




DA 22/11272

Alpine Coaster and Associated Works

Response to Additional Information Request

December 2022

	Department of Planning and Environment
<i>Issued under the Environmental Planning and Assessment Act 1979</i>	
Approved Application No DA 22/11272	
Granted on the 31 March 2023	
Signed	S Butler
Sheet No	58 of 58

Document Control

Revision	Date	Revision Type	Author	Approved by
A	22/12/2022	Draft	C.Chalk	R.Nuridin
0	23/12/2022	Final	C.Chalk	R.Nuridin

Kosciuszko Thredbo Pty Ltd

1 Friday Drive, Thredbo, New South Wales 2625
www.thredbo.com.au

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Overview

This document has been prepared in response to the ***Request for Additional Information, DA 22/11272 – Alpine Coaster, 2 Friday Drive, Thredbo (Lot 876 DP 1243112)*** issued by the Department of Planning and Environment (DPE) on 4 November 2022.

It should be noted that some of the items outlined in DPE's RFI will be addressed in detailed design at the construction certificate stage.

Section 36(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) states:

A consent authority may not request additional information in relation to building work or subdivision work if the information is required to accompany an application for a construction certificate or subdivision works certificate.

1.1 Scope of this Response

The detail requested by DPE is provided in **blue**, with KT's response provided below. A list of updated documents is provided in **Appendix A**.

2 Operational Details

Additional details in relation to the operation of the alpine coaster is requested as follows:

2.1 Hours of Operation

Hours of operation: further to your comments in Section 3.5.2 of the Statement of Environmental Effects (SEE), please be specific in detailing the requested hours of operation in relation to the coaster facility, including (but not limited to) commencing and finishing hours of operation during the various seasons and any limiting factors to operation.

The Coaster will operate in accordance with the resort's lifting operating hours. The resort's lift operating hours vary throughout the year. Generally, lifts operate during the following hours:

- 8:30 am – 4:30 pm during winter; and
- 8:30 am – 4:30 pm during summer, with extensions up to 5:30 pm during holiday periods.
- Coaster will be scheduled to operate in daylight hours, when natural light is sufficient to operate safely and artificial lighting is not required. This means operation times will vary depending on time of year.

Limiting factors to operation of the Coaster include extreme weather events (e.g. heavy rain, wind, heavy snow, bush fire and lightning).

2.2 Maximum Ride Capacity

Maximum ride capacity: provide details of the maximum number of coaster users possible at any time assuming operating at peak capacity, together with a calculation as to the maximum number of users in a one-hour period (i.e. assuming operating all carts at capacity with tandem riders).

The maximum number of concurrent users is (theoretically) 70. Calculated from an absolute maximum complement of 40 carts less 5 in the loading/unloading area. I.e. $(40-5) \times 2 = 70$, assuming every cart has two riders.

The maximum capacity per hour is calculated from the shortest interval between release of carts at bottom station of 12 sec. Means $3600/12 = 300$ carts per hour $\times 2$ persons = 600 people/hr as the theoretical maximum.

This is the maximum number of users on both the lift and downhill track sections with two users on every cart. In practice, this capacity is never achieved because not every cart has two riders and many users do not travel the downhill section at high speed. For example, popular installations in Europe with similar track lengths achieve a maximum number of approximately 1,100 – 1,200 riders on a busy 8-hour day.

2.3 Night Time Operation

If/when night-time operation is proposed, provide details of all current and proposed lighting to be provided on and adjoining the coaster facility. This should include details of the lighting on the coaster equipment, and provision of a lighting plan and light spill information detailing the location and nature of lighting to be provided on the line, the customer waiting areas, carpark and pedestrian pathways to and from the site.

After further consideration the Coaster will not operate at night.

Details of lightning is provided below:

- *Coaster track/alignment* – No lighting will be provided.
- *Customer waiting areas* – Low-level lights will be fitted on the canopy of the queueing area at Bottom Station.
- *Carpark and pedestrian pathways* – The existing light poles (LED flood lights) (refer **Figure 1**) in the vicinity provide sufficient lighting along the existing footpath for pedestrians travelling between Woodridge and Valley Terminal.

Given the proposed low-level lighting will be located on the underside /canopy of the bottom station building, and no additional light poles are proposed, the provision of a lighting plan and light spill information is not warranted.

