

HIE's decision to close the Cairn Gorm funicular again! (2) What's happening?

Description

Since the funicular was closed on 25th August for snagging (see here) to address public safety concerns the re-opening date keeps getting put back. The latest is Monday 16/10/2023!

Little further information has been forthcoming from HIE about the reasons for the closure or the work being done although following my post they did once again claim this was normal snagging practice:

The need to increase the tension on scarf joints was picked up as part of a month long snagging and inspection programme that had been running since the funicular's relaunch, as is usual practice with complex engineering projects.

What a month ago was described as a major civil engineering project has now become a complex engineering project! The longer the funicular has been closed the more obvious it becomes that far more than snagging is involved. This post takes a further look at what has gone wrong.

A specification unfit for purpose

I have been undertaking further research into the decision (see here) to build the funicular out of concrete rather than steel.

In 1995 Tim Whittome, the then Chief Executive of the Chairlift Company, wrote a letter to the Herald:

The description of the funicular track (attributed to Martin Mathers of WWE Scotland) as a "single-line motorway up the side of the mountain" has no basis in fact. The rails for the funicular will be carried on a light structure comprising two eight-inch-wide steel beams supported at intervals on concrete columns.

The beams will be spaced 6ft apart and will run four or five feet above the ground for most of their length. (For comparison, the existing chairlift towers are between 20 and 35 feet high.)

This letter shows that as late as November 1995 everyone was under the impression that the funicular would be built of concrete and light steel beams NOT just concrete.

This is further confirmed by the planning application that was lodged with the Highland Council (ref. 98/00254/FULBS) on 29/08/1994 which gave the go-ahead to the funicular on 27/03/1997. While I have submitted an FOI for a full copy of that planning application, the piers and foundations were to be made of concrete with steel beams 8ins (20cms) wide. I have also established there are no further planning applications on the Highland Council website asking for permission to change the original plans.

Tim Whittome's letter coupled with the planning application provides some answers to the three questions I posed in my first post on the decision to build the funicular with concrete beams ([see here](#)):

- (1) Was the original design specification, used to obtain tenders from companies, for steel rather than concrete ?
- (2) If so, when the specification was changed from steel to concrete were any other tenders sought?, and,
- (3) Were A. F. Crudens paid first to design in steel and then again to change the specifications to concrete?

Q.1. The response to this is an emphatic YES.

Q 2. By implication this is probably a NO because Morrison Construction had already won the contract, and,

Q.3. Since there was no change to the planning application then A.F.Crudens were probably only paid to change the specifications for the steel beams.

The important point here is that the foundations/ piers were left as they were BUT the changed concrete beams on top of them were approximately 3.5 times heavier than the steel ones ([see here](#)). According to both a beam manufacturer and a railway designer **the span between the piers is too long for the weight** of the concrete beams.

But increasing the number of foundations and piers to provide more support for the heavy concrete beams or to enable shorter beams to be used would have needed a new planning application. This would have put the whole project in jeopardy because of the deadline for getting a grant from the European Union. It appears HIE decided to plough on despite the risks and have now reaped a £25m repair bill and rising.

HIE use of the term 'snagging' to cover-up major problems

Having created a massive liability with the funicular HIE then tried to transfer the Cairngorms estate back to the Forestry Commission 2006/07. The FC were not fooled:

In documents obtained by The Herald it was revealed that the Forestry Commission had serious concerns about the cost of bringing the ski area infrastructure up to scratch.

The F. Co's senior official, Mr Hugh Insley, told colleagues

There is a very real risk that in their (HIE's) haste to tie this up they are trying to sweep some potentially big liabilities under the carpet. I am fairly clear that we should not do this deal without HIE retaining the long-term liabilities it has created at Cairngorm. He went on, in an email in February 2007,

Put simply there is a lot of poorly maintained infrastructure on a highly designated area. This must either be brought up to standard or removed.

The month following the email, Mr Insley was advised to avoid *any involvement whatsoever with the ski area* by one of his negotiators.

(Herald article 05/07/2008)

This provides a damning indictment of HIE's management of the mountain and demonstrates a complete lack of trust in the negotiations with HIE! The article goes on to show this poorly maintained infrastructure included the funicular (just 6 years after it opened!).

Among several snagging issues left over from the construction of the funicular railway in **2001** was the lack of lifting gear capable of removing the train from the tracks. According to one report, not being able to do this every five years was severely impeding maintenance of rolling stock.

Based on this record, the public should anticipate that the current snagging issues will continue for another six years! A response from HIE to Freedom of Information Requests revealed that the rolling stock had actually been removed for overhaul only once in the period 2001 - 2018.

The repairs to the concrete support beams and current ‘snagging’ issues at Cairn Gorm

While it appears the specification for the size and number of foundations and piers was not changed after the decision to use concrete beams, they will have been over specified (i.e significantly larger than required) for safety reasons. The original specification for the foundations and piers was therefore probably sufficient to support the weight of the new beams.



The bottom anchor block (photo above) which is designed to stop the section of railway above moving downhill and a few piers (photo below) have been reinforced but this is the exception, not the rule, and the explanation for why this was needed in these cases is unclear.



This photo shows how the scarf joints (where the beams meet the in-situ blocks) have been added. The beams in this picture appear to be sound with no brackets holding them together ingress into the joint

The real problem with more than tripling the weight of the beams was that their span meant they were too large to support their own weight given their intended use. It is for that reason that brackets have been added to strengthen the thinnest section of the beams on either side of each scarf joint as in the photo above.



On many other beams, however, further brackets have been added to the strengthen the main section. This indicates the beams were at risk of breaking up.



The numbers of brackets used to reinforce the concrete beams varies, as you can see from the photo above. This suggests that the risk of beams breaking up varied and when to use them was a finely judged exercise (easy to get wrong)



Photo showing the extensive use of metal reinforcing brackets by the mid-station

Some of the beams with brackets are at points which could have suffered higher stresses from the use of the railway:

- The beam below the exit from the tunnel at the top of the funicular;
- The beams immediately below the anchor blocks at Piers 78 and 65 (these are the only other reinforced beams between the tunnel and the mid-station);
- Around the mid-station;
- And on the curved sections below.



However, there are also brackets around beams on the lower section of straight horizontal track. This suggests that some of the beams may have been breaking up under their own weight.

What does all this tell us?

If the safety issue which HIE claims led to the funicular closure just lay in the tension of the brackets, that should have been sorted weeks ago. Measuring the tension and then adjusting nuts and bolts should not take that long but perhaps the funicular will re-open on Monday?

One possible explanation is that HIE has now found that further beams are cracking up, something which looks inevitable over the next few years because the spans are too big to support the weight. Or maybe new problems have emerged! What is certain is that HIE is not telling the whole story.

Postscript ??? update (from Nick Kempe)

A few hours after Graham's post was published yesterday we saw the news release HIE issued yesterday ([see here](#)) stating the funicular would not now re-open until mid-November. During this week there appears to have been fairly intensive repair work being undertaken on the funicular and we had

wrongly concluded this might be in an attempt to get the funicular open for Monday. Clearly the problems are far more serious than HIE is admitting.

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1. Cairngorms

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2. funicular
3. HIE

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