

Geomorphology survey

River Clywedog – Felin Puleston Weir removal

Basic site information

Address: Weir near to Felin Puleston Outdoor Centre (Erddig), Wrexham LL13 7RF . River Clywedog.

Grid reference of weir: SJ 32565 49299

Elevation of weir crest: 69.8m a.o.d.

The impacted reach following removal will be from SJ 32519 49332 upstream to approximately SJ 32586 49249 downstream, a length of 120m. This reach will be positively impacted, and although the bed slope wont change over the reach, the removal of the weir will create a more natural gradient along its length and allowing the free passage of both species and sediment.

Weir information

Width along crest	10.5m
Wetted width at crest	6.3m
Total hydraulic head	1.1m
Length of structure	0.9m
Type of structure	Stepped weir
Number of steps	3

The following report shows the river Clywedog from approximately 500m downstream, to 500m upstream of the weir. The map on the following page shows where each photo was taken from and the direction of view.

Abbreviations used throughout the captions include

LHB – Left hand bank, looking downstream

RHB – Right hand bank, looking downstream

Where mentioned sediment size refers to

Name	Size
Boulder	>256mm
Cobble	64mm – 256mm
Gravel	2mm – 64mm
Sand	62.5 µm – 2mm
Silt/clay	<62.5µm

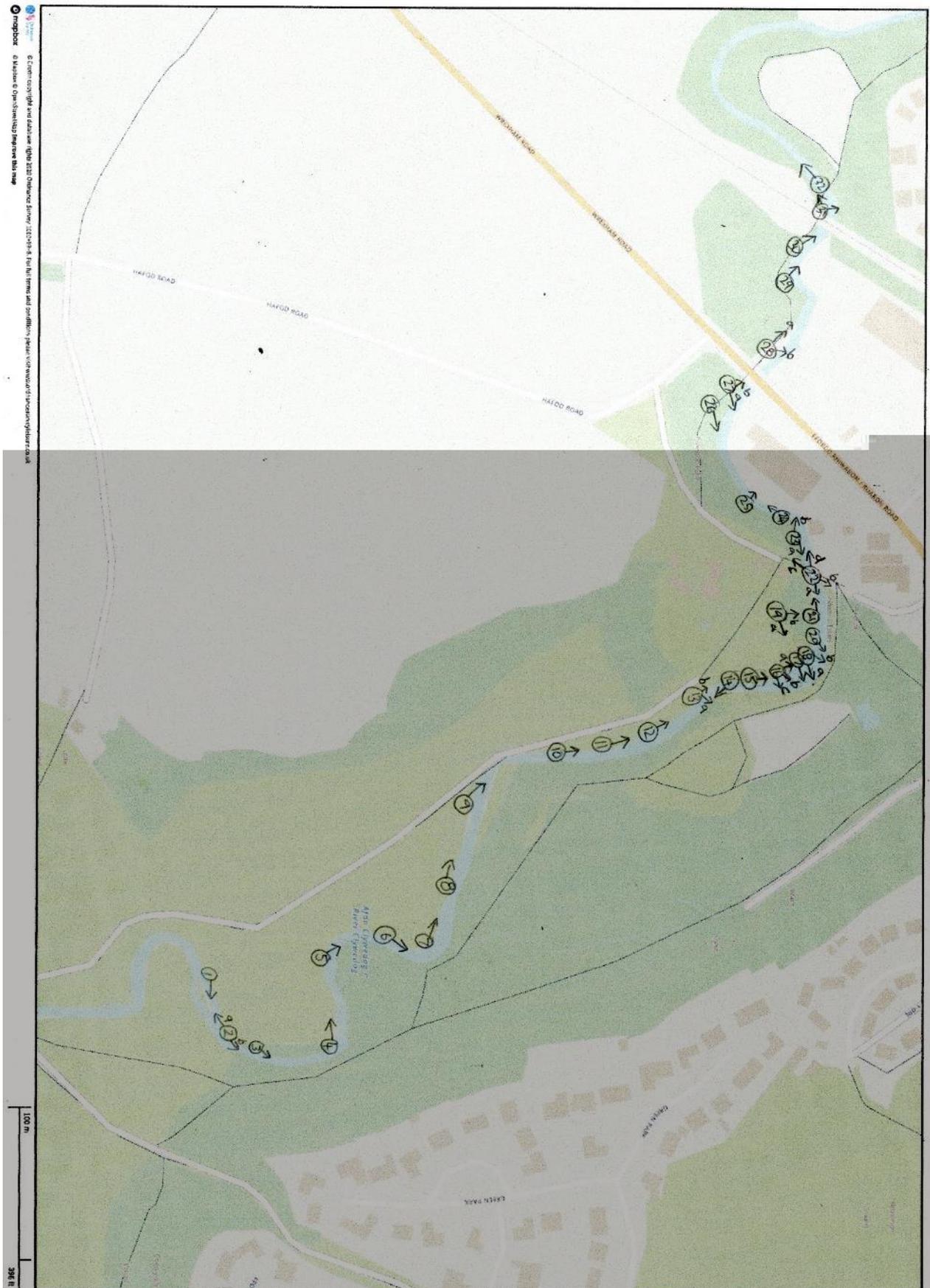


Figure 1 Photo points with directional markers

1 – Vegetated mid-channel bar (gravel with some cobble). Eroding LHB approx. 2m high. Inset of sediment size.



2a – Predominantly gravel bed, with occasional cobbles and finer sediment accumulating on RHB.



2b – Tree and roots interacting with channel on LHB, deep channel beneath roots, accumulation of cobbles on RHB.



3 – Shallow, fast flowing section



4 – Clear evidence of flood flows interacting with historic channel. Gravel and sand bar formed on LHB



5 – Severe active erosion on RHB. Bank majority earth leads to rapid collapse in high flows. Turfs remain in channel and large gravel bar on LHB. Inset RHB 1.6m high.



6 – Deeper, slower section of river with vegetation interacting with channel on LHB, gravel bar formed on RHB. Inset channel sediment size -gravel



7 – Riffle section with more cobbles, gravel bar formed on RHB



8 – Backwater in historic channel with willow growth. Bar formed of range of sediment, majority gravel with cobble and sand. Inset sediment size on bar