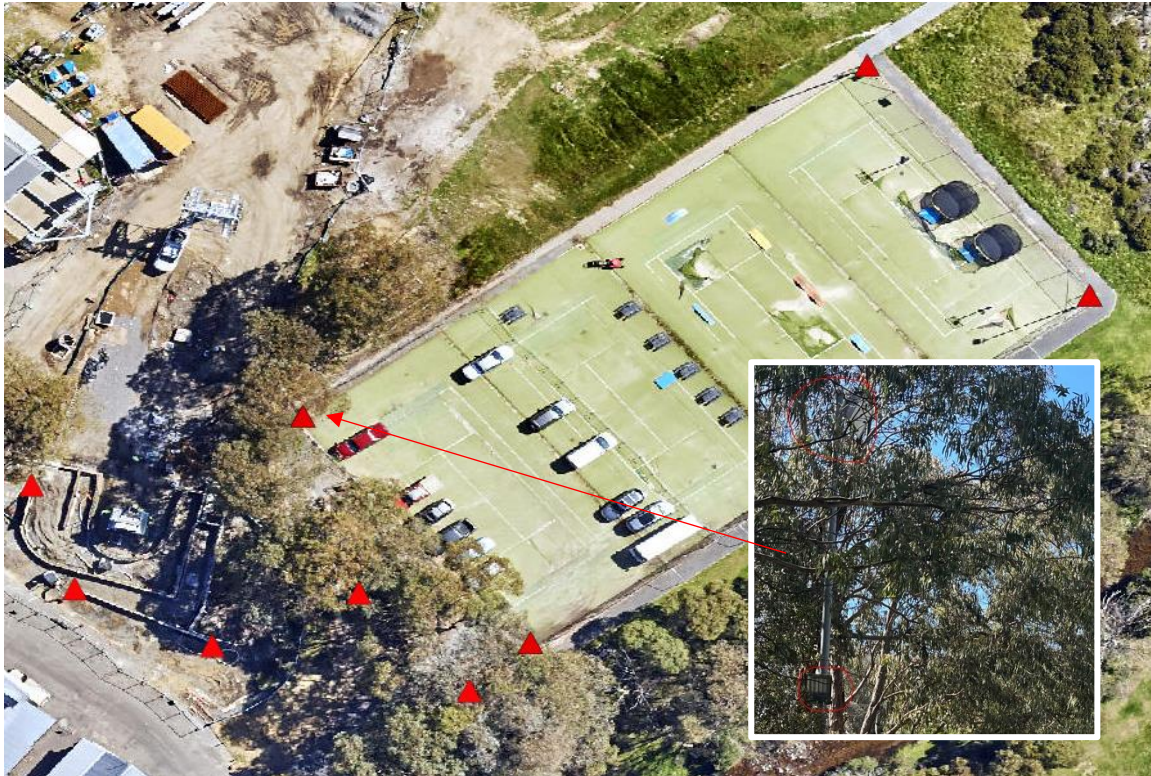


Figure 1: Existing light poles in the vicinity of the Development

3 Proposed Infrastructure

The Department considers further information is required in relation to the proposed infrastructure to support the proposal, including detailed plans and information in relation to the following:

3.1 Tower and Support Details

The specific location of each of the towers and supports and a numbered table of specifications for each.

The location of footings and towers for circles and bridges was provided on the profile plans. For further clarity, additional profile and top view plans have been provided in **Appendix B**. The specific location of each tower and supports, and a numbered table of specifications for each is not warranted at the DA stage as this will form part of the construction certificate stage. For previous DAs such as Merritts Gondola and Easy Rider T-bar Replacement, profile plans were provided and accepted.

Additional detail regarding the number and type of each footing/foundation proposed is provided in **Section 3.2**. A mark-up on the Site Plan has also been provided.

3.2 Footing / foundation Details

Footing/foundation details and size, including disturbance footprint and base (square metres) for each type.

Concrete footing/foundation details are provided in **Table 1** and **Appendix C**. An allowance of up to ~1 m additional disturbance around the base of each footing will be required for installation.

Table 1: Footing / Foundation Details

Footing / foundation details	Document Reference	Footing size (width x length x depth)	Base (m ²)	Location / No.
Reinforcement foundation	FD-BLK-006_AU	1.85 x 1.40 x 0.80 m	2.59	• Conveyor/tunnel section = 1
Reinforcement foundation	FD-BLK-007_AU	2.80 x 1.00 x 0.80 m	2.8	• Conveyor/tunnel section = 1
Reinforcement foundation	FD-MST-WieFu-2	1.50 x 1.50 x 1.0 m	2.25	• Mono support uphill (below BrU1) = 4
Reinforcement foundation	FD-MST-WieFu-3	1.60 x 1.60 x 1.10 m	2.56	• Mono supports uphill = 4 • Mono supports downhill (BrD2) = 4 • Bridge downhill (BrD2) = 2
Reinforcement foundation	FD-MST-WieFu-4	1.70 x 1.70 x 1.10 m	2.89	• Bridge uphill 1 (BrU1) = 2 • Mono supports downhill (BrD3) = 4
Reinforcement foundation	FD-MST-WieFu-5	1.80 x 1.80 x 1.10 m	3.24	• Mono supports uphill = 8
Reinforcement foundation	FD-MST-WieFu-7	2.00 x 2.00 x 1.10 m	4	• Mono supports downhill (BrD1) = 3 • Bridge downhill (BrD3) = 2
Reinforcement foundation	FD-MST-WieFu-10	2.30 x 2.30 x 1.10 m	5.29	• Circle 1 = 1 • Circle 2 = 1 • Circle 3 = 1
Reinforcement foundation	FD-MST-WieFu-11	2.40 x 2.40 x 1.10 m	5.76	• Bridge downhill (BrD1) = 2
Reinforcement foundation	FD-MST-WieFu-16	2.00 x 2.00 x 1.00 m	4	• Mono support downhill (uphill of circle 3) = 1 • Mono support downhill (uphill of circle 2) = 1
Reinforcement foundation	FD-KR0-008_EU	1.43 x 1.43 x 1.00 m	2.04	• Circle 1 = 10 • Circle 2 = 8 • Circle 3 = 10
Reinforcement centre-foundation of circle	FD-KR0-012_EU	2.30 x 2.30 x 1.50 m	5.29	• Circle 1 = 1 • Circle 2 = 1 • Circle 3 = 1
Reinforcement foundation	Basic prism design. Dimensions not to exceed those given.	0.60 x 1.80 x 0.80 m	1.08	• Bridge downhill (BrD4) = 2

3.3 Ground stakes and support wires

Ground stakes and support wires, including (but not limited to) how many and where, particulars of how far out they extend, how they will be clearly identified for all recreational users in the locality (also refer to safety considerations requested elsewhere).

Structural supports are of two general types:

- Those that require a concrete footing and tubular steel tower. The location of these are shown in Error! Reference source not found.).
- The trestle type that require only ground nails (stakes) to secure their footing plate (claw) without the need for a concrete footing. These vary in height according to the ground profile and would be installed at 3 m intervals along the majority of the uphill and downhill track wherever there are no tubular type towers. On the downhill track there will be approximately 270 trestle type supports with another approx. 90 on the uphill track making a total of 360 such supports. Trestle supports on curves require four ground nails per support, those that support straight sections of track require only two per support. Typical specifications are provided in **Appendix D**. Ground nails (stakes) do not require identification as they finish flush with the footing plate, refer **Figure 2**.

