



Ref: 22757~Statement of Justification for Structural Repairs

June 2026 – Revision B: 14 July 2026

Manor House, Crowland

Statement of Justification for Structural Repairs

Structural Issues

The property was surveyed by Stuart Armitage of The Morton Partnership on a number of occasions to identify the condition, and in particular the structural issues. It is readily apparent that the entire building to greater or lesser degree has been subject to subsidence. This is evident through distortions and cracks in walls, walls that are out of plumb, out of horizontal, or out of line, and the separation of elements of structure, and areas of floor that have substantially sunk.

There are some areas of past repair works, as well as the original main phasing of the construction of the building that indicate the process of subsidence has existed and been contended with for many years. To aid a better understanding of the site and the structure, ground investigations were carried out, as well as sample removal of panelling to view walls and lifting of floorboards to view floors (further panel temporary removal is planned). In addition to the issues that relate to the structural movement, it has become evident that there has been a history of repeated water ingress, particularly through damaged roof valleys.

Repairs completed and repairs in progress to date have largely dealt with the water ingress problems and the damage caused by them to the main roof of the west range. Wall tops and wall top timbers have been badly damaged by water ingress. To west range range, there has been subsidence, but less extensively than that to the east and rear range. The ground investigations focused on the movement that has occurred to the south and east walls of the east range and the south wall of the rear range.



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As an indication, the southeast corner of the east range has settled more than 300mm relative to other parts of this range.

Investigations

Investigations have been carried out to help inform a strategy of structural repair, with an emphasis on minimum intervention to the fabric.

Ground Investigation

Under my supervision, nine boreholes (window samples) were sunk at positions in the yard to the northeast corner of the site and then to the south of G10 (the Great Room) and G6 (the Drawing Room) and to the southwest corner of the south range of G11 (Kitchen) and G12 (Utility). This gave a basic representation of the ground make up around the most heavily subsided part of the building. A trial hole was also dug below the easternmost window to the south wall of G10.

Two additional boreholes were sunk for the purpose of carrying out percolation tests in the rear garden in respect to the design of new soakaway drainage to replace the rather ad-hoc existing.

The boreholes typically showed made-ground over clay and a narrow band of peat below it over sand/gravel. The depth of the made-ground was at the shallowest, 0.8m below the surface and at the deepest, was to 2.1m. Notably, the deepest make up was on the southeast corner of G10 where the subsidence has been greatest and where the footing depth was approximately 1.2m; this indicating that this corner has likely been built onto the fill. Peat and clay layers were similar throughout, but the sample closest to the southeast corner of G10 was slightly wetter than the others. The firm sand and gravels were reached about 2.6m in depth.

Overall, a combination of placed fill (made-ground), soft clay and peat indicate poor ground stability (as anticipated) with firm sand below the depth practically reachable by conventional strip footings, or indeed the footings of the building as it stands. Exceptional susceptibility of the rear corner to movement could relate to the increased moisture content (possibly influenced by defective downpipe here), and the increased depth of fill. The prevailing characteristics are otherwise similar for all the boreholes; poor ground susceptible to volume change, and prone to local differential change.

To the southwest corner of the south range (G11 & G12), there was an increased depth in peat, which may be the cause of the exceptional movement that is seen here, but also there is also a drain at this position and a redundant water cistern, which the presence or construction of, may have been a contributing factor.

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Overall, the site ground condition is poor and there has been a long history of structural movement.

Wall Condition Investigation

The purpose was to understand the building condition better and identify the relationship between the distorted above ground structure, subsidence and any other apparent factors.

G10 and Rooms Above

Investigation of south wall of G10 found that significant first floor load and south wall load is supported on a relatively small plan areas of masonry forming the two piers between the southern windows. This takes account of findings that under the window there is very thin brickwork and either side adjacent to the door, there are timber support posts rather than masonry piers. The loading arrangement has concentrated a significant proportion of the building weight above on relatively small area of footing top.

Further investigation of this south wall identified that there is a built-in and decayed timber running above the windows for the full length of the wall, and this has contributed to the hinging/bowing effect seen in the shape of the south wall. To make matters worse, the post either side of the door appear to have suffered decay to the bottom end due to moisture, and therefore the weight of the arch and the centre floor beam above to a degree must be carried on the ends of the defective built-in timber plate cantilevering out from each side. In this area, the crushing of the wall has resulted in the thin external ashlar stones bowing out and separating from the wall core either side, but especially to the east, of the doorway.

Further up the building, despite significant historic distortions to the south wall, there is less notable sign of recent movement since repointing/repairs have been put in place. The east wall has coped remarkably well with the substantial subsidence of the southeast corner, with cracks only against the stairwell end, but otherwise with the wall moving down largely as one. Inside there are piecemeal ties that are relatively modern, but of poor quality, as well as a steel angle section in the southeast corner that ties the quoins back to the internal tie straps. The floor was investigated and a steel piece repair was found on the easternmost of three floor beams, and some decay found to the top of the centre beam. The west one was sound. Valley beams have short bearings due to the wall movement.

The condition of the timber ground floor was investigated with a trial hole and the bearing timbers were found to be substantially decayed and surrounded in damp soil.

