

CAIRNGORM SKI AREA FEASIBILITY ASSESSMENT & STRATEGIC PLAN – ADDENDUM



July 2019

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INTRODUCTION

In 2018, Highlands and Islands Enterprise (HIE) contracted with SE Group to complete a ***comprehensive, independent review*** of the uplift facilities at Cairngorm Mountain ski resort to determine the best way forward for potential reinvestment. As the review was nearing completion, a structural issue was found with the funicular, that has since caused it to stop running for the foreseeable future. In light of this, HIE approached SE Group for an addendum to revisit the recommendations from the initial review.

This addendum addresses the immediate priorities for potential investment at Cairngorm, while the funicular is out of operation. These priorities and recommendations acknowledge HIE's intention to reopen the funicular, subject to repairs being achievable and affordable. Therefore, options for investment in alternative infrastructure have not been widely considered at this time and will be strictly assessed against the potential benefits.

The strategic planning process for this addendum included a site visit in March 2019 that included on-site discussions with the operations team, as well as meetings with the Cairngorms National Park Authority representatives, the Aviemore and Glenmore Community Trust (AGCT), the Funicular Response Group, and HIE representatives.

For a comprehensive picture, this addendum is best read together with [the original 2018 review](#). Both documents will be used by HIE and other Cairngorm stakeholders to inform future investment decisions to benefit Cairngorm itself and help to underpin the wider economy of Badenoch and Strathspey.

A REVISED STRATEGY FOR THE FUTURE

While the current challenges with the funicular have certainly altered the landscape of immediate and longer-term opportunities at Cairngorm, the ski area remains one of the largest and most challenging in Scotland and it still sits in the centre of one of the busiest National Parks and adventure tourism destinations in the UK. As a result, Cairngorm continues to enjoy the potential to be highly successful. However, the window of opportunity for the ski area to turn things around is even narrower today than it was a year ago. The sustainability and viability of the operation rests upon a very delicate balance between measured and responsible investments, increased operational efficiency, and the need to elevate the guest experience at the resort.

The revised Phase One upgrade concept for Cairngorm builds upon the 2018 report findings to address all aspects of the current condition. The revised concept continues to focus on the investments with the greatest potential impact and creating a more desirable—and competitive—experience for visitors. This will facilitate greater revenues, through the increase in visits. Enhancements are also focused on creating a more efficient, and thus economically viable operation capable of maintaining its popularity with visitors throughout the year. This is primarily accomplished through upgrading the lift infrastructure to provide the much needed out-of-base capacity at the resort and enhancing snowmaking capabilities. Summer enhancements are focused on improving the base area experience—which is even more important today than it was a year ago—and expanding the offerings to a broader audience. The funicular railway has played a vital role in enabling all-season access to the mountain over the past 18 years. It is a considerable asset and, provided repairs are achievable and affordable, will again become a central part of the visitor offering in future.

All the proposed upgrades at Cairngorm are designed to work together as part of a new and sustainable business model for the ski area. Infrastructure improvements are expected to drive additional skier visits. The installation of a snowmaking system will create a more consistent snowpack and improve the quality of the skiing and riding surfaces. Reliable snow conditions, along with a modern aerial lift to service the ski terrain will encourage skiers to plan trips to Cairngorm and visit more frequently throughout the season. Our projections estimate the upgrades will increase annual winter visits to 130,000 consistently, with higher numbers during a peak year. This increase in visits is expected to increase overall revenues. At the same time, labour and other operating expenses are expected to decrease as a result of the new lift scheme and other improvements.

While current conditions at Cairngorm present huge challenges—especially after the 2018/19 season—there is still immense unlocked potential in the mountain which can be unleashed with targeted, strategic investments. With this updated review in hand, Cairngorm is poised to capitalise on this potential and create a sustainable operation that will continue to provide recreation, economic and other community benefits to the region long into the future.

PHASE ONE IMPLEMENTATION PRIORITIES

The original 2018 findings identified significant shortcomings in the existing operation, related to inefficiencies and a poor guest experience primarily caused by the use of surface lifts and the lack of reliable snow surface due to an absence of snowmaking. The 2018 findings stated quite simply that the operation as it stood was unsustainable.

This situation has not changed, but has been amplified by the circumstances of the past year:

- The lack of the funicular has removed the primary focus of tourism business to Cairngorm, resulting in significant loss of tourism revenue. The winter ski operations are also affected by the inability to get to the top of the mountain when lower mountain snow cover is lacking.
- The 2018-19 ski season saw unseasonably high temperatures not experienced since the early 2000's. Despite HIE's significant investment in snowmaking infrastructure (8 new fan guns and a double Snowfactory unit that were installed in December), Cairngorm was in effect closed to skiers for much of the season.
- HIE established a new subsidiary to take over operations in December 2018, buying the business and assets of Cairngorm Mountain Ltd (CML) from administrators. The new company, Cairngorm Mountain (Scotland) Ltd succeeded in maintaining business continuity and protecting jobs. However, the collapse of CML, in concert with the funicular and weather issues has created uncertainty and concern within the community, much of which has been expressed publicly in the press and on social media.

Considering all of these factors, the Phase One recommendations outlined below represent the initial upgrading and improvements that must be undertaken to allow the operation—both winter and summer—to become viable. The investment is significant, but necessary to correct the existing shortcomings—those identified in the 2018 findings, as well as the more recent issues created by the closing of the funicular.

