

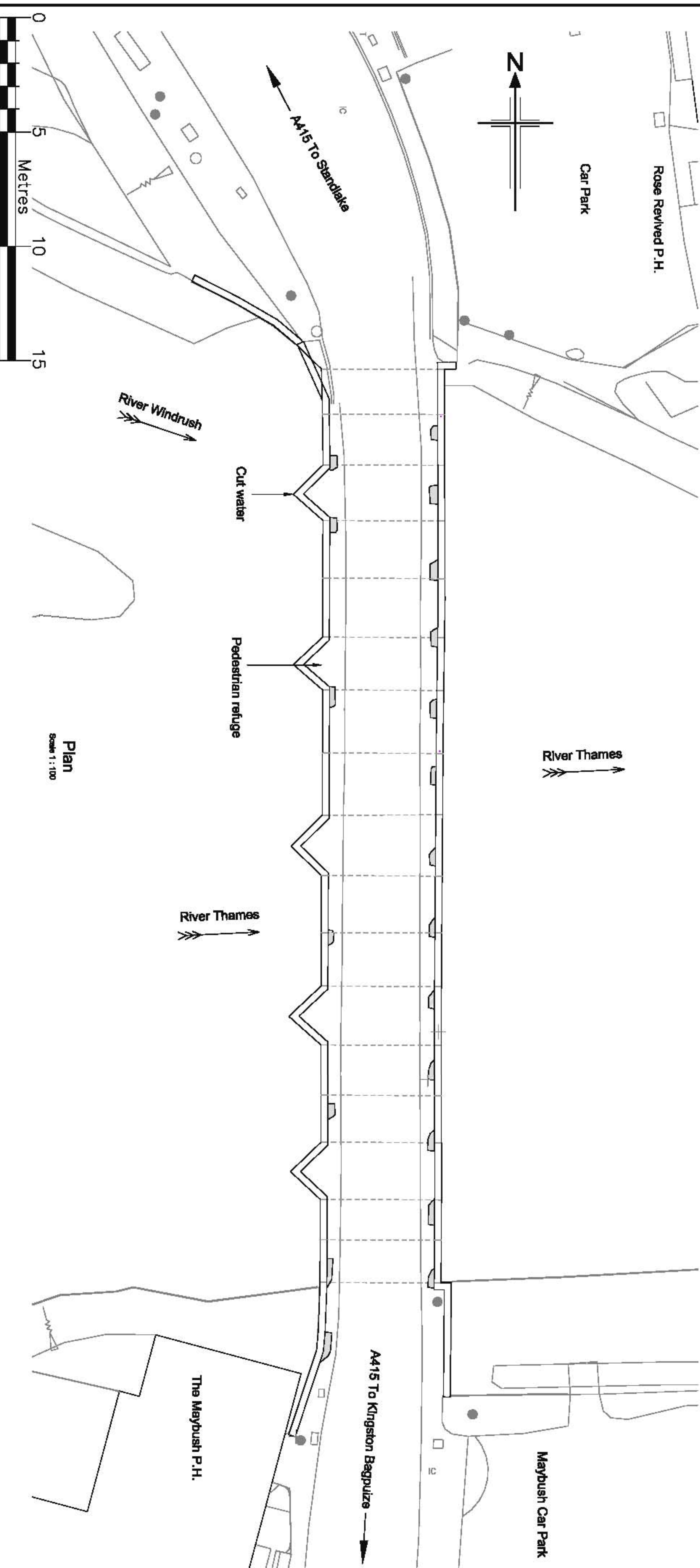
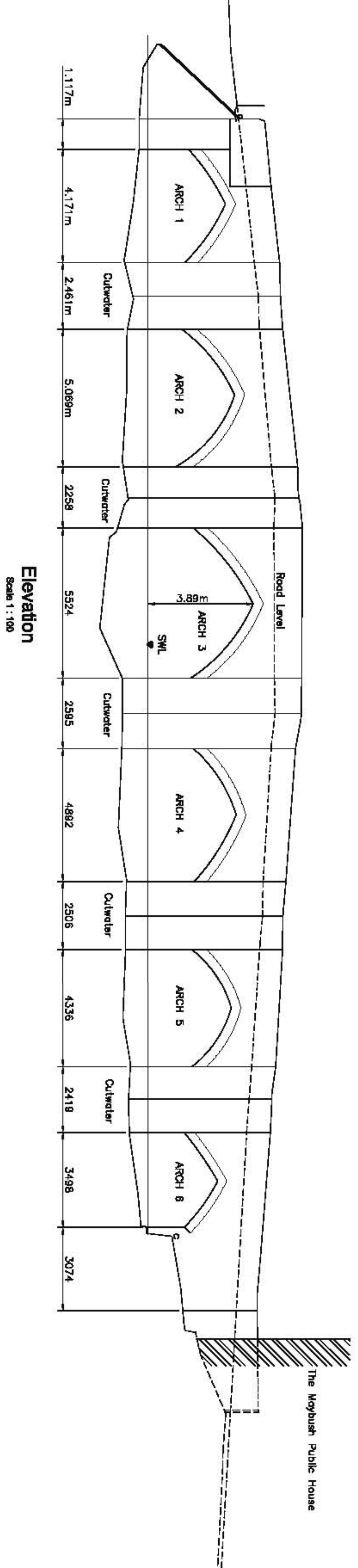
