Schedule of Repairs & Demolition

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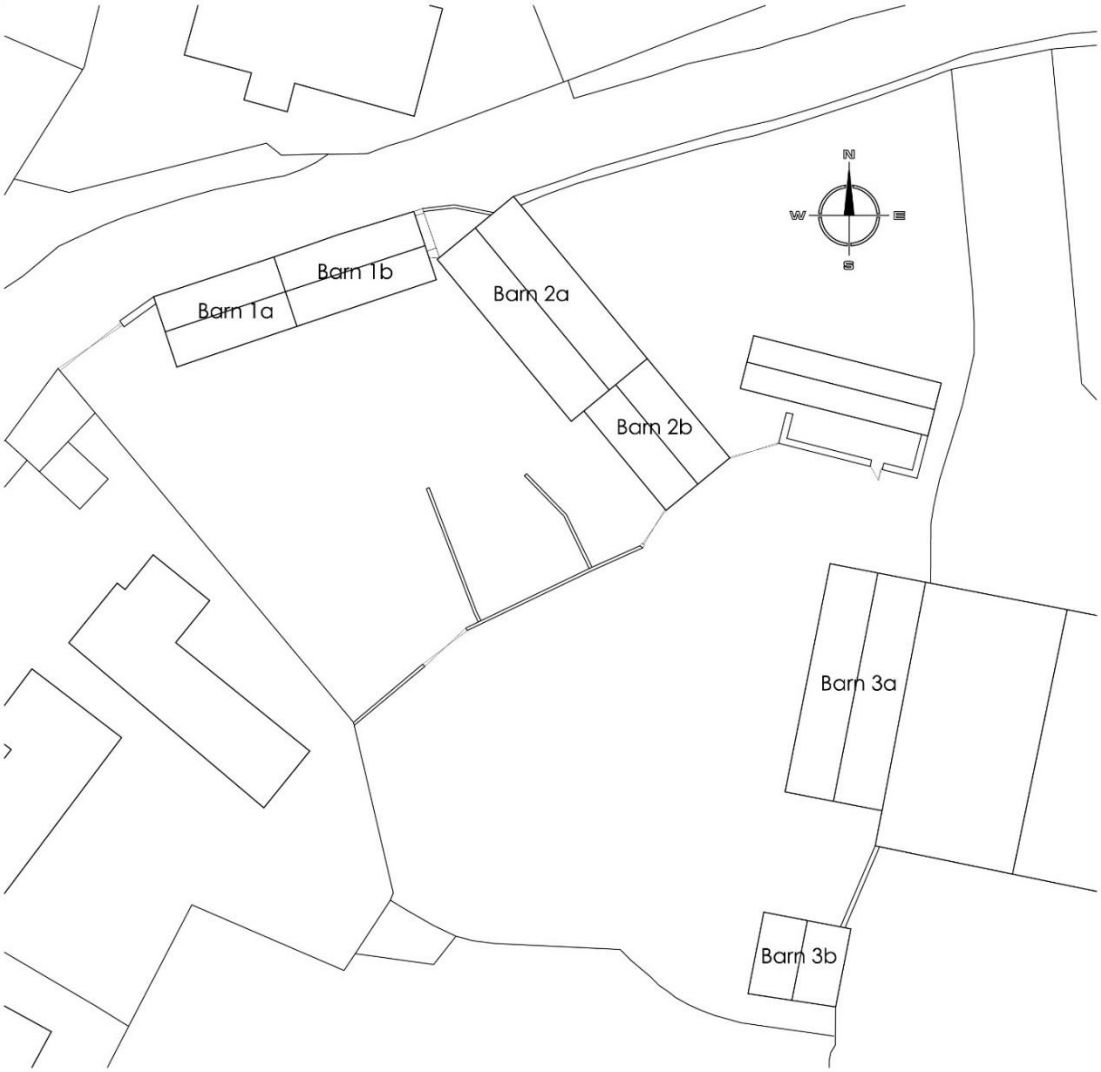
1.0 Pre-Amble

1.1 This schedule of repairs has been compiled following a site survey undertaken in March 2019, together with the recommendations contained within the structural appraisal (carried out by Bob Johnson Consulting Engineers in November 2016) and the Heritage Statement & Impact Assessment (Mel Morris Conservation, June 2017).

1.2 The survey was undertaken by John Sambrook (Senior Consulting Architect) and Kate Walker (Architect), on behalf on Hewitt & Carr Architects.