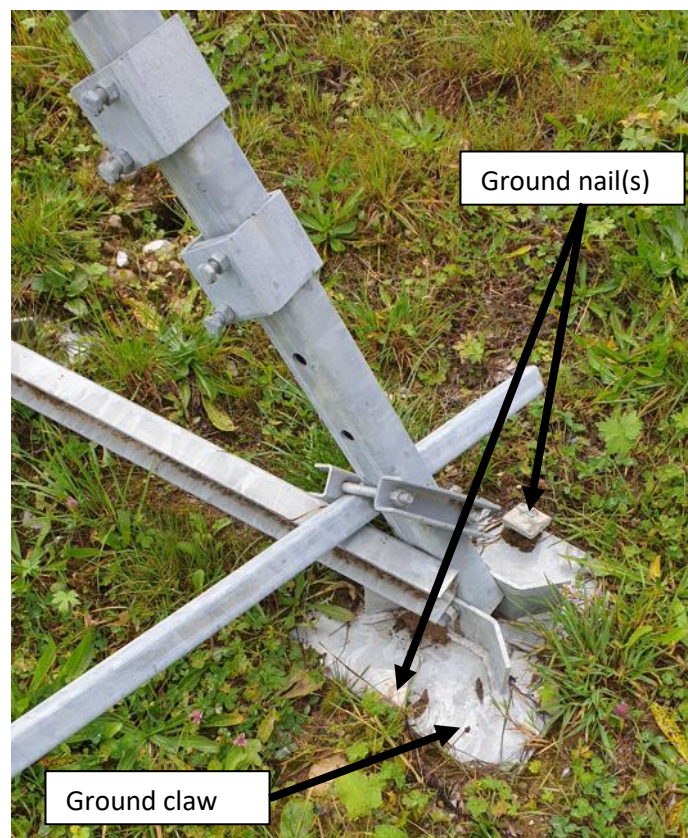


Figure 2: Example of trestle footing



Figure 3: Example trestle supports on a bend



Figure 4: Example trestle supports on straight track

Support tension-rods are only used as bracing within the circles of the downhill track. They comprise 16 mm diameter steel rods each with turnbuckles for correct tensioning. **Figure 5** shows an example of how bracing is used within a circle, i.e. tension rods between supports and between supports and a central footing.

Tension rods are only used within the confines of the three downhill track circles, two circles are on the slope away from recreational users and the third near bottom station which is fenced off to the public. Hence there are no particular additional safety measures considered to be required.






Figure 5: Example of bracing rods within a track circle


3.4 Signage




Signage that has not already been depicted on the plans to provide greater clarity of proposal including materials and if illuminated.

Additional signage detail is provided in **Table 2**. No signage will be illuminated. Signage will include a mix of prohibition and warning.

Table 2: Signage

Sign	Temporary / Permanent	Location	Purpose	Example
No entry. Authorised Vehicles Only.	Existing / permanent	Top of Quad bike track	To ensure vehicles on Quad track are operated by KT employees only	
Closed	Permanent	Along fencing at Coaster Top Station / below Lovers Leap Station	To exclude the public from accessing the Snowgums chairlift line and Lovers Leap ski run.	
Ski Area Boundary Closed Area	Temporary – winter only	Along skiers right of Sundance ski run	Exclude the public from accessing the Coaster site	

Sign	Temporary / Permanent	Location	Purpose	Example
Maximum height sign	Permanent	Fixed to coaster, where required	Communicate maximum height requirements for underpasses for machine and vehicle operators	
Slow zone	Temporary – winter only		To reduce speed coming into Snowgums and Merritts Gondola bottom stations	
No entry. Authorised Vehicles Only. Shared Zone.	Existing / permanent	Entrance of bridge to Valley Terminal	Exclude unauthorised vehicles into resort operations carpark.	

Sign	Temporary / Permanent	Location	Purpose	Example
Shared zone	Existing / permanent	Entrance of bridge to Valley Terminal	Exclude unauthorised vehicles into resort operations carpark.	
Restricted Parking Area	Existing / permanent	Entrance into staff carpark	To exclude unauthorised vehicles entering/utilising the staff carpark.	
Coaster safety signage	Permanent	Throughout Coaster track (exact locations and details to be incorporated during detailed design, refer to Appendix E).	To provide warnings to Coaster riders along the track e.g. notify Coaster riders to slow down as they approach the exit	Example from Smoky Mountain Alpine Coaster 

3.5 Snowmaking Infrastructure

Snowmaking infrastructure to be installed (including the manual hydrants, pits, depth of trenching, cross-sections).

Portal reference: Statement of Environmental Effects

- SEE – Alpine Coaster_Rev2_17.08.2022 (PDF page 22-23).
- Appendix B – Site plans and Drawings (PDF pages 17-30).

Since submission, the proposed snowmaking layout has been altered at the tunnel location. The new alignment allows the pipes to be installed within the fill at the uphill end of the tunnel, rather than across the tunnel at the services end. Please refer to updated Drawing – Snowmaking Layout, Rev H, 13/10/2022 prepared by KO (**Appendix H**).

3.6 Power Supply Trenches

Power supply trenches (depth, cross-section).

The depth of the power supply trench was provided in Section 3.2.6 of the SEE – 0.6 m deep. A cross section of the proposed electrical services trench is provided in **Appendix I**. Further details to be included in the construction certificate plans.

3.7 Walkway and Netting

The walkway and netting (materials to be used, dimensions, support framework, colours), and additional site plans (such as in the format of the site coaster overlay on the vegetation plans) showing where these additional components will be required (i.e. where any section of track is <1.5 metres from the ground surface).

After further consideration, KT will be opting for the latest version Alpine Coaster (Wiegand “2.0” model) without the requirement for netting. Given the proposed installation is in an alpine region, netting is not well suited to snow loading and also degrades the visual amenity of the device. In lieu of netting, a static fall-arrest rail is provided as an anchor point for connecting fall-restraint PPE – for use in the unlikely event someone needs to be rescued from a cart, or when staff require access for maintenance.

For the uphill track, a walkway and handrail would be installed on one side where the track height is 1.5m or more above the ground. **Figure 6** and **Figure 7** show examples of walkways on the uphill track.

Where the downhill track exceeds approx. 2.5 m height above ground, walkways (without hand rails) are to be installed to one side of the track along with the fall arrest rail system, see examples of walkways on downhill track sections in **Figure 8** and **Figure 9**.



Figure 6: Example of uphill track walkway and handrail



Figure 7: Example walkway with a ramp (can be a ladder) to ground level



Figure 8: Downhill track with walkway, safety rail and ramp



Figure 9: Walkway on the inside of an elevated circle

3.8 Stormwater Pits and Sub-surface drainage

Proposed stormwater pits to be installed to capture sediment runoff entering the stormwater system and of the subsurface drainage to be installed (location, depth, cross-section/s).

