DIRTART

WORLD LEADERS IN TRAILS

TRAIL AUDIT REPORT

Manly Dam

CLIENT: Northern Beaches Council

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1 INTRODUCTION

1.1 Project Overview

Dirt Art has been engaged by the Northern Beaches Council (NBC) undertake the following with regards to the formal Manly Dam mountain bike trail:

- Review the completed and outstanding recommendations from the Manly Warringah War Memorial Park Plan of Management (2014) and the Manly Dam Bike Trail Audit (2013)
- Review proposals for trail improvements made by riders during consultation for the draft Open Space and Recreation Strategy
- Undertake an on-ground audit of the formal 9.8km Manly Dam mountain bike trail loop to identify any safety or environmental issues and provide appropriate remediation solutions or realignments where required
- Provide an estimate of ongoing maintenance costs

2 EXECUTIVE SUMMARY

This trail audit has been undertaken from a mountain biking perspective and provides detailed analysis and recommendations that specifically relate to the safety, sustainability, and user experience of the Manly Dam mountain bike trail.

The trail is predominantly a shared fire trail that is popular with walkers and riders, with limited sections of singletrack. The formal Manly Dam mountain bike loop is classified as an intermediate trail with a mixture of easy and advanced sections/features. The primarily issue identified during the trail audit is that the majority of the trail is deemed not fit for purpose as a dedicated mountain bike trail. To be clear, the trail was never designed specifically for mountain bike usage nor intended to be solely orientated towards this user group. Rather, it is a shared-use trail that services a variety of recreational users as well as functioning as a primary service route for the park's adjoining utilities.

By implementing the recommendations in this report there is an opportunity to make significant long-term improvements to the trail:

- safety for riders and walkers by separating the two distinct user groups
- improved environmental outcomes through the employment of sustainable trail alignments
- improve the rider experience by designing and creating trails specifically for the activity

The recommended improvements have been categorised into those that sit within the park's current Plan of Management and those that are outside the project's immediate scope of works. The reason these recommendations have been included in the latter part of this report is due to the fact that Dirt Art strongly believe they are the primary means of resolving the underlying issues that have been highlighted in the latest trail audit and previously in the 2013 Manly Dam Bike Trail Audit. These recommendations are generally considered as major realignments that would have to undergo the same environmental impact assessment and detailed design process as the construction of any new section of trail. In these cases, any form of intermediatory upgrades would otherwise be a short-term solution that fixes the problem temporarily instead of addressing the root cause. As such, Dirt Art has not suggested any remediation works on the sections of the trail that these realignments bypass other than closure and rehabilitation where deemed necessary.

Overall, the trail has the potential to provide a truly iconic mountain biking destination and authentic trail experience to cater for beginner to intermediate riders. With a series of strategic realignments on sustainable gradients, Dirt Art are confident the existing Manly Dam loop can be transformed into a sustainable mountain bike trail that will reduce the overall maintenance burden drastically while providing a genuine mountain biking experience that services the needs of the local community.

Northern Beaches Trail Audit

OVERVIEW MAP: MANLY DAM

10.12.20

Northern Beaches Trail Audit

MAP: EXISTING TRAIL TYPES

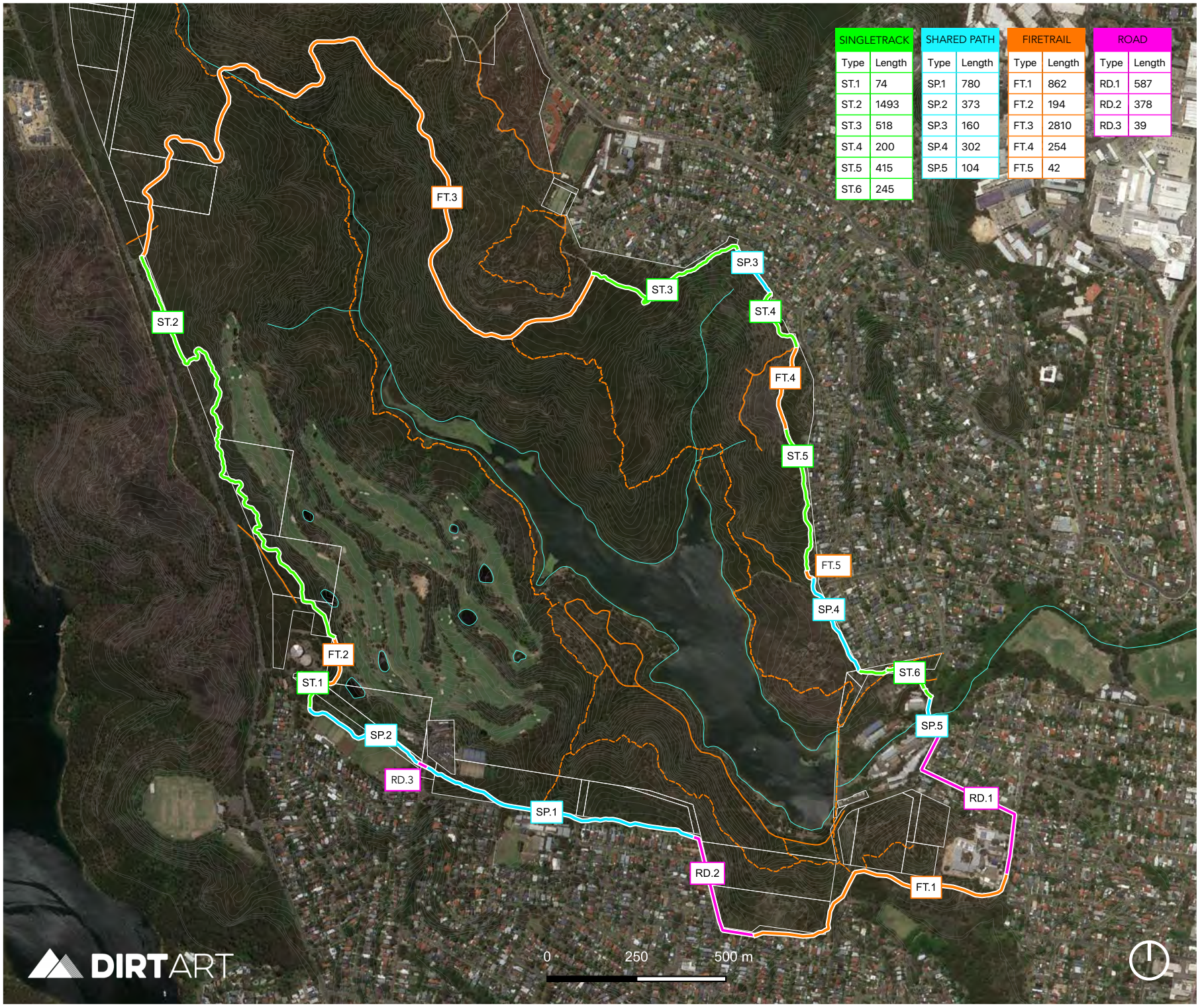
23.11.20

SINGLETRACK	
Type	Length
ST.1	74
ST.2	1493
ST.3	518
ST.4	200
ST.5	415
ST.6	245

SHARED PATH	
Type	Length
SP.1	780
SP.2	373
SP.3	160
SP.4	302
SP.5	104

FIRETRAIL	
Type	Length
FT.1	862
FT.2	194
FT.3	2810
FT.4	254
FT.5	42

ROAD	
Type	Length
RD.1	587
RD.2	378
RD.3	39



Trail Types

- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Base Layers

- Walking Track
- Internal Road
- UtilityTrail
- LPI_Drainage
- LandBoundaries
- Contours2m

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3 DESIGN NOTES

3.1 Scoping Works

- All trail audit works were conducted by foot and bicycle over the course of two days in November 2020. Jason Lam (Dirt Art) undertook the initial detailed trail audit by foot on Monday 9 November 2020. A secondary audit by bicycle was undertaken by Simon French (Dirt Art) and Jason Lam (Dirt Art) on Wednesday 18 November 2020

3.2 Waypoints

- Waypoints are provided for each trail feature audited
    - Road Sections
        - RD.1: W625-500
        - RD.2: W520-522
        - RD.3: W529-530
    - Firetrail Sections
        - FT.1: W500-520
        - FT.2: W534-535
        - FT.3: W560-585
        - FT.4: W603-606
        - FT.5: W611-612
    - Shared Path Sections
        - SP.1: W522-529
        - SP.2: W530-532
        - SP.3:W597-598
        - SP.4: W612-613a
        - SP.5: W621-625
    - Singletrack Sections
        - ST.1: W532-534
        - ST.2: W535-560
        - ST.3: W585-597
        - ST.4: W598-603
        - ST.5: W606-611
        - ST.6: W613a-621
- All GPS waypoints and tracks are available as in GPX and Shapefile formats on request

3.3 Machine / Vehicle Access

- Machine access (1.7t) mini excavator is available throughout the existing trail alignment
- Vehicular access is available to all sections of the trail identified as Road, Shared Path, and Firetrail.
- Limited vehicular access and machine access (>1.7t) to sections of the trail identified as Singletrack

3.4 Imported Materials

- All imported materials to be certified as pathogen and weed free from the supplier
- The use of imported material has been limited where possible throughout the proposed upgrade works by recycling existing materials or those won naturally during new trail construction works
- Imported rock has been suggested in areas where no existing site rock can be recycled or re-used – i.e. rock already being used within the existing trail tread

4 LITERATURE REVIEW

4.1 Manly Dam Bike Trail Audit (2013)

4.1.1 Overview

In 2013, the Australian branch of the International Mountain Bike Association (IMBA) undertook a detailed trail audit of the Manly Dam mountain bike trail loop for Warringah Council. At the time of writing, the report acknowledged Manly Dam's popularity and the "distinct under-supply of authorised MTB riding opportunities" within the densely populated Sydney area.

Seven years on, the popularity of mountain biking continues to increase at a rapid rate, surpassing many of its contemporaries such as rock climbing or other outdoor/adventure-orientated activities. Previously perceived as a fringe sport or fad, mountain biking has since established itself as a legitimate sport in its own right and popular recreational activity for many Australians.

The rapid growth of the sport continues to place increasing demands on the informal and formal trail networks currently available. During the recent COVID-19 pandemic, there has been a marked increase in the volume of off-road cyclists frequenting or discovering their nearby trails for the first time. For Manly Dam, there was a significant increase in laps with a peak in April 2020 at 10,000 per month at the peak of COVID-19 lockdown, which is more than double the usual count.[1] In Sydney, there has been a visible increase in the sheer number of users found on the local trails on any given day, not just the weekends.

4.1.2 Previous Recommendations

- Signage
    - Develop and implement a signage strategy for the mountain bike trail loop
    - Formalise and enforce the single direction of the loop
    - Designate Section 3 and proposed new trail sections in Sections 4 and 5 as mountain bike only use. Designate all other sections as shared use
- Proposed Realignments
    - Three (3) realignments to address risk issues
    - Five (5) realignments to address risk and erosion issues
    - Two (2) realignments as optional trail enhancements
    - Relating trail closures
- Maintenance / Upgrade Works

[1] Statistic provided by Northern Beaches Council

- Engage professional trail construction contractor to implement Priority 1 and 2 upgrades
- Formalise a volunteer trail maintenance program with user groups to address Priority 2 and 3 actions
    - Regular monitoring of the existing mountain bike trail loop
    - Undertake routine maintenance on as required basis
    - Provide Council with feedback relating to the ongoing maintenance of the trail loop

4.1.3 Review

The points and issues raised in the 2013 trail audit by IMBA Australia are still relevant, especially those pertaining to the proposed realignments. The majority of the realignments proposed in the original report were identified in Dirt Art's most recent trail audit with several brought to light again as the best option forward in terms of creating a trail that is safe, sustainable, and fit for the purpose of mountain biking.

4.1.3.1 Signage

Trail signage is visible throughout the mountain bike trail loop and is generally functional in its current state with some minor vegetation pruning in areas where regrowth has covered or obscured signage.

Areas of improvement are listed below:

- Trail signage is lacking along the following sections of street:
    - King Street
    - Arana Street
    - Gibbs Street
    - Kalaui Street
    - Bangaroo Street
- Trailhead signage
    - There is no official or distinct primary trailhead for Manly Dam where riders can congregate and orientate themselves
    - The majority of new trail users rely heavily on friends that are familiar with the trail loop
    - Alternatively, those familiar with Trailforks, will likely utilise this phone application to navigate their way around the trail loop
- Trail closures
    - During the trail audit by foot, the Manly Dam mountain bike loop was officially closed due to the previous weeks' wet weather
    - There were limited trail closure signs identified throughout the trail loop, but many were obscured by vegetation or not clearly visible to passing riders
    - The current system in place to close the trail off to the public is inadequate and clearly not effective given the number of riders that continued to ride the trails during the time of the trail audit

        - Perhaps a physical barrier such as a chain across the various trail entries is required in conjunction with more prominent ‘CLOSED’ signage
        - Another alternative is to issue on the spot fines for those riders caught riding the trail when it is formally closed
    - The lack of a primary trailhead does not help this situation

4.1.3.2 Proposed Realignments

The 2013 ‘Review of Rejected Re-routes on the Mountain Bike Circuit Track, Manly Warringal War Memorial Park (Manly Dam)’ prepared by Epacris stated the key reason for the majority of the proposed realignments put forward by IMBA Australia to be rejected were on the basis that they would require full environmental assessment and the added management burden from any new trail would be significant. One specific example is the Curl Curl Creek fire trail descent, which was highlighted by the audit as having significant safety and sustainability concerns due to the steep gradients of the existing trail. The proposed realignment of the trail was rejected on the grounds of additional environmental impact and a comment stating that the safety concerns raised could be addressed with additional trail signage.

After the most recent 2020 trail audit conducted by Dirt Art, it is clear that the latter issue relating to rider safety has not been resolved. Additional trail signage has been installed in the respective areas of concern; however, they do little to change or adequately address the significant safety concerns originally highlighted by IMBA Australia and again in Dirt Art’s follow-up trail audit. The signage is impractically placed from a rider’s point of view, and likely missed by most riders even traveling down the hill at a moderate speed let alone at the speed the trail naturally promotes. It is clear that there is a fundamental lack of understanding regarding the intricacies and complexities inherit to a trail when ridden as opposed to walked. Our professional analysis is from a rider’s point of view as opposed to any other user group as this is Dirt Art’s primary role in this trail audit. These safety issues are significant and must be addressed in a holistic manner that fixes the underlying problem as opposed to relying on signage that is easily missed or in most cases, ineffective in communicating the potential dangers let alone promoting positive change.

Any proposed realignments, like any new trail construction, will require a comprehensive environmental impact assessment and additional cultural heritage assessment to ensure there are no adverse effects as a result of the proposed trail developments. At the time of writing, there are no publicly available datasets relating to detailed environmental studies in the Manly Dam area. The current data that form the basic desktop review for the purposes of developing potential realignment concepts include the following:

- Warringah Natural Area Survey Vegetation Communities and Plant Species (Smith and Smith2005);
- Warringah Natural Area Survey Fauna Species (Smith and Smith 2005); and
- Warringah Natural Area Survey Vegetation History and Wildlife Corridors (Smith and Smith 2005); and
- NSW BioNet Species Sightings

4.1.3.3 Maintenance / Upgrade Works

Professional trail construction works have occurred on the priority areas identified in the original IMBA Australia report. However, these areas continue to show signs of long-term damage and erosion due to the underlying issue being constrained to an existing trail alignment. The root cause of the problem is the poor and unsustainable alignment, which must be addressed by realigning the trail as opposed to the continual short-term remedies.

A similar case applies to the areas currently maintained by the volunteers, specifically the section of trail leading into the 19th Hole zone. There has been an incredible amount of trail upgrade and remediation works carried out throughout this section. The majority of the works witnessed by Dirt Art were of good quality with adequate drainage controls and measures installed in combination with the extensive rock armoured trail surface. However, despite the volunteer's efforts, the area continues to hold incredible amounts of groundwater due to the poor fall-line alignment. A properly designed and constructed trail on a sustainable gradient /alignment will result in minimal ongoing maintenance and provide a significantly better user experience.

5 TRAIL AUDIT

5.1 Overview

Dirt Art has undertaken an in-field assessment of the formal Manly Dam mountain bike trail loop.

The trail has a number of generally consistent issues, including but not limited to:

- Sustainability
    - Poor trail alignments
    - Unsustainable gradients
    - Ongoing erosion issues
- Experience
    - No formal trailhead or orientation space
    - Falls short of providing a genuine mountain biking experience such as a trail that has been designed and constructed specifically for the end use
    - Extremely limited singletrack or purpose-built mountain bike trail
    - Lacks any physical or visual connection to Manly Dam
- Safety
    - Safety concerns relating to shared paths, roads, and streets
    - Current loop is not suitable nor cater for beginner riders, which Council's website currently states '*Manly Dam Mountain Bike track is one of Sydney's best and is enjoyed by beginners to advanced riders'*
    - No formal IMBA difficulty classification for the Manly Dam mountain bike trail
    - Lack of formal trail maps at trailheads

5.2 Access Nodes

Users currently access the trails through a variety of access nodes with many local riders riding to the various trail entries scattered throughout the respective networks. The most popular entry point is via the carpark located on King Street outside the Manly Hydraulics Laboratory. The other known entry is via the Wakehurst Parkway entry, which has very limited parking.

5.3 Auditing Process

Dirt Art employ the below methodology to assess all trails. The step-by-step process provides a broad analysis of the trails key characteristics and includes both a desktop and in field assessment.

1. Desktop analysis- This stage involves a desktop analysis of the trail, with the view to establishing environmental values, gradients, and fit within the broader trail network (if relevant). Desktop analysis will generally establish larger, more fundamental flaws in the trail.
2. In field analysis- All trails are reviewed in detail during a field assessment. The assessment may be completed on foot or on bicycle. The in-field analysis aims to establish trail issues such as alignment, drainage issues and safety concerns.

3. Network analysis- Using desktop and in field analysis, *Dirt Art* will assess the trails value to the broader trail network.
4. Signage analysis- *Dirt Art* will assess the adequacy and appropriateness of trail signage during infield analysis.
5. Budget scope of works- The trail audit will conclude with an overview of key works required (if any) and a suggested market rate budget for these works

5.4 Aims and Objectives

In undertaking any trail audit, *Dirt Art* are working to the following key objectives.

1. Improve user safety- trails should wherever possible be predictable and minimise the consequence should a crash occur. Trails must meet the criteria for their difficulty grading.
2. Improve the trail experience- trails should provide high-quality user experience.
3. Improve environmental performance of the trail- trails should minimise environmental impacts, including minimising vegetation impact and erosion.
4. Provide objective advice around trail closure/s and network rationalisation- trail networks should be functional and limit duplication and braiding. Low quality trails that are not practical to repair should be closed and rehabilitated.
5. Provide advice that allows land managers to effectively invest in priority trail projects- the trails audit will assist land managers in programming and budgeting priority trail upgrades.
6. Address any user conflict- trails will be designed and/or reconfigured to minimize potential user group conflict

5.5 Ranking Criteria

5.5.1 Overview

To provide objectivity and clarity to the trail audit process, *Dirt Art* has developed an attribute ranking system for trail auditing. Each trail audited is ranked against 10 key criteria, which assess its performance against a wide range of qualitative and quantitative metrics. These 10 criteria are provided a score of 1-5, which results in a total score from 50 for each trail.

Dirt Art recommend that trails scoring less than 25 should in most cases not be included in a formalised trail network. In addition to this, the sensitivity layer provides a secondary level of scrutinization to which the trails are evaluated. Should a trail be sited in an area ranked as ‘very high’ or above in the sensitivity layer, it has subsequently been recommended for closure.

Exceptions to this would be trails that have been deemed as holding high value to the overall network in a strategic sense, which have been brought to light and discussed with Council as to the final decision to close or recommend for further investigation/formalisation.

An example of this trail assessment table is shown below.

Table 1 - Assessment Table Example

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	30/50

5.5.2 Sustainability

This criterion refers to the sustainability of the trail in the short, mid and long term. The trail is assessed for its capacity to manage water and rider traffic, with a focus on gradient versus soil type and rider behaviour. The capacity of the site to manage the trail use in the local climate is also considered. A low sustainability score does not necessarily mean that a trail should be closed, rather the sustainability issues in some cases may be easily and cost effectively addressed.

Trails have been assigned a rating out of five to assess overall trail sustainability. These ratings are assessing the trails as they were found at the time of assessment and may not reflect current trail conditions.

1) **Very poor levels of sustainability:** This trail offers very poor sustainability even in the short term. Trail alignments are poor, as is trail construction technique.
2) **Poor levels of sustainability:** This trail offers poor sustainability in the short-mid-term. Trail alignments and/or construction techniques are not conducive to a sustainable trail.
3) **Average levels of sustainability:** This trail offers sub-optimal levels of sustainability but will offer reasonable levels of mid-longer-term sustainability. Some sections are poorly aligned and/or poorly constructed.
4) **Good levels of sustainability:** This trail offers good levels of long-term sustainability. The trail will require minimal input in the long term.
5) **Excellent levels of sustainability:** The trail is aligned and constructed to a best practice standard for the majority of its length. The trail will offer best-case levels of sustainability in the long term.

5.5.3 Ride Experience

This criterion refers to the trails capacity to provide a high-quality riding experience in the sense of a rider's perception and appreciation of trail flow, challenging technical features (when applicable), and generally memorable riding experience. This qualitative criterion assesses the ride quality across a wide range of trail types (cross-country, flow, enduro technical, etc) - no one trail style is considered to provide a higher quality experience than any other trail style.

Trails have been assigned a rating out of five to assess the trails ride quality. The below ratings assess general trail experience and trail flow. A summary of values can be found below.