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G6 and Rooms Above

I looked at the wall make up in the Drawing Room, and found substantially decayed lintels to the south wall, little tying into the first floor, and one of the structural brick piers between the windows largely perished, cracked and blown, and the other one whilst slightly better, has been subject to damaging low level damp. There has been some separation of brickwork core and outer face, but principally the whole wall has moved out as one, bowing vertically and horizontally. Other walls are presently enclosed by panelling, but to the room above, initial removal on the east wall has identified major displacements, downward movement of the south end and loose brickwork and long-standing cracks. It may be possible that the panelling was applied as a means to help mask the effects of the structural movement.

Note that some of the mortar found was extremely lean and to the core of the wall resembled an earth mortar. This also explains why the wall tops have been so prone to water damage.

The condition of the timber ground floor was investigated with a trial hole and again the bearing timbers were found to be substantially decayed and surrounded in damp soil.

G11 Kitchen and G12 Utility

There has been substantial movement to the southwest corner of the south range, which has effected the south gable wall and the south end of the west wall. There is bulged and substantially cracked brickwork in both the south and west walls close to this corner, and additionally the south gable has suffered water ingress from the top, outward rotation and poor quality past enlargement of the first floor window and also has an embedded partially decayed tie beam and the weakening effect of the adjacent doorways below.

It is possible that the presence of the underground water cistern (either through leakage or poorly compacted back filling), defective drains and deeper band of peat found at this position has caused the structural movement. Towards the north end of the range, one of the tie beams has failed to the roof (support scaffolding was added to the east wall some years ago) and it is likely that there is decay to the timbers on the wall head due to past defects in the roof coverings at the eaves. At least one other of the tie beams is showing decay at one end, and there is a substantial crack through despite some past repairs, the chimney stack and the chimney is in poor condition externally, especially at the head.

The present twentieth century store (G13) and wood store (G14) built of fletton brickwork have subsided badly and this has formed extensive cracking, leaning and buckling to these walls.

Structural Assessment and Approach to Structural Repair

Movement can be seen to a number of the older properties in the vicinity of this building in Crowland; this an indication of the ground condition (and possibly the historic watercourses now covered/filled). It is evidently long-standing, any may be continuing, or at least have the potential to continue to some extent, dependent on what factors (especially water related) or environmental changes occur in the future.

The fabric is of high historic value. A low intervention conservation approach is favoured by the present owner, principally with repairs and consolidation to deal locally with the effects of the structural movement that has occurred cumulatively over many years, and with a priority to making the roof weatherproof and improving structural integrity. I am content that such an approach is possible, and the repairs importantly will be designed to help make the building more resilient wherever possible to future movement damage, particularly through the introduction of tie rods. There is risk of further movement, but the present proposals address the culmination of many years of past damage. In effect 're-setting the clock', so that the structure is best able to accommodate what may come before this may (or may not) again become critical, and recognition that the current movement is the result of many years of issues combined. High intervention (and the different set of risks of doing such) for present has been rejected. The only exceptions being to the rebuilding of the twentieth century additions of G13 and G14 and the corner of G12 in the immediate vicinity of these.

G10 and Rooms Above

My overall view of the results of the investigations into the ground condition and inspection of this part of the building indicates to me that the settlement has been driven by ground condition, possibly made worse by defective underground drainage. The east wall of the range has generally moved as one, descending at the south corner, whilst indications are that the west and south walls have cracked/abruptly distorted more due to the presence of more openings (of doorways and windows) weakening these. There is not significant sign of new movement to the south wall based on integrity of passed repairs, although some wall faces internally remain hidden by panelling (further panel temporary removal is planned). Internal strapping is generally of poor quality. The other contributory factor is the poor arrangement of the south wall due to the decayed embedded timber plate and overloaded masonry piers and lack of lateral continuity due to the high door arch. Inevitably, a wall of poor arrangement and structural continuity will be more susceptible to damage under settlement of ground materials.

My assessment of the situation supported by the present owner, leads me to an approach to repair that does not include to underpin the walls to this room. Subsidence has been substantial, but the materials in general have coped well and more corrective engineering intervention would need to be widespread and would be very significant in terms of disruption and risk to the building. There is

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not enough evidence of fast ongoing movement to justify this approach, and in itself it also brings a degree of different type of risk associated with temporary support and interfaces between flexible and less-flexible footing types. However, it will be necessary to have some degree of intervention, to temporarily remove the panelling to remove the embedded timber plate and fill this void, improve the support around the south doorway, rebuild the stone facing around the doorway and adjacent windows and provide a way of spreading the weight along the foundation and repair and tie across other cracks that may become revealed.

Once the panelling has been removed, a modest structural timber frame lining (not a steel frame as I understand was proposed in the past) will need to be constructed against the inside face of the east wall and the south wall to strengthen it around the doorway and strengthen the bowed wall and help take some of the weight from the floor beam ends above. This being in conjunction with realigning the failed area of external stonework and improving the support around the doorway with new brick piers and strengthened brickwork under the windows. This may require the panelling to be rebuilt slightly further into the room to provide a zone for the structural improvements, including tie rods, and better alignment to allow the refitting of the windows and shutters. This concealed structural lining will include timber posts propping vertically under the first floor outer beam ends and especially aid to better support to the central one, but because this is over the doorway, to do so with a timber beam between these posts. The south wall will also be tied in better to the first floor structure.

