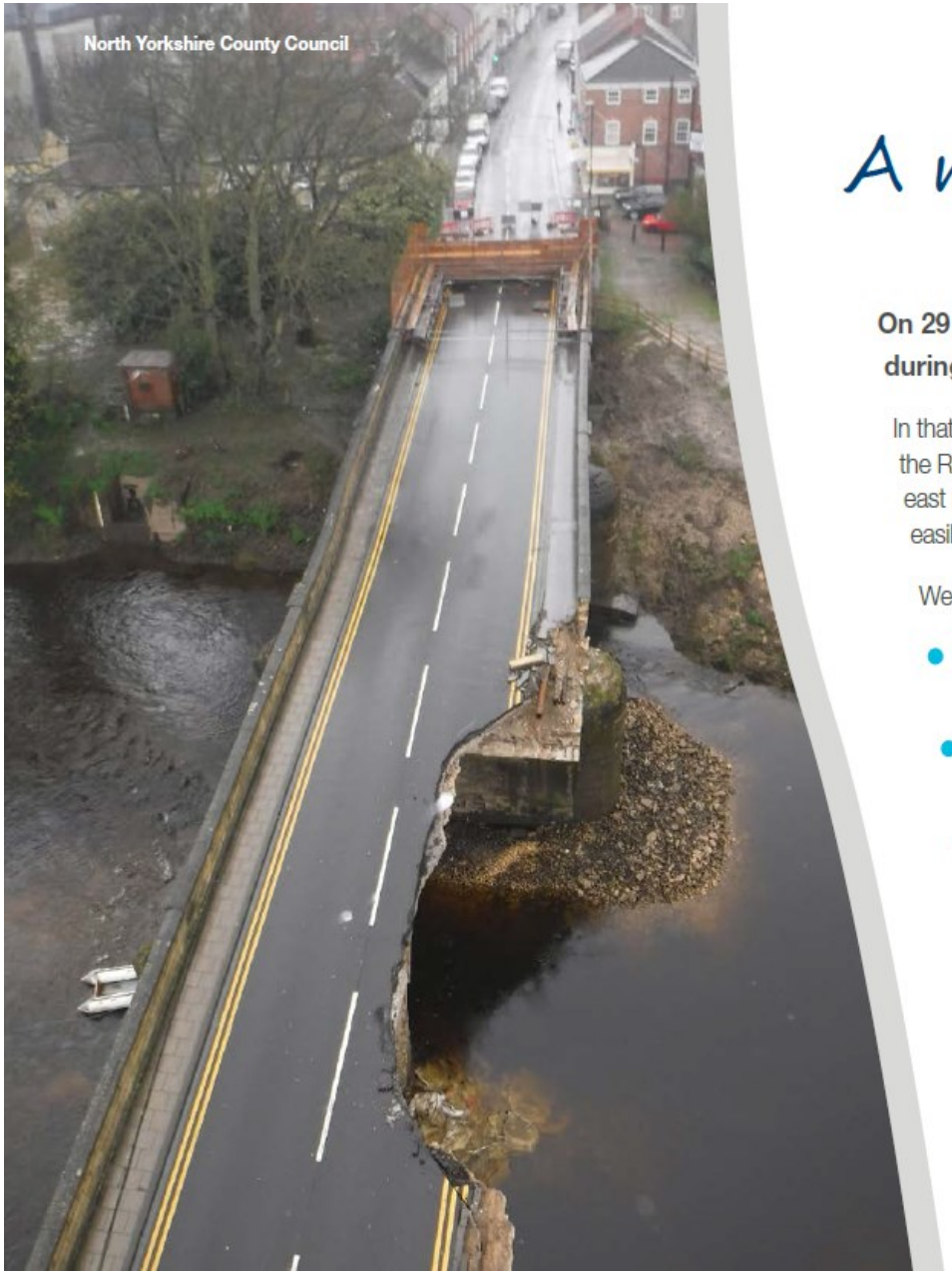
North Yorkshire County Council

THE REPAIR OF TADCASTER BRIDGE DAMAGED BY FLOOD WATER BOXING DAY 2015

The River Wharfe had been swollen since September this photograph is dated29/09/2015


North Yorkshire County Council

A moment of disaster

On 29 December 2015, Tadcaster Bridge collapsed during flooding caused by Storm Eva.