1.3 This report should be read in conjunction with drawings 00875 AL(0)20, 21, 22, 23, 24 & 25.

1.4 For clarity, the building group has been labelled as follows:



2. Demolition of Modern Barns

2.1. Demolition of modern barns to take place towards the end of construction works on site, as they will be utilised for secure storage of materials and equipment throughout the duration of the works.

2.2. Prior to any demolition taking place, the structure should be investigated by a structural engineer. Cracking and bowing are present to the east flank wall of Barn 3a, and the potential impact of any demolition adjacent to this historic building must be properly assessed. It is likely that the internal structural works to Barn 3 will need to be completed prior to demolition, in order to consolidate the external wall (potentially tying the existing wall into the new steel frame), preventing potential damage/collapse.

2.3. Demolish two easternmost bays first

2.4. Specialist asbestos contractor to investigate, remove and dispose of roofing material

2.5. Concrete stanchions closest to Barn 3 to be cut off at floor level

2.6. In-situ cast concrete infill (between stanchions and Barn 3) can be knocked out by hand

2.7. Make good any damage to stonework

2.8. Carefully take up concrete floor slab, taking extra care when coming within 1m of Barn 3

2.9. Remove any remaining concrete and cement mortar by hand, rake out and re-point in NHL 3.5 Hydraulic lime mortar

2.10. Dispose of material off-site

2.11. Level ground in line with the existing level of surrounding land, and re-seed using Germinal A25 seed mix for agricultural reinstatement. If any topsoil is required, attention is drawn to condition 24 of the planning and listed building approvals, requiring that any top soil to be imported must first be tested and assessed for contamination and suitability, in accordance with a methodology that must be submitted to, and approved in writing by, the Local Planning Authority.

3. Barn 1A

3.1. <u>Internally</u>

3.1.1. Remove existing floor joist ends and make good internal face of brickwork

3.1.2. Strip off flaking plaster to internal walls and consolidate brickwork in NHL 3.5 Hydraulic lime mortar, where necessary

3.1.3. Replace timber lintels to inside face with concrete lintels (W.1.01, 1.02 & 1.03). Make good any disturbances to brickwork.

3.1.4. Carefully break up and remove existing concrete floor slab, taking extra care not to damage the external walls

3.1.5. Install new first floor, to architect/engineer's details

3.2. <u>Externally</u>

3.2.1. Remove ivy to west gable and north (roadside) elevation.

3.2.2. Remove cement flaunching to tops of walls

3.2.3. Remove concrete infill to top of gable wall and replace with stone to match existing.

3.2.4. Take down minimum 20 courses of 9" brickwork (as indicated on drawing 00875 AL(0)11) to south (farmside) elevation where the wall is leaning out. Rebuild using existing bricks (mixed with new, to match, as necessary), and NHL 3.5 Hydraulic lime mortar to level with eaves of adjacent Barn 1b. No recognisable brickwork bond is evident within the existing walls but suggest rebuilding top courses in Flemish or English garden wall bond to ensure cross headers aid structural stability. Incorporate sawtooth and plain corbelled eaves to match Barn 1b.

3.2.5. Remove timber lintel to south elevation (above door) and rebuild brickwork arch
3.2.6. Remove timber lintels to windows 1.01 & 1.03 and replace with Staffordshire blue bricks carried by catnic lintel.
3.2.7. Insert Staffordshire blue brick sill to window 1.03 to match window 1.01
3.2.8. Repair and repoint steps and gable end stonework, where necessary, using NHL 3.5 Hydraulic lime mortar
3.2.9. Rebuild top portion of gable end wall, as per drawings, in stone and brickwork to best match existing (if not present on site). Picture from 2011 (before roof collapse) included in appendix for reference.
3.2.10. Rebuild adjoining drystone garden wall utilising exiting stone
3.2.11. Take down top 5 courses of brickwork to north elevation and rebuild up to eaves level of adjacent Barn 1b using existing bricks (mixed with new, to match, where necessary) and NHL 3.5 Hydraulic lime mortar. Incorporate sawtooth and plain corbelled eaves to match Barn 1b.
3.2.12. Remove timber window frame to north elevation, rebuild brickwork arch to window head, and infill opening in brickwork to match
3.2.13. Remove bolts (visible externally) retaining internal water troughs
3.2.14. Install new roof to architect/engineer's details, with eaves and ridge lines to remain continuous from Barn 1b. Suggest tiles are stripped from Barn 1b and re-used to roadside elevation across both Barns 1a and 1b. Source reclaimed Staffordshire blue tiles to match as closely as possible (unless original tiles found on site) and apply to farmside roof.
3.2.15. Localised re-pointing in NHL 3.5 Hydraulic lime mortar, as required. Sample panel of pointing to be provided on site and approved by the conservation officer.
3.2.16. Provide new cast iron rainwater goods on rise and fall brackets