The following improvements and activities are planned:

- Lift A: a base area carpet conveyor surface lift
- Lift B: a 6-person detachable lift (capacity of 3,200 pph)
- Terrain improvements (summer grooming of beginner zone and 8.7 hectares of new terrain associated with Lift B)
- Snowmaking (15.9 hectares)
- Reopening Sheiling Restaurant
- Base area lodge improvements, landscaping, outside food and beverage, and base area activities
- Mountain Coaster
- Continued planning and entitlement work toward establishing lift-served mountain biking

The proposed components of the Phase One Addendum are illustrated in the plan graphic that accompanies this document.

In addition to the proposed physical improvements, it is recommended that there be additional focus to 1/resolving the operating structure of the facility and 2/ marketing and public relations. The former responds to the opportunity created by the change in operating entity and the ability for the new company to deploy staffing and management more effectively. The latter is in acknowledgment that the brand and reputation of Cairngorm are key assets that need rebuilding, and additional effort will be required to engage effectively with the community, customers and other stakeholders to correct and improve perceptions of the operation.

I. PHASE ONE – WINTER

2018 findings: The updated concept for Phase One upgrades addresses the issues of the current condition, improving the ski area’s function, operational efficiency, and experience for skiing and non-skiing visitors. This concept also makes the ski area less susceptible to weather. This is primarily accomplished through an out-of-base aerial chairlift, an enhanced snowmaking system, and terrain improvements.

As identified in the 2018 findings, the Cairngorm winter guest experience is sub-standard and fails to meet market demand. Skiers frequently face mountain and lift closures, poor snow conditions, and long lines at lifts, for food and beverage, and other guest services. Although not experienced in the 2018/19 season¹, the closure of the funicular would exacerbate these issues.

The funicular had been the ski area’s most reliable lift and primary form of out-of-base transport. Without it, there is a heightened need to improve the out of base uphill transport options for skiers. In addition, the funicular provided access to much of the ski area’s top-of-mountain beginner terrain – an alternative beginner area in the base will need to provide that experience. The funicular also saw heavy use from non-skiers looking to ride the funicular and enjoy the views and a meal at the Ptarmigan restaurant. In order to continue to draw non-skier winter visitors, the ski area will need to enhance the appeal of the base area while providing on-mountain food options for skiers to limit the crowding at the base.

¹ The uncertainty around operations, coupled with the poor snowfall, resulted in significantly decreased skier volumes during the 2018/19 season.

A. Lift Infrastructure

2018 findings: The upgrade concept significantly reduces the total number of lifts, providing a greatly improved, and more competitive guest experience and a more efficient operation. The proposed improvements are not intended to increase the CCC², but rather allow the resort to well-meet its existing CCC.

As per the original recommendations, the concept for Phase One lift upgrades addresses two primary goals:

- 1) Increase operational efficiencies. Increased efficiency of the lift network leads to reduced operational costs.
- 2) Improve the quality of experience. The aerial chairlift is faster, reliable, and has a higher capacity than the existing lifts, reducing queues in the base area. On the lift, the high-speed detachable technology results in the shorter ride times and more comfortable ride that skiers have come to expect. And while riding the six-person lifts, whole families and groups of friends can sit together, better enjoying each other's company and their day at Cairngorm. This will result in Cairngorm becoming more competitive in the marketplace, enabling Cairngorm to increase its utilisation so that it may come closer to achieving 130,000 skier visits a year³ as it has in the past⁴. As noted in the 2018 Assessment, additional visitation would be generated by 1/ an improved beginner experience, supporting an increase in British families wishing to teach their children to ski in Scotland, 2/ providing the modern infrastructure destination skiers have come to expect (reliable snowpack, modern lift infrastructure), supporting an increase in British skiers choosing Cairngorm for short-stay destination ski trips, and 3/ Cairngorm's unique, rugged experience creating a 'niche' in the destination marketplace, attracting international skiers who are collecting unique skier experiences.

² Comfortable Carry Capacity (CCC) defines a skier visit level where all the infrastructure is being used at its capacity (e.g., there are queues at all lifts, all parking spaces are full, etc.), but that there isn't over crowding (e.g., wait times for ski hire aren't very long, lift queues are manageable, everyone can find a seat at the restaurant, etc.).

The accurate estimation of the CCC of a mountain is a complex issue and is the single-most important planning criterion for a ski area. Related skier service facilities, including base lodge seating, mountain restaurant requirements, toilets, parking, and other guest services are planned around the proper identification of the mountain's true capacity.

Resort CCC is calculated by summing the individual CCC calculation for each individual lift. The calculation is based on a comparison of the uphill capacity (supply) with the downhill capacity (demand) for each lift.

³ This visitation projection assumes that the funicular would be in operation and contributing to the skiable lift network.

⁴ Higher skier visits were last achieved in 2009/10 (144,000).

Figure 1. Lift Specifications – Phase One Upgrade Plan

Lift Name, Lift Type	Top Elevation	Bottom Elevation	Vertical Rise	Slope Length	Average Grade	Actual Capacity	Rope Speed	Carrier Spacing	VTMH	Lift Maker/ Year Installed
	(m.)	(m.)	(m.)	(m.)	(%)	(pph)	(m./sec.)	(m.)		
<i>Funicular Railway (operational status unknown)</i>	1,087	639	447	1,940	24%	1,200	10.0	3600	536,744	<i>Doppelmayr 2000</i>
<i>Car Park T-Bar (as-needed-only)</i>	776	628	148	914	16%	600	2.5	30	88,544	<i>Muller 1965</i>
M1 Poma	1,090	788	303	992	32%	900	4.0	16	272,508	Poma 1980
Sheiling Platter	755	703	52	280	19%	720	2.0	10	37,722	SunKid 2016
Coire Na Ciste T-Bar	1,102	973	130	805	16%	782	2.5	23	101,526	Muller 1973
Polar Express Poma*	1,099	1,087	3	32	10%	600	0.6	4	1,800	Poma 1987
Ptarmigan T-Bar	1,146	1,064	82	535	16%	709	2.5	25	58,425	Muller 1970
West Wall Poma**	1,003	714	289	772	24%	800	4.0	18	231,163	Poma 1986/2016
Day Lodge Poma	800	641	159	784	21%	900	4.0	16	142,833	Poma 1988
Lift A (Base Area Carpet)	620	623	3	31	10%	600	1	3.6	1,800	Proposed
Lift B (Chairlift)	1,018	630	388	1,982	20%	3,200	5.0	34	1,240,778	Proposed

* The Polar Express lift was originally purchased and installed in 1987 in Lower Coire Na Ciste; it was moved to its current location in the mid-2000s.

