

Our Ref: 17446/JAE/KL

24 November 2023

Mr Dermot McCarthy
16 Hampden
Kimpton
Hitchin
SG4 8QH

Dear Mr McCarthy

Kimpton Players Playhouse by the Memorial Hall, Hall Lane, Kimpton, CG4 8RD
Structural Inspection

I refer to your instructions that we carry out a structural inspection of the prefabricated building at the rear of the Memorial Hall, and report to you on the condition of the structure. You require advice on the cracks observed in the concrete frame and possible remedial options.

I visited the property on 1 November 2023 to carry out the structural inspection and give a brief summary of my observations and opinion as follows:

General Conditions:

1. This letter of opinion is based on a visual inspection and is accordingly limited in scope. It is not normal practice to lift floor coverings or floorboards, remove panels or plaster or move items of furniture. It does not include those parts of the structure which were covered, unexposed, or inaccessible, including services and drains below ground. The report also does not cover decorative conditions, damp proofing, non-structural timbers, and other non-structural matters.
2. The presence or possible consequences of any site contamination, asbestos products or invasive plants are not researched or covered by this report.
3. I shall report only upon those structural defects that I consider will materially affect the structural integrity of the property, provided that these defects were reasonably detectable at the time of the inspection.
4. Whilst I have used reasonable skill and care in preparing this letter of report, it should be appreciated that David French Partnership LLP cannot offer any guarantee that the property will be free from future defects or that existing defects will not suffer from further deterioration.
5. This report is for the sole use of the Client relating to the property and is limited to the current brief. No responsibility is accepted by David French Partnership LLP if used outside these terms.

Description of the Building:

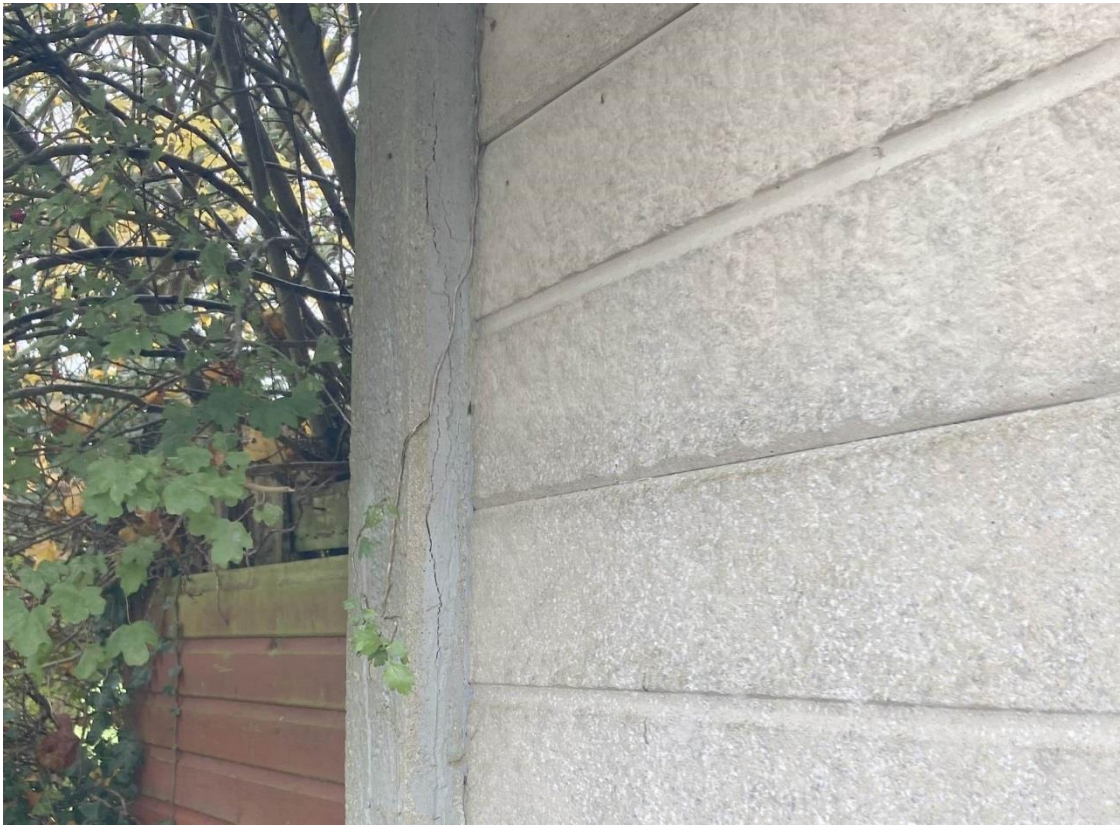


6. The property is a single storey detached prefabricated building built in about 1970.
7. It is built on a site sloping from the rear to the front and is built on a brick plinth which is built off strip foundations stepped to allow for the slope of the site.
8. The walls are constructed of precast concrete posts supporting precast concrete panels slotted into the posts. There is a concrete slab and the roof is formed from asbestos cement sheets supporting on lightweight steel sections.

External Inspection:

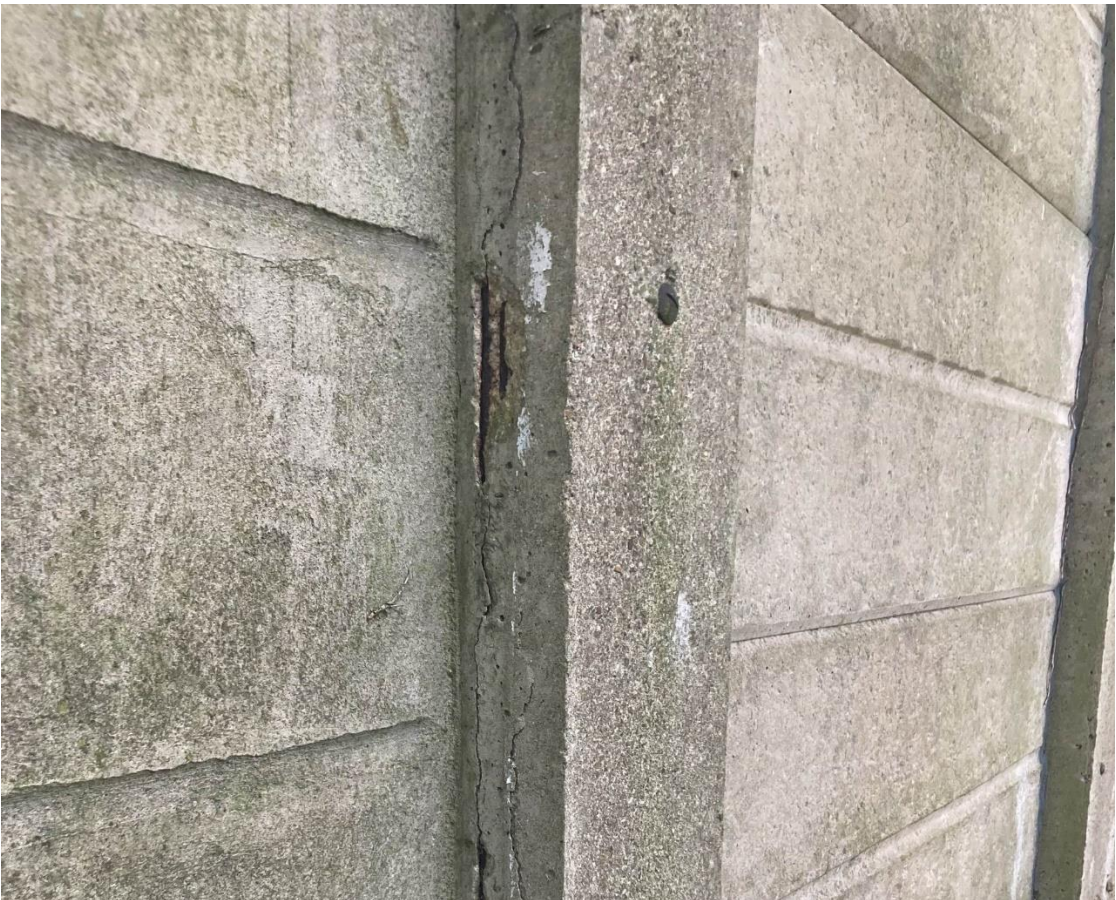


9. Most of the concrete posts are cracked, with the cracks typically running vertically up the posts.





10. Some of the cracking was relatively minor.





11. In some areas, the reinforcement was exposed and was rusted. The cover was noted to be minimal.



12. Several of the posts have been repaired. Some of the repair appeared to be just normal mortar and this has cracked again. Some appears to be some form of painted on coating which has also cracked.



13. Some of the cracks have been filled with mastic. Also, where the concrete has spalled some areas appear to have been painted over with a coating material.