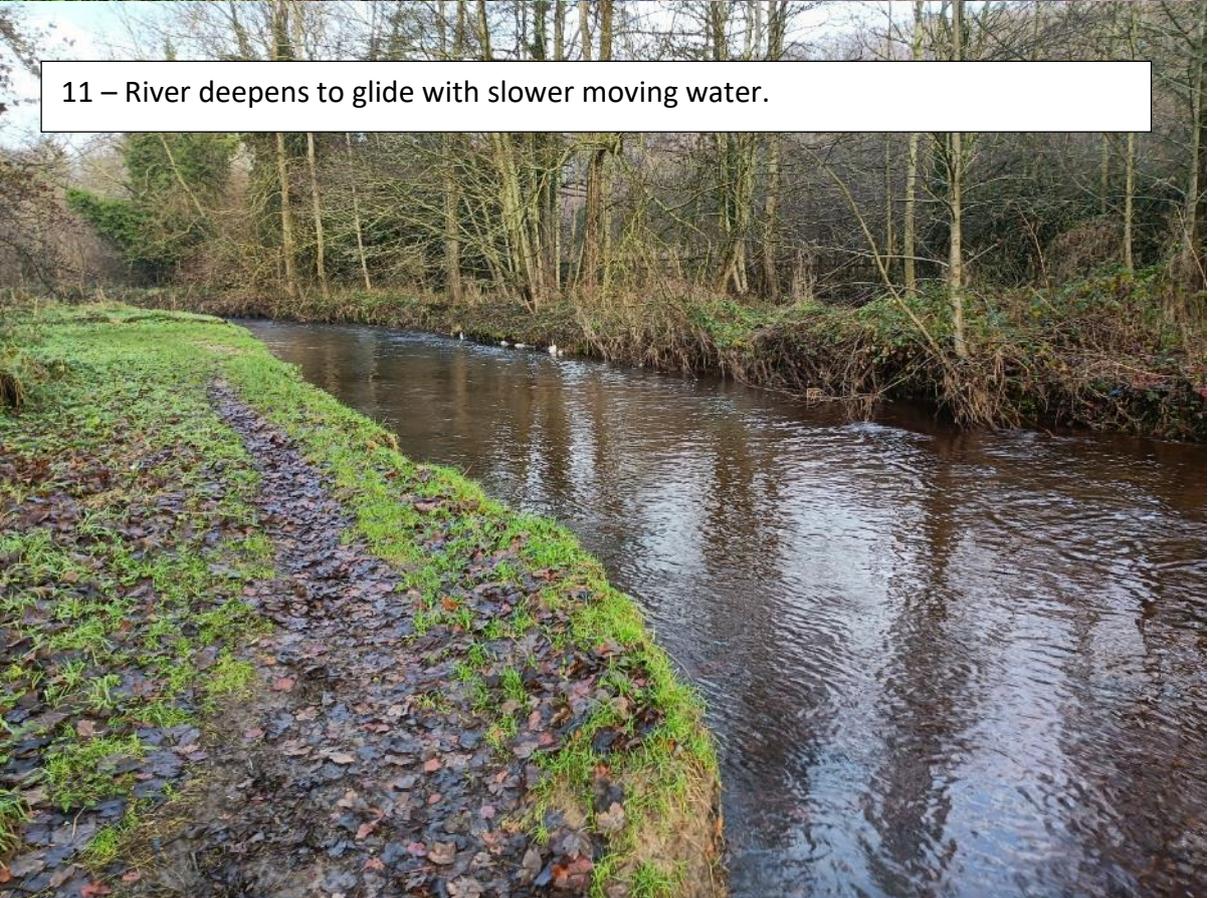
9 – Severe active erosion on RHB where earth bank rapidly eroding to channel. Large gravel bar on LHB and turfs remaining in channel. Inset RHB height 1m



10 – Shallow riffle section with cobble bed.



11 – River deepens to glide with slower moving water.



12 – Riffle run section



13a – Collapsed gabion baskets on LHB



13b – High bank with failing gabion baskets on RHB



14 – View of failed gabions on LHB and tree interacting with channel on RHB



15 – Section downstream of weir generally narrow channel. Willow and large woody material in channel on RHB



16a – RHB of weir. Severe erosion around concrete weir structure



16b – LHB of weir. Tree growth in channel restricting flow to LHB and failing gabions along LHB.



16c – Mid channel gravel cobble bar formed below weir and plunge pool, creating fast flow toward RHB



17 – Across top of concrete weir, finer sediment held behind crest



18a – Large blockstone and gabion revetment on LHB above weir



18b – Failing gabion revetment on LHB. Comparatively deep and slow water



19a – Floodplain showing residue from recent flood



19b – Floodplain showing sediment deposition from recent flood



20 – Large woody material accumulation in channel and failing gabions on LHB.



21 – Riffle section, cobble/gravel substrate. In lower flows central bar formed.