1) **Very poor ride quality:** Trail flow/dynamics are very poor as is ride quality and experience. This trail offers a generally very low-quality riding experience.
2) **Poor ride quality:** Trail flow/dynamics are generally poor, as is ride quality and experience. This trail offers a generally low-quality riding experience.
3) **Average ride quality:** Trail flow/dynamics are reasonable for the majority of the trail, thus offering an average ride quality. This trail offers some quality riding experiences but is generally not of a particularly high standard.
4) **Good ride quality:** Trail flow/dynamics are generally good, thus offering a predominantly quality riding experience. Some areas offer potential for improvement.
5) **Very good ride quality:** Trail flow/dynamics are optimised along the entire trail alignment. This trail offers a very high-quality riding experience.

5.5.4 Broad Market Appeal

This criterion refers to the capacity for the trail to cater for a broad market of riders. A low score for this criterion does not necessarily mean a trail is low quality, rather that the trail will cater only for a smaller market segment (notably small market segments may translate to strong visitation if that market segment is poorly catered for in the market).

Trails have been assigned a rating out of five to assess overall market appeal. A summary of various levels of market appeal can be found below.

1) **Very limited market appeal:** This trail does not offer a trail style or riding experience that is widely sought after in the current mountain bike market. It does not have enough favorable characteristics to entice riders to seek out and ride the trail regularly.
2) **Limited market appeal:** This trail exhibits limited (1-2) attributes that make it desirable to the current mountain bike market.
3) **Moderate market appeal:** This trail possesses some interesting attributes and/or constructed in a style that is generally appealing to the current mountain bike market. The trail has a moderate level of appeal, typically to riders that reside locally and use it as part of their regular ride/loop as opposed to a stand-alone trail experience.
4) **High market appeal:** The trail holds significant value in the network as it offers a range of desirable trail attributes and constructed in a style that is popular in the current mountain bike market. The trail holds merit as a stand-alone trail that offers a highly desirable riding experience. The trail is highly popular amongst local riders and has the potential to attract those form further afield – e.g., within the state.

5) **Very high market appeal:** This trail is of the highest importance to the current trail network as it offers a unique riding experience that stands out from the other offerings within the given network. In addition to this, the trail is in a genre that is popular and favored in the current mountain bike market. The trail is recognized as a 'must-ride' trail that has the potential to attract local riders as well as those from within further afield – e.g., interstate visitors.

5.5.5 Environmental Experience

This criterion refers to the environmental experience that the trail provides for the user as opposed to the inherent ride qualities as described in 'Ride Experience'. A strong environmental experience may include unique and appealing vegetation, views points and vistas, rivers and creeks and related attributes. A weaker environmental experience may include heavily disturbed areas such as a powerline easement for example or a zone where the predominate vegetation are undesirable. For example, a trail sited along a highway verge may be heavily laden with Lantana or scattered rubbish.

Trails have been assigned a rating out of five to assess overall environmental experience for the rider. A summary of the environmental experiences can be found below.

1) **Very poor environmental experience:** This trail offers little to no positive environmental qualities that complement the riding experience – e.g., traverses a heavily disturbed urban-fringe area with rubbish or noxious weeds.
2) **Poor environmental experience:** This trail offers a generally poor environmental experience with the exception of limited (1-2) attributes that may seem desirable.
3) **Average environmental experience:** This trail offers an unremarkable environmental landscape with no distinct features or memorable experiences to note.
4) **Good environmental experience:** This trail offers a range of interesting environmental attributes whether it be expansive views/vistas, patches of native vegetation, or remarkable natural landscape features.
5) **Excellent environmental experience:** This trail offers a distinctly memorable riding experience with respects to the natural landscape and terrain. The trail provides a unique opportunity to submerse the rider in the natural environment and resultingly create a sense of being in remote wilderness.

5.5.6 Value to Network

This criterion ranks the trail on the value it adds to the broader trail network. Trails that provide key connectivity and/or provide diversity in the network will score higher, whereas trails that are duplicated in alignment and style will generally score lower.

Trails have been assigned a rating out of five to assess the trails value to the trail network. A summary of values can be found below.

1) **Very limited value to the current trail network:** Closure and rehabilitation is recommended.
2) **Limited value to the current trail network:** Closure and rehabilitation may be warranted.

3) **Moderate value to the current trail network:** Trail possesses some value to the current network; potential upgrade is worthy of exploration.
4) **High value to the current trail network:** The trail is of significant value to the current network and should be retained and potentially upgraded.
5) **Very high value to current trail network:** This trail is of the highest importance to the current trail network, providing a high-quality experience and/or a strategically important network connection that is essential.

5.5.7 Environmental Compatibility

This criterion refers to the compatibility of the trail with the environmental values of the site. Trails that have a significant detrimental impact on natural values will score low, whereas trails that do not impact on natural values will score higher. This criterion also analyses a broad spectrum of natural values, including rare and endangered flora and fauna on site.

Trails have been assigned a rating out of five to assess the trail's environmental compatibility. A summary of values can be found below.

1) **Very limited environmental compatibility:** Closure and rehabilitation is recommended.
2) **Limited environmental compatibility:** Consider implementing partial closures and/or realigning sections of trail that enter environmentally sensitive areas. In this case, substantial trail upgrades or remediation works will not adequately address the identified environmental concerns.
3) **Moderate environmental compatibility:** Sections of trail may not be entirely compatible with environmental values in their current state but have the potential to undergo extensive upgrade/remediation works to mitigate and address any adverse environmental impacts.
4) **High environmental compatibility:** Limited sections of trail may show evidence of not aligning completely with environmental values in their current state but have the potential to undergo minor upgrade/remediation works to mitigate and address any adverse environmental impacts.
5) **Very high environmental compatibility:** This trail is sited favorably within its environmental context and requires minimal upgrades or remediation works to bring the trail up to an acceptable standard.

5.5.8 Social Compatibility

This criterion assesses the trails impact on the social values of the site. Trails that negatively impact on other trails and user groups, and/or trails that impact negatively on local residences will score low. For example, trails on the verge of neighbouring houses will generally score lower in this criterion as opposed to those located further away from built-up residential areas. Trails that do not negatively affect any other users or residents will score highly.

1) **Very poor social compatibility:** This trail offers very poor social compatibility as it is located within the close confines of built-up urban/residential areas and/or adversely impacts other trail user groups – e.g. illegal mountain bike use on a formalized/establishing walking trail.

2) **Poor social compatibility:** This trail offers poor social compatibility as it adversely impacts existing residents and/or other trail user groups.
3) **Average social compatibility:** This trail offers average social compatibility as it does not strictly categorise or define the trail as being single or shared-use – i.e., mountain bike or walking only. User conflict may arise from popular trails with misunderstandings between the various user groups.
4) **Good social compatibility:** This trail is sited away from built-up urban/residential areas and the various user groups have a mutual respect amongst one another.
5) **Excellent social compatibility:** This trail clearly defines whether it is single or shared use and does not adversely impact other trail user groups or residents.

5.5.9 Lifecycle Cost Rating

This criterion assesses the lifecycle costs of the trail. Trails will score low where lifecycle costs are higher, which may be due to several factors such as poor soil types, poor maintenance access and climatic factors.

1) **Very poor lifecycle cost rating:** This trail has been poorly sited/aligned and subsequently showing extreme signs of degradation that are beyond practical repair.
2) **Poor lifecycle cost rating:** This trail is poorly sited and requires significant upgrades and/or remediation works to limit the ongoing maintenance burden.
3) **Average lifecycle cost rating:** This trail has a generally sound alignment and sited in an area conducive to sustainable trail building. Several remediation points and potential areas of minor realignments have been identified that can be undertaken to improve the overall longevity of the trail.
4) **Good lifecycle cost rating:** This trail follows a good alignment and sited in an area conducive to sustainable trail building. The trail may require some minor remediation works such as clearing out drains or pruning vegetation, but otherwise is in good condition with no major remediation points identified.
5) **Excellent lifecycle cost rating:** This trail has been designed and built to best-practice IMBA guidelines. The trail exhibits sustainable average gradients and has consistent cross-fall throughout the trail tread, helping to drain the trail passively. There are no remediation points identified.

5.5.10 Safety

This criterion ranks the trail feature on its overall safety in respects to external factors that could potentially adversely impact the rider. Trail features that have a very good level of safety score higher, whereas trail features have a very poor level of safety score lower. A run out zone is the immediate area surrounding a technical trail feature. Having a relatively clear space in this area improves the safety of a feature by allowing adequate room for riders to safely stop, avoid, or worst-case scenario – crash.

Trail features have been assigned a rating out of five to assess the trail feature's level of safety. A summary of values can be found below.

1) **Very poor safety:** Trail feature does not have any run out zones and may by heavily affected by external factors.

2) **Poor safety:** Trail feature has a small/narrow run out zones and may be affected by external factors.
3) **Average safety:** Trail feature has a wide run out but has some external factors that will adversely impact the rider.
4) **Good safety:** Trail feature has a wide run out but may have some external factors that may potentially impact the rider.
5) **Very good safety:** Trail feature has a wide run out with no external factors that could potential adversely impact the rider.

5.5.11 Emergency Access

This criterion assesses the complexity of emergency access to the site, should it be required. A range of access methodologies are considered, including on trail, road and via air.

1) **Very limited emergency access:** This trail does not have any emergency access available in the form of vehicular or practical pedestrian means (>30min walk/hike). The most efficient means would be via air extraction – e.g., helicopter.
2) **Limited emergency access:** This trail offers limited emergency access with the potential of utilising a 4WD vehicle in conjunction with a walk/hike (<30min). Life-threatening cases would still be better served by air extraction – e.g., helicopter.
3) **Average emergency access:** This trail offers a reasonable level of emergency access via a 4WD vehicle means with a short walk/hike (<15min).
4) **Good emergency access:** This trail offers a good level of emergency access with direct 2WD vehicle access and/or a short walk/hike (<15min).
5) **Excellent emergency access:** This trail is located close to major roads/streets and has provision for direct 2WD vehicle access.

Northern Beaches Trail Audit

MAP: REMEDIATION POINTS

23.11.20

Trail Audit
- Waypoints

Base Layers
- Manly Dam Loop
- Walking Track
- Internal Road
- UtilityTrail
- LPI_Drainage
- LandBoundaries
- Contours2m

DIRTART

Northern Beaches Trail Audit

TRAIL MAP: RD.1

13.04.21

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

6 TRACK RD.1

6.1 Overview

This section starts at the carpark directly in front of the Manly Hydraulics Laboratory on King Street, Manly Vale. The strip of King Street is largely considered by many local riders as the informal start and finish point to the Manly Dam loop. If driving, riders often prefer parking here as it allows them to finish the loop on the final descent.

The informal trailhead is less than ideal given the busy vehicular traffic that frequents King Street from local residents as well as visitors passing through on their way into and out of the Manly Warringah Memorial Park (Manly Dam). Parking is an issue especially on the weekends during peak visitation.

The formal loop departs King Street and follows a sustained road climb along Arana Street before turn right at the top of the hill at Gibbs Street. At this point (WP498), a shared-use cycleway is provided on the pathway along Gibb Street heading south towards Manly Vale Public School. The cycleway passes two (2) driveways, No. 23 Arana Street and the entry into the northern carpark for Manly Vale Public School, before leading riders into the southern carpark located at the end of Gibbs Street.

6.2 Key Information

Section	RD.1
Length (m)	587m
Waypoint (Start)	WP625
Waypoint (Finish)	WP502
Trail Type	Road / Carpark

6.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	26/50

6.4 Remediation Works

Nil.

6.5 Recommendations

For an official mountain bike trail, the initial user experience is poor given the first section of the loop forces riders to ride on the road. The RD.1 section links three independent streets together (King, Arana, and Gibbs) and goes through an active school carpark before riders reach anything resembling an off-road trail. First time visitors have no formal trailhead or place to orientate themselves and need to rely on friends or asking local riders for directions. More tech savvy individuals can use phone applications such as Trailforks to help direct themselves around the loop.

- Formal Trailhead
    - Investigate options to create a formal trailhead
        - OPTION 1: Manly-Warringah War Memorial Park to utilise existing parking and amenities
            - Additional parking and amenities maybe required to service the increased visitor demands
        - OPTION 2: Vacant lot behind the UNSW Water Research Laboratory buildings
            - Provide off-street parking and utilise existing private road access
            - Create a formal trail hub in this space to service the start/finish of the formal trail loop
    - Primary trail signage
        - Trail Map

        - Code of Conduct
        - Emergency Information
        - Status Updates

6.6 Recommendations (Outside of Scope)

Please refer to Section 25 – Proposed Major Realignments.

- Realignment (R1)
    - Realign trail back into the natural bushland located to the west of Manly Vale Public School
        - Create a better user experience by allowing riders to start the official Manly Dam loop on trail rather than road
    - Bypass Arana Street and Gibbs Street entirely
        - Create a safer route for riders by taking them off the existing streets
        - Reduce user conflict along residential streets and Manly Vale Public School carpark

Northern Beaches Trail Audit

TRAIL MAP: FT.1

30.11.20

DIRTART

Trail Audit

- Waypoints

Trail Types

- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments

- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

7 TRACK FT.1

7.1 Overview

This section starts at the end of the southern Manly Vale Public School carpark at WP500 and finishes at Kalaui Street (WP520). The trail is characterised predominately as firetrail or vehicular access track, providing a popular thoroughfare frequented by local residents. Several areas were identified throughout this section as exhibiting signs of bad to severe erosion due to reasons pertaining to poor alignment, inadequate trail surface crossfall, and insufficient drainage controls.

Although it sits outside the immediate scope of this project and the relating Plan of Management, this section of trail is strongly recommended to be removed from the formal Manly Dam mountain bike loop and replaced with a purpose-built trail in the form of the proposed realignments R1 and R2 respectively. The existing firetrail is recommended to remain as an access track for service vehicles and pedestrian traffic.

7.2 Key Information

Section	FT.1
Length (m)	862m
Waypoint (Start)	WP500
Waypoint (Finish)	WP520
Trail Type	Firetrail

7.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	17/50

7.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
500-501	Install Sump + Culvert	1

Reference Images


Photo 17


Photo 18


Photo 19


Photo 20


Photo 21

Description of Works

The short section of gravel surfaced trail shows signs of erosion and surface scouring. The nearby dish drain currently directs stormwater onto the trail surface. A suitably sized drainage culvert needs to be installed at the southern end of the existing carpark to capture surface runoff and prevent water from channelling directly onto the trail surface

Waypoint(s)	Treatment	Volume / Type
503-504	Re-Profile Trail	Heavy

Reference Images


Photo 22


Photo 23


Photo 24


Photo 25


Photo 26

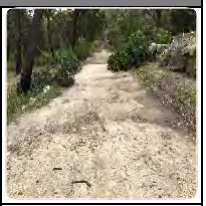


Photo 27


Photo 28

Description of Works

Existing firetrail showing signs of holding water due to inadequate drainage and natural surface cross fall / runoff. The exposed geotextile fabric is catching water on low side edge of the trail and preventing water from naturally drain across the trail. Consider installing an inside drain along the high side of the trail to catch and redivert stormwater runoff from the adjacent oval.

Waypoint(s)	Treatment	Volume / Type
503-507	Close / Rehabilitate	80m

Reference Images


Photo 29


Photo 30


Photo 31


Photo 32

Description of Works

Close and rehabilitation informal side-track. The poor condition of the existing firetrail has resulted in an informal singletrack line being developed to the southern (low side) of the trail.

Waypoint(s)	Treatment	Volume / Type
508-509	Re-Align Trail	Medium

Reference Images


Photo 33


Photo 34


Photo 35


Photo 36

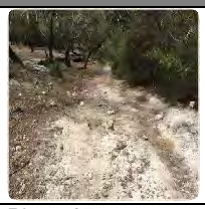


Photo 37

Description of Works

This section of trail is fundamentally flawed with an unsustainable alignment. The steep pinch climb is measured at approximately 15% gradient. There are clear signs of erosion, which have been caused by the poor alignment and inadequate drainage. Consider realigning the climb to the low side (southern side of the firetrail). Any resurfacing work on the existing alignment will likely continue to wash away.

Waypoint(s)	Treatment	Volume / Type
510-513	Elevate Trail Surface	26m

Reference Images


Photo 38


Photo 39


Photo 40


Photo 41


Photo 42


Photo 43


Photo 44


Photo 45

Description of Works

Raise trail surface with imported road base. Install high side drain with two sump and culverts in low points to drain water away.

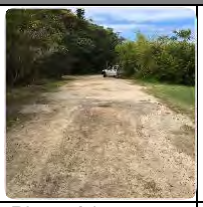
Waypoint(s)	Treatment	Volume / Type
514	Re-Profile Trail	Medium
Reference Images		
Description of Works		
Reprofile trail to reinstate natural cross fall. Utilise high side material and supplement with imported road base if required.		

Waypoint(s)	Treatment	Volume / Type
515-516	Re-Align Trail	Heavy
Reference Images		
 Photo 46	 Photo 47	 Photo 48
 Photo 49	 Photo 50	 Photo 51
 Photo 52	 Photo 53	 Photo 54
Description of Works		
Unsustainable steep slope measured at 20 percent gradient. Realign climb to a mellower gradient. Severe erosion towards top of the climb with the trail tread at least 600mm below natural ground level		

Waypoint(s)	Treatment	Volume / Type
517-518	Re-Profile Trail	Low
Reference Images		
 Photo 55	 Photo 56	 Photo 57
 Photo 58	 Photo 59	 Photo 60

					
Photo 61	Photo 62				
Description of Works					
Trail requires minor reprofile. Top of climb needs a drain to be installed to control surface runoff from driveways into existing inside drain.					

Waypoint(s)	Treatment	Volume / Type
518-520	Re-Align Trail	Realignment (R2)
Reference Images		

					
Photo 63	Photo 64	Photo 65	Photo 66	Photo 67	Photo 68
					
Photo 69	Photo 70				
Description of Works					
Existing trail shares old roadway and existing private driveways. Signage needs to clearly point riders in the rider direction to continue along the formal trail loop. Undefined where the track goes at the Tottenham Street exit.					

7.5 Recommendations (Outside of Scope)

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: RD.2

30.11.20

Trail Audit

- Waypoints

Trail Types

- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments

- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

8 TRACK RD.2

8.1 Overview

This section of trail utilises two existing streets: Kalaui Street and Bangaroo Street. Although it sits outside the immediate scope of this project and the relating Plan of Management, it is recommended that this section be realigned back into the adjacent bushland to provide a mountain bike experience that will be consistent with the proposed reconfigured Manly Dam loop.

8.2 Key Information

Section	RD.2
Length (m)	378m
Waypoint (Start)	WP520
Waypoint (Finish)	WP522
Trail Type	Road

8.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	26/50

8.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
521	Re-Align Trail	Realignment (R2)
Reference Images		


Photo 71


Photo 72


Photo 73


Photo 74


Photo 75

Description of Works
No signage. Safety concerns for riders.

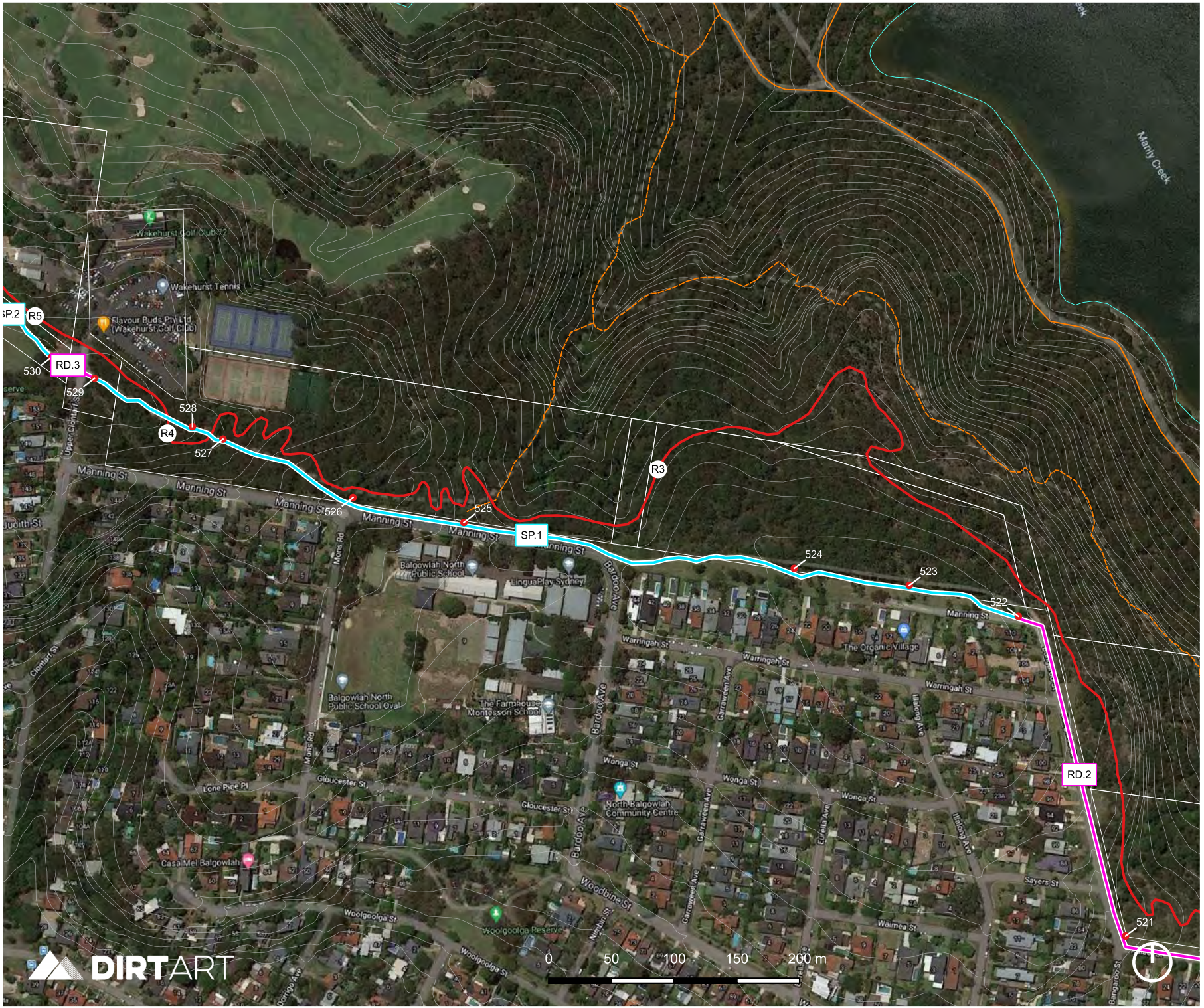
8.5 Recommendations (Outside of Scope)

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: SP.1

30.11.20



Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

9 TRACK SP.1

9.1 Overview

This section at WP522 at the corner of Manning Street and Bangaroo Street and ends at WP529 at the Bantry Bay Reserve carpark. The first section of the trail begins to the east and traverses a flat easement / firebreak. There is evidence of informal jumps being built by local children along this section of the trail – especially towards the descent leading down towards the corner of Manning Street and Bardoo Avenue. The trail then joins a concrete pathway that runs parallel to Manning Street in front of Balgowlah North Public School before turning off into the bush at the roundabout at the junction between Manning Street and Mons Road.