14. Where patch repairs have been carried out, the repair is being pushed out of position.

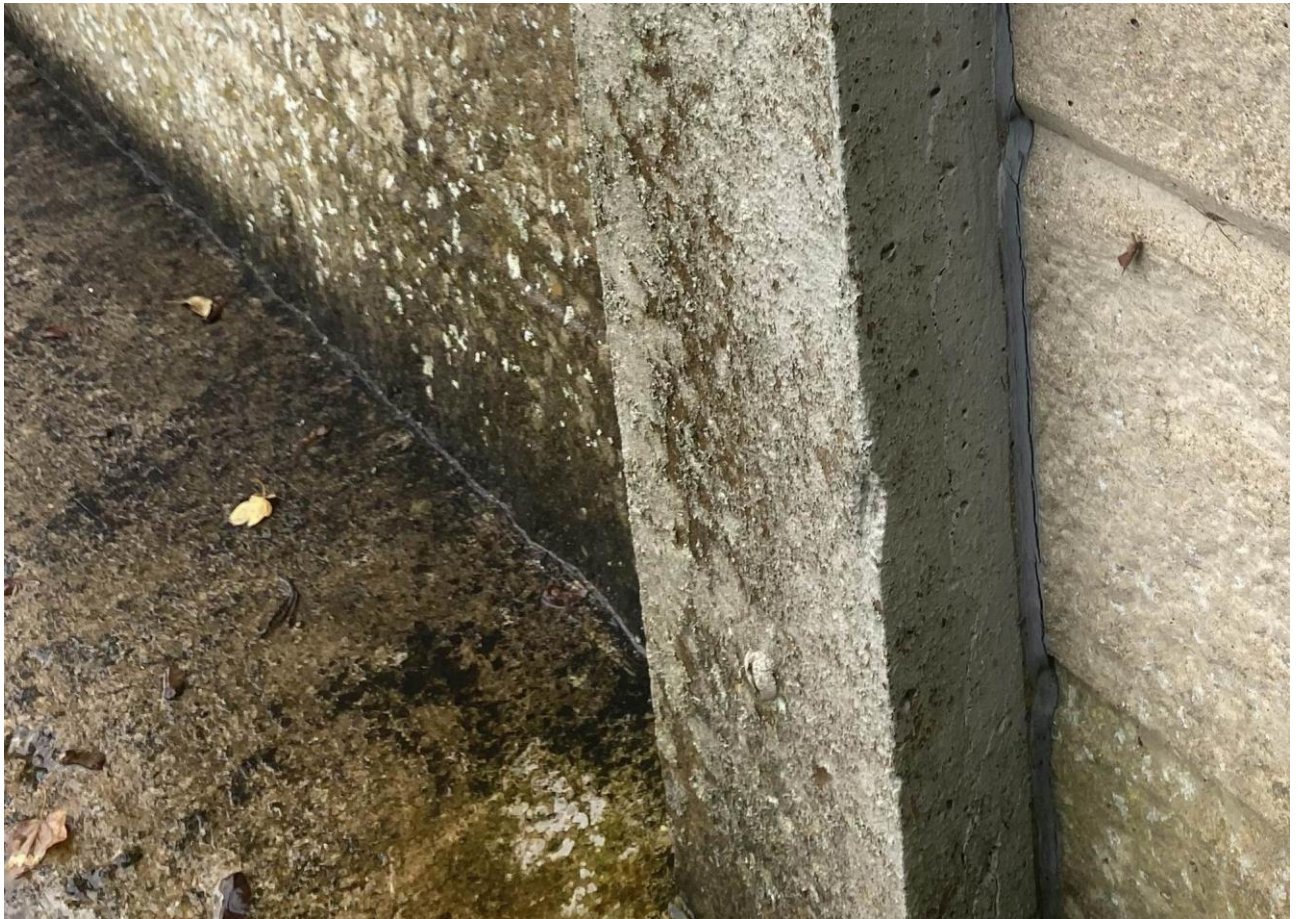


15. The gutters have missing downpipes and several areas do not drain away from the structure.



16. The brick plinth has a number of bricks with spalled faces.





17. The raised plinth has a concrete slab and it can be seen that there was a lot of water landing on the slab and splashing the walls.

Internal Inspection:



18. The floor has been covered with thermoplastic tiles with areas of this lifting.

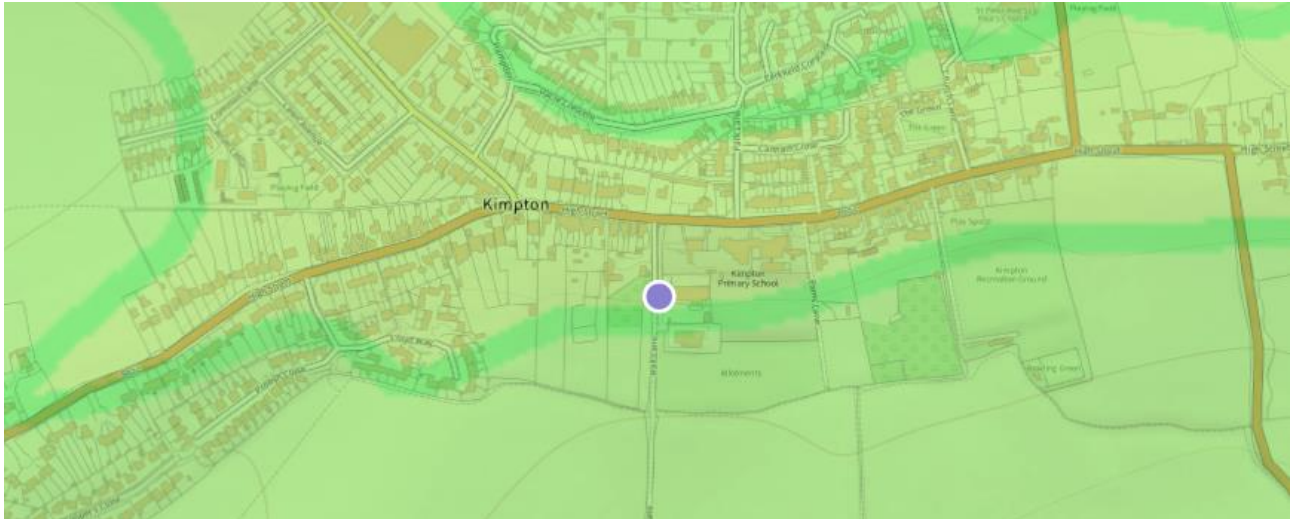


19. The roof structure is formed with a small steel 'I' beam supporting a rolled steel angle purlin which in turn carries the roof sheeting.
20. There is a fibre board suspended ceiling below the sheeting with a second similar ceiling installed below.