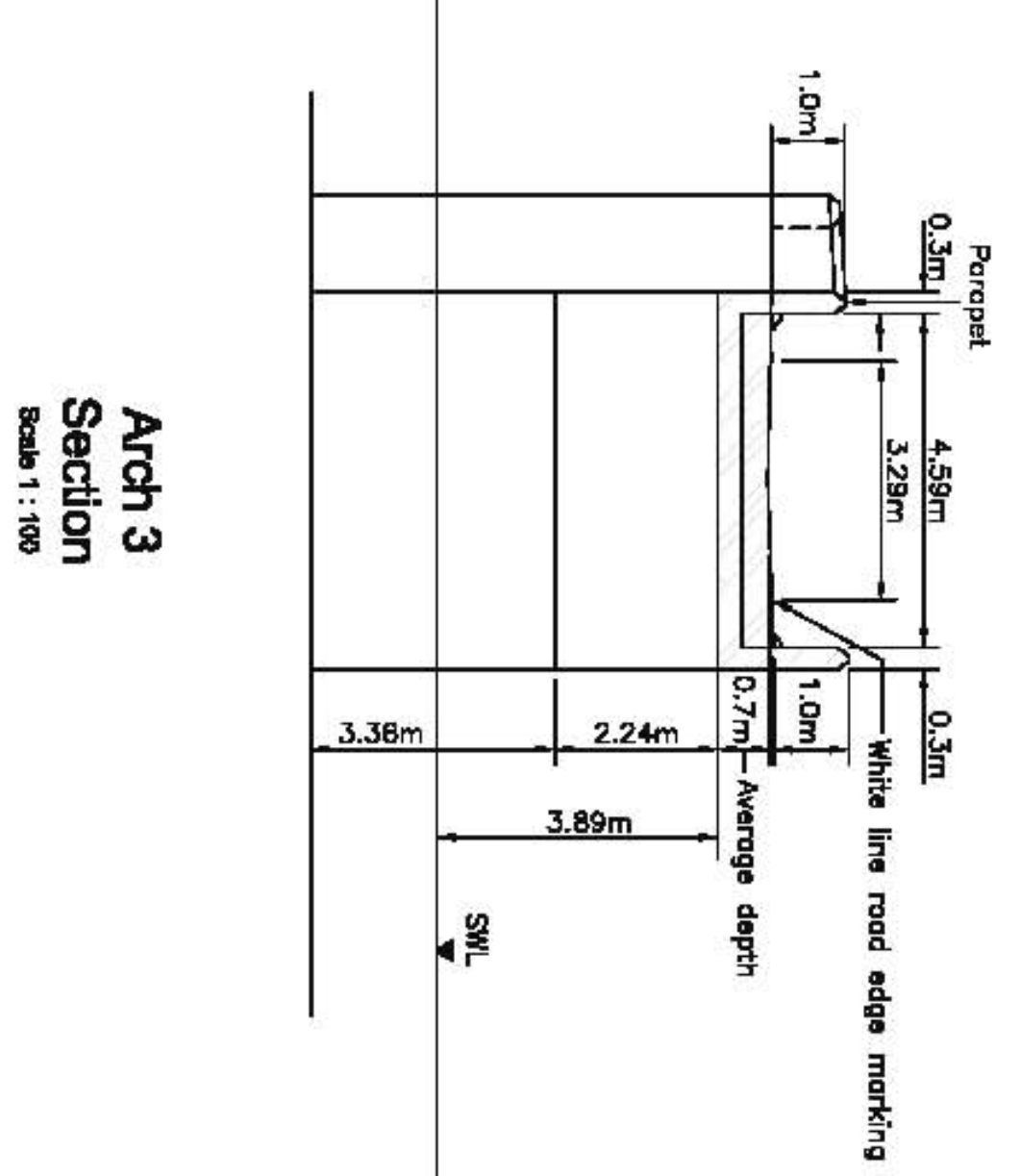
Arch Strength Assessment

