LIFEDeeRiver Project

Geomorphological Stage 1 Photo Survey

Horseshoe Falls weir is a designated UNESCO world heritage site that also lies within the Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI) The weir is a large horseshoe shaped structure that abstracts portable and navigation water via the canal, as such removal or modification is not possible.

The weir extends for approximately 145 m across the channel, has a vertical downstream face with a head difference of approximately 1.5 – 2 m. The weir was constructed approximately 200 years ago by Thomas Telford to maintain water levels in the canal.

The weir is a barrier to C gobio, L fluviatillis, L planeri and a partial barrier to S salar. Work on the weirs downstream to improve fish passage under the project for P marinus will result in this weir becoming a barrier to this species. Currently there is no formal fish passage at this structure.

Site address:	Horseshoe Falls, Llangollen, LL20 8BT
Site grid ref:	SJ 19534 43364
Proposed IL of bed at upstream headwall:	94.07mAOD
Proposed IL of bed at downstream headwall:	93.80mAOD
Bypass channel length:	120 metres 60 metres culverted and 60 metres open channel
Gradients:	Culvert 1:223
	Open channel 1:126 changing to 1:100 at the downstream end at chainage ~55 to 71

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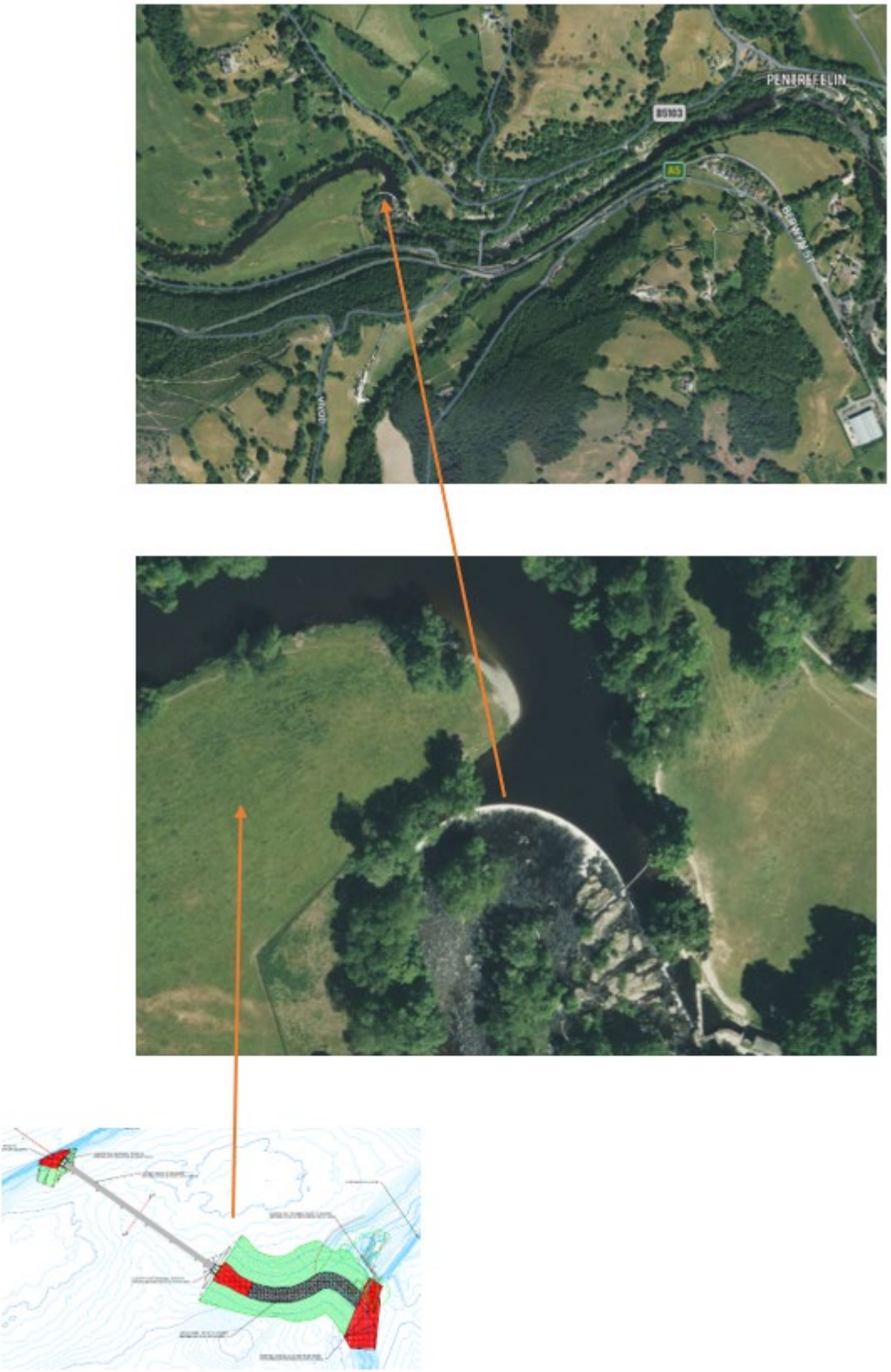

Location of proposed works.