The Concept Stormwater Plan for Bottom Station was provided in Drawing A1.220, Rev B. Subsurface drainage and stormwater pits are only proposed at the tunnel location and Bottom Station. No stormwater pits are required at other stations. Further details pertaining to the depth of sub-surface drainage, pit specifications and cross-section/s will be provided during detailed design at the construction certificate stage. This approach is consistent with the Development Consent for DA 9130 Merritts Gondola (Condition B.10) and DA 10669 Easy Rider T-bar Replacement (Conditions B.3 & B.6) (refer **Appendix F**).

During the meeting with DPE on 25/11/2022, it was agreed between DPE and KT that a detailed stormwater plan will form part of the construction certificate. However, DPE noted the SEE did not describe any stormwater controls for other station buildings e.g. catchment of roof runoff. Additional detail has been provided below.

Stormwater control in the dripline of station buildings will comprise rubble drains discharged into a suitable location e.g. existing stormwater pit at bottom station, gravel pit or suitable vegetated area. This method is widely used across the mountain on other station buildings. Exact locations and specifications to be confirmed during detailed design.

3.9 Settling Pond / Filter Dam

Settling pond/ filter dam (including detailed design of location, size, depth, capacity, lining, management and overflow), to be shown in relation to proposed infrastructure.

Information is required to accompany an application for a construction certificate.

The Geotechnical Report identified water at depths below 1.3 m in clayey, medium to coarse grained sand in the area of the tunnel construction (refer to the Geotechnical Report for Test Pit 20). Dewatering of the excavation will be by pumping to a temporary basin where sediment is allowed to settle before water is discharged.

Stantec provided a Conceptual Stormwater Plan which identified the proposed location of the filter dam which is on a relatively flat area up-slope of a significant grassed area, and more than 70 m from Thredbo River.

As an indicative guide, a preliminary estimate for the sediment control basin size allows for: design flow 2.5 l/s, surface area 10m(L) x 4m(W), a settling depth 0.6m and a sediment retention capacity of approx. 5m³. However, a detailed design will be prepared at the construction certificate stage to confirm the requirements. A detailed stormwater plan was condition for DA 9130 (Merritts Gondola, Condition B.10) (refer **Appendix F**), and KT requests consistency in DPE's approach to required documentation at the DA phase.

During the meeting with DPE on 25/11/2022, it was agreed between DPE and KT that a detailed stormwater plan is to be provided at the construction certificate phase. The filter dam will be designed to a maximum capacity to reduce the risk of a blowout.

The construction contractor will be responsible for the ongoing maintenance of all drainage, erosion and sediment controls during construction in accordance with the detailed Stormwater Plan.

Management/maintenance will include: regular inspections (and at least daily during de-watering activities) to identify tears, leaks etc. and repairs as needed.

3.10 Building Classification and Building Code of Australia

The proposed BCA classification or classifications of structures and fire safety measures to be provided in relation to the content of fire safety schedules. Where any measures in Part G4 (Construction in alpine areas of Volume 1 of the BCA) need to be incorporated into the design of any buildings or structures associated with the Coaster, such design elements should be considered and proposed as part of the development application.

AED Group has been engaged to provide consulting advice in relation to building classification/s in accordance with the Building Code of Australia (BCA).

A full BCA Compliance Assessment Report will form part of the construction certificate stage, with detailed information to be included with the construction certificate plans and specifications.

3.10.1 Proposed Building / Structure Classification

The proposed classifications are as follows:

- Class 10a – non-habitable building (top station, NB.: operator’s room has been removed);
- Class 7b – storage (bottom station);
- Class 9b – assembly (bottom station); and
- Class 10b – structures including retaining walls, stairs, fencing, amusement ride.

It is noted that the tunnel has not been classified as there is not a BCA classification for a tunnel.

3.10.2 Proposed Fire Safety Measures

The proposed BCA deemed to satisfy fire services for the bottom station are outlined below:

- Fire hydrants are required to serve all floor areas;
- A fire hose reel system provided to serve all floor areas;
- Portable fire extinguishers;
- An emergency lighting system must be installed throughout the building; and
- Exit and directional exit signs.

Details to be confirmed at the construction certificate stage.

3.10.3 Part G4 (Construction in Alpine Areas)

Design elements outlined in Part G4 of the BCA have been incorporated into the design. Details demonstrating compliance with the relevant clauses of Part G4 will be incorporated into the construction certificate plans and specifications, and addressed in the BCA Compliance Report.

3.11 Chemical Treatment of Timber

Details of any chemical treatment of timber elements used in the fencing or landscaping (if painted, specify colour).

Treated timber will be utilised for fencing. It is noted, timber must not be treated with copper chrome arsenic. Fencing will not be painted.

3.12 Communications Cabling

Location of communications cabling between the top and bottom stations.

The communications cabling will run along the underside of the uphill track.

4 Public Safety Considerations

Provision of a detailed safety review relating to coaster patrons, non-users and workers who will interface with the coaster infrastructure, including:

4.1 Safety of Coaster Patrons

Potential safety risks and proposed controls are outlined in **Table 3**.

Table 3: User Safety

Potential safety risk	Control
Ignoring signposted health and safety restrictions e.g. height and weight limitations; reaching hands, feet or head outside the toboggan; not using seat belts or other safety equipment as instructed; riding while intoxicated; disembarking prematurely; running or jumping while getting on or off the Coaster	Health and safety instructions / demonstrations <ul style="list-style-type: none">• Communication of health and safety information to users• Users to sign waiver to ensure understanding and compliance with health and safety requirements.
Running into other riders/toboggans	Distance control & brake system at the end <ul style="list-style-type: none">• Intelligent distance control assist system• coaster is fitted with an automatic braking system that slows the cart down at the end of the track
Running into other riders/toboggans; derailing toboggans	Toboggan design/fittings <ul style="list-style-type: none">• Individual belt systems (for both passengers) and belt-locking devices to ensure passengers are held securely in their seats.• Energy absorbing front and rear buffers on toboggan.• Manual brake – All toboggans are fitted with a manual brake. This enables riders to adjust the ride to a speed they feel comfortable with.• Centrifugal brake – in addition to the manual brake, the cart is fitted with a centrifugal brake which limits its maximum speed to 40km/h (same as the existing Thredbo Bobsled). Even if the rider does not use the manual brake the cart cannot go above this speed ensuring maximum safety for user. Coaster track safety <ul style="list-style-type: none">• Stainless steel anti-derailment system• Walkways
Unauthorised access	Safe access / exit <ul style="list-style-type: none">• Clearly marked entry and exit for users.• Barriers/fence to assist safe and orderly queuing at Bottom Station.• Provision of safe loading and unloading area.• Provision of safe passage for operating staff and users.

