

Written Summary of Scope and Specification

Phase One Repair, Investigations and Trials – Stage One

Text based on the 'Definitive Project Brief'

3.0 Phase One Scope - Main Mill Upper Storey and Roof

Scope – Second floor upward.

Whole of the upper storey extending from the structural soffit of the second floor upward. Extending to the full length of the main mill building. This scope is also informed by the form and function of the scaffold needed to undertake the works.

Definers for scope of phase one:

- Securing safe means of access (for approved parties)
- Construction Budget to target most cost-effective package for Phs 1
- Scaffold - Access, protection and stabilisation scaffold
- Building repairs / remediation of defects
- Fabric enhancements (improved drainage, roof insulation etc.)
- Fabric investigations
- Trials to inform future works

Variation in scope will be guided by:

- Efficiencies in access – scaffold form and cost
- Scope of repair needs – remediation of structural defects
- Repair efficiencies – expansion of discrete aspects of work to mitigate future cost
- Removal of hazardous materials e.g. asbestos
- Remediation of dangerous structures e.g. internal alterations / adjoining structures

Scaffold - The repair and remediation work to the roof and upper storey of the main mill building require a scaffold that will allow for complete encapsulation and provide structural restraint to permit the removal of the roof and works to the upper story of masonry including rebuilding of elements that have been substantially displaced by the jacking of embedded iron.

Building repairs, fabric enhancements and investigations are described below.

Trials – Early trials will be undertaken to allow for exploration of repair and adaption measures. The trials will allow solutions for future fabric adaption to be explored and to inform applications for future approvals. This work will be designed and guided by the Conservation Architect / Surveyors. See section 5 below for further details.

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3.1 Strategy for Phase One Consolidation and Repair

The following works are specifically concerned with the stabilisation, consolidation, remediation, repair and reinstatement of the upper most storey and roof of the main mill building.

Address agents of instability

- High level work - upper storey and parapet masonry stabilisation / remediation of structural movement, failure of coverings, rainwater drainage systems and fabric generally
- Roof remediation arising from walls moving out and rot from water penetration / possible alteration in roof design and detailing to accommodate outward movement of the upper storey
- Cornice parapet – determine stability and condition of core fabric / investigate form of construction to inform proposals for consolidation

Inherent Defects

- Address jacking from corroding iron
- Appraise scope of removal / renewal of embedded ironwork
- Anticipate rebuilding of large areas of masonry at the northwest and northeast corners

Repair and Enhance

- Iron Cutter – retain iron / overhaul in workshop / develop details to manage thermal movement and improved water management
- Rainwater Goods – wholly renew and identify required improvements
- Roof Coverings (modern mineral slates) – complete renewal (Blue Bangor Quarry)
- Water tank at the head of the south stair – seek to retain in-situ / possible reuse for grey water recycling

Alteration

- Removal of early C20th lift overrun / reinstate roof
- Removal of ceilings to allow for overall repairs / consider designs that leave the roof space on show i.e. no reinstatement of the lath and plaster ceiling
- Removal of later partitions to the upper floor
- Appraise location for new roof level access / consider designs solutions to include for access

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It will be necessary to make assumptions to suit the future reuse. The trials will allow for some of this to be explored and will inform future designs. Some aspects of reuse will likely impact the design for the repairs e.g. a lift overrun and service distribution. This will need to be properly considered as part of the development of designs for reuse covered under a separate commission.

3.2 Repair Method Recommendations

The works must follow conservation principles which include maximum retention of historic fabric and sympathetic repairs. A combination of dismantling, in-situ repairs and offsite works will be required to achieve the necessary repairs. The extent of deterioration and nature of the defects will require rebuilding / renewal of parts.

