

TOWER HILL

Mountain Bike Trail Network

Concept Plan

June 2020



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Prepared by Magic Dirt Enterprises for GSCORE
(Great Southern Centre for Outdoor Recreation Excellence)

Acknowledgments

Magic Dirt would like to provide many thanks to the contributors that helped make this possible. The input of the relevant parties, the stakeholders, organisations representatives, users and individuals, are what will make this project come together.

Without your help it would not be possible.

Many many thanks... *Magic Dirt*

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OVERVIEW



Overview

Project Aims

- Develop a high quality, sustainable and accessible MTB single track trail network suitable for a diverse range of users and skills development.
- Provide inclusive trails, specifically trails with access for off-road hand cycles and other mobility equipment.
- Ensure trails consider environmental and cultural heritage values and provide a sympathetic fit within the natural landscape.
- Maintain the primary land use as parklands as outlined in the Shire of Plantagenet Reserves Management Plan.
- Ensure trail development is not visually obtrusive by implementing best practice planning, design and construction standards.
- The Concept Plan will provide for staged development of trails within the project area, including links to a future town trail network
- The Concept Plan is to avoid crossing points between MTB and walking trail
- The MTB trail network forms a key “activity node” of the regional Mountain Bike Trail Network



Overview

Scope and Scale

Tower Hill Reserve 15162 lies approximately 3 km to the south west of the Mount Barker townsite in the Shire of Plantagenet. The summit is 404 m above sea level and represents a significant local and regional landmark. Vehicle access to the summit is from the west via an open public road that was recently sealed in March 2020. Prior to this date the road was an all-weather gravel road.

The project will develop up to 10 km of single-track cross country (XC) and downhill (DH) MTB trail. The MTB network will provide connections to the neighbouring Mount Barker town trail network.

A walk trail will be designed to provide improved access to the Tower Hill lookout.

The proposed Tower Hill project area is Crown Reserve which allows the development and construction of trails. Design for a trail network will help protect the site from the negative impacts of unsanctioned trail use by providing high quality experiences and facilities.



Target Market & User Types

The primary focus of the Tower Hill network is the provision of trails for recreational mountain bike riding and walking for the local community and for visitors. The leisure and active market cohorts are the intended trail users.

(see Great Southern Regional Trails Master Plan for a definition of market segments)

Trail System

The MTB trail network is to incorporate the design principles outlined in the Tower Hill Trail Development Framework.

The walking trail is to incorporate the following design principles:

- Provide a trail to link with the existing lookout at the top of the hill
- Provide opportunities for viewing points and interpretive panels.

Overview

Constraints

The project area contains Reserve 44652 Telecommunications Site and Lot 6924 owned by Broadcast Australia Pty Ltd. The site has steep topography and varying soil types, which has been considered in the concept plan design.

The concept plan has considered environmental values, avoiding any areas known to contain threatened species, and ensuring that the design has minimal impact on both biodiversity and cultural heritage values.

Other elements considered in the design:

- Design trails to link with proposed walk trails as per attached Tower Hill plan from the Plantagenet Trails Masterplan Review 2019.
- Location of lookout, toilets, parking, roadways, trailheads and signage.
- Provide opportunities for viewing points and interpretive panels.

Environmental Balance

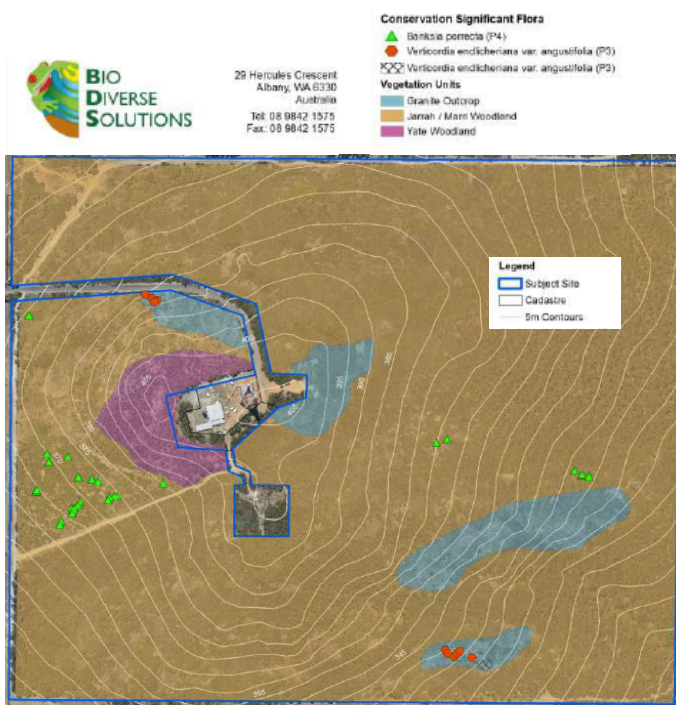
Magic Dirt Enterprises have compiled this document in the knowledge that the Shire has followed due and proper process. The Shire of Plantagenet will facilitate engagement with the local Aboriginal community to obtain their input. Site assessments including environmental survey (flora, fauna, Dieback), were conducted in March and April 2020. Flora survey has identified two species of threatened flora, represented by the red and green dots on the map.

A spring flora survey is recommended to provide a full assessment. No conservation significant fauna were identified during the site survey. We recognise the significance that large granite outcrops can sometimes hold. Accordingly, large granite outcrops that could be regarded as places of interest have been avoided.

Wet areas have also been avoided. If it is unavoidable to cross a wet area, it will be identified in the detail design, and it is the strong recommendation that wet areas are to be rock armoured.

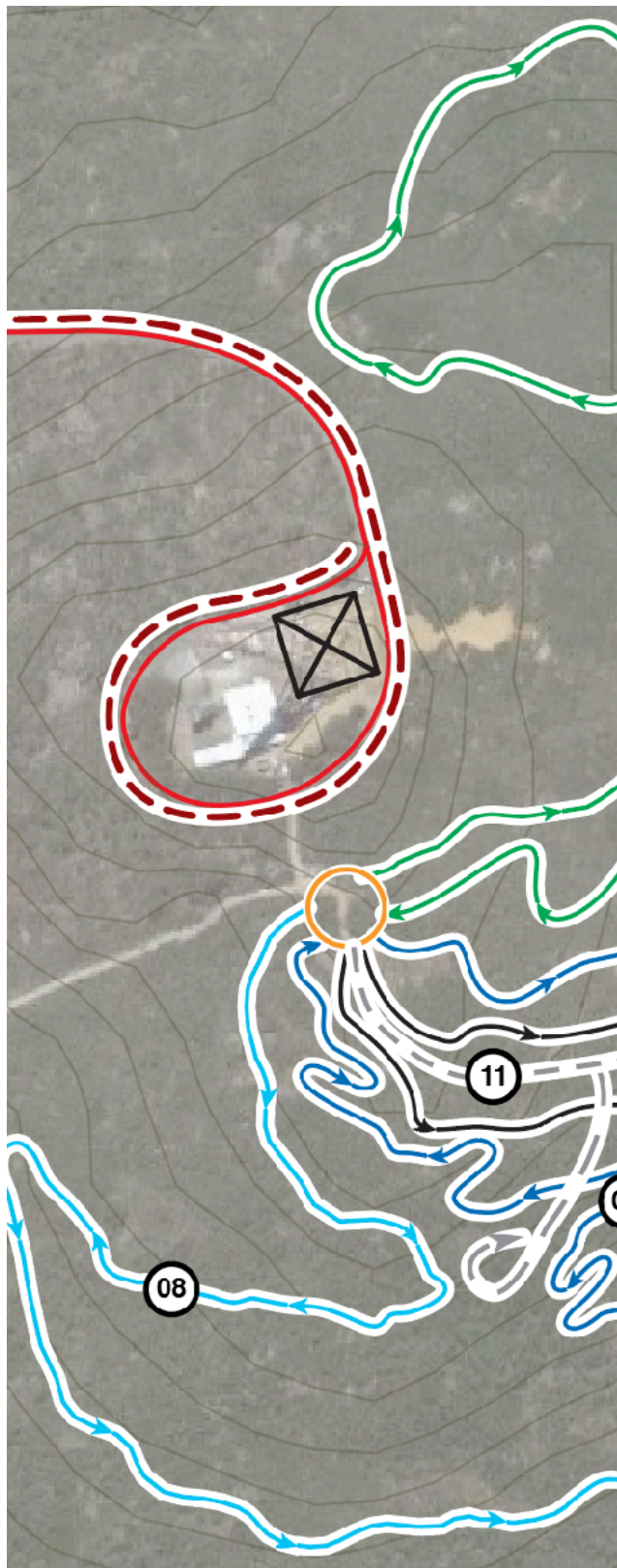
Recommendations

A Dieback consultant report in May 2020 observed that due to the recent fire activity within the reserve, accurate disease occurrence data is unable to be developed. However, due to the presence of high risk, uncontrollable disease vectors and the known presence of the disease within the reserve there are no areas that are considered to protectable from the future introduction and spread of the disease.



Results of the 2020 flora survey - location of Priority 3 and Priority 4 flora.

Overview



Location Within The Site

Top trailhead on the South West Knoll.

Locating the trail head to the South West knoll is desirable for a number of reasons

- 1) It separates the cyclists from other user groups. Separating the two groups means that visitors going to Tower Hill to experience the views and the walkway will not have their experience diminished by the hustle and bustle of mountain bikers.
- 2) It separates the mountain bike and vehicle traffic. Riders can unload in the carpark. Once they leave the carpark to the SW trail head they are completely separated from traffic until it's time to load their vehicles again.
- 3) There is an existing track to the SW trail head in place already.
- 4) There is no visual impairment to visitors taking in the view from the look out. All the trails exit the knoll further to the south and drop down behind the tree line or the ridge. None are visible from the lookout or the walk way.
- 5) The knoll provides good access to trails down the southern side, and adds length to the the trails contouring to the North.

Environment

The style, size, and build of trails has been chosen to sit within the site. The trails are not visible from the lookout area and will not impact on the scenic vista.

The Trailhead has been moved to the Southern knoll, again so as not to impact non riding visitors.

It is the understanding of the Concept designer that the Detail Design and Construction will be completed by professional companies. This will guarantee there is no erosion caused by the trails, and that the construction footprint remains minimal.



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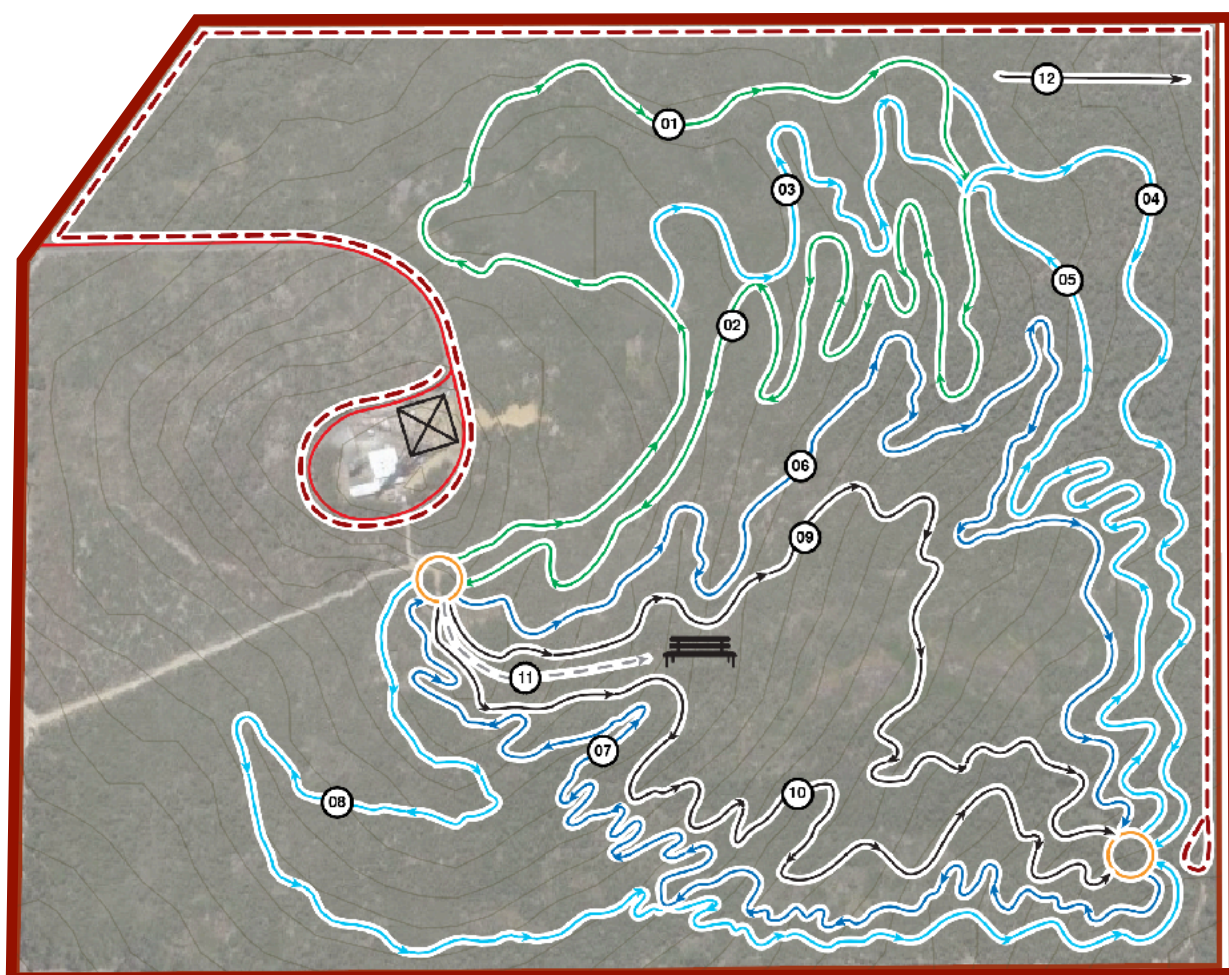
TRAIL SYSTEM



Network Composition

Suggested Trail System

This Trail System caters to all levels of riders and provides a diverse blend of trail styles. The site's elevation makes it ideally suited to become a gravity focused trail network. It can be broken down into a variety of circuits as described in the following section.



LEGEND:

- | | | | |
|--|---------------|--|------------------------|
| | PROJECT AREA | | SHORT LOOP OPTION LINK |
| | MINOR ROAD | | TRAIL HEAD |
| | CONTOURS (5M) | | TRAIL DIRECTION |
| | WALK PATH | | SHUTTLE ROAD |

Trail System Overview

Balance

Tower Hill is an exciting site with a lot of potential. The length of the trails and the diversity of the levels and styles should appeal to a very wide user base and regular repeat usage.

Magic Dirt have put a lot of focus on balancing the requirements of the different user groups, the different styles of trails, and what is suitable for the environment and the build site.

The concept holds something for everyone and allows local riders a pathway to progress through over time.

Within the circuit there are several shorter loops of different styles for green riders, or riders that have not yet built up their fitness base.

There are long XC loops for those looking to build up the legs, or just looking for the longer ride experience.

There are several linking options so that riders can put different loops together. This is important to achieve long term, repeat usage from locals.

There is good scope for progression within the system, regardless of the preferred riding style. The Flow lines range from blue to black, as do the tech and all mountain lines. The intention in the concept is that the flow lines all be inclusive and rollable.

The specific location of the trails within the circuit have been located to be sympathetic to the environment, and the builder. We have deliberately avoided the big "Air Flow" style of construction due to its large footprint. With the speed available on inclines this steep, we believe the same effect can be achieved on pure flow trails.

The location should not require imported materials. The flow trails are located where it appears to hold a solid base of build material of good integrity. It is

intended that the flow trails are built by digging features *into the ground* rather than building on top of it. There is enough slope to achieve this. It will minimise the visual and environmental impact, and reduce material requirements.

No Wooden features are included in the initial concept.

This can be revisited by the Shire at a later date and is not a complete bar to their placement. We have not included wooden features in this plan for 3 reasons:

- 1) The site is burnt regularly
- 2) It adds considerable cost to the build
- 3) There are many rock features already available

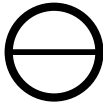




Shuttle Road

This site is very conducive to shuttles as are most sites with more than 60 meters of fall. There is a fire road along the Northern and Western perimeters that could be utilised. Although they are narrow for dual direction, passing areas, and appropriate signage would make them usable for this purpose.

This would greatly enhance the usability of the site, especially for young riders and families. It is an area the Shire should make a priority to investigate in the future, to ensure the trails reach their full potential.

Trail System Overview

Trail Difficulty Ratings

SYMBOL	SHORT DESCRIPTOR
 <p>easiest</p>	<p>This symbol indicates a typically wide trail with smooth terrain and low gradients. Surface may be uneven, loose or muddy at times but free from unavoidable obstacles. Recommended for novice riders.</p>
 <p>easy</p>	<p>This symbol indicates a typically flowing, open trail on firm terrain with gentle gradients. Surface may be uneven, loose or muddy at times. Riders may encounter small rollable obstacles and technical trail features. Recommended for beginner riders.</p>
 <p>moderate</p>	<p>This symbol indicates a typically narrow trail with loose, soft, rocky or slippery sections and hills with short steep sections. Riders will encounter obstacles and technical trail features. Recommended for intermediate riders with some technical mountain biking experience.</p>
 <p>difficult</p>	<p>This symbol indicates a trail with variable surfaces and/or steep gradients. Riders will encounter large obstacles and technical trail features. Recommended for experienced riders with good technical skills.</p>
 <p>extreme</p>	<p>This symbol indicates the trail may contain highly variable surfaces, very challenging terrain and/or very steep sections. Riders will encounter committing and unavoidable obstacles and technical trail features that may not be rollable. Recommended for very experienced riders with high level technical skills.</p>

Trail System Overview

Network Signage Plan

The 3 Trailheads in the Mount Barker Tower Hill network will each have an Overview sign. The Mt Barker Town Site, the Trail Head (top of hill) and Trail Terminus (base of hill - SE corner).

These signs should include a map of the Trail Network, the Circuits (or Loops) and a brief description of each trail. They provide information on the type of trail, its length, its difficulty rating and any points of interest (see *photo bottom right*).

The top of each individual trail is marked with a Trail Marker mounted on a signage pole, with the grading colour, direction and classification at the Trail Head (see *photo bottom left*).

At each fork, the trail will require another marker, and some trails that start further down the network will require a direction sign at the Trail Head eg. "This way to Trail 3".

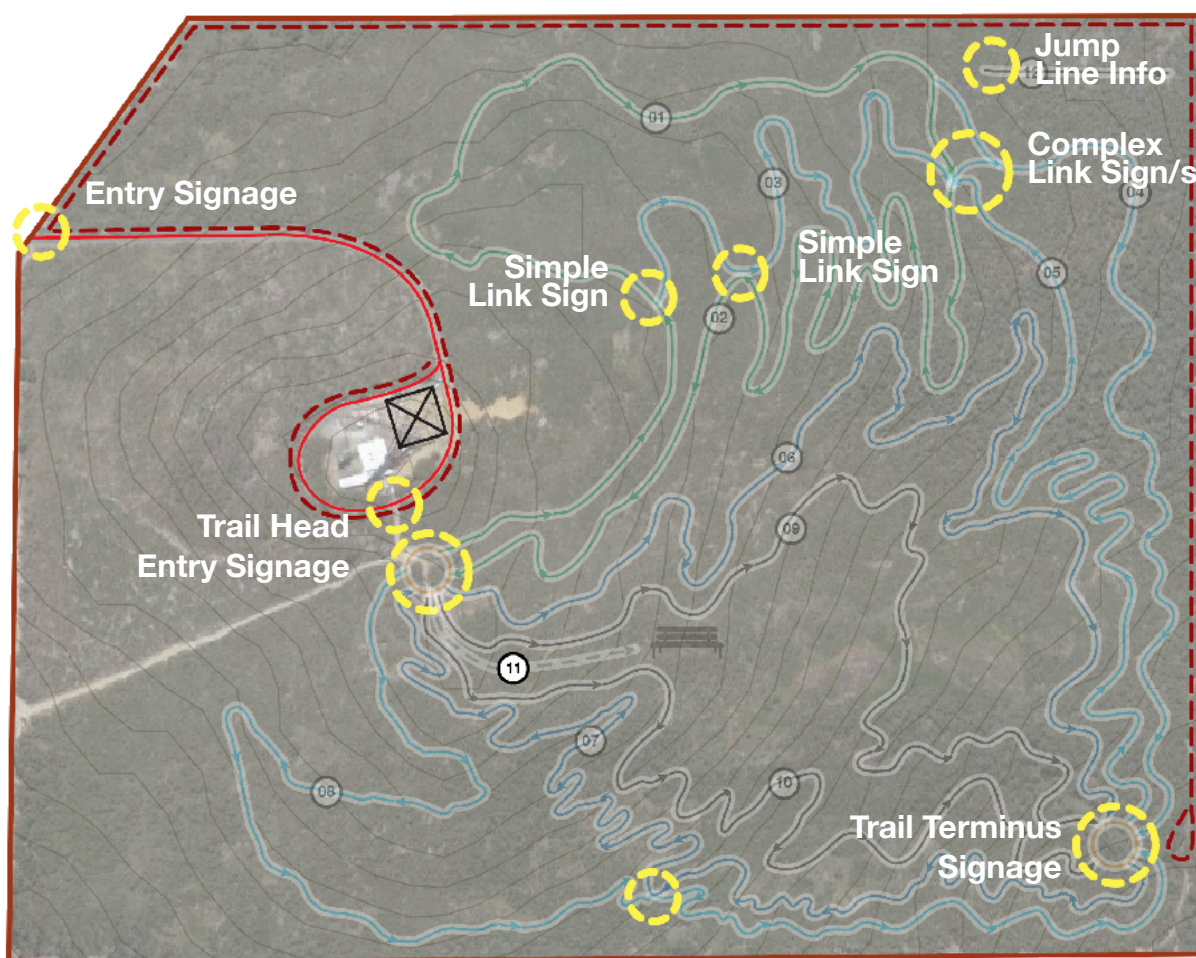
The short links that create circuits will require unique direction markers to ensure less experienced riders do not enter a trail that is too advanced for them.