Rider medical episode; unexpected weather event	Emergency stop
Disembarking prematurely; running or jumping while getting on or off the Coaster	Warning signage

4.2 Non-Users and Workers

The management of pedestrian access around Bottom Station was addressed in Section 3.2.3 of the SEE. A more detailed safety review of coaster patrons, non-users and workers who will interface with the Coaster infrastructure is provided in **Table 4**.




Signage and fencing will be the main safety controls implemented to manage non-users and workers e.g. ensure the public are aware of any potential hazards and prevent unauthorised entry into areas of the Coaster site. Proposed signage is outlined in **Table 2**. In addition to the fencing proposed in the Fencing Sections and Elevations (Drawing No. A1.228), the proposal will also include snow fencing and bunting/flagging, refer **Table 5**.


Table 4: Safety Considerations – Non-users and Works

Location	Season	Users	Potential Impact / Risk	Safety Controls
Home Run Mountain Bike trail	Summer	Non-coaster users, general public	<ul style="list-style-type: none"> Risk of collision with coaster infrastructure 	<ul style="list-style-type: none"> Appropriate clearances have been incorporated into the design, safety padding as required Thredbo's Mountain Bike Responsibility Code – "Keep off closed areas and obey all signs and warnings" and "Stay on marked trails".
Valley Loop Mountain Bike trail	Summer	Non-coaster users, general public	<ul style="list-style-type: none"> Risk of collision with coaster infrastructure 	<ul style="list-style-type: none"> Appropriate clearances have been incorporated into the design, safety padding as required Thredbo's Mountain Bike Responsibility Code – "Keep off closed areas and obey all signs and warnings" and "Stay on marked trails".
Merritts Nature Track (walking)	Summer	Non-coaster users, general public	<ul style="list-style-type: none"> Risk of collision with coaster infrastructure 	<ul style="list-style-type: none"> Appropriate clearances have been incorporated into the design
Quad bike access track	Summer	KT operational staff only	<ul style="list-style-type: none"> Risk of collision with coaster infrastructure 	<ul style="list-style-type: none"> Appropriate clearances have been incorporated into the design Thredbo's <i>On Mountain Vehicle Operations Handbook</i> and <i>Mountain Vehicle Access Information</i>
4 Wheel Drive track / Mountain access road	Summer	KT operational staff only, contractors	<ul style="list-style-type: none"> Risk of collision with coaster infrastructure 	<ul style="list-style-type: none"> Appropriate clearances have been incorporated into the design Thredbo's <i>On Mountain Vehicle Operations Handbook</i> and <i>Mountain Vehicle Access Information</i>
Entry into the top of Snowgums chairlift line / below Coaster top station	Winter	Public	<ul style="list-style-type: none"> Risk of unauthorised access & collision with coaster infrastructure 	<ul style="list-style-type: none"> Snow fencing and exclusion signage to exclude skiers/snowboarders from accessing lift line and Lovers Leap ski run. Refer to Table 2, Table 5 and updated Site Analysis Plan (Drawing No. A1.218). <ul style="list-style-type: none"> Thredbo's Alpine Responsibility Code – "Observe and obey all signs and warnings. Keep off closed trails or runs"

Location	Season	Users	Potential Impact / Risk	Safety Controls
Sundance by-pass (3 locations along skiers right)	Winter	Public	<ul style="list-style-type: none"> Risk of unauthorised access & collision with coaster infrastructure 	<ul style="list-style-type: none"> Snow fencing and exclusion signage to direct skiers/snowboarders to remain within the dedicated ski run. Refer to Table 2, Table 5 and updated Site Analysis Plan (Drawing No. A1.218). Thredbo's Alpine Responsibility Code – "Observe and obey all signs and warnings. Keep off closed trails or runs"
Bottom of Sundance by-pass (below vegetation island)	Winter	Public	<ul style="list-style-type: none"> Risk of collision with coaster infrastructure 	<ul style="list-style-type: none"> Safety flagging/bunting to direct skiers/snowboarders to remain within ~10m corridor (free of infrastructure)
Bottom of Sundance by-pass / above bottom station (10m ski corridor)	Winter and summer	Public; KT staff (e.g. snow groomer operator in winter or excavator operator in summer)	<ul style="list-style-type: none"> Risk of collision with coaster bridge 	<ul style="list-style-type: none"> Appropriate clearances have been incorporated into the design e.g. the bridge over the 10 m corridor at the base of Sundance by-pass provides a nominal 5 m vertical clearance path. In winter snow depth will be managed in this location, refer Section 4.3 for details.

Table 5: Fencing and Padding

Type	Temporary / Permanent	Location	Purpose	Example
Snow fence	Permanent	Along fencing at Coaster Top Station / below Lovers Leap Station (shown on Site Plans as 'permanent fencing'). Will include closed ski area boundary sign.	To exclude the public from accessing the Snowgums chairlift line and Lovers Leap ski run.	
Safety bunting/flagging	Temporary – winter only	Along skiers right of Sundance by-pass (shown on Site Plans as 'temporary fencing'). Will include closed ski area boundary sign.	Exclude the public from entering tree island and accessing the Coaster site above the tunnel	
Padding	Temporary – summer	On Coaster support posts and fences within proximity of public interface e.g. next to MTB track, where required	To warn the public of infrastructure and minimise impact in the event of collision	

Type	Temporary / Permanent	Location	Purpose	Example
Padding	Temporary – winter	On Coast support posts within proximity of ski run crossing, where required	To warn the public of infrastructure and minimise impact in the event of collision	

4.3 Staff using various vehicles in both summer and winter

Appropriate clearances (height and width) and signage (existing and proposed) have been incorporated into the design to ensure the safe operation of vehicles and machinery along mountain access roads and quad tracks during summer. Only authorised vehicles and trained personnel are permitted on mountain access roads and tracks.

