

**St Michael & All Angels Church, Thornhill.  
Conservation report on the internal monuments**

**Section 4**

**Summary of the condition and treatment options for the  
monument to Sir George and Lady Anne Savile**



Prepared for:  
**Thornhill Parish Church Council**  
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## **Summary of the condition of the monument to Sir George and Lady Anne Savile at the time of survey.**

### ***Summary of the surface condition.***

The monument is extremely dirty and has a significant covering of dust.

The monument has been repaired and restored on several different occasions as evidenced by the various re-pointing mortars, mortar or plaster repairs, surface coatings and re-painted heraldry. This report has not identified the full nature and extent of these works which is recommended to be undertaken as a secondary stage investigation.

There remains an ongoing issue about impact damage which occurs both at high and low level possibly even indicating ladders or other access equipment is placed against the monument.

The lower sections of the monument on both elevations are suffering badly from the ingress of moisture and soluble salts. There is substantial surface friability induced by the movement and crystallisation of the salts in and on the surface. On the north side it is noted that salt growth is appearing very active at a surprisingly high level on the pilaster panel of the eastern end.

No moisture readings were carried out but at the time of survey visual observation clearly indicated the presence of water in the stone surface. As this is predominantly at low level and decreases in severity with height in the monument it is reasonable to assume the source has been from the ground/floor. There is also evidence of salt at high level and this may have been the consequence of poor roof maintenance in the past. At the current time the salts may be exacerbating the problem if they are deliquescent in nature. Further analysis to determine the type of salts present at different locations would be advised as this might assist in understanding the extent of the problems and the source of the salts.

The mortar in the joints needs to be fully checked as the various re-pointing repairs would appear to have introduced hard mortars which will be bad in terms of allowing the structure to breath.

It is noted that the heraldic images have been painted relatively recently; that paint remains in reasonably sound condition. There are other areas of possible early painted decoration (noted on the effigy of Sir George within the report) that have not been restored recently and these are somewhat friable. Further analysis is required to determine exactly the extent of remaining original or early decoration both on the restored areas and the non-restored areas.

**Structural condition.**

An analysis of the structural condition of the monument has been carried out by the church structural engineer;

*(D.A.C.Wood, East Ings Farm, Bulmer, York, YO60 7ES Report reference 421, July 12<sup>th</sup> 2010. "St. Michaels Church, Thornhill, Wakefield Report an appraisal of the structural condition of parts of the church structure and the monuments in the chancel and north aisle).*

The conclusion relating to the monument to Sir George and Lady Anne Savile is taken from section 4.0 of the above report and copied below;

- 4.4 *This monument is built in limestone and consists of a large tomb, side walls and a large vaulted canopy. It stands below the arch in the colonnade between the chancel and the Savile chapel.*
- 4.5 *There has been some slight settlement on the east side but this is not of major structural significance. It is not clear if the movement has ceased but no structural intervention is considered necessary at present.*
- 4.6 *The barrel vault is nominally 2.0m wide and built using limestone blocks. It has spread and dropped as a result opening up gaps in the joints between the blocks. There are timber packs to prevent further spread between the walls of the monument and the wall and pillar supporting the arch and wall of the chancel.*
- 4.7 *The pillar appears to be restraining the vault at present but in my opinion this cannot be relied upon, and additional restraint is required. Strengthening works are required; these can take the form of reinforcing the vault using "Cintec" anchors or rebuilding the vault and canopy with additional structure.*

Section 4.5 above concludes that it is not currently necessary to provide a foundation to prevent further settlement.

Section 4.7 above concludes that additional restraint is required to the canopy to prevent further spread of the structure.

This report concurs with both of these proposals.

In addition it is suggested that the movement within the structure that is attributed to the spreading of the canopy could mask deterioration within the cramps of the monument. If stones had been tied together, as would be expected in a construction of this type, then these would help to provide some restraint even if not sufficient to tie the canopy together. There are some joints such as on top of the columns where the major disruption would disguise any localised corrosion jacking in the cramps. It should be considered that there is a risk of failure resulting from the loss of support from localised cramps. Corrosion of restraining cramps is noted in other monuments



within the church and surveyed at the time of this report; evidence of this can be read in the appropriate reports. It is therefore likely that the cramps within this monument will be suffering due to the effects of atmospheric moisture; especially as the joints have been opened allowing the buried cramps to be further exposed. It might be possible to visually inspect some of these by removing areas of pointing at strategic locations.

In addition to the major structural concerns there is evidence on the south elevation that high level elements have possibly been re-fixed (allegorical figures) and additional surface fixing added in the case of the pediment cartouche; this would appear relatively recent. This may be a further indicator of deterioration within localised cramps having given rise to concern about the stability of certain elements.



## **Treatment options.**

### ***Further investigations required***

This report has highlighted the requirement to undertake a number of further tests and investigations both on site and off site that would be necessary to arrive at a fully developed specification for conservation.

### **Preliminary cleaning.**

It is suggested that there are several areas requiring further investigation and that a preliminary clean to brush and vacuum the surfaces of the monument would greatly assist the process. For this and other aspects of the proposed investigations scaffold or access towers would be required. Before cleaning sampling for salt analysis should be undertaken.

### **Paint analysis**

Detailed paint analysis of the heraldic emblems and the arch stones and all other surfaces to ascertain if additional evidence of polychrome work remains. Some medium analysis may be required. Following receipt of information about the paint a decision can be made about the desirability and feasibility of removing the restorations to reveal original polychrome work.

### **Geological survey.**

A geological survey with stone identification would be advisable. This would be of historical interest but also provide technical information relevant to the understanding of possible sources of salts within the structure.

