**STRUCTURAL REPORT**

**AT**

**THE OLD METHODIST CHAPEL**

**GAMLINGAY**

Job Number: G10388

ClientGamlingay Parish Council

Date: 25/04/2024

Engineer: P R Carruthers

BSc (Hons), CEng, MICE, MIStructE, ACIOB, FFB, FGS, FASI

We have been requested by Mr Peter Dolling on behalf of Gamlingay Parish Council to undertake an inspection and provide recommendations in respect of both structural movement to the building, and advice in respect of the proposal to reclad the existing roof and provide inset solar panels.

By way of background the building is a former Methodist Chapel constructed circa 1855.

Construction is conventional for the building usage and its age.

The walls are solid 9 inch brick with associated brick openings.

The walls are double height internally with an elevated ceiling giving access to the roof void.

Tthe roof itself would originally have been clad in slate and in more recent years it has been re clad in concrete tiles and provided with a felt under cloak.

the roof is conventionally constructed with four number king post trusses, associated purlins rafters, ceiling joists, and binders.

A previous report by Messrs Frith Blake Consulting Limited recommended that the gable walls were tied back to the rest of the roof structure and their recommendations have been carried out in general accordance with their sketches.

However we would comment further with our own recommendations.

In addition comments were made with respect of structural cracking in particular to the front elevation again we will comment on this within the body of our report

To try to address the two issues we set out below our observations and recommendations

the roof strengthening works to date have been carried out in general accordance with the engineers recommendations however in our opinion the repair works do not fully deal with the structural issues.

It has not addressed the considerable deflections to the purlins and the ceiling members.

It also lacks sufficient lateral restraint to the two gables which can be improved at a very little additional expense.

This includes a ply sheath and noggins on the line of all straps which does not always exist at present.

We are unsure what Mrs Frith blakes brief was but it does not deal with the introduction of solar panels or or turn it roof coverings our advice is as follows.

Introduce additional lateral restraint straps along the rafter line and also ceiling gable wall interface on both Gable and elevations.

Provide additional purlins and ceiling binders to reduce the span of the rafters and ceiling joists.

These can be supported on the existing trusses on the basis the loading is will now be more equally spread.

To deal with the change in roof coverings ,and the introduction of the solar panels this can be achieved from within the roof void using a ply sheath screwed and glued to the underside of the existing rafters ,by doing this the roof will become very much stiffer and its strength and resistance to the new loads improved dramatically.

To assist I have attached a few details to demonstrate the process.

Once the above is done the roof will be structurally able to resist wind dead and live loads associated with the current proposals

An inspection of the structural cracking was made along with the details of the trial holes and condition of subsoils these are attached.

As expected the foundations are a simple 2 brick corbel arrangement which steps out at the bottom.

The subsoils are generally of a made ground nature but predominantly of a non cohesive sandy type.

We suspect at depth the ground would reflect the virgin sand formation shown on the geology maps.

Of particular interest and in all honesty quite expected is that the subsoils on the front right hand corner were noticeably wetter and softer than those further along the right hand flank elevation and away from any water discharge.

The cause of the damage is quite clear to ourselves in that it is due to a vertical and rotational effect on the foundations local to a source of water, the water has caused washout of the fines and further softening of the non cohesive materials.

An examination of the areas of damage are consistent with the local location of down pipes.

We believe the one on the left hand front corner has been replaced in the past but where it discharges is unknown and the one on the right hand corner ie adjacent to the worst cracking discharges directly onto the ground and has probably done this for a number of years,

as such damage is only to be expected given the shallow nature of the foundations and the subsoil type.

Our advice is to re direct the rainwater pipe on the right hand side either to a soak away or possibly to a drain run which we noted on the right hand flank elevation

We would also advise that a CCTV survey of the left hand water discharge arrangement is made and any alterations to this made if appropriate

With regards to monitoring our advice is to install more up-to-date monitoring studs which are far more accurate in order to monitor the effects of any mitigating works and then and subject to the monitoring repair the damage providing providing stabilisation occurs

the monitoring will need to be read on a bi monthly basis we would not advise photographic evidence.

Heli bar repairs can be undertaken local to the cracks and if deemed necessary by the way of introducing heli beams at low level along part of the front and flank walls to effectively locally underpinned the walls affected “above ground level” by enhancing the low level brick panel thus allowing it to arch.

This we feel is far more appropriate than conventional underpinning as this will require substantial excavation be extremely expensive as extensive left lengths of underpinning will be required to achieve a transition back to the existing foundation formation

We trust that the above identifies and provides advice in respect of both the roof and the structural damage to the property if required we can install the demec studs, undertake the monitoring ,and also cctv the drainage system and we await your advice is in this respect,

![](data:application/vnd.openxmlformats-officedocument.wordprocessingml.document;base64,)Paul R Carruthers

***P R Carruthers***

***BSc (Hons), CEng, MICE, MIStructE, ACIOB, FFB, FGS, FASI***