** The West Wall Poma is recommended to be shortened.

With the uncertainty around the funicular, the Phase One concept has been modified slightly. The 3,200 pph aerial chairlift (Lift B) originally proposed as the Phase One lift in the 2018 findings remains a focus of this strategy, as it is critical to resolving the out-of-base uphill transport issue and improving the guest experience at Cairngorm.

Much consideration was given to the proposal of adding a mid-station configuration to this chairlift, located somewhere in the “Zig Zag” area. Using the “one side” (i.e., either load or unload but not both) technology or a full mid-station option were proposed, and a number of opportunities were discussed related to this concept:

- A mid-station unload would allow for round-trip skiing on the lower terrain by beginner/novice skiers. This could also be utilized during low-snow years if snowmaking operations were limited to the lower Car Park T-bar (the “Beginner Zone”) terrain.
- A mid-station load would allow skiing the upper terrain when snow cover is limited to the upper mountain and allow upper ability level skiers to roundtrip on the more challenging terrain of the upper mountain.
- A full mid-station would allow maximum flexibility of the lift: upper or lower mountain skiing only, or full lift access.

After much consideration, SE Group’s recommendation for this initial chairlift does not include a mid-station of any kind. Our reasoning for this is related to cost vs. benefit: the additional costs for any kind of mid-station (£760,000 for a one side station and £1,140,000 for a full mid-station) outweigh the benefit. Additionally, mid-stations are traditionally problematic from an operational perspective, and additional operational costs would be expected. Because of the operational issues of mid-stations, two separate lifts are often recommended instead of a mid-station configuration; this option was also considered and discarded due to additional expense (£9M for two lifts vs. the original price of £7M for one).

A proposed compromise, to respond to concerns around the unpredictability of natural snowfall and the possibility of snowmaking operations being limited to the lower “Beginner Zone” terrain, is to not remove the Car Park T-Bar. This T-Bar could be utilised until the aerial chairlift is constructed and as needed during low snow periods when there is not enough snow on the upper mountain for skiing.

Other changes from the original 2018 Phase One concept include removing the proposed upgrade of the Polar Express Poma to a carpet conveyor. Given the uncertainty around the funicular, upgrading this lift may be delayed. The proposed carpet conveyor in the base area is proposed to be the focus of the resort’s beginner area, as it was during the 2018-19 season (with much success despite the snow limitations).

B. Snowmaking

2018 findings: The improvement of the existing snowmaking system and expansion would enable Cairngorm to ensure snow coverage on a significant portion of the runs for the entirety of the ski season, including the lower mountain and critical base area environment. This is a key improvement towards enabling the ski area to open and operate more consistently.

The first and highest priority recommendation for snowmaking at Cairngorm is to clarify the needs of the system: a Snowmaking Master Plan must be undertaken to fully articulate the specifics of the system including power and water source and distribution and gun type and location. This plan would respond to the specific conditions at Cairngorm and build upon the investment already made. Understanding this is a mission critical component of the snowmaking discussion, “big picture” assumptions may be made regarding the initial priorities for coverage and the potential costs associated with establishing the system.

Significant investment was made in 2018 in snowmaking infrastructure, including the purchase of eight additional fan guns (for a total of 12 at the resort) and a double Snowfactory. Despite this additional snowmaking infrastructure, there remains issues related to providing power and water to allow these guns to operate at full capacity. Phase One investment in snowmaking must initially address the fundamental infrastructure needs of power and water source and distribution. This would allow the existing guns and Snowfactory to be utilised to provide adequate coverage on the lower mountain “beginner zone” terrain. In concert with the new carpet conveyor and temporary operation of the Car Park T-bar, this would allow minimal operations in seasons like 2018/19 where natural snowfall is minimal and weather conditions are challenging.

Subsequent to this initial investment, snowmaking should be added to the upper runs of the Phase One Lift B terrain. The first priority would be the beginner run (labelled B1 on the plan) down through the Zig Zag to Home Road, to provide top-to-bottom snow coverage on a run accessible to all levels of skiers.

Snowmaking would be added next on runs B2 and B3, other runs from the top of Lift B. Snowmaking on run B4, an intermediate run from the Zig Zag to the base area, would eventually be added, to create an alternate, more advanced run to the bottom and separate beginners and intermediate skiers heading into the base area.

Again, prior to any further discussion around snowmaking at Cairngorm, it is recommended that a full analysis by a snowmaking engineer should be undertaken and a Snowmaking Master Plan developed to fully articulate the specifics of the system including power and water source and distribution and gun type and location.

C. Terrain Improvements

2018 findings: While the ski terrain at Cairngorm is excellent, terrain improvements would improve the operational efficiency of the ski area and the visitor experience.

Approximately 8.7 hectares of new ski terrain would be created as a result of the implementation of the Phase One Lift B. The terminal location of this proposed aerial lift presents opportunities to create additional ski routes that would complement the existing terrain, proposed lift alignments, and disperse skiers from the existing runs.