Trail	Signs Required
Trailhead 1 - Top of hill	Map + Trail Descriptions
Trailhead 2 - Terminus	Map + Trail Descriptions
Trailhead 3 - Town Site	Map + Trail Descriptions
Trail 1	2 Trail Markers
Trail 2	2 Trail Markers / 1 No entry
Trail 3	3 Trail Markers / 1 No entry
Trail 4	3 Trail Markers / 1 No entry
Trail 5	2 Trail Markers / 1 No entry
Trail 6	1 Trail Markers / 1 No entry
Trail 7	2 Trail Markers / 1 No entry
Trail 8	2 Trail Markers / 1 No entry
Trail 9	1 Trail Markers / 1 No entry
Trail 10	1 Trail Markers / 1 No entry
Trail 11 - Walk Trail	2 Trail Markers
Trail 12 - Jump Line	2 Trail Markers + Info Sign
Shuttle Road	Directional Signs x 2



Trail System Overview

Network Signage Plan



Trail System Overview

Findings

The original scope requested a total cycling circuit of approximately 10 km. After data collection and mapping the total trail length has come out at 11.4 km including Trailheads, Walkway, and the Jump Line. This brings the trail density within the site to 1km/5.5 hectare.

This figure sits in the middle of similar sites -
Compartment 10 (*Margaret River*) 1km/4.5ha,
the You Yangs (*Vic*) 1km/6.5ha, Nannup 1km /
5.5 hectares

Once Detail Design takes place, the descents
tend to shorten as planners instinctively search
for faster lines.

If shortening is required

The trails have been set to run at the
appropriate gradient per level.

We have deliberately aspired to create
maximum length of the trails. The long trail
lengths we have achieved sets it apart from
other sites in WA.

If an overall reduction was necessary we would
do so in the following order.

Reduce:	By:
• Trail 03: PUMP FLOW	150m
• Trail 01: GREEN FLOW DESCENT	250m
• Trail 06: AM DESCENT	250m
• Trail 08: BLUE TRAIL	250m

These changes could be made if necessary,
without having a large impact on the overall
experience of any of the trails.



Trail System Overview

Tower Hill Trail Makeup, Based On Trail Difficulties.

THE GREEN TRAILS

The Green Loop contains approximately 20% of the trails makeup. Early DBCA requirements for a public circuit were set at 35% GREEN whereas the international standard for GREEN is set at 10%. This has been scaled back as authorities recognised that green riders only remained at this level for a short space of time.

The GREEN LOOP in this circuit is perfectly suited to the adaptive rider. The climb runs at only 3% with frequent grade reversals and flat sections.

THE BLUE TRAILS

New building techniques, and the advent of FLOW trails also began to encompass a much wider user group. Focus was placed on creating trails that could be ridden differently by different rider groups. Builders became better at building two different rider levels into the one trail. A good BLUE trail now, will allow the accomplished blue level rider to spend a lot of time in the air, while a GREEN user can still enjoy the trail safely, but at a much lower speed. A simple example of this is utilising table top jumps, instead of gap jumps, and rollers that can be

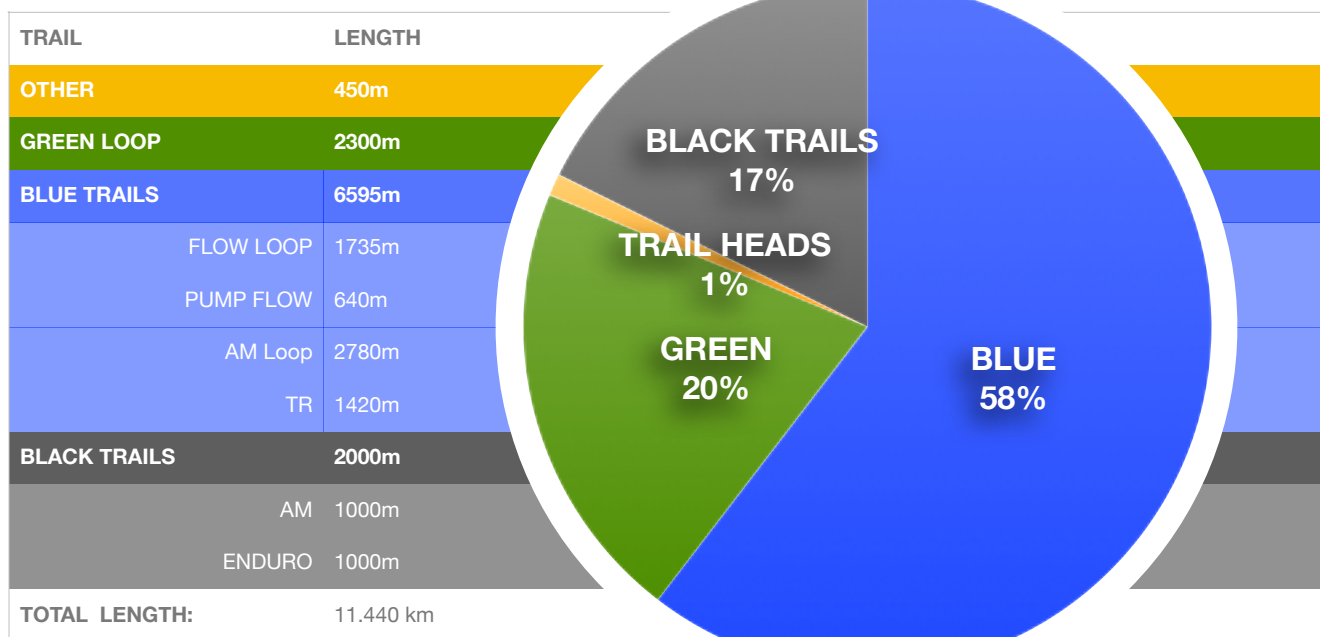
doubled by the blue rider. This puts the bulk of the trails into the BLUE level. This is where 80% of riders sit. There is a good make up of trail styles within this BLUE level group with PUMP, FLOW, AM, and TR all present within this circuit (see pg 17).

THE BLACK TRAILS

The BLACKS are the eventual target for many riders and need to be pitched high. The focus of these trails is to be challenging. The skill level of younger riders is rising at an exponential rate, and it's important the trails are set at a level so they don't "ride old" within 12 months. The corridor on these lines has been set wide to allow for more undulations rather than sticking to the constant 10% gradient the original line has been set at.

WALK TRAIL

The walk trail is a 250m route that traverses to the North of the new look out and meanders back to the original lookout. It switchbacks its way up the slope to the old lookout to reduce the gradient and make it more user friendly for all ages and abilities.



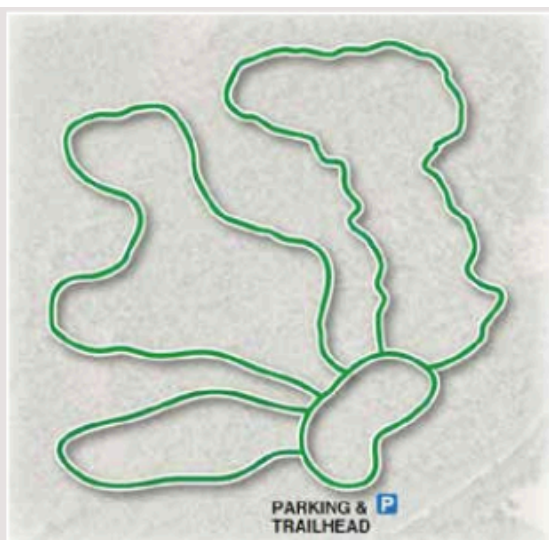
Trail System Overview

Trail Types & Suitability

Abbrev	Type	Description	Suitability
XC	Cross Country	Primarily single-track orientated with a combination of climbing and descending, and natural trail features of varying technicality. Cross Country trails have become more defined with fitness and climbing as a focus. Typically bikes are lightweight with shorter travel dual suspension or have no rear suspension.	Not as popular as it used to be. Modern XC trails have moved closer to Trail designated trails. XC riding can be conducted on Flow and Trail styled trails.
XCO	Cross Country Olympics	'Cross-Country Olympics' is a race format held over undulating circuits including; technical descents, forest roads, rocky paths and obstacles, which riders must complete several times. A typical XCO course is usually 6-7 km in length.	There are 3 loops within the proposed circuit. The Green Loop, The Blue Trail Loop, and the Blue All Mountain Loop. Any of these would be suitable for an XCO Course. The circuit has been designed so a blend of these loops is also possible.
Flow	Flow trail	'Flow trail' is a relatively recent addition to the mountain bike lexicon, a phrase used to describe a trail, usually machine made, that's full of berms and rollers, a dirt roller coaster ride that almost any ability level can make their way down without much trouble. The berms and features are designed to hold the rider in the trail.	Flow is an extremely popular style and is almost essential on public circuits. A modern Flow Trail is a highly manipulated design that requires a lot of build material. This is a key factor in locating these trails in the area that holds the most soil.
Tr	Trail	'Trail' tends to hold components of several of the other styles. It is less gravity focused than AM/End, and is more technical than full flow style trail. Often called 'Old school trail'.	The topography of Tower Hill reserve is ideally suited to Trail, and All Mountain styled trails
AM/End	All Mountain / Enduro	Similar to Cross Country and primarily singletrack orientated, with greater emphasis on technical descents and non-technical climbs. All Mountain trails can cater for timed competitive events (Enduro). All Mountain trails may use shuttles to the trailhead where appropriate. Bikes are typically light to medium weight with medium-travel dual suspension.	As stated above the topography of the site presents fantastic opportunities for AM /End trails. This is the most popular style of mountain biking today.
FR	Free Ride	Typically descent-focused trails with emphasis solely on technical challenge and skill development. Trails feature both built and natural terrain technical features with a focus on drops and jumps. Appeals to the more experienced market and caters for competitions judging manoeuvres and skills only. Bikes are typically medium to long-travel dual suspension and are built for strength.	The Black Trail will be aimed squarely between the FR and DH designations. It is purely gravity focused and will utilise one of the green or blue climbs for return. Most suited to a black designation.
PK	Park	Built feature environment with emphasis on manoeuvres, skill development and progression. Appeals to a wide market including youth, and can cater for competitions judging aerial manoeuvres. Can include jump tracks, pump tracks and skills parks. Typically dirt surfaced but can include hardened surfaces. Bikes are typically built for strength, with short travel suspension.	Park requires a huge construction footprint and a lot of clay/soil. It is not appropriate for this area.
DH	Down Hill	Purely descent only trails with emphasis on steep gradients for speed and technical challenge, with a focus on skill development. These trails can cater for timed competitive racing. Downhill trails typically appeal to the more experienced market. Downhill trails usually require uplift to the trailhead via chairlift or vehicle shuttling. Bikes are designed for descending, built for strength over weight and typically long-travel dual suspension.	As stated in the FR section the black trail will have be a FR/DH hybrid. A shuttle road is highly desirable for this style. It would be ideal to have more than one of these runs to help attract the WAGE (West Australian Gravity Enduro) style events

Trail System Overview

Trail System Layouts



Cloverleaf

Cloverleaf designs are a series of loop trails that radiate from a central trailhead and core trail. Linear trails can link loops together meaning the trails can be used in many combinations.



Stacked Loop

With stacked loop designs, trails networks can provide a variety of different length experiences, and may become more technically challenging as the distance from the trailhead increases, given trail users seeking difficult or remote experiences are usually willing to travel further.

The *Cloverleaf* and *Stacked loop* are two of the traditional layouts for a mountain bike circuit. Due to the smaller scale of the site, and the descending focus of the trails, we have opted to use a more space effective hybrid of the 2 systems. This can best be classed as a finger system. The best advice we have received from DBCA states a black can run straight from the trailhead proving it is clearly signed and filtered This finger system maximises the space and slope available for the runs and enables riders to “choose their own adventures” by mixing and matching the trails.

Adopting this system allows for much longer runs, with each trail able to run the full height of the hill. It also allows for all the trails to finish in the South Eastern corner, which is the lowest point of the system. Another advantage is that no black trail can be accessed from anywhere but the top trailhead, so the rider is making a deliberate choice before entering.

Stopping riders from “accidentally” accessing a black trail from a blue allows for the black trails to become “full black” and helps protect the land managers from litigation. The length of the runs achieved in a site of this size, can only be achieved with the style of system.

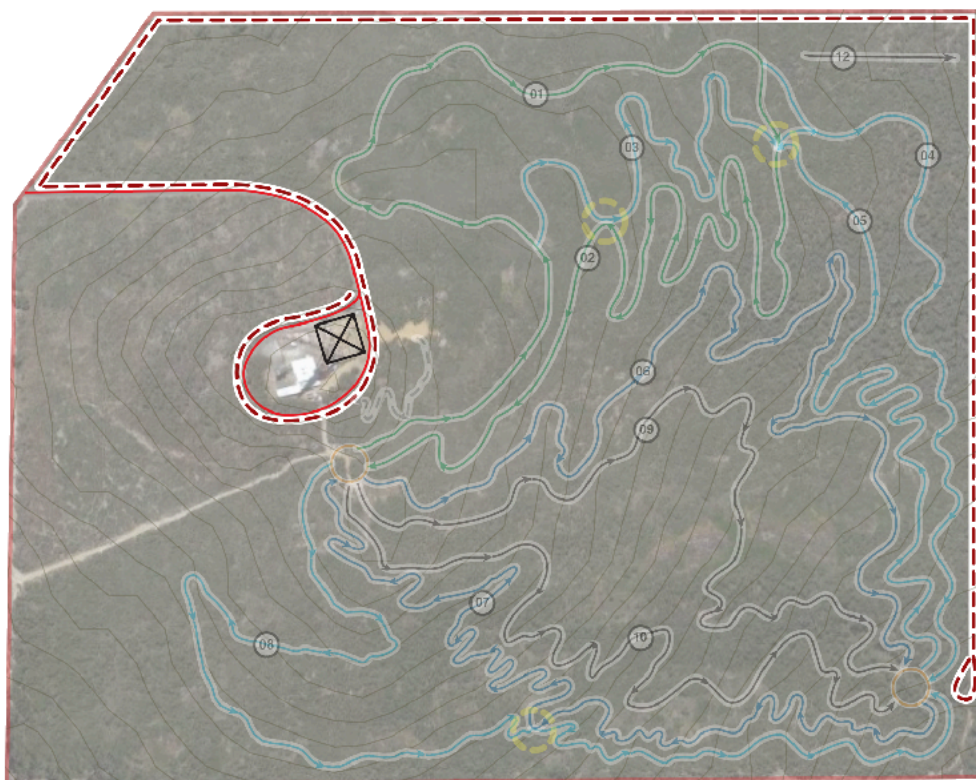
Trail System Overview

Shuttle Road

Shuttling is the use of vehicles to drive the riders and their bikes from the bottom of the hill to the top. The vehicles are fitted with a bike rack or a trailer that can quickly load and unload many bikes at a time (*see photo*). This is suited to Enduro and Downhill style riding as the focus is on making use of the gravity to create fun through speed, with bikes that are not enjoyable to ride up the hills.

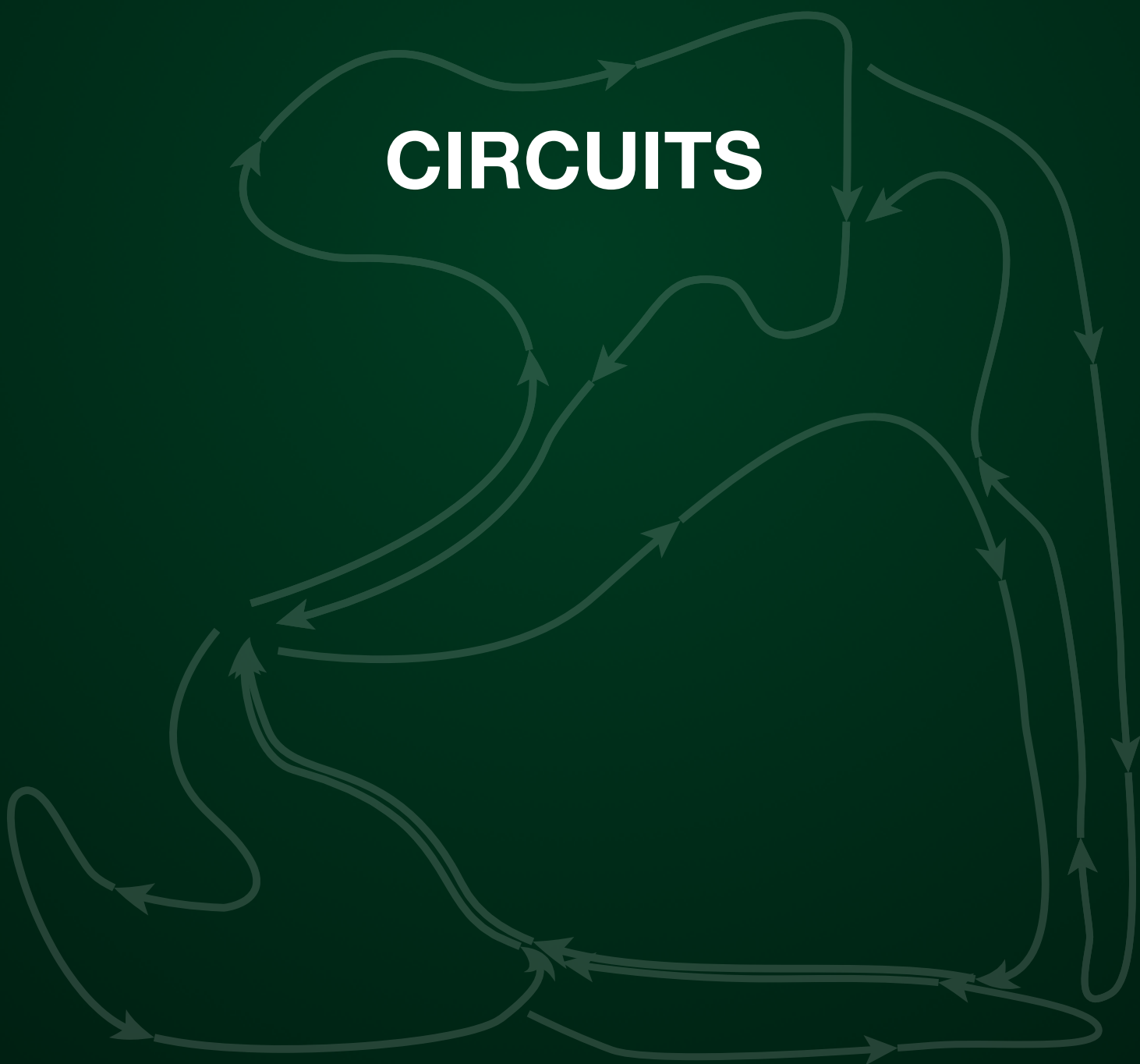
The proposed Shuttle Road makes use of the existing road up to the telephone tower, as well as the firebreak roads along the North and East sides.

The road ends in loops so as the vehicles can continue around. There must be a wide enough area so that waiting vehicles can pull to the side and park, and moving vehicles can pass safely.



