lying beneath the base track. These steps are located in high visibility areas for safe access. Excess material can accumulate on the tread of the steps so it is recommended that this is maintained.

Figure 6: Exposed clay cliff faces to the inside of the track are subject to intentional gouging, particularly to chisel names into the clay. Over time this recedes the cliff face and causes instability. In one instance recently a costly stone retaining wall had to be installed to prevent collapse partly caused by this intentional gouging of the cliff face.

Figure 7: Formal access to Shelly beach lying beneath the base track. These steps are located in high visibility areas for safe access. Excess material can accumulate on the tread of the steps and gouging beneath the last step can occur so it is recommended that this is maintained.

Figure 8: An older seat installed looking over the northern shore of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats.

Figure 9: An older seat installed into the bank face looking over the northern shore of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats. The Park Ranger is looking to replace all memorial seats over time with wishes from iwi stating that Mauao is not a memorial site.

Figure 10: The grade along the base track is relatively easy, however at some points the grade is quite steep for a period of time, posing potential issues for wheelchair users in which Tauranga City Council states that the base track is suitable for.

Figure 11: An older seat installed looking over the northern shore of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats.

Figure 12: Users are accessing maintenance only tracks for alternative routes around and up Mauao. This can be dangerous with terrain and ground material not being suitable to traverse, however these areas, if upgraded have potential for more formalised alternative routes that create added escape routes.

Figure 13: An older memorial seat installed looking over the northern shore of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats.

Figure 14: Historic access track to the beach at the northern tip of Mauao, beneath the base track.

Figure 15: Users are forming informal tracks for alternative routes around and up Mauao. This can be dangerous with terrain and ground material not being suitable to traverse, however these areas, if upgraded have potential for more formalised alternative routes that create added escape routes.

Figure 16: Vehicular and pedestrian gate are located along Mauao's base track. These gates are installed to keep the sheep stock contained. The vehicular gate is only unlocked in emergency cases.

Figure 17: The track is elevated above the shoreline of Mauao with clear visibility down this edge for aesthetic as well as safety benefits by reducing opportunities for hiding.

Figure 18: Seat at the base of steps which continue to the rocks on the shoreline. This seat overlooks the 'Ranui' wreckage site, in which the engine block still lies amongst the rocks and is visible at low tide. This seat will be replaced with a newer seat over time

Figure 19: The low point on the base track has been elevated over time. In the worst of weather only there is minimal amounts of sea spray onto the track with can wash away some ground material.

Figure 20: An older seat installed looking over the north-western shore of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats.

Figure 21: Along the track efforts have been made to remove any leaf litter and easily ignited vegetation within 1m either side of the track to reduce the risk of arson.

Figure 22: An older memorial seat installed looking over the western shore of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats.

Figure 23: An older seat installed sunken down to track level looking over the western shore of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats.

Figure 24: Along the track efforts have been made to remove any leaf litter and easily ignited vegetation within 1m either side of the track to reduce the risk of arson. This is the location where a fire was started in an arson attack on Mauao, burning through a large amount of bush cover.

Figure 25: The base track is wide, well maintained with quality ground material and clear sightlines which provide a sense of safety and awareness.

Figure 26: Sign notifying users of potential rock fall hazards in the higher risk areas. Similar signage could be used for other purposes, particularly indicating the safe use of the area as well as location of entries and exits as well as distances from these access points.

Figure 27: Seat looking over the western shore of Mauao out to Matakana island. Seats of this age are to be retained in the near future and replaced once older seats have been.

Figure 28: The use of fences and other blocking techniques to prevent users from entering closed tracks is not completely effective. It is recommended that alternatively informative signs on why the track is closed would be more effective of a deterrent from entering the track and is also less intrusive on the character of the walk.

Figure 29: Edging boards are located along the edges of particularly narrow sections of the baser track or more high risk slip areas of the track to better define the edge of the track and reduce falls. It is recommended that other areas are assessed for possible installation of the edging boards to further improve safety.

Figure 30: Informal tracks are formed along the edge of some sections of the track. This can become an issue if excessive damage upon the surface occurs, however currently it is not an issue and is hard to prevent when keeping vegetation away from the edge to reduce arson risk.

Figure 31: Some sections of the base track narrow considerably. It is recommended that potentials for widening is assessed to better accommodate users for greater safety and better views down the track for increased awareness of surroundings.

Figure 32: Access to the beach is informal but with clear sightlines, providing safe access whilst maintaining the natural feel of the walk.