The assessed capacity is the calculated long term safe load carrying capacity based on what is known about the structure of the bridge.

Where information is missing and cannot readily be obtained conservative assumptions are made in calculating this capacity. The individual arch strengths of Newbridge have been assessed and the assessment results are as follows:

Assessed permitted gross vehicle weights
Arch 1 30tonnes
Arch 2 30tonnes
Arch 3 Nil
Arch 4 13 tonnes
Arch 5 13 tonnes
Arch 6 13 tonnes

These results show that span 3 is the weakest span and that theoretically Newbridge should not be expected to carry any traffic loading at all long term.



Parapet Strength Assessment

The strength of Newbridge's parapets have also been assessed and have been found to be weak, not providing the minimum capacity required to contain even light vehicles travelling at 30mph.

Further Shortcomings of Newbridge

Newbridge's parapets are hit and damaged by vehicles quite regularly as can be seen in the photographs included on this panel. At the north-west corner of the bridge the parapet has been splayed back to reduce the number of times it is struck, but this area is still regularly damaged as can be seen by the cracks in the stonework in the photo centre right.

The frequency of parapet impacts is no doubt partly due to the poor horizontal alignment of the A415 approach from the north, and also partly due to the narrow width of Newbridge. In addition Newbridge has a humped-backed vertical profile that causes the underside of some long vehicles to ground on the crest of the bridge.

Users of the Thames Path National Trail and all other pedestrians who wish to cross the River Thames here must share the A415 carriageway with traffic as Newbridge is too narrow to provide a segregated raised pedestrian footway.

Scheduled Ancient Monument Status

Newbridge's obvious historic value and Scheduled Ancient Monument status means the options available to us to address its structural and physical shortcomings are far more restricted than for a less historic bridge. The basic conservation principle for managing any Scheduled Ancient Monument is that one should not interfere with its internal or external original fabric unless there is absolutely no alternative.

Current Restrictions

We are currently still permitting traffic to use Newbridge and have implemented an 18 tonne maximum weight (MGW) limit as an interim measure. Newbridge's continued use by traffic above its assessed capacity is currently still being permitted on the understanding that:

- Newbridge has been carrying unrestricted A415 traffic (i.e. including a full range of HGV's) prior to the 18 tonne weight restriction being imposed.
- The 18 tonne MGW limit will significantly reduce the number of the heaviest HGV's using the bridge.
- Arch failure mechanisms are not sudden occurrences and therefore cracking and surface deformation would become apparent before any catastrophic collapse.

As well as more frequent physical inspections, remote crack and tilt monitoring equipment has been temporarily installed in various positions on the bridge which report via an internet based system every 24 hours. This remote monitoring and inspection regime has been in operation since March 2008 and currently has not yet identified any movements sufficient to cause concern or require the 18 tonne weight limit to be lowered any further.

Possible Future Restrictions Required

It is inevitable that Newbridge will continue to deteriorate due to the actions of vehicle loading, vibration, accidental impacts with the parapets, long vehicles grounding and the weather.

Any further significant movement detected may require the immediate imposition of a lower weight limit restriction, to either 7.5 tonnes, 3 tonnes or even a complete closure of the A415.