In addition to the new terrain, additional grading or “summer grooming” (removing stumps, humps, and rocks to create a smoother surface) is proposed for the lower mountain beginner zone terrain. This smoothing of the surface lessens the amount of snow (natural or manmade) needed to make the slope suitable for skiing, increasing the efficiency of the winter operation during low snow years.

D. The Beginner Experience

2018 findings: Providing a ‘best-in-class’ beginner experience is critical to attracting and maintaining the family market, as well as ensuring the future sustainability of the sport. An additional conveyer lift for beginner skiers would enable Cairngorm to offer a great beginner experience regardless of weather.

The beginner ski experience at Cairngorm would be improved by the addition of a carpet conveyor located in the base area adjacent to the lodge. With the funicular out of operation, this lift and adjacent terrain will be the primary learning zone. If the funicular resumes operation, this area will complement the terrain at the top of the mountain and serve the ski school programming during inclement weather. Over the 2018/19 season, holding children’s lessons at the base of the mountain was a positive experience.

E. Base Area Facilities

2018 findings: Improving the base area guest services will address deficiencies and improve the Cairngorm experience in both winter and summer and benefit both skiing and non-skiing guests. Without the attraction of the funicular, Cairngorm will need to enhance the base area to appeal to and accommodate the non-skiing guests.

Without the funicular, the experience at Cairngorm for non-skiing guests is limited to the base area. There is currently limited reason to come up to the mountain, let alone stay in the base area for any length of time.

In the absence of the tourism-oriented funicular operation, and even if the funicular were in operation, the base area should be a destination in itself, in winter and summer. The views are still stunning, as is the experience of being within a mountain environment. Enhancing this experience must be the focus of Phase One.

In the winter, that primarily involves enhancing food and beverage service and creating a better arrival experience. With the added pressure of non-skiing guests visiting the base area in the winter crowding in the lodge will be exacerbated and re-opening the Sheiling facility may alleviate some of this pressure (see below).

F. Sheiling Restaurant

2018 findings: Reopening Sheiling would provide much needed seating capacity, bring the resort capacities into better balance, and improve the visitor experience for skiers and non-skiers.

Without access to Ptarmigan restaurant via the funicular, it is recommended that the Sheiling facility be brought back into operation as a lunch restaurant. The lack of the funicular creates an additional burden on existing base area facilities, from both skiers and non-skiers.

The Sheiling Restaurant would be needed to accommodate a large share of the skiers at lunch, as the base area would be serving all of the non-skiing visitors. This would create a more pleasant experience at each facility. Without the threat of crowds and long lines, more visitors would choose to purchase lunch at resort restaurants, increasing the resort's food and beverage revenue.

II. PHASE ONE – SUMMER

2018 findings: The upgrade concept for Cairngorm expands on the current offering and is focused on broadening the experience to a broader audience by providing activities that offer 'something for everyone' and complement the existing recreational complexion of the larger Aviemore/Glenmore area. As with the winter concept, these upgrades significantly improve the Cairngorm summer experience as well as the revenue-generating opportunities of the summer business.

The current summer guest experience is severely limited by the lack of the funicular. In the past, the funicular was the centrepiece of a summer visit to Cairngorm. The base area was uninviting, and people tended to pass through quickly, on their way to the funicular.

Without the funicular, the base area will need to be an inviting, engaging place for summer visitors. The base area has fantastic views that Cairngorm can capitalise on to bring visitors, but there is a need for support activities/facilities to support this experience. Offering base area activities, walking trails, and an enhanced food and beverage service would entice visitors to linger and spend money at the ski area. In addition, an inviting base area would encourage the tourists who drive up but remain in the parking area to come onto the resort and spend money on activities, food, and beverage.

A. Mountain Coaster

2018 findings: A mountain coaster ride is a unique way to experience the mountain environment and would be a beneficial addition to the base area experience at Cairngorm.

This addendum proposes a new location and alignment for the mountain coaster. Given feedback from the National Park Authority regarding concerns around visual impacts of the previous alignment, a new alignment was investigated. While the previous location was on an exposed undeveloped ridge, the new location is lower and within the already disturbed area of the ski resort. The coaster staging area is within the base area, creating an easy-to-access activity for all visitors. For the alignment and cost proposal developed by Wiegand, see Appendix I.

The Mountain Coaster is included in Phase One as a key source of revenue without the funicular. The coaster would operate in both winter and summer, providing non-skiing visitors a reason to visit and spend money and time at Cairngorm. In the summer, the mountain coaster would enhance the appeal of the base area and similarly, give visitors a reason to spend time and money at Cairngorm.

B. Mountain Biking

2018 findings: Downhill mountain biking has long been recognised as a 'complementary' summer athletic pursuit to winter skiing/riding. While the activity does require a certain level of physical fitness, the advent of 'flow' style downhill riding, and the creation of trail systems that accommodate a broader ability level range of riders have increased the appeal and accessibility to the marketplace. Additionally, as an activity, mountain biking is consistent with the 'outdoor adventure' orientation of the Aviemore area visitors/residents.

Downhill mountain biking is a key opportunity for Cairngorm to consider and discussions should continue to be ongoing with all relevant stakeholders.

Initial conversations with regulatory agencies identified concerns around a mountain biking operation, specifically around potential erosion issues created from the construction and ongoing maintenance and operation of the trail network, and the ability to contain riders within the Cairngorm operating area, preventing them from venturing into adjacent protected habitat areas within Glenmore Forest Park.

Pursuit of establishing mountain biking at Cairngorm will require continued agency coordination and regulatory compliance. While it will likely be a lengthy process to implement the activity, mountain biking could be a significant asset for the future viability of Cairngorm. It is recommended that as part of the Phase One recommendations, the opportunity for mountain biking at Cairngorm continues to be discussed.