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CIRCUITS

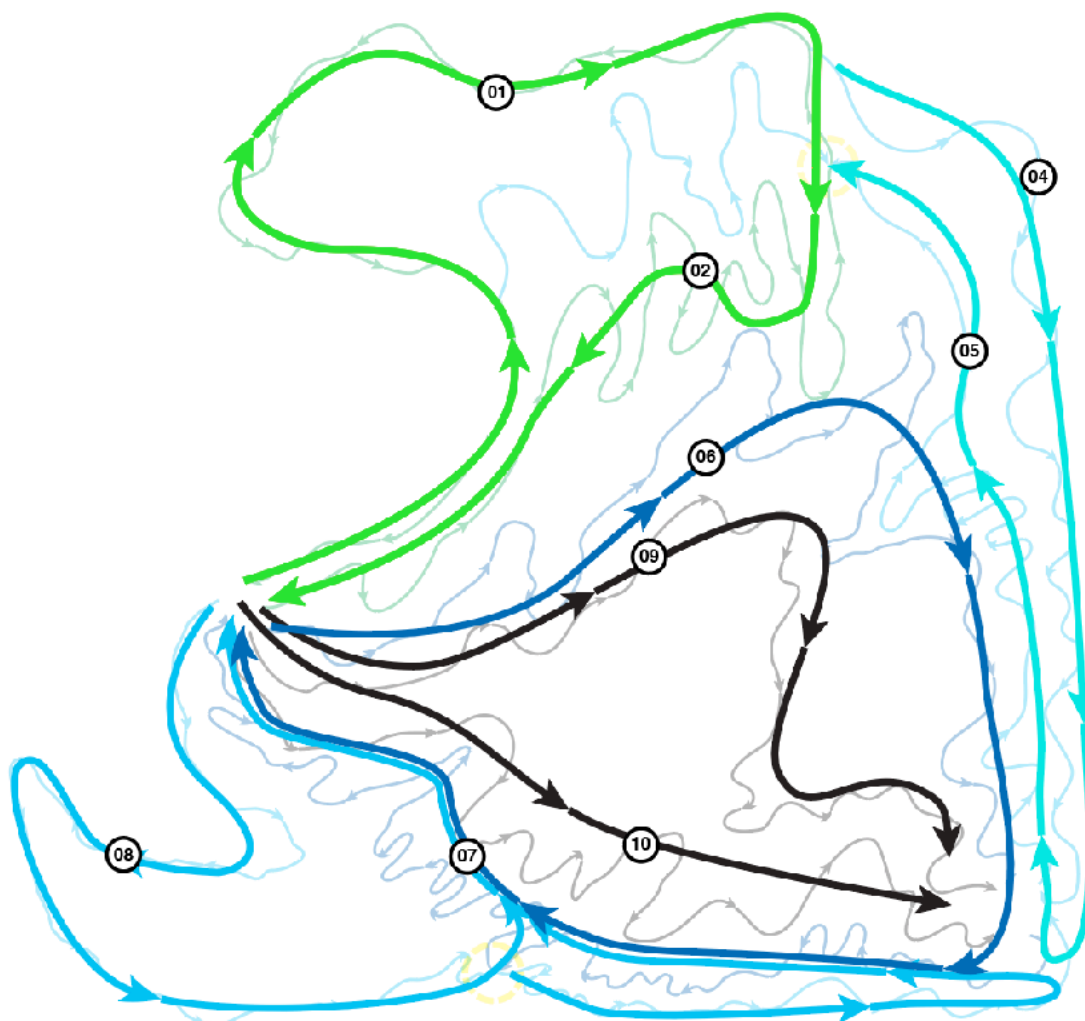


Circuits

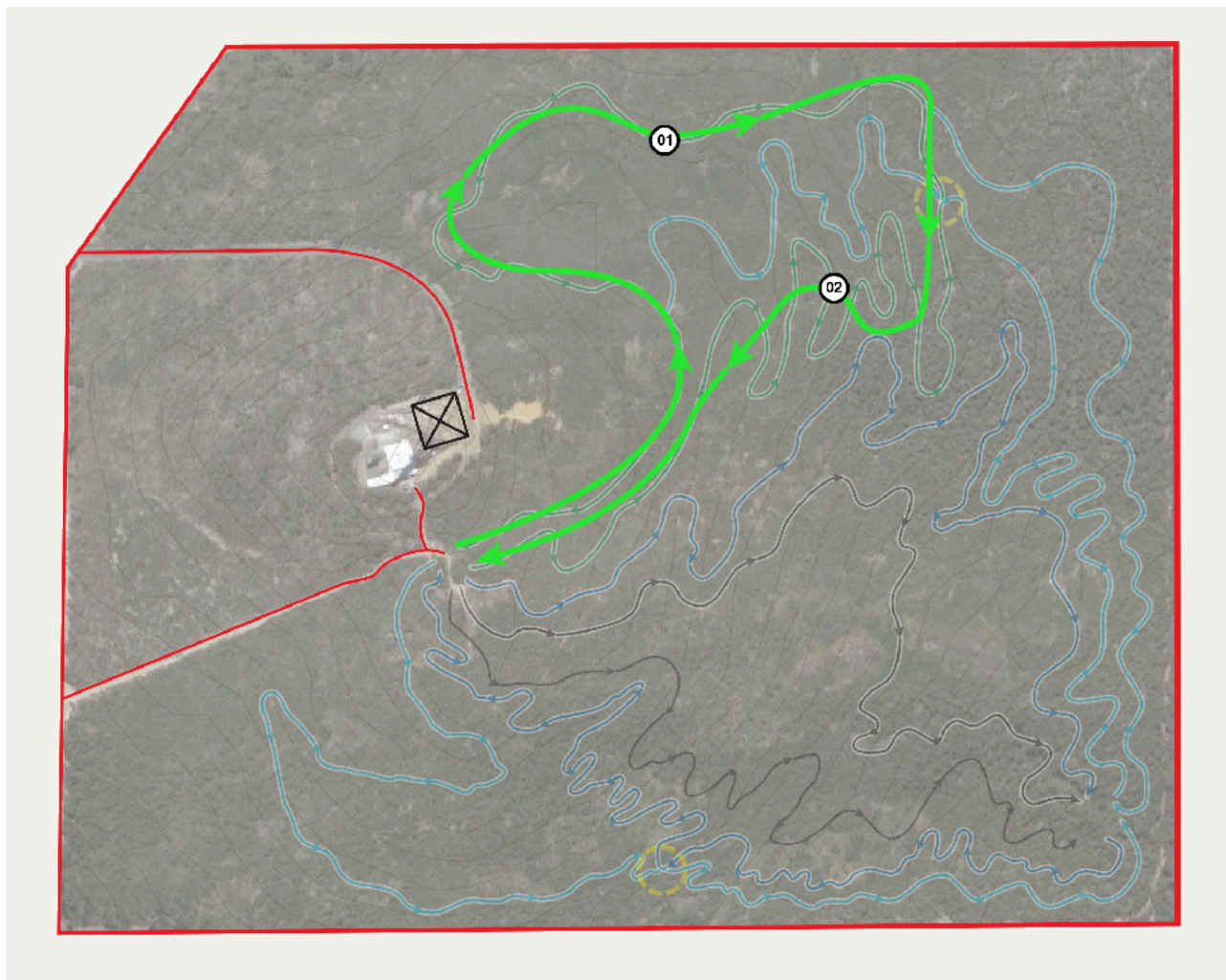
Circuit Overview

The Trails can be mixed and matched to make separate loops as shown. Adding links at strategic points allows the rider to shorten or extend their ride experience without creating their own lines, which can be detrimental to the environment.

The Green Loop, Blue All Mountain Loop, Blue Trail Loop, Blue Flow Loop and Black All Mountain trails are shown here, and are further explored in the following pages. There are many possibilities to mix and match, creating new combinations to encourage repeat usage



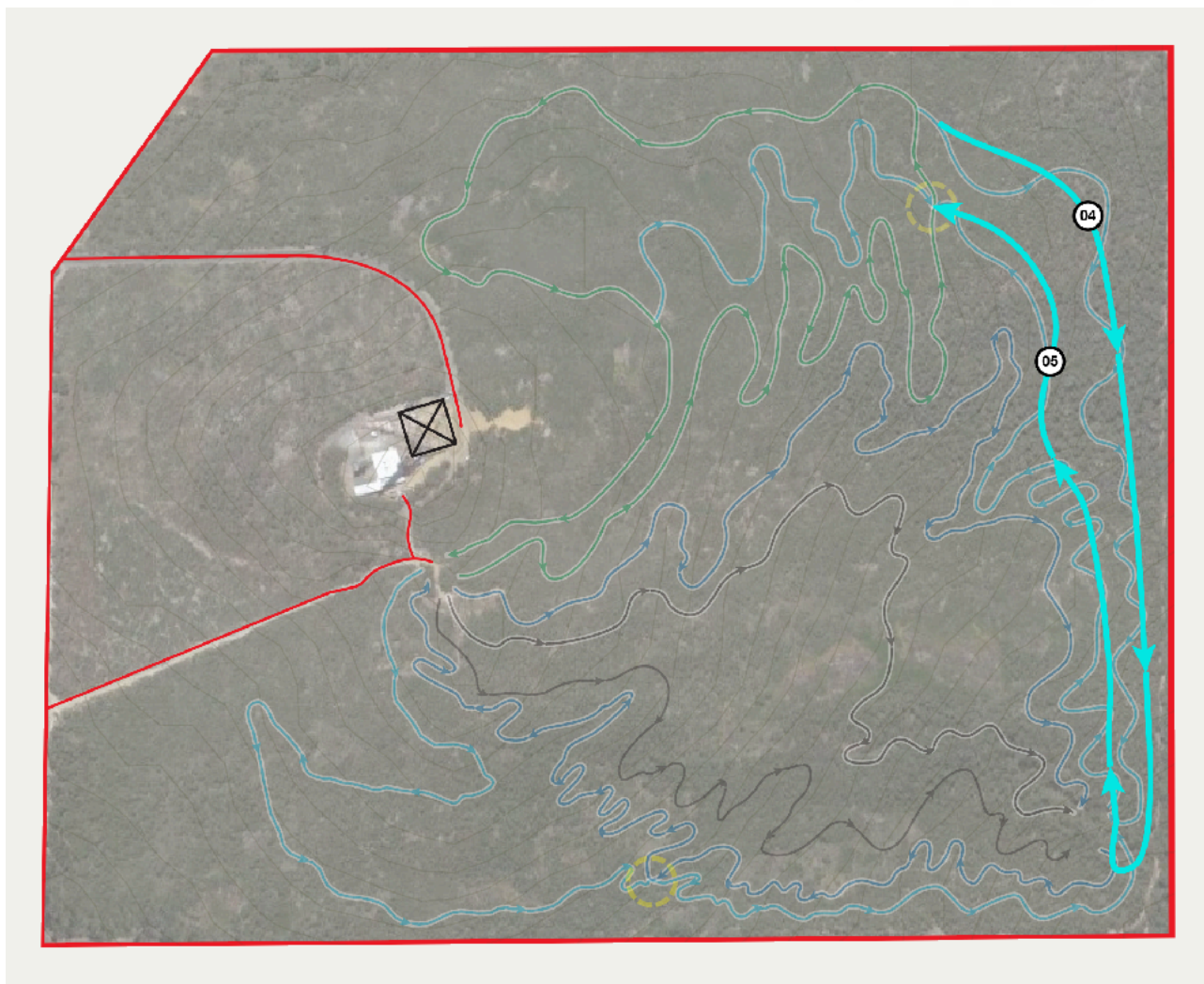
Circuits



The Green Loop - 2300m

The GREEN LOOP has been positioned on the gentlest Northern slopes, which are more suitable to the Green rider. The Green “Flow” trail has been located in this area, as it holds more soil and construction material, required for a flow trail. Running the Green around the outside of the site provides the longest run, while reducing the overall steepness of the trail. The GREEN LOOP is highly accessible and will provide a good gateway to the blue trails

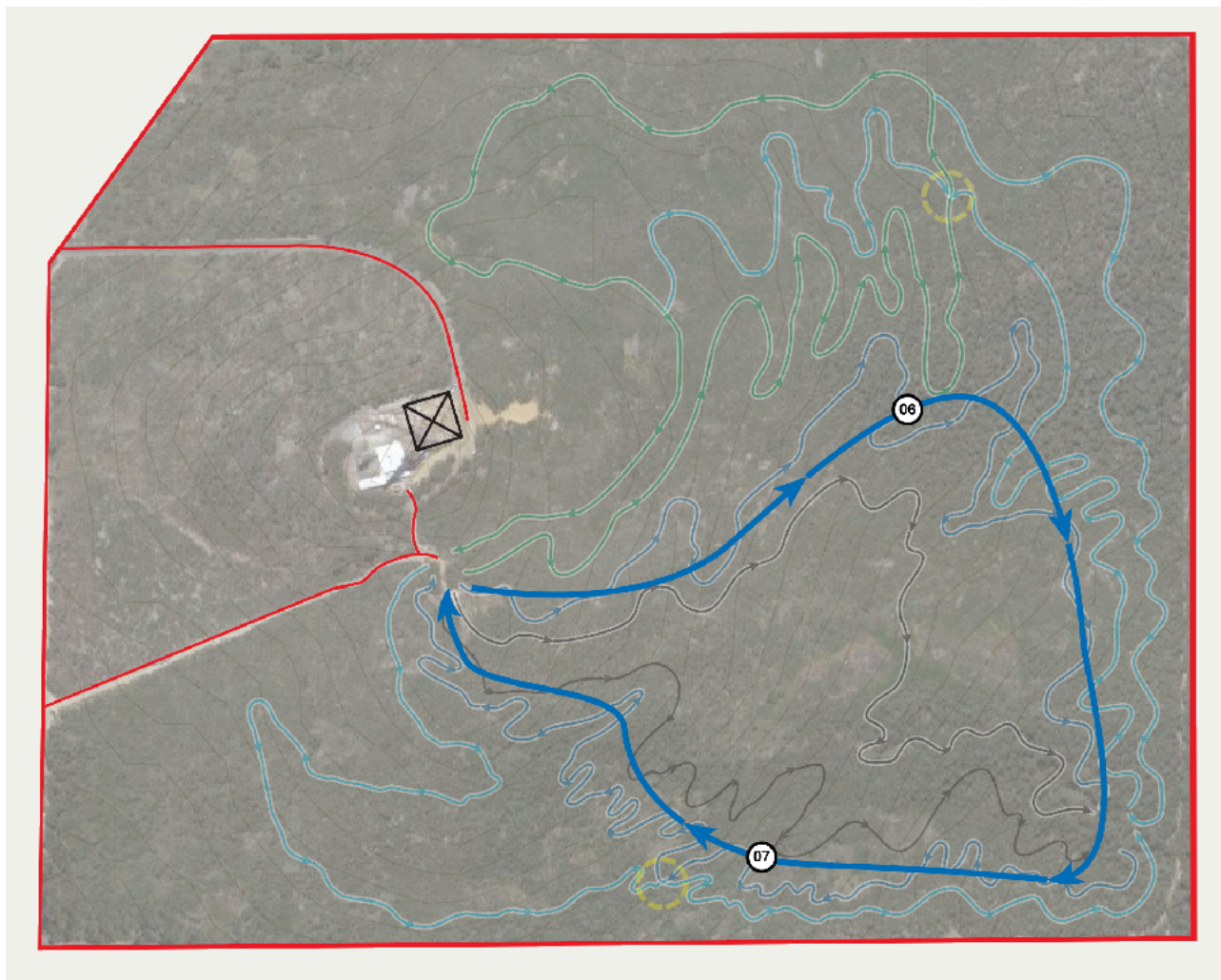
Circuits



The Blue Flow Loop - 1735m

The BLUE FLOW Loop is the natural progression from the GREEN FLOW Loop. It is the big brother of the GREEN. It has the same DNA and build style but everything is faster and steeper. The average grade increases to 7% and the finish width reduces from 1300 mm to 900 mm. The climbing section is a mid 7% until it connects again with the GREEN LOOP. The climbing gradient then drops to 3% making the second half much easier.

Circuits

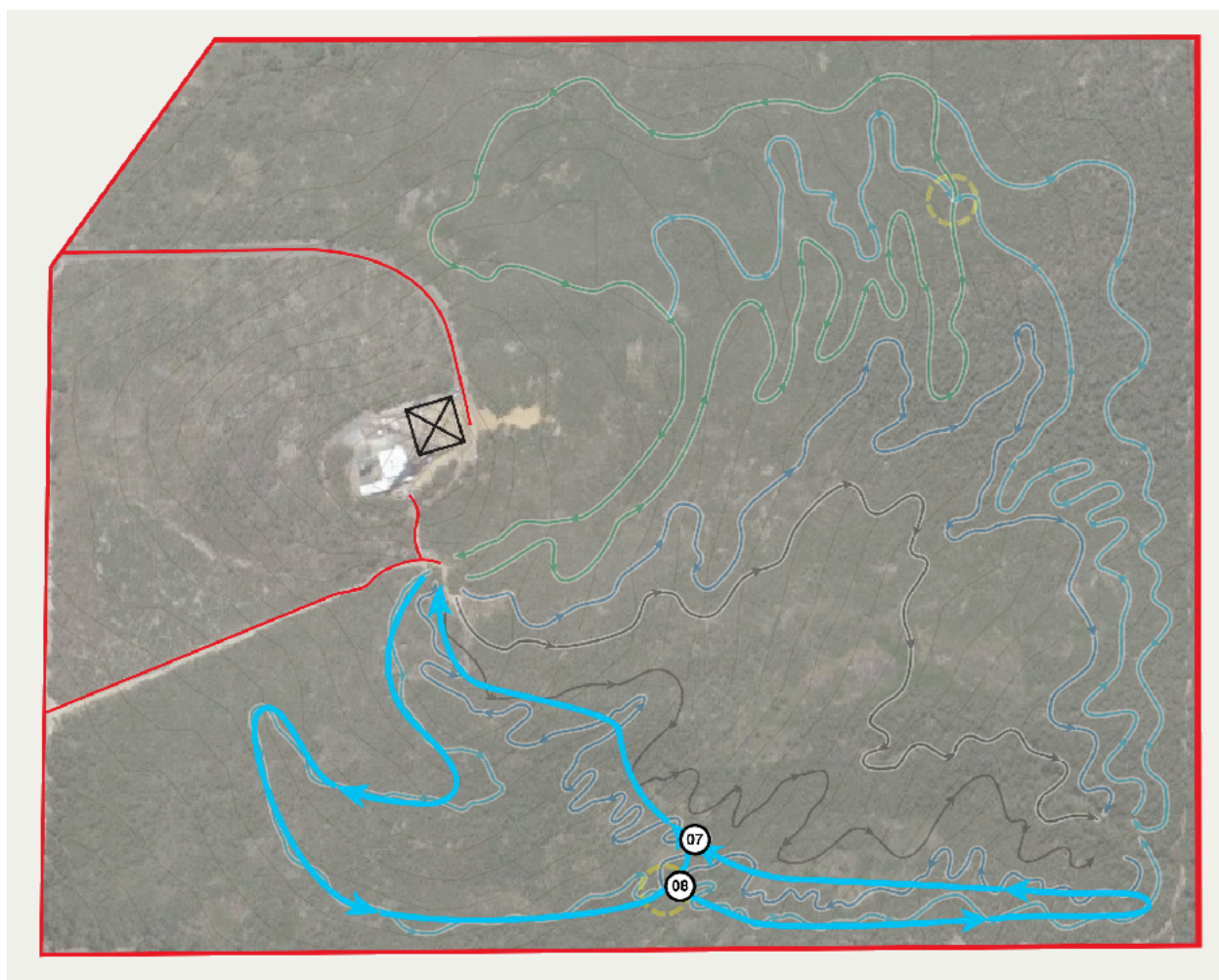


moderate

The Blue All Mountain Loop - 2780m

The Blue All Mountain Loop is a 2.8 loop of intermediate difficulty. It is a marked step up from the Green Loop. It is longer, steeper and more technical. The loop covers a wide range of topography and has a mix of technical sections and fast flow areas. The trail is designed to test many different skillsets. The descent begins with steady contouring, and builds in gradient and turns. The climb makes its way up the scenic southern side. It is diverse and interesting, and is testing, but achievable for all but the lowest BLUE fitness levels.

Circuits



The Blue Trail Loop - 1420m

Located on the southern side to take advantage of the rocky topography. This is a technically demanding trail, both up and down. Most of it will be hand made and undulating in nature. A shorter option is available for those that choose. To ride as a complete loop, the Blue AM ascend trail, or the BLUE FLOW ascend trail, are both of the same level, and can be utilised to return to the Trail head.

Circuits



The Black AM Trails - 2 X 1000m

The Black FR/AM runs from the highest point, to the lowest point along the shortest route. This is to maximise the steepness of the run. This trail is unapologetic in its dedication to speed and technicality. The features are to be large, but rollable, and are to be hidden so they appear natural. Extensive use of the locally lying rock will be perfect to achieve this. They are single direction gravity trails that rely on the blue climbs, or shuttles to return to the trail head.

Circuits

Events

Events are a highlight for any trail circuit, and provide welcome income for the towns that host the circuit. The two largest series' in WA cover the XC and the Enduro disciplines.

The XC has a dedicated State season, each round held in a different location. These event can attract up to 300 competitors.

The State Enduro series runs under the WAGE (West Australian Gravity Enduro) banner. This is a huge event that can attract up to 450 competitors of all ages.

The course is designed designed to provide a range of (gravity ride) experiences for different users, including events. XCO races prefer to run on 6 km laps. There are several options available to fulfil this requirement and there are several superb XCO courses on offer.













WAGE usually prefer to run on 6-7 trails but they do sometimes operate on less. With shorter loops available on some of the trails, these could be separated to bring the number up to the required amount. Most of the descending trails in this circuit would prove ideal as WAGE runs.

Event Constraints

The constraints for events lies not in the layout or design of the trails, but in the lack of access within the trail system. Spectator access is very limited, as are medical emergency points. As with many circuits, spectator access is monitored by marshals with whistles. Spectators can move up the trail, and move off on the marshal's whistle. Medical evacuation would require moving the patient to the proposed shuttle road manually, which only runs on 2 sides.