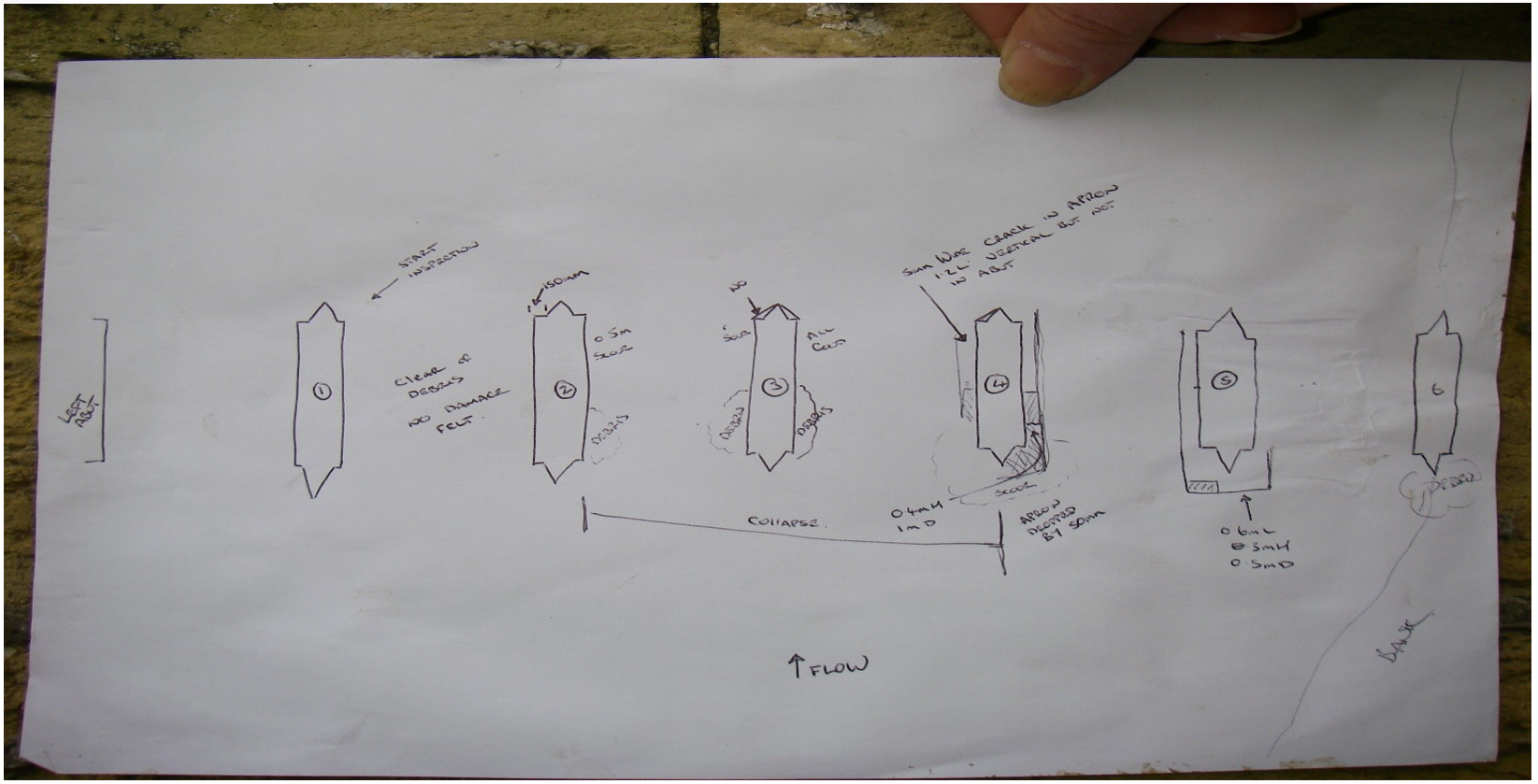
In that moment, as a large section of the 300-year-old listed structure fell into the River Wharfe, the historic brewery town of Tadcaster was split in half, the east and west separated. Families were divided. Suddenly, people could not easily travel from their homes to their work or to shops or to see their GP.

We knew we had to reunite the community and we acted immediately.

- A shuttle bus to take passengers from one side of the River Wharfe to the other was put in place.
- Within days, improvements had been made to a viaduct across the Wharfe to maintain a pedestrian crossing.
- Before long a new temporary footbridge was erected to give the people of Tadcaster a proper pedestrian crossing.
- And all this time plans were taking shape to repair – and even improve – the devastated road bridge.

- It rained quiet heavily throughout November and December and on Boxing Day 2015 the bridge partially collapsed due to the scour of pier number 3 in the main river flow.

- The collapse of the pier stripped the support of the two arches back to the downstream side of the bridge which remained intact, but we did not know if the pier in the photo was undermined. So we sent in the divers when the water levels dropped to carry out an inspection



- Divers sketch of the damage before the formal report was written it confirmed the reason for the collapse and identified areas of the other piers which had been affected by scour.

- We had meeting with the Minster for Transport and the Dft on the 5th of January 2016 and it was agreed that we could save the bridge and that they would provide £ 3million for the repair of the bridge.
- Plus, £300,000 for the provision of a temporary footbridge over the River Warfe to reconnect the areas of the town due to the closure of the bridge.

- Piece of Cake it will all be over by Christmas

- So we turned this into,

- The complete elevation.