C. Base Area Experience

2018 findings: Despite the viewing opportunities, the base area in the summer is not attractive. Little attention has been paid to creating a welcoming environment that encourages arriving visitors to get out of their car. Creating a more inviting outdoor seating area, additional viewing locations, and accessible (without a lot of gradient change!) walking paths that connect the various activities and areas of interest, would greatly improve the base area experience at Cairngorm. This in turn would increase the length of stay, as well as increase the opportunity for additional food & beverage revenue and participation in the other activities offered at the resort.

Without the funicular, the summer operations at Cairngorm centre around the base area. This heightens the importance of creating a welcoming, exciting base area. At present, the base area lacks the appeal, facilities, and activities to draw many visitors and generate sufficient revenue. While this was an important priority in the 2018 strategic plan, the uncertainty around the funicular has made the proposed improvements more urgent and important. Improving the arrival experience is key to drawing visitors out of the car park and into the ski area. Designated places to walk (without climbing a hill!) and viewing areas will allow visitors to fully appreciate and capture the scenery. Other activities and facilities, such as children’s play activities, at-grade walking paths, and food and beverage improvements, encourage whole families to venture to Cairngorm, enjoy activities, and buy food and drinks. Possible activities/structures that may be suitable—provided they can be introduced in ways that are sympathetic to the natural environment and the Cairngorm brand—include summer tubing, a pump track, a ski-themed play structure, a slide from the upper to the lower car park, and giant games such as draughts or chess. Interpretive signage, speaking to the unique ecosystem of Cairngorm, should also be part of the base area experience.

THE FINANCIALS

An important aspect of understanding the future opportunities for multi-season operations at Cairngorm is understanding the capital costs and possible economic performance of the potential facilities and/or activities. As part of this addendum the financial assessment has been updated to reflect the revised recommendations of Phase One. This summary is limited to changes to the initial financial assessment; unless noted the 2018 findings remain.

The following improvements and activities could be considered:

- Lift A: a base area carpet conveyor surface lift
- Lift B: a 6-person detachable lifts (capacity of 3,200 pph)
- Terrain improvements (summer grooming of beginner zone and 8.7 hectares of new terrain associated with Lift B)
- Snowmaking (15.9 hectares)
- Reopening Sheiling Restaurant
- Base area lodge improvements, landscaping, outside food and beverage, and base area activities
- Mountain Coaster
- Continued planning and discussions work toward establishing lift-served mountain biking

A. Skier Visits

The 2018 findings related to skier visitation projections have been adjusted to reflect Phase One only. Skier visits, both existing and expected, are essential to estimating the potential revenues and determining the necessary facilities and infrastructure. The proposed improvements to the lift infrastructure and addition of a snowmaking system are intended to increase winter visits to a consistent average of 130,000, with higher numbers during a peak year.

This increase will be achieved through increased utilisation of the ski area throughout the season, rather than expanding capacity (CCC to remain around 2,700). The installation of Lift B (and associated terrain/snowmaking is expected to attract and increase skier visits.

For purposes of the financial analysis, we assume 60,000 for base year visits, (the average for the last five seasons) and that visits will increase significantly in the year after the installation of Phase One improvements, followed by incremental increases in visits over the next few years up to 130,000 visits.

Figure 2. Estimated Skier Visits

Season	Skier Visits	
	New	Total
Base Year		60,000
Phase One		
Year 1	30,000	90,000
Year 2	20,000	110,000
Year 3	20,000	130,000

B. Lifts

The cost estimates for the two proposed lifts (Lift A – base area conveyor carpet and Lift B – six-passenger detachable) have not changed from the 2018 reporting. These estimates are based on very preliminary planning; further master planning and design will be required to establish a more comprehensive understanding of the capital costs.

Figure 3. Capital Costs – Lifts

Lift	Type	Capacity	Capital Cost	
			Low	High
Lift A	conveyor carpet lift	900 pph	£263,000	£331,000
Lift B	six-passenger detachable	3,200 pph	£6,059,000	£7,513,000

Notes:

Ranges are based on preliminary vendor estimates. Actual figures will vary depending on further design and analysis of the site, regulatory and operation-specific circumstances.

Lifts: Quoted from Doppelmayr (May 7, 2018)

C. Snowmaking and Terrain

The following tables summarise an estimated range of capital costs for the extension of a snowmaking system and new terrain at Cairngorm. Again, these estimates are based on very preliminary planning; further master planning and design will be required to establish a more comprehensive understanding of the capital costs.

Costs for the implementation of terrain improvements and snowmaking have been broken down by trail and/or area to allow for consideration of additional “sub-phases” for the Phase One implementation. For example, once the beginner zone and one route (i.e., B1) from the top of the new chairlift has been established and connected to the snowmaking system, the subsequent terrain and snowmaking coverage upgrades (trails B2 through B4) may be delayed until further funding is available.

Note that while investment has already been made, and there are 12 (8 new) fan guns and a double Snowfactory at Cairngorm, the supporting physical plant (specifically related to supplying power and water to the system) is lacking. As such, the cost/hectare estimate for the initial beginner zone snowmaking investment assumes utilizing the existing fan guns and Snowfactory and the establishment of a Snowmaking Master Plan and the supporting physical plant and other infrastructure needed for the initial implementation of the system.

Figure 4. Capital Costs – Snowmaking

Snowmaking Zone	Hectares	Cost per Hectare	Capital Cost
Beginner Zone	3.1	£137,333	£434,733
Trail B1	4.9		£668,117
Trail B2	2.7		£374,001
Trail B3	2.3		£316,633
Trail B4	2.9		£394,031
Total Snowmaking	15.9		£2,187,515

Notes:

Snowmaking assumption based on industry average pricing per hectare of proposed coverage.
 More accurate estimates may be determined upon further design and analysis of the site, regulatory and operation-specific circumstances.