### **Salt analysis**

Analysis of the salts from across the different locations on the surface: Consideration to be given to the need for a quantitative survey in addition to a qualitative survey. The analysis would assist in preparing and specifying for any consolidation that may be required on the stone work.

### **Surface coating identification.**

Analysis of the unidentified surface coating or coatings to ascertain the nature, function and possible date of application: For this it may be necessary to examine and sample other monuments within the church to ascertain if there has been a general application of treatment at some time.

### **Cramps**

Consider investigation of the condition of localised cramps in the monument by removing sections of pointing to establish if visual examination is possible. Investigate the possibility of non invasive techniques for examining the cramps.

### **Stability of the embellishments.**

From suitable access all embellishments should have their stability and fixings checked.



Should it be decided to install stabilisation to the canopy using the "Cintec" method then the high level elements in particular need to be examined from suitable access to determine their long term stability.

If partial dismantling of the canopy is undertaken the stability of the high level elements would be incorporated into that work perhaps negating the need for further investigations against this item.

#### North elevation stone pillars and corbels.

Investigation and/or confirmation from the engineer about the function of the north elevation stone pillars and corbels would be required.

#### Pointing and bedding mortars.

An investigation and survey of the different types of pointing and bedding mortars would be useful in establishing areas where it would benefit from being removed and replaced with a more suitable mortar.

If the monument is to be dismantled the pointing survey would be required for archaeological and documentary purposes. During dismantling the majority of the old mortars would be replaced.

#### Previous repairs survey.

Due to the limitations of time, access and the condition of the surface of the monument this report has not established the various old repairs that may require attention as part of any detailed conservation specification: it is suggested that a survey of previous restorations be carried out in detail.

#### Cleaning trials

It would be desirable to undertake cleaning trials in order to establish what might be possible and to what level cleaning should be carried out. This would be best undertaken following the investigation into the surface coatings and the paint surfaces. If cleaning trials were not possible from a contractual point of view provision and contingencies could be made within a more detailed contract by setting out a series of options with on site testing as part of a contract.

### ***Dismantling of the monument***

There are three main considerations relating to the possibility of dismantling the monument: (1) the stabilisation of the canopy; (2) the salt and moisture ingress at lower level; (3) deterioration and possible failure of the embedded structural cramps.

1 It has been established that the canopy requires the introduction of tie bars to provide tension and prevent the further spread of the ends and to relieve the forces being exerted on to the fabric of the church. Two options have been suggested by the engineer: the "Cintec" system requires no dismantling but drilling into the structure from the ends. The alternative is to undertake partial dismantling of the canopy allowing a full inspection of the internal structure at high level and the design of suitable restraint bars to be incorporated during the rebuilding.



Is there a concern with the Cintec system that the structure of the canopy is unknown and is likely to consist of poorly compacted rubble and soft mortar with ashlar outer sections? Consideration would need to be given to the impact of inserting a steel bar into this unknown fabric.

Should dismantling be preferred the issue of the stone pillars relating to the roof corbels will need to be addressed and confirmation given about the support provided by the pillars to the roof and/or to the compression provided to the stone work below.

2 The high levels of salt and moisture in the monument following further analysis may be shown to be an ongoing issue that would be controlled only by isolating the monument from the floor and other stone work of the church. Further investigation of the floor and the surrounding area may provide additional information about the possibility of reducing the moisture by other means but at the present time this would not appear to be a very realistic option.

It is therefore advised that consideration be given at an early stage to the possibility of a total dismantling in order to introduce membranes if required. Final decision would be postponed until completion of additional analysis but in terms of preparing for a project the issues need to be discussed and considered in some depth.

Subject to the salt analysis it may be beneficial to poultice the stones to remove the soluble salts to help reduce further deterioration from the forces of crystallisation within the stone. This may not be successful using in situ poulticing and therefore dismantling may have an additional benefit for the long term preservation of the monument.

3 It has been proposed in the report that there is a possible issue about corrosion jacking and deterioration within the structural cramps of the monument. This needs further consideration and should it be agreed it is an issue then it too will contribute to the discussion about the need to dismantle the monument.

***Cleaning and surface coatings***

The monument would benefit greatly from cleaning: This item would be applicable whether or not the monument is to be dismantled.

Brushing and vacuum cleaning has been suggested within the investigations above.

Subject to the findings of the investigation into the surface coatings a decision may be taken to remove the coatings from the stone or whether the coatings themselves should be cleaned if retained.

Overall the surfaces might require additional dry or wet cleaning methods.

***Polychrome paint work***

Following further investigations a decision will be required about the option to remove the restoration paint coats to reveal any retained original paint work.

There may also be traces of other polychrome work revealed by cleaning that could require consolidation.

***Previous and new repairs to surface detailing***

An additional survey of old repair work has been suggested above and following this a decision can be reached about the option to remove and /or replace previous repairs. This should be on an individual basis and would be based principally upon technical needs to remove damaging or poorly executed repairs.

Where damage currently exists it would not be envisaged to repair or replace missing elements as nothing is of structural significance. Some cosmetic repairs could be considered following other conservation works and cleaning.

***Pointing***

If the monument is dismantled the pointing would be replaced as part of that process.

If the monument is not to be dismantled then the pointing will need to be replaced in areas where it is missing, defective, unsuitable or damaging to the structure. This may include cutting out some areas of hard pointing so great care will be required.

Detailed treatment proposals would be drawn up following the proposed survey of the pointing.

***Black Marble.***

The Belgian black elements would benefit from cleaning and being given a coating of black micro-crystalline wax. This would help in protecting them from the affects of condensation and help in restoring some of the appearance of the lost original polish.