# Visual Structural Survey
# Sampford Brett Village Hall, TA4 4LD

September 2017

Client: Sampford Brett Village Hall Management Committee

Job No. : 2472

Report No. : 2472-R01

6 High St, Devizes, Wilts, SN10 1AT    t: 01380 724 213    f: 01380 721 753    e: team@mlde.co.uk    w: www.mlde.co.uk

Principal: Mark Lovell M.Sc. B.Sc (Hons) C.Eng.F.I.E.D    Associate: Sandra Lovell Dipl. Ing. Arch.

## 1.0 Brief

Mark Lovell Design Engineers were engaged by Sampford Brett Village Hall Management Committee to provide a visual structural report on the condition of the village hall. It was also requested, in order to assist the making of a grant application, that commentary is included which discusses the expected future service life and some potential repair/replacement options that could be considered when assessing the long term future of the facility. No opening up of the structure took place apart from a few endoscope inspections of the void in the external wall formed between the outer cladding panels and the internal board lining, therefore certain faults may remain undetected and undisclosed.

The services within the building were not inspected and where mentioned have been done so in passing only. The mechanical and electrical services should be reviewed and commented upon by a specialist.

The report will aid future investigation works and the development of a long term maintenance plan and development strategy for the building. The survey was conducted on Wednesday 30th August 2017. The weather was generally bright and sunny conditions with some showery interludes.

The structural survey was carried out for the private use of Sampford Brett Village Hall Management Committee and to assist with the grant application documentation, the document cannot be copied or sold to a third party without the prior written consent of MLDE.

## 2.0 INTRODUCTION

The village hall is located within the heart of Sampford Brett. It is believed to have been constructed in the mid 1970's and consists of a simple detached single storey linear rectangular form, with a plan size of about 18.5m by 6m (Please see Appendix A – Photograph 001). The building sits with its narrow gable elevation almost directly along side the main village road carriage (002). The site plot is only a few metres larger than the footprint of the building (003). The external roof structure is formed from interlocking concrete tiles set on a shallow pitched roof structure.

The internal ground floor level of the building is raised above the main roadside level due to the slight rising nature of the site and the building users have to use a short steep ramp from the carriageway to gain access to the front door.

The pedestrian access is not ideal for a number of reasons; the ramp is too steep to be easily used by wheelchair users and does not meet current DDA requirements (004) and building users leaving/arriving at the facility have no refuge or footpath alongside the carriageway before having to step directly onto the roadway (005).

The village hall has been constructed with a non-traditional building system which consists of a series of prefabricated components which were quickly assembled on site.

## 3.0 STRUCTURAL FORM AND CONDITION OVERVIEW

Externally the village hall walls are formed from segmental precast concrete panels which have been cast with a "fine pebble dashed" finish. The modular concrete panels directly form window and door openings with their surrounds. The precast concrete panels are joined together with a mastic type sealer which is now brittle and aged. The sealer, in some places, is split and needs to be resealed to prevent water ingress into the internal fabric of the walls (006 and 007).

The joints between the concrete panels are not even nor planar in many places which does indicate that the alignment and fixing relationship of the elements has altered over the years. The local movement and displacement of the joints is normally attributed to either degraded fixings or corrosion expansion of the fixing cleats and their packing shims (008 to 011 inclusive).

The actual condition and integrity of the pre-cast concrete panel retention system is not known but the joints indicated that the assembly fixing arrangement is degraded, the extent of which is not fully known. It must be remembered that this system building is about forty five years old and would have originally been theoretically designed for a service life of about fifty or sixty years. The removal of the internal lining board in a few locations would allow closer inspection of the condition of the brackets, fixings and shim packs.

The general condition of the precast concrete cladding panel elements appear to be reasonable and not particularly visually degraded. The 75mm concrete corner cloak panels do exhibit some linear edge cracks which probably is due to advanced corrosion jacking caused by the expansion of the contained ferrous edge reinforcing steel. The limited cover to the steel and carbonation of the concrete has allowed this process to occur (012, 013 and 014).

The external precast concrete cladding panels appear to not only provide the external envelope to the building but also provides the longitudinal racking bracing strength to the primary steel portal frames. No steel side bracing was observed in the steel frame system along the side walls.

The original windows to the property are a single glazed metal framed system such as the Crittal W30 section. A few of these windows and doors have been changed to a UPVC type.

The roof covering is an interlocking concrete tile type supported on felt, battens and timber jack rafters (015 and 016). The timber rafters are supported by timber purlins which span between a hollow box section steel frame.

The roof structure doesn't show any obvious major defects or deterioration. There are no signs of major water ingress, although local water staining along the ceiling eaves edge is evident is a few places.