9.2 Key Information

Section	SP.1
Length (m)	780m
Waypoint (Start)	WP520
Waypoint (Finish)	WP522
Trail Type	Road

9.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	22/50

9.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
522-524	Re-Profile Trail	Low

Reference Images


Photo 76

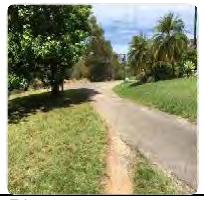


Photo 77

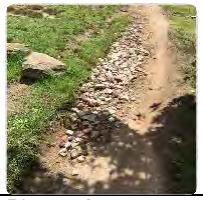


Photo 78


Photo 79


Photo 80

Description of Works

This section of trail requires minor reprofiling to remove the cupping forming on the trail surface.

Waypoint(s)	Treatment	Volume / Type
524-525	Re-Align Trail	Realignment (R3)

Reference Images


Photo 81


Photo 82


Photo 83


Photo 84


Photo 85


Photo 86


Photo 87


Photo 88


Photo 89


Photo 90


Photo 91

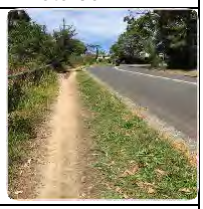


Photo 92


Photo 93

Description of Works

Trail braiding evident throughout this section. Evidence of informal jumps being built in this area with damage to the surrounding landscape and bush land visible. Open borrow pits visible at trail edge. Potential to create a series of large rollers or tabletop jumps through this section to manage water flow and also prevent further informal building. Nice gradient well suited to beginner jumps.

Waypoint(s)	Treatment	Volume / Type
525-526	Re-Align Trail	Realignment (R4)

Reference Images

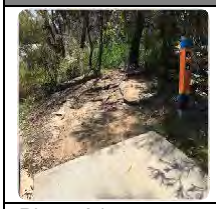


Photo 94

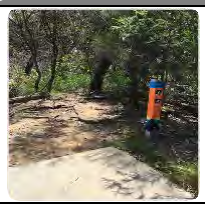


Photo 95

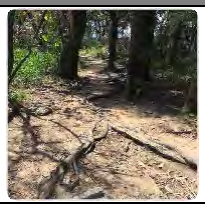


Photo 96


Photo 97

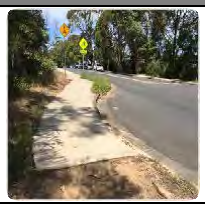


Photo 98

Description of Works

The existing trail follows a concrete pathway directly next to a busy suburban road. There are no safety barriers between the pathway and the road itself, which poses a safety concern for cyclists – especially those with young children. The width of the pathway makes it difficult to pass other users and without a physical barrier between the path and the road, it leaves no margin for error for a rider and oncoming vehicular traffic. The end of this section if directly next to a roundabout. The trail is strongly recommended to be re-routed into the adjacent bushland to address the safety issue while also providing a better riding experience.

Waypoint(s)	Treatment	Volume / Type
526-527	Re-Align Trail	Realignment (R4)

Reference Images


Photo 99


Photo 100


Photo 101


Photo 102

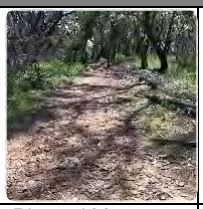


Photo 103

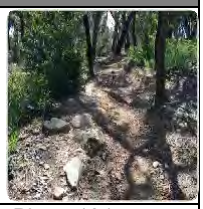


Photo 104


Photo 105


Photo 106

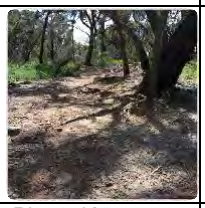


Photo 107


Photo 108


Photo 109


Photo 110

Description of Works

No drainage through section of steep trail. Gradient measured at 14%. Severe erosion evident. Recommended for realignment as current trail is unsustainable. Undercutting of tree roots visible throughout trail and root zone exposed. Trail continues to widen from riders and walkers avoiding the tree roots.

Waypoint(s)	Treatment	Volume / Type
528	Re-Align Trail	Realignment (R4)
Reference Images		
		
Photo 111		
Description of Works		
Exposed pipe needs to be buried or the trail needs to be re-routed to avoid this area completely.		

Waypoint(s)	Treatment	Volume / Type
529	Re-Align Trail	Realignment (R5)
Reference Images		
		
Photo 112	Photo 113	Photo 114
Description of Works		
Remove timber post. Reconfigure rock gate to be more useable for bikes. Pedal marks visible on rock.		

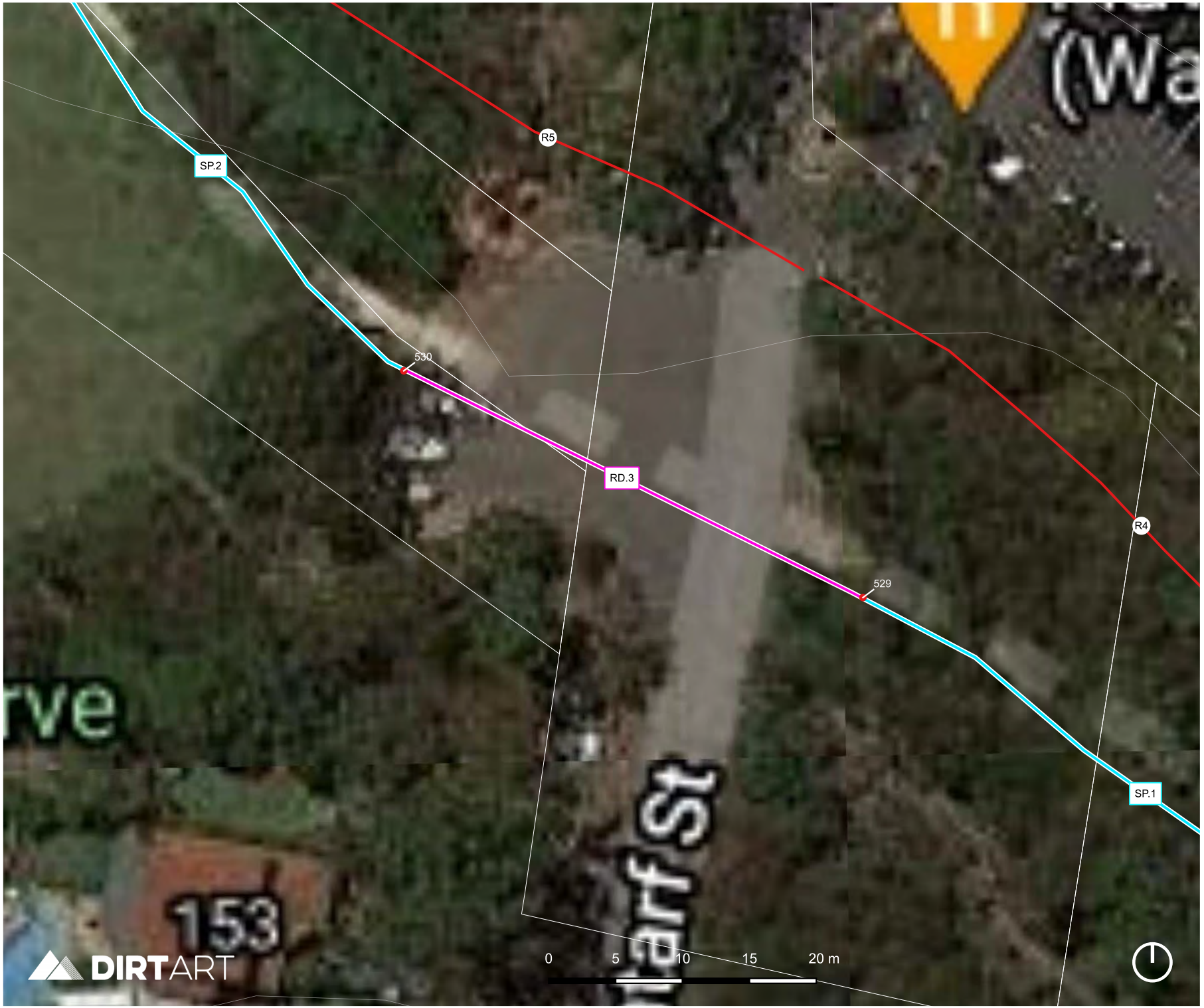

Photo 115


Photo 116

9.5 Recommendations (Outside of Scope)

Several safety and environmental issues were identified throughout the existing trail alignment. As such, it is highly recommended that the entire section of trail be realigned to the adjoining bushland to the north to resolve these issues permanently.

Please refer to Section 25 – Proposed Major Realignments.



Northern Beaches Trail Audit

TRAIL MAP: RD.3

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

10 TRACK RD.3

10.1 Overview

This section is defined as the existing Bantry Bay Reserve Carpark between WP529-530. The existing trail loop bisects this public carpark before entering the shared pathway around the northern perimeter of the oval.

It is highly recommended that the trail gets realigned closer to the entry to Wakehurst Golf Club to formalise the bicycle crossing point. The current crossing puts riders directly in amongst parked cars, which presents a range of safety concerns as well as promotes user conflict – especially during busier periods such as weekends.

10.2 Key Information

Section	SP.1
Length (m)	39m
Waypoint (Start)	WP529
Waypoint (Finish)	WP530
Trail Type	Road

10.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	22/50

Waypoint(s)	Treatment	Volume / Type
529	Re-Align Trail	Realignment (R5)
Reference Images		

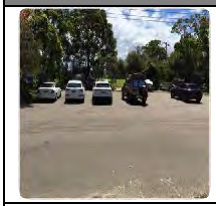



Photo 116		
Description of Works		
Consider realigning crossing towards golf club entry as a formal zebra crossing point. Current crossing takes riders between parked cars and poses a safety concern as well as a major point of user conflict with existing park users.		

10.4 Recommendations (Outside of Scope)

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: SP.2

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

11 TRACK SP.2

11.1 Overview

This section starts at the Bantry Bay Reserve Carpark (WP530) and finishes at WP532 at the singletrack turn-off. This gravel-surfaced path receives high traffic usage by a range of different user groups including spectators on the weekends at various sporting events held at the adjoining playing fields.

11.2 Key Information

Section	SP.2
Length (m)	373m
Waypoint (Start)	WP530
Waypoint (Finish)	WP532
Trail Type	Shared Path

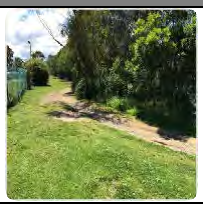
11.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	19/50

11.4 Remediation Works

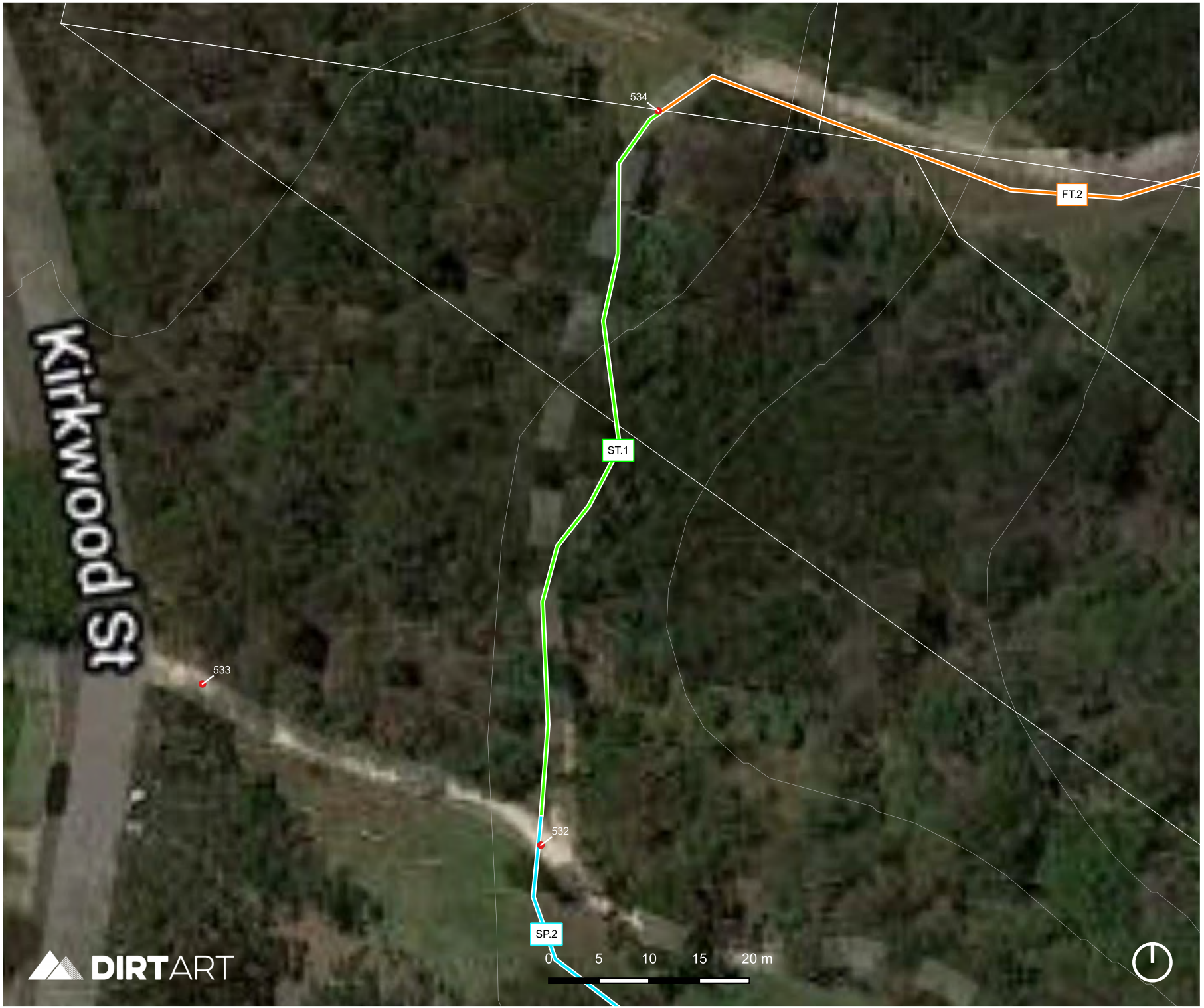
Waypoint(s)	Treatment	Volume / Type
530-531	Re-Profile Trail	Low
Reference Images		
    		
Photo 116		
Description of Works		
This section of trail is heavily utilised by a range of different user groups including walkers, runners, and weekend spectators when sporting events are taking place. The existing shared use path needs to be widened to at least 2.1m to allow dual direction access and reduce rider conflict with other users. The section of trail nearest to the north-eastern corner of the sporting field is too close and there is insufficient room to widen the shared path at this point. A suitable realignment to the north in the adjacent bushland is highly recommended.		

Waypoint(s)	Treatment	Volume / Type
531	Re-Profile Trail	Low
Reference Images		
   		
Photo 116		
Description of Works		
Install water bar on high side of trail to prevent scouring out of corner. Widen corner to create more room for riders and walkers. This corner currently poses a safety concern to riders and other trail users as it is essentially a blind corner. Rider will typically move through this section with a fair amount of pace and even more so if they are on an e-bike. Ideally, this section of trail should be entirely re-routed to separate bicycle riders and other trail users.		

11.5 Recommendations (Outside of Scope)

It is recommended that this entire length of trail remains as a walking trail to service the needs of the existing oval as well as the local user group. However, the formal Manly Dam mountain biking route should be completely separated from this high-use area to reduce user conflict and address safety concerns regarding all respective trail users. It is strongly recommended that the mountain bike trail be realigned to fit within the bushland situated to the north between Bantry Bay Oval and the nearby Wakehurst Golf Club.

Please refer to Section 25 – Proposed Major Realignments.



Northern Beaches Trail Audit

TRAIL MAP: ST.1

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

12 TRACK ST.1

12.1 Overview

This section starts at the WP532 where the shared path turns off into the singletrack link and finishes at the firetrail (WP.534). The short section of singletrack provides a fun and flowy link for riders between the existing shared path and firetrail to the north.

12.2 Key Information

Section	ST.2
Length (m)	74m
Waypoint (Start)	WP532
Waypoint (Finish)	WP534
Trail Type	Singletrack

12.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	40/50

12.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
532-534	Re-Profile Trail	74m

Reference Images


Photo 126


Photo 127

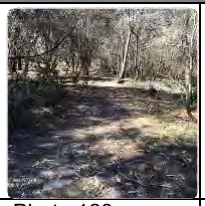


Photo 128


Photo 129

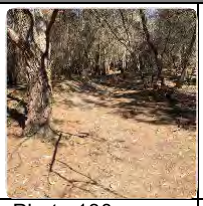


Photo 130


Photo 131


Photo 132


Photo 133

Description of Works

Minor reprofile along entire section. Potential to add 1-2 grade reversals near existing bermed corner to help divert water during heavy down pours.

12.5 Recommendations (Outside of Scope)

It is recommended that this trail be closed and rehabilitated if the proposed realignment (R5) is implemented. A similar style of flowing singletrack would be easily transposed in the proposed realignment and would make the existing section of trail redundant.

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: FT.2

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

13 TRACK FT.2

13.1 Overview

This section starts at WP534 and ends at the existing firetrail gate at WP535. The trail is characterised as an old access road or track the start showing signs of being previously being asphalt surfaced. This section of trail would benefit from a general resurface and reprofile.

13.2 Key Information

Section	FT.2
Length (m)	194m
Waypoint (Start)	WP534
Waypoint (Finish)	WP535
Trail Type	Firetrail

13.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	31/50

13.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
534-535	Re-Profile Trail	194m
Reference Images		

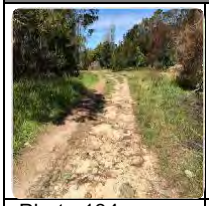


Photo 134


Photo 135

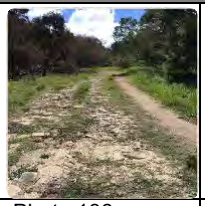


Photo 136

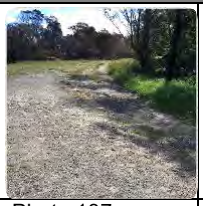


Photo 137

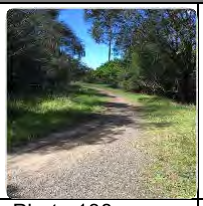


Photo 138


Photo 139


Photo 140


Photo 141

Description of Works
Resurface and reprofile existing access track.

Northern Beaches Trail Audit

TRAIL MAP: ST.2

30.11.20

Trail Audit

- Waypoints

Trail Types

- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments

- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

14 TRACK ST.2

14.1 Overview

This section starts the old firetrail gate at WP535 and ends at the Wakehurst Parkway entry at WP560. The singletrack found in this section of the Manly Dam loop displays the many inherent qualities enthusiast mountain bikers seek in terms of flowy trail weaving its way through an intimate bushland environment. As a case study, this section of trail provides a fitting example of what the rest of the formal Manly Dam loop could potentially look like if the majority of the loop was reconfigured to include more purpose-built singletrack.

The first half of this section caters well for beginner to intermediate riders with smooth and flowy singletrack. Less confident riders are able to enjoy the trail at slower speeds while more experienced riders can ride the same section of trail faster, making infinitely harder and more challenging.

The latter half of this section would benefit from additional rock armouring to tie into existing sections that have been paved previously. The organic process of harder and easier lines being developed throughout the more technical sections of this trail has worked well in most cases. However, there are sections where the easier line options are still too difficult for a beginner rider and as a result, several minor realignments have been suggested to accommodate a wider demographic of rider and to encourage individuals to build up to more challenging features.

14.2 Key Information

Section	ST.2
Length (m)	1,493m
Waypoint (Start)	WP535
Waypoint (Finish)	WP560
Trail Type	Singletrack

14.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	37/50

14.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
535-536	Re-Align Trail	50m

Reference Images					

Description of Works

The existing section of trail leading off from the old service road is too steep. The gradient is measured at 16% and clearly unsustainable given the amount of erosion that is evident on such a short section of trail. A mixture of rock, concrete, and asphalt debris was noted in the trail surface. This section of trail needs to be realigned to a more sustainable gradient with the incorporation of potentially 1-2 switchback turns to help reduce the grade/steepness of the terrain. An alternative solution would be to rock pave the entire track surface along this steep section of trail with imported rock, a surface area measuring approximately 15m (L) x 3m (W).

