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HeliPod - Mar Lodge

High up among the Cairngorm mountains in the Scottish Highlands, a team of four labours long and hard to help restore some of the upland area's ancient footpath network. With operations based from the 72,000-acre Mar Lodge Estate, owned by the National Trust for Scotland (NTS), the work is being undertaken as part of the £2.1m Cairngorms Mountain Heritage Project. Developed by the Cairngorms Outdoor Access Trust (COAT), funding was provided by the Heritage Lottery Fund, European Regional Development Fund, Cairngorms National Park Authority, Scottish Natural Heritage, Highlands and Islands Enterprise, Royal Society for the Protection of Birds and the Scottish Mountaineering Trust.

Given the remoteness of this wild landscape, a daily commute is not an option for path workers, as even the fittest is likely to take two to three hours to walk to the nearest public road. Until this year, the solution had been for the team to assemble flat-pack huts at the start of each season in which to live during the working week.

Such accommodation didn't stand up well to repeated helicopter delivery and recovery, or to erection and dismantling. Assembly also took up valuable time. Fierce weather, even over the summer months, meant that the shelters were often battered by high winds and no longer water-tight, rendering life pretty uncomfortable for their inhabitants.

Seeking a better solution, COAT consulted Mar Lodge Estate to design and commission replacements for the old NTS huts. Mar Lodge Estate foreman, Neal Gregory, comments: "It was clear that our old shelters were past their best. Another year out on the hill and they would have started to leak badly. We also had issues with the diesel generator and battery bank inverter. With no built-in system redundancy, this was always going to be a weak link.

"With the benefit of a decade's experience, we put together outline designs for a totally weather-proof, steel cabin system light enough to be lifted in by Squirrel helicopter. We were also looking for a back-up generator system and hoping to achieve better fuel efficiency.

"While we were confident about our broad requirements, finding suppliers willing to work with us on the detailed specifications proved much more difficult. Following persistent research, we were delighted that Empteezy came forward with a superb solution for the cabins and Ampair significantly adapted its diesel/renewable energy hybrid generator technology to suit our particular needs."

For the cabins, West Lothian company Empteezy, took a detailed brief from Neal and his team, significantly modifying its standard chemical store designs to create four air-portable units comprising sleeping quarters, kitchen, washroom and store/drying facility. As the designs progressed, it became obvious that the bunk-house and kitchen units would exceed the maximum permissible payload, so Empteezy's engineers re-designed the units to be split horizontally, keeping the weight per lift within limits yet not compromising on the buildings' integrity.

Commenting on his company's contributions to the collaboration, general manager Kenny Carr, said: "We listened to what the National Trust for Scotland wanted, and designed and manufactured bespoke cabins to fit in with what Neal Gregory and his men required. Splitting the cabins to ensure the helicopter could lift them high into the mountains meant we had to make sure the electrical system, steel furniture and weather-proof aspect were not compromised during the design work on the accommodation units. It all came good in the end."

Cabin living offers little luxury, especially for those working so far from home. A reliable power source for lighting, heating, cooking and drying is, therefore, essential. Before this year, a single generator and battery inverter pack was employed for the full three-month path repair season. The Mar Lodge Estate team wanted to reduce the risk of outage by doubling up and using one generator to back up the other. After a thorough search of what was already on the market, Dorset-based Ampair came up with the goods.

Ampair's business is more usually associated with renewable energy solutions in extreme environments, but the company was keen to apply its expertise to meet the NTS brief. In the end, it adapted its diesel/battery/solar hybrid generator to be diesel/battery only due to the poor levels of sunlight at the site. According to the company's sales and marketing manager, Jeremy Davies: "we are pleased to see that COAT's site team is now enjoying autonomously delivered power 24 hours a day, with a significant saving on generator fuel, servicing and access costs when compared to the previous non-hybrid system. Had the site been more wind and solar friendly, we could have produced further savings."

With all the specifications ironed out and contract terms agreed, it took three months to complete and deliver to Braemar.

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Neal and his team then had a month to fit out each of the cabins with the necessary bunks, cooking equipment, bio-toilet, water heaters, as well as safety items such as fire blankets and extinguishers. The time was also used to test how easily the two halves of the horizontally split cabins could be re-united, using a tractor's hydraulic fork rather than using up expensive helicopter time.

The project is now underway, with the lift-in going smoothly on 7 June. COAT's chief executive, Dougie Baird is pleased with how the cabins have dramatically improved welfare standards for his path workers. "COAT had looked at the possibility of hiring in existing systems, such as those put together at NTS during the Sustainable Tourism at Mar Lodge project 2003-8, but they really were beyond use in terms of condition. We took the decision to purchase a new system, building on invaluable lessons and experience gained over the years by NTS's Estate Team at Mar Lodge Estate, hiring in Neal and his colleagues to help design assemble, deploy and maintain the kit to allow us to tackle mountain path repairs in Scotland's most inhospitable environment.

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