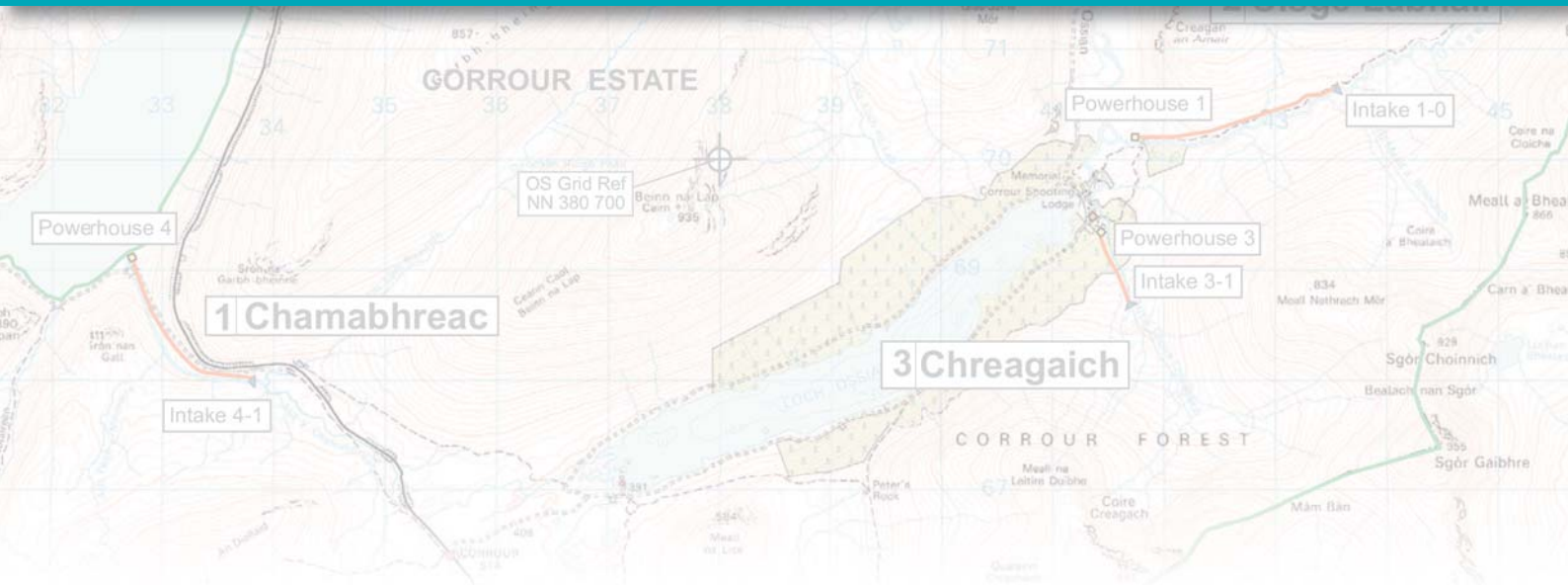
CORROUR ESTATE HYDROPOWER SCHEMES

Uisge Labhair Intake – Corrour Estate



CORROUR

CORROUR ESTATE

5.3MW of Remote Renewable Energy

The Corrour Estate is a remote sporting estate located on the eastern end of Loch Ossain on Rannoch Moor, West Scotland, covering some 65,000 acres (255km²).

Hydroplan was employed by the estate in 2009 to explore hydropower development potential. Working closely with the client, a 2 phase project was devised that would

Chreagaich Intake

Chamabhreac Intake

Uisge Labhair Powerhouse

Phase 1

Three run-of-river schemes were identified for the first phase of development, with planning consent granted in November 2011 and construction starting in July 2013.

Redevelopment

Chreagaich – with the existing hydro scheme underperforming, Hydroplan designed a complete replacement of this scheme, moving the intake further up the river to double the amount of head and increasing the installed capacity to 100kW. This scheme uses a Gilkes Turgo turbine and was commissioned in December 2015.

Big potential

Chamabhreac – this scheme has a single intake on the Allt Chamabhreac which flows into Loch Treig. This scheme was particularly challenging to develop, not only due to the remote location, but due to the access road crossing under the railway line that serves Courrour Station, one of the most remote stations in the UK. This meant a close working relationship with Network Rail was needed to undertake this scheme. The 1m diameter 1.7km pipeline flows into a stone clad powerhouse, producing 105m of head and 1.39m³/s of flow creating 1.2MW from the Gilkes Turgo turbine, the scheme was commissioned in December 2015.

Uisge Labhair – the powerhouse for this scheme is in full view when visiting the estate house at Corrour. Working with the client Hydroplan designed a building that fitted in with the surrounding buildings and sat naturally in the landscape. The scheme is a single intake, with 1.2km of pipeline creating 72.4m of head and 1.96m³/s flow; this produces 1.2MW Gilkes Francis turbine, the scheme was commissioned in December 2015.

create 3 new schemes and include replacement of an existing scheme, bringing installed capacity for the estate to 5.3MW.

With such a remote location for the proposed schemes, the construction of new access roads and cable routes was considerable and with the environmental impact in mind, Hydroplan designed the routes in such a way, that all 4 schemes would share the infrastructure.

Ghuilbinn Intake

Ghuilbinn - 2.6m Diameter Pipeline

Ghuilbinn manifold

Phase 2

The second phase of development at Corrour saw the estate nearly double the capacity for green energy production from a single scheme. All of the numbers for this scheme are big; planning was consented in September 2014.