Figure 5. Capital Costs – Terrain

Terrain	Hectares	Cost per Hectare	Capital Cost
Summer Grooming			
Beginner Zone			£100,000
New Terrain			
Top of B1	0.4	£35,000	£13,650
B2	2.4		£82,775
B5 (Connecting to Fiacaill Ridge)	3.2		£110,332
B3	2.8		£97,653
Total of New Terrain	8.7		£304,410

Notes:

Terrain assumption based on industry average pricing per hectare of new terrain.
 More accurate estimates may be determined upon further design and analysis of the site, regulatory and operation-specific circumstances.

D. Power Source

HIE are currently engaging with SSE with regard to the power supply from the valley to the mountain and the main ring round the mountain. An upgrade of the supply from the valley is required, with an initial estimate of circa. £500,000 as a customer contribution. The review will inform on capacity and future requirements for investment in the ring main round the mountain.

E. Summer Improvements

The Phase One summer improvements are intended to generate additional revenue, both by attracting more visitors to the resort and creating paying activities for the existing and new visitors. In combination, the activities to be added in Phase One (a mountain coaster along with smaller base area activities) appeal to nearly the whole spectrum of potential resort visitors.

Additional improvements proposed in this addendum (lodge improvements and activities) are intended to generate some additional revenue but primarily drive additional visits and provide sufficient food and beverage facilities given the lack of access to the Ptarmigan restaurant without the funicular.

Mountain Coaster

The estimate from Wiegand for the revised alignment (see Appendix A) was less than the original 2018 estimate; the previously estimated capital costs at £2,885,000 has been carried in this addendum given the preliminary nature of the estimate and the desire to be conservative.

Base Area Lodge Improvements

It is our understanding that CMSL are planning improvements to the Day Lodge to enhance the F&B offer and improve the experience.

Base Area Landscaping and Outside F&B

Proposed in the 2018 findings, this update to the arrival experience and the installation of at-grade walking paths, seating areas and signage within the base area environs is even more critical given the lack of funicular operations. Capital costs continue to be estimated at £250,000 as per the 2018 findings.

Base Area Activities

Capital costs for base area activities are estimated at £250,000. The potential activities at the base area are a mix of paid (i.e., summer tubing) and free (play structures), and may directly generate additional revenues or contribute to a more appealing base area. In concert with the lodge improvements and an outdoor food and beverage space, the goal of these activities is to enhance the guest experience for all visitors and encourage sightseers driving through to get out of their cars and enjoy a cup of tea and a snack while taking in the view.

Mountain Biking

Costs include £100,000 towards planning and permitting of a future downhill mountain bike trail system at Cairngorm, in recognition of the need to continue to work toward implementation of this activity.

F. Financial Analysis Summary

Below is a summary of the estimated capital costs, visits, revenues, expenses and contribution to operations from the implementation of the Phase One facility improvements and activities.

Figure 6. Phase One Summary Costs and Revenue

Phase 1 Expense Item	Phase 1 Capital Cost	Visits	Revenue per Visit	Revenue (000)	Operating Expenses (000)	Expense Savings (000)	Potential Average Annual Contribution (000)
Facility Improvements							
Snowmaking	£2,187,415				£112,000		-£112,000
New Terrain	£304,410				£29,000		-£29,000
Beginner Zone Summer Grooming	£100,000*						
Lift B (chairlift)	£7,513,000	30,000	£30.00	£900,000	£128,000	-£40,000	£812,000
Year Two		20,000	£31.50	£630,000			£630,000
Year Three		20,000	£33.08	£661,500			£661,500
Existing Visits		60,000	£3.56	£213,600			£213,600
Lift A (Base Area Surface Lift)	£331,000				£18,500		-£18,500
Base Area Lodge Improvement	£500,000						
Base Area Outside F&B	£250,000	20,000	£6.00	£120,000	£105,000		£15,000
Base Area Activities	£250,000	20,000	£5.00	£100,000	£65,400		£34,600
Utilities - Electrical	£500,000						
Total Facility Improvements	£11,935,825			£2,625,100	£457,900	-£40,000	£2,207,200
Additional Winter Revenues (% of new revenues)							
Equipment Hires				£287,000	£69,000		£218,000
Catering				£725,000	£609,000		£116,000
Retail				£231,000	£192,000		£39,000
Snow School				£211,000	£186,000		£25,000
Total Additional Winter				£1,454,000	£1,056,000	£0	£398,000
Activity							
Mountain Coaster							
Mtn Coaster – Summer	£2,885,000	76,000	£6.00	£456,000	£84,000		£372,000
Mtn Coaster – Winter		24,000	£6.00	£144,000	£27,000		£117,000
Mountain Biking – Plan & Approval	£100,000						
Total Activities	£2,985,000			£600,000	£111,000	£0	£489,000
Phase One Grand Total	£14,920,825			£4,679,100	£1,624,900	-£40,000	£3,094,200

