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Structural Inspection

Redundant Water Tank

At Kerley Downs

Chacewater

For

Mr F Brannan

Job no 17:7178

1.0 Introduction:

1.1 Brief:

Derek Gray & Associates have been asked to provide a structural appraisal of the buildings as part of a current planning application for the conversion of the buildings to domestic use.

1.2 Scope and limitations of report:

The scope of this report is restricted to an appraisal and opinion of the buildings general structural suitability.

Only those structural elements that may particularly affect the stability of the property have been noted, with the proviso that they were reasonably accessible and visible at the time of the inspection**.** Although we have taken all reasonable skill and care in the preparation of this report it should be noted that no guarantee can be given that the property will be free from future defects or those noted be free from increased deterioration.

This document is not to be considered to be a full structural survey

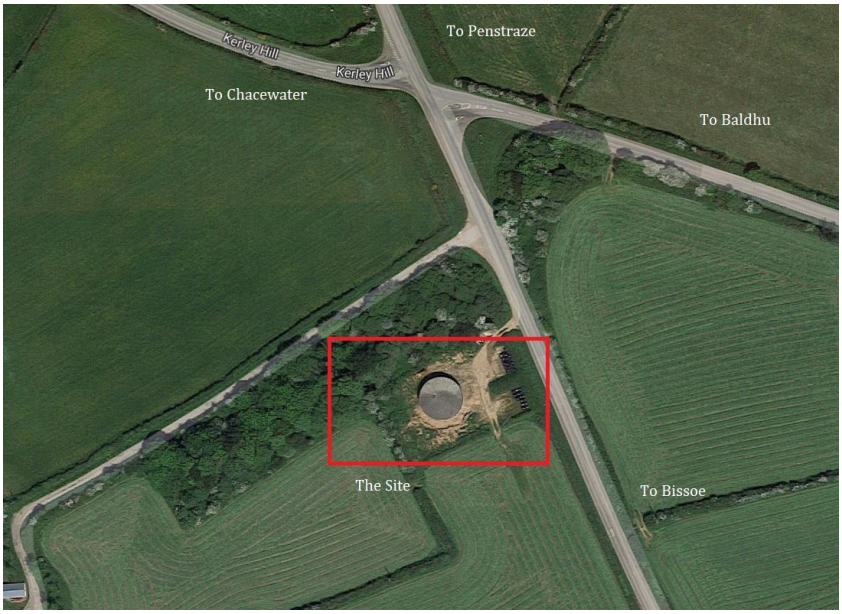
1.3 Method of Inspection

No specialist investigations or opening up works have been undertaken this appraisal being a visual assessment of the structural elements. No opinion can be given, or responsibility taken, for any part of the structure hidden by fixtures, finishes or otherwise inaccessible, at the time of the survey. Such unexposed parts may contain problems and special arrangements would need to be made for those areas to be investigated. See full terms and conditions at the end of this report

Where applicable, BRE Digest 366, Structural Appraisal of Existing Buildings for Change of Use and The Institute of Structural Engineers publication Appraisal of Existing Structures have been used as the basis of the report