Figure 33: Drainage grate flush with the track is an effective, safe option for drainage as it eliminates any trip hazard as well as opportunity to intentionally damage drainage pipes.

Figure 34: Small bridge that traverses a gully is one of the few built elements on Mauao's tracks excluding furniture.

Figure 35: The presence of stiles for authorised access into the farmed areas of Mauao are used by the public as an informal route. This can be seen as an alternative escape route in untoward situations.

Figure 36: Seat looking over the southern shore of Mauao into Tauranga harbour. Seats of this age are to be retained in the near future and replaced once older seats have been.

Figure 37: Informal beach access to the beach at the southern tip of Mauao. Due to the vegetation it provides an area for hiding so is recommended that vegetation be manicured in such a way that it opens sightlines and reduces opportunities for hiding.

Figure 38: Vegetation obscuring sightlines along the base track. It is recommended that vegetation be manicured in such a way that it opens sightlines and reduces opportunities for hiding.

Figure 39: Base track and beach access path. The use of grass allows for clear sightlines, resulting in a good sense of safety for users of the base track as well as those using the beach access track.

Figure 40: Informal access routes have been formed by users to link to other tracks on Mauao. These informal tracks have potential to act as alternative routes that increase safety and potential for escape in untoward situations. It is recommended that these routes are not shut off and possible formalisation of these tracks could be looked in to.

Figure 41: The signs contain a multitude of information, discouraging users to read all of the points. This can lead to improper use of the base track. It is recommended that these signs are reviewed with an aim to provide more concise and informative signs that are visually dominant resulting in a greater uptake of users abiding by the safety procedures.

Figure 42: Information signs are located in relatively hidden areas, resulting in very few users reading the information. It is recommended that these signs are relocated into more visible areas, resulting in more users reading the information, This could bring about outcomes including reduced vandalism and encourages a sense of ownership

Figure 43: The road that links to the Pilot Bay entrance is not open to public vehicle use. It is wide with open sightlines, however does not provide any alternative routes for escape. The addition of lighting could improve the feeling of safety in this area at night.

Figure 44: Dog free zone should be incorporated in to simple signage at key entry points. This sign is contributing to the undesired proliferation of signs on Mauao.

Figure 45: The road before the section closed off for public vehicular use leading to the base track is used for boat trailer parking. This allowance for boat trailer parking results in an extra wide road, providing extensive sightlines for a high sense of safety. CCTV is recommended to be mounted upon the toilet block at the edge of this road section.

Figure 46: The toilet block that lies on the edge of the campground and the Pilot Bay entrance to the base track of Mauao. The return wall at the back of this toilet block provides a place to hide as well as vandalise. It is recommended that this return wall is removed to increase safety for users.

4 WD Track

Figure 47: Access at the base of the 4WD track, located at the Pilot Bay side of Mauao includes both pedestrian and 4WD access. Pedestrian access is up steps and through a gate, located next to the 4WD access which is through a farm gate that is locked at all times. 4WD access is restricted to authorised persons only.

Figure 48: Along the first half of the 4WD track is open farmed land with no fences at the edge of the track. This provides good potential for escape in untoward situations. Because the track has to accommodate vehicles the width is consistently wide, making access straightforward, even at busy periods.

Figure 49: The water reservoir is subject to graffiti and vandalism on occasion. The current remedy is to paint over any graffiti at the first instance, this is not a more permanent and lasting solution. It is recommended to vegetate around the water reservoir to create a screen and barrier for anyone intending on vandalising it.

Figure 50: An old concrete seat has become a landmark and feature of the walk. It is recommended that this seat is maintained due to its significance and familiarity to users as well as its unique nature being made out of concrete.

Figure 51: Leading up to the hairpin corner of the track access to the outside edge of the track has been stopped through the installation of hand railing. This was installed after a landslip revealed the steepness and instability of this edge.

Figure 52: Highly visible sign notifies users that the track is closed. It is recommended that signage options be assessed with potential incorporation of more informative details incorporated into the sign e.g. 'track closed due to rock falls' to better inform and deter users from accessing the closed tracks.

Figure 53: The clearing along the 4WD track leading up to the summit provides both good panoramic views as well as quality sightlines for a good sense of safety and knowledge of the surroundings.

Figure 54: An older seat installed in the clearing along the 4WD track just beneath the summit of Mauao. Seats of this age are to be removed in the near future and replaced with more modern seats.