4. Barn 1B

4.1. Internally

4.1.1. Remove existing first floor and make good internal face of brickwork
4.1.2. Strip off flaking plaster to internal walls and consolidate brickwork in NHL 3.5 Hydraulic lime mortar, where necessary
4.1.3. Replace timber lintels to inside face with concrete lintels (W.1.04, 1.06, 1.08, 1.09 & 1.12). Make good any disturbances to brickwork.
4.1.4. Carefully break up and remove existing concrete floor slab, taking extra care not to damage the external walls
4.1.5. Wall plate to roadside elevation requires replacing due to extensive insect infestation
4.1.6. Wall plate to farmside elevation is partially sound but may require replacing left of the window reveal
4.1.7. Treat all remaining woodwork i.e. trusses, purlins etc. for woodworm/beetle infestation. Suggest existing trusses are inspected by appropriately qualified timber specialists, such as Robinsons Preservation, for capacity to carry additional loads from insulation etc.
4.1.8. Timber truss pads to be replaced in engineering brick
4.1.9. Remove 2 courses of brickwork (level with the base of the truss pads) and build up to underside of rafters on flank walls
4.1.10. Rafters appear sound
4.1.11. Large timber lintel to west gable appears sound and can be left in-situ
4.1.12. Reinstate missing braces to both trusses
4.1.13. Install flitch plates to strengthen purlin joints, where required

4.1.14. Carefully remove small section of brickwork (approx. 10c x 2 stretchers) to south east corner at first floor level, where cracking is visible. Rebuild in bond to match using existing bricks and NHL 3.5 Hydraulic lime mortar
4.1.15. Add additional internal skin to top 8 courses of single skin brickwork to eastern gable apex
4.1.16. Install new first floor, to architect/engineer's details

4.2. Externally

4.2.1. Make good any disturbances to outer leaf caused by works to inner walls
4.2.2. Rebuild arch to window 1.07
4.2.3. Remove timber lintels to windows 1.04, 1.06, 1.08 & 1.12 and replace with Staffordshire blue bricks carried by catnic lintel.
4.2.4. Remove sagging timber lintel to window 1.11 and replace with plain brickwork corbel detail carried by catnic lintel.
4.2.5. Rebuild 9" brick arch to window 1.09
4.2.6. Insert Staffordshire blue brick sill to windows 1.06, 1.08, 1.09 & 1.12 to match windows 1.01 & 1.04.
4.2.7. Carefully take down and rebuild small portions of damaged brickwork to eastern gable, particularly around the apex, using existing bricks and NHL 3.5 Hydraulic lime mortar
4.2.8. Carefully take down and rebuild small portions of cracking brickwork to SW and NW corners using existing bricks and NHL 3.5 Hydraulic lime mortar
4.2.9. Rake out (by hand) and repoint joints to farmside and east gable, as necessary.
4.2.10. Strip tiles to roofs and retain for re-use. Provide felting beneath new laths before replacing tiles.
4.2.11. Provide new cast iron rainwater goods on rise and fall brackets

5. Barn 2A

5.1. Internally

5.1.1. Remove existing first floor boards, joists and steel beams, and make good internal face of brickwork
5.1.2. Strip off flaking plaster to internal walls and consolidate brickwork in NHL 3.5 Hydraulic lime mortar, where necessary
5.1.3. Replace timber lintels to inside face with concrete lintels to all windows and doors. Make good any disturbances to brickwork.
5.1.4. Carefully break up and remove existing concrete floor slab and cow byres, taking extra care not to damage the external walls
5.1.5. Remove modern truss and provide support, in consultation with structural engineer. Make good any damage to brickwork.
5.1.6. Wall plates and rafters are sound. Should be possible to leave existing felt, battens and roof tiles in place.
5.1.7. Treat all remaining woodwork i.e. trusses, purlins etc. for woodworm/beetle infestation. Suggest existing trusses are inspected by appropriately qualified timber specialists, such as Robinsons Preservation, for capacity to carry additional loads from insulation etc.
5.1.8. Timber truss pads to be replaced in engineering brick
5.1.9. Build up brickwork to underside of rafters on flank walls
5.1.10. Remove timbers to south gable and replace with brickwork to match existing
5.1.11. Install flitch plates to strengthen purlin joints, where required
5.1.12. Replace modern purlin (to southern end) and timbers with reclaimed oak

5.1.13. Install new first floor, to architect/engineer's details

5.2. Externally

5.2.1. Make good any disturbances to outer leaf caused by works to inner walls
5.2.2. Recently rebuilt north gable is sound
5.2.3. Remove timber lintels to windows 2.01 & 2.04 and replace with stone
5.2.4. Remove cement strap pointing to any areas where causing obvious deterioration to the stone. Chisel out by hand, rake and clean out joints, and repoint using NHL 3.5 Hydraulic lime mortar.
5.2.5. Remove panels of brickwork to D2.01 & W.2.03 and make good any damage
5.2.6. Selective remedial repointing to other areas where mortar is cracked or missing
5.2.7. Make good stonework where drains are removed at base
5.2.8. Remove portion of timber and brickwork at eaves to east elevation and reinstate stone corbel, in profile to match existing
5.2.9. Remove timber lintel to window 2.11 and replace with deeper stone lintel, lowering the window head beneath the new internal floor level
5.2.10. Some cracking evident to south gable. May require further investigation by structural engineer. If sound, rake out and re-point in NHL 3.5 Hydraulic lime mortar.
5.2.11. Make good ridge and verge to south gable
5.2.12. Provide new cast iron rainwater goods on rise and fall brackets

6. Barn 2B

6.1. Internally

6.1.1. Strip off flaking plaster to internal walls and consolidate brickwork in NHL 3.5 Hydraulic lime mortar, where necessary
6.1.2. Replace timber lintels with concrete lintels to all windows and doors. Make good any disturbances to brickwork.
6.1.3. Carefully break up and remove existing concrete floor slab taking extra care not to damage the external walls
6.1.4. Wall plate and rafters appear sound but require further investigation due to possible water damage following slipping of the roof tiles to the eastern elevation (tiles have subsequently been stripped and stored, and the roof covered with tarpaulin, in agreement with the conservation officer).
6.1.5. Increase support to truss ends at tops of piers, increasing the width of the bearing and replacing standard brickwork for engineering brick.
6.1.6. Rebuild top 10c of brickwork to SW corner, where cracking is evident. May require further investigation once closer inspection is possible.
6.1.7. Treat all remaining woodwork i.e. trusses, purlins etc. for woodworm/beetle infestation. Suggest existing trusses are inspected by appropriately qualified timber specialists, such as Robinsons Preservation, for capacity to carry additional loads from insulation etc.
6.1.8. Build up brickwork to underside of rafters on flank walls

6.2. Externally

6.2.1. Make good any disturbances to outer leaf caused by works to inner walls
6.2.2. Remove timber lintel to window 2.06 and replace with stone
6.2.3. Remove panel of brickwork to D2.02 and make good any damage

6.2.4. Cracking and leaning evident to gable wall, particularly along vertical joint between stone and brickwork pier. Repair and/or rebuild, as per engineer's details, utilising existing stone and lime mortar.
6.2.5. Selective remedial repointing to areas where mortar is cracked or missing
6.2.6. Rebuild top 2 courses of brickwork to east flank wall, with projecting header corbel to match small portion already in-situ
6.2.7. Provide new cast iron rainwater goods on rise and fall brackets

7. Barn 3A

7.1. Internally

7.1.1. Replace timber lintels to inside face with concrete lintels to windows 3.02, 3.03, 3.05 & 3.06. Window 3.02 will be in new position, as per architect's drawings. Make good any disturbances to brickwork.
7.1.2. Carefully break up and remove existing concrete floor slab, taking extra care not to damage the external walls
7.1.3. Provide additional support behind external timber lintel to window 3.01, to structural engineer's details.
7.1.4. Rebuild approx. 600mm of stone to top of east flank wall towards NE corner
7.1.5. Cracks evident to SE corner. May require further investigation by structural engineer. If sound, repoint in NHL 3.5 Hydraulic lime mortar.
7.1.6. Build up walls in brickwork to underside of rafters on flank walls
7.1.7. Install new first floor, to architect/engineer's details

7.2. Externally

7.2.1. Make good any disturbances to outer leaf caused by works to inner walls
7.2.2. Remove metal straps, sheeting, modern trusses and purlins to roof. Make good any damage to walls.
7.2.3. Install new roof, to architect/engineer's details. Source reclaimed Staffordshire blue clay roofing tiles to best match those to Barns 1 & 2.
7.2.4. Remove modern casement to window 3.02. Carefully remove approximately 3 courses of stone beneath window and provide new stone sill and lintel in position as per architect's drawings.
7.2.5. Remove panel of brickwork to window 3.03 and make good any damage
7.2.6. Provide new stone to bottom left reveal of window 3.05
7.2.7. Selective remedial repointing (in NHL 3.5 Hydraulic lime mortar) to any areas where mortar is cracked or missing
7.2.8. Some cracking and bowing evident to east flank wall. May require tying in to new steel frame, as per engineer's recommendations. If sound, rake out and re-point in NHL 3.5 Hydraulic lime mortar.
7.2.9. Provide new cast iron rainwater goods on rise and fall brackets

8. Barn 3B

8.1. Internally

8.1.1. Strip off flaking plaster to internal walls and consolidate brickwork in NHL 3.5 Hydraulic lime mortar, where necessary
8.1.2. Replace timber lintels with concrete lintels to all windows and doors. Make good any disturbances to brickwork.
8.1.3. Carefully break up existing concrete floor slab and lift remaining gritstone setts, setting aside for re-use. Take extra care not to damage the external walls
8.1.4. Remove timber currently acting as wall plate to east flank wall. Rebuild top section in stone and provide new wall plate.
8.1.5. Treat all remaining woodwork i.e. truss, purlins etc. for woodworm/beetle infestation. May require input of specialist timber consultant.
8.1.6. Build up brickwork to underside of rafters on flank walls

8.2. Externally

8.2.1. Make good any disturbances to outer leaf caused by works to inner walls
8.2.2. Remove brickwork panels to front elevation, in consultation with structural engineer
8.2.3. Repoint stone, above eaves level, to rear gable in NHL 3.5 Hydraulic lime mortar
8.2.4. Some cracking and bowing evident to east flank wall. May require further investigation by structural engineer. If sound, rake out and re-point in NHL 3.5 Hydraulic lime mortar.
8.2.5. Selective remedial repointing to areas where mortar is cracked or missing
8.2.6. Remove timber to top of east flank wall and rebuild in stone
8.2.7. Strip roof tiles and retain for re-use. Check soundness of existing rafters and replace where necessary. Re-install existing tiles on new battens and roofing felt.
8.2.8. Provide new cast iron rainwater goods on rise and fall brackets

9. General Specification

9.1. Ground Floors

9.1.1. Construct new floor consisting of 75mm lime screed, laid on 150mm limecrete with insulating aggregate on non-woven geotextile membrane, on loose fill above non-woven geotextile membrane on compacted subsoil. Provide perimeter insulation between wall and slab. Floor finish to be suitably sourced natural stone flags, with levels set as indicated on drawing 00875 AL(0)17.

9.2. Walls

9.2.1. Externally - All remaining loose lime and all sand/cement mortar removed from stone joints. Structural repairs and rebuilding carried out where indicated by structural engineer. All re-pointed in NHL 3.5 Hydraulic lime mortar (provide sample panel, to be approved by conservation officer).
9.2.2. Internally - Remove all loose finishes and rake out all loose mortar (as above) and re-point in NHL 3.5 Hydraulic lime mortar. Provide tanking membrane to areas where internal finished floor level will be below external ground level. Apply secondary stainless-steel stud system to walls (utilising packers wherever wall is uneven), on breather paper, followed by mineral wool insulation added between studs, and finished with 12.5mm Gypsum plasterboard.

9.3. Roof

9.3.1. Existing plain clay tiles removed to be removed and retained for re-use. Remove all battens and repair/replace any defective rafters. Provide new SW treated tiling battens on breathable sarking felt, fixed to rafters. Re-lay old tiles together with any new required (to match in size, colour and texture). Roof void insulated with 70mm PIR (Celotex or other approved), with 30mm air space above/25mm below, and Super Quilt on u/s of rafters. Finish with 12.5mm Gypsum plasterboard on counterbattens.

10. Appendix



1: Purlin to Barn 1B



2: Timber lintels to Window 1.11



3: View of gable end to Barn 1A, prior to its demolition (courtesy of Google Maps 2011). Suggest rebuilding to best match.



4: Timber lintel to Window 1.09



5: Brickwork requiring rebuilding to Barn 1A



6: Cracking and leaning to Barn 1A



7: Timber lintel to Window 2.12



8: Failing timber lintel to Window 2.03



9: Cracking to SW corner of Barn 2B



10: Leaning out of gable to Barn 2B



11: Corbel to Barn 2B



12: Timber lintel to Window 3.01



13: Concrete frame of modern barn attached to Barn 3A



14: Timber 'wall plate' to Barn 3B