

Our Ref: 12799.2/SK/DS/KW

Samir Khatri
Philip Hughes Associates
Old Manor Stables
Tout Hill
Wincanton
Somerset
BA9 9DL

Dear Samir,

RE: BRIDGWATER ARTS CENTRE – REPORT ON REAR EXTENSION

Further to our meeting on Friday 10 November 2023 we write to confirm the following.

The rear extension is a single storey building at first floor level built off two rows of steels which are supported by brickwork piers at three corners and the main building on most of one side.



Figure 1: View from South West

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The construction appears to consist of a tiled roof with a relatively shallow pitch of about 30 degrees, which is likely to be supported by timber rafters with, what appears to be, a level concrete ceiling. No roof access was possible.



Figure 2: View of steels over SW column

This is supported by masonry walls on all sides and a concrete transfer slab providing the base for the first floor. The outer steels seem to support the roof and wall only, whilst the inner steels of each pair seem to support the roof and walls, as well as the transfer slab. The steels load onto masonry columns measuring approximately 450mm square. All the masonry columns appeared to be in a reasonable condition.

The steel's exposed location and inadequate protection has meant that they have been vulnerable to corrosion since their construction. In addition, the steels are landed on the tops of the brick columns which have a flat surface allowing rainwater to collect around the steels encouraging further corrosion. As a result, it was observed that the two rows of steels have undergone corrosion to various extents. Some areas are mild with loss of paint and loose scale, while other areas of the outer beams have lost a considerable amount of their cross-sectional area. The worst case being the outer beams directly over the south east piers (figure 4) where there is up to a 50% loss in area of the web and more than 25% loss of the bottom flange.

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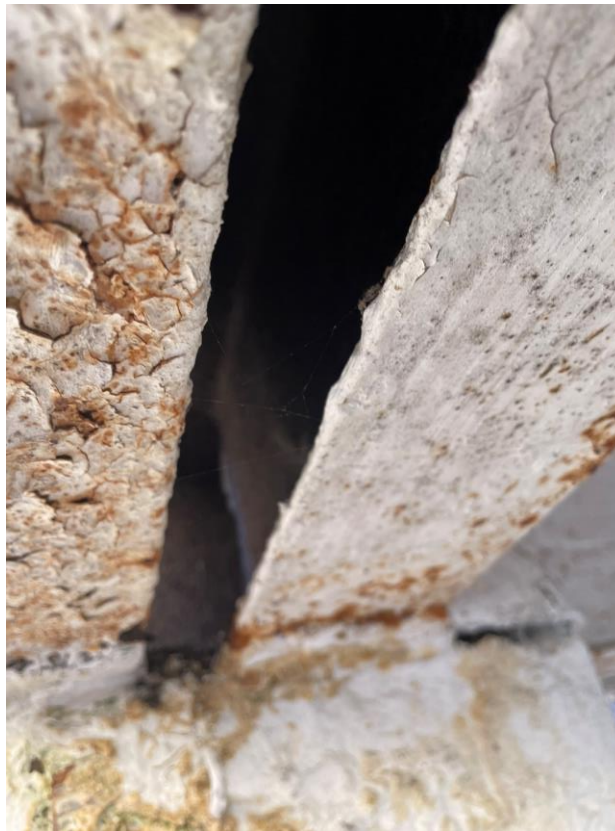


Figure 3: Underside of steels - demonstrating limited access to inside steel

We have back analysed the beams under the loading observed on site and found that the outer beams in the south east corner will fail in web buckling. **In short, the vertical element of the beam is at risk of crushing because there is insufficient remaining steel thickness.** This has started, as shown in the buckle of the web in Figure 4 and Figure 5, and collapse is probably resisted by a combination of infill brickwork and slate, seen in the image and load transfer to the inner beam.

Cracking was also noticed on the East side of the two-storey element of the property. It is not clear whether this movement is historic or ongoing. As such, it is recommended that this cracking is monitored, especially if the plans are to keep this element.

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Figure 4: Heavy corrosion in outside steel above SE column



Figure 5: Web Buckling in steel above SW column (viewed from the south)

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We would strongly recommend one of the following, which may depend on the medium to long term strategy of the building.

OPTION 1

Thoroughly clean and strengthen the beams by plate welding. Then apply a high-quality paint protection system to as much of the steelwork as possible.

Advantages: Relatively inexpensive.

Disadvantages: This solution is only temporary (say 5 years). This is because the shape and form of the structure allows oxygenated water to sit on or against the steel and not all the steelwork is accessible.

OPTION 2

As Option 1 with the addition of flashing or covering to prevent standing water.

Advantages: Again, relatively inexpensive and depending on the quality of the detail and steel protection this should provide a time to first maintenance of 10-15 years.

Disadvantages: Again, not all the steelwork is accessible for cleaning and painting; also, it may be difficult to make the covering attractive.

OPTION 3

Replace the beams with galvanised ones and improve the detailing to prevent standing water

Advantages: This uses completely protected beams of a known quantity. Despite the poor detailing and risk of sitting water, the time to first maintenance should be in excess of 50 years.

Disadvantages: Significant increase in cost and risk of damage to the outer brickwork, for which it may be impossible to achieve an invisible repair.

OPTION 4

Take down and completely rebuild the extension.

Advantages: An opportunity to make vast improvements.

Disadvantages: Cost and limited access.

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Yours sincerely

DAVID STOTT - BTech Eng
Technical Director

DISCLAIMER:

Our report concerns only the parts of the structure we that were appointed to inspect. Any other parts, adjacent structures, buildings or other areas are explicitly not considered unless deemed to pose some risk to the inspected structure.

Our inspection was visual in nature only. We did not include any intrusive investigations unless specifically noted otherwise. Where reasonably practicable we have attempted to access and inspect safely accessible areas.

We have not inspected all structural members in their entirety, but have examined a representative sample of areas that we believe offers a reliable indication of the overall structure. Localised areas with different construction types may not have been identified as a result.

All external observations of the structure are made from ground level only.

No guarantee can be given against the presence of rot, disease, beetle infestation or other defects within the timber elements of the structure.

No guarantee can be given against the presence of dampness, asbestos, harmful gases or other hazardous materials within the structure.

No testing or enquiries as to the presence of or susceptibility to pollution contamination, radiation, methane, radon and toxic mould, fungus or spore or other hazardous substances has been carried out.

Our inspection concerned structural aspects only and no comment or guarantee can be made on the condition of services, architectural finishes or decorations.

Any potential work valuations mentioned are estimated based on prior experience and should not be relied upon without consulting a professional cost consultant.

No responsibility is accepted to any third party for the whole or part of the contents of this report, which has been exclusively compiled for the use of our client.

The client should also note that liability to the client, whether in contract or tort, shall not exceed the amount as stated in the agreement, recoverable by way of indemnity insurance taken out by Andrew Waring Associates at the time we received instruction from the client.

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