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BOTANIC GARDENS HISTORIC GARAGE

24 VINICOMBE STREET, GLASGOW G12

INTERIM ENGINEERING APPRAISAL

We have been commissioned by the Friends of Glasgow West to give an opinion on the condition of the Garage and to advise on its potential for conservation, also to comment on the likely costs of repairing it for it to have a continuing use as a garage.

In the absence of any permissions being granted by the owners to inspect the property, we have had to revert to commenting on the various reports which have been made available to us by the Friends, being mainly those prepared by Messrs Struer, Consulting Engineers who have also summarised work by other engineers.

Being restricted to inspecting reports is clearly far from ideal, however the comments we have made below may be relevant to the ongoing discussions about the future of the building particularly those in connection with the apparent incompleteness of the engineering assessment work and what that might mean to those who are acting on it.

We have also perused a report made by Stuart Willett of Glasgow City Council who inspected the property.

As an initial observation, from everything we have been given to read, which seems to have a provisional and preliminary flavour to it throughout, we would be more optimistic than the authors about the possibilities for reviewing the evidence of deterioration and considering what is really involved in retaining and repairing the building. Economics obviously comes into it; however it is the engineering analysis and solutions which lead the likely repair costs. These need to be founded on good factual information and informed analysis.

Given that the future of an important listed building is being considered and actively being debated by Senior Officials in Planning and Historic Scotland, we would expect to see evidence from significantly more survey and analysis of the structure. The reports by Messrs Struer paint a gloomy impression of the building and contain a seemingly wide and long catalogue of corrosion led defects.

That said however, none of the reports describe any signs of fundamental active structural distress arising from these defects such as the deflections, sagging, bending, buckling, twisting and other distortions which usually accompany a metal structure in real trouble and beyond any hope of conservation.

There are many references in the reports to cracks in the concrete floors but the ones described in the report are the inevitable result of rusting of the steel beams which are partially embedded in its concrete. Although the corrosion is described as severe in some areas, there is apparently no evidence of the active consequences of this or of any cracks which might suggest a breakdown of the beneficial composite action between the two materials. It is evident that wear and tear has added to these cracks.

We would also have expected much more analysis of the structure in terms of its performance and stress levels under its own self-weight and then under imposed (live) loadings. It is easier to do this with steel than other materials. Steel is the main component of the structural framing. Given that it is exposed, it can be readily measured for deflection, and any other distortions, and these measurements can be compared to the outputs from calculations. Moreover, the measurements can also be used to estimate the actual level of loading performance of the structure, "warts and all", and what is needed for its future survival. Steel and concrete working together are covered by a huge amount of knowledge accumulated in this field over at least a century of construction experience and research. In the reports we could not find any reference to such appraisal methodology.

As said above, and we repeat it again here, there are plenty of references to the existence of corrosion but no measurements of material or assessments of strength losses such as might lead to a conclusion about the safe load on the building, and from this evidence, the type of repairs which are needed. It has to be said that in the context of performance under load, the archive drawings refer to the floors being designed for at least 2cwt/sq ft. This is equivalent to at least 10kN/sqm which is well over twice what we would design for these days in this situation. So we could conclude that there was plenty of beefiness, one could say, through a large overdesign, built into the construction. Our own calculation, from the limited data given in the report, suggests a load capacity in the floors of this magnitude. Inevitably this also leads to a conclusion that this is a significant reason why the structure has survived. This could be exploited, with appropriate assessment, to find a repair solution.

We would therefore encourage the Engineers to do more advanced investigation and analysis. Any action to decide the future of the building should therefore be postponed until this has been done.

The City Engineers did not express a lot of concern. It would be useful to also get an opinion from Historic Scotland's Engineers. We are sure that if the structure can be shown to them to exhibit any serious deflection or stress there might be some justification for Historic Scotland to accept the basis of the proposed major interventions. However if none of this can be demonstrated by Messrs Struer, we might fairly safely assume that the structure has more than sufficient strength left to be worthy of more positive consideration. Some of the more general statements about corrosion could then be translated into another understanding of what the building needs.

It is often said that conservation is about the wise use of resources. However we would add that it's also about using the resources of the wise! In this we mean the resources, experience and knowledge that Engineers have acquired over a century into how such buildings really behave under stress, none of which is reflected in the papers we have read.

John Addison
for Addison Conservation + Design

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