INDIVIDUAL TRAIL SUMMARIES

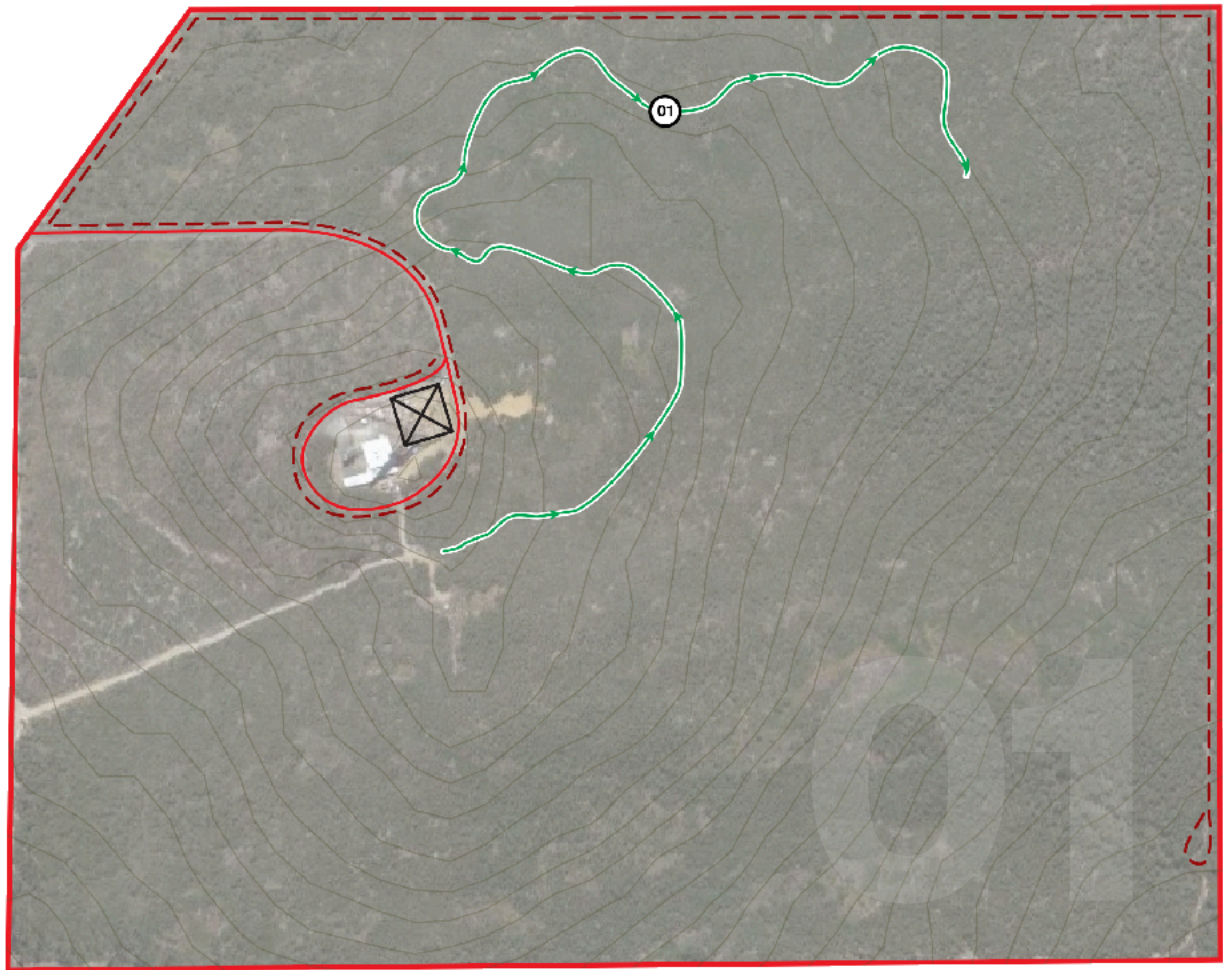
	TRAIL 1: GREEN DESCENT	29
	TRAIL 2: GREEN FLOW ASCENT	31
	TRAIL 3: BLUE PUMP DESCENT	33
	TRAIL 4: BLUE FLOW DESCENT	35
	TRAIL 5: BLUE FLOW ASCENT	37
	TRAIL 6: BLUE AM DESCENT	40
	TRAIL 7: BLUE AM ASCENT	42
	TRAIL 8: BLUE ASCENT	44
	TRAIL 9: BLACK DESCENT	46
	TRAIL 10: BLACK DESCENT	48
	TRAIL 11: SPECTATOR ACCESS/VIEWING POINT	50
	TRAIL 12: JUMP LINE	52

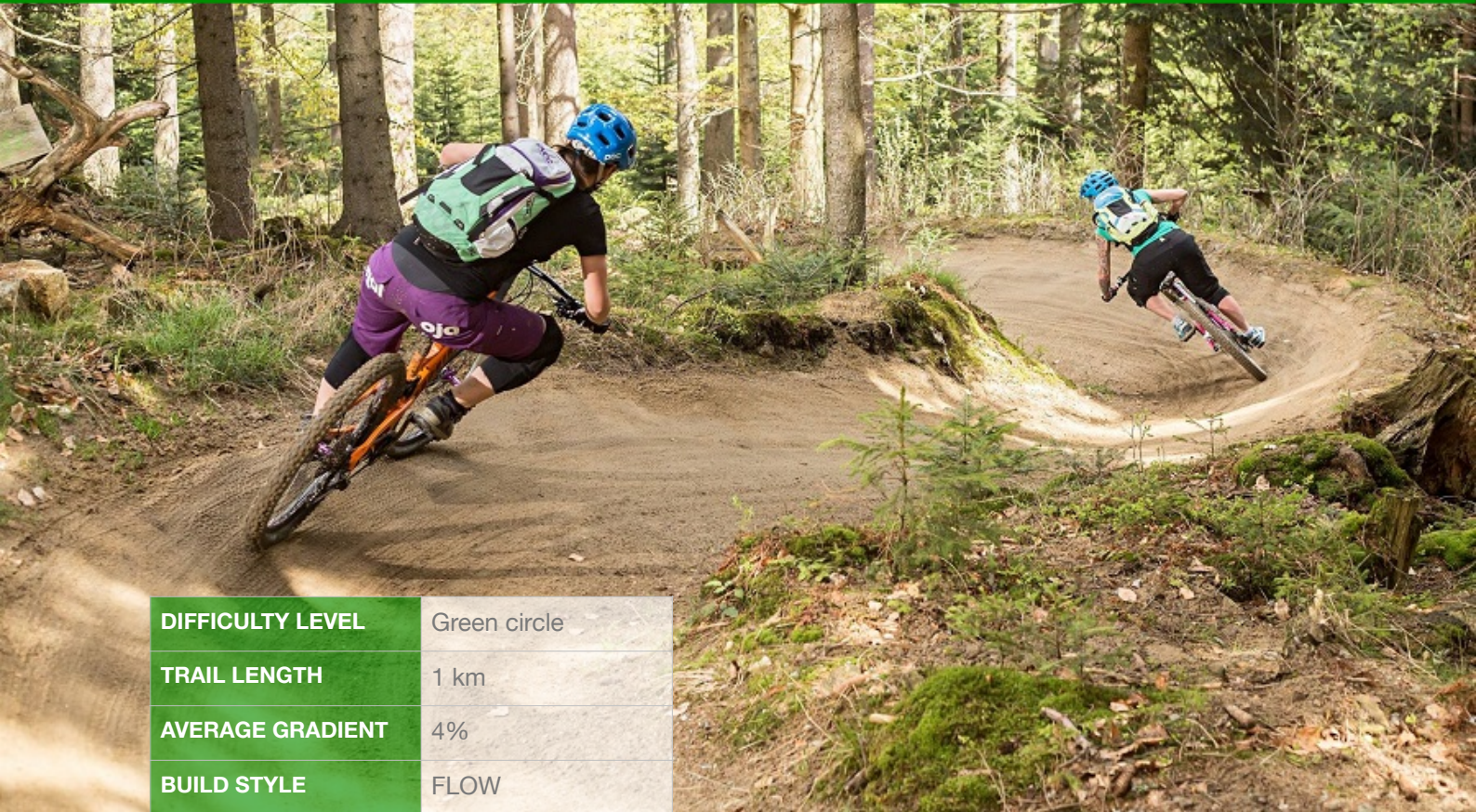




Trail 01

GREEN DESCENT





DIFFICULTY LEVEL	Green circle
TRAIL LENGTH	1 km
AVERAGE GRADIENT	4%
BUILD STYLE	FLOW
TRAIL TYPE	XC /Adaptive
DIRECTION	Descending. Single direction.
STRATEGIC RATING	STAGE 01
TOPOGRAPHY	Sandy loam. Some rock, loam in lower area.
GPS CORRIDOR WIDTH	10 meters either side of GPS line
CONSTRUCTION TYPE	Machine
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXC / Skid Steer
FINISHED TRAIL WIDTH	1.3 meters
TRAIL FINISH	Smooth. Heavily compacted
COMMENTS	Fast, smooth, flow trail with a hard finish suitable to adaptive trikes

The **Green Descent** is a high priority Stage 1 Trail.

The **Green Descent** will be the entry trail for many users of the circuit. Many riders will veer to the Green as a first option to test the waters and get the feel of a new site.

The **Green Descent** is also the access trail to the **Blue Flow**, and the **Blue Pump Flow**, so this trail will receive very heavy usage. Inexperienced riders are very hard on a trail surface, so this trail needs to be wide with a heavily compacted surface.

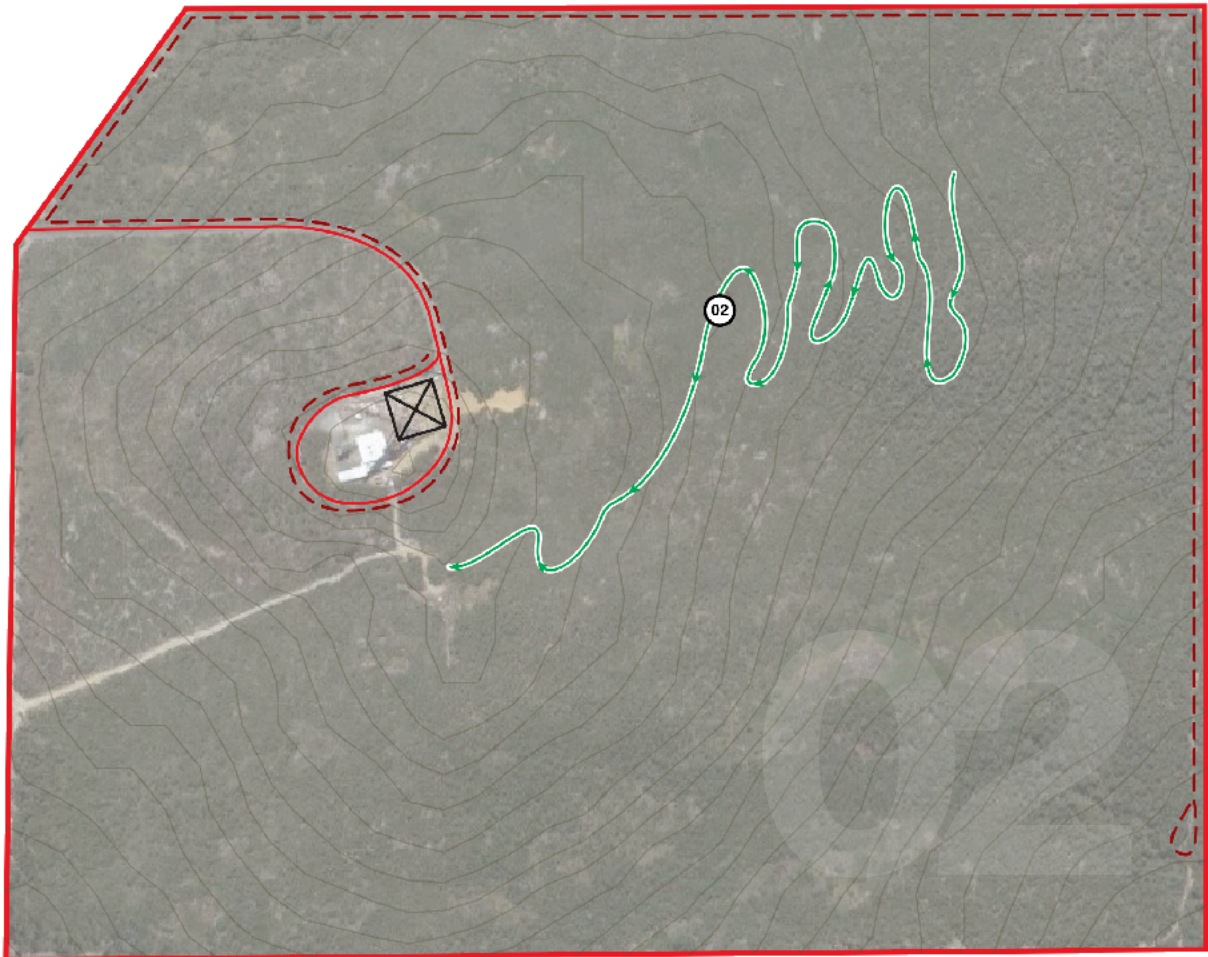
A 4% grade is a fast **Green** and with the wide user base on this trail, the design should encourage the speed. It will receive higher repeat usage if it is developed as a precursor to the **Blue** trails, rather than a light “baby green” style

Focus should be put on retaining its width, as it will add to the feeling of security, and provide the ability to handle adaptive bikes.



Trail 02

GREEN FLOW ASCENT

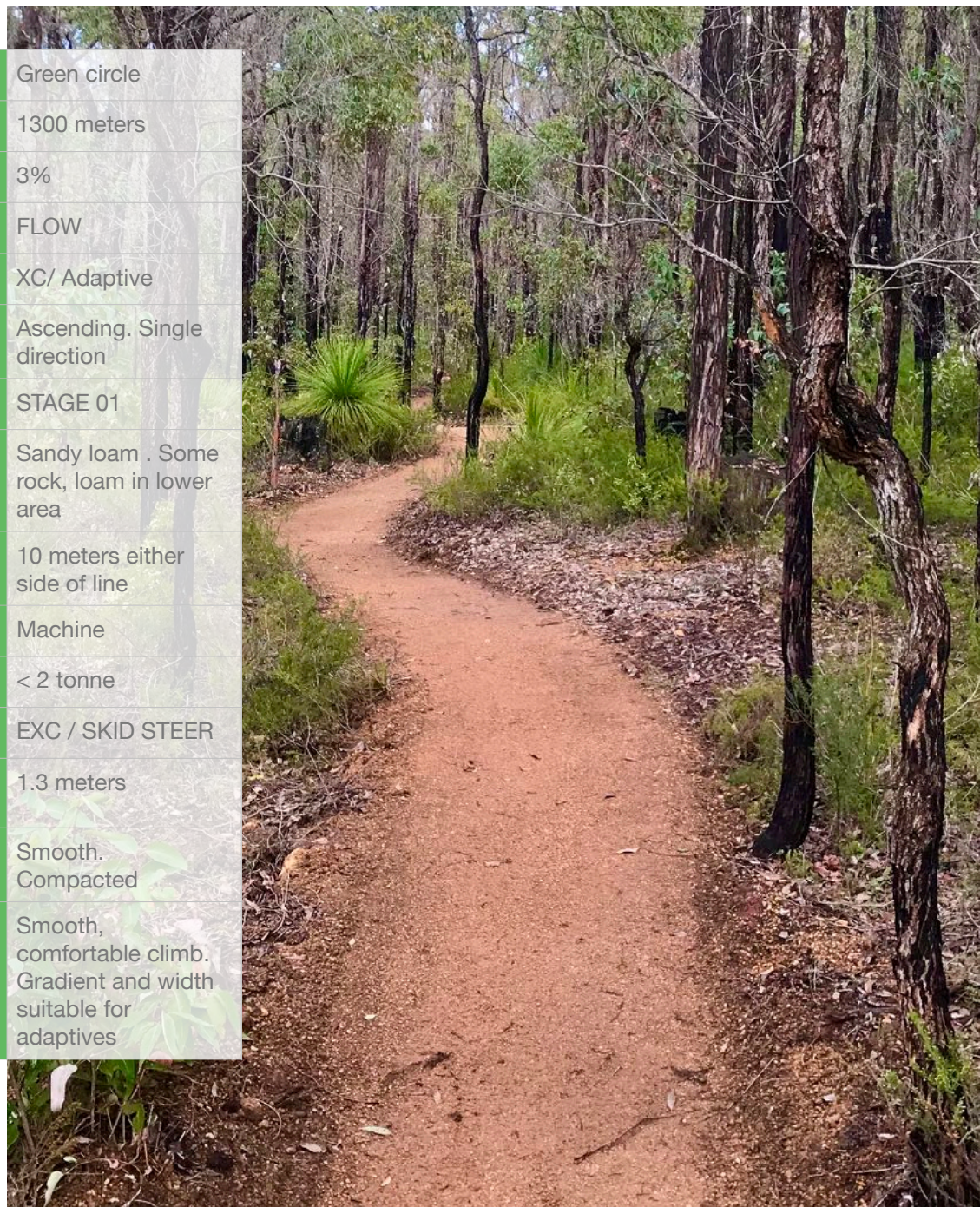


The concept of the **Green Ascent** has been squarely aimed at creating the most painless and interesting route to the top Trail head.

The route is meandering to provide grade reversals and flat sections so the user has areas to recoup in. This trail will also be utilised by riders returning on the **Blue Flow** climb. It will provide pleasant respite for them after the 7% average of that trail. This trail also has a link straight back to the top of the **Pump Flow** trail to provide easy access for repeat runs.

Focus should be put on retaining its width, as it will add to the feeling of security, and provide the ability to handle adaptive bikes.

DIFFICULTY LEVEL	Green circle
TRAIL LENGTH	1300 meters
AVERAGE GRADIENT	3%
BUILD STYLE	FLOW
TRAIL TYPE	XC/ Adaptive
DIRECTION	Ascending. Single direction
STRATEGIC RATING	STAGE 01
TOPOGRAPHY	Sandy loam . Some rock, loam in lower area
GPS CORRIDOR WIDTH	10 meters either side of line
CONSTRUCTION TYPE	Machine
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXC / SKID STEER
FINISHED TRAIL WIDTH	1.3 meters
TRAIL FINISH	Smooth. Compacted
COMMENTS	Smooth, comfortable climb. Gradient and width suitable for adaptives





Trail 03

BLUE PUMP DESCENT 





DIFFICULTY LEVEL	BLUE CIRCLE
TRAIL LENGTH	640 meters
AVERAGE GRADIENT	3.9%
BUILD STYLE	NATURAL
TRAIL TYPE	TRAIL
DIRECTION	Descending. Single direction
STRATEGIC RATING	STAGE 03
TOPOGRAPHY	Sandy loam / Rock
GPS CORRIDOR WIDTH	15 meters either side of GPS line
CONSTRUCTION TYPE	Hand built. Machine features
MACHINE SIZE	
MACHINE TYPE	EXCAVATOR ONLY
FINISHED TRAIL WIDTH	1 meter
TRAIL FINISH	Smooth Compacted
COMMENTS	Old school hand built natural trail

Trail 03 **Pump Flow** is a short optional Blue line, offering a more overbuilt “semi pump track” feel to it.

The **Pump Flow Trail** is designed to deliver more the faster and higher they go. It is constantly undulating with deep walls and lots of rollers, hips, and table tops. The overbuilt design allows for good size features for accomplished riders, while being safe for learner riders at the same time.

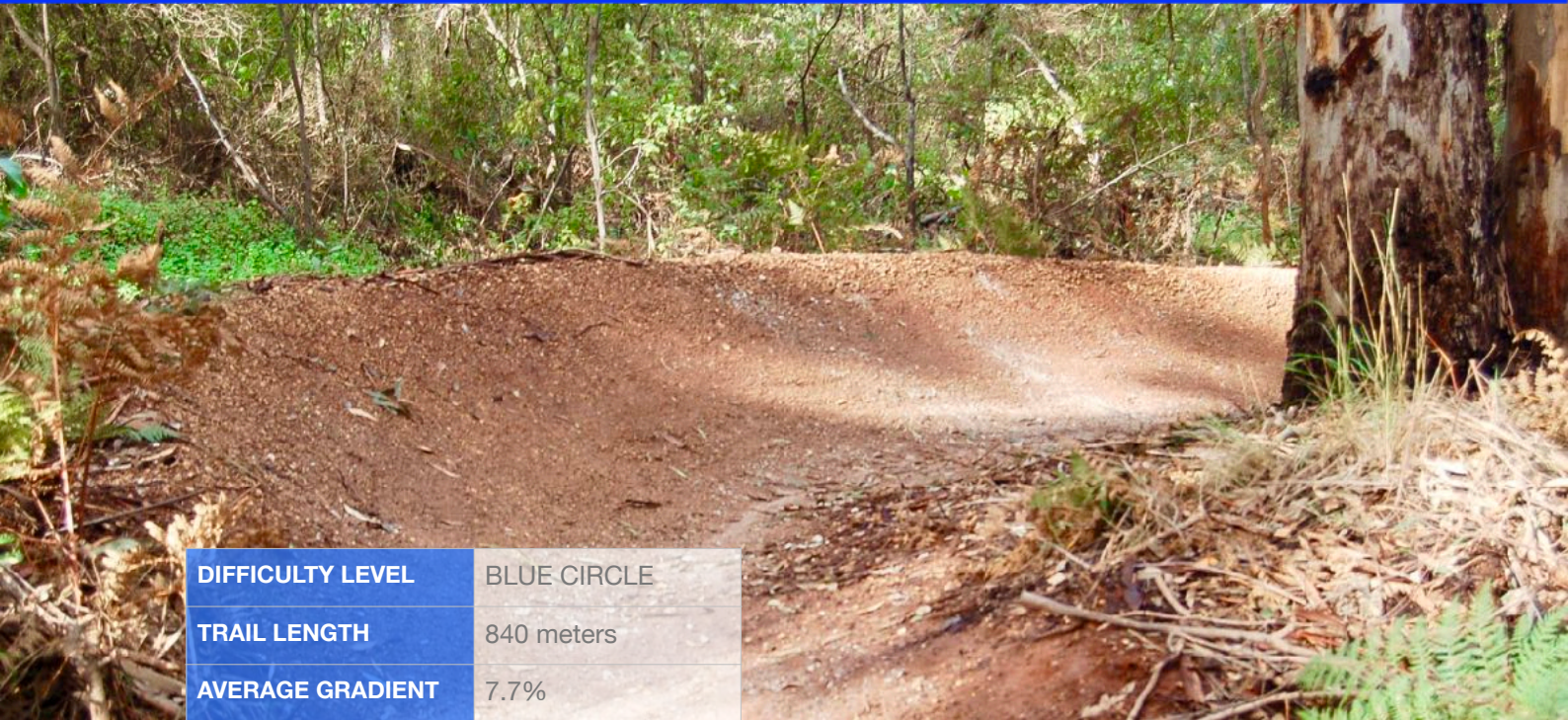
The speed is generated from the shapes and transitions so does not need steep gradient to achieve a good adrenaline rush. The trail will require lots of manipulation to the shapes to ensure it runs at speed. The walls need to be deep and steep and the roller pronounced with long transitions on the table tops.