Figure 55: The viewing track at the summit of Mauao is lined with a soft border of mountain flax. This provides not only visual amenity but also added safety from slipping as well as hindering the ability to stray off the designated areas into hazardous areas.

Figure 56: Stairs leading down to the viewing track at Mauao's summit are wide, well-constructed and maintained with mountain flax borders and quality ground material that reduces slipping. This promotes proper usage of the area by providing quality viewing spaces and access ways.

Figure 57: Some users have opened gaps in the mountain flax border to access dangerous viewing points along Mauao's cliff edges. It is recommended that these gaps in the mountain flax border are filled in to reduce opportunities to access these dangerous areas.

Figure 58: The summit of Mauao. The area is open and well maintained, providing a safe, highly visible area which deters any vandalism upon the summit marker.

Motu Kauri Track

Figure 59: Connecting the Motu Kauri track to the Waikorire track there is a series of winding, steep steps through bush. It is recommended that the steps are maintained by removing any excess material and levelling the tread. Ensure that all wood is structurally sound and not rotting, if so, replace.

Figure 60: Signage and wire fencing used to prevent users from cutting through bush. This is quite unsightly and also relatively ineffective. It is recommended that border planting is installed to prevent cutting through the bush whilst providing amenity.

Figure 61: The final series of steps on the Motu Kauri track leading to the summit of Mauao. The steps are well constructed, with a good quality and well maintained ground surface. The absence of vegetation at the immediate border of the track provides greater sightlines for an increased sense of safety and less opportunities for hiding.

Figure 62: The track is rather narrow and runs through vegetation that is closely located to the track. There are some opportunities for hiding within this closely located, dense vegetation and it is recommended that vegetation is maintained close to the track to ensure best possible visibility while maintaining the bush track atmosphere.

Figure 63: A short set of steps marks the access to the Motu Kauri track from the 4WD track, ascending to Mauao's summit. It is recommended that vegetation is maintained close to the track to ensure best possible visibility while maintaining the bush track atmosphere and excess build-up of material on the steps is removed.

Waikorire Track

Figure 64: The Waikorire track links to both the 4WD track and the Oruahine track. The junction between the Waikorire track and the Oruahine track is marked with this wide set of steps which are well maintained and constructed.

Figure 65: Access up Waikorire track from Oruahine track is via a constant combination of steps and landings, ascending steeply. The ground material is well maintained and the steps are well constructed. Sightlines along the track and out are clear, providing a sense of safety for users.

Figure 66: The track narrows at points which can become an issue for passing on this highly used track, particularly popular with runners. Flax borders provide a soft edge definition for added awareness and safety.

Figure 67: Rest areas, particularly seats are quite sparse in relation to the severity of steepness of the track which results in a greater need to rest at shorter intervals. Older seats like this are to be removed and replaced by newer seats in the near future.

Figure 68: Access up Waikorire track from Oruahine track is via a constant combination of steps and landings, ascending steeply. The ground material is well maintained and the steps are well constructed. Sightlines along the track and out are clear, providing a sense of safety for users.

Figure 69: The bridge along the track is in good condition and is well constructed with good handrails and slip proofing. There is evidence of minor, old vandalism, however the design of the bridge is such that it provides very little areas for vandalism to occur or have a major effect.