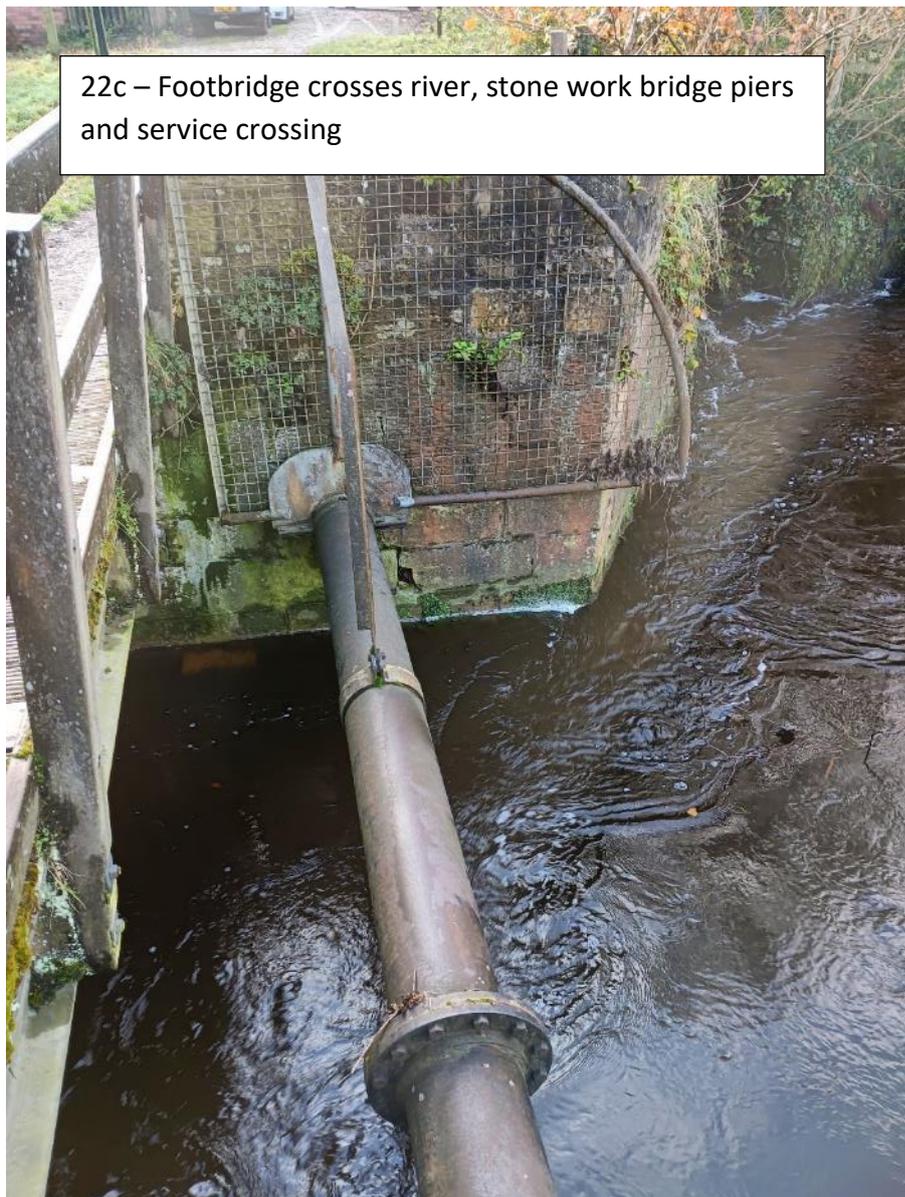
22a – Riffle section, cobble/gravel substrate. In lower flows central bar formed.