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The local staining appears to be due to overflowing gutters and a little from condensation around the exposed steel haunch sections (017).

The primary structure of the building consists of steel portal type frames at about eight feet cross centres (2.44m). The frames appear to be constructed from 90 x 50mm steel rectangular box sections. The steel frames appear to be tied together at eaves level with a light gauge pressed metal rail section which supports the roof edge structure and the top of the pre-cast concrete cladding panels (018).

The 90 x 50mm box steel column sections were originally zinc rich primer painted. The upper sections of the steel frame, where viewed, generally were found to be in a reasonable structural condition apart from the lower cast in sections of the columns (019 and 020).

The endoscope review of the steel columns in three places showed that general light surface corrosion of the sections has taken place, more towards the ground floor level, with some surface areas more locally blistered, which indicates that the corrosion levels were higher in these zones and more developed (021 and 022). The reason for corrosion levels being higher in the lower sections of the column is due to the fact that the supporting concrete and screed are damp and have been cast directly around the steel sections. The "Marley Floor Tiles" bonded to the top surface of the screed were then installed not only as a floor covering but also the damp proof membrane (023 and 024).

It is difficult to be precise about the estimated future service life expectancy of the main steel columns without detailed information about the actual condition of each section. However, based on the evidence gleaned with the endoscope, it is not unreasonable for the main steel frames to be serviceable to carry the applied dead and imposed loads for a further period of about 10 to 15 years without any intervention repair or upgrading. It is thereafter quite feasible to further extend the service life of the existing steel frame by welding new steel sections onto the lower parts of the existing frames.

Further dialogue on the service life of the building will follow later in this report.

The external side wall construction consists of outer pre-cast concrete panels which are attached to the steel primary frame, with the inside skin of the building formed with a fibre board lining which is framed into the uninsulated cavity with timber studding (025 to 028 inclusive).

The end gable walls of the building are formed with concrete panels up to the eaves level and above this level is constructed from timber studding and timber boarding.

The ground floor structure seems to be solid concrete construction and from the exposed concrete edge appears to consist of a ground floor slab integral with the concrete raft type foundation. It is believed that the steel frame is bolted directly down to the raft slab. However, the fixing feet to the portal frames are not now visible as a 100mm thick sand cement screed appears to have been cast directly onto the top of the floor slab.

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The ground floor screed has then been covered with Marley Floor Tiles. This type of floor tile does usually contain asbestos based material and usually are also bedded in a bitumen based adhesive which also contains asbestos. The original floor tiles and adhesive would have acted as the damp proof membrane for the building. These original tiles have been covered at some point with a bonded carpet.

It should be noted that it is highly likely that asbestos containing material will be present in many places within the fabric of the building, a Demolition & Refurbishment Asbestos Survey must be carried out and added to the Building File before any repair works are carried out on the building.

An indication of some of the common items which contain asbestos: Marley Floor Tiles, tile adhesives, Artex Plasters, Fire Boards, Old Pipe Insulation, Renders & Floor Screeds, Supports to sinks and Appliances, etc.

The external concrete hardstandings around the building are in an unkempt condition, it is moss covered and un-swept, which is allowing excessive water retention on the concrete surfaces which further compromises the condition not only of the surrounding slab but the building's foundation concrete and the lower edge of the pre-cast concrete cladding panels. The degree of wetness within the concrete structure will also impact on the corrosion levels and rates of corrosion occurring to the main steel frames columns connected to the concrete (029 to 033 inclusive).

The drainage channel within the concrete surface is partially blocked which restricts the egress of the surface water to the drainage system.

The surface water gulley at the front of the building was full of water and appeared not to flow away, the adequacy and function of this drain is questioned (034). A digital drainage survey of both the foul and surface water systems needs to be carried out around the building and the intactness of the water main also needs checking.

The efficient drainage of the rain water off the paths is also fundamental in helping to preserve the condition of the building fabric over the longer term. Also, wet and slippy concrete surfaces create a safety hazard to the building users.

The overgrown nature of the fence line and access path further unnecessarily shades one side of the building, which compounds the degradation issues.

Internally the walls are generally of lightweight timber stud construction. The plaster board ceilings to the underside of the roof structure have been coated with a finish which may be Artex. Artex is a finish material that was commonly applied to ceilings of buildings in the 1970's, this coatings contained asbestos fibres.

There is some minor water marking of the ceiling in a few places, this staining appears to be from a combination of either overflowing/leaking eaves gutters and/or localized condensation around the exposed steel framework.