Better spreading of the load on the south footing will involve thicker brickwork under the windows and strengthening over the top of the foundation, with a beam (limecrete or reinforced brickwork).

To the east wall and west wall, ties rods will be introduced at a number of levels running back-to-front of the range and again generally to be hidden in linings, except through the stairwell where they may have to be independently boxed around or expose depending on exact line.

At an early stage, drains will need to be relayed to a new large soakaway constructed in the garden. The sooner this work process starts, the better, because the initial drying of the soil could cause some further movement. In the longer term, this will prevent the high water concentrations seen at certain positions that appear to have had an ongoing detrimental effect.

The ground floor structure is rotten and will need to be replaced.

Additional details of the works may need to be added once the wall is exposed after the panelling has been temporarily removed.

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G6 and Rooms Above

I am proposing that the south needs to be tied back into the first floor as well a rebuilding locally to the most defective brickwork around the windows and parts of the face of the east wall.

On drawn long sections and cross sections of survey, I have marked up anticipate tie rod positions, but with some opening up of the ground and first floor needed to finalise these. The ground floor structure is similarly rotten and will need to be replaced. There will need to be temporary support installed under the first floor and also during the works, lateral bracing of the rear wall and temporary needling through window heads to allow to replace defective lintels and brickwork piers. Presently, first floor joists may only sit on timber wall linings on the south wall due to the detachment of the rear wall, and extension and re-support will be necessary in conjunction with the proposed tying in.

There will need to rebuilding of the brickwork piers and possible improvement of the top of the footing (similar to that for G10) and investigation of the depth of the footing by trial hole. At high level, the coping and gable edge have been repaired, and this process will continue down the wall, with local rebuilding of the face where this this has been poorly repaired in the past and has areas of water damaged brickwork.

The ground floor structure is rotten and will need to be replaced.

Additional details of the works may need to be added once the wall is exposed after the panelling has been temporarily removed.

G11 Kitchen and G12 Utility

It will be necessary to demolish and rebuild the twentieth century highly subsided and damage store and woodstore building (G13 and G14), after first installing temporary scaffolding restraint to the utility south gable and south end of the west wall of this range. The store and woodstore will need to be rebuilt on a new engineered footing of piling and a concrete slab that will bridge the very weak ground in this location, and this will be constructed around the existing water cistern.

Extensive repairs will be required to the southwest corner of the utility, which could include reconstruction of the damaged south wall and south end of the west wall. In respect to this, the engineered footing to the adjacent store may be enlarged to carry the corner of the south range, but with doorway openings in two walls helping to form transition mechanisms (between parts of the building on the two types of footing, which is on balance considered more appropriate in this particular location). The solution will be assessed as the building becomes more accessible for repair, including when temporary support is in place and the roof coverings have been temporarily removed for localised repair to the roof structure.

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After temporary support has been installed through the kitchen and utility to carry the roof, it is anticipated that timber repairs will be required on a localised basis and new or repaired tie beams will be required to ensure that the roof structure is properly restrained. Part of the chimney top will need to be rebuilt and the main crack stitched as far as it can be accessed.

Structural Proposals

The proposed structural repairs are shown on the following outline drawings:

G10 and G6 and Rooms Above

- 22757/R/01 Ground Floor Plan – Partial
- 22757/R/02 First Floor Plan - Partial
- 22757/R/03 Second Floor Plan – Partial
- 22757/R/04 Section A-A
- 22757/R/05 Section B-B
- 22757/R/06 Section C-C
- 22757/R/07 Section D-D
- 22757/R/08 Rear (South) Elevation
- 22757/R/09 Front (North) Elevation
- 22757/R/10 Side (West and East) Elevations

G11 Kitchen and G12 Utility

- 22757/R/30 Ground Floor Plan - Partial

Note that west range local structural repairs have been largely carried out already, and are not included in the drawing set.

Drainage

- 22757/D/01 Site Drainage Plan East
- 22757/D/02 Site Drainage Plan West
- 22757/D/03 Drainage Details - Soakaway
- 22757/D/04 Drainage Details – Chambers

Scale and Appropriateness of Repairs

The building has been subject to very substantial movement as a result of subsidence. However, the approach is to better tie the building together and deal with the worst of the condition defects

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that have developed as a response to that movement. No underpinning is planned to the historic vast majority of the building, but there remains a risk that further movement may occur. Without taking this approach, the repair task could otherwise be extremely disruptive to the fabric. The present owners are supportive of a sympathetic and least intrusive structural and fabric repair proposal. Some decisions will need to be made on most befitting exact details as more of the fabric is exposed during repair.

The works on a wider basis to the building will deal with the decay that has occurred due to water ingress, and improve the drains. In the future, other, repeat or further works may be required. In the future, more intrusive works may be required, but these do not form part of this current proposal.

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