The bridge over the 10 m corridor at the base of the Sundance by-pass provides a nominal 5 m vertical clearance path above the ground below. Snow depth will be managed in this location to ensure it does not exceed 0.6 m hence resulting in a clearance of 4.4 m compared to a snow groomer maximum height of 3.3 m. Likewise, the largest vehicle to pass under during the summer season is the Volvo 14t excavator of 3.3 m travelling height.

4.3.1 Lighting

Lighting pedestrian and parking areas previously mentioned, and any curfew on lighting

Existing lighting (including relocation of two (2) light poles) was shown on DJRDJ Drawing No. A1.225, Rev B. To provide further clarity, all existing light poles within the vicinity of Bottom Station are shown on Error! Reference source not found.. As mentioned in the SEE, the existing light poles on the tennis courts will be retained (with two being relocated to the south). No additional pedestrian and carpark lighting is proposed as the existing remains adequate. Some low-level lighting will be installed under the canopy of the queueing area at Bottom Station. This will form part of the detailed design of Bottom Station.

4.3.2 Separation of Vehicles and Pedestrian Pathways

Separation of vehicles and pedestrian pathways for staff

The separation of vehicles and pedestrian pathways within the Valley Terminal precinct (including the disused tennis courts / staff carpark) is currently managed through fencing and directional signage (refer **Figure 10** and **Figure 11** for example). KT will continue to manage pedestrian and vehicle access with this approach. The replacement of crowd control type fencing (**Figure 11**) with new timber fencing around the existing operational staff carpark will also improve the aesthetics of the locality.



Figure 10: Directional / Safety Signage within Valley Terminal Precinct

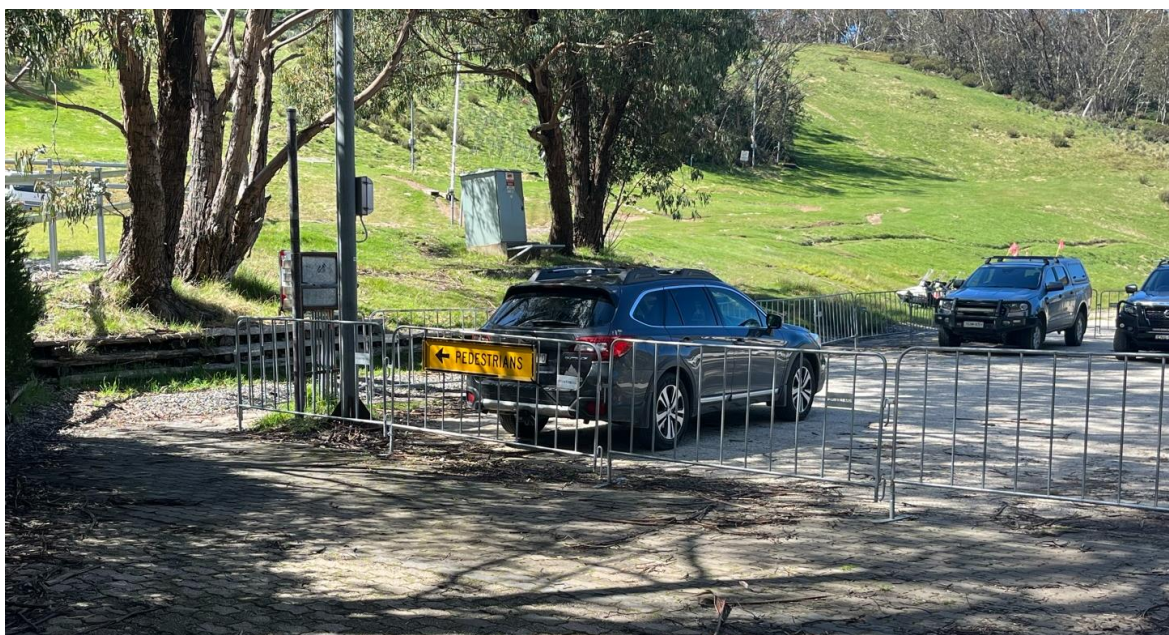


Figure 11: Existing Directional Signage and Fencing around Operational Staff Carpark

4.3.3 Warning Signage

Any warning signage proposed, such as to maximum heights (e.g. for under passes)

Refer to **Section 2.4** for proposed signage. The Coaster has been designed with relevant clearances (height/width) around existing resort infrastructure and access tracks (4WD, quads, biking and walking) to mitigate potential safety risks. Where the Coaster infrastructure is located within proximity of existing recreational infrastructure such as mountain bike trails and walking tracks, signage and other safety controls (i.e. padding) will be installed.

4.3.4 Ground Stakes and Support Wires

How will ground stakes and support wires be clearly distinguished so they can be avoided (day and night)

Where trestles/support posts are located within proximity of recreational infrastructure and public access routes, coloured padding will be installed to clearly identify the infrastructure. This approach is widely implemented across the mountain, refer **Figure 12**.



Figure 12: Example of padding installed on posts within proximity of MTB Trail Overpass

Other controls have also been incorporated into the design to minimise the Coaster infrastructure/non-user interface, such as:

- Exclusion fencing and signage to prevent unauthorised access into sections of the Coaster site e.g. via ski runs; and
- Appropriate clearances (height/width) between trestles/support posts and public access points to ensure safe distances for the public utilising existing mountain bike trails, walking trails and ski runs.

4.3.5 Emergency Management Plan

Provision of an Emergency Management Plan, including the evacuation procedure and details of the procedure to dismount the coaster.

Provision of an Emergency Management Plan is not warranted. The evacuation procedure will form part of KT's operating procedures. KT will evacuate guests as per other lifting operations. No additional disturbance will be required to evacuate riders.

In the unlikely event that evacuation is required, the procedure is similar to that for a ropeway manual evacuation, except that far fewer passengers are involved and rescue by lowering people from height suspended in harnesses is not required.

Over the length of the track the maximum number of riders is approximately 70 considering 35 carts with 2 riders each (refer **Section 2.2**). Hence carts will be spread 37 m apart on average. Where the track is low to the ground, staff tasked with evacuation (patrollers, maintenance and operating staff) can use a tool to unlock the seat belts allowing riders to step off the cart and walk away, back to the bottom station. Where the track is higher from the ground, a portable set of steps is used to allow riders to safely exit off the carts to the ground. The Coaster would be equipped with two such sets of steps, one to be stored at each of the top and bottom stations for ease of deployment. At places where the track is even higher, walkways are provided on one side of the track with a safety rail. Evacuation methodology involves the rescuer releasing the seat belt, assisting the rider(s) to fit a safety harness and clipping onto the safety rail and walking down to the nearest ramp or short ladder to reach the ground.