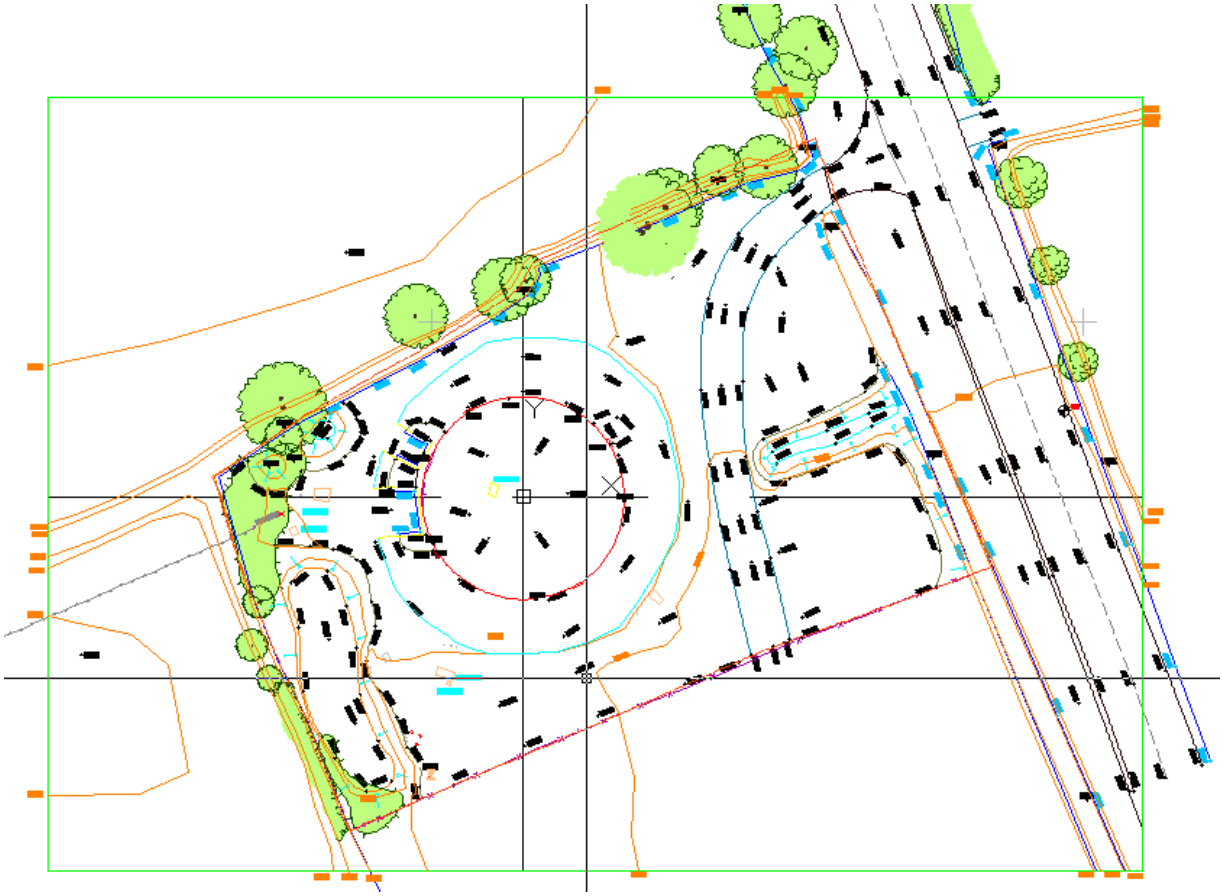
2.0 Position

The site is located at OS grid ref SW 760438, close to the junction with Kerley Hill leading from Chacewater village. The site is close to the highest point locally and the building commands extensive views to the south and southwest although it is screened from the north and east by dense trees and hedges.



Plan on site before clearance

Road View



Site Plan

2.1 The Building Overview

The building under consideration was primarily constructed as a water storage tank by South West Water being the purchaser of the site from its previous owner in 1950.

The building is circular in plan with a domed roof and the sole construction material used was reinforced prestressed concrete.

Before clearing of site.

View to the southwest from the current roof

3.0 Roof:

The roof is constructed with a domed profile rising approximately 1.50 m to the centre. A series of rib beams span from a thickening in the outer wall to a ring of beams supported on columns spaced around the centre support the main roof construction.
As mentioned above all of the construction is of reinforced concrete and is very robust.

It is proposed to further strengthen the roof by the introduction of a system of further radial beams enable the roof to support additional loading from the proposed new finishes as well as to aid in the support of new internal flooring.

4.0 Walls:

As the tank was intended for the long term storage of water and was probably kept nearly full for most of its lifetime the concrete used will have benefitted from the increased strength that comes with contact with water.
The main loading on a wall system such as this apart from the axial loading due to the

weight of the roof is derived from the effect of water pressure. The depth of water in the tank could have been as much a 5.0 m and the horzintal pressure on the walls at this depth is in the order of 50 kN/sq.m (1/2 ton / sq foot).

The tank is no longer being used to store water and as the walls have been breached the hoop tension resistance will be lost. However this results in the vertical load bearing capacity of the walls increasing proportionately (the sum of the horizontal load divided by the permitted horizontal and the vertical load divided by the permitted vertical must equate to less than 1).

Overall the load bearing capacity of this concrete wall is far in excess of any normal loading likely to be applied by conversion to domestic accommodation.
Inspection of the concrete used shows that there is no deterioration of the fabric, the cover being intact in every position inspected. (It should be noted that at the time of the inspections there were no openings in the walls and roof other than a new access doorway and that inside was very dark. Light provided was lost in such a large space).

Central ring of columns supporting ribs in roof.

Condition of the cover to the column.

View of central columns and external wall. Wall staining is not rust from the reinforcement.

Access hatch in roof.

View up wall to junction with roof and ring beam

5.0 Floors

The whole concrete tank is supported on a concrete floor slab acting as a raft and spreading the loading from the walls and roof over the base area together with the uniformly distributed loading from the contained water.

The resulting loading is unlikely to exceed 75 kN/sq.m which the local ground is quite capable of resisting – witness the condition of the walls after 67 years.

6.0 Conclusion

The original use of the building was such that the robust construction used, the present condition of the concrete and the proposed use (and therefore loading) are such that it is advised that the structure is more than adequate for any non industrial use.

7.0 Terms and Conditions of Report

Statutory Requirements

Enquiries with local or statutory authorities have not been carried out. Although attention may be drawn to any apparent breach or statutory requirement relative to the building or site, the absence of any such comment does not imply compliance with any such requirement.

Methane & Radon

Testing for, or enquiry about possible methane presence from geological or organic sources, or the presence of Radon Gas have not been carried out as part of this structural assessment

Building Faults

No inspection for building faults such as defects in rainwater systems, drains, roof coverings or rising damp have been carried out as part of this survey.

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