The Morton Partnership
Structural Engineers

Registered in England No. 2727193

Brunel House, Norwich Road
Halesworth, Suffolk IP19 8HX
Tel: 01986 875651 Fax: 01986 875085
Email: halesworth@themortonpartnership.co.uk
www.themortonpartnership.co.uk

SCHEDULE AND SPEFICATION
FOR
ROOF STRUCTURE REPAIRS
CLAYTON HALL,
MANCHESTER



Client: Manchester City Council
Town Hall
Albert Square
Manchester M60 2LA

Architect: BB Heritage Studio
Conservation Architects and Consultants
Fox Corner,
Fox Hill Drive,
Stalybridge,
SK15 2RP

Prepared by: The Morton Partnership
Old Timber Yard House
55 The Timber Yard
Drysdale Street
London N1 6ND

Date: June 2026

Reference: RGR/BBR/16076~Roofsched&spec~Rev2

CONTENTS:

1.0 Specification

2.0 Schedule of Work

APPENDICES:

A Drawings – The Morton Partnership

Rev	Comments	Engineer	Date
0	Initial issue	RGR	28/05/2026
1	Minor Drawing Amendments	RGR	02/06/2026
2	Minor Amendments following comments	RGR	08/06/2026

The Morton Partnership
Structural Engineers

1.0 SPECIFICATION

Note that the masonry arch bridge providing access to the hall has a load bearing capacity of 11kN/m2. Full vehicle weights should not exceed this value. In addition, the width of the bridge between parapets is circa. 3.6m therefore care to be taken in ensuring suitable width vehicles access site. Allow for forming a corner crack monitor to the south abutment to the bridge where some lateral movement in noted to the parapet under instruction by the Engineer, for this to be monitoring throughout the project.

1.1 SCAFFOLDING

Introduction and Preamble

1.1 It is proposed to provide an access and protection scaffold to the entire Clayton Hall building, Manchester to facilitate access for re-roofing and repairs to this elevation. This is to include:

- A temporary roof to the building to provide protection against weather for the fabric, considering the bell tower and chimney stack projections from the existing roof structure;
- Suitable working access for the roof repairs to the north, south and western roof ranges as included within the schedule.
- Suitable working access for the repairs needed to masonry and at high level to the verge / eaves to the Eastern Elevation to both Northern and Southern Ranges as included within the architect's schedule.
- Suitable working access for the repairs required to the top of the belltower, as well as the chimney stacks.

1.2 The Contractor should refer to the contract documents for the full extent of the works and provide scaffold as necessary.

1.3 Due to the importance of the fabric, the Employer and Design Team need to be confident that the scaffold design will be able to fulfil the requirements of the enclosed specification.

1.5 It will be for the scaffolding contractor to provide their own fully detailed design based on this specification and schedule. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE DESIGN OF ALL SCAFFOLD, PREPERATION OF DRAWINGS AND CALCULATIONS AS WELL AS AN INDEPENDENT CHECK, METHOD STATEMENTS, RISK ASSESSMENTS etc. as detailed in this specification. Measured survey drawings will be provided to the appointed contractor including plans, elevations and sections.

1.6 **The Contractor should provide a clear statement, with their tender, of the basis of their scaffold design for the work and including an outline methodology.**

1.7 The scaffold must be designed to meet certain parameters which cannot be altered in any way. These include, but are not restricted to:

- No fixings will be permitted into fabric of the building;
- Butts will be permitted providing they have suitable end pads and that individual butts can be removed to allow repairs to stonework if agreed etc.;
- Sheeting is required to the areas of works to protect the structure, to provide suitable conditions for any limework. 'Monarflex airflow sheeting' is suggested to reduce wind loading and is required down to the boarded lifts at eaves/cornice level as well as other boarded areas such for periods as required for works;
- That the scaffold should be designed to support one lift fully loaded to 2.0kN/m2 and one further lift for access at 0.75kN/m2.
- That the scaffold will be based out to leave free and to allow continued access to all gullies, manholes and other service points etc;
- Provide gutters to roof and downpipes to discharge on ground at positions agreed with the Architect/Contract Administrator.
- To protect the users of the building from falling material etc. by forming a fully enclosed and encapsulated temporary structure to protect material and debris falling onto the ground below.

- Hoists, access stairs and loading bays, are provided at positions to suit phasing but can be changed subject to a clear methodology and fitting with the performance parameters;
- That any temporary waterproofing measures or sheeted sides will be watertight for the duration of the contract to prevent any water penetration into the building and to protect the historic fabric;
- That side sheeting may need to be removed at stages during the work to allow suitable conditions for mortars;
- That unauthorised access to the scaffold will be restricted;
- Allow for gutter provisions over the single storey offshoot to the North elevation, so that it is not adversely affected by the temporary scaffold.
- The scaffold to the chimney stacks should be designed to support one lift fully loaded to 2.0kN/m2. To the bell tower, this only requires access at 0.75kN/m2.
- Note that care will be needed with scaffold loadings to the east of the hall, based on the presence of a half basement area, which external wall structure will be subject to surcharge from the scaffold system. Therefore, proposed loading and spreading requirements need to be clear in this area, allowing for a maximum of 55kN/m2 bearing pressure on the ground in close proximity.

1.8 The appointed Contractor will be required to provide a fully documented design which will include calculations, drawings and independent certification. A detailed programme, method statement and risk assessments will also need to be provided. This information should be provided as soon as possible after appointment and prior to commencement of erection.

1.9 In accordance with regulation 10 of the Work at Height Regulations 2005, the scaffold shall be designed, taking account of the exact nