Method Statement Draft #2.

Repairs and Refurbishment – The Granary.

Upper Tye Farm, Copse Lane,
Hayling Island, Hampshire, PO11 0RJ.

1.0 Generally and Background.

1.1 This Method Statement is in support of a Listed Buildings application to the Havant Borough Council. No other use is intended or anticipated. The copyright remains with the authors.

1.2 The subject granary is a Listed Building. The surrounding farm buildings and farmhouse are not listed.

1.3 The granary is a typical free standing small grain store:-
Approximately 4metres x 4 metres, single storey.
Heavy oak framed with a pyramid pitched roof, plain clay peg tiled.
Entrance door. One window.
Raised on stone steddles.
The oak frame members have been infilled with brick panels, one wall frame has been completely replaced with brickwork.
It is our belief that originally the walls were clad with weather boarding, and not brick infilled.

1.4 During the first week of February 2010 the north wall (a frame and brick infill panel) of the granary collapsed, leaving the roof above unsupported. A temporary support has been inserted.

1.5 Reference should be made to drawing 0721-418 for clarification of the following descriptions.

2.0 Objective

2.1 Prior to February 2010 it was clear that the granary was close to collapse and required major repair.

2.2 The granary is considered to be failing in the following respects :-

a. Ground subsidence leading to severe frame deformation.
b. Lack of structural integrity within the wall panels.
c. Inability to support floor loads.
d. Inability to support roof loads.
e. Inability to resist external weather elements.
f. Inability to provide any useful function.

2.3 The decay and deformation in the timber frame members has reached a point where urgent action is required to restore the structural stability and integrity of the whole building. As a secondary objective, the restoration of the framing offers an opportunity to improve the weathering and environmental performance of the roof and walls.

2.4 The overall intention is to prevent further degradation, and to assure the future integrity and long term life of the granary.

2.5 Messers Gyoury Self, consulting engineers, have been engaged to assess the condition of the structure of the granary, for structural stability, and their report (F.15454 – June 2010) is included in the application documents.

3.0 Construction Details.

3.1 See drawing 0721-418. The original frame was a floor deck of large section (200x200) oak baulks supported on 'mushroom' stone steddles, raising the floor clear of the ground surface. Three principle baulks run on grids 1,4 and 7,

3.2 There is little evidence of foundations beneath the steddles. The steddle at grid 7/C is missing. Subsidence in the steddles on Grid A has contributed to distortion of the frame, to 'tipping' of the superstructure, and ultimately is a factor in the February 2010 collapse.

3.3 The 'superstructure' frame is of lighter oak members, typically 125x125, with mortice and tennoned joints fixed with oak pegs. Frames on Grids A and E were divided into 5 bays, and on Grids 1 & 7 into 3 bays. There were diagonal top braces at the top corners of all frames.

3.4 Prior to the collapse, the frame on Grid E was complete. The distorted parts remain.

3.5 The frame on Grid A is complete, except for losing the diagonal braces.

3.6 The frame on Grid 1 has lost all its intermediate members, and has been infilled with a single panel of brickwork.

3.7 The frame on Grid 7 has lost all its intermediate members, save one diagonal brace, and has lost its base rail. The frame is infilled and supported with a panel of brickwork down to ground level. This change more than any other compromises the integrity of the granary, in that the underfloor void, and function of the steddles is conspicuously lost. Without the floor void the distinctive granary appearance is lost.

3.8 The plain tiled roof is a simple pyramid, with jack rafters pitched onto a principle truss frame on Grid 4. The tie rail of the truss is a 200x175 oak rail. Unfortunately the north end of the truss was supported on the collapsed frame on Grid E, and has itself collapsed in consequence, with following distortion of all the roof frame members. The roof rafters are in poor condition with much deterioration in the rafter feet, leaving little rigidity in the roof structure. The rafters are little more than propped poles in 'teepee' formation.

3.9 As a result of previous frame distortion (2.3 and 3.2 above) an iron tie rod has been fitted through the building at mid height between Grids 2 & 3, with strap iron restaints at the ends. Any effect from the tie is lost with the collapse of the frame on Grid E, and the release of the north end of the tie. The tie relates to an intermediate use of the granary as a feed store, with timber framed 'bins' in the line of the tie.

3.10 The roof tiles are predominantly plain clay peg tiles, in reasonable condition. Aprroximately 5% have been replaced with machine made nib tiles. The hips were originally bonnet hip tiled of which approximately 50% remain. The missing hips have been replaced with running courses if plain tiles bedded on cement mortar.

3.11 The infill brickwork is not in our view original. Other similar granaries in the county have been (and still are) clad in tarred weather boarding. The advantage of weatherboarding, particularly for a granary, is for a 'breathing' waterproof skin, to keep the stored grain dry. Brick infill panels are prone to leak at the perimeter frame joints and to 'sweat' internal condensation in damp weather.

3.12 This granary has clearly had brick infill panels for some considerable time, possibly as much as 100 years in some parts. The bricks and the mortars used vary considerably around the building. There are variously :-

Imperial 3" plain clay bricks
Imperial 2" plain clay bricks
Imperial 3" frogged clay bricks
Metric 75mm frogged clay bricks
Metric 75mm fletton bricks
Sand lime mortar
Weak sand/cement mortar
Strong sand/cement mortar

The random mixing of all of the above elements would indicate a series of ad hoc repairs and replacements, and repeated use of second hand materials. Clearly the oldest, and possibly original, bricks are the unfrogged plain clays.

3.13 The entrance door on the south side, and two small shutter panels on the north side are ledged and braced softwood, possibly of Victorian origin and retain some original fittings. They are variously distorted by the collapse and the earlier frame distortion, and are unfixed from their frames.

4.0 Assessment.

4.1 There is a clear intention as 2.4 above that Granary should have an assured and useful future. It is not enough to repair it to its condition prior to the February 2010 collapse (ready to collapse again in the near future). The function and integrity of the original granary has been progressively lost through a series of ad hoc and inadequate repairs. All the elements of failure as 2.2 above require to be addressed.

4.2 Critical elements of the structure have failed, particularly :-

a. The roof truss on Grid 4.
b. The wall frame on Grid E.
c. The foundation support.

Individually these elements might be repaired in-situ, but in combination, and post partial collapse this is not a practical option.

4.3 The surviving structure is highly unstable, and further collapse can not be ruled out. The remaining frame members are overstressed by the failure of parts, and the distortion to the whole from the impact of the collapse. Frame joints weakend by age are being twisted and pulled in ways never intended.

4.4 Simply 'pulling' (by what ever means) the building back to straight will not overcome the compromise repairs, particularly the full height wall on Grid 7 (3.7 above) which substantially reduces the integrity of the original Granary design and function.

4.5 Messers Gyoury Self are clear in their Conclusions (9.6) and Recommendations (10.1) that further collapse is a serious risk and the rebuilding is the only safe option. We agree.

4.6 Even basic repairs will require the roof tiles to be removed, and some of the surviving brick panels to be removed, to relieve the weight on the surviving members, to allow the frame to be straightened, and the joints to be repaired. Noting that 25% of the walls have already collapsed, a total in excess of 50% of the tlies and bricks will have to be removed to complete even 'holding' repairs. Against this background it is our firm view that a more thorough refurbishment is required, to repair the damaged parts, and to reinstate the original parts lost in intermediate and inappropriate repairs.

4.7 Fundamental problems like the foundation subsidence can only practically achieved with the structure reduced to a skeleton, and relevelled.

4.8 With the building dismantled, best use can be made of the surviving parts. Old bricks can be combined together with lime mortar, and the modern bricks eliminated. Rafters can be relocated 'down the slope' to a shorter location after removal of their rotten feet, with a single replacement rafter at the apex. The alternative is that all rafters have spliced ends. The interlocking nature of the timber frame components can only successfully be repaired with the frame in a skeletal form, and full access to each individual joint.

4.9 The frame has to be repaired and straightened which affects every component. The need for urgent and extensive repairs presents an opportunity for a thorough refurbishment to give the Granary a viable future, rather than a stay of execution.

4.10 The Granary is a humble agricultural building in a private location. It is not a 'premium' historical asset with particular architectural or social connections. Repairs and maintenance of the Granary must be seen in an economic and practical context. It is our view that the future and integrity of the Granary can best be served by substantial rebuilding to restore its original condition and appearance.

5.0 Repair Method Statement.

5.1 Provide temporary supports to floor and roof members. Take care to protect existing structure. Short term raking shores to be erected externally (south side), to prevent further deformation and possible collapse.

5.2 Remove collapsed wall debris.
Set aside and sort salvaged bricks.
Record and set aside loose timber frame members.

5.3 Record (survey) remaining structure.
Measure principal members.
Photograph externally and internally.

5.4 Remove peg tiles, sort and set aside. (Weight reduction)

5.5 Carefully break out remaining brick infill panels, sort and set aside salvaged bricks. (Weight reduction and access to frame members).

5.6 Insert temporary scaffold support 'cage' and props to surviving skeletal frame.

5.7 Tarpaulin over retained parts.

5.8 Temporarily support steddles, one at a time. Remove steddles. Underpin foundations to common level. Reposition steddles. Replace missing steddle.

5.9 Repair timber frame. Retain as much as possible of existing frame members.
Splice new ends to part deteriorated members.
Reinforce failed joints with timber or fabricated iron brackets.
Re-use original members in alternative frame locations to maximise their use.
Replace totally failed members with new oak members.
Reconstruct 'missing' wall frame panel on Grid 7, with matching oak members.
Preservative treat (anti fungal and insect) complete frame.

5.10 Remove temporary supports and covers.

5.11 Re-tile roof.
Blend replacement peg tiles with salvaged originals.
New split oak lath battens.
New bonnet hip tiles to match.

5.12 Re-board floor.
Make good floor with 'wide' salvaged pine boards.

5.13 Reinstate side boarding. (Option).
Rough sawn softwood boards.
Boards lapped. (Not jointed).
Fixed with iron nails.
Treated with coal tar.

5.14 Reinstate brick infill panels. (Option).
Sort bricks into original types.
Relay in lime mortar with like bricks in adjacent panels
Make up shortfall bricks with reclaimed plain imperial bricks.
Point externally with struck lime pointing
Lime wash walls internally.

6.0 Summary.

6.1 If the building is to have an assured future, it needs to be brought back into a use-able condition, and not just retained for its own sake.

6.2 The relatively poor condition of the frame prior to the February 2010 collapse, and the subsequent instability of the overall structure require substantial rebuilding and repair works.

6.3 The rebuilding works offer an opportunity to make good insensitive and inappropriate repairs to restore the building to a more original condition.

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