21. The roof has a suspended ceiling and the roof itself is formed with asbestos cement corrugated sheeting.

Other Information:



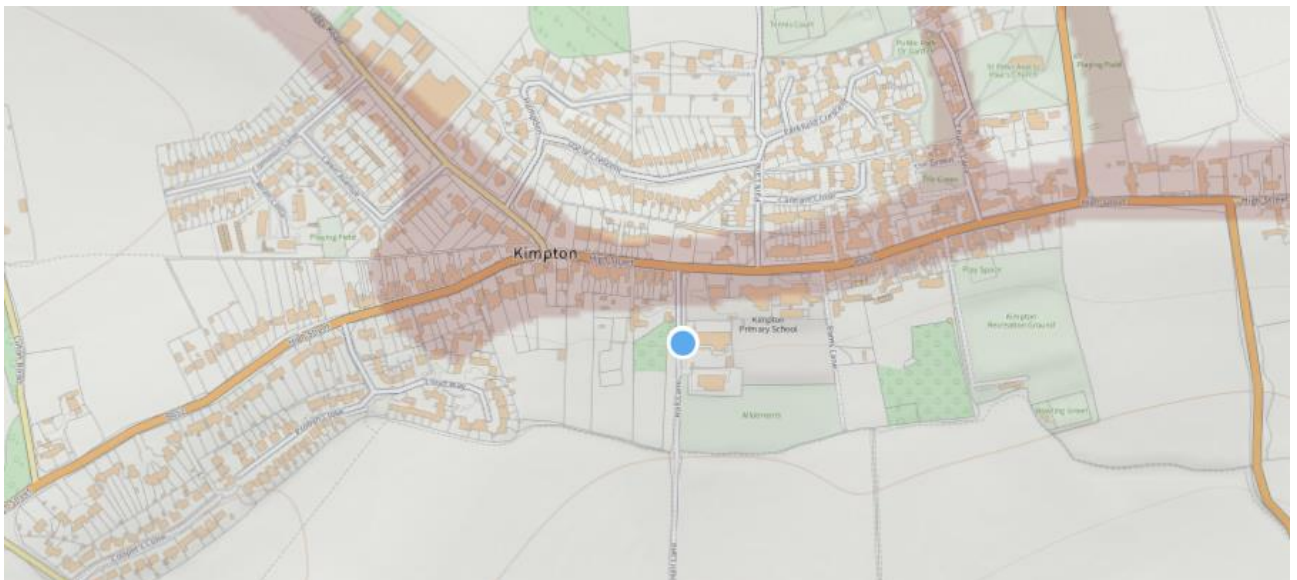
22. The British Geological Survey suggests the most likely 'bedrock' is expected to be:
Chalk Rock Member - Chalk. Sedimentary bedrock formed between 93.9 and 89.8 million years ago during the Cretaceous period.

The building is right on the border between:

Holywell Nodular Chalk Formation and New Pit Chalk Formation - Chalk. Sedimentary bedrock formed between 100.5 and 89.8 million years ago during the Cretaceous period.

and

Lewes Nodular Chalk Formation and Seaford Chalk Formation - Chalk. Sedimentary bedrock formed between 93.9 and 83.6 million years ago during the Cretaceous period.



There are no superficial deposits expected at this location.

23. The following trees & shrubs were observed near the property:



23.1. There is a bank of mixed trees up to about 10 metres high located around the corner of the site close to the building in question.