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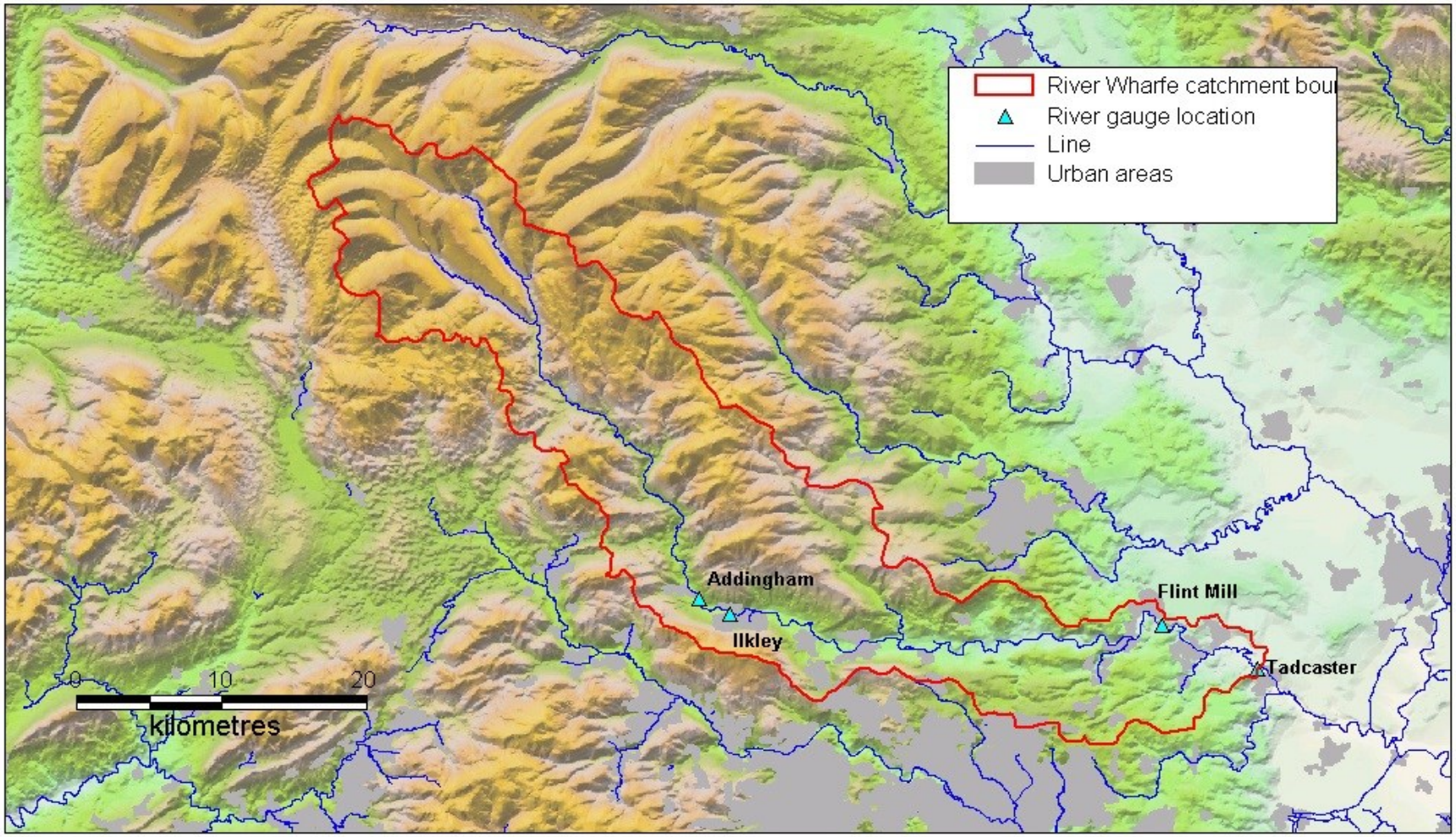
- Immediately after the flood receded we commissioned a hydrology report and a study of the river.
- We needed to confirm how the bridge had been damaged so that we could decide how to protect the bridge in future events.
- JBA Consultants produced a report and modelled the river flow around the bridge.
- Contrary to the general mood of the time the bridge was not the dam in the river.

- The design process;
- Provided a Temporary footbridge with a single span of 67 metres complete with piled foundations.
- We ordered ground investigation for the river to identify the ground conditions for the new pier foundation.
- Found the matching stone and arranged for it to be quarried and cut to shape for the pier and the arches.
- Designed the new pier base and its piles.
- Design the cofferdams which protect the structure from future scour.

- The river downstream was naturally backing up and forming a standing wave which was acting of a wall of water causing the water travelling down the river to crash into it and tumble.
- This is a similar action to the one you can see at the beach the surf rises because of the energy from the out going wave causing it to rise, here we have the reverse, high speed water is forced downward eating into the river bed.