Trail 04

BLUE FLOW DESCENT





DIFFICULTY LEVEL	BLUE CIRCLE
TRAIL LENGTH	840 meters
AVERAGE GRADIENT	7.7%
BUILD STYLE	NATURAL
TRAIL TYPE	TRAIL
DIRECTION	Descending. Single direction
STRATEGIC RATING	STAGE 03
TOPOGRAPHY	Sandy loam / Rock
GPS CORRIDOR WIDTH	10 meters either side of line
CONSTRUCTION TYPE	Hand built. Machine features
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXCAVATOR ONLY
FINISHED TRAIL WIDTH	900 mm
TRAIL FINISH	smooth compacted
COMMENTS	Steep walls, long fast features

Trail 04 **Blue Flow** continues in the same style as the **Green Flow** trail it feed off, but the walls and features are larger and steeper, and the speed is much higher.

Traditionally, this style of trail achieves the highest user numbers. When built properly it can be two different trails to two different user groups.

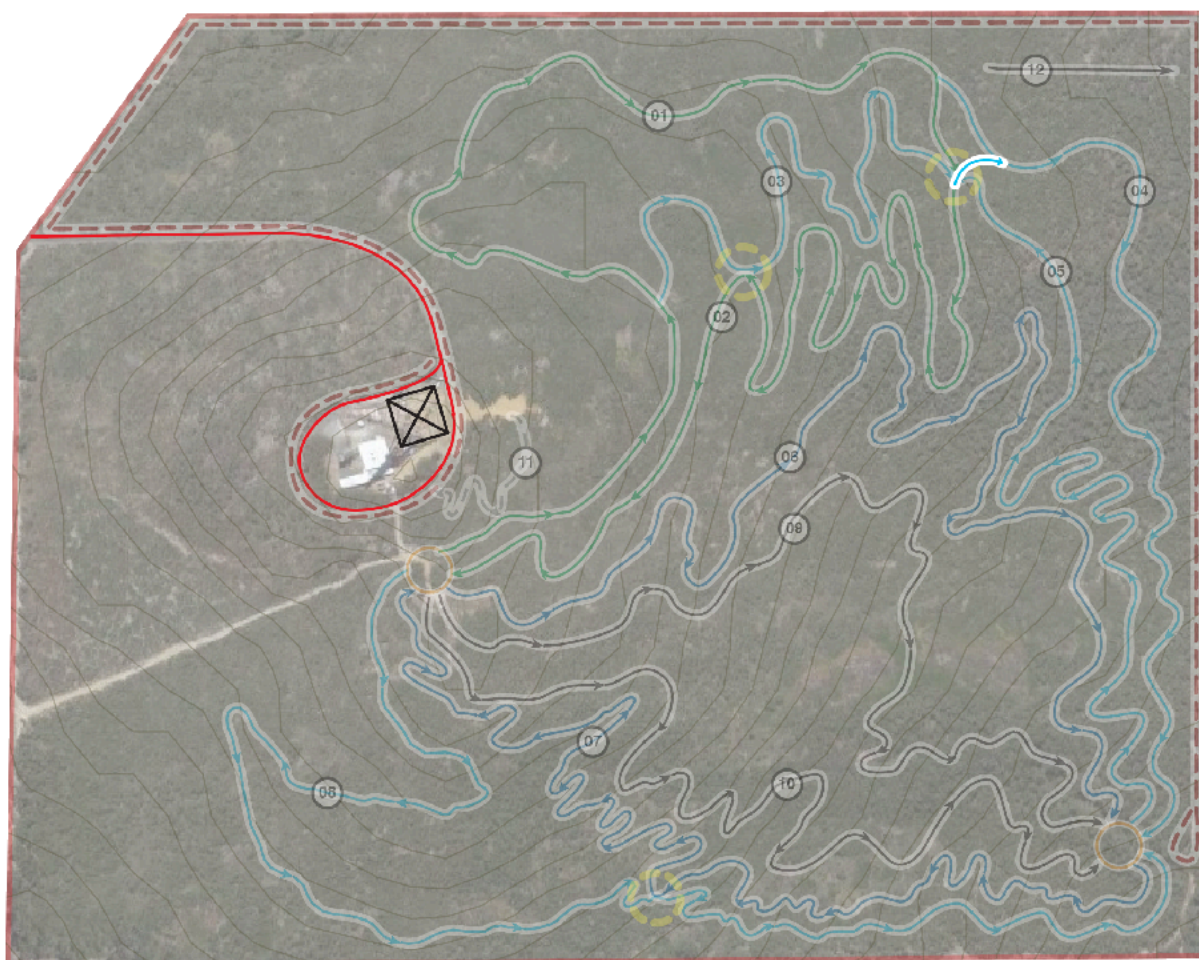
For the learner rider they are a safe, fast thrill with large rollers, table tops and whaleback jumps. This style of jumps hold low consequence if the rider lands short and encourages them to progress.

For the more accomplished rider the rollers become jumps and the transition on the back of the table tops provides more speed. There is a lot of air built into these trails for riders of moderate ability and above. An average gradient of just below 8% guarantees a rocket ride on this style of trail.



Trail 04/05 Link Track

BLUE FLOW



This 50m link track has been included to join Trail 05 back into Trail 04 in order to create the seamless circuit for the The Blue FLOW Loop. This allows the descent to be seasoned without having to return all the way to the top. This is very useful for first time users. After taking a cautious first run to scope the trail, the rider can take the link, and enjoy the descent at a higher speed as they are more familiar with it.





Trail 05

BLUE FLOW ASCENT





Trail 05 is listed as a **Blue Flow Ascent** but it is not to be built in the descending flow style. It is listed as this because it forms the climb of the blue flow loop. The build does not need to be anywhere near as overbuilt as the descent, as the speeds will be much lower.

The picture below illustrates well a blue flow climb on a of a similar gradient. The finish is to be smooth with the correct cambers applied to the corners.

Switchbacks will be required to break up the constant 7% grade. it is important to keep the trail open and flowing as it will be utilised by the growing E bike market. The gradient is reasonably steep but the trail is short as it connects onto the **Green Flow Ascent**, where the gradient halves.

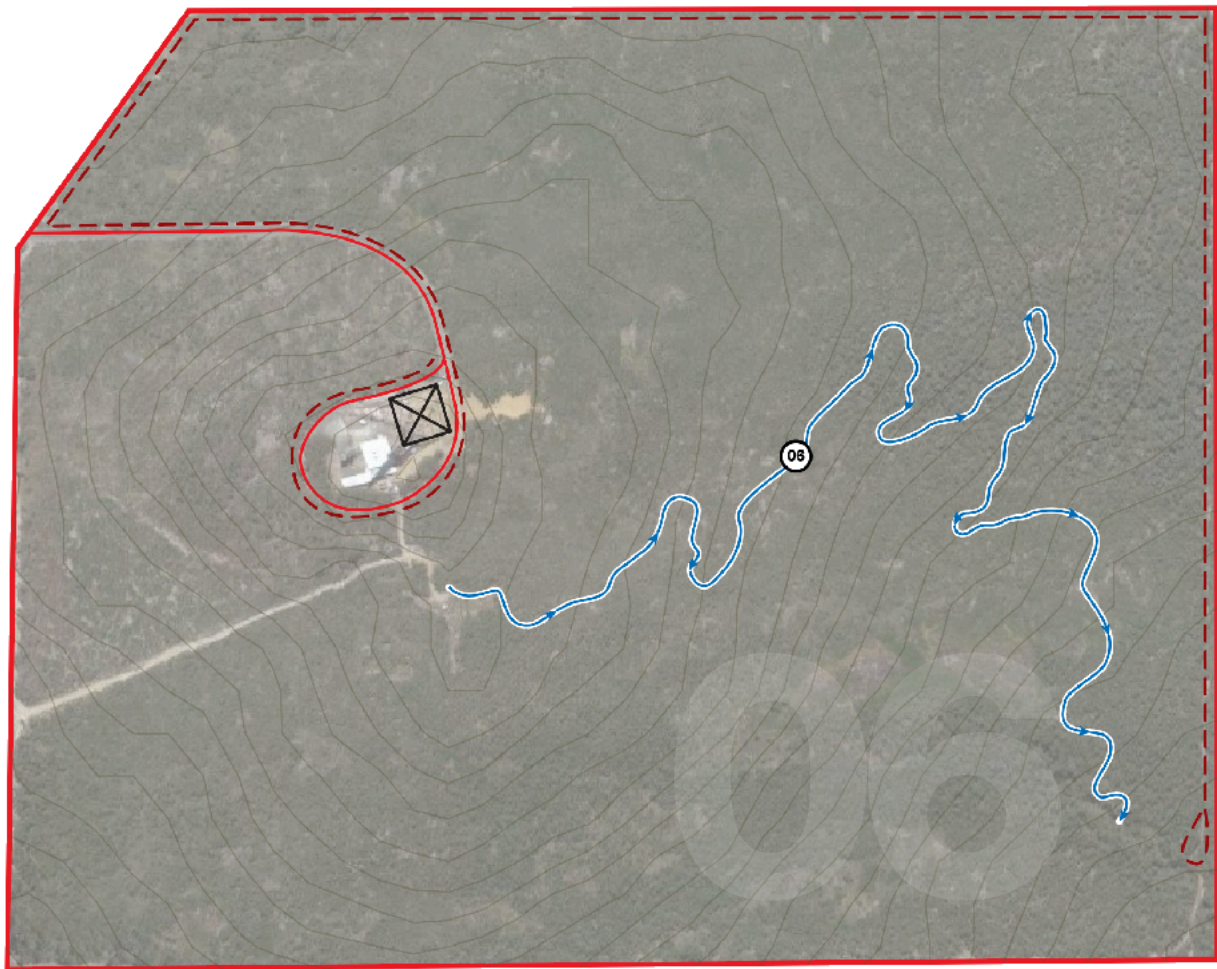
DIFFICULTY LEVEL	Blue square
TRAIL LENGTH	895 meters
AVERAGE GRADIENT	7.5%
BUILD STYLE	ALL MOUNTAIN
TRAIL TYPE	XC /AM
DIRECTION	Descending. Single direction
STRATEGIC RATING	STAGE 02
TOPOGRAPHY	Sandy loam . Some rock, loam in lower area
GPS CORRIDOR WIDTH	10 meters either side of line
CONSTRUCTION TYPE	Machine
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXC / SKID STEER
FINISHED TRAIL WIDTH	900 mm
TRAIL FINISH	Manipulated/ natural
COMMENTS	Fast with manipulated features hidden to retain a trail feel

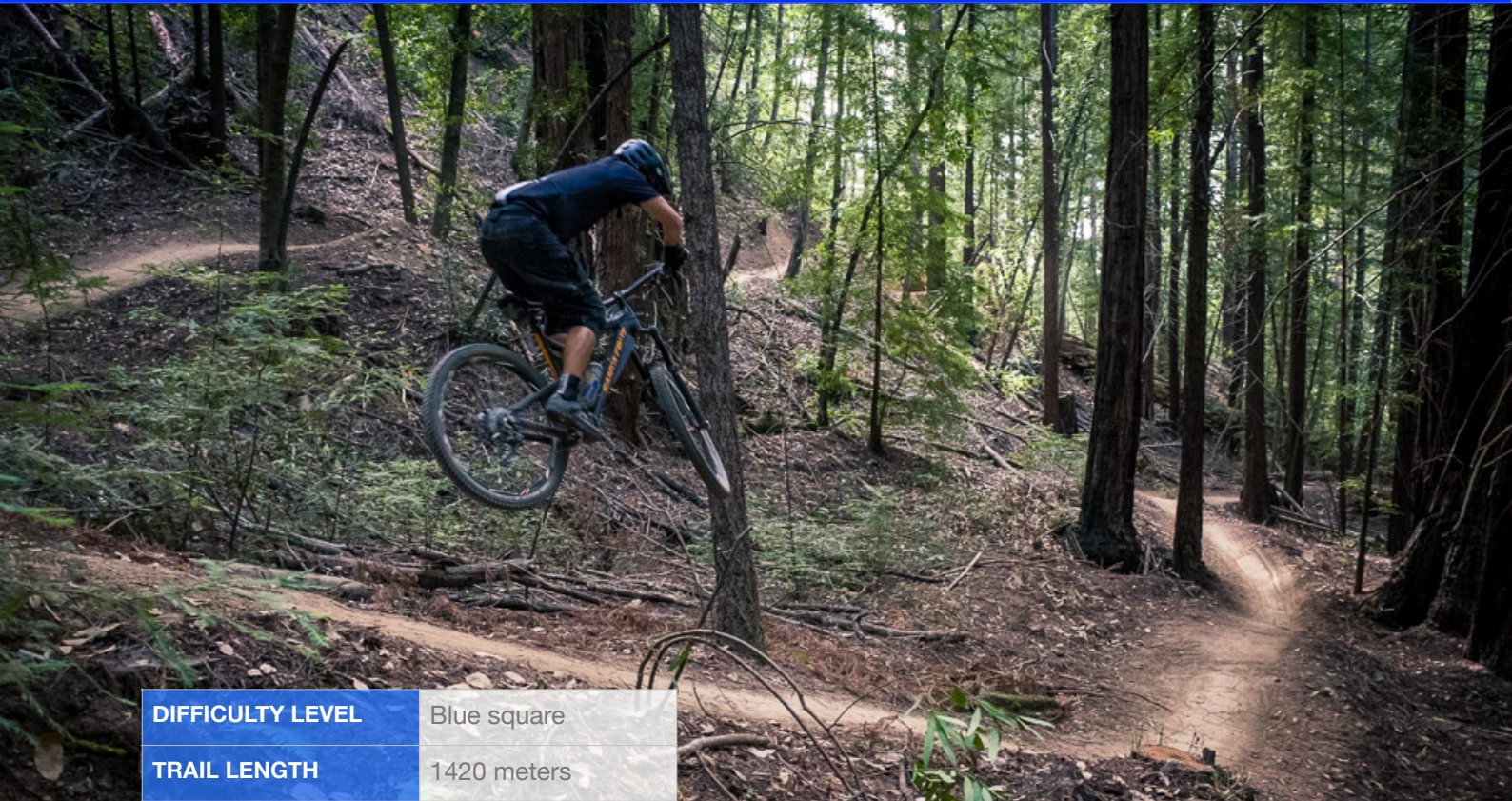




Trail 06

BLUE AM DESCENT





DIFFICULTY LEVEL	Blue square
TRAIL LENGTH	1420 meters
AVERAGE GRADIENT	7.2%
BUILD STYLE	ALL MOUNTAIN
TRAIL TYPE	XC /AM
DIRECTION	Descending. Single direction
STRATEGIC RATING	STAGE 02
TOPOGRAPHY	Sandy loam . Some rock, loam in lower area
GPS CORRIDOR WIDTH	15 meters either side of GPS line
CONSTRUCTION TYPE	Machine
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXC / SKID STEER
FINISHED TRAIL WIDTH	600 mm
TRAIL FINISH	Manipulated/ natural
COMMENTS	Fast with manipulated features hidden to retain a trail feel

TRAIL 06 is to be built in an **All Mountain** style. It is to be machine built to add shoulders and features, but the finish should appear natural. The over all finish is narrower with jumps and rollers hidden within the build. The thick vegetation and steep slopes of the middle section provide an ideal location for heavily demarcated tighter lines.

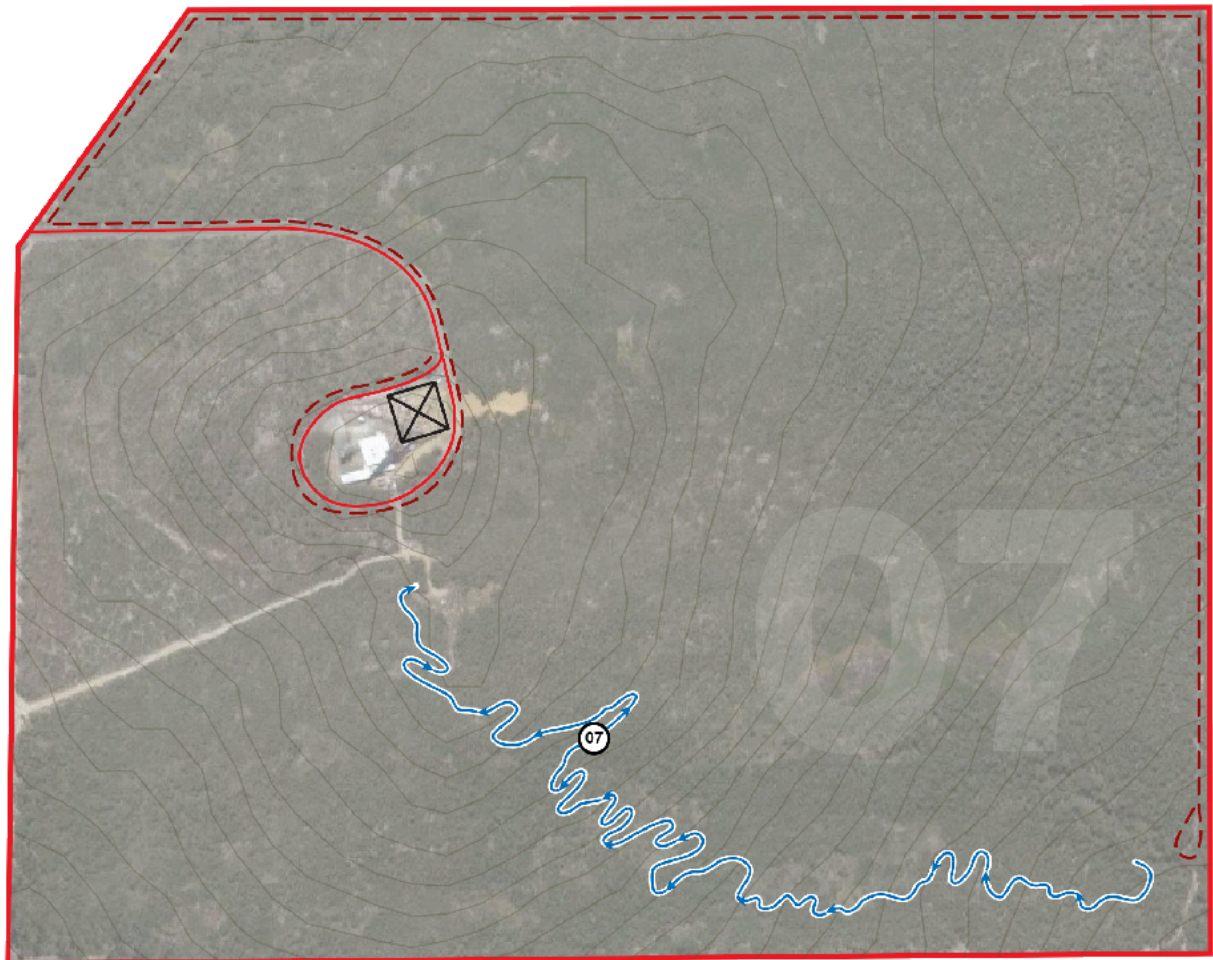
The **All Mountain** styled trail, is aimed to land squarely between the fast over built lines of the **Flow Trail** and the narrow hand made **Full Trail** style of Trail 08. It will be fast, fun and testing. A high priority should be placed on ensuring this is a different riding experience than the **Blue Flow** trail.

Opportunities for tight sections, turns, and sharp grade reversals, are possible. The average trail grade in excess of 7% ensures speed will be gained quickly on the back side. This will be another very popular trail that will appeal to an extremely wide user group.