Waypoint(s)	Treatment	Volume / Type
537	Signage	1

Reference Images


Photo 142

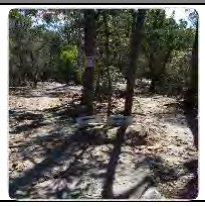


Photo 143

Description of Works

Install formal signage distinguishing between harder (“A” line) and easier (“B” line) lines to replace the existing signs on the trees. Signage needs to be clear and consistent with the rest of the mountain bike trail signs. The riders’ left line is currently the more difficult line with a rollable rock step, while the easier line to the right allows riders to roll around this technical feature.

Waypoint(s)	Treatment	Volume / Type
542	Install Rock Armouring	6m / Imported Rock

Reference Images


Photo 144


Photo 145


Photo 146


Photo 147


Photo 148


Photo 149


Photo 150

Description of Works

Install 6m of rock armouring to infill areas between existing paving to prevent further erosion. Rock will need to be imported and there is no availability of site-won rock in the vicinity. Investigate a minor realignment as shown in Photo 150 above to create a more beginner-friendly B-line option than what currently exists.

Waypoint(s)	Treatment	Volume / Type
543	Install Rock Armouring	20m / Imported Rock

Reference Images

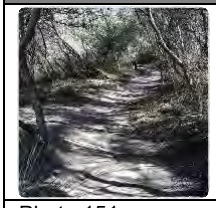


Photo 151

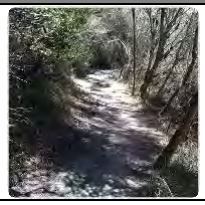


Photo 152


Photo 153

Description of Works

Extend rock armouring into the low section of trail that hasn't already been rock paved to prevent further erosion. Minor vegetation pruning required along trail corridor to re-establish sightlines and adequate trail width.

Waypoint(s)	Treatment	Volume / Type
545	Clearout Drainage	2
Reference Images		

					
Photo 154	Photo 155	Photo 156			

Description of Works
Clear out low side edge of the trail to allow natural overland flow. The built-up edge is currently inhibiting water from naturally escaping and dispersing.

Waypoint(s)	Treatment	Volume / Type
549	Re-Profile Trail	6m / Low
Reference Images		

					
Photo 157	Photo 158	Photo 159	Photo 160		

Description of Works
Re-profile short section of trail between existing Banksia tree and start of the paved climb. Raise trail surface and remove trail scouring. Option to pave this section with imported rock.

Waypoint(s)	Treatment	Volume / Type
550	Install Rock Armouring	3m / Imported
Reference Images		

					
Photo 161	Photo 162	Photo 163			

Description of Works
Extend paving at top of climb to protect existing tree root.

Waypoint(s)	Treatment	Volume / Type
551	Vegetation Pruning	1 / Medium

Reference Images

Photo 164

Description of Works

Remove dead tree and root ball. Reprofile this section of trail and ensure adequate crossfall in the trail tread.

Waypoint(s)	Treatment	Volume / Type
552	Install Rock Armouring	5m / Local

Reference Images

Photo 165

Photo 166

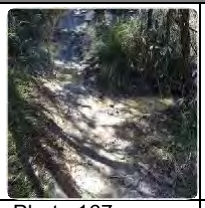


Photo 167

Photo 168

Photo 169

Photo 170

Description of Works

Option to realign onto the existing large rock slabs to the right of tree or rock pave the existing alignment. Paving the existing alignment is the preferred option to reduce further impacts to the adjoining bushland. Heavy rock works required to move the large rock slabs into the existing alignment.

Waypoint(s)	Treatment	Volume / Type
553	Install Rock Armouring	5m / Imported Rock

Reference Images

Photo 171

Photo 172

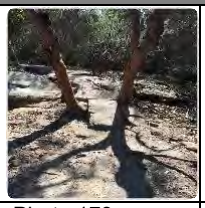


Photo 173

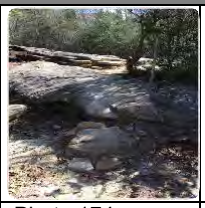


Photo 174

Photo 175

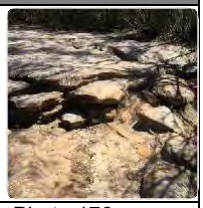


Photo 176

Description of Works

Reset rock work on upper section of the two technical rock step-up features. Existing key rocks are moving and need resetting to prevent movement and/or future cracking. Approximately 3-4m2 of rock paving using imported rock to rebuild the existing technical rock step-up features. Local rock is scarce as most of the suitable stone has already been sourced and used from the nearby area. As such, imported rock will be required.

Waypoint(s)	Treatment	Volume / Type
556	Create Optional Bypass	R6 Realignment

Reference Images


Photo 177


Photo 178


Photo 179


Photo 180


Photo 181

Description of Works

Create an optional bypass line to allow less capable riders to avoid the technical rock step-up feature at WP554. This alternate line will follow a more sustainable gradient and re-join the existing trail after the technical section on the upper rock slab.

Waypoint(s)	Treatment	Volume / Type
557-558	Install Rock Armouring	22m / Imported

Reference Images


Photo 182

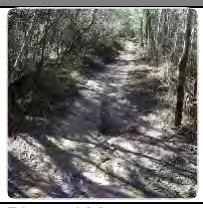


Photo 183

Description of Works

Install 22m of rock armouring to tie in with existing paved surface to prevent further erosion. Flat section of trail is prone to cupping and retaining water. Allow adequate drainage devices along paved section including at least 1-2 rock drains to help disperse water from the trail tread.

Waypoint(s)	Treatment	Volume / Type
559-560	Install Rock Armouring	36m / Imported Rock

Reference Images


Photo 184

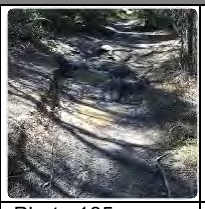


Photo 185


Photo 186


Photo 187

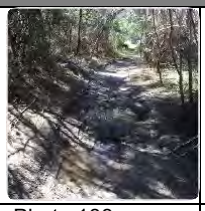


Photo 188


Photo 189


Photo 190


Photo 191


Photo 192

Description of Works

Install 36m of rock armouring prevent erosion along trail tread. Rock will need to be imported and there is no availability of site-won rock in the vicinity. Existing straight

alignment limits options to effectively drain the trail. The alternative would be to realign the entire section of trail to a more sustainable grade to the eastern side.

Northern Beaches Trail Audit

TRAIL MAP: FT.3

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

15 TRACK FT.3

15.1 Overview

This section starts at the Wakehurst Parkway entry (WP560) to the Manly Dam mountain bike loop and ends at WP585. The firetrail descent down to the Manly Creek crossing currently poses the greatest risk to riders out of the entire loop. The steep and sustained trail alignment combined with the variable trail surface conditions create a section of trail not suited to beginner to intermediate riders.

15.2 Key Information

Section	FT.3
Length (m)	2,810m
Waypoint (Start)	WP560
Waypoint (Finish)	WP585
Trail Type	Firetrail

15.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	19/50

15.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
561-563	Re-Align Trail	Realignment (R7)

Reference Images

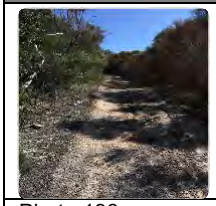


Photo 193


Photo 194


Photo 195

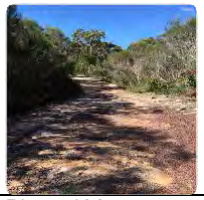


Photo 196

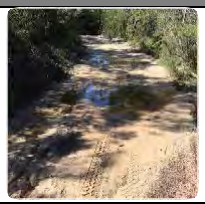


Photo 197

Description of Works

This section of trail is dangerous and needs to be realigned to address several safety concerns. The fast section of trail is made up of a variable trail surface, which makes it unpredictable and hazardous for beginner to intermediate riders.

Trail Surface

The trail surface along this section is characterised by loose gravel/shale, which alternates between being atop a hard rock slab sub-surface and soft sand. The former creates an extremely unpredictable and slippery riding surface akin to riding on ‘marbles’, where the rider has very little control of their tyres on the trail surface. The latter also creates issues for less experienced riders, as the softer surface allows the tyres of the bicycle to sink into the sand, which can often catch unsuspecting riders off guard.

Water Bars

The high-speed nature of this section combined with the steep and pronounced embankments of the water bar drains presents a serious risk to beginner to intermediate riders. The water bars create an unsuspecting jump that launches less experienced riders airborne, which can often result in serious harm or injury as the rider does not have the ability to control themselves or their bicycle in the air. This issue is compounded by the loose trail surface, which leaves little room for error and generally further extenuates any mistakes in the air if the rider lands askew.

Alignment

The straight alignment down the fall line allows riders to reach high speeds, which combined with the factors already mentioned above, leads to an extremely dangerous section of trail for the given target market – beginner to intermediate riders. Further to this, the sustained descent ends with a fast and eroded sweeping left-hand corner, which is presents several hazards to riders depending on their ride line choice.

Waypoint(s)	Treatment	Volume / Type
563	Install Sump + Culvert	1

Reference Images

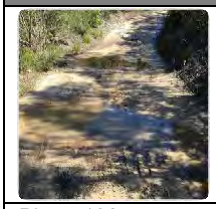


Photo 198


Photo 199


Photo 200

Description of Works

Install a drainage sump and culvert to drain the existing low point in the trail that is holding a large body of water. Alternatively, utilise imported materials to raise the low point in the trail and reprofile the entire section to create passive drainage through adequate crossfall through the trail tread.

Waypoint(s)	Treatment	Volume / Type
564-565	Re-Align Trail	Realignment (R7)

Reference Images


Photo 201


Photo 202


Photo 203


Photo 204

Description of Works

This section of trail is dangerous and needs to be realigned to address several safety concerns. The average gradient for this section is measured at 14%, which is too steep to be sustainable and presents a serious safety concern to beginner to intermediate riders.

Erosion

The heavily eroded surface clearly shows the alignment is unsustainable with the softer top layer of the trail continuing to be washed away leaving exposed bedrock. No amount of trail resurfacing or drainage devices can retain the trail surface at this gradient. Any future resurfacing works will continue to be washed away during heavy rain events as is visibly evident in the lower righthand corner where sedimentation and runoff has accumulated on the northern edge of the firetrail.

Trail Surface

The trail surface is badly scoured in areas with wheel-sized ruts presenting major safety hazards to riders of any ability. Whether this trail is ridden fast or slow, it requires a high level of riding ability, experience, and control in order to negotiate the eroded section of trail successfully.

Alignment

The straight alignment down the fall line allows riders to reach high speeds, which combined with the factors already mentioned above, leads to an extremely dangerous

section of trail for the given target market – beginner to intermediate riders. Further to this, the sustained descent ends with a fast and eroded sweeping right-hand corner.

Waypoint(s)	Treatment	Volume / Type
566	Re-Profile Trail	1 / Waterbar

Reference Images


Photo 205

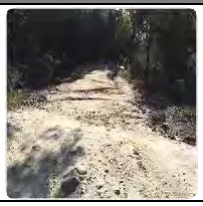


Photo 206


Photo 207

Description of Works

Re-profile existing water bar. The existing water bar currently poses a safety concern for beginner to intermediate riders due to the current profile of the drain. The section of trail leading into the waterbar is rough and eroded, which has the potential to unsettle less confident riders before they reach the waterbar and subsequently takes their attention away from the upcoming waterbar. Upon reaching the drain, the steep and abrupt embankment has the potential to buck unwary riders and causing serious harm.

Water Bars

The steep and pronounced embankments of the water bar drains presents a serious risk to beginner to intermediate riders. The water bars create an unsuspecting jump that launches less experienced riders airborne, which can often result in serious harm or injury as the rider does not have the ability to control themselves or their bicycle in the air. This issue is compounded by the loose trail surface, which leaves little room for error and generally further extenuates any mistakes in the air if the rider lands askew.

Waypoint(s)	Treatment	Volume / Type
567	Install Sump + Culvert	1

Reference Images

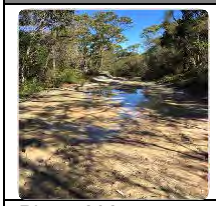


Photo 208


Photo 209


Photo 210

Description of Works

Install a drainage sump and culvert to drain the existing low point in the trail that is holding a large body of water. Alternatively, utilise imported materials to raise the low point in the trail and reprofile the entire section to create passive drainage through adequate crossfall through the trail tread.

Waypoint(s)	Treatment	Volume / Type
568-569	Re-Align Trail	Realignment (R7)

Reference Images


Photo 211


Photo 212


Photo 213


Photo 214


Photo 215


Photo 216

Description of Works

This section of trail is dangerous and needs to be realigned to address several safety concerns. The average gradient for this section is measured at 20%, which is too steep to be sustainable and presents a serious safety concern to beginner to intermediate riders.

Erosion

The heavily eroded surface clearly shows the alignment is unsustainable with the softer top layer of the trail continuing to be washed away leaving exposed bedrock. No amount of trail resurfacing or drainage devices can retain the trail surface at this gradient. Any future resurfacing works will continue to be washed away during heavy rain events as is visibly evident in the lower righthand corner where sedimentation and runoff has accumulated on the northern edge of the firetrail.

Trail Surface

Sharp depression at the base of rock slab unsettled less experienced riders. 15m between depression and next water bar. Inadequate time for unexperienced rider to recover.

Whether this trail is ridden fast or slow, it requires a high level of riding ability, experience, and control in order to negotiate the eroded section of trail successfully.

Alignment

The straight alignment down the fall line allows riders to reach high speeds, which combined with the factors already mentioned above, leads to an extremely dangerous section of trail for the given target market – beginner to intermediate riders. Further to this, the sustained descent ends with a fast and eroded sweeping right-hand corner.

Waypoint(s)	Treatment	Volume / Type
569-570	Re-Align Trail	Realignment (R7)

Reference Images


Photo 217

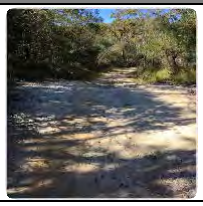


Photo 218

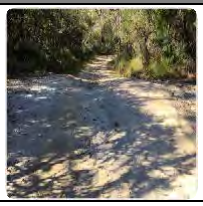


Photo 219


Photo 220

Description of Works

This section of trail is dangerous and needs to be realigned to address several safety concerns. The average gradient for this section is measured at 15%, which is too steep to be sustainable and presents a serious safety concern to beginner to intermediate riders.

Erosion

The heavily eroded surface clearly shows the alignment is unsustainable with the softer top layer of the trail continuing to be washed away leaving exposed bedrock. No amount of trail resurfacing or drainage devices can retain the trail surface at this gradient. Any future resurfacing works will continue to be washed away during heavy rain events as is visibly evident in the lower righthand corner where sedimentation and runoff has accumulated on the northern edge of the firetrail.

Water Bars

The high-speed nature of this section combined with the steep and pronounced embankments of the water bar drains presents a serious risk to beginner to intermediate riders. The water bars create an unsuspecting jump that launches less experienced riders airborne, which can often result in serious harm or injury as the rider does not have the ability to control themselves or their bicycle in the air. This issue is compounded by the loose trail surface, which leaves little room for error and generally further extenuates any mistakes in the air if the rider lands askew.

Trail Surface

Sharp depression at the base of rock slab unsettled less experienced riders. 15m between depression and next water bar. Inadequate time for unexperienced rider to recover.

Whether this trail is ridden fast or slow, it requires a high level of riding ability, experience, and control in order to negotiate the eroded section of trail successfully.

Alignment

The straight alignment down the fall line allows riders to reach high speeds, which combined with the factors already mentioned above, leads to an extremely dangerous section of trail for the given target market – beginner to intermediate riders. Further to this, the sustained descent ends with a fast and eroded sweeping right-hand corner.

Waypoint(s)	Treatment	Volume / Type
571	Re-Align Trail	Realignment (R7)

Reference Images

Photo 221

Description of Works

Fast and tight left-hand corner.

Waypoint(s)	Treatment	Volume / Type
575	Drainage Clearout	1 / Drain

Reference Images

Photo 222

Photo 223

Photo 224

Description of Works

Clear out existing drain at water bar.

Waypoint(s)	Treatment	Volume / Type
576-580	Re-Align Trail	Realignment (R8)

Reference Images

Photo 225

Photo 226

Photo 227

Photo 228

Photo 229

Photo 230

Description of Works

This section of trail is poorly aligned and needs to be realigned to a more sustainable gradient. The sustained nature of the steep climb exceeds the IMBA guidelines for a beginner to intermediate trail difficulty classification.

No amount of trail resurfacing or drainage devices can retain the trail surface at this gradient. Any future resurfacing works will continue to be washed away during heavy rain events as is visibly evident in at the exit point of the existing waterbars where sedimentation and runoff has accumulated off the trail edge.

Section 1 (WP576-577)

The average gradient for this section is measured at 15% from the first waterbar to the second.

Section 2 (WP577-578)
The average gradient for this section is measured at 18% from the second waterbar to the third.

Section 3 (WP578-579)
The average gradient for this section is measured at 20% from the third waterbar to the fourth.

Section 4 (WP579-580)
The average gradient for this section is measured at 22% from the fourth waterbar to the final waterbar.

Waypoint(s)	Treatment	Volume / Type
581	Install Sump + Culvert	1

Reference Images

Description of Works

Install a drainage sump and culvert to drain the existing low point in the trail that is holding a large body of water. Alternatively, utilise imported materials to raise the low point in the trail and reprofile the entire section to create passive drainage through adequate crossfall through the trail tread.

Waypoint(s)	Treatment	Volume / Type
582-583	Re-Align Trail	Realignment (R10)

Reference Images

Description of Works

This section of trail is poorly aligned and needs to be realigned to a more sustainable gradient. The average gradient for this section is measured at 15%. The sustained nature of the steep climb exceeds the IMBA guidelines for a beginner to intermediate trail difficulty classification.

The existing surface of the firetrail has been washed away to bedrock making re-profiling impossible without cutting directly into the sandstone surface, which is to be avoided. Any resurfacing attempts will be futile as the material will inevitably be washed away during heavy rain events exactly like what has happened previously.

15.5 Recommendations (Outside of Scope)

The Descent (WP560-573)
The trail is fundamentally flawed for mountain biking use as it is not designed or constructed with riders in mind. The firetrail was primarily installed to provide service vehicle access around the dam with no specific adherence to following IMBA guidelines in regard to safe and sustainable trail gradients. As a result, although the descent looks fairly safe at face value, in actual fact it presents the greatest danger to riders as the risks are generally less obvious to inexperienced riders. For example, the steep and sustained sections of trail naturally promote high speeds and unless the individual has the ability and experience to modulate their braking on loose and variable trail surfaces – it will inevitably lead to riders losing control and hurtling down the trail faster than they safely should. Brake modulation is not a skill or attribute that beginner to intermediate riders will often possess, especially on loose and varied gravel surfaces, which are challenging at the best of times, let alone on a steep descent. The introduction of a waterbar at this point in time can quickly compound the situation and lead to the subject being launched unsuspectingly into the air or 'bucked over the handlebars' as the sensation is commonly referred to by riders. Thus, a section of fairly mundane looking trail with no obvious technical features such as rock rolls or drop-offs as is so often associated as part of technical mountain biking, very quickly becomes dangerous to an inexperienced and even experienced rider. Although it sits outside the immediate scope of this project and the relating Plan of Management, It is our strongest recommendation that the descent (WP560-573) down to Manly Creek is completely realigned from the existing firetrail with a professionally designed and built mountain bike descent. The existing firetrail can be retained for pedestrian use and service vehicular access.

'Heart Break Hill' (WP576-580)
This section of the trail is affectionately referred to as 'Heart Break Hill' and describes the steep firetrail climb between WP576 and WP580. The trail is poorly aligned and follows an unsustainable alignment directly up the hill. The average gradients along this entire section exceed those specified in IMBA guidelines as being acceptable for a Green Circle or Blue Square rated trail. The steep climb requires regular maintenance and resurfacing as the unsustainable grade results in the surface of the trail being washed away repeatedly overtime by heavy rain events. Despite the pronounced waterbar drainage, the trail will continue to erode away with any resurfacing works being washed into the adjoining gullies as sedimentation. It is our strongest recommendation that this entire climb be removed from the formal mountain biking loop and realigned to a more sustainable gradient in the form of the proposed realignment (R8). The existing firetrail can be retained for pedestrian use and service vehicular access.

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: ST.3

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

16 TRACK ST.3

16.1 Overview

This section starts at WP585 at the junction of several fire trails and finishes at Cootamundra Drive (WP597). The existing descent follows an unsustainable alignment that looks to be an old powerline easement or access way. It is clearly evident that an extraordinary amount of work has been undertaken throughout this section of the trail – especially with regard to drainage and the installation of a series of trenches throughout the descent. However, due to the poor alignment and underlying issues pertaining to water retention in this area of the hill, large amounts of water were visibly evident in each of the drainage devices identified. That flatter section of this descent was severely eroded and unrideable during the trail audit.