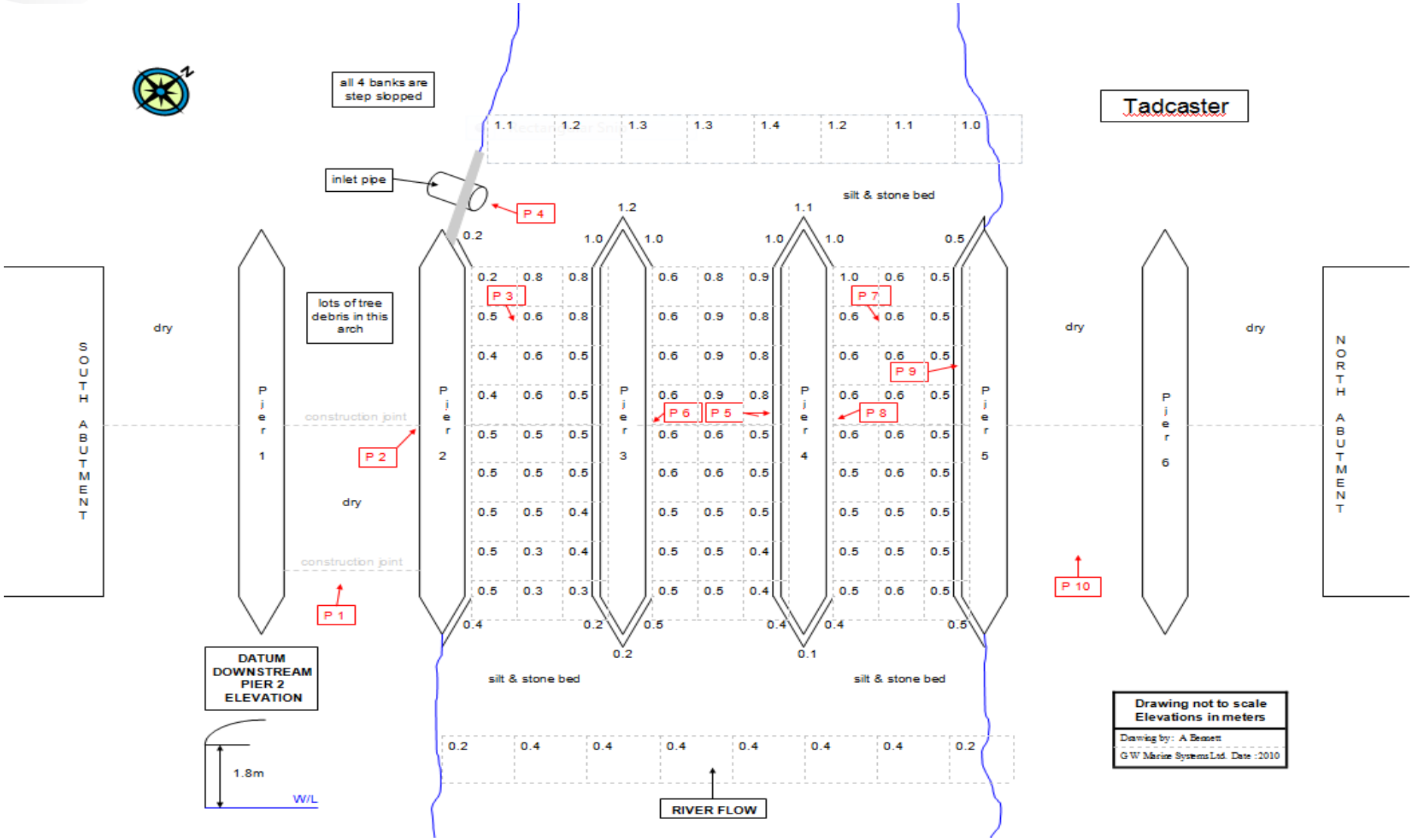
The River Wharfe catchment area

In Yorkshire this heavy rainfall caused river flows which were unprecedented in the gauged records. On the River Wharfe, the gauging stations at Flint Mill (80 years of record) and Tadcaster (25 years of record) both recorded their highest ever flow and volume. At the upstream station Addingham (43 years of record), the flow was the fifth highest ever recorded. Table 2-1 summarises information about the December 2015 flood on the Wharfe.

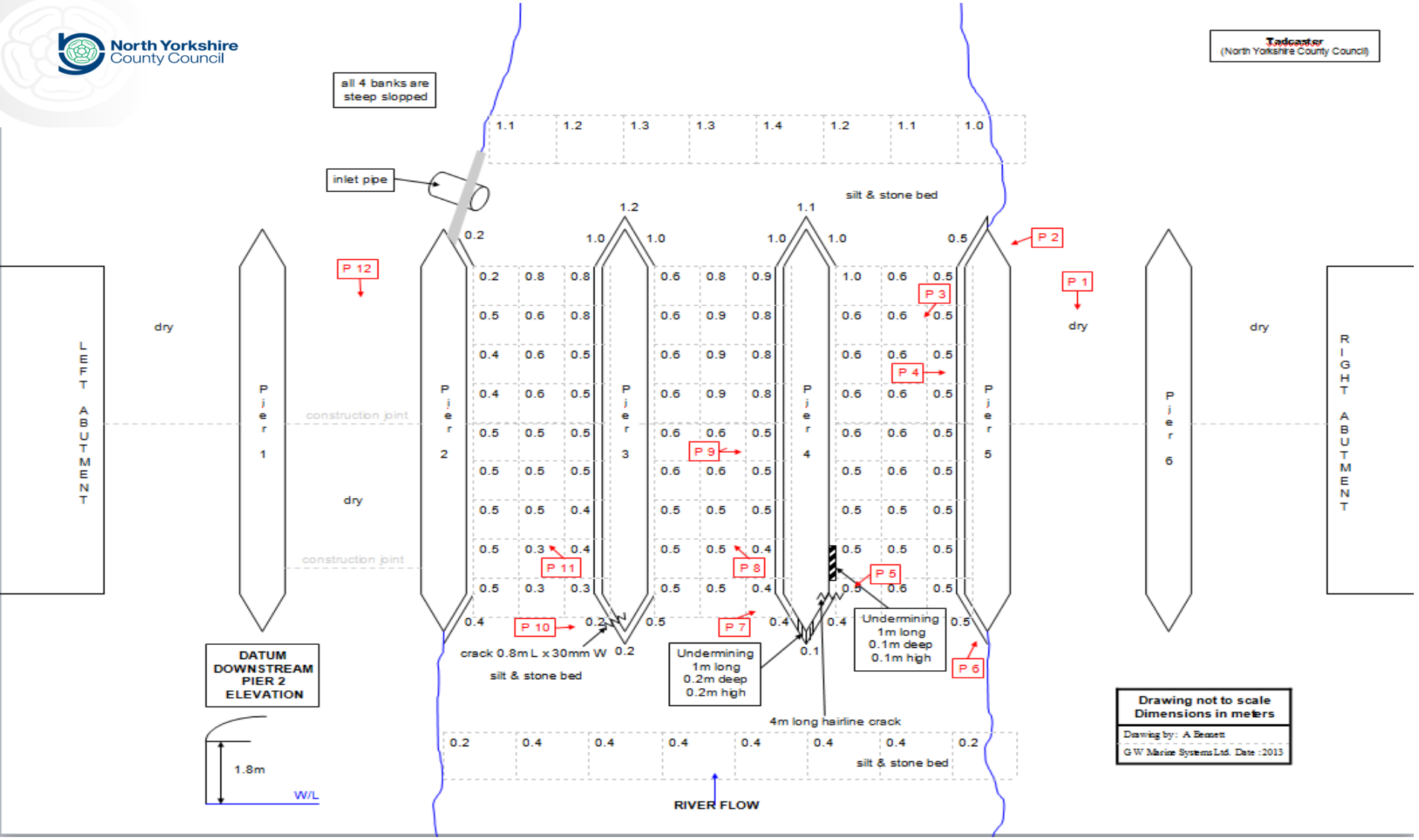
Considering the records of gauged floods, the December 2015 event appears to have been more severe in the lower catchment, where it was by far the largest event.