Trail 07

BLUE AM ASCENT

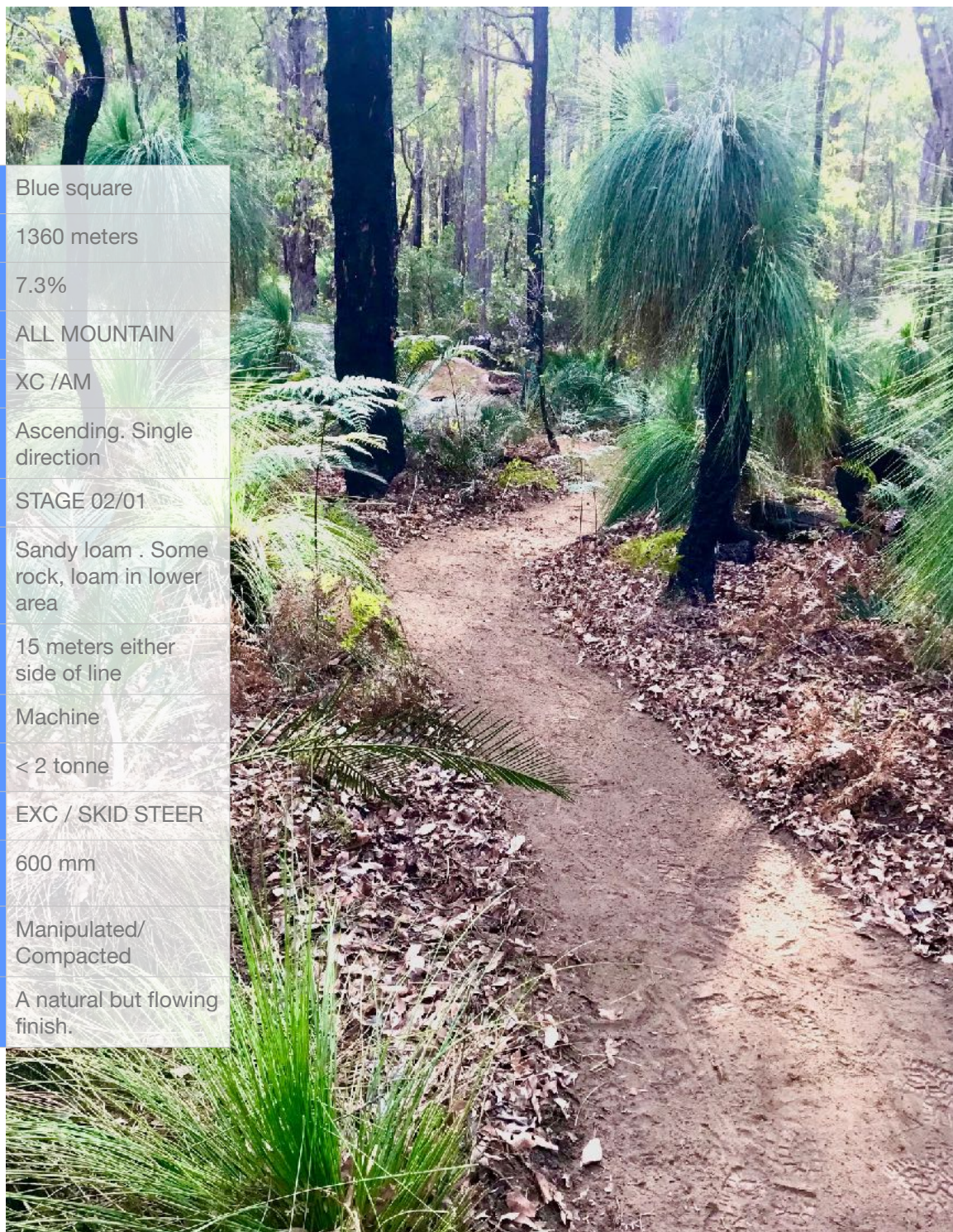




Trail 07 is a **Blue All Mountain** style, winding climb. It makes its way up the scenic southern side. The primary focus is to create a climb that is interesting and scenic without being super demanding. Diversity of topography and meandering lines will create an enjoyable climbing experience. It is a narrower finish than the **Blue Flow Ascent** with a more natural finish.

An average gradient over 7% is no walk in the park, but is well within reach of the average BLUE rider. There are many grade reversals and flat sections to recoup along the way.

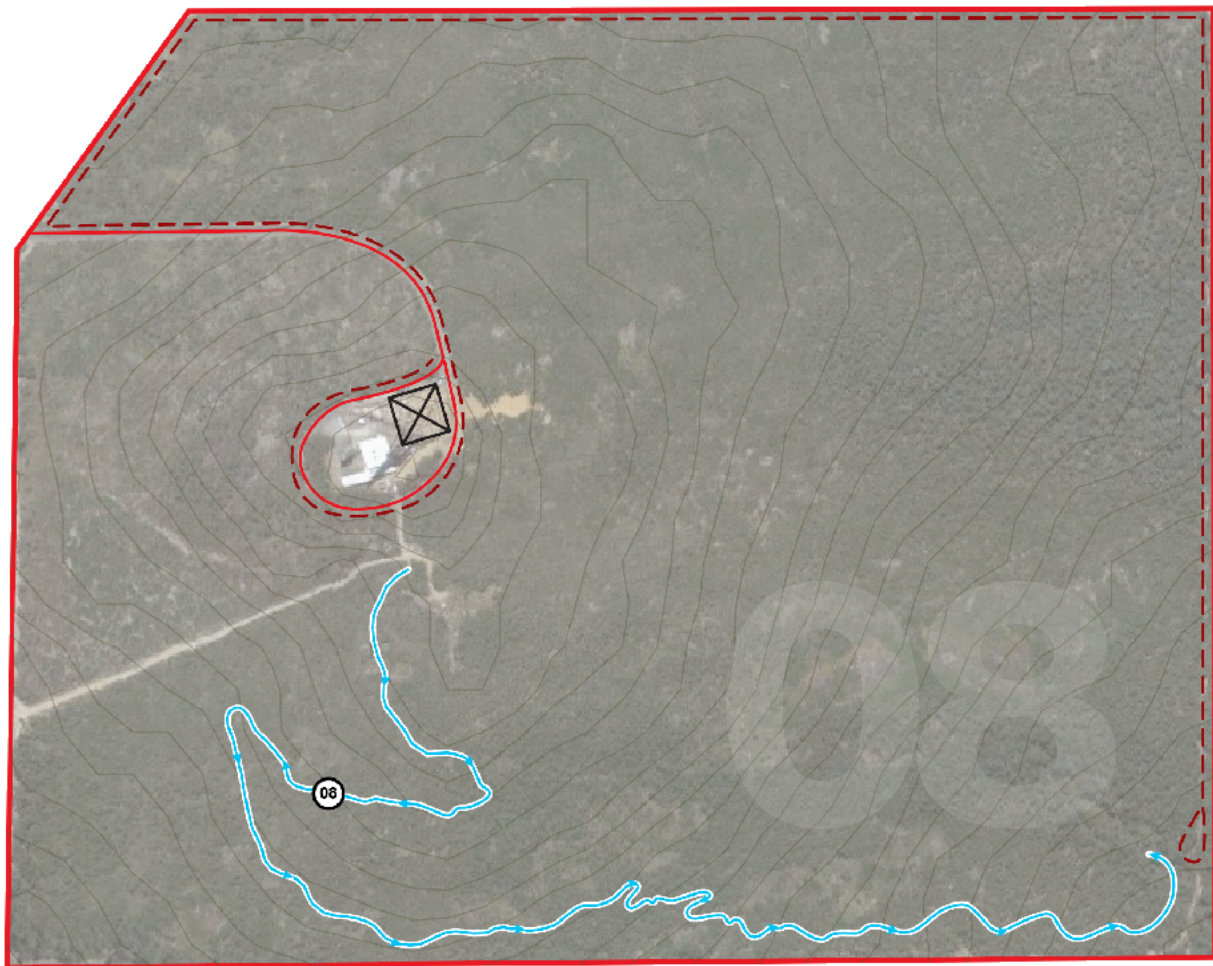
DIFFICULTY LEVEL	Blue square
TRAIL LENGTH	1360 meters
AVERAGE GRADIENT	7.3%
BUILD STYLE	ALL MOUNTAIN
TRAIL TYPE	XC /AM
DIRECTION	Ascending. Single direction
STRATEGIC RATING	STAGE 02/01
TOPOGRAPHY	Sandy loam . Some rock, loam in lower area
GPS CORRIDOR WIDTH	15 meters either side of line
CONSTRUCTION TYPE	Machine
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXC / SKID STEER
FINISHED TRAIL WIDTH	600 mm
TRAIL FINISH	Manipulated/ Compacted
COMMENTS	A natural but flowing finish.





Trail 8

BLUE DESCENT





The **TR Trail** is aimed at the old school tech trail ride, rather than a full gravity focused blast.

At 7% average grade, it will still be no slouch but the focus should be on finding the most interesting and technical features to navigate.

To accommodate this we have allowed a wide corridor in the top section so that the designer can utilise the best lines. This should take precedence over maintaining a constant descent. An undulating result will be the best result for this trail.

This type of trail is very sought after by some riders, as it represents a timeless design that takes people back to their roots. Many centres are returning to this trail of style. They require a high skill level and are very rewarding to conquer at speed.

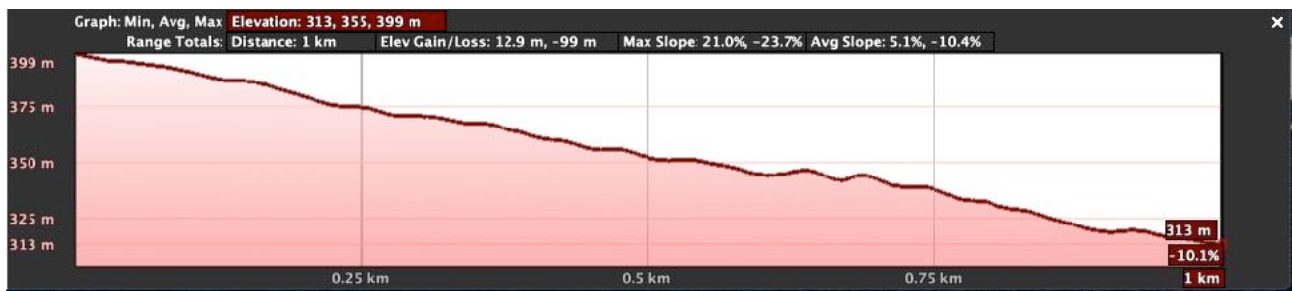
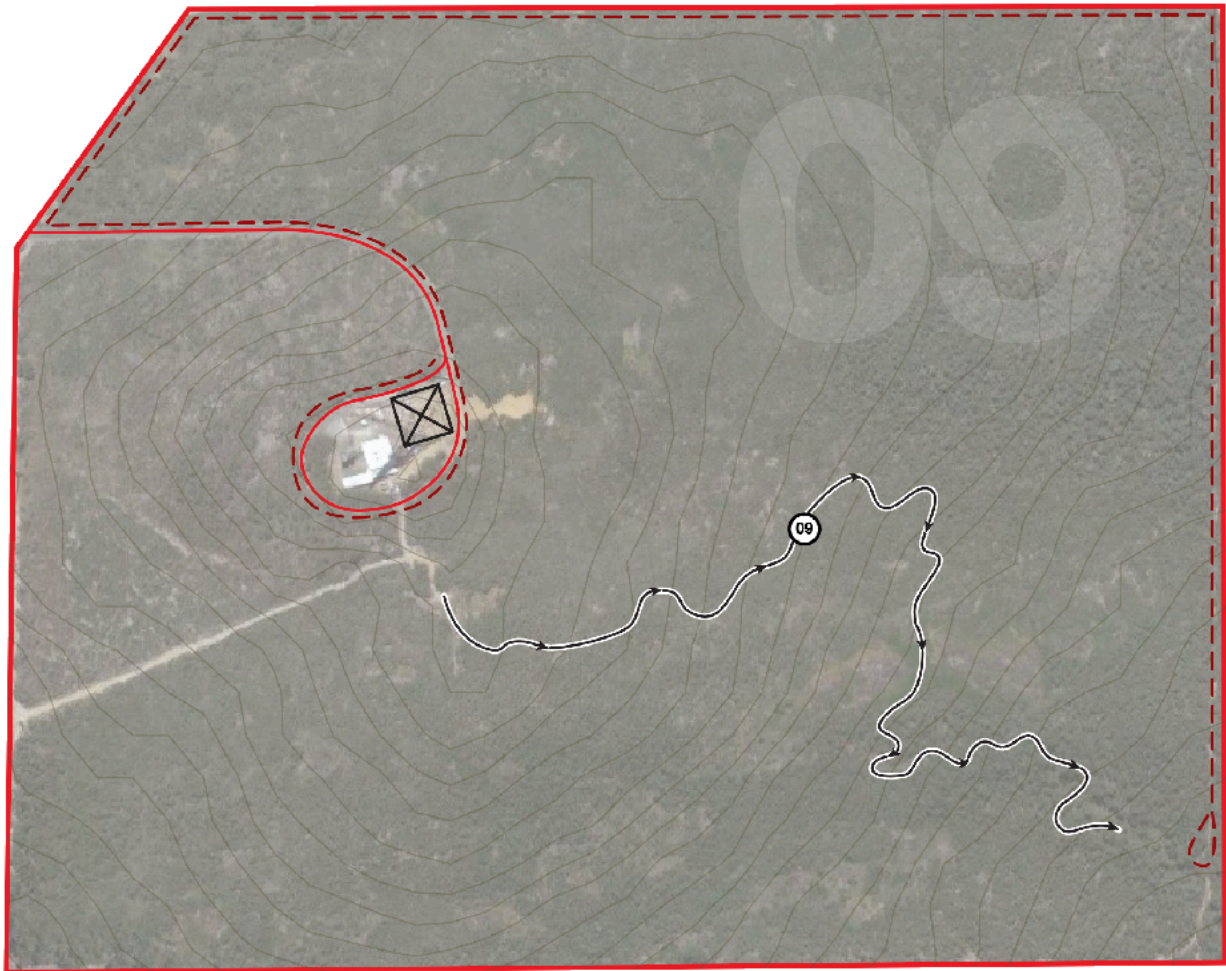
DIFFICULTY LEVEL	Blue square
TRAIL LENGTH	1440
AVERAGE GRADIENT	7%
BUILD STYLE	ALL MOUNTAIN
TRAIL TYPE	XC /TR
DIRECTION	Descending. Single direction
STRATEGIC RATING	STAGE 02
TOPOGRAPHY	Sandy loam . Some rock, loam in lower area
GPS CORRIDOR WIDTH TOP SECTION	20m either side of GPS line
GPS CORRIDOR WIDTH BOTTOM SECTION	10 meters either side of GPS line
CONSTRUCTION TYPE	Hand built
MACHINE SIZE	< 2 tonne
MACHINE TYPE	Excavator
FINISHED TRAIL WIDTH	600 mm
TRAIL FINISH	Natural
COMMENTS	Majority Hand built with machine assist where necessary

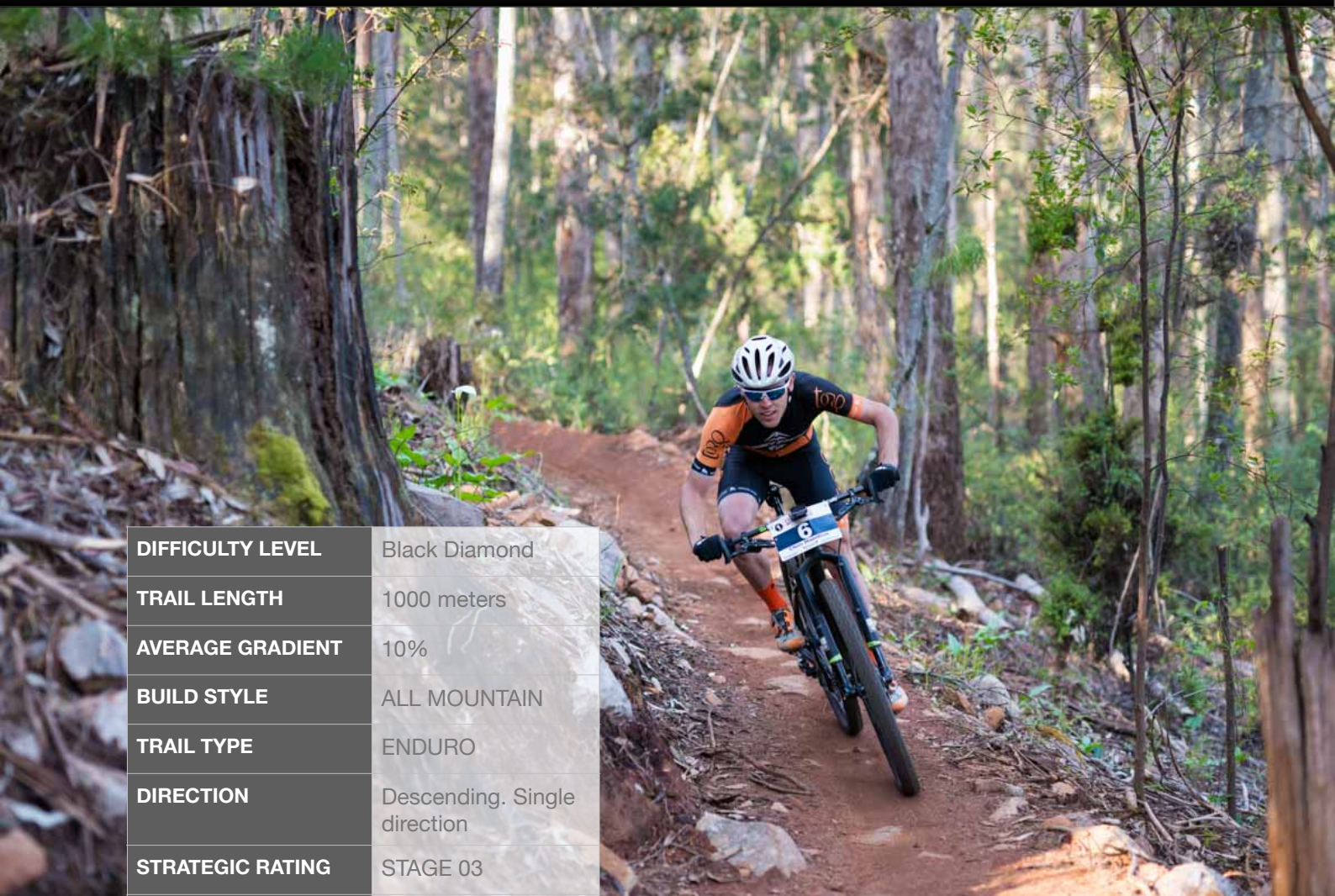




Trail 09

BLACK AM DESCENT





DIFFICULTY LEVEL	Black Diamond
TRAIL LENGTH	1000 meters
AVERAGE GRADIENT	10%
BUILD STYLE	ALL MOUNTAIN
TRAIL TYPE	ENDURO
DIRECTION	Descending. Single direction
STRATEGIC RATING	STAGE 03
TOPOGRAPHY	Rock, loam in lower area
GPS CORRIDOR WIDTH	20 meters either side of GPS line
CONSTRUCTION TYPE	Machine/Hand built
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXCAVATOR ONLY
FINISHED TRAIL WIDTH	900 mm
TRAIL FINISH	Manipulated/ natural
COMMENTS	Use rock where possible. Machine features to add air and difficulty. Hidden to appear natural

As with the **Blue All Mountain** trail, the focus is placed on creating a run with lots of features hidden within the trail. At 10% it is going to be an extremely fast trail and the features need to be sized to handle the speed.