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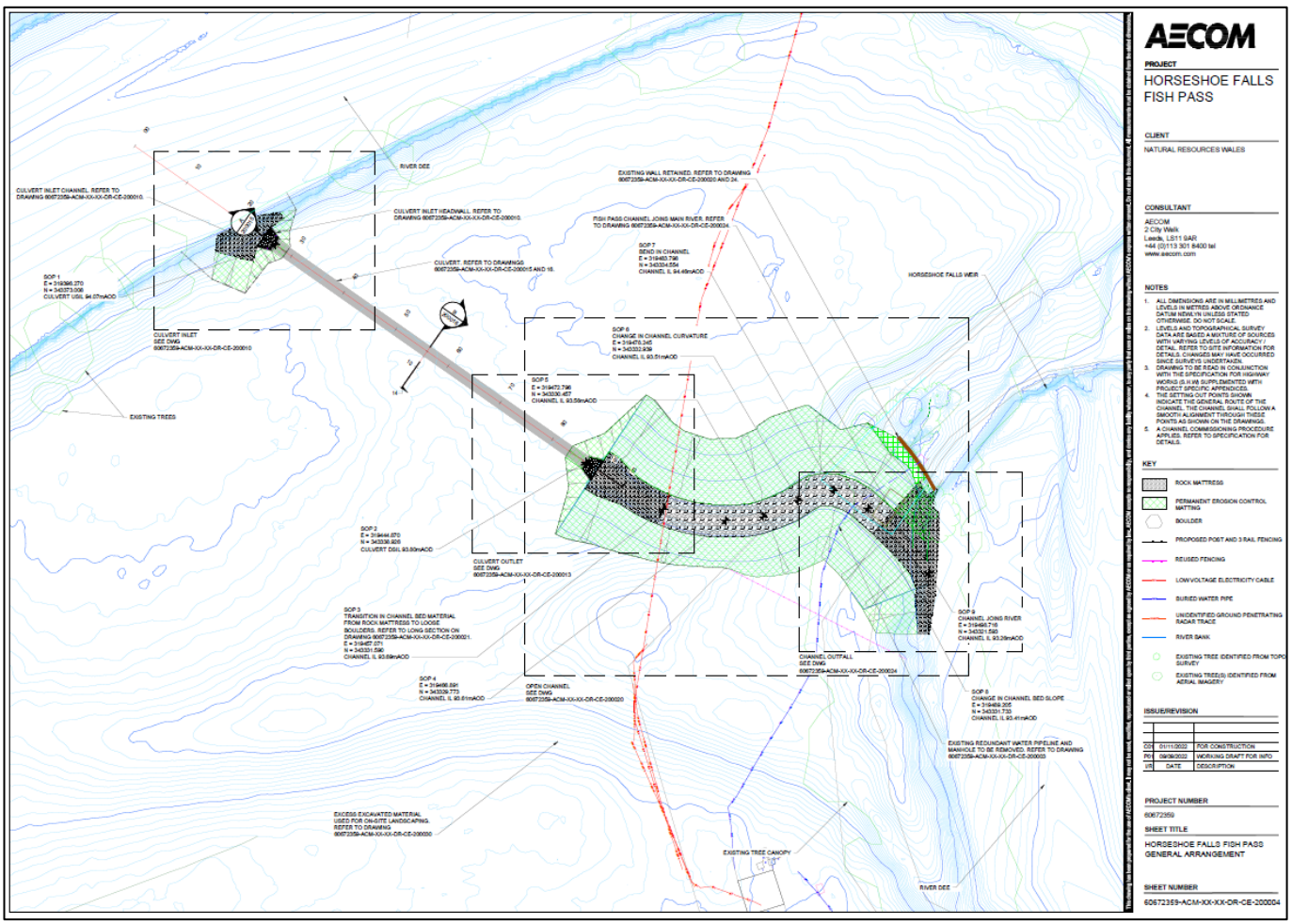
Drone image of the site taken from downstream, looking upstream at the structure and area of land proposed works will cross.