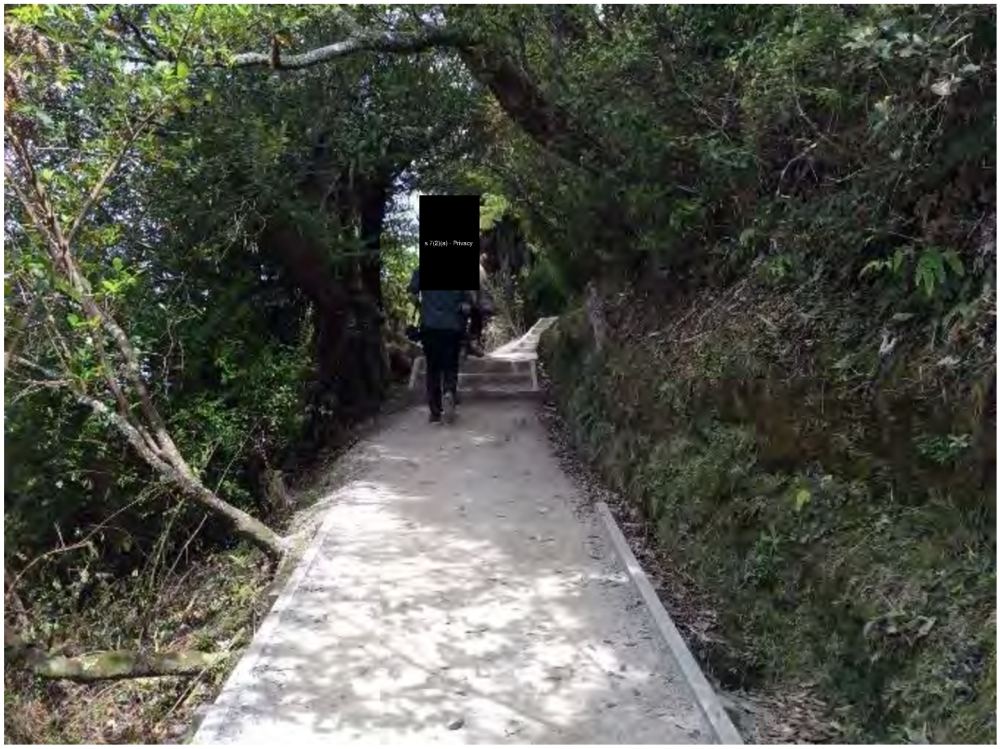


Figure 70: In sections of the track there is vegetation enclosing on both sides of the track, however sightlines along the track are good and the steepness of terrain off the track does not support opportunities for hiding so in this case the high sense of safety is still maintained.

Figure 71: A sign indicating the direction of the Waikorire track to the base of Mauao. This sign is not seen as very useful as it is obvious that the track leads to the base of Mauao, it would be more effective with a distance marker and approximate time to the base to better inform users of their location.

Figure 72: Access up Waikorire track from Oruahine track is via a constant combination of steps and landings, ascending steeply. The ground material is well maintained and the steps are well constructed. Sightlines along the track and out are clear. Although there is vegetation surrounding there are good sightlines that maintain the good sense of safety.

Figure 73: The track narrows along the section between the junction with the Motu Kauri track and the connection to the 4WD track. Although narrow, it is straight with clear sightlines.

Figure 74: An older seat nestled into the vegetation along the narrow section of the Waikorire track between the connection to the 4WD track and the junction with the Motu Kauri track. Seats of this age are to be removed in the near future and replaced with more modern seats.

Oruahine Track

Figure 75: Access leading up to the junction with the Waikorire track is a gentle grade with a wide track, however, from the stone steps up to the junction the ground material is a GAP 40 chip. This results in a much higher frequency of slipping as the larger chip moves more freely. It is recommended that this chip is replaced with the finer gravel.

Figure 76: On the lower section of the track there are informal tracks that connect to the base track through farm land. These provide added escape routes and should be looked into for enhancement to add safety for those choosing to access informal tracks.

Figure 77: Vehicular and pedestrian gate are located along Mauao's base track. These gates are installed to keep the sheep stock contained. The vehicular gate is only unlocked in emergency cases.

Figure 78: Access leading up to the junction with the Waikorire track is a gentle grade with a wide track, however, from the stone steps up to the junction the ground material is a GAP 40 chip. This results in a much higher frequency of slipping as the larger chip moves more freely. It is recommended that this chip is replaced with the finer gravel.