In summary:

Roof Coverings

- Strip existing asbestos mineral slates and bitumen felt
- Renew all coverings with traditional slates over a breathable felt
- Insulate subject to design appraisal (*see notes under enhancement strategies*)
- New flashings, etc to all abutments and penetrations
- Roof deck and lead work to coverings to water tanks

Parapet and Cornice

- Localised take down where greatest movement has occurred / fabric appears unstable
- Remove all render / Roman cement
- Renew roman cement render to whole parapet
- Rebuild in brick and stone to match original and to correct areas of major outward movement
- *Worst case will require extensive rebuilding of the parapet from cornice up*
- Opening up of cornice to confirm stability and construction
- Allow for localise rebuilding in areas of movement and instability
- *Worst case complete rebuild of the cornice*
- Crouting where voids are identified in areas of retained masonry
- Metal (lead /SS) covering to parapet head and cornice to provide improve weather protection

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- Render the cornice and parapet with Roman cement made to match original mix

Roof Structure

- Repair of all rotten truss and rafter elements
- Disassembly, repair, adjustment and resetting of roof elements to address movement in the wall
- Renewal of gutter base design to allow for new additional gutter detailing / fail safe gutter
- Remediation of historic interventions i.e. the lift shaft
- Interventions - fall arrest anchors / new access route to the roof level / potential circulation core and lift over run proposed as part of reuse scheme

Roof Level Access Systems

- Provision of tethers and cables as part of a fall arrest system

Wall

- Localised take down and rebuild where extensive movement or mortar washed out
- Removal of embedded ironwork causing jacking
- Opening up to every window reveal to allow for removal of iron bands
- Installation of replacement bands of 316 austenitic stainless steel
- Replacement of failed damaged limestone units anticipated to be minimal at upper level
- Grouting to upper story to address loss of mortar to wall core from washout
- Full repointing to extent of phase one
- Wall head - rebedding of masonry shelf for truss / installation of pad stone at truss positions
- Renewal of tie detail between truss and wall head
- Removal of internal wall linings to expose brickwork
- *Reapplication of internal lining subject to discussion and programme for future phases. Also see note on trials.*

Rainwater Goods including gutters

- Recording and cataloguing of all gutters
- Removal for off-site conservation repair and restoration / with flame zinc protection
- Allow for renewal of failed sections in new cast iron
- Reassembly with enhancement to improve potential movement plates

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- Options for improved detailing of gutter to include additional outlets and back up sub-gutter
- Rainwater Drainage Strategy - New down pipes with external chutes, outboard pipes to northeast elevation and carefully located internal pipes to the gable and southwest elevations

Windows

- Subject to budget, approvals and trial – re-fenestration of part of the upper floor

Enhancements – see section 6. for further details

- Roof level insulation
- Wall insulation
- Window renewal

Asbestos

- Remove asbestos material identified in the 2021, 2023 and 2024 survey report. Follow up level 3 / demolition surveys to inform removal of asbestos from adjacent structures.

4. SURVEY and INVESTIGATIONS

The phase one construction period will include investigations that will inform repairs and enhancements contained within future phases. Early opening-up investigations will be undertaken to inform phase one designs.

The following list of surveys described the intention to gather sufficient information to inform proposals for repair and reuse.

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Phase One Investigations

Survey Requirement	Type / Method	Location
Identification of embedded ironwork	Ferrosan	Whole façade
Assessment of the iron – columns, beams, tie rods, water tanks, etc.	Sampling and analysis	Key elements
Structural Appraisal	Visual inspection + cores and opening-up	Whole building
Building Assembly – beam, column and tie rod connections / jack arch spring from beam, etc.	Opening-up and recording	Key junctions
Presence of timber as part of the original connection of the beam into the external envelope	Opening-up and recording	Beam to external wall connection
Cornice – material, form and construction	Opening-up and recording	Cornice
Upper floor later parti-ions - fabric and construction	Opening-up and recording	Second floor
Floor slab – construction, make up and junction at external wall	Opening-up and recording	Floor edge
Material Sampling – type, components, behaviour, performance	samples and analysis	Stone, brick, roman cement render, mortar, historic plaster
Element behaviour and potential for thermal adaption	Modelling based on sample data	Hygrothermal modelling and moisture risk analysis
Coatings – type, chemistry, colour / surfaces, soffits, walls, columns	Paint Scrape Analysis	Coated surfaces
Window – history, material, form	Desk based and site survey	Windows
Identification of hazardous materials – roof slates / internal linings / disused services	Specialists	Asbestos survey
Ecology – bats, pigeons, other?	Main mill including the roof voids	Ecological Evaluation

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5. TRIALS

The preparation of trials will allow for fabric renovation ideas to be explored and can serve to support the development of designs for reuse. For Cleaves, the future use of the mill will require substantial improvements in the building envelope's performance. The following items can be included as a means to explore potential for change while also establishing a basis against which time and cost can be measured.