16.2 Key Information

Section	ST.3
Length (m)	518m
Waypoint (Start)	WP585
Waypoint (Finish)	WP597
Trail Type	Singletrack

16.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	19/50

16.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
585-586	Re-Align Trail	Realignment (R11)

Reference Images


Photo 231

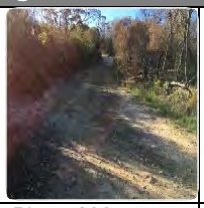


Photo 232


Photo 233


Photo 234


Photo 235


Photo 236


Photo 237


Photo 238


Photo 239


Photo 240


Photo 241


Photo 242


Photo 243


Photo 244


Photo 245


Photo 246


Photo 247


Photo 248


Photo 249


Photo 250


Photo 251


Photo 252


Photo 253


Photo 254


Photo 255

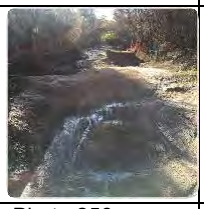


Photo 256


Photo 257


Photo 258


Photo 259


Photo 260


Photo 261

Description of Works

This section of trail exhibits severe signs of erosion and is heavily affected by groundwater being retained throughout the given alignment. It is recommended that this section of trail be closed and rehabilitated as soon as a more suitable realignment is established. The current state of the trail especially at the midpoint between WP585 and WP586 poses a serious safety concern for riders. The informal and poorly built jump feature here should be removed immediately to prevent any potential injury to unassuming riders.

Alignment
The root of the problem seems to be the poor alignment, which is fundamentally flawed in that it takes a direct fall line path down the hill following what looks to be the remnants of an old powerline easement and/or access way.

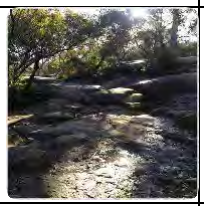
The firetrail located higher up to the north-west of WP585 is also contributing to the diversion of water towards this problem area as it drains directly into the start of the singletrack section of the trail.

Existing Drainage
It is obvious that a great deal of trail work and effort has gone into this section with the sheer volume of drains and rock armouring noted throughout the alignment. These drainage devices have been successful in capturing and rediverting surface flow and runoff. However, the underlying issue remains that ground water continues to penetrate the area even with the extensive drainage controls already nn place.

Water/Moisture Retention
One possible reason for the high retention of water and moisture in this area may be caused by a subsurface rock slab or bedrock that runs beneath the trail alignment, which does not allow water to be actively absorbed into the ground. It was noted during the trail audit that the majority of low-lying areas around the Manly Dam loop had signs of holding water, but not to the same extent or volume as seen in the drains scattered throughout this section.

Waypoint(s)	Treatment	Volume / Type
588	Install Rock Armouring	5m / Imported Rock

Reference Images

<table>
<tr><td>  </td><td>  </td><td>  </td><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Photo 262</td><td>Photo 263</td><td>Photo 264</td><td>Photo 265</td><td>Photo 266</td><td>Photo 267</td></tr>
<tr><td>  </td><td>  </td><td>  </td><td></td><td></td><td></td></tr>
<tr><td>Photo 268</td><td>Photo 269</td><td>Photo 270</td><td></td><td></td><td></td></tr>
</table>

Description of Works

This section of the Manly Dam loop is known as the '19th Hole' and has a variety of technical features predominately characterised as rock rolls with the exception of a more advanced rock drop line. The area is well used and loved by local riders. As a whole, it functions well to allow a range of options to cater for a variety of riding abilities and skill levels. The area would benefit from additional imported rock including paving stone and larger blocks for corralling riders into the formal ride lines.

Realignment

Any potential realignments higher up on the trail should seek to incorporate this area given the amount of work and disturbance that has already happened at this location, unless a suitable alternative is found during the realignment investigations. Any area to replace the 19th Hole will need to provide a series of technical natural rock rolls of varying size and difficulty.

Waypoint(s)	Treatment	Volume / Type
592-593	Install Rock Armouring	8m / Imported Rock

Reference Images

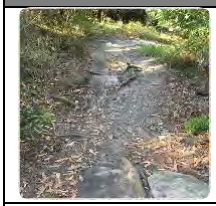
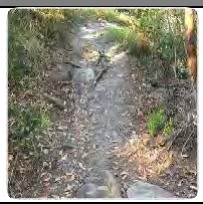
	

Photo 271	Photo 272				

Description of Works

Install 8m of rock armouring to prevent further scouring and erosion in a high impact area where riders are braking excessively.

Waypoint(s)	Treatment	Volume / Type
594	Install Rock Armouring	5m / Imported Rock

Reference Images

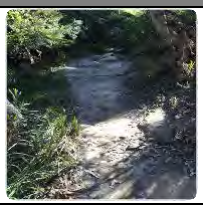
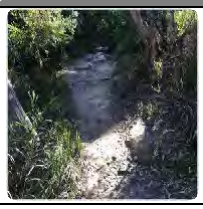
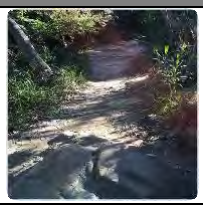
		

Photo 273	Photo 274	Photo 275			

Description of Works

Install 5m of rock armouring to prevent further scouring and erosion. The large stone here is starting to protrude, creating a technical obstacle in itself, which less confident riders are trying to ride around to avoid. This will continue to happen due to the lack of an easy option to bypass and the track will inevitably grow in its overall width. By paving this section, the harden trail surface will remain durable and reduce the overall maintenance burden.

Waypoint(s)	Treatment	Volume / Type
595	Install Rock Armouring	15m / Imported Rock

Reference Images

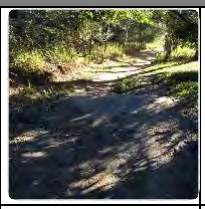
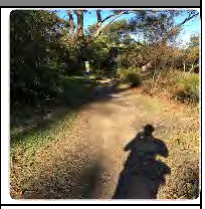
					
Photo 276	Photo 277	Photo 278	Photo 279	Photo 280	Photo 281
					
Photo 282					

Description of Works

Install 15m of rock armouring to formalise two distinct lines through this area: harder line on the high side and an optional easier line on the low side.

Waypoint(s)	Treatment	Volume / Type
596-597	Re-Profile Trail	150m / Low

Reference Images

					
Photo 276	Photo 277	Photo 278	Photo 279	Photo 280	Photo 281
					
Photo 282					

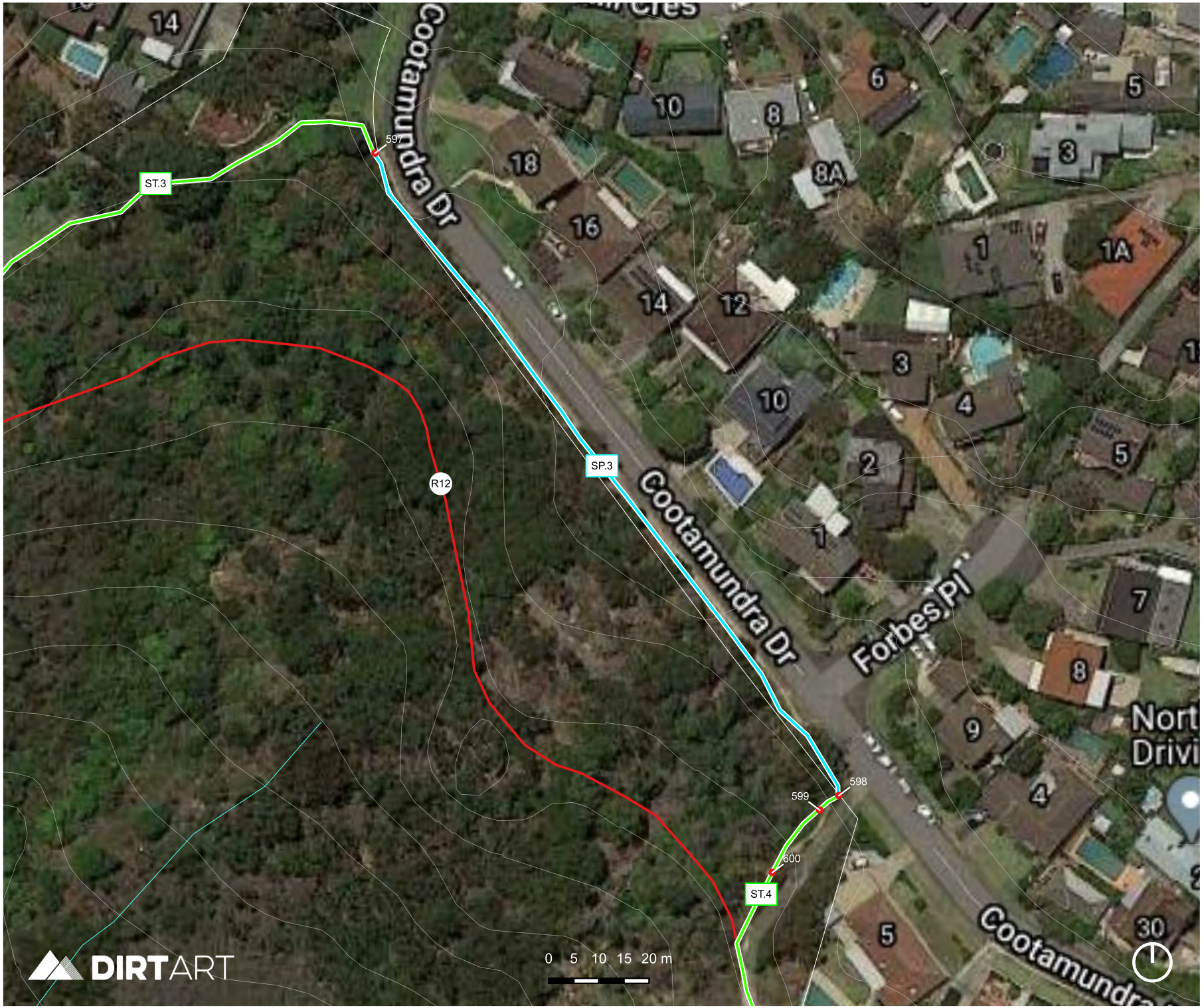
Description of Works

Re-profile section of trail to include regular dirt drains at minimum 10-15m intervals. Re-shape existing waterbar to be less abrupt by reducing the overall height.

16.5 Recommendations (Outside of Scope)

It is strongly recommended that this entire section of trail is closed and rehabilitated due to its unsustainable alignment. A suitable realignment (R11) needs to be investigated to bypass this entire section of the hill with the potential to re-connect into the existing 19th Hole area; or alternatively, negate this 19th Hole area entirely if an alternate technical rock feature(s) is found in the proposed realignment corridor that could adequately replace this iconic zone.

Please refer to Section 25 – Proposed Major Realignments.



Northern Beaches Trail Audit

TRAIL MAP: SP.3

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

17 TRACK SP.3

17.1 Overview

This section runs alongside Cootamundra Drive, starting at WP597 and finishing at WP598. The trail is characterised as a gravel-surfaced shared pathway that is used as the primary pedestrian thoroughfare given the lack of a concrete pathway on the opposing northern side of the street.

17.2 Key Information

Section	SP.3
Length (m)	160m
Waypoint (Start)	WP597
Waypoint (Finish)	WP598
Trail Type	Shared Path

17.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	21/50

17.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
596-597	Re-Align Trail	Realignment (R12)

Reference Images


Photo 283


Photo 284


Photo 285


Photo 286


Photo 287


Photo 288


Photo 289


Photo 290

Description of Works

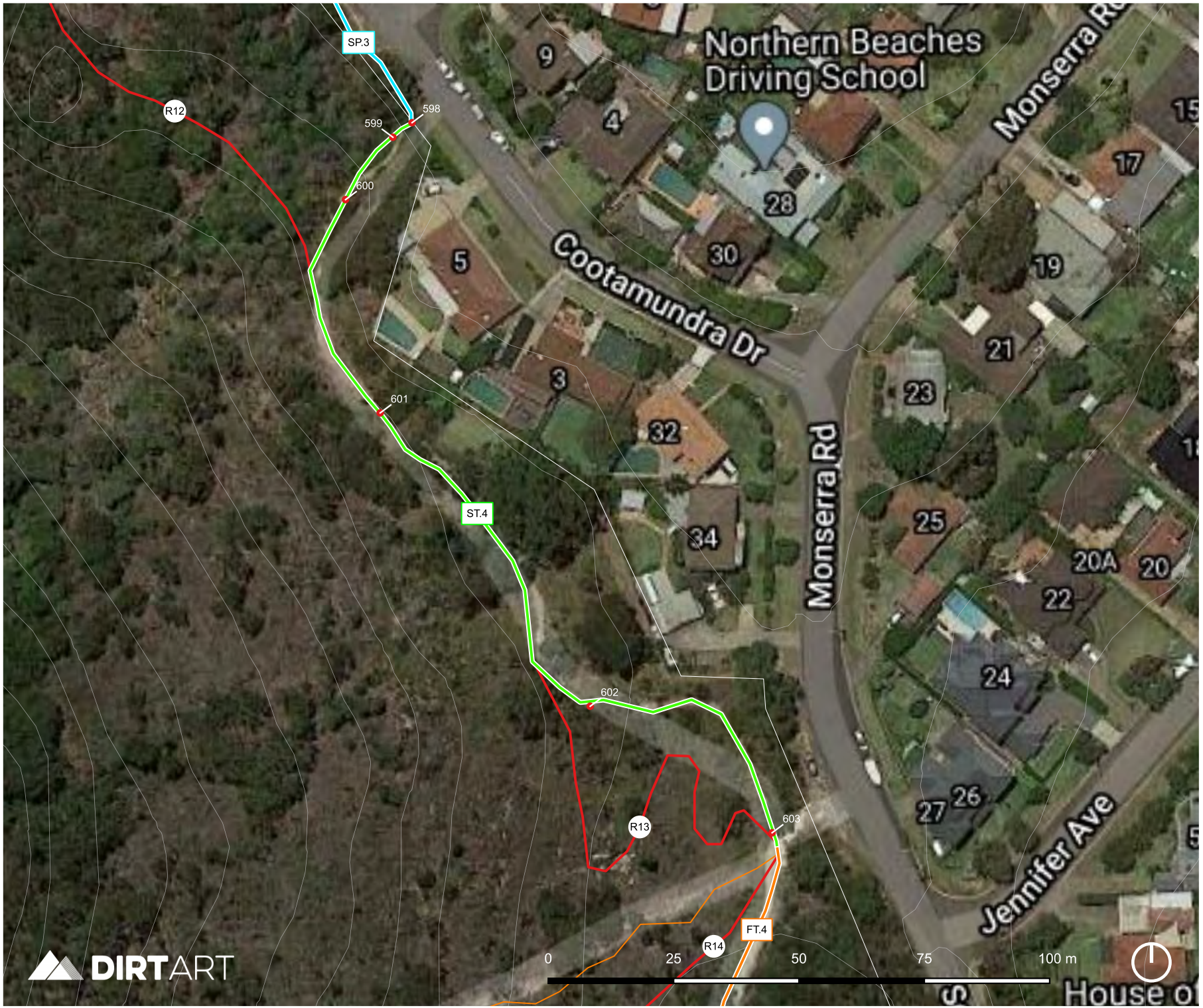
This section of trail runs parallel to an existing road (Cootamundra Drive) and is used as a shared path with other trail users. The track width is inadequate to allow riders to pass other users safely and presents a safety concern given the lack of a physical barrier between the road and trail – especially for those family riding with young children. The road barrier near WP597 restricts the trail with the end post protruding into the trail's edge. Ideally, the trail would be widened along its entirety, however, with the road to its north and the terrain dropping off steeply to the south, there is no room to do so.

It is recommended this entire section of trail be realigned to bypass this shared use path entirely. See Realignment (R12).

17.5 Recommendations (Outside of Scope)

The trail offers a poor riding experiences and presents a safety concern for families with younger children given the proximity of the trail to the road and oncoming vehicles. At times, the trail hugs the road verge with the trail surface meeting up with the concrete kerb. The lack of a physical barrier between the road and trail is something to consider for rider safety. It is strongly recommended this section of trail be realigned completely to bypass this road verge – please refer to the proposed realignment R12.

Please refer to Section 25 – Proposed Major Realignments.



Northern Beaches Trail Audit

TRAIL MAP: ST.4

30.11.20

Trail Audit

- Waypoints

Trail Types

- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments

- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

18 TRACK ST.4

18.1 Overview

This section starts at the Cootamundra Drive (WP598) entry and finishes at WP603 at the gated firetrail entry at Monserra Road. The short section of trail runs along the backs of five residential properties along Cootamundra Drive and Monserra Road.

18.2 Key Information

Section	ST.4
Length (m)	200m
Waypoint (Start)	WP598
Waypoint (Finish)	WP603
Trail Type	Singletrack

18.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	20/50

18.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
598-599	Install Rock Armouring	5m / Imported
Reference Images		

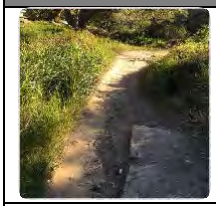



Photo 291		
Description of Works		
Install 5m of rock armouring to re-establish trail tread and prevent further trail widening. The local sandy soils in this area are not conducive to re-profiling the existing trail surface. Any reprofiling work carried out here will likely erode again over time due to the short and steep gradient of the road entry.		

Waypoint(s)	Treatment	Volume / Type
599-600	Re-Profile Trail	15m / Low
Reference Images		

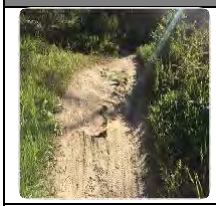



Photo 292	Photo 293	
Description of Works		
Install 5m of rock armouring to re-establish trail tread and prevent further trail widening. The local sandy soils in this area are not conducive to re-profiling the existing trail surface. Any reprofiling work carried out here will likely erode again over time due to the short and steep gradient of the road entry.		

Waypoint(s)	Treatment	Volume / Type
601	Install Rock Armouring	15m / Imported
Reference Images		

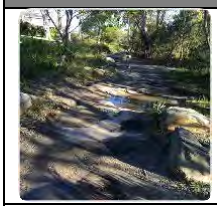
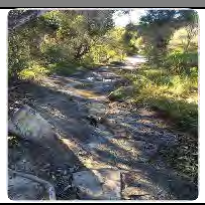
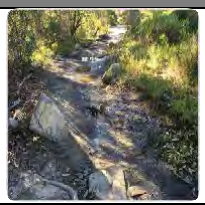

		  

Photo 294	Photo 295	Photo 296 Photo 297 Photo 298
Description of Works		
Install 15m of rock armouring in low lying areas that are prone to holding water. Incorporate dish drains throughout the paved section to promote passive drainage across the trail surface.		

Waypoint(s)	Treatment	Volume / Type
602	Install Rock Armouring	10m / Imported
Reference Images		


Photo 299


Photo 300


Photo 301

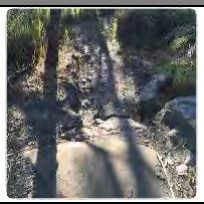


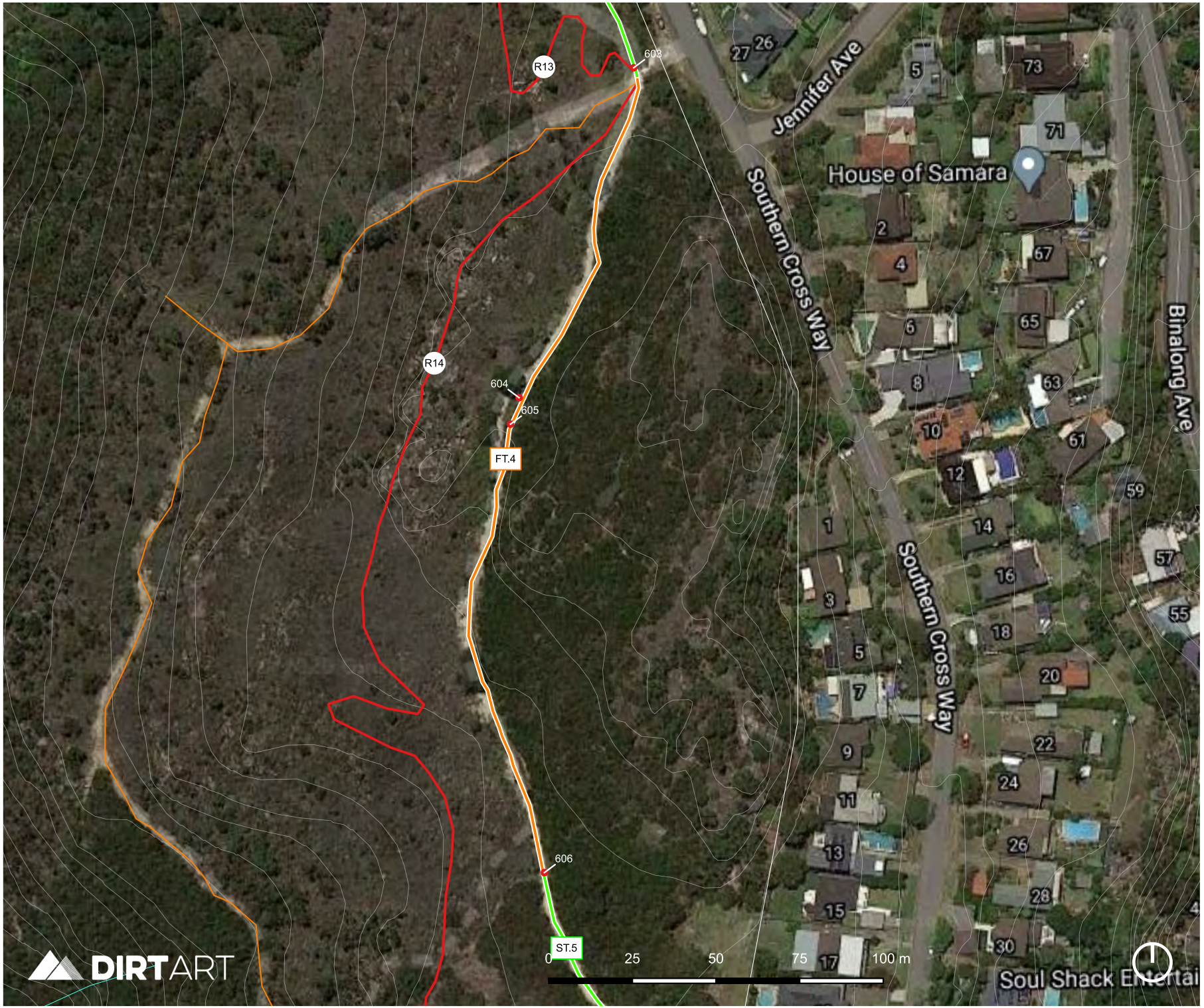
Photo 302

Description of Works
Install 10m of rock armouring in the lower section of the steep pinch climb. Alternatively, realign the climb to a more sustainable gradient – Realignment (R13)

18.5 Recommendations (Outside of Scope)

The start and finish of this short section of trail is recommended for realignment as the current gradients are proving to be unsustainable. Please refer to the proposed realignments R12 and R13.