The building has poor and inadequate trickle type ventilation, it is recommended that the current situation is improved, even if it is limited to slightly cracking open the windows when the building is occupied and for a short period afterwards to allow the dissipation of the respiration moisture load added to the fabric whilst being inhabited and used for events.

The rear of the property and surrounding footpath are cut into the naturally rising ground level. The surrounding raised ground level of the adjoining property is supported by a blockwork retaining wall. The retaining wall appeared in a reasonable condition, the actual form of construction of the structure is not known.

The services within the building were not inspected and where mentioned have been done so in passing only. The mechanical and electrical services should be reviewed and commented upon by a specialist (035 and 036). A utility supply pole is sited nearby in the front corner of the plot near to the building, the service wires run overhead to the other surrounding properties. Any outside work to the building will need to be controlled by working to Method Statements to limit the dangers of working within the vicinity of the services.

All works should be carried out to Building Regulation Standards and certified by a competent contractor. The Building File should contain an up to date Asbestos Register and must be shown to all Contractors when assessing works. The report will aid future investigation works and the development of a long term maintenance plan for the building.

A detailed and careful inspection of the foul and surface water systems needs to take place, it is believed that some repair and upgrading of the foul and surface water systems may need to take place.

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## 3.0 Summary and Conclusion

This initial visual non-invasive structural survey of the village hall has been carried out to assist the owners in gaining an understanding of the overall structural condition of the building. This report may be considered as the first of a number of investigations and inspections that will be needed, some of which will need to be more invasive and parts of the building will need to considered and inspected in more detail.

The village hall is formed from a collection of prefabricated system components and is about 45 years old. The expected design life for the hall would have initially been about 50 to 60 years.

It is believed that the building fabric in the current arrangement is likely to be structurally serviceable for about 10 to 15 years more. General minor maintenance items will need to be carried out on a normal ongoing basis.

The question to consider is whether it is sensibly viable to substantially repair and upgrade the current facility or not?

In economic terms significant works are likely to be needed to the current building if the service life is to be extended beyond about 15 years, whether this is sensible or not will also depend on: the extent of the asbestos containing materials within the existing building, the condition and serviceability of the Mechanical & Electrical installations and the required future expected use for the facility including utility running costs, heating and lighting, etc.

In broad terms the expected fabric items which will need to be repaired/replaced in the longer term (Beyond 15 years) are:

- New Welded Repair Sections to Lower Column Sections to Primary Steel Frame.
- Replacement of Existing External Concrete Panel Façades (inc Windows and Doors) & Internal Linings. New Building Wall Envelope to be Insulated and Building Regulation Compliant.
- Replacement of Internal Linings to Roof Slope with Fully Insulated Material.
- Replacement of Mechanical & Electrical Systems.

In broad terms it is suggested that the next phase of works works should be:

- Camera inspect the surface & foul drainage systems in more detail.
- Inspect & clean out the gutters, down pipes and hardstandings.
- Carry out Demolition & Refurbishment Asbestos Survey.
- Specialist to survey Mechanical & Electrical systems.

Following on from the suggested more detailed inspections it will then be possible to gauge what must be done in the near future to the building and to review the costs of such against a new replacement upgraded and efficient modern facility which is fully DDA and Building Regulation compliant.

## Suggested Basic Options for Consideration

A Develop and prepare live long term planned maintenance schedule for the existing building, including repair specifications as needed for the elements and gain Building Regulation Approval for these works.

B Develop strategy for replacing or rebuilding new village hall.

The suggested above next steps are a brief incomplete summary of the likely works that are needed in the first instance in order to better understand and arrest the decayed and deteriorating condition of the fabric.

It is difficult to be precise or accurate about the long term repair and upgrading costs of the existing building to make it serviceable for many decades to come as many items are unknown. However, in general terms the costs of upgrading the existing building will not be significantly less than the replacement cost of a totally new facility. A totally new facility could be designed to offer much better access and facilities for the users than the current building.

In general comparative terms the cost of a new modern similar type facility would likely be around £1500/m2 to £2000/m2 of constructed plan area. This cost will depend on actual site conditions within the ground and specification of the new facility, etc. If the existing building were to be fully upgraded it is expected that the likely cost of such would be about £1000/m2 to £1500/m2. The actual cost will depend on information which will be input from the suggested additional surveys required.

In broad terms based on the information gleaned from this visual non invasive survey it is suggested that the most pragmatic financial long term development strategy for this aged pre-fabricated system structure would be to "nurse" the existing building forward for up to about fifteen years, keeping the investment to a sensible minimum and there afterwards replace the building with a completely new facility.

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# Appendix A - Recorded Photographs

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