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SUSTAINABLE STEEL IN SKI RESORT CONSTRUCTION

With the destruction of the original Knoll Ridge Chalet in February 2009, an ambitious design/build programme was initiated to create new facilities to be ready for the 2010 winter. RAL engaged Stanley Construction to provide a design/build service with HB Architecture providing the architectural services.



In designing both the café and the equipment shed, the challenge was to create a facility within a tight time frame using appropriate materials. These had to be durable to withstand the extreme alpine conditions, transportable, prefabricated and pre-finished as much as possible to speed on-site construction.



The challenge of constructing a 1512m² café perched on a rockface some 2010 metres up a mountain within a tight 18-month time frame which straddled two winters seems insurmountable – but it didn't deter owners Ruapehu Alpine Lifts (RAL) from engaging the Stanley Group team who relished the challenge. The Knoll Ridge Café on Mt Ruapehu opened for business in mid-July to a flurry of snow and an avalanche of enthusiasm. Comments like 'cosy – and sensational'; 'all that glass gives

an airy impression, like you're floating over the snow' and 'it's a beautiful building, warm and welcoming, with clever use of wood and glass' confirm the new facility has got the thumbs-up from skiers. Later in July the building won peer acknowledgement when it took out the 2011 Supreme Award for the Waikato Registered Master Builders Commercial Project of the Year, and more recently it achieved a 'highly commended' award at the NZ Wood Awards. The building is located 50 metres downhill from the original site, its eastern, fully glazed face perching

on the edge of the drop off to the Te Heuheu Valley ski area, affording patrons stunning views to the Pinnacles. Inside, 400 patrons can be accommodated while the surrounding deck seats another 200. Under the building are the public toilet areas, staff facilities and storage. A 'temporary café' was the first project – constructed on the remaining floor slab of the original building which was destroyed by fire in February 2009. This building had to be ready for the 2009 ski season. Once this was underway, focus moved to the new Cat Shed and Café. Pre-finished concrete floor panels for



both the shed and the café were precast by Stanley Construction at their Matamata premises and transported from the Whakapapa depot by Snow Cats drawing sledges over the 2009 winter snow. The following summer LVL beams were helicoptered in and quickly erected to support the shed's upper roof structure of profiled steel cladding, which also protects the east wall. The building was completed in early 2010.

Meanwhile construction of the Knoll Ridge Café had started.

Work had to be fast-tracked to take advantage of the late summer weather, ensure the structure was closed in before the winter snows – and to be complete for the start of the ski season.

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Due to helicopter weight restrictions, all the steel componentry, roof panels and structure had to be designed to weigh less than 900kgs. Precast units transported over snow were also weight-limited to loads of 1.5 tonnes – or six tonnes on a towed trailer.

The modular design system allowed for considerable off-site prefabrication from information supplied by the architect and engineer. The standard of precision permitted only small tolerances in every component, from foundation



beams to roof panels, glulam structural frames, glass units to structural steel – and all the steel connectors.

This precision workmanship enabled rapid on-site construction – an essential provision, given the area's extreme conditions with winter temperatures dropping to -13°C, wind speeds of up to 241km/h, severe storms and heavy snow.

The café uses all three structural materials: timber for the exposed structure aesthetic, concrete for the robustness of the floors and steel for the lower frame.

Significant use of steel includes column/beam capitals, wall panels on the internal stairway, profiled steel on the roof and on small portions of external walls – and the 10mm steel-plated 'ice wall' featured at the outflow of the 6.0m-wide roof valley.

All steel was fabricated off site. For the roofing, Comag Ltd of Matamata used COLORSTEEL® sourced from Steel & Tube Roofing and structural steel fabricators, Bedford Engineering of Hamilton, handled all other steel componentry.

Project Architect of HB Architecture, Grant Harris notes: "Timber has been used extensively throughout the building in order to create the warm 'alpine chalet' atmosphere, establishing a connection with

the original building. This timber structure would not have been possible without the steel connections – an example of two products working together to get the best result!

"Steel is also featured in its own right. The natural colour of the clear lacquered steel plate connections to the beams and columns and the panelling to the main stair reflects the colour (and durability) of the natural rock formations whilst providing the strength to the structural junctions."

Stanley Construction

With 80 years experience the Stanley Group offer unparalleled expertise specialising in off-site construction. From Cape Reinga to the Mt Ruapehu project Stanley Construction have built a solid reputation for meeting challenges with their "can do" attitude.

The group offers expertise in a variety of specialist areas from commercial fit outs, kitchens and joinery to modular off-site pre-construction and Ecobuilding.

Stanley Construction believe Innovative and modular building solutions are the way to the future offering many time and cost saving advantages that are particularly well suited to remote and difficult locations.



"Besides offering a thorough planning process, a rigorous quality assurance programme and a solid guarantee," says Managing Director Kevin Stanley, "we are committed to the concept that every person at Stanley is on your side. This has kept us in business for the last 80 years and we reckon it'll stand us in good stead for the next 80 years."

Stanley Construction won the following awards in 2011; NZIA Western Area Local Award for Commercial Architecture. National Winner 2011 RMB Commercial Project Awards. Gold Reserve Award 2011 RMB House of the year. Local Category Winner RMB Commercial Project Awards. Gold Award 2011 RMB Commercial Project Award.

Client: Ruapehu Alpine Lifts (RAL)

Architect: Grant Harris
Harris Butt Architecture Ltd
Whangarei
www.hbarchitecture.co.nz
email: info@hbarchitecture.co.nz

Engineers: Dunning Thornton

Construction:
Stanley Construction Waikato Ltd
Telephone AK: 09 304 2200
Telephone M: 07 881 9000
Email: info@stanleygroup.co.nz
www.stanleygroup.co.nz

Roofers: Comag Ltd
COLORSTEEL® roofing
profile ST900 Colour Ironsand
supplied by Steel & Tube, Roofing