Please refer to Section 25 – Proposed Major Realignments.



Northern Beaches Trail Audit

TRAIL MAP: FT.4

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

19 TRACK FT.4

19.1 Overview

This section starts at WP603 near the firetrail entry from Monserra Road and finishes at WP606. The trail follows a relatively flat alignment and there were no remediation issues noted during the trail audit other than the close of an informal line between WP604-605.

19.2 Key Information

Section	FT.4
Length (m)	254m
Waypoint (Start)	WP603
Waypoint (Finish)	WP606
Trail Type	Firetrail

19.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	29/50

19.4 Remediations Works

Waypoint(s)	Treatment	Volume / Type
605-606	Close / Rehabilitate	10m / Side Track
Reference Images		


Photo 303


Photo 304


Photo 305


Photo 306

Description of Works
Close and rehabilitate informal line.

19.5 Recommendations (Outside of Scope)

Given the shared-use trail is frequently used by walkers and runners, it is recommended the existing trail remains as such. However, the mountain bike trail is recommended to be realigned to the west back into the existing bushland to create separation from other trail users and form a more sustainable descent that bypasses the proceeding sections of existing trail – i.e., ST.5 and FT.5.

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: ST.5

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

20 TRACK ST.5

20.1 Overview

This section starts at WP606 and finishes at the firetrail junction at WP611. The trail seems to follow an old firetrail / access track alignment with sections that have been rediverted to slightly to the west and designated for mountain bike use only. The existing sections of fire trail in these cases are marked for pedestrian use to separate the two user groups.

The trail is fast throughout this descent and follows a fall line alignment that is clearly unsustainable given the amount of rock armouring that has already been installed and continues to show signs of degradation throughout its length. The existing alignment takes the trail close to residential properties along Southern Cross Way and potentially creates drainage issues with the trail draining towards the adjoining properties. The land naturally falls in a south-easterly direction towards the houses in this area and given the proximity of the trail to the houses, this presents an ongoing problem that would be difficult to resolve without a significant realignment.

20.2 Key Information

Section	ST.5
Length (m)	415m
Waypoint (Start)	WP606
Waypoint (Finish)	WP611
Trail Type	Singletrack

20.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	24/50

20.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
607-608	Re-Profile Trail	100m / Medium

Reference Images


Photo 307

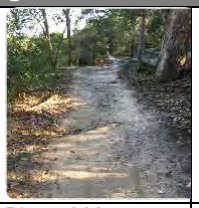


Photo 308

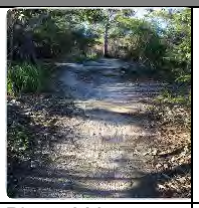


Photo 309

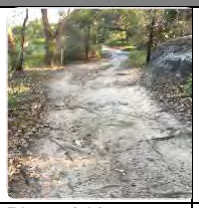


Photo 310


Photo 311


Photo 312


Photo 313


Photo 314


Photo 315


Photo 316

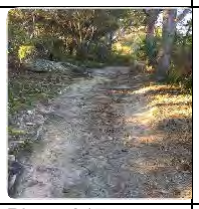


Photo 317

Description of Works

Entire section of trail requires imported surfacing material to reprofile the existing trail tread to manage water and erosion. The straight (fall line) alignment and lack of significant tree cover is unsustainable with clear evidence of long-term erosion and sedimentation present throughout the trail. Consider realigning the entire section of trail into the tree line in the adjoining bushland to the west – Realignment (R14).

Given the root problem throughout this section of trail relates to poor alignment, any resurfacing works will likely be a futile attempt to fix the issue temporarily as opposed to any meaningful long-term solution.

Alignment

The existing alignment runs parallel to a row of residential blocks (No. 23-53 Southern Cross Way) with the natural fall of the land heading in a south-easterly direction towards the housing. It would be difficult to install any additional drainage devices along the given alignment without potentially affecting the adjoining houses in an adverse manner – i.e., diverting overland flow towards the residential properties.

Waypoint(s)	Treatment	Volume / Type
609	Install Rock Armouring	10m / Imported

Reference Images

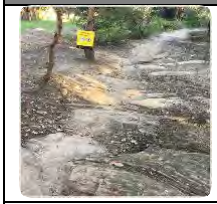


Photo 318


Photo 319


Photo 320

Description of Works

Install 10m of rock armouring between the exposed tree roots to prevent further erosion and scouring between existing rock.

Waypoint(s)	Treatment	Volume / Type
610	Install Rock Armouring	3m / Imported
Reference Images		
		
Photo 321	Photo 322	
Description of Works		
Install 3m of rock armouring to extend the existing paving and prevent further erosion.		

20.5 Recommendations (Outside of Scope)

It is strongly recommended this section of trail be realigned – see realignment R14.

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: FT.5

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

21 TRACK FT.5

21.1 Overview

This section starts at WP611 and utilises an existing section of firetrail / access track between Coolalie Place the carpark to the south on Nyrang Road. This short section of trail is often ridden at high speeds as riders exit the ST.5 descent directly onto this fire trail. The trail alignment poses a safety concern as it funnels riders at speed into a high traffic area – especially on weekends. The carpark is frequently used by other trail users as a point to access the adjoining walking trail that takes them down to the lower dam. As such, people unpacking their cars are not conscious of the fact that they have a mountain bike trail directly behind them to the western edge of the carpark.

21.2 Key Information

Section	FT.5
Length (m)	42m
Waypoint (Start)	WP611
Waypoint (Finish)	WP612
Trail Type	Firetrail

21.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	24/50

21.5 Recommendations (Outside of Scope)

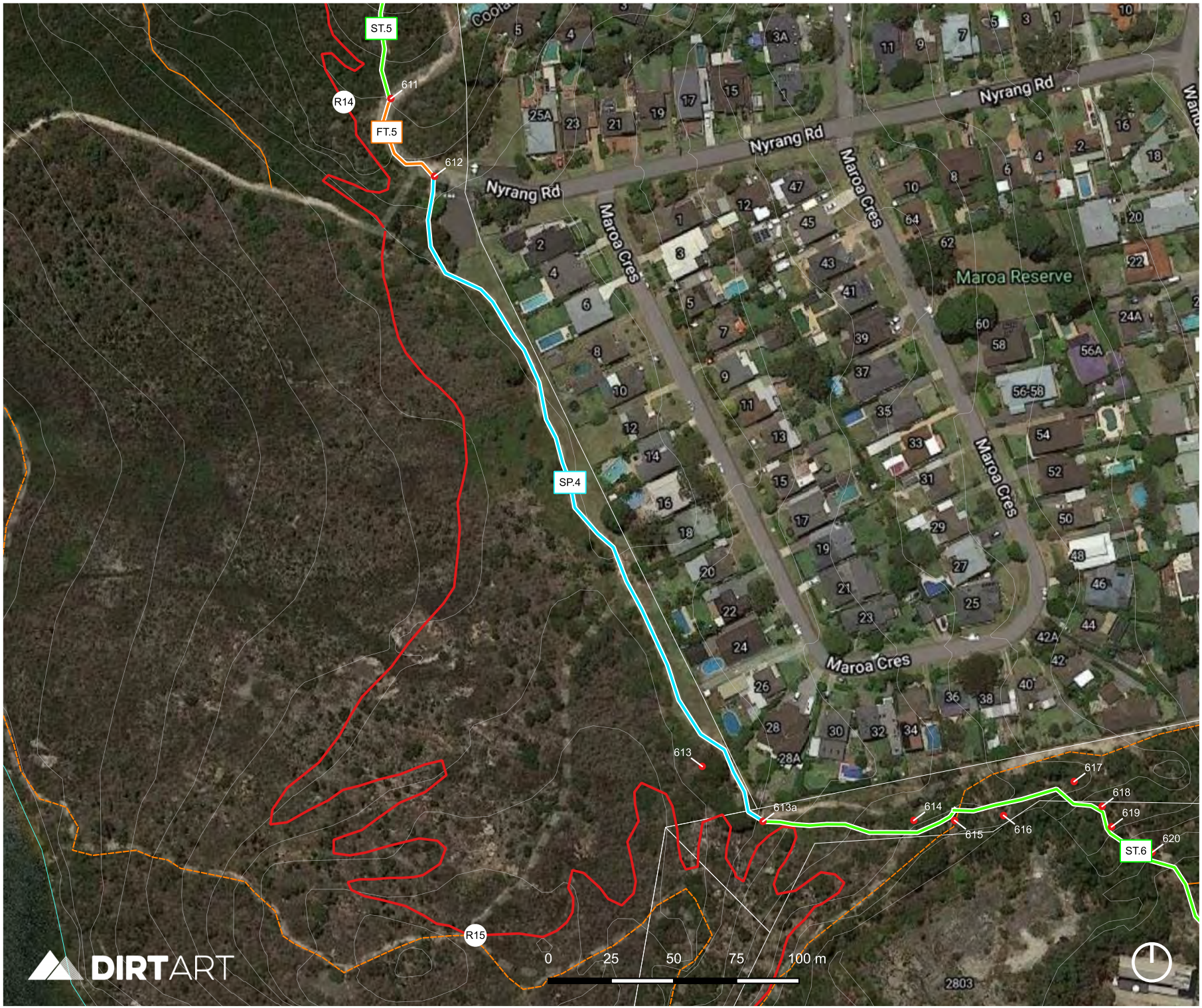
This section of trail is strongly recommended for realignment with the proposed R14 and R15 pulling the trail away from the carpark area and further to the west. By creating a formalised trailhead for the mountain bike trails and walking trails, a more prominent trail hub and dedicated orientation space can be designed and created to avoid user conflict.

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: SP.4

30.11.20



Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

22 TRACK SP.4

22.1 Overview

This section starts at WP612 at the carpark located at the end of Nyrang Road and ends at fire trail gate located at WP613a. The shared path runs on a north to south alignment along an easement / firebreak parallel to a row of houses on Maroa Crescent. The trail is poorly aligned with the flat trail profile causing issues during heavy rain events due to surface cupping and the lack of adequate crossfall throughout the trail tread. The proximity of the trail to existing residential properties and their respective backyard is far from ideal and presents privacy issues to those houses that back onto the easement.

22.2 Key Information

Section	SP.4
Length (m)	302m
Waypoint (Start)	WP612
Waypoint (Finish)	WP613a
Trail Type	Shared Path

22.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	24/50

22.5 Remediation Works

Waypoint(s)	Treatment	Volume / Type
613	Install Rock Armouring	3m / Imported
Reference Images		


Photo 323


Photo 324

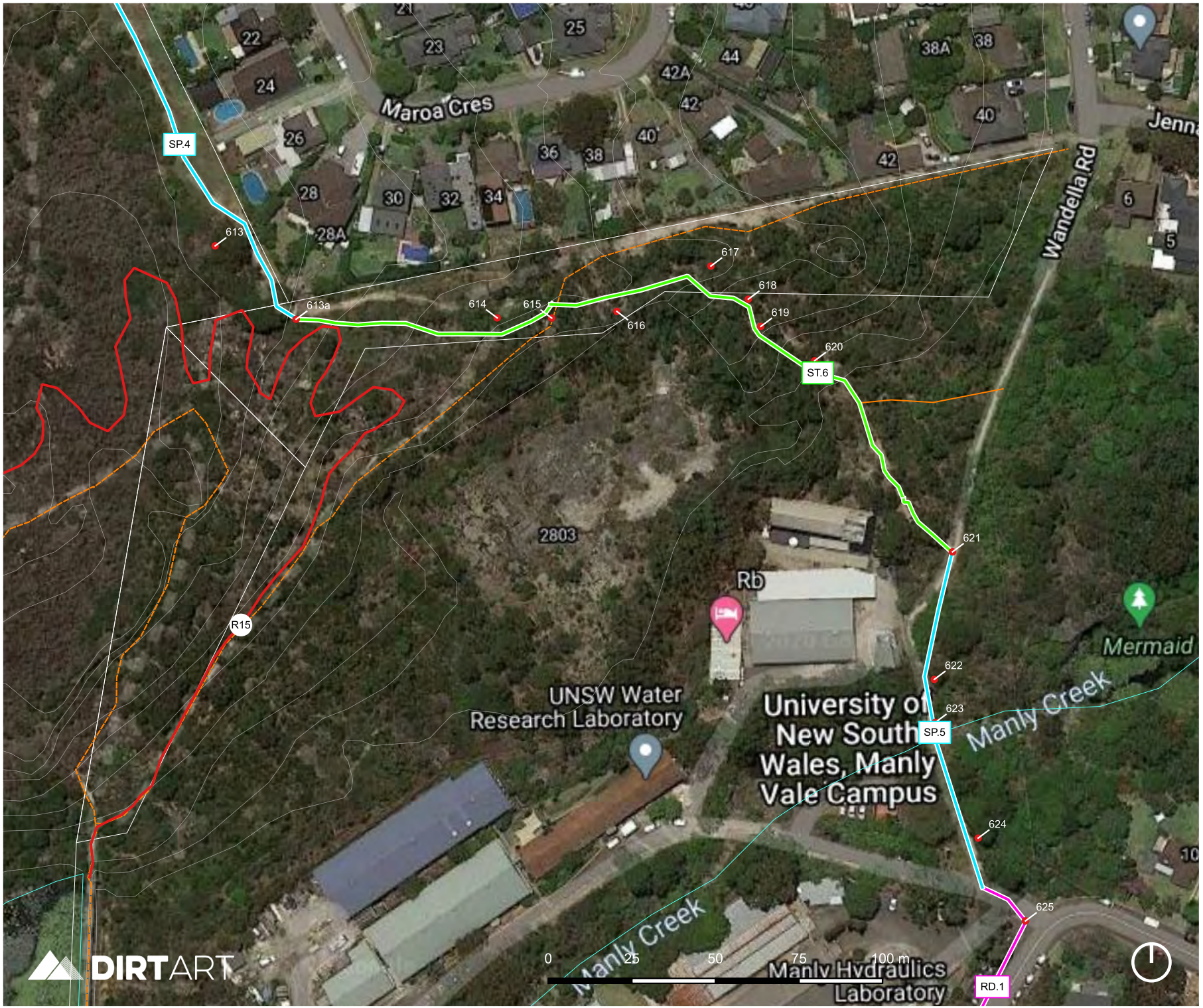

Photo 325

Description of Works
Install 3m of rock armouring protect the existing tree root.

22.6 Recommendations (Outside of Scope)

The trail would benefit significantly from being realigned into the adjoining bushland to the west to create a more sustainable trail tread that is systematically profiled to passively shed and disperse water throughout the trail's entirety. Creating a vegetation buffer between the realigned trail and the residential properties will also help to reduce any potential privacy or conflicts with local residents.

Please refer to Section 25 – Proposed Major Realignments.



Northern Beaches Trail Audit

TRAIL MAP: ST.6

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

23 TRACK ST.6

23.1 Overview

This section starts at the fire trail gate located at WP613a and finishes at WP621 where the trail meets the concrete pathway. Like SP.4, the trail follows an alignment that is close to several residential properties along Maroa Crescent. This section of trail has seen multiple upgrades throughout its length with significant portions of the trail already heavily rock armoured and paved. The trail is poorly aligned to begin with and subsequently requires rock armouring to fortify the trail surface given the steep alignment and high rider traffic through this zone.

The primary concern for this section relates to the safety issue of having a high-speed section of trail exiting directly onto a public footpath that is frequented by walkers and other trail users. The exit onto the pathway is blind for riders with very little visibility or awareness of the pathway. For other users, there is some a pre-warning of an approaching bicycle in regard to the sound; however, like the riders, they have no direct line of sight until the very last moment when they pop out onto the footpath and potentially result in a collision.

23.2 Key Information

Section	ST.6
Length (m)	245m
Waypoint (Start)	WP613a
Waypoint (Finish)	WP621
Trail Type	Singletrack

23.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	22/50

23.4 Remediation Works

Waypoint(s)	Treatment	Volume / Type
614	Install Rock Armouring	6m / Imported
Reference Images		


Photo 326


Photo 327


Photo 328

Description of Works
Install 6m of rock armouring prevent further erosion.

Waypoint(s)	Treatment	Volume / Type
615	Install Rock Armouring	9m / Imported
Reference Images		

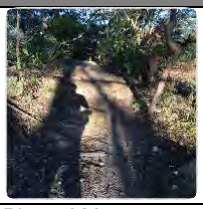


Photo 329

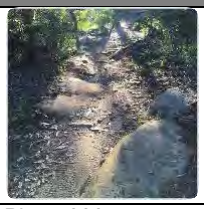


Photo 330

Description of Works
Install 9m of rock armouring to protect the existing exposed tree roots and prevent further erosion.

Waypoint(s)	Treatment	Volume / Type
616	Close / Rehabilitate	10m / Low
Reference Images		


Photo 331


Photo 332

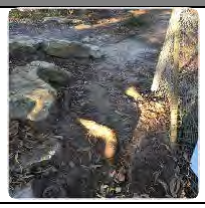


Photo 333


Photo 334


Photo 335

Description of Works
Close off and rehabilitate the lower B-line near the existing fence line. The line is unsustainable and cutting into the existing established root zone of the nearby mature tree. The alignment is also too close to the wire mesh fence, making it dangerous to less confident riders as they can easily catch a handlebar on the fence.

Waypoint(s)	Treatment	Volume / Type
616	Reconstruct Technical Feature	1 / Medium

Reference Images


Photo 336


Photo 337

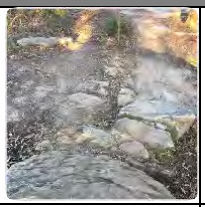


Photo 338


Photo 339


Photo 340


Photo 341

Description of Works

Reconstruct existing 'A-line' rock roll to cater for beginner to intermediate level riders. Widen the existing rock ramp to ensure a clear, straight, and rollable line is achievable for less confident riders. Heavy rock works required. Approximately 10m of imported rock required to rebuild rock ramp to a wider and more approachable tread.

Waypoint(s)	Treatment	Volume / Type
617	Close / Rehabilitate	15m / Low

Reference Images


Photo 342

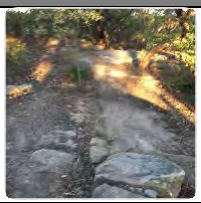


Photo 343


Photo 344

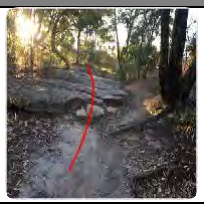


Photo 345

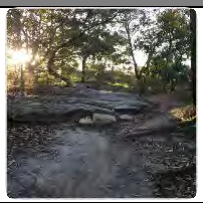


Photo 346

Description of Works

Close off informal (riders) left line and bring riders back onto the existing rock slab. The informal line is unsustainable and will continue to erode without being rock paved extensively. The informal alignment also ends on a large and established tree root.

Waypoint(s)	Treatment	Volume / Type
618	Install Rock Armouring	20m / Imported

Reference Images


Photo 347


Photo 348


Photo 349


Photo 350

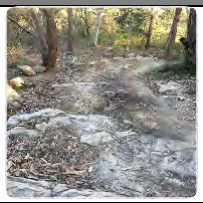


Photo 351

Description of Works

Install 20m of rock armouring to create a completely rock-armoured right-hand berm using the older outside line. Close off inside line to prevent continued trail widening. The inside line is unsustainable and results in riders braking heavily at the bottom as the turn tightens abruptly as opposed to following a more gradual and sweeping arc evident in the old outside line.

Waypoint(s)	Treatment	Volume / Type
619	Install Rock Armouring	10m / Imported

Reference Images

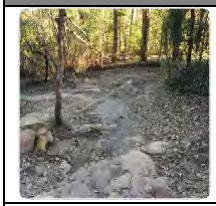


Photo 352

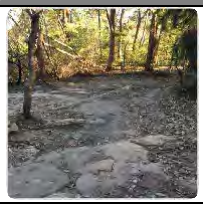


Photo 353

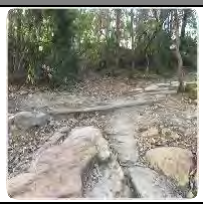


Photo 354


Photo 355

Description of Works

Install 10m of rock armouring to create a completely rock-armoured left-hand berm.

Waypoint(s)	Treatment	Volume / Type
620	Install Rock Armouring	10m / Imported

Reference Images


Photo 356


Photo 357


Photo 358


Photo 359


Photo 360


Photo 361

Description of Works

Install 10m of rock armouring to pave between the existing rock slabs to prevent further erosion in a high impact area.

Waypoint(s)	Treatment	Volume / Type
621	Install Rock Armouring	10m / Imported

Reference Images


Photo 362


Photo 363


Photo 364


Photo 365


Photo 366


Photo 367

Description of Works

Install 10m of rock armouring to pave the last section of the trail before it meets the concrete pathway. The existing trail is currently being washed across the pathway making it dangerous for pedestrians and riders as it creates a loose and unpredictable surface.