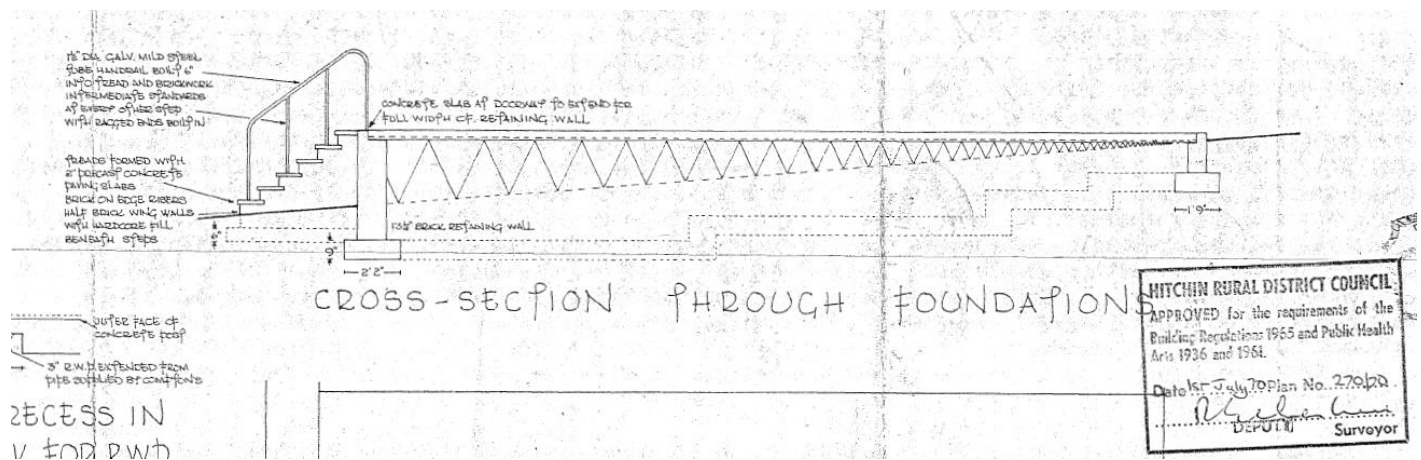
24. There was no evidence or report of any trees having been near to the property in the past, and subsequently removed.

Assessment and Recommendations:

25. The 'bedrock' at this location, according to the British Geological Survey, is expected to be chalk and this is normally found to be non-shrinkable.

Bedrock does not necessarily mean 'rock' but is the primary subsoil and this is then sometimes overlain by superficial deposits.

26. There are no superficial deposits at this location.
27. With the expected subsoil, means that there is a low risk of subsidence at this property and the trees located close to the property should have no effect on the building. There was nothing I saw to suggest there was any historic or on-going subsidence movement and no action is required.