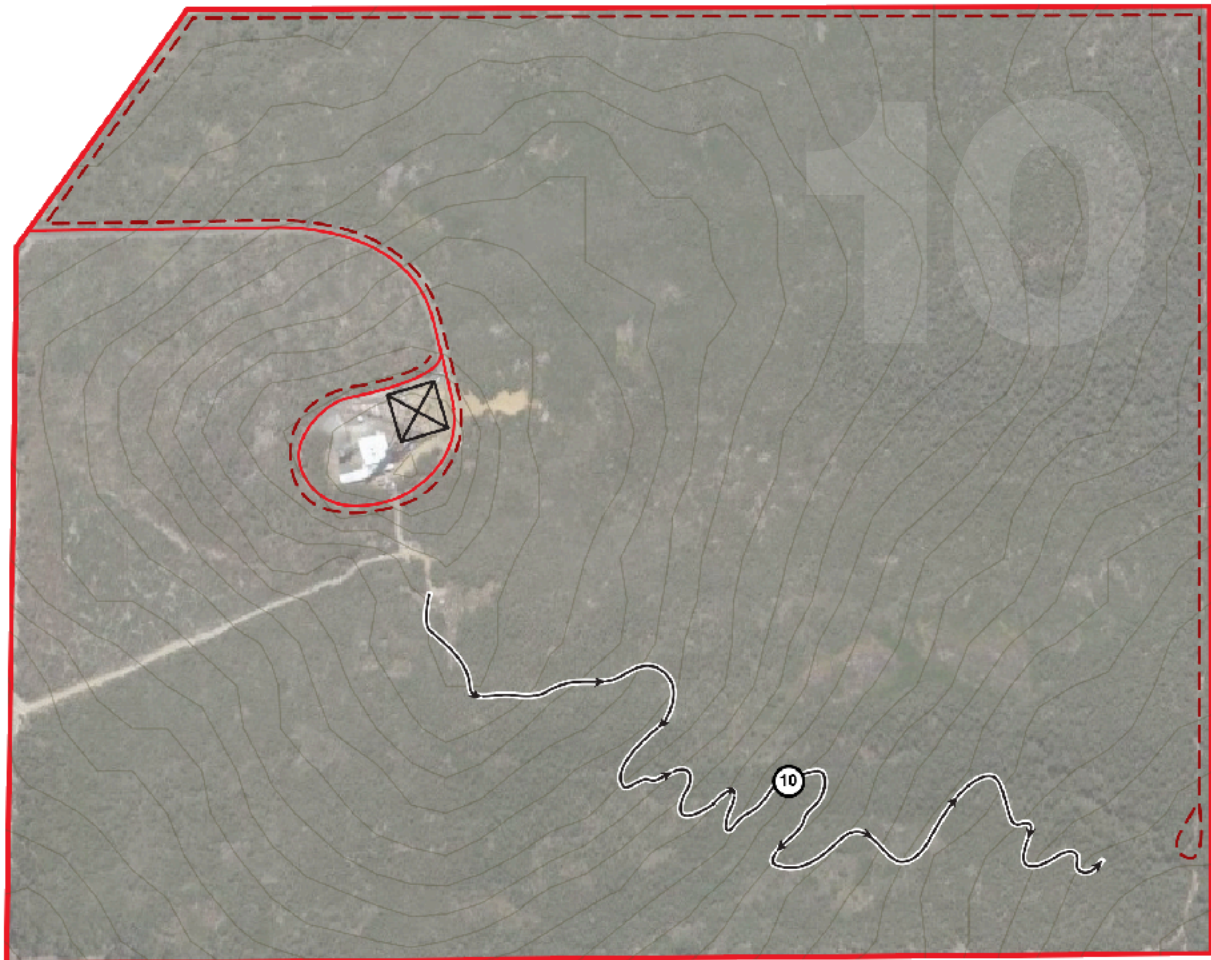
While accessible to a blue rider at a slower pace, the features need to be placed and constructed in a way that rewards the pure black rider. Of the two **Black AM** trails on the circuit this one is to lean more towards the Flow style than its southern counterpart.

Whereby the pure flow is clear on a FLOW trail, it needs to be disguised more on this trail. Obstacles between jump lips and landings, jumps made from rocks, and drop off A-Lines will create a full **Black AM** experience



Trail 10

BLACK DH DESCENT 





DIFFICULTY LEVEL	Black Diamond
TRAIL LENGTH	1000 meters
AVERAGE GRADIENT	10%
BUILD STYLE	NATURAL
TRAIL TYPE	AM / ENDURO
DIRECTION	Descending. Single direction
STRATEGIC RATING	STAGE 03
TOPOGRAPHY	Rock, loam in lower area
GPS CORRIDOR WIDTH	20 meters either side of GPS line
CONSTRUCTION TYPE	Hand built. Machine features
MACHINE SIZE	< 2 tonne
MACHINE TYPE	EXCAVATOR ONLY
FINISHED TRAIL WIDTH	600 mm
TRAIL FINISH	Natural
COMMENTS	Uncompromised natural Black enduro run

Although both BLACK trails are **All Mountain**, the **Enduro** classification separates it from the semi-flow style of the Northern Black trail.

The intended style of this trail is to be hand built with “Machine Assist”. This means that the majority of the trail is built by hand, with an excavator on site to assist with any heavy rock work etc.

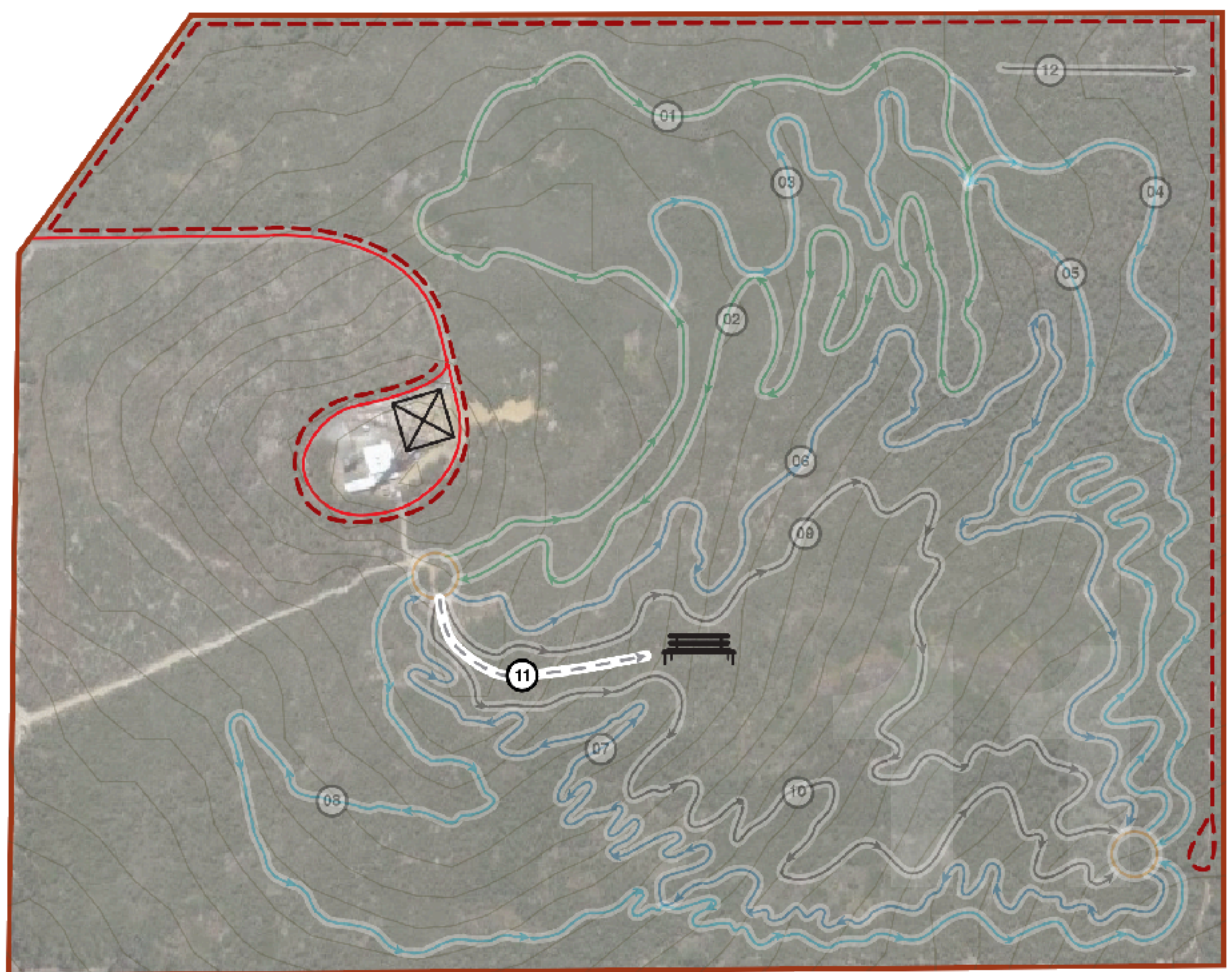
This minimal hand built style has a very narrow and natural finish with some hidden machine manipulated features where required.

This is the most technical trail in the circuit and effort will need to be applied to ensure that it does not become too inclusive, and only accessible to elite level riders.

The builder must be aware in the construction of this trail that it holds a fast techy character, but options need to be retained so that advanced blue riders can attempt it without huge consequence. Having BLUE level “B” lines and rollable backs on rock features is the most practical method.

Trail 11

SPECTATOR ACCESS/VIEWING POINT





DIFFICULTY LEVEL	WHITE ALL ACCESS
TRAIL LENGTH	350 METERS
AVERAGE GRADIENT	3%
BUILD STYLE	WALK
TRAIL TYPE	hard surface
DIRECTION	Dual direction
STRATEGIC RATING	To be determined
TOPOGRAPHY	Sandy loam. Some rock
GPS CORRIDOR WIDTH	20 meters either side of GPS line
CONSTRUCTION TYPE	Machine
MACHINE SIZE	To be determined
MACHINE TYPE	EXC / Skid Steer
FINISHED TRAIL WIDTH	1.5 meters
TRAIL FINISH	Hard surface
COMMENTS	Short scenic walk, disability friendly. suitable for wheelchairs etc

Trail 11 is a walk trail for spectators see part of the MTB trail, as it is the closest point between the black descent and blue climb. It proceeds through a reasonably open area to grassed open areas with scenic NE views.

The gravel track at the top bike trail head should be gated off at the road, making the area pedestrians and cycles only.

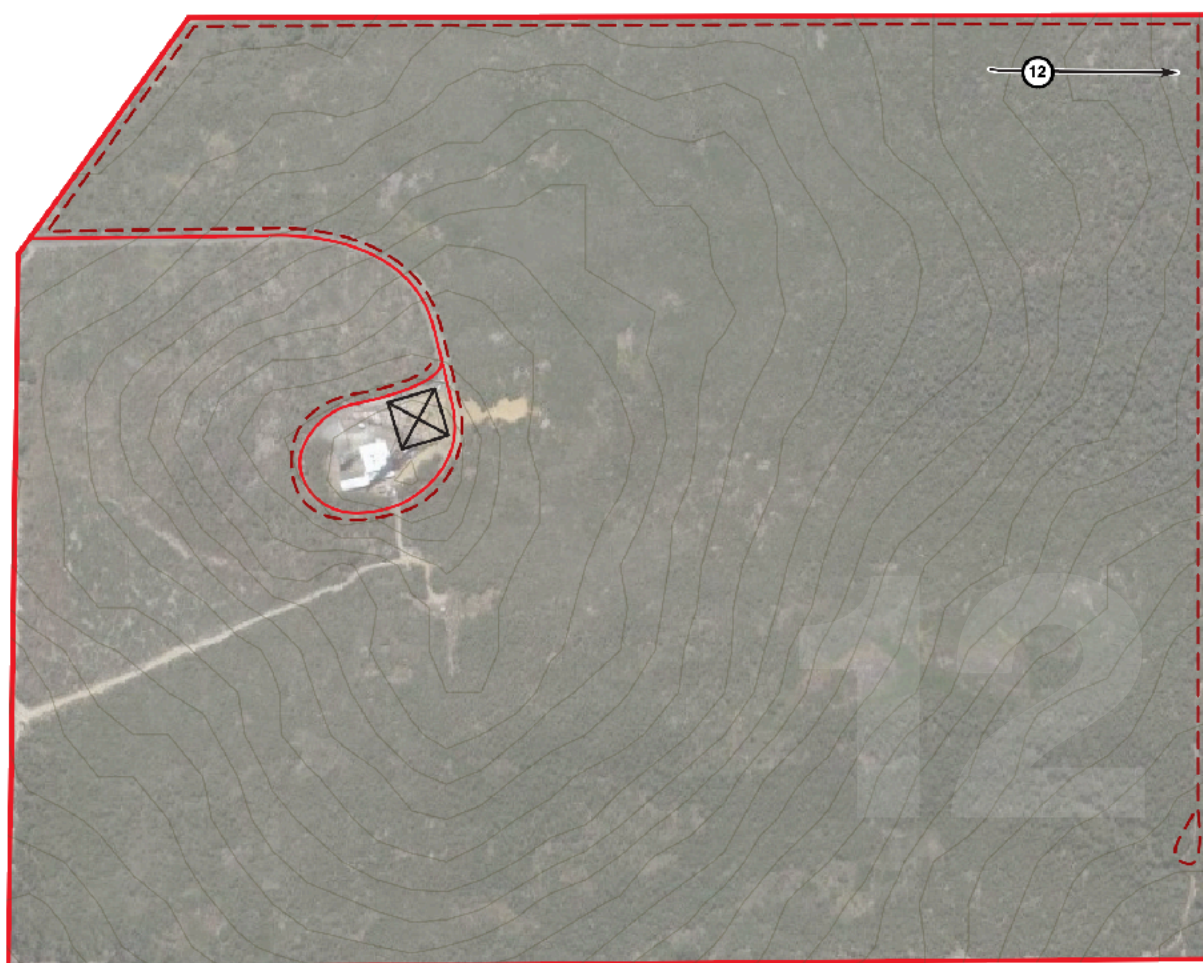
The wider GPS line is indicative only. The trail has not being designed on site, as the brief was amended after the initial site inspections had taken place. The trail crossings are at safe points, and the detail of the alignment will be done at a later date.

Pricing is vague until the site inspection has taken place and clear specifications on the trail are decided.

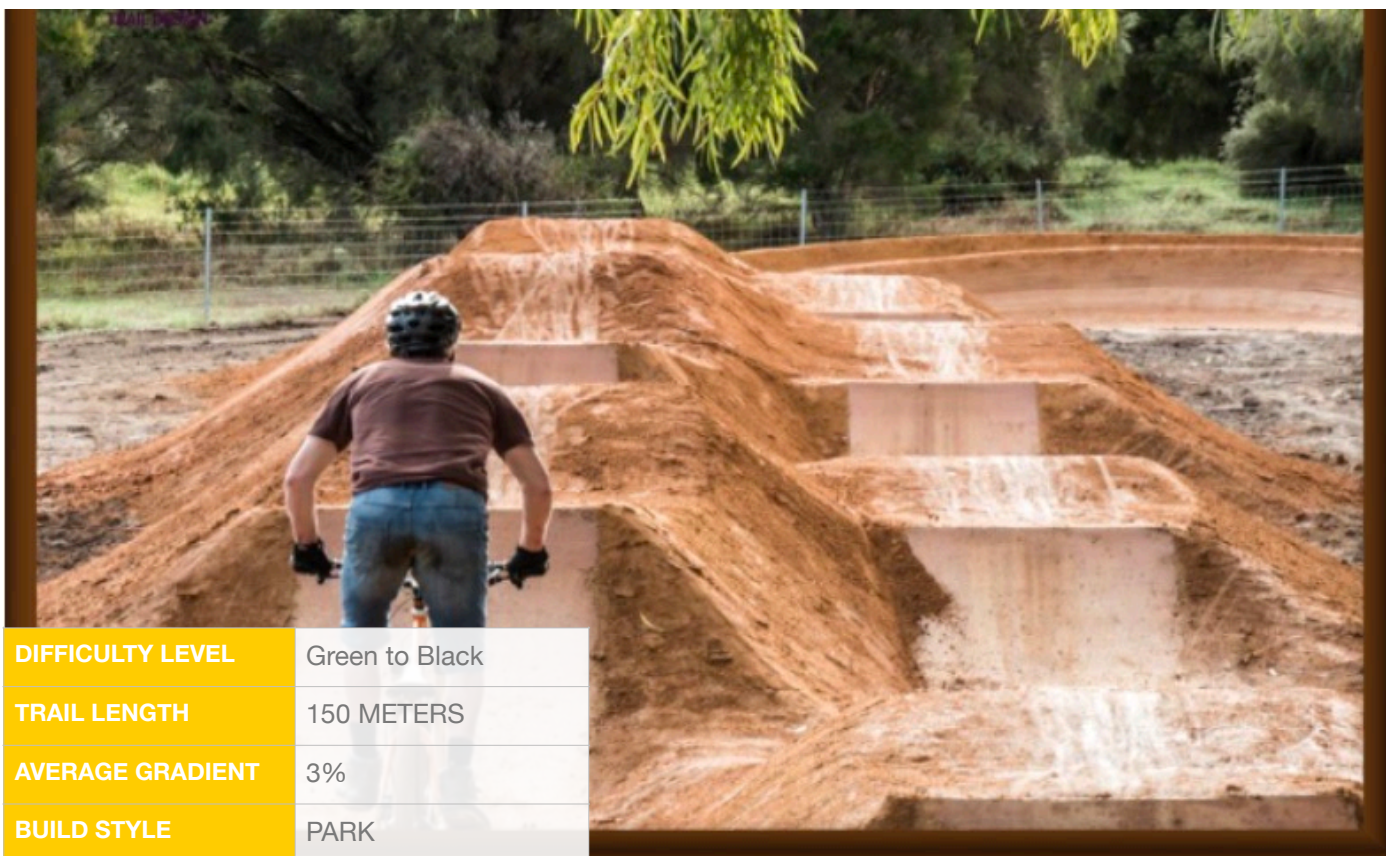


Trail 12

JUMP LINE



TRAIL 12: JUMP LINE



DIFFICULTY LEVEL	Green to Black
TRAIL LENGTH	150 METERS
AVERAGE GRADIENT	3%
BUILD STYLE	PARK
TRAIL TYPE	JUMP
DIRECTION	Single Direction
STRATEGIC RATING	To be determined
TOPOGRAPHY	Loam
GPS CORRIDOR WIDTH	10 meters either side of GPS line
CONSTRUCTION TYPE	Machine
MACHINE SIZE	To be determined
MACHINE TYPE	EXC / Skid Steer
FINISHED TRAIL WIDTH	2 meters
TRAIL FINISH	Heavily compacted
COMMENTS	Imported materials may be required

Trail 12 is a pure JUMP LINE.

There is space allowed for 150 meters of trail, but in reality, it will be much shorter. Seperate lines should be included so that it cater to all levels. The picture above is a good example of how this can be achieved.

Jump lines do not require a lot of space, but require a high degree of construction.

Jump lines are very popular with younger riders so it has been deliberately located closest to the town.

The lips and landing of the jumps require an extremely hard face, and many now are constructed with clay, cement, or have hardeners added to the material. Imported material will likely be required to achieve the level of compaction required.

Construction will require imported material, but the cost may be reduced if the dirt can be donated.

After discussions with the Shire it was recommended we remove the jump line, as they thought it was better located in town.

As it stands, the Jump Line can be accessed from the proposed North shuttle road.

A-Line Options

Optional *A-Lines*, one level higher than the actual trail colour, should be included in the Detail Design Plan.

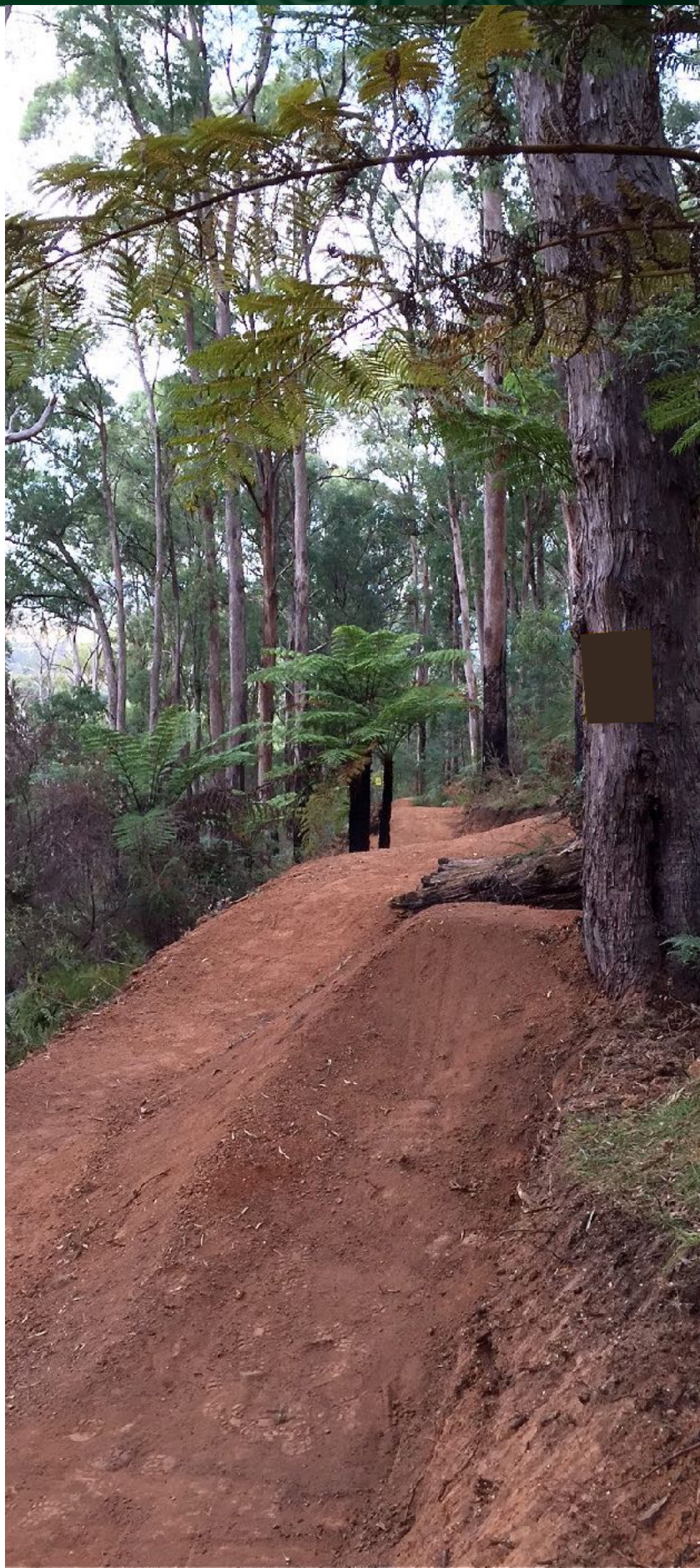
For example, a *Green* trail can have optional *Blue* A-Lines, and a *Blue* trail would include optional *Black* A-Lines. The example here illustrates a blue flow trail with an optional Black A-Line.