Gauging station	Peak flow	Hydrograph volume	Largest recorded event?
Addingham	386 m3/s	48.4 M m3	No, 5th largest (1982 overall largest)
Flint Mill	582 m3/s	80.8 M m3	Yes
Tadcaster	547 m3/s	83.2 M m3	Yes

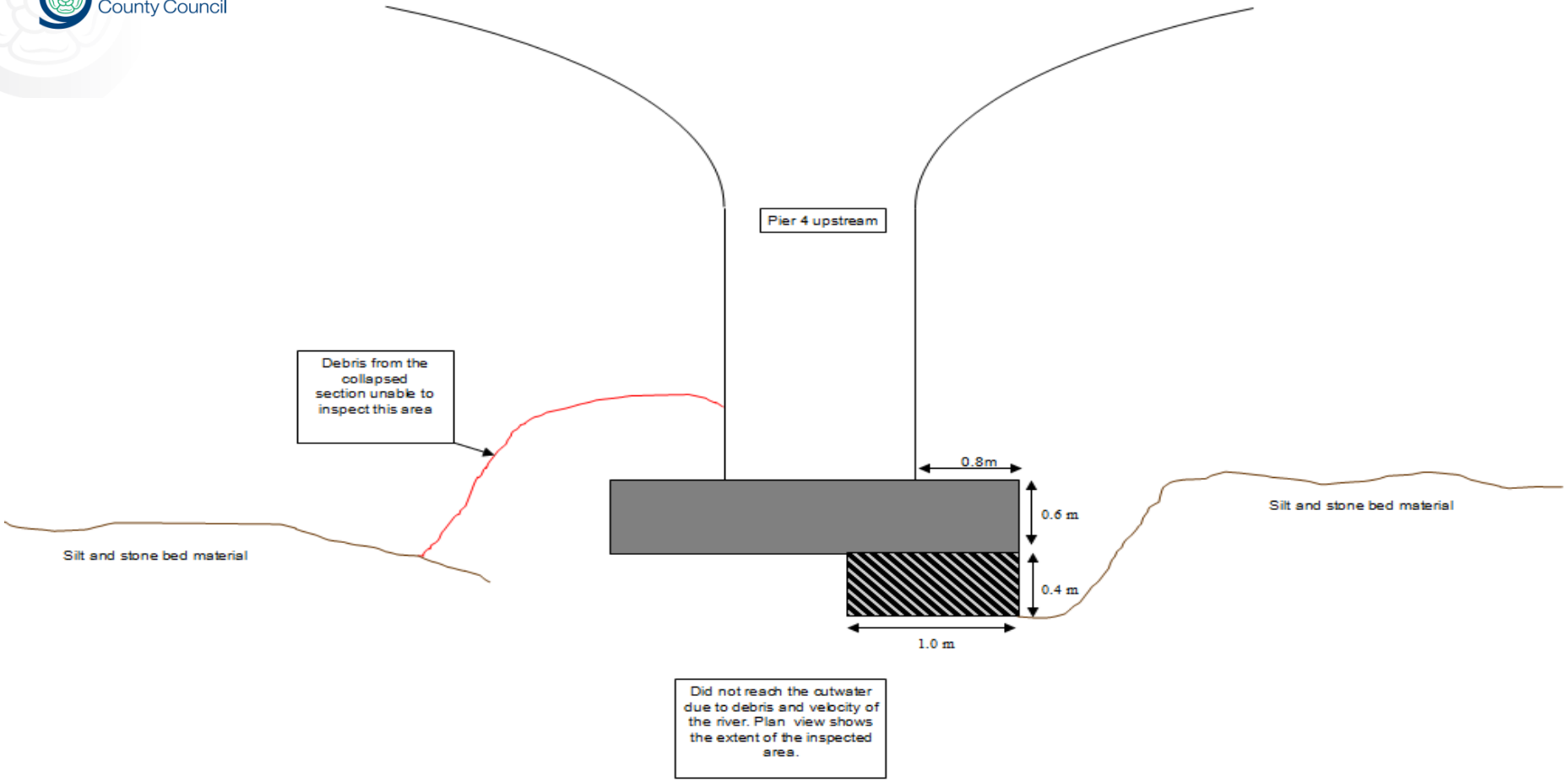
From JBA Report 2016



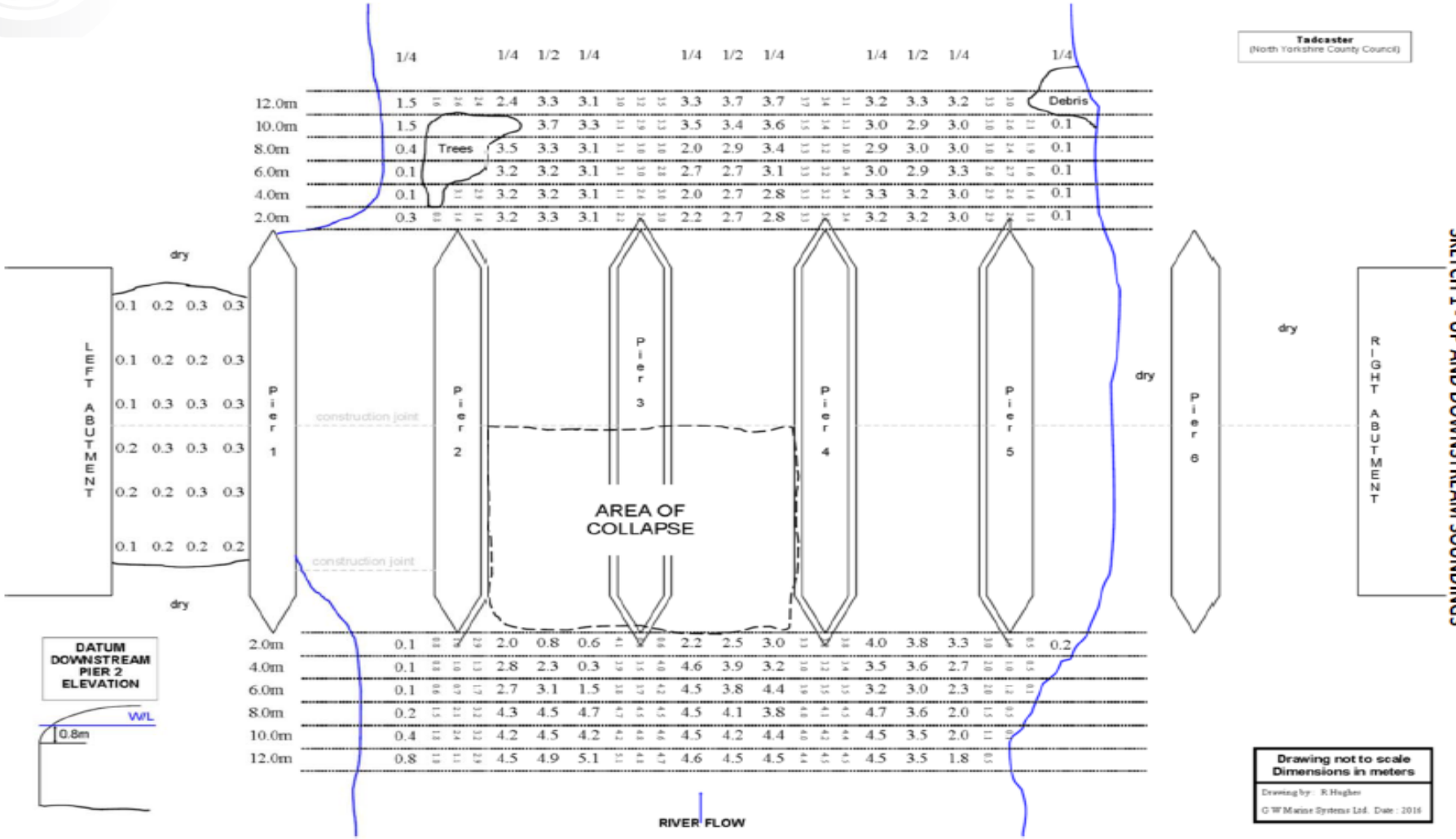
- Divers Survey 30th of December 2010



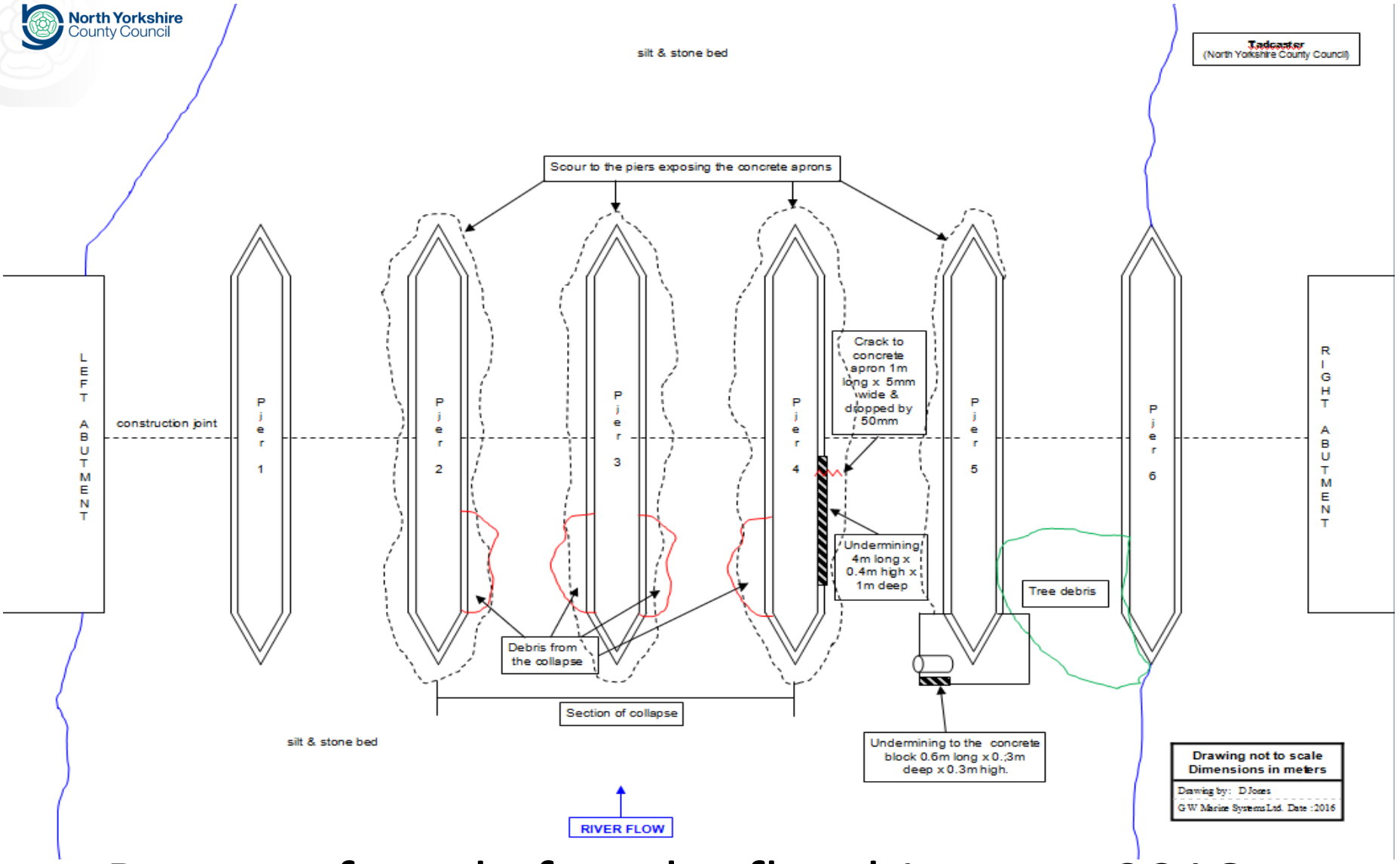
- Damage and invert depths 2013



- Damage to Pier 4 December 2015



Soundings taken by the divers after the flood January 2016.



- Damage found after the flood January 2016

- Designed the widening of the structure.
- Applied for List Consent and Planning Consent.
- Project managed the rebuilding of the bridge.
- Designed precast concrete slabs to form the cantilever when delays due to river levels and masonry supply left no time for the convention slab to be used.

- Into this and added a cantilever which allows two 1.8 m wide footpaths and a 7.3m carriageway over the bridge.


SELWOOD

- Rebuilding the arches.

- Laying the precast slabs to form the cantilever.

- Before the widening the bridge looked like this.

- The completed carriage way before the centre line marking were placed.