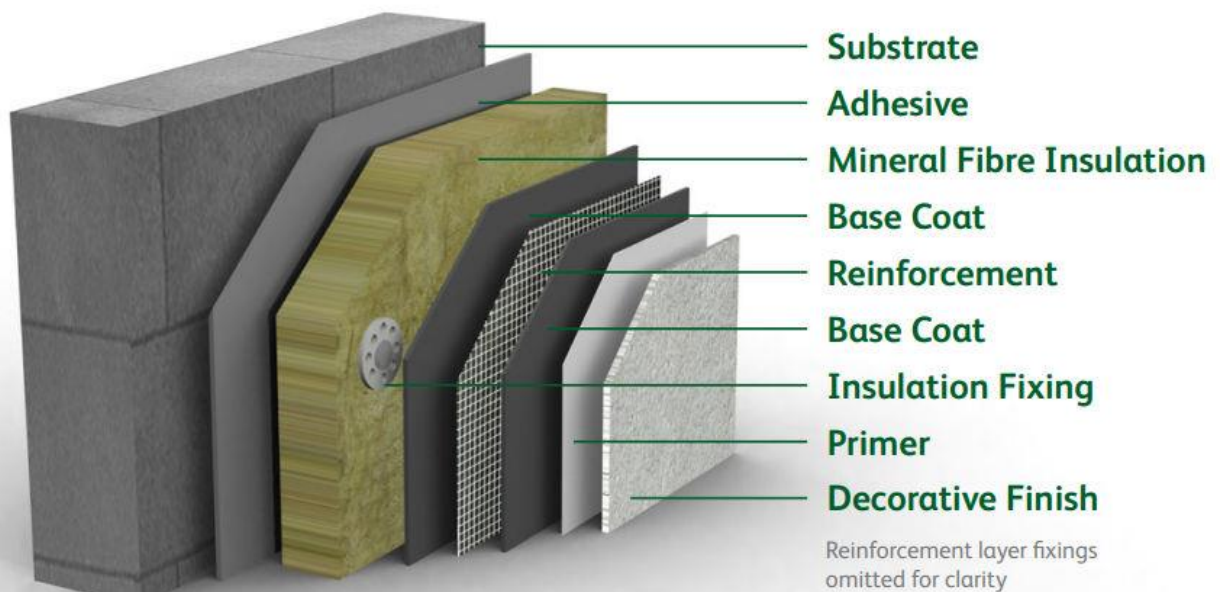
28. From the information provided, the foundations are about 2'0" deep (600mm), stepping up to follow the slope of the ground.
29. The wall by the steps is 325 thick with the other walls 215 thick.
30. A depth of hardcore fill has been called up below a thin mesh reinforced slab.
31. There were a number of bricks with eroded faces. Normally bricks form a very durable outer finish to an external wall however in some cases the faces begin to erode. There are two main causes of erosion of the face of the brickwork.
 - Frost damage
 - Dissolved salts.
32. Frost damage is caused when there is excessive water ingress into the brick which then retains the water.
33. In cold weather this water can freeze and expand, causing the brick to spall and the face flakes away. Once the face has spalled, it makes the brick more susceptible to absorbing water and the process accelerates the degrading of the brick.
34. Dissolved salts in the walls can also cause problems when you have dampness in the walls from causes such as from the ground water and poor storm drainage to the building.

The moisture contains dissolved salts which are transported through the fabric. Where the moisture reaches the outer face, the water evaporates and leaves the salts in the form of interstitial crystals.

As this process continues, the crystals grow in size and can then reach the size where their growth breaks the brick fabric and can cause the face of the bricks to spall.

35. You can also get a combination of both of these issues occurring.
36. There is no simple solution to dealing with eroded brickwork. The only real option is to cut out the damaged bricks and stitch in new bricks.
37. With the way this building has been sat on a raised concrete plinth and the poor rainwater provision, there is a lot of water getting onto the slab and around the base of the building. Ideally the topping should be removed and laid to better falls away from the building.
38. The gutters and down pipes need to be adjusted and/or replaced to drain the water from the building and to discharge it away from the building, ideally taken into a soakaway away from the building. Good practice is for the soakaway to be located a minimum of 5.0m from any structure.
39. The main issue is the deterioration of the concrete posts.
40. The cracking and spalling of the concrete is probably due to carbonation of the concrete.
41. The process of carbonation is almost impossible to avoid in untreated concrete that is exposed to the elements.
42. As soon as the concrete is exposed to the air, the process of carbonation can begin where carbon dioxide slowly penetrates the surface of the concrete, where it reacts with moisture in the pores and one of the compounds in concrete, calcium hydroxide, to form calcium carbonate. As carbon dioxide meets the pore water, a dilute carbolic acid is created which acts to reduce the concrete's natural alkalinity.
43. Depending upon the concrete's porosity and permeability, concrete carbonation may advance at a rate of about 1mm per year.
44. The initial effect is a hardening of the concrete and a corresponding increase in its compressive strength. However, the process of carbonation also serves to reduce the natural alkalinity of the concrete. As carbon dioxide travels deeper into the concrete and approaches the depth of embedded steel, the passivating layer around the reinforcement is broken down by the process of carbonation, exposing the steel to the corrosive effects of air and water. As the steel reinforcement rusts and expands in volume it places force on the concrete which cracks and spalls, causing the rate of failure in the surrounding area to increase exponentially.
45. The cracking and spalling seen to the posts is typical of rusting steel causing spalling due to carbonation issues.
46. The test for carbonation is quite a simple, cheap test. A small core or a section of dislodged concrete is sprayed with an indicator such as phenolphthalein and the concrete remains colourless on carbonated concrete and turns pink on alkaline concrete.
47. Chloride in concrete is another issue that can cause spalling of the concrete and if you have someone doing the carbonation tests it may be worthwhile also have the Chloride tests carried out. Chloride tests are also a relatively simple test, although this is normally carried out in the laboratory, which also provide data on the likelihood of reinforcement corrosion.