Bigger really is better

Ghuilbinn – the fourth scheme developed on the estate has 2 intakes, the main intake on the Ghuilbinn River and a second smaller intake (a March burn with the neighbouring estate) on the Allt Cam. The pipelines used are some of the largest in modern UK hydropower development at 2.6m diameter; with a pipe length of 1.8km and a design flow of 10.225m³/s. The water is then fed into the 4 Gilkes Francis turbines via a bespoke manifold designed using CFD, giving an installed capacity of 2.8MW.

Connecting Energy and Landscapes.

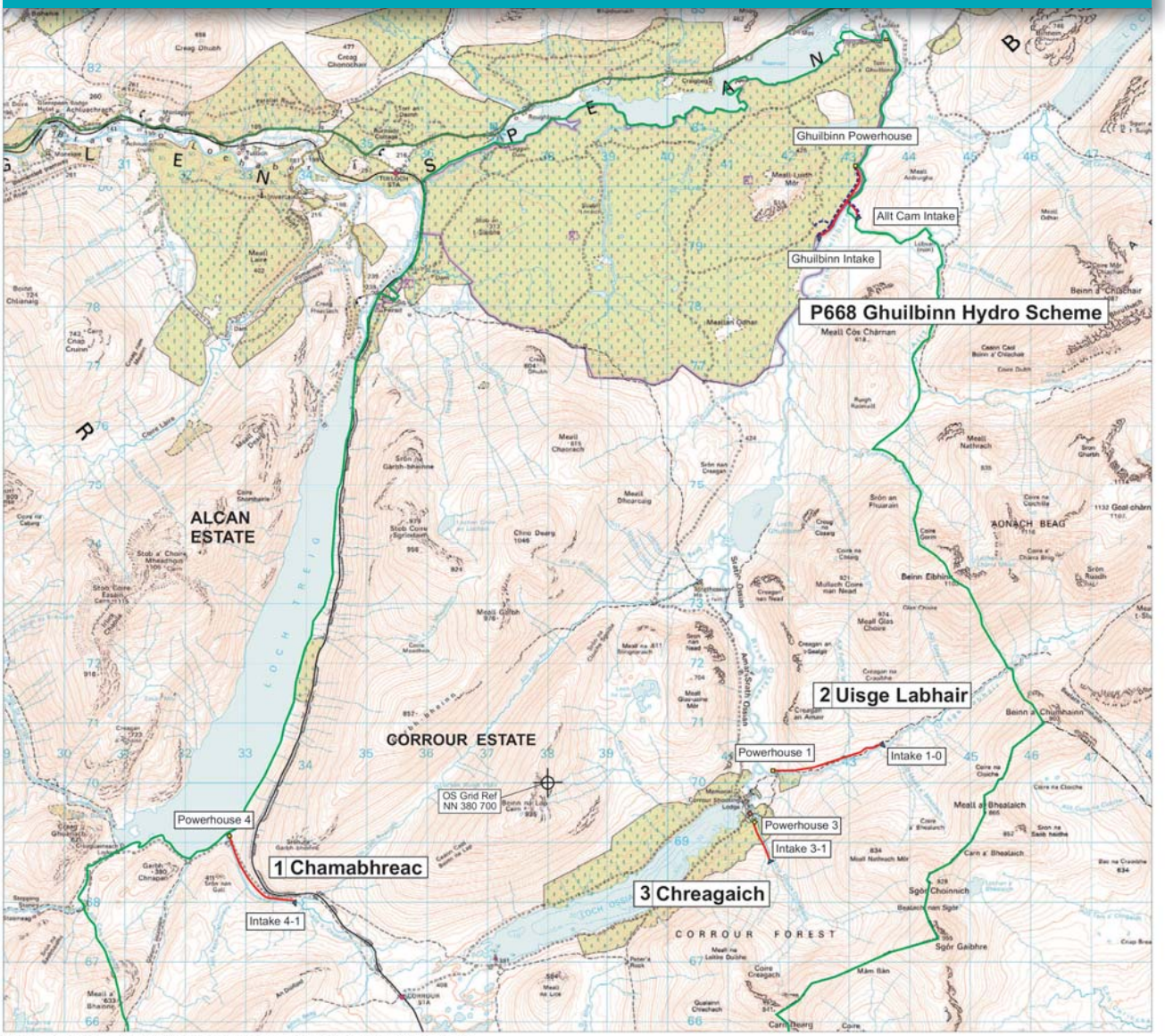
The developments undertaken at Corrour have allowed Hydroplan to work closely with the client, who wanted the schemes to blend into the surroundings, with the careful application during the design stage Hydroplan was able to deliver powerhouses that fit perfectly into their surroundings to form a natural part of the landscape. In order to connect these schemes to the national grid, some 60km of cable have been laid across the estate and 6 sub stations have been constructed. This has allowed electrification of the railway station and youth hostel on the estate for the first time.

With the amount of civil engineering undertaken, access roads and tracks being installed to allow development of the schemes and grid infrastructure, the estate has endeavoured to return the ground to as normal as possible to lessen the impact on the landscape, meaning access roads will be reduced to smaller access tracks giving a network of high-quality walking paths.

Corrour Scheme Statistics

Scheme	Chreagaich	Chamabhreac	Uisge Labhair	Ghuilbinn
Installed Capacity	100kW	1195kW	1195kW	2800kW
Turbine Type	Turgo	Turgo	Francis	Francis
Intake Type	Drop	Drop	Drop	Side
Total Pipe Length	745m	1.7km	1.2km	1.8km
Head	65.5	105	72.4	35
Design Flow m³/s	0.215	1.39	0.215	10.225

Corrour Estate Hydro Schemes



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