It is envisaged that there would be two to three rescue teams allowing for quick evacuation. Detailed procedures would be developed, regular training provided to staff and routine practice drills enacted as is the process with ropeway manual evacuations.

5 Geotechnical Investigation

5.1 Filter Dam and Trenching

Geotechnical review to include the location and specifications of the filter dam and all trenching (including the proposed diversion trenching and drains).

Once the detailed design of the filter dam has been completed at the Construction Certificate stage, a Geotechnical engineer will be engaged to review and confirm its suitability. See also **Section 3.9** above.

5.2 Updated Plans

An updated Geotechnical Investigation Report is to be provided that references all revised site documentation supplied to the Department (noting also that all documents referenced, site plans and documentation in the Geotechnical report are to be supplied to the Department, including the Wiegand documents which may be able to address other components).

Refer to updated Geotechnical Report provided in **Appendix O**.

5.3 Form 1

A completed 'Form 1' in accordance with the Department's Geotechnical Policy.

Refer to updated Geotechnical Report provided in **Appendix O**.

6 Visual Assessment

Preparation of a photographic analysis with photomontages depicting the coaster, buildings and structures in the landscape, and where the proposed backdrop where clearing will occur should also be clearly highlighted.

Views from key public areas (such as the memorial site, the Alpine Way and other public areas within Thredbo Village with clear sight-lines of the facility. The compilation should include a range of photos looking both towards the site and back at the village from bottom station, top station and mid-point locations. The building and coaster detail should be shown in colour, together with any walkway and netting that may accompany the coaster track.

As discussed in the meeting with DPE on 25/11/2022, photomontages are not warranted to assess the visual impacts of the Development. The Coaster alignment has been superimposed on various viewpoints from the Village and Alpine Way to provide further visual analysis and context (refer **Appendix G**). Additional photos depicting the Coaster infrastructure have also been provided to illustrate the proposed materials, form and colours of infrastructure that will be introduced to the site (refer **Figure 13** and **Figure 14**).

The assessment provided in Section 7.5 of the SEE largely remains relevant. Additional viewpoints across the Village have been included in the visual analysis to help conceptualise the visual impacts of the infrastructure. Some of these locations provide clear sightlines to the Development site. The 4m clearing corridor and infrastructure that will be introduced as a result of the Development will not be dissimilar to the current cleared corridors visible across the ski resort. Whilst there may be a perceived loss of amenity for some stakeholders, the proposal has demonstrated sufficient design controls to minimise the visual impacts as much as practicable. The visual impacts are considered acceptable in the context of the site and surrounding resort infrastructure.



Figure 13: Example of Alpine Coaster Installation Overseas



Figure 14: Example of Alpine Coaster Installation Overseas

7 Carpark Details

7.1 Detailed Parking Layout

A detailed parking layout is to be provided that demonstrates compliance with the relevant guidelines (Austroads Guidelines/ Australian Standards, including AS 2890.1:2004 mentioned in the SEE). All vehicles should enter and leave in a forward direction, with clear sight lines for any reversing spaces and clear view of the pedestrian entry points.

After further consideration regarding the future proposal for the redevelopment of the Valley Terminal precinct, upgrades to the staff carpark at this time are not necessary as future plans include the provision of an expanded and improved carparking facility. As such, the works proposed on the existing operational staff carpark in Section 3.2.2 of the SEE are excluded from this Development.

To ensure public safety is maintained in this area, the openings in the fence around the staff carpark have been removed. This is to discourage unauthorised pedestrian access into the existing operational staff carpark. The existing carpark will continue to be for KT operational staff only.

The limit of works has been identified on the Site Works Sheet 2 of 2 (Drawing No. A1.225).

7.2 Bus Parking

Bus parking details, including the bus dimensions, circulation manoeuvrability and turning circles, accessibility requirements and confirmation that there will be no access to the carpark for bus passengers. Alternatively, it is recommended to delete the bus parking bay from the plans.

As mentioned above, all works on the existing staff carpark are excluded from this Development. Therefore, no further detail is required.

7.3 Authorised Access Provisions

Areas where only staff entry is permitted to be identified, together with details of how members of the public will be excluded from accessing these areas.

Exclusion / authorised access zones will be managed through the installation of fencing and signage. The fencing has been updated to clearly delineate the fencing proposed to exclude unauthorised access into the site from the top station, Lovers Leap and various points along Sundance by-pass. Refer to the updated Site Analysis Plan (Drawing No. A1.218) and existing/proposed signage in **Section 2.4**.

Authorised access signage upon the approach to the KT staff carpark currently exists, and this signage will be retained. The openings in the staff carpark fence have been removed to discourage unauthorised pedestrian access.

7.4 Stormwater Management

Details as to the management of stormwater from the parking area to be specifically addressed in detailed drawings of the parking area, including the provision of information as to any proposed surface treatment of the carpark during Winter (such as whether the application of salt or any defrosting agent is proposed) and how runoff will be contained and managed, including in the event of an incident (such as liquid load spill or vehicular collision and hydrocarbon spill).

As mentioned above, works on the staff carpark are excluded from this Development. All existing stormwater management controls/infrastructure within/adjacent to the carpark will be retained (i.e. grate inlets, drainage channels, vegetation/landscaping). No additional stormwater infrastructure is proposed within the carpark.

In accordance with general resort operations/maintenance, the Environmental Services Department is responsible for snow clearing in the resort. Clearing in the carparking is generally undertaken with a bobcat. Spills in the resort are managed in accordance with KT's Emergency Response Spill Procedure.