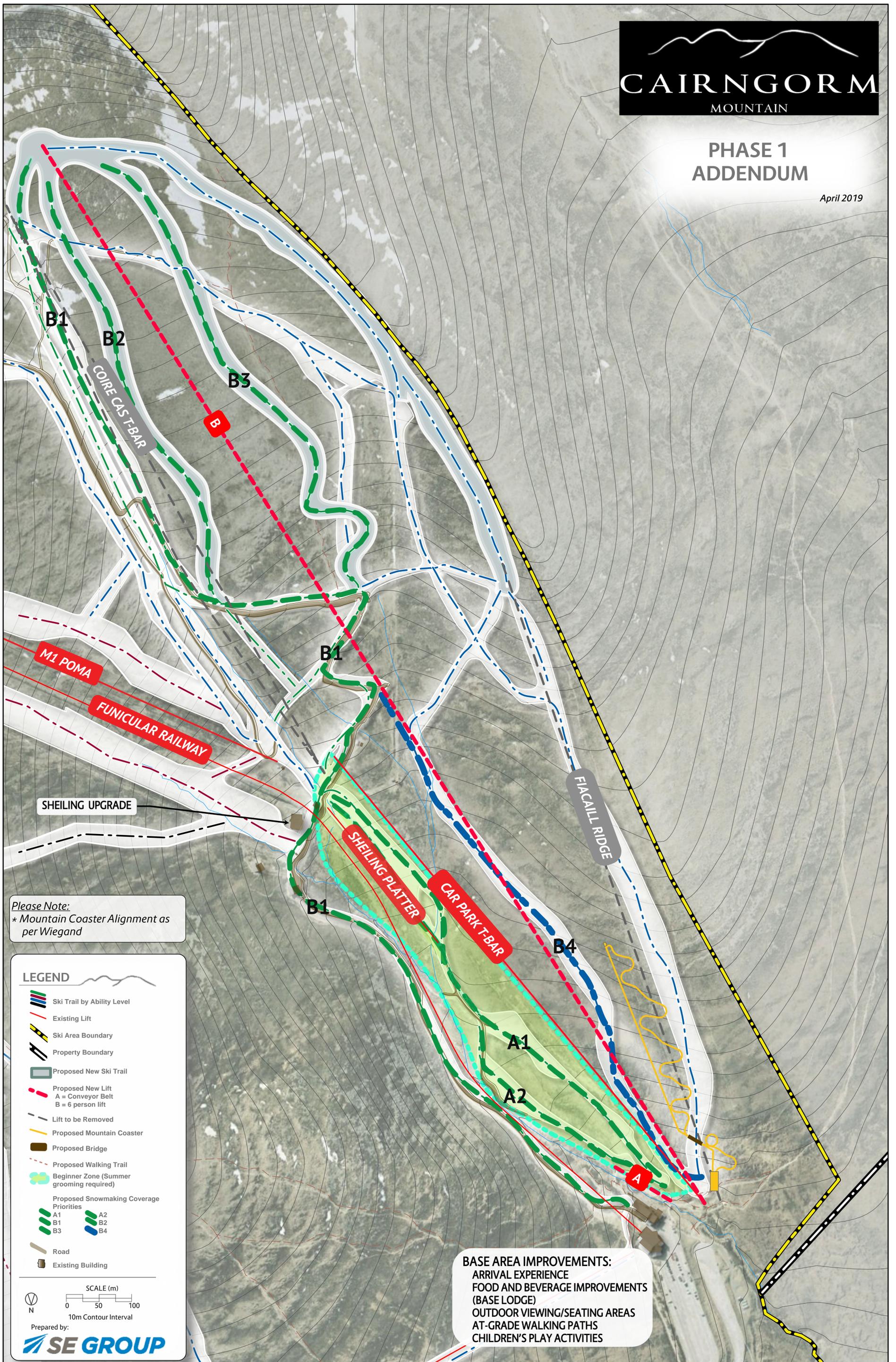
*waiting on estimate from the client

MAP

Phase One Addendum Upgrade Concept

**PHASE 1
ADDENDUM**

April 2019



Please Note:
* Mountain Coaster Alignment as per Wiegand

LEGEND

-  Ski Trail by Ability Level
-  Existing Lift
-  Ski Area Boundary
-  Property Boundary
-  Proposed New Ski Trail
-  Proposed New Lift
A = Conveyor Belt
-  B = 6 person lift
-  Lift to be Removed
-  Proposed Mountain Coaster
-  Proposed Bridge
-  Proposed Walking Trail
-  Beginner Zone (Summer grooming required)
-  Proposed Snowmaking Coverage
Priorities
A1
-  A2
-  B1
-  B2
-  B3
-  B4
-  Road
-  Existing Building

SCALE (m)
0 50 100
10m Contour Interval

Prepared by:


BASE AREA IMPROVEMENTS:
ARRIVAL EXPERIENCE
FOOD AND BEVERAGE IMPROVEMENTS
(BASE LODGE)
OUTDOOR VIEWING/SEATING AREAS
AT-GRADE WALKING PATHS
CHILDREN'S PLAY ACTIVITIES

APPENDIX

Mountain Coaster Alignment and Cost Proposal



		DIN ISO 2768 - m	
Höhenunterschied: diff. in altitude:	100 m	Datum	Name
Länge Bahn: length slide:	800 m	Bearb.	04.04.2019
Neigung: inclination: Ø 12,5% max. 15%		Gepr.	Jruschke
Länge/Neigung Lifter: length/inclination lifter:	410 m / 24,4%	Norm	

Masstab 1:1250		Alpine Coaster Cairngorm	Blatt
Material Material			-
-		Proposal04042019	- B

T-BAR

EDGE SKI LIFTS

Downhill track 775 m

Liftsystem 425 m

bridge

circle

Entry

Exit

Bottomstation

Path

Day



WORLD OF SLIDES

Wiegand

Abteilungsleiter Fahrgeschäfte

Tel.: (+49 6651)

E-mail

Rasdorf, 09.04.2019



JOSEF WIEGAND GMBH & CO. KG

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D-36169 Rasdorf

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Fax: +49 (0) 6651. 379

Mail: info@wiegandslide.de

Web: www.wiegandslide.com

**Estimate Offer Alpine-Coaster - 800 m length (Cairn Gorm Scotland)
incl. Wiegand Lifter System for uphill transportation of guest and sleds**