Some of the facts and what did the works cost;

- 1000 tonnes of stone was quarried.
- 1342 stones were cut.
- Repairing the original bridge £3.9 million.
- The cantilevered footway cost £1.5 million.
- From the beginning of February 2016 we took twelve months to get the road reopened, 2.5 months were lost to high river levels.

A single voice of truth

Media interest, locally and nationally, was huge from the moment of the collapse and throughout the rebuilding. We did everything you would expect: regular press releases, sometimes on an almost daily basis; dozens of television and radio interviews; on-going social media and website updates.

But in a self-contained, tightly knit community like Tadcaster we knew we needed to do more.

Work on the rebuilding project was moving quickly, with every agency pulling out all the stops, but initially there was not a lot of activity to be seen on the bridge. Before the practical repairs could start, we needed to survey the damage, establish why it happened, design improvements, gain funding for repairs and for widening the bridge to improve pedestrian access, and gain the required planning permission and Environment Agency approval.

In fact, under normal circumstances a project of this nature would have taken twice as long, but when it's your town that's split in half the repairs can't happen quickly enough.

In the light of an apparent lack of action on the ground, it was easy for rumours to start and misunderstandings to arise.

We knew we had to make sure that North Yorkshire County Council was the one trusted source of the facts. We had to be seen to be transparent and we had to keep people up to date. Conventional channels of communication would not be enough.

This called for innovative thinking to put in place communication channels where and when the public wanted them. We had to take our communications to the heart of the community.

"In December 2015, my constituency suffered terrible flooding, especially in the town of Tadcaster. The damage became worse when the bridge collapsed, separating the town. Thankfully, the bridge will be reopened, hopefully this week. Will the Prime Minister join me in thanking all those who were involved in the restoration of the bridge and, most importantly, the residents of Tadcaster, who have had a terrible year?"