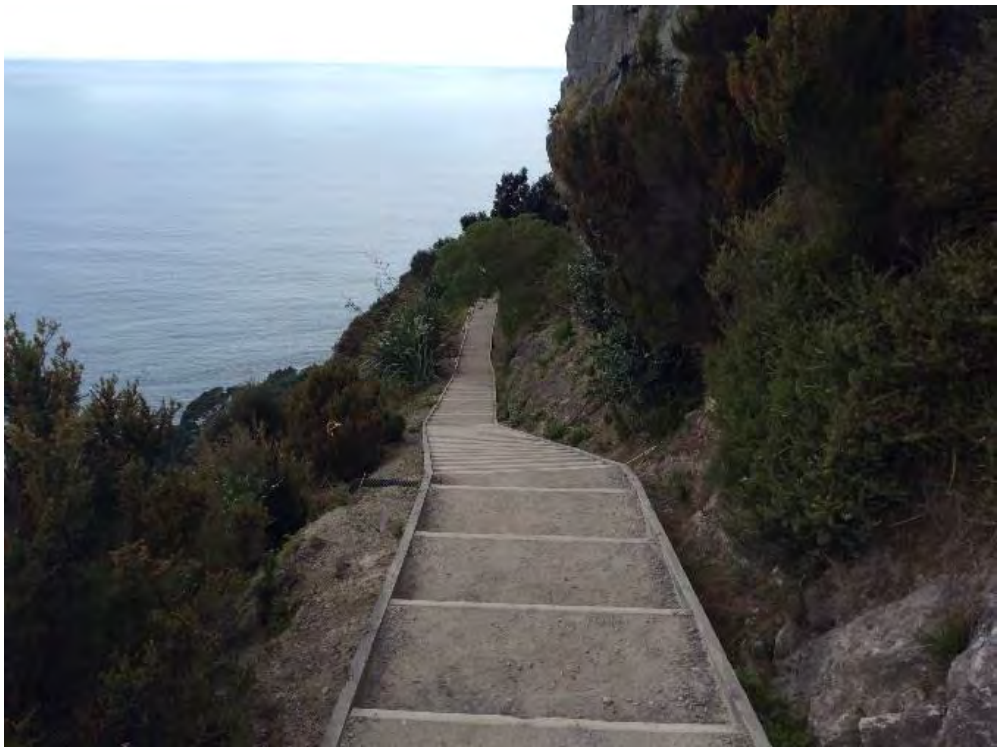


Figure 79: The upper section of the track consists of stairs that cascade down through a short section of bush and down an area on the cliff edge. The steps are well constructed with a good quality and well maintained ground material. Sightlines are clear for safety. Mountain flax is used as a soft border to define the steep cliff edge.

Figure 80: The upper section of the track consists of stairs that cascade down through a short section of bush. Although surrounded by vegetation there are good sightlines for an added sense of safety.

Appendix 2: Track Grading System

A Grade 1 walk corresponds to AS 2165.1 Class 1 track

	Technical Description for Land Manager use	**Walk Description for Public Information**	**Generic Description for Public Information**
Grade of walk	Grade 1	Grade 1	Grade 1
Symbol	Symbol	Symbol	Symbol
Distance	Total distance of track must not exceed 5km.	Total distance of track to nearest 100 metre (eg 4.2km).	No bushwalking experience required. Flat even surface with no steps or steep sections. Suitable for wheelchair users who have someone to assist them. Walks no greater than 5km.
Gradient	Grades in accordance with the AS 1428 series. *(AS 2165.1)* A ramp at 1:14 (7.14% slope or 4.1degrees) is the maximum slope/gradient suitable for a person in a wheelchair.	Flat.	
Quality of path	Broad, hard surfaced track of path suitable for wheelchair use. Width: 1200mm or more. Well maintained with minimal intrusions. *(AS 2165.1)*	Well formed track.	
Quality of markings	Track head signage and route markers at intersections.	Clearly sign posted.	
Experience required	Users need no previous experience and are expected to exercise normal care regarding their personal safety. *(AS 2165.1)*	No experience required.	
Time	30 minute increments (eg 1-1.5hr) or if the predicted time is less than an hour in 15 minute increments (eg 30-45 minutes).	Time needed to complete track to nearest half hour or nearest 15 minute increment (eg 1-1.5 hours or 30-45 minutes).	
Steps	Steps allowed only with alternate ramp access. *(AS 2165.1)*	No steps.	

A Grade 2 walk corresponds to AS 2165.1 Class 2 track

	Technical Description for Land Manager use	**Walk Description for Public Information**	**Generic Description for Public Information**
Grade of walk	Grade 2	Grade 2	Grade 2
Symbol	Symbol	Symbol	Symbol
Distance	Total distance of track must not exceed 10km.	Total distance of track to nearest 100 metre (eg 4.2km).	No bushwalking experience required. The track is a hardened or compacted surface and may have a gentle hill section or sections and occasional steps. Walks no greater than 10km.
Gradient	The gradient is generally no steeper than 1:10 (or 10% or 5.7 degrees). *(AS 2165.1)*.	Gentle hills.	
Quality of path	Generally a modified or hardened surface. Width: 900mm or more. Well maintained with minimal intrusions. (AS 2165.1).	Formed track.	
Quality of markings	Track head signage & route markers at intersections.	Clearly sign posted.	
Experience required	Users need no previous experience and are expected to exercise normal care regarding their personal safety. *(AS 2165.1)*. Suitable for most ages and fitness levels.	No experience required.	
Time	30 minute increments Time needed to complete (eg 1.5-2hrs) or if the predicted time is less than an hour in 15 minute increments (eg 30-45 minutes).	Time needed to complete track to nearest half hour or nearest 15 minute increment (eg 1-1.5hrs or 30-45 minutes).	
Steps	Minimal use of steps. *(AS 2165.1)*.	Occasional steps.	