General Arrangement of proposed works

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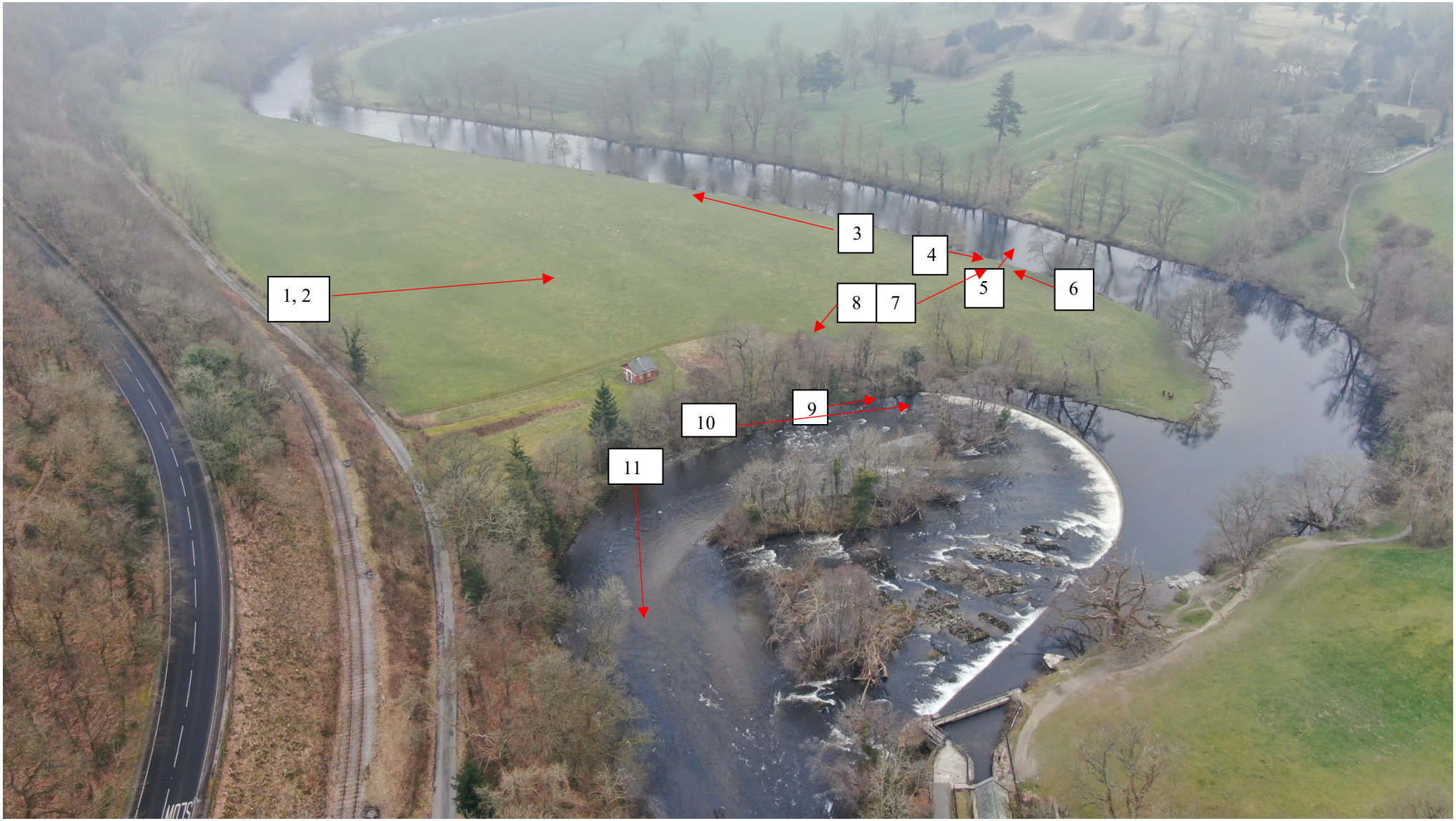
2.2.2 Geomorphology

Geomorphology specialists from AECOM visited the site on 16th-17th July 2020 prior to the outline design work. Refer to the outline design report (AECOM, 2021) for geomorphology assessment and audit information. The site was re-visited on 14th December 2021 to inform the detailed design of the fish bypass channel. As a result, it was concluded that geomorphological risks for the project have been assessed as low throughout baseline, optioneering (section 5), outline design, and detailed design, due to the bedrock typology of the local River Dee. The natural bedrock outcrops forming the Horseshoe Falls weir mean the river has no significant vulnerability to scour or to any localised changes in flow patterns that would be brought about by the fish pass.

Extract from design report following site visits and surveys by AECOM geomorphologist



Location of photos

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Photo 1 looking across field from the south from access gate

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Photo 2 looking across field fromsouth at entrance gate

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Photo 3 looking upstream from the exit of the bypass channel.

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Photo 4 looking downstream at the location of the exit of the bypass channel

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Photo 5 looking at the exit of the bypass channel over where the upstream headwall will be located.

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Photo 6 looking upstream across the exit of the bypass channel

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Photo 7 looking in a northwest direction at the location of the downstream headwall of the culvert towards the exit of the bypass channel

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Photo 8 looking from the downstream headwall over the area the open channel will run towards the entrance of the bypass channel

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Photo 9 looking upstream across the exit of the bypass channel

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Photo 10 looking upstream towards the exit of the bypass channel

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Photo 11 looking downstream of the entrance of the fish pass towards Chainbridge.

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