48. If you want a definitive answer, it is worthwhile getting a specialist company to look at the concrete, test for carbonation and provide a remedial solution.
49. Often all that has to be done is to hack off the spalled or loose areas. The steel can then have the rust removed and can be treated against further corrosion and then the area repaired with an epoxy render. It is also possible to apply an anti-carbonation coating which can then extend the life of the concrete.
50. The company we have used for this type of work is:
Concrete & Corrosion Consultancy Practice Ltd
Broadlands Bus Park
Blean
Canterbury
CT2 9JJ
info@concorr.co.uk
Phone: 01227 452200
51. As this is not a high-quality building it is hard to justify the cost of having tests carried out and it may be best to assume the concrete is carbonated and make repairs accordingly.
52. If you repair using normal mortar this will not give a long-term solution and will tend to spall as has happened on some of the repairs here.
53. Ideally, repairs should be carried out by a specialist contractor, but they tend to be expensive. As stated above, all that has to be done is to hack off the spalled or loose areas, remove the rust from the rebar, treat the steel against further corrosion and then the area repaired with an epoxy render. If you can keep the post sheltered from the weather, then these repairs are not so critical, and a general builder could probably do the repairs.

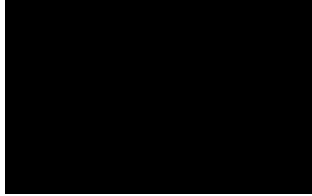


PERMAROCK 

54. To make the building more usable, it really needs to be insulated and I think an option which can insulate the building and protect the frame might be to use and externally applied proprietary insulation system such as that supplied by:
- PermaRock Products Ltd
Jubilee Drive, Loughborough
Leicestershire, LE11 5TW.
01509 262924
permarock@permarock.com
55. Their product is normally used on, for instance, solid walled houses so may need some adaptation for use here.
56. The roof has asbestos cement sheets. These are safe if left totally alone but if any work is required to them then this may require special precautions depending on the type of asbestos.
57. If you have not had the asbestos tested, you should have this tested to enable you to know what options you have with the roof.
58. The company who we have used for asbestos reports and removal is:
- C Wood & Son (Luton) Ltd
Newbury House
1 London Road
Luton
Bedfordshire
LU1 3UE
01582 722119
- C Wood & Son Environmental Services is a Health & Safety Executive Licensed Asbestos Removal Contractor, holding an ISO 9001/2000 Quality Systems accreditation, ARCA site accreditation, and membership of numerous professional bodies.
59. If you are spending money to upgrade the building, I would recommend that you have the asbestos roof removed. You can then install a new roof which can be insulated.
60. Removal of asbestos cement sheeting is covered by the UK's Control of Asbestos Regulations 2012, although in many cases this work falls within exemptions to the licensing requirements and so does not usually require use of a licensed contractor.
61. On the floor there are thermoplastic tiles. Older thermoplastic tiles contained asbestos, and you should get C. Wood to check these if they have not already been checked.
62. If you are going to repair and upgrade the building, the costs are likely to be quite high and it may be a better option to knock it down and rebuild it. If you want a long-term solution, then building in brick or blockwork may be best but this is likely to be quite expensive. It could be built in timber studwork which can achieve a long life particularly if it is clad with a cement board which does not rot.

I trust this gives you the information you require, but if you have any queries, please contact me.

Yours sincerely,



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for David French Partnership ^{LLP}



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