- Window – options for reuse / replacement and enhancement (design / fabricate / instal)
- Wall insulation
- Sample panels to guide pricing for main tender – pointing / plaster / render / removal of paint

These trials will require designs to be prepared in advance of the phases within which the works are to be undertaken. The proposals, methods and outcomes of these trials will be recorded in sufficient detail to inform future applications for approval.

6. ENHANCEMENTS

The renovation of the fabric presents opportunities for improvements in the quality of the future internal environments that will be provided. Thermal alterations of the fabric must be informed by an understanding of the impact such a change will cause. This impact should be considered philosophically, practically and in terms of the behaviour of the historic fabric. Proposals must be sensitive to the potential for change and seek a proportionate solution.

Initial thoughts on enhancement of the fabric include:

Roof – *2nd floor lath and plaster ceiling original or late 1800s addition?*

- insulate at line of slates
- Sarking / close boarded for show with insulation over
- Insulate at ceiling level

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Roof Insulation Options¹

- Woodfibre over rafter
- Woodfibre between rafters
- Woodfibre beneath rafters
- Aerogel membrane
- Other insulation board

Windows

Summary of Options:

Retain and Enhance

- A- Retain existing as found – 100% repair and reglaze. Redecorate. (assume 50% renewal as a necessity) In combination with secondary glazing formed by a window.
- B - New slim hardwood frames to match original with micro DG units – 100%

New Windows

- C - Thermally broken frames – new metal frames – high quality not seeking to match the pattern of the existing
- D - Composite approach - Unglazed metal window to match the appearance of the original set in existing line of windows. New modern and high performing DG window set within the insulated reveal.

Window Description

- Existing – single glazed 60 pane timber windows formed with upper portion as a centre pivot opening light.
- Proposal – exploration of options for the replacement of the existing to a selected number of window openings.
- Context – The existing are not readily adaptable or reusable. This is due to the demands of the building in its future use and the limited potential for the existing to be enhanced. The existing windows are tall with exceptionally slim glazing bars. Modern alternative windows that meet Part L are unlikely to achieve the same ratio of frame to glass with a 60-pane

¹ Strategies and materials in keeping with the guidance contained within RoI Gov's document "Improving Energy Efficiency in Traditional Buildings" December 2023.

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format. A variety of options will be explored as part of the trial with the most suitable and permissible solution progressed to a selected number of the openings.

Walls – *to be informed by the hygrothermal analysis of the existing wall material*

Summary of Options:

- Do nothing
- Insulated with modified plasters
- Insulate with lining board (Calcium silicate / woodfibre / other)
- Independent insulated wall (sketch studies / modelling)

Walls Description

- Existing – The walls have been lined with lime plaster and later linings of cement-based render.
- Proposal – remove existing linings to expose the masonry face. Clean prepare and lineout with different forms of insulation as a trial to inform future proposals for thermal renovation. Assume the application of four different treatments each stretching across two window ways, floor to wall head.
- Analysis and Reporting – Each trial will require in-situ testing and investigation. Each area will need to be enclosed within its own timber box forming a room insulated and isolated from the unheated building. These rooms will be heated over a period of weeks to allow for the analysis of the behaviour and performance of the trial linings. This work will need to be progressed at the end of the construction phase to inform further phases of work.

Floors – *Options to be informed by opening up works*

- Slim over floor membrane e.g. cork - *Limited scope without impact on window cill*
- Jack arch thermal mass – *appraise how this may inform thermal strategy*

Passive Ventilation

- Swan neck detail through wall

Mechanical Ventilation

- Explore options for vent ducts and plant locations

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Drawings

Refer to annotated plans and elevations.