Dear Sirs,

we thank you for your friendly contact. On the basis of the given information and the sent material we have prepared the following offer for you:

approx. 800 m Wiegand-Alpine-Coaster,

consisting of straight segments, curves, bows and jumps, thereof

approx. 370 m up to 1 m height

approx. 250 m up to 2 m height

approx. 100 m up to 3 m height

approx. 50 m up to 4 m height

approx. 30 m up to 5 m height

40 Alpine-Coaster sleds

40 lockable belt system

40 centrifugal brakes (back)

40 clamps (teetering function for downhill track)

40 safety packages for the sleds incl. high backrest,
nose protection, seat booster and three point belt

approx. 410 m Wiegand-uphill-track, thereof

approx. 230 m up to 1 m height

approx. 100 m up to 2 m height

approx. 40 m up to 3 m height

approx. 20 m up to 4 m height

approx. 20 m up to 5 m height

1 Wiegand-Liftersystems for the uphill-transportation
of guests and sleds (heavy weight version)

approx. 250 m safety nets (downhill-track)

approx. 180 m railing (uphill-track)

2 middlestation

1 double cable duct for uphill-track

3 chainstopper





supplementary equipment

approx. 50m circle steel construction for the circle in the downhill-track

Automatic storage system for 40 sleds located at the bottom station (rehang system) incl. supports

25m double floor bridge, associated steel construction

Eddy current brake for the downhill track consisting of:

- 40 sets of eddy current brake installed in the sleds
- approx. 800 m aluminum / copper rail
- 2 magnet rocker to secure the eddy current brake at top station
- 1 conveyor belt for magnet-check at the end of track

1 exit belt with 7.5 m length,
for more comfortable step out of the sled in the bottom/exit station



Total price ex works EUR 1.110.091,55

I would like to present you our latest technology which replaces the eddy current technology and offers the highest level of safety.

Intelligent Driver Assistance System:

- Each sled knows its own position on the downhill track. By transmitting this position to the following sled, the sled can calculate the distance to the sled in front and brake if it falls below a defined distance (speed-dependent).
- Below a defined minimum speed, this function is inactive. This means that the vehicle can be driven up at a much reduced speed.
- The distance control function is superior to the speed control and the endbrake.
- 1 x Planning/ Software / Control
- 40 x Slide Mechanics Electrics
- 800 m equipment for downhill track (sword, magnetic sensors including holder)
- 1 x charging station
- 1 x magnetic monitoring (tape)

price ex works EUR 203.616,13

not included in the total price, to be calculated instead of eddy current technology

For earthworks, mounting, buildings, customs etc. please add approx. 45 % of the above amounts to have a rough estimation of the complete investment. These information of the additional costs are average empirical values, these can however varying according to location and completion of the installation. All costs are without taxes.



Our offer is valid for 3 month.

Our delivery scope includes the following services:

- planning of the track with the corresponding plans
- foundation and reinforcement plans
- statics for foundation for our delivery scope
- plans for the official allowance procedure
- plans for technical approval
- el. connecting plans
- operation instructions
- necessary instruction signs (English and neutral / pictures)

Our delivery scope does not include the following services:

- earthworks according to our plans
- necessary foundations for lifter, bridges, channels etc.
- installation/assembling costs approx. 10 -12% of the material value depending on the customer support
- all safety nets and safety walks are mounted under instructions of Wiegand supervisors by helpers of the buyer.
- 8 - 12 helpers as well as welder and electrician (according to order), working time every day about 10-12 hours
- storage and distribution of the material at site
- cable channels and empty tubes as well as el. connection of the device
- drainage
- costs for technical approval
- blocking, (bridges), channel or other not mentioned buildings
- fixing of the pavement etc.
- energy supply for the installation works
- working platform for installation work up to 6m height, 30 m along the slide
- camera monitoring system for remote station
- all additionally, not mentioned service
- crane (for erection of bridges and heavy track-supports) if necessary.
- Station building for distribution and control panel, workshop for the sled maintenance
- Electrical power supply with cables
- All other services and material supply not mentioned in the delivery scope above.



According to the special assembly conditions the final erection at the site by our supervisors we charge as follows:

- | | | | |
|----|----------------------------------|-----|---|
| a. | traveling times | EUR | 45,00/h |
| b. | installation and waiting periods | EUR | 60,00/h |
| c. | Van | EUR | 0,60/km |
| d. | room and board (expenses) | EUR | 115,00/day (scotland, according to list for expenses) |
- If the buyer will provide free accommodation for the Wiegand supervisors the 115,--Euro a day will be reduced to 20,-- Euro a day per person. (single room Hotel with hot shower; free food and drinks)
- | | | | |
|----|------------------------------|--|------------------------------|
| e. | flight costs and other costs | | at actual cost with invoices |
|----|------------------------------|--|------------------------------|

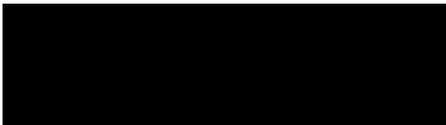
The final invoice for installation is payable within 4 weeks after finishing the installation. Weekly partial invoices are allowed and have to be paid within 5 days after invoiced.

The seller guarantees for delivery and installation of the facility according to German standard.

The guarantee period is 2 years not included in the guarantee are the wear out parts as brake rubber, wheels and so on.

We hope our offer will meet your requirements and look forward to hearing from you soon.

In the meantime we remain
with best regards,



**Josef Wiegand GmbH & Co. KG
Freizeiteinrichtungen**