22b – Footbridge crosses river, stone work bridge piers and tree growth



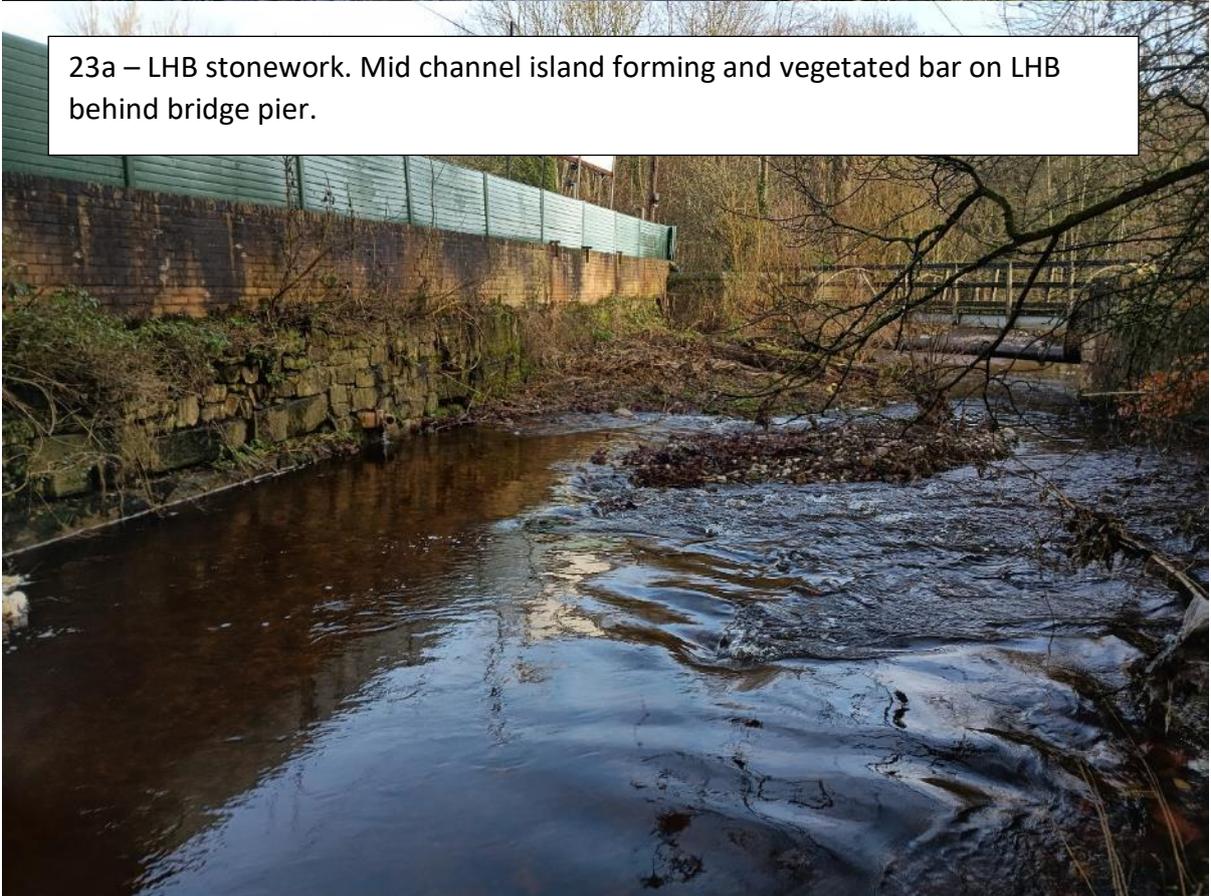
22c – Footbridge crosses river, stone work bridge piers and service crossing



22d – LHB stonework and blockwork. Mid channel island forming with riffle and vegetated bar on LHB by bridge pier.



23a – LHB stonework. Mid channel island forming and vegetated bar on LHB behind bridge pier.



23b – LHB brickwork and failed stonework and gabions protecting industrial estate. River fairly deep and slow



24 – LHB brickwork and gabions protecting industrial estate. RHB is not reinforced. Channel along this section narrower than downstream of weir



25 – LHB gabions protecting industrial estate with historic channel narrowing.
RHB is not reinforced



26 – Steep earth RHB. Large gabion wall on LHB, some collapsing mid picture.
Some sediment deposition on LHB.



27a – Steep earth RHB. Large gabion wall on LHB. Some sediment deposition and vegetation growth on LHB.