23.5 Recommendations (Outside of Scope)

Safety
The current alignment of the trail onto an existing pedestrian pathway presents a serious safety concern for riders and walkers respectively. Riders are generally travelling at high speeds through this section of the trail as all proceedings sections of trail leading to this point are sustained descents. The exit onto the footpath is completely blind without adequate sight lines for either party.

Alignment
This particular zone is heavily constrained in terms of other re-routes or potential options to realign the trail due to land tenure and the narrow strip of land available. It is highly recommended that a more suitable and safer alternative is investigated. Two options worthwhile pursuing are listed below:

1. Utilise the existing Manly Dam wall as a shared-use pathway – whereby cyclists are forced to dismount and give way to pedestrians.
    a. Creates an iconic way to finish the Manly Dam loop and is fitting to the trail's name
    b. Allows riders to see and appreciate views/vistas over Manly Dam (riders are completely unaware of Manly Dam as they do not get a chance to see it in the current loop alignment)
    c. Utilise existing car parking and amenities within the Manly-Warringah War Memorial Park
    d. Create a formalised trailhead with potential for paid off-street parking
2. Investigate whether there is an option to utilise the vacant lot owned/managed by UNSW situated to the north of the existing UNSW Water Research Laboratory.
    a. Existing driveway access into facility
    b. Create a formalised trailhead with potential for paid off-street parking

Potential to realign the trail to descend directly into this compound and avoid user conflicts on the existing pathway between King Street and Wandella Road

Please refer to Section 25 – Proposed Major Realignments.

Northern Beaches Trail Audit

TRAIL MAP: SP.5

30.11.20

Trail Audit
- Waypoints

Trail Types
- ST-Singletrack
- SP-Shared Path
- FT-Firetrail
- RD-Road

Realignments
- MD.R1
- MD.R2
- MD.R3
- MD.R4
- MD.R5
- MD.R6
- MD.R7
- MD.R8
- MD.R9
- MD.R10
- MD.R11
- MD.R12
- MD.R13
- MD.R14

24 TRACK SP.5

24.1 Overview

This section starts at WP 621 and utilises the existing pedestrian footpath that connects Kings Street and Wandella Road. The section finishes at WP625 at the driveway crossover into the UNSW Water Research Laboratory on King Street. The existing footpath is inadequate sized to service the high volume of riders and presents serious safety concerns already mentioned in ST.6 where the trail exits directly onto the footpath. The pathway itself is narrow and is regularly used by local walkers as it is a popular pedestrian thoroughfare. The width of the path does not allow a rider to safely pass without a walker physically stepping off the path or vice versa. Similarly, the bridge crossing exhibits the same issues and is insufficient to service the volume of rider and walker traffic – often in both directions.

24.2 Key Information

Section	SP.5
Length (m)	104m
Waypoint (Start)	WP621
Waypoint (Finish)	WP625
Trail Type	Shared Path

24.3 Trail Assessment

CRITERIA	RATING				
A. Sustainability					
B. Ride Experience					
C. Broad Market Appeal					
D. Environmental Experience					
E. Value to Network					
F. Environmental Compatibility					
G. Social Compatibility					
H. Life Cycle Cost Rating					
I. Safety					
J. Emergency Access					

TOTAL SCORE =	26/50

24.4 Recommendations (Outside of Scope)

This section of trail is recommended to be removed from the formal Manly Dam mountain bike loop and replaced with a purpose-built trail in the form of the proposed realignment R15. Alternatively, the footpath needs to undergo significant upgrades to widen the entire pathway including the footbridge.

Please refer to Section 25 – Proposed Major Realignments.

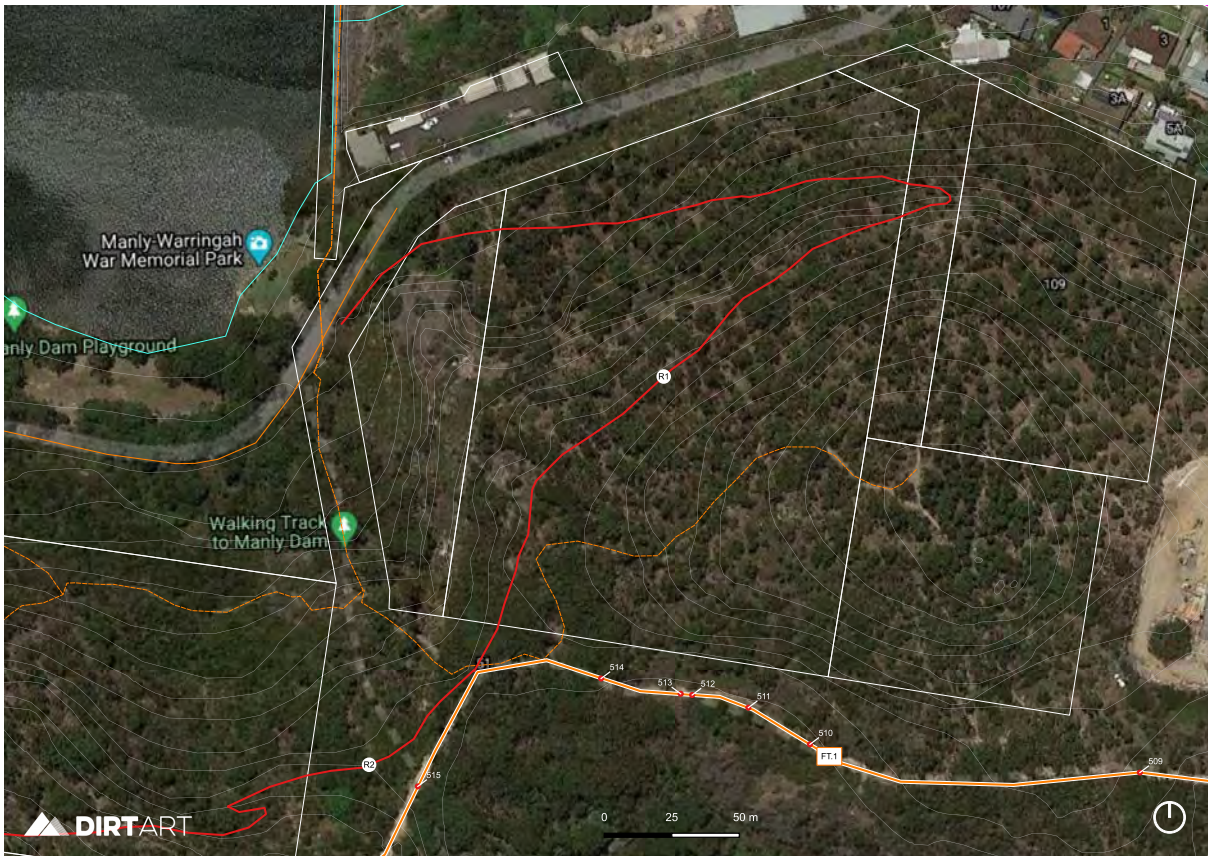
25 PROPOSED MAJOR REALIGNMENTS

25.1 Overview

The following works sit outside the current scope of works of this project as they are defined as major realignments and constitute ‘new trail’, which is incompatible with the park’s Plan of Management. Notwithstanding, Dirt Art has proposed these realignments as they represent the best pathway for Council to address the primary concerns highlighted in this trail audit in a long-term and meaningful way. It is important to note, the recommendations are framed from a mountain biker’s perspective as the scope of the audit is in direct relation to the Manly Dam trail functioning as a formal mountain biking loop. Dirt Art acknowledges the other users of the park and functionality of sections of the trail for vehicular access to service various onsite utilities. As such, it will be at Council’s discretion as to the extent to which they wish and are practically able to pursue the following options in light of the various needs of the relating user groups and stakeholders of the park.

The sections of existing trail that these proposed realignments bypass have been deemed not fit for the purpose of mountain biking by Dirt Art due to reasons relating to rider safety, environmental sustainability, and the overall user experience. For these reasons, Dirt Art have strongly recommended that these major realignments be investigated to properly address and resolve the underlying issues that pertain to the problems highlighted within the existing Manly Dam mountain bike trail. The realignments are conceptual in nature and have not been ground-truthed in any manner. They do not represent finalised alignments or ‘shovel ready’ options. Rather, like any proposed trail to be constructed, further analysis and detailed design will be required to refine the proposed alignments to a 10-20m corridor with all relating impact assessments to be undertaken to ensure there are no adverse impacts to the surrounding environment.

25.2 Realignment R1



Realignment	R1
Length (m)	507m

25.2.1 Description

Realignment R1 seeks to remove the existing section of the formal Manly Dam loop that utilises the existing roads: King Street, Arana Street, and Gibbs Street. The primary reason for the realignment is to address key safety concerns related to riders having to share the road with vehicular traffic. The lack of a dedicated cycleway on King Street and Arana Street makes it dangerous for families riding with young children especially who are less aware of their surroundings and the changing environment, for example reversing cars or car doors opening in their path of travel. The proposed realignment also serves to reduce user conflict with nearby residents as well as the nearby Manly Vale Public School, which the loop currently passes through their carpark at the southern end of Gibbs Street.

25.3 Realignment R2

25.3.1 Map

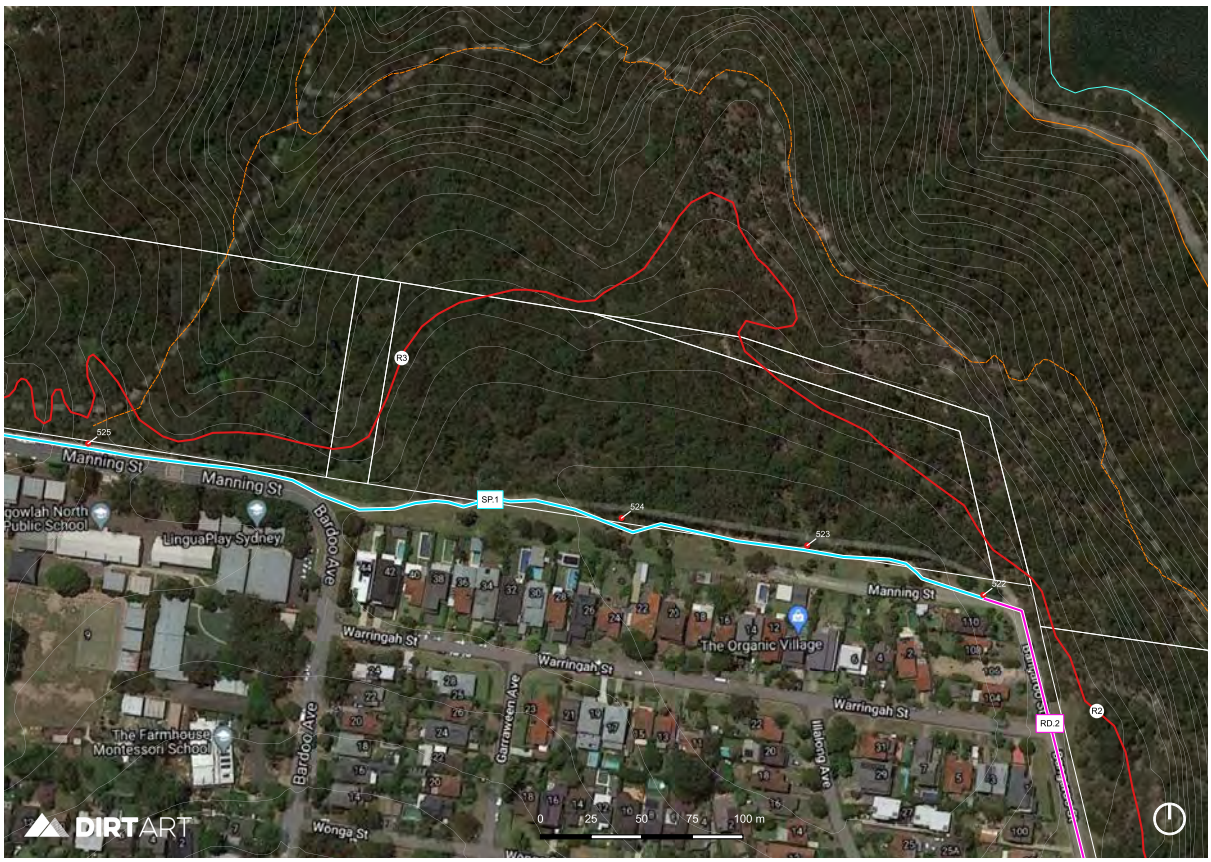
Realignment	R2
Length (m)	768m

25.3.2 Description

Realignment R2 extends the proposed R1 realignment and bypasses a severely eroded section of steep fire trail between W515-516. The proposed route bypasses the steep climb and follows a more sustainable and gradual gradient to the northern – traversing series of rocky outcrops onto a flat area of rock slabs before heading south towards the corner of Kalaui Street and Bangaroo Street. The realignment then climbs gradually weaving its way up to a highpoint that presents spectacular ocean views back towards Manly Beach. The proposed route then takes riders further north along the ridgeline creating a complete singletrack experience, removing the road sections (RD.2). Realignment R2 shifts the riding traffic away from the boundaries and frontages of the adjoining houses and re-establishes privacy to these local properties.

25.4 Realignment R3

25.4.1 Map



Realignment	R3
Length (m)	857m

25.4.2 Description

Realignment R3 pushes the existing trail alignment into the adjoining bushland to the north to create a singletrack riding experience that follows a generally contouring alignment to take riders out to a prominent spur that offers views back down towards Manly Dam. This concept of offering glimpses of the dam throughout the loop is essential in creating a sense of adventure and accomplishment. If riders can see the dam, they can naturally orientate themselves and understand where they are in relation to their start/finish point without having to constantly refer to a map or their smartphone.

The current shared path is to remain for pedestrian traffic only. Realignment R3 shifts the riding traffic away from the rear boundaries of the adjoining houses and re-establishes privacy to these local properties.

25.5 Realignment R4

25.5.1 Map

Realignment	R4
Length (m)	341m

25.5.2 Description

Realignment R4 starts at the end of R3 where it meets an existing walking trail. The proposed realignment bypasses the shared pathway that has been flagged as having safety concerns about its proximity to Manning Street and also the roundabout at the corner of Manning Street and Mons Road. In addition to address the safety concerns of the road, R4 presents a more sustainable alignment to the current trail, which is heavily eroded due to its poor alignment. The current trail between W526-528 should be closed and rehabilitated.

The last section of the proposed R4 realignment takes riders towards the entrance of Wakehurst Golf Club to a formalised cross area away from the existing Bantry Bay Reserve carpark. The current RD.3 takes riders directly through the middle of a carpark, which is dangerous for several reasons including poor line of sight at the crossing, conflict with carpark users, and placing riders in the blind spot of parking cars.

25.6 Realignment R5

25.6.1 Map

Realignment	R5
Length (m)	370m

25.6.2 Description

Realignment R5 starts after the proposed formal crossing near the entry to the Wakehurst Golf Club. It takes riders away from the busy shared-use path along the northern edge of Bantry Bay Reserve and helps remove the user conflict between other trail users. For example, the path is used regularly by local walkers, dog walkers, runners, and spectators during sporting events/training. The Manly Dam mountain bike trail needs to be completely separated from this high use area as a matter of safety as there is zero benefit to any user group for shared use in this instance.

25.7 Realignment R6

25.7.1 Map

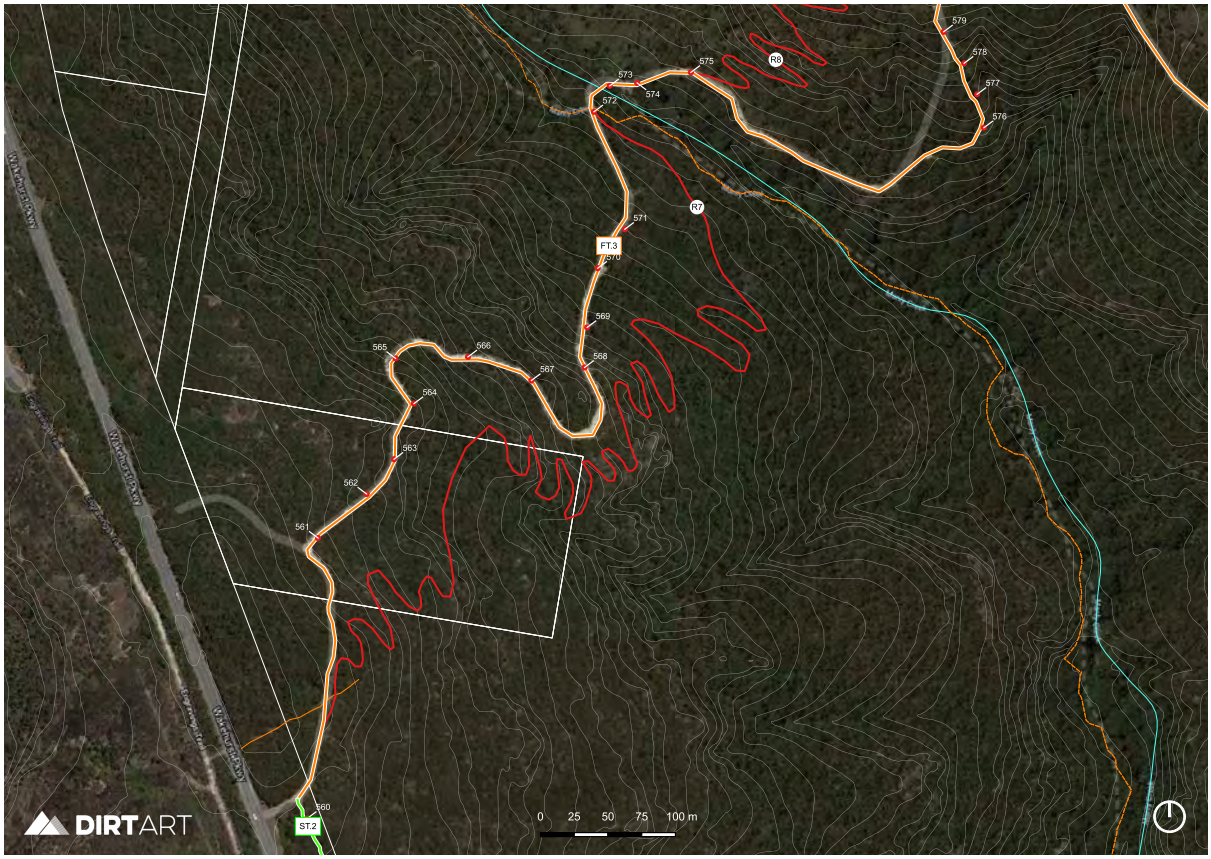
Realignment	R6
Length (m)	87m

25.7.2 Description

Realignment R6 provides beginner to intermediate riders an option to bypass the technically challenging section of trail at W554-556. The technical trail features here are catered more towards the enthusiast level rider with a strong grasp of slow-speed technical skills, specifically those that can confidently lift their front wheel up a double rock step. A large proportion of riders in the beginner to intermediate category would likely be pushing their bike up this difficult feature. Thus, the short bypass option allows a much wider demographic of rider to enjoy the Manly Dam loop by staying on their bike and not having to get off and push their way up a seemingly cumbersome and difficult feature.

25.8 Realignment R7

25.8.1 Map



Realignment	R7
Length (m)	1524m

25.8.2 Description

Realignment R7 addresses the major safety concerns identified along the steep and sustained section of firetrail leading down to Manly Creek between WP561-572. The trail audit highlighted several issues relating to unsustainable gradients exceeding the IMBA guidelines for a beginner (Green Circle) to intermediate (Blue Square) mountain bike trail. The steep nature of the trail alignment is not suited to mountain biking, with high speeds presenting a significant hazard to rider safety, especially to those that are less experienced and unaware of the subtle dangers that waterbars and variable trail surfaces present to beginner to intermediate level riders.

The proposed realignment relocates the mountain bike descent to south of the existing fire trail taking a gradually descending alignment that meanders its way down to Manly Creek in a safer and more sustainable manner. The existing fire trail will remain accessible to service vehicles and function as a walking/running track.

25.9 Realignment R8

25.9.1 Map

Realignment	R8
Length (m)	534m

25.9.2 Description

Realignment R8 provides a more sustainable climbing alignment to the current 'Heartbreak Hill' section of the fire trail between WP576-580. The trail audit highlighted several issues relating to unsustainable gradients exceeding the IMBA guidelines for a beginner (Green Circle) to intermediate (Blue Square) mountain bike trail. The fire trail follows an unsustainable fall-line alignment up the existing spur, which is too steep and relies on several large waterbars to divert water from the trail surface during heavy rain events. The steep section of trail will continue to erode badly overtime due the unsustainable gradients and any resurfacing works will inevitably be washed away.

The proposed realignment relocates the mountain bike descent to the north-west of the existing fire trail taking a gradually ascending alignment that meanders its way up to the highpoint of the trail in a more sustainable manner. The existing fire trail will remain accessible to service vehicles and function as a walking/running track.

25.10 Realignment R9

25.10.1 Map

Realignment	R9
Length (m)	481m

25.10.2 Description

Realignment R9 provides a more sustainable alignment that avoids a steep gully, eliminating a steep descent and corresponding climb. The trail audit highlighted several issues relating to unsustainable gradients exceeding the IMBA guidelines for a beginner (Green Circle) to intermediate (Blue Square) mountain bike trail.

The proposed realignment relocates the mountain bike trail to the north-east of the existing fire trail taking a more gradual descending and climbing alignment than what currently exists. The existing fire trail will remain accessible to service vehicles and function as a walking/running track.