Adding A-Line options increases the appeal of a trail to a wider range of user groups. It greatly increases the progressiveness of a trail system and narrows the gap between the Trail Levels.

A Green rider over time will start taking the Blue A-Line options, then progress to the Blue Trail. Once comfortable on the Blue Trail, they can start hitting Black A-Line before progressing onto the actual Black Trail.

A discussion with stakeholders would be required to look at Double Black options on the Black Trail.

An example of a Black “A Line” jump option on a Blue level trail



BROAD COST ESTIMATE



Broad Cost Estimate

Costing

The prices below are indicative only and are provided to give an approximate pricing for upcoming budgets. Prices may vary due to requirements of the Land Managers and because of the different trail styles.

A FLOW TRAIL is much more expensive to build. A hand-built trail is slow to construct, because it is so labor intensive. When volunteers from clubs or other labor sources can be bought on board, the cost is greatly reduced.

The prices listed below are based on a full professional build by any of WA's dedicated mountain bike construction companies. The detailed design cost is based on a *full DBCA specification requirement*. This is very precise and time consuming procedure and may not be required by other land Managers. Offering a design and build tender would greatly reduce the price of this component.

ID	PROVISIONAL NAME	CLASSIFICATION	STYLE	LENGTH (m)	DETAILED DESIGN	TOTAL	≈ APPROXIMATE CONSTRUCTION PRICE/M	≈ APPROXIMATE CONSTRUCT TOTAL	TOTAL
1	Green Descent	Green Circle	FLOW	1 km	\$2/m	\$2000	≈ \$34/m-\$42/m	\$38,000	\$40000
2	Green Flow Ascent	Green Circle	FLOW	1300m	\$2/m	\$2600	≈ \$34/m-\$42/m	\$49,400	\$52000
3	Blue Pump Descent	Blue Square	PUMP	640m	\$2/m	\$1300	≈ \$27/m-\$35/m	\$19,500	\$20800
4	Blue Flow Descent	Blue Square	FLOW	840m	\$2/m	\$1680	≈ \$34/m-\$42/m	\$31,920	\$33600
5	Blue Flow Ascent	Blue Square	TRAIL	895m	\$2/m	\$1790	≈ \$34/m-\$42/m	\$34,010	\$35800
	Link Trail 04/05	Blue Square	TRAIL	50m	\$2/m	\$100	≈ \$30/m	\$1500	\$1600
6	Blue AM Descent	Blue Square	AM	1420m	\$2/m	\$2840	≈ \$27/m-\$35/m	\$40,000	\$42840
7	Blue AM Ascent	Blue Square	AM	1360m	\$2/m	\$2720	≈ \$27/m-\$35/m	\$39,000	\$41720
8	Blue Descent	Blue Square	TRAIL	1440	\$2/m	\$2880	≈ \$27-30/m	\$40,000	\$42880
9	Black Descent	Black Diamond	AM	1 km	\$2/m	\$2000	≈ \$30/m	\$30,000	\$32000
10	Black Descent	Black Diamond	AM	1 km	\$2/m	\$2000	≈ \$30/m	\$30,000	\$32000
11	Spectator Access Trail	Grade 1	WALK	300m	\$2/m	\$600	≈ \$50/m	15000	\$15,600
12	Jump Line	Green > Black	JUMP	150m	\$2/m	\$300	≈ \$55/m	\$8250	\$8550
TOTAL TRAILS:						\$22,810		\$376,580	\$399,390

NB. Project management, approvals, additional site assessments, materials for features, gates or fencing, road improvements, all site work in parking area and lookout & any design and construction of amenities and/or ablutions are NOT included in this quote.

Broad Cost Estimate

Costing

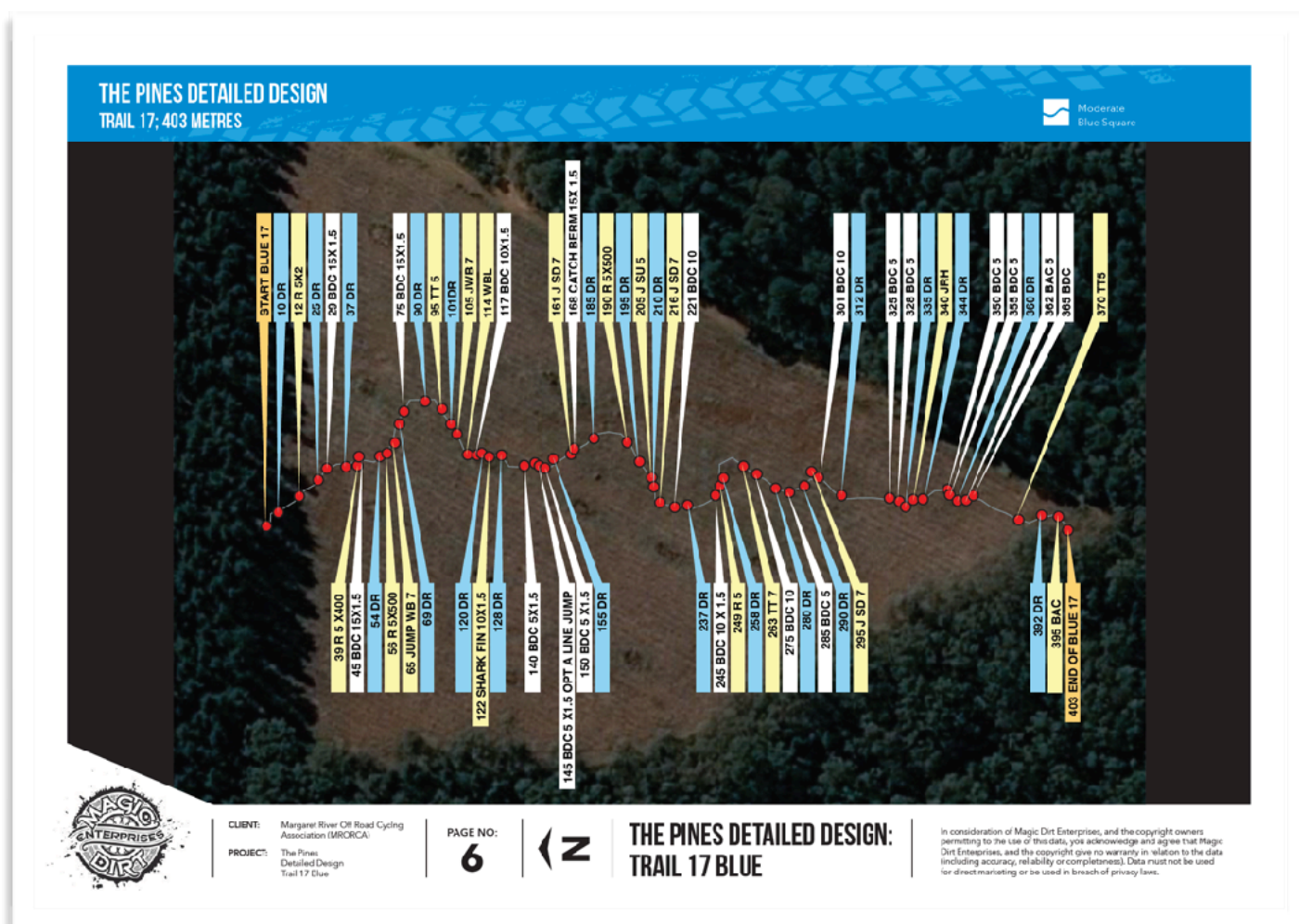
Signage	No.	Price per item + GST	Total
Trailheads: Pedestal inclined frame structure sheeted with aluminium panel and high res digitally printed graphics and uv/anti-graffiti film. Sheet size up to 900m x 600mm. Cost per completed trailhead, excludes installation.	3	560	1680
Trail Marker Posts: 90mm x 90mm galvanised steel either powder coated or sprayed in 2 pack to colour of choice. Capped on top. Pole can have relevant info applied to top with digitally printed vinyl graphics then clear coated over to seal in the graphics. Cost per completed sign, excludes installation.	32	350	11200
Shuttle Road Direction signs: Galvanised steel frame structure sheeted with aluminium panel and high res digitally printed graphics and uv/anti-graffiti film. Sheet size up to 2000 x 1000mm Cost per completed sign, excludes installation.	2	980	1960
		TOTAL:	\$14,840.00

OTHER COSTS:	ESTIMATED COST FOR WORKS:
Development of the Shuttle Road (firebreak)	\$161,500 ex GST

ONGOING COSTS:		
Maintenance	\$1000 - \$2000 Per Trail / Per Year	(depending on involvement from local clubs)

Broad Cost Estimate

Detailed Design Example Page - Mapping



A partial component of a DBCA spec Detail Design

CODE DESCRIPTIONS: See page 60 for diagrams of Features

R	Roller	TT	Table Top	BAC	Banked Ascending Corner
RJ	Roller Jump	DBL WB	Double (Whale Back)	BDC	Banked Descending Corner
H	Hip	SU	Step Up	DR	Drain
L	Landing	SD	Step Down	IMP	Imported Materials

Broad Cost Estimate

Detailed Design Example Page - Run Sheet

THE PINES DETAILED DESIGN TRAIL 17: 403 METRES



SCT	+M	CODE	L (max)	H (max) *	NOTES: FEATURES TO BE GROUPED AS A SECTION
PART 1-1:					
1-1	0				START TRAIL 17
1-1	10	DR			
1-1	12	R	5	2000	
1-1	15	DR			
1-1	20	BDC	15	1500	Large descending corner to generate speed
1-1	37	DR			
1-1	39	R	5	400	
1-1	45	BDC	15	1500	Similar to first BDC to help generate speed from a short run up
1-1	54	DR			
1-1	56	R	5	500	
1-1	61	JWB	7	1500	Whale Back shape with long landing into BDC
1-1	69	DR			
1-1	75	BDC	15	1500	
1-1	90	DR			
1-1	95	TT	5	1000	Steeper Table Top to add pop
1-1	101	DR			
1-1	105	JWB	7	1500	Whale back shape - Slightly stepped down
1-1	114	WBL		500	Long hipped landing leading into BCT
1-1	117	BDC	10	1500	
1-1	120	DR			
1-1	122	BAC SF	10	1500	Shark fin corner
1-1	130	DR			
1-1	135	BDC SF	5	1500	Shark fin Landing
1-1	145	BDC	5	1500	Tight S section with option to jump straight through
1-1	150	BDC	5	1500	
1-1	155	DR			
1-1	161	JSD	7	1000	Step down with long transition
1-1	168	BCCATCH	15	1500	Catch berm to hold speed back up the hill
1-1	185	DR			
1-1	190	R	5	500	

SCT	+M	CODE	L (max)	H (max) *	NOTES: FEATURES TO BE GROUPED AS A SECTION
1-1	195	DR			
1-1	205	JSD	5	1000	
1-1	210	DR			
1-1	216	JSD	7	1200	
1-1	221	BDC	10		Fast Banked Section
1-1	237	DR			
1-1	245	BDC	10	1500	
1-1	249	R	5	600	
1-1	258	DR			
1-1	263	TT	7	1500	Steeper and higher to provide pop
1-1	275	BDC	10		
1-1	280	DR			
1-1	285	BDC	5		
1-1	290	DR			
1-1	295	JSD	7	1200	Step Down using BDC as landing
1-1	301	BDC	10		
1-1	312	DR			
1-1	325	BDC	5		START OF FAST S SECTION
1-1	328	BDC	5	400	
1-1	335	DR	10		
1-1	340	JRH	5	1000	Table top with hipped landing into S Section
1-1	344	DR			
1-1	350	BDC	5		START OF TIGHT S TO FINISH
1-1	355	BDC	5		
1-1	360	DR			
1-1	362	BAC	5		
1-1	365	BDC	5		
1-1	370	TT	5	1500	Steep BMX style jump to reduce speed before finish
1-1	392	DR			
1-1	395	BAC	5	1500	
1-1	403				END OF BLUE 17



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PROJECT: The Pines Detailed Design Trail 17 Blue

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**THE PINES DETAILED DESIGN:
TRAIL 17 BLUE**

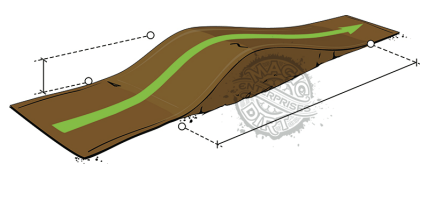
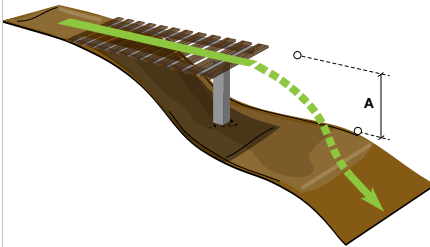

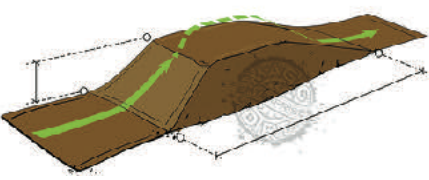
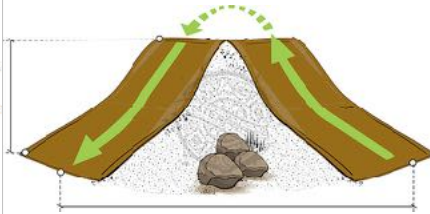
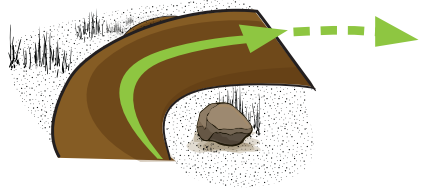
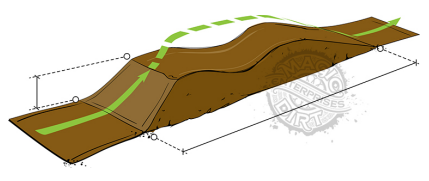
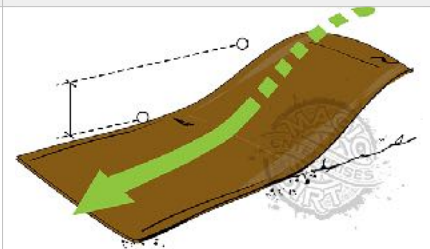

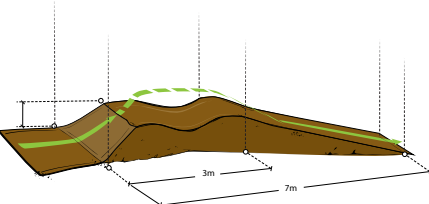
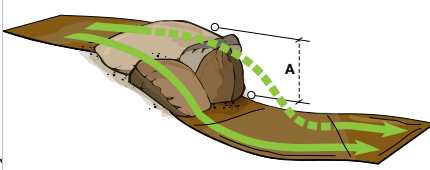
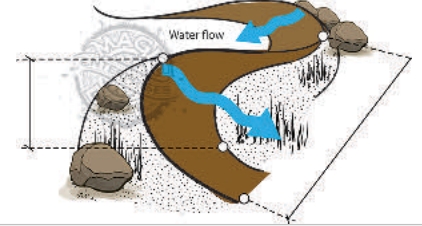
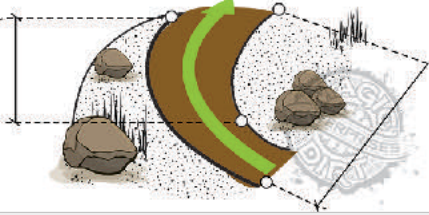
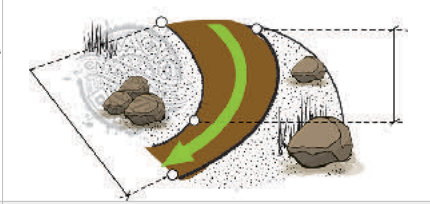
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A partial component of a DBCA spec Detail Design

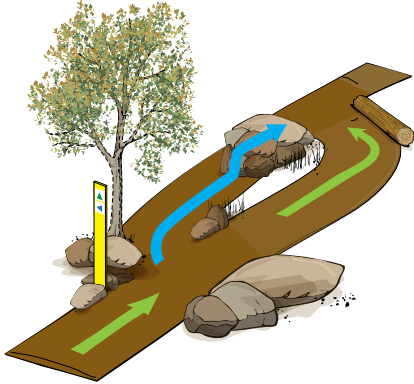
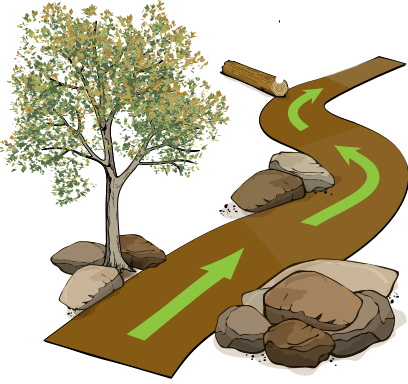
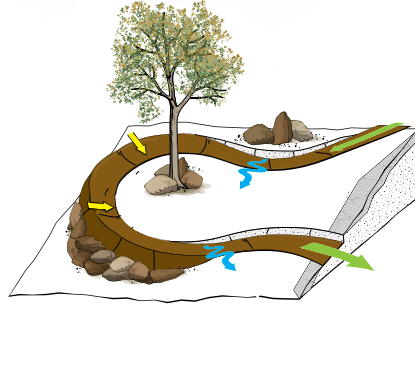
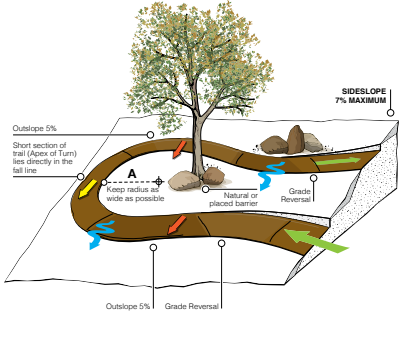
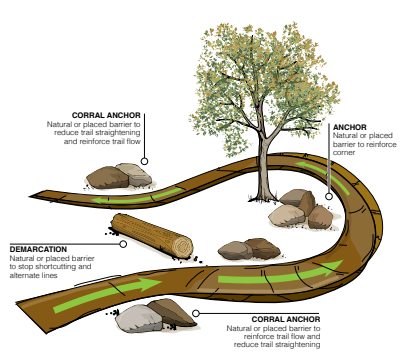
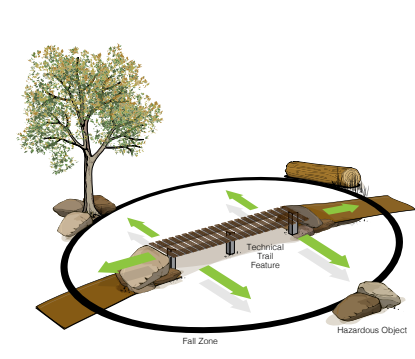
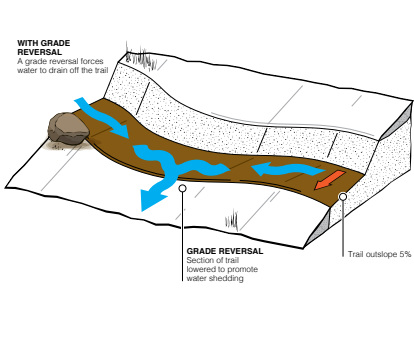
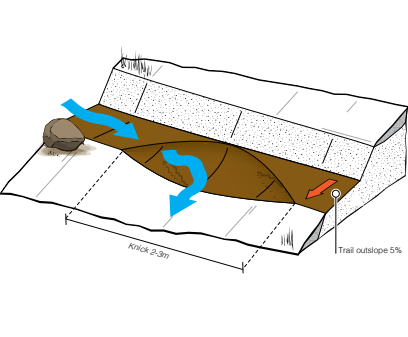
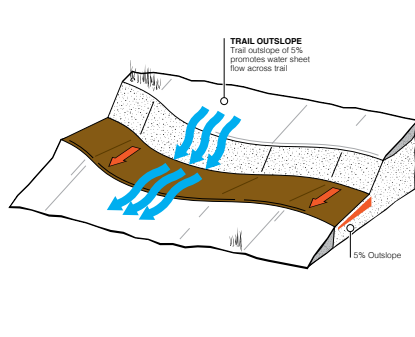
TRAIL FEATURES



Trail Features

		
ROLLER	DROP OFF	SKI JUMP
		
TABLETOP	HIP JUMP	SHARK FIN
		
WHALEBACK	LANDING	STEP UP JUMP
		
LONG WHALEBACK	ROLLABLE STEP DOWN	JOINED BANKED CORNERS
		
BANKED ASCENDING CORNER	BANKED DESCENDING CORNER	

Trail Features

		
<p>ALTERNATIVE LINES</p>	<p>CHICANE AND CHOKE</p>	<p>BERMED TURN</p>
		
<p>CLIMBING TURN</p>	<p>DEMARCATON</p>	<p>FALL ZONE</p>
		
<p>GRADE REVERSALS</p>	<p>KNICKS</p>	<p>OUTSLOPE</p>