8 Response to Attachment B - RFI from NPWS

8.1 Vegetation Clearing

It was observed during the site visit that a 5-metre-wide clearance corridor has been marked out on one side of the uphill section of the proposed coaster. However, the Statement of Environmental Effects (SEE) provided with the DA specifies that a 4-metre clearance corridor (presumably 2 metres either side of the centre line of the proposed coaster alignment) is required for the coaster. Given the uncertainty this discrepancy creates, NPWS requests clarification from the applicant about the following:

- a) Specific details of the required clearance corridor for the construction and operation of the proposed coaster (i.e. the total width of the proposed clearance corridor and the location of the proposed clearance corridor in relation to the centre line of the proposed coaster alignment).*
- b) If the clearance corridor width is in-fact 5 metres, the reason for this change from the width described in the SEE.*
- c) The total amount, location and nature (i.e. overstory/trees, understory/shrubs and groundcover/grass/heath) of vegetation clearance required to construct and operate the proposed coaster.*

The proposed vegetation clearing required for construction of the Coaster was identified on DJRD Drawings No. A1.219-A to D, Rev B. The corridor width required for the safe operation of the Coaster is a total of 4 m (2 m either side of the centre line).

The total maintenance area will encompass approximately 4,160 m² [track length (1,040 m) x corridor (4 m)]. Note, the maintenance area contains a fair portion of pre-cleared/ heavily disturbed vegetation associated with ski runs and access tracks.

The total amount, location and nature of vegetation clearance was provided in the DJRD drawings and described in the Flora and Fauna Report. The nature of vegetation within the Coaster corridor was depicted with photos and described in Sections 3.2.1 – 3.2.4 of the Flora and Fauna Report. No further information is warranted.

To provide further clarity, two additional plans have been prepared which illustrate the vegetation disturbance required for construction and the proposed maintenance area which will require ongoing vegetation management including slashing and trimming of regrowth (where necessary).

Construction Vegetation Clearance

The total area of native remnant vegetation disturbance required for construction is approximately 0.29 ha, made up of approx. –

- 10 m² of vegetation trimming within PCT 1271: Subalpine Riparian Scrub; and
- 2,919 m² of vegetation removal within PCT 644: Subalpine Woodland.

The construction vegetation clearance is identified in **Appendix J**, including:

- The extent of vegetation trimming proposed within PCT 1271: Subalpine Riparian Scrub; and
- The extent of vegetation removal proposed within PCT 644: Subalpine Woodland.

Operational Vegetation Clearance

During operation, vegetation management (including slashing and trimming of regrowth) will be required within the Coaster corridor (2 m either side of centre line) to enable the safe operation of the Coaster. The maintenance corridor has been identified in **Appendix K**.

8.2 Stormwater and Flood Management

The Stantec letter provided with the DA states that alterations/upgrades to stormwater services are required to ensure adequate drainage and stormwater management occurs around the proposed base station for the coaster. These works include sub-surface drainage lines, swales, diversion trenching and a dewatering filtration dam.

Would the applicant please advise whether the stormwater works mentioned by Stantec form part of the works proposed in the DA? If so, further details as to the nature of the works should be provided. If not, will the works form part of another DA to be determined contemporaneously and/or how will stormwater be managed absent these works?

The proposed stormwater controls outlined in Stantec's letter form part of this Development.

For further clarity the proposed measures outlined in Stantec's letter have been tabulated. Refer to **Table 6** which presents the proposed controls, indicative location and whether the control will be temporary or permanent. Additional details pertaining to proposed stormwater controls have been provided in sections above (**Sections 3.8, 0 and 7.4**).

Information on the exact locations, size, and specifications of stormwater controls will be provided at the construction certificate phase. This approach is similar to the Development Consent issued for DA 9130 (Merritts Gondola).

Table 6: Proposed Stormwater Controls (adopted from Stantec letter)

Proposed Control / Recommendations (Stantec page reference)	Location	Temporary (construction) or Permanent
Sediment fence (p.7)	Adjacent to Snowgums bottom station, upstream of Merritt Gondola base station and carpark. Shown on the Conceptual Stormwater Layout (Stantec letter, Appendix A).	Temporary (construction)
Silt socks or approved equivalent (p.7)	Existing stormwater pits/inlets, where required	Temporary (construction)
Diversion trenching (p.4)	Where required, on localised springs or where shallow groundwater is intercepted.	Temporary (construction)

Dewatering filtration dam (p.4)	Indicative location on flat land north of tunnel. Shown on the Conceptual Stormwater Layout (Stantec letter, Appendix A).	Temporary (construction)
Rock-lined earth swale and bund (p.5)	Upstream of tunnel and Bottom Station. One-side outlet to connect to existing pit via pipe connection, another side to discharge to existing terrain. Details are shown on Conceptual Stormwater Layout (Stantec letter, Appendix A).	Temporary (construction)
Contour drains / rock-line earth swale (p.5)	Suitable intervals along the hill. Shown on the Conceptual Stormwater Layout (Stantec letter, Appendix A).	Temporary (construction)
Subsoil drain (p.5)	100mm diameter slotted uPVC subsoil drainage pipe (AGI) line to be provided around footing/base of structural elements such as the tunnel and retaining walls to intercept groundwater and relieve water pressure to structure.	Temporary (construction); permanent
Revegetation and landscaping (p.6)	Any disturbed areas to be revegetated.	Permanent
Stormwater inlets and pipes (p.6)	Gabion and retaining walls, tunnel, bottom station to be provided with subsoil around footings and to connect into the existing stormwater network. Some additional stormwater inlets and pipes are proposed to provide connection to the downstream existing network. Shown on the Conceptual Stormwater Layout (Stantec letter, Appendix A). Note, all stormwater inlets within vicinity of the site are diverted through the Gross Pollutant Trap (GPT) which is a Class D Continuous Deflection Separation (CDS) GPT.	Permanent

9 Response to Attachment C – Public Submissions

The public exhibition for the DA was from Monday 5 September 2022 to Tuesday 4 October 2022 as specified in the notification letters. The public exhibition period was extended to 7 October 2022. A response to the two (2) public submissions has been provided separately to this document.

Appendix A List of Updated Documents / Plans

Appendix B Profile and Top View Plans

Appendix C Footing / Foundation Drawings

Appendix D Example of Typical Trestle Support Details

Appendix E Coaster Signage Plan

Appendix F Example of Previous Conditions

Appendix G Visual Analysis Images

Appendix H Updated Snowmaking Layout

Appendix I Electrical Services Cross Section

Appendix J Construction Vegetation Clearance

Appendix K Operational Vegetation Clearance

Appendix L Track Locations with Walkways

Appendix M Site Analysis Plan

Appendix N Site Works Sheet 2 of 2

Appendix O Geotechnical Report