25.11 Realignment R10

25.11.1 Map

Realignment	R10
Length (m)	159m

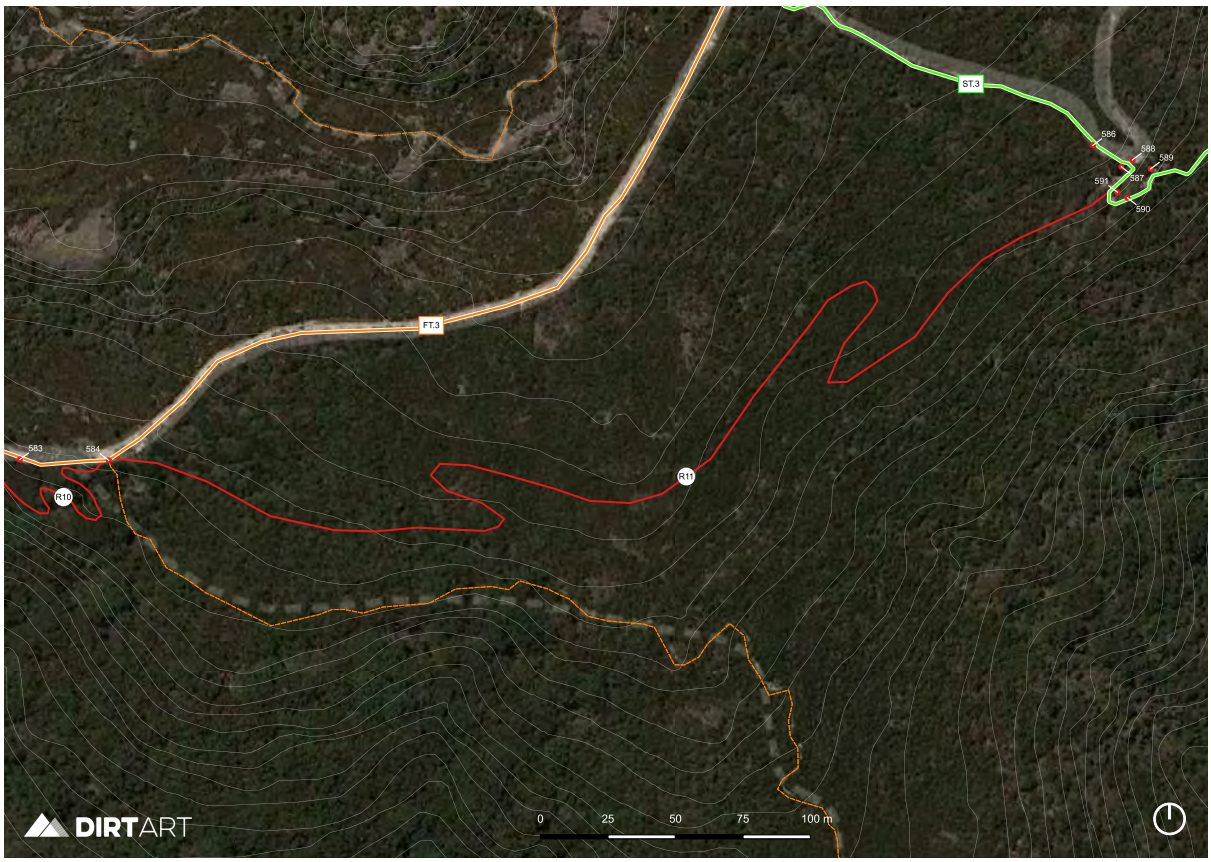
25.11.2 Description

Realignment R10 provides a more sustainable alignment that avoids a steep and rough climb. The trail audit highlighted several issues relating to unsustainable gradients exceeding the IMBA guidelines for a beginner (Green Circle) to intermediate (Blue Square) mountain bike trail. Sections of the existing fire trail has been cut into bedrock, making any surface reprofiling works difficult without the need to undertake substantial rock works. The current trail is unsuitable for beginner riders with the rough and variable trail surface presenting a difficult and technically demanding section of trail that is inconsistent with the rest of the Manly Dam loop.

The proposed realignment relocates the mountain bike trail to the south of the existing fire trail taking a more gradual descending and climbing alignment than what currently exists. The existing fire trail will remain accessible to service vehicles and function as a walking/running track.

25.12 Realignment R11

25.12.1 Map



Realignment	R11
Length (m)	559m

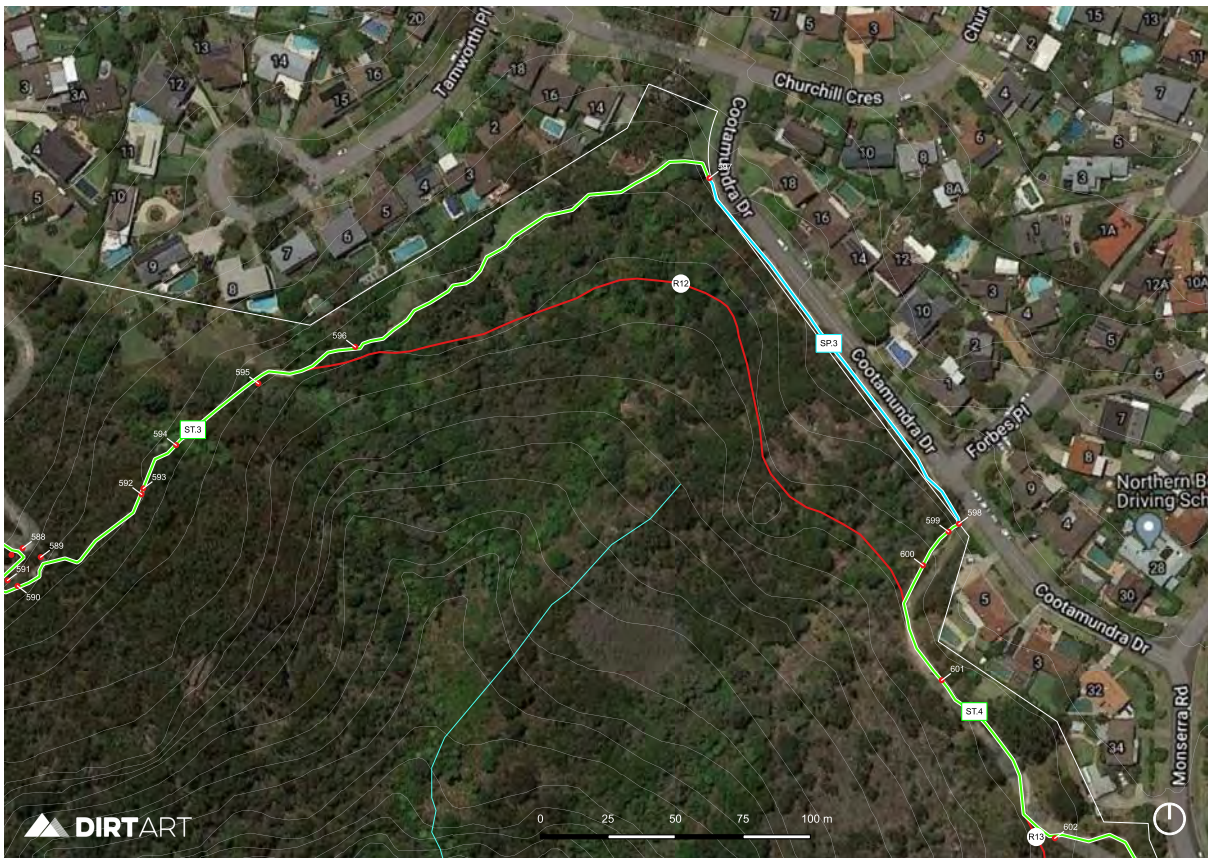
25.12.2 Description

Realignment R11 provides a more sustainable alternative to the current section of trail between W585-586, which is poorly located in area prone to holding large amounts of surface and ground water. The trail audit identified major environmental issues relating to this particular section of trail with clear evidence that the underlying problem relates to poor alignment. The realignment seeks to avoid this area entirely.

The proposed realignment relocates the mountain bike trail to the south of the existing fire trail taking a more gradual contouring alignment than what currently exists and avoids an area prone to withholding water. The proposed route re-joins the existing trail at the popular 19th Hole area. The existing section of trail between W585-586 is proposed to be closed and rehabilitated as soon as a suitable realignment is completed. There is potential to harvest and recycle the rock in this area to be reused at the 19th Hole to provide further rock armouring to the formalised lines.

25.13 Realignment R12

25.13.1 Map



Realignment	R12
Length (m)	304m

25.13.2 Description

Realignment R12 provides a safer and more socially compatible alignment than the current trail, which runs parallel to the rear boundaries of residential properties, traverses the edge of a children's playground, and puts riders (especially young children) at risk along the edge of Cootamundra Drive on a shared path with no physical barrier to the road.

The proposed realignment relocates the mountain bike trail to the south of the existing trail and bypasses the highly constrained sections of existing trail entirely, by placing riders back into the adjoining bushland and away from the nearby houses and road. The existing trail and shared path will remain accessible to pedestrians.

25.14 Realignment R13

25.14.1 Map

Realignment	R13
Length (m)	117m

25.14.2 Description

Realignment R13 provides a more sustainable alignment that avoids a steep and eroded climb. The current trail is unsuitable for beginner riders with the rough and variable trail surface presenting a difficult and technically demanding section of trail that is inconsistent with the rest of the Manly Dam loop.

The proposed realignment relocates the mountain bike trail to the south of the trail taking a more gradual descending alignment than what currently exists. The existing trail is recommended for closure and rehabilitation.

25.15 Realignment R14

25.15.1 Map

Realignment	R14
Length (m)	1500m

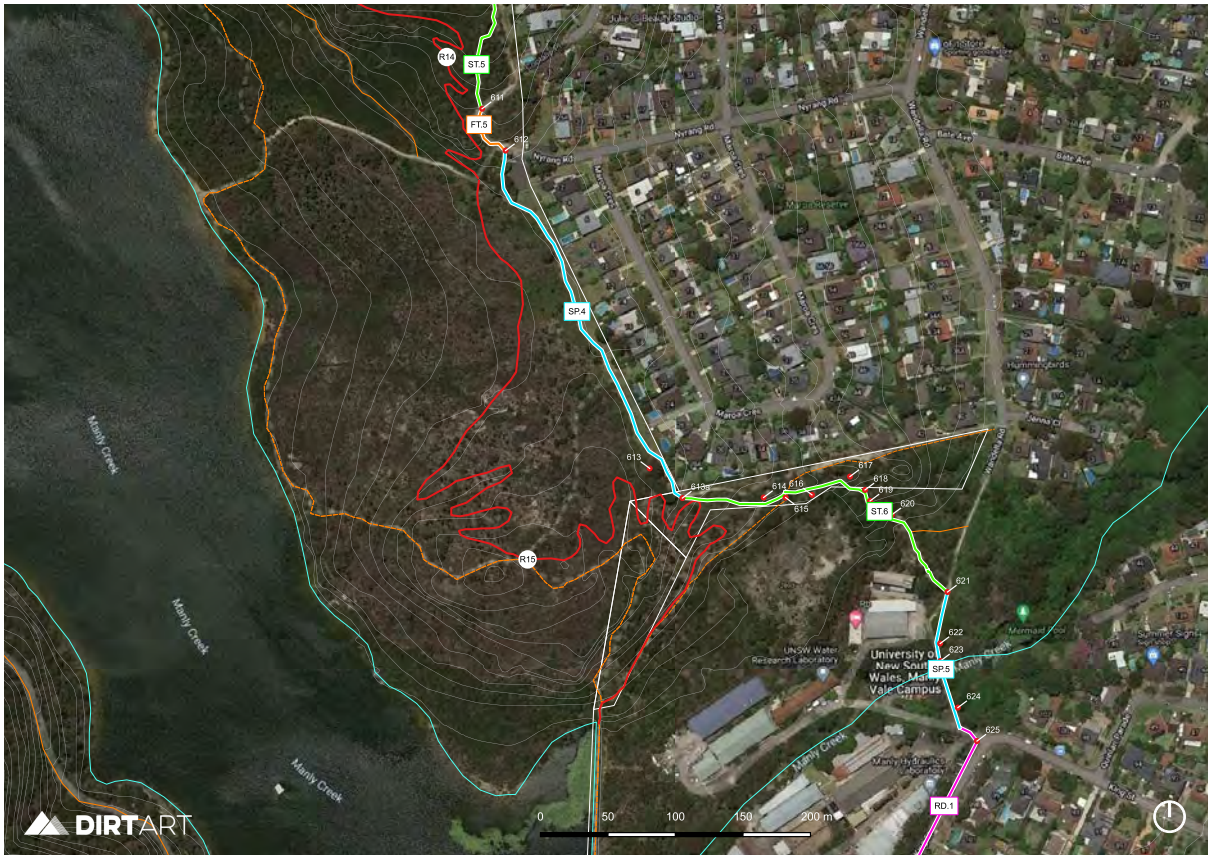
25.15.2 Description

Realignment R14 provides a more sustainable and safer alternative to the current section of trail between W603-612, which suffers from constant upkeep due to its poor fall line alignment as well as social compatibility issues with the route being popular with other users such as walkers and runners. The existing trail seemingly follows an old fire trail alignment, which has been repurposed in sections to accommodate mountain use. However, despite the significant trail works that have been implemented in this area, the underlying issue of the trail being poorly aligned continues to undermine these efforts and will continue to do so until the trail is realigned completely.

The proposed realignment relocates the entire descent to the west of the existing trail taking a more gradually descending alignment than what currently exists and realigns the trail to the western side of the existing ridgeline to resolves issues of the trail draining towards the residential properties to the east due to the natural topography and lay of the land.

25.16 R15

25.16.1 Map



Realignment	R15
Length (m)	1072m

25.16.2 Description

Realignment R15 provides a more sustainable and socially compatible alternative to the current section of trail between W612-625. The existing trail seemingly follows an old fire trail alignment and firebreak between the bushland and adjacent residential properties. The flat topography is prone to holding water in heavy rain events with no passive means of drainage due to the lack of crossfall and/or available gradient. In addition to this, the trail alignment brings the trail within close proximity to a series of houses along Maroa Crescent, which is less than ideal given the trail and its users impedes on the privacy and natural amenity of these residents.

The proposed realignment starts by shifting rider traffic away from the existing carpark (at the end of Nyrang Road) to the west to allow a formalised trailhead to be instated. This will help to reduce the conflict between other users and address safety concerns with riders moving around the perimeter of this carpark at speed and colliding with unsuspecting pedestrians. The realignment than heads towards a prominent highpoint to the south,

offering riders a vista down to the dam, before the final weaving descent down to finish the formal trail loop along the dam wall.

This realignment provides the best possible solution to resolving the end of the Manly Dam loop. The crossing of the dam wall provides an iconic user experience and major point of difference from other trail destinations. It will help strengthen the overall brand and identity of the locally known trail loop, while providing a means to capture a much broader audience from further afield. There will no doubt be complexities relating to this option; however, these far outweigh the strict limitations currently imposed by the alternative, which is to continue using the existing poorly aligned exit onto King Street. The dam wall provides an end-to-end solution that allows the formal trail loop to stand alone as an entire trail product, not having to comprise the safety its users or detract from the overall experience by having to share suburban streets/roadways. Realignment R15 is an integral part of re-interpreting the current configuration of the formal Manly Dam mountain bike loop and transforming it into a more sustainable and safer trail experience for beginner to intermediate riders.

26 Conclusion

26.1 Overview

The formal Manly Dam mountain bike trail loop is a mishmash of fire trail (42%), roads/streets (10%), shared paths (17%), and limited sections of singletrack (17%). In its current configuration, the loop offers an underwhelming mountain bike experience compared to those trails and networks that have been designed and constructed informally or professionally to cater for riders and their specific needs. For mountain biking, the underlying issue pertains to the trail not being fit for purpose and subsequently highlights a series of fundamental problems identified consistently throughout the trail audit relating to sustainability, rider safety, and poor user experience.

26.2 Sustainability

Poorly aligned trails with unsustainable gradients and sustained steep sections exceed the trail industry's best practice (IMBA) guidelines. As a result, these sections are inconsistent with a beginner (Green Circle) or intermediate (Blue Square) difficulty trail and show signs of erosion or constant upkeep/maintenance.

Sections of trail most commonly found to exhibit these steep grades are those typically along the existing fire trails, which have been designed and constructed for the sole purpose of providing access for service vehicles as opposed to mountain bikes. As such, there is a fundamental disconnect between the trail's original function and the mountain bike use that has since been retrofitted or allocated to these sections of trail. In these instances, the trail has been proposed to be realigned to a more sustainable alignment with the fire trail remaining open to other user groups and to function as a route for service vehicles.

There are sections of trail that have received significant amounts of remediation works and upgrades at volunteer level and also professional capacity, which continue to perform poorly in an environmental sense. The root cause in these cases is poor alignment, which cannot be adequately fixed without addressing the underlying problem. Most attempts will be futile in this sense and it is clear the issue will continue to occur. As a result, these sections are proposed to be realigned to a more suitable alignment or to avoid any low-lying areas prone to withholding water.

26.3 Rider Safety

There are sections of trail identified in the trail audit that present significant risks to riders' safety. The three main areas of concern are categorised as the steep descent down to Manly Creek, trails utilising existing streets/roads, and sections of the formal loop identified as shared path.

The primary concern relates to a steep and fast section of fire trail leading down to Manly Creek, which is strongly recommended to be realigned to a more sustainable gradient and take a safer, more gradually descending route. The current fire trail poses serious safety

hazards to beginner to intermediate riders with the combination of high speeds, waterbars, and a constantly changing trail surface. These corresponding factors push the trail beyond the realms of a less capable rider and challenge even the most experienced riders, making it unsuitable and inherently dangerous to the specific demographic that frequent the Manly Dam mountain bike loop - beginner to intermediate riders.

The secondary concern relates to sections of trail that utilise existing roads or streets, whereby cyclists are forced to share the road with motorist without a dedicated bike lane or any form of separation. Although limited, these instances present a potential safety concern especially with families with young children. The Manly Dam mountain bike loop is marketed as an off-road riding experience and should therefore seek to eliminate these sections of sealed roads to make it consistent with user expectations.

The last area of concern relates to the shared paths that the loop utilises with other user groups. This presents significant potential for user conflict and paired with the recent rise in popularity of outdoor recreation and other pursuits, there has been a noticeably increase in the number of people that frequent these areas in which the trail traverses. Thus, it is recommended that the formal Manly Dam loop seeks to realign the trail away from high traffic areas and separate the mountain bikers from less mobile user groups.

26.4 Poor User Experience

From a mountain bike user point of view, the current configuration of the Manly Dam loop falls short of providing an experience consistent with other public trails of a similar scale and size. Two reasons detailed below account for why this is the case with rider expectation being one and the other being the lack of a formal trailhead and associated signage.

The track is marketed as genuine mountain biking experience, but in actual fact only a small percentage (17%) of the formal loop can be considered singletrack or anything resembling a purpose-built trail for mountain bikes. As such, the trail falls short of many visiting riders' expectations. With most riders starting from the carpark at King Street, they resultingly start their ride climbing up a road climb, which is less than ideal, and finish their ride on a concrete pedestrian footpath that leads them directly onto a driveway. From a user point of view, the overall experience is poor and does not capture the true potential of Manly Dam and the natural beauty that is available. The existing trail loop does not offer any views towards the dam and the separation of riders from the otherwise iconic waterbody is a missed opportunity to create a destination synonymous with its name.

The distinct lack of a formal trailhead is noticeable when compared to other mountain bike facilities and is a strong reason for visiting riders feeling a sense of being lost with no designated orientation area. Without a trailhead, map, or dedicated carpark, first time visitors rely heavily upon word of mouth or phone applications to find their bearings and familiarise themselves with the Manly Dam loop. From a risk management point of view, signage is essential in terms of educating riders and making them aware of the inherent risks associated with mountain biking. The absence of a formal trailhead and signage leaves a major liability issue as riders do not have the ability to understand the full implications of what they are getting themselves into. For example, the trail difficulty rating is a clear piece

of information that is missing and something that is not clearly conveyed even on Council's website, *"Manly Dam Mountain Bike track is one of Sydney's best and is enjoyed by beginners to advanced riders".* All of this affects the overall user experience of any visiting rider and this key information is essential in managing expectations as well as the associated risk.

26.5 Key Recommendations

There is an incredible opportunity at Manly Dam to create a truly iconic mountain biking destination and authentic trail experience to cater for beginner to intermediate riders. In its current configuration, the trail fails to realise its full potential as it continues to wrangle with old sections of fire trail, access roads, and shared paths that have been compiled haphazardly to form a loop without considering the overall sustainability, safety, and user experience. The underlying issue at hand remains that majority of the trail is not fit for the purpose of mountain biking and will continue to erode and cause environmental damage unless the root cause of the problem is addressed, poor trail alignment. With a series of strategic realignments on sustainable gradients, Dirt Art are confident the existing Manly Dam loop can be transformed into a sustainable mountain bike trail that will reduce the overall maintenance burden drastically while providing a genuine mountain biking experience of regional significance.

The realignments proposed by Dirt Art are significant in nature and unfortunately sit outside the project's immediate scope of works and the current Plan of Management. However, they have been put forward by Dirt Art as we strongly believe they resolve the core problems identified by the trail audit and provide a long-term solution that address the three fundamental issues defined by this project: rider safety, environmental sustainability, and overall user experience.

As it stands, Sydney currently lacks a true beginner to intermediate mountain bike trail. With the sustained growth of the sport over the past decade and unprecedented numbers participating in off-road cycling, Manly Dam is exceptionally well-positioned to deliver a state-significant riding destination to draw visitors from further afield while servicing the needs of the local community.