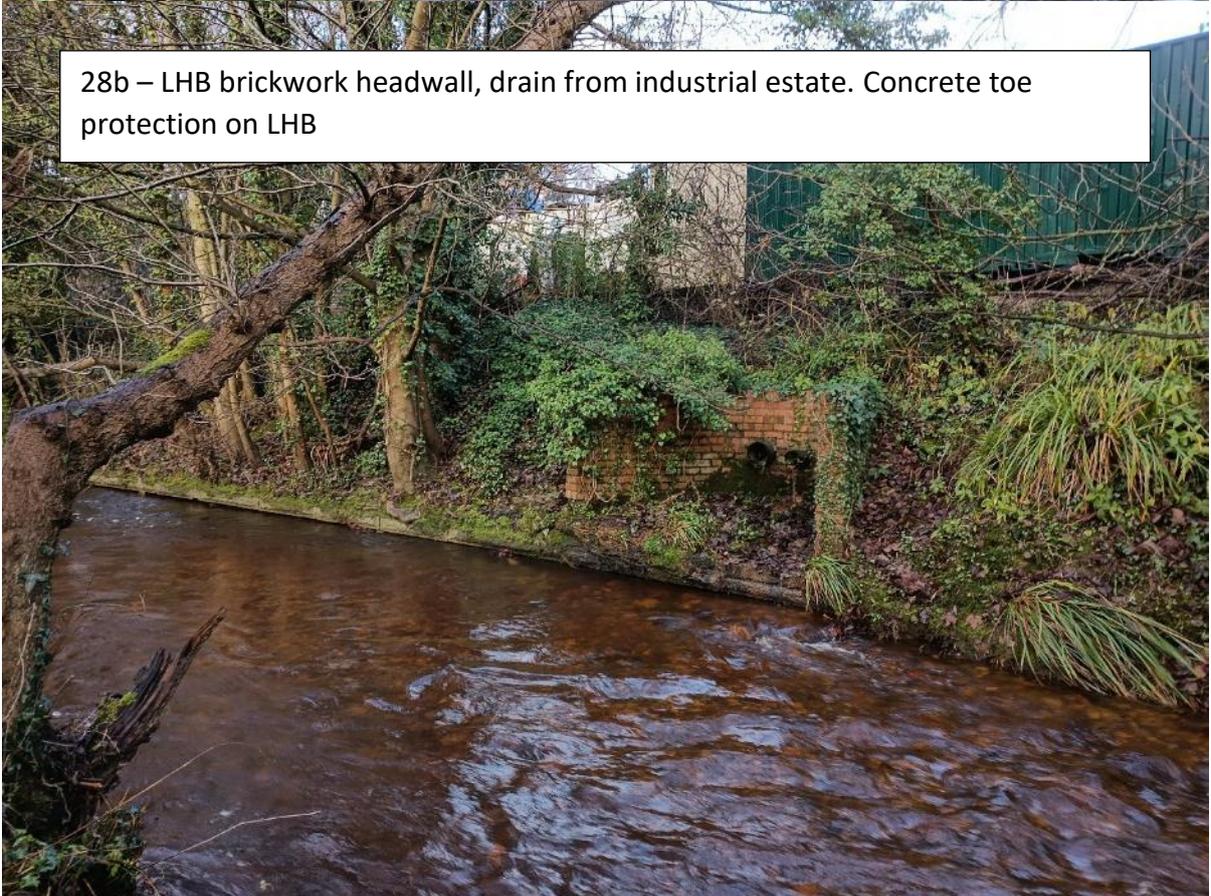
27b – Channel widens through road bridge. Shallow riffle section



28a – LHB brickwork and concrete reinforcement, riffle section with cobble bed, inflow from wet woodland on RHB



28b – LHB brickwork headwall, drain from industrial estate. Concrete toe protection on LHB



29 – Riffle section with cobble gravel bed, recent deposition of large sediment on RHB, gravel bar on LHB. Some willow revetment on RHB.



30 – Riffle section with cobble gravel bed, beneath railway bridge. LHB and bridge protected with brickwork.



31a – RHB concrete beneath railway bridge, footbridge leading off. Less protection on LHB until bridge pier. Deep section



31b – Brickwork railway bridge pier and stonework bank revetment on LHB





32 – RHB stonework revetment upstream of footbridge, then more natural channel. LHB unprotected, vegetation interacting with channel.