Nigel Adams, MP for Selby and Ainsty

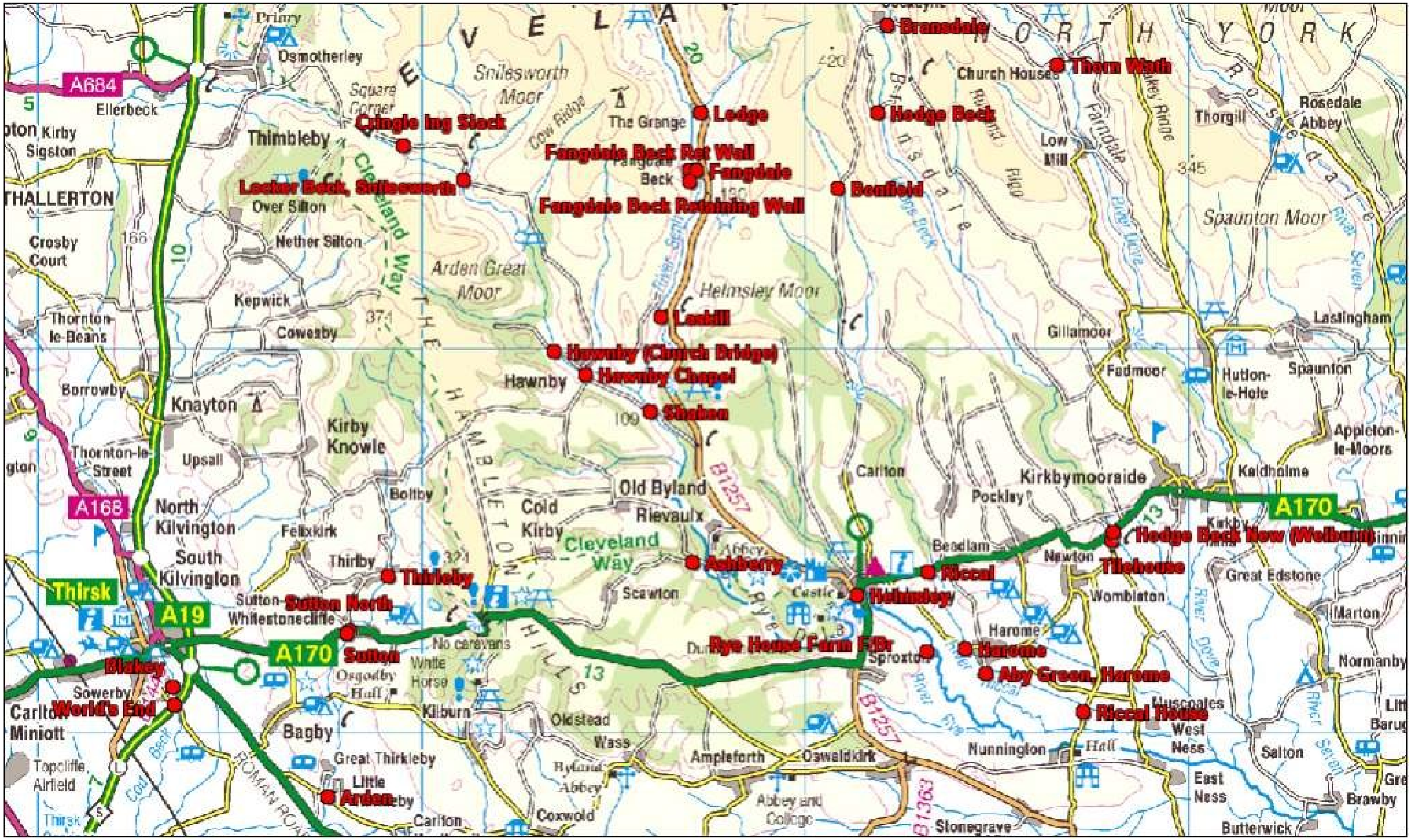
"I am happy to join my Honorable Friend in commending and thanking not only all those who worked so hard to restore the bridge at Tadcaster, but the people of Tadcaster, who have had to put up with disruption and inconvenience for such a long time. I am sure that those people will all welcome the return of the bridge, and we commend all those who have ensured that that has happened."

The Prime Minister

- At the reopening of the bridge school children cut the ribbon with the MP Nigel Adams for Tadcaster and the Local Government Secretary on the 6th of February 2017.

- The complete elevation.

HAWNBY 2005


Bransdale
Thorn Wath
Ledge
Hedge Beck
Cringle Ing Slack
Fangdale Beck Ret Wall
Fangdale
Locker Beck, Snilesworth
Bonfield
Fangdale Beck Retaining Wall
Laskill
Hawnby (Church Bridge)
Hawnby Chapel
Shaken
Hedge Beck New (Welburn)
Tilehouse
Ashberry
Riccal
Thirleby
Helmsley
Sutton North
Sutton
Rye House Farm F/Br
Harome
Aby Green, Harome
Blakey
World's End
Riccal House
Arden
Osmotherley
Snilesworth Moor
Thimbleby
Over Silton
Nether Silton
Arden Great Moor
Helmsley Moor
Kepwick
Cowesby
Hawnby
Knayton
Kirby Knowle
Old Byland
Rievaulx
Cold Kirby
Cleveland Way
Thirsk
Sowerby
Kirkbymoorside
Gillamoor
Fadmoor
Hutton-le-Hole
Lastingham
Spaunton
Rosedale Abbey
Spaunton Moor
Ampleforth
Oswaldkirk
Coxwold
Kilburn
Bagby
Oldstead
Wass
Nunnington
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A168
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The finished bridge