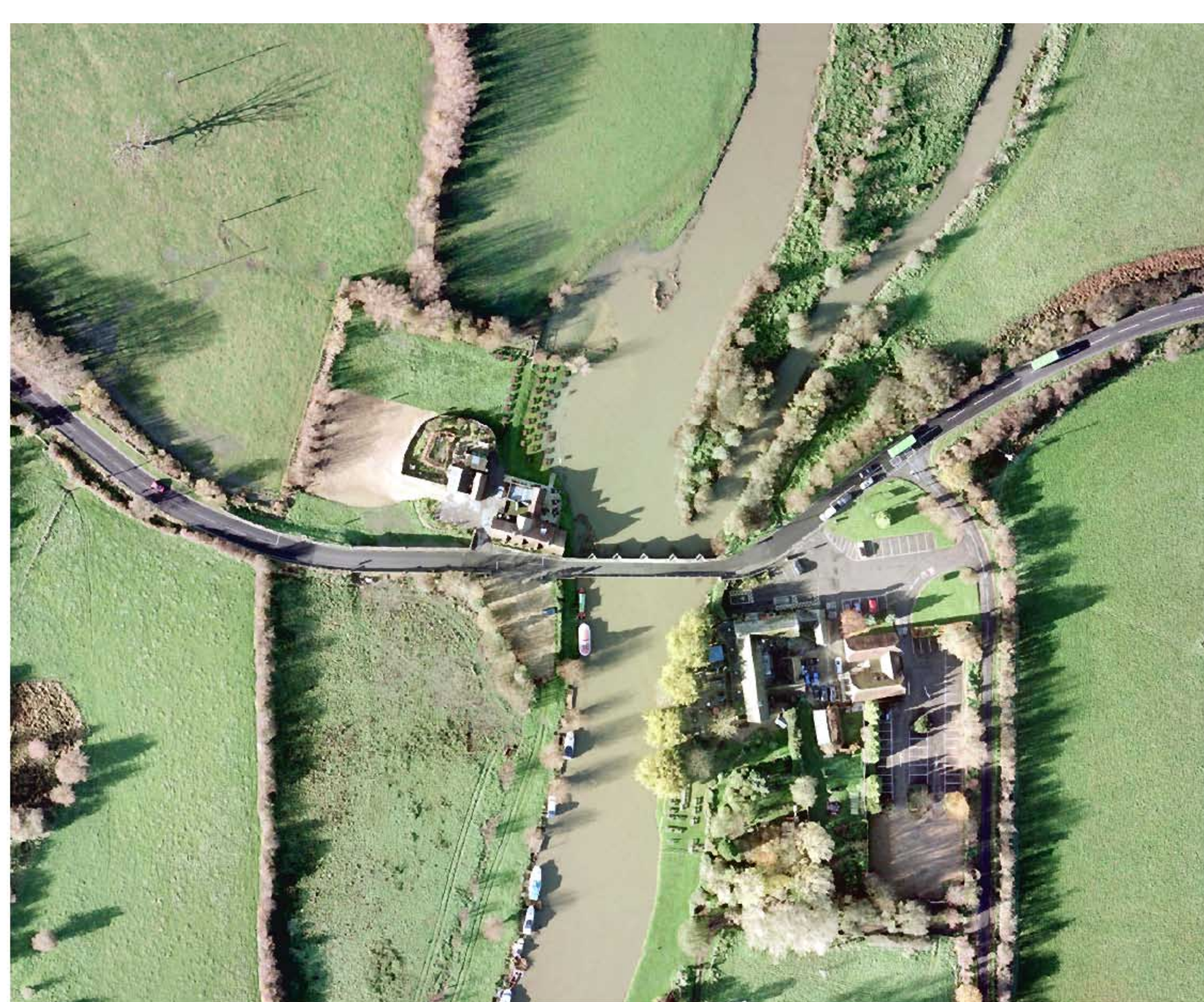
Vehicle Impact Damage to Parapets - 1



Vehicle Impact Damage to Parapets - 2



Aerial Photograph of Newbridge showing the sharp bend on the A415 immediately to the north of Newbridge



Vehicle Impact Damage to Parapets - 3



One of the electronic devices used to monitor movement of structure



Problems with Newbridge