A Grade 3 walk corresponds to AS 2165.1 Class 3 track

	Technical Description for Land Manager use	**Walk Description for Public Information**	**Generic Description for Public Information**
Grade of walk	Grade 3	Grade 3	Grade 3
Symbol	Symbol	Symbol	Symbol
Distance	Total distance of track must not exceed 20km.	Total distance of track to nearest 100 metre (eg 4.2km).	Suitable for most ages and fitness levels. Some bushwalking experience recommended. Tracks may have short steep hill sections a rough surface and many steps. Walks up to 20km.
Gradient	May exceed 1:10 (or 10% or 5.7 degrees) for short sections but generally no steeper than 1:10. *(AS 2165.1).*	Short steep hills.	
Quality of path	Formed earthen track, few obstacles. Generally a modified surface, sections may be hardened. Width: variable and less than 1200mm. Kept mostly clear of intrusions and obstacles. *(AS 2165.1).*	Formed track, some obstacles.	
Quality of markings	Track head signage and route markers at intersections and where track is indistinct.	Sign posted.	
Experience required	Users need no bushwalking experience and a minimum level of specialised skills. Users may encounter natural hazards such as steep slopes, unstable surfaces and minor water crossings. They are responsible for their own safety. *(AS 2165.1).*	Some bushwalking experience recommended.	
Time	Hours/days (eg 9hrs) or if the predicted time is less than an hour in 15 minute increments. (eg 45 minutes).	Hours/days or if the predicted time is less than an hour in 15 minute increments.	
Steps	Steps may be common. *(AS 2165.1).*	Many steps.	

A Grade 4 walk corresponds to AS 2165.1 Class 4 track

	Technical Description for Land Manager use	**Walk Description for Public Information**	**Generic Description for Public Information**
Grade of walk	Grade 4	Grade 4	Grade 4
Symbol	Symbol	Symbol	Symbol
Distance	Total distance of track may be greater than 20km. Distance does not influence grading.	Total distance of track to nearest km.	Bushwalking experience recommended. Tracks may be long, rough and very steep. Directional signage may be limited.
Gradient	May have arduous climbs and steep sections. May include long steep sections exceeding 1:10.	Very steep.	
Quality of path	Generally distinct without major modification to the ground. Encounters with fallen debris and other obstacles are likely. *(AS 2165.1)* Walkers may encounter natural obstacles (eg tides).	Rough track, many obstacles.	
Quality of markings	Track head signage and route markers.	Limited signage.	
Experience required	Users require a moderate level of specialised skills such as navigation skills. Users may require maps and navigation equipment to successfully complete the track. Users need to be self-reliant, particularly in regard to emergency first aid and possible weather hazards. *(AS 2165.1)*.	Experienced bushwalkers.	
Time	Hours/days (eg 9hrs) or if the predicted time is less than an hour in 15 minute increments (eg 45 minutes).	Hours/days or if the predicted time is less than an hour 15 minute increments.	
Steps	Steps N/A *(AS 2165.1)* Steps do not influence grading.	-	

A Grade 5 walk corresponds to AS 2165.1 Class 5 & 6 track

	Technical Description for Land Manager use	**Walk Description for Public Information**	**Generic Description for Public Information**
Grade of walk	Grade 5	Grade 5	Grade 5
Symbol	Symbol	Symbol	Symbol
Distance	Total distance of track may be greater than 20km. Distance does not influence grading.	Total distance of track to nearest km.	Very experienced bushwalkers with specialised skills, including navigation and emergency first aid. Tracks are likely to be very rough, very steep and unmarked. Walks may be more than 20km.
Gradient	May have very arduous climbs and steep sections. May include long steep sections exceeding 1:10.	Very steep and difficult.	
Quality of path	No modification of the natural environment. *(AS 2165.1)*.	Rough unformed track.	
Quality of markings	Signage is generally not provided. *(AS 2165.1)*.	No directional signage.	
Experience required	Users require previous experience in the outdoors and a high level of specialised skills such as navigation skills. Users will generally require a map and navigation equipment to complete the track. Users need to be self-reliant, particularly in regard to emergency first aid and possible weather hazards. *(AS 2165.1)*.	Very experienced bushwalkers.	
Time	Time Hours/days.	Hours/days.	
Steps	N/A *(AS 2165.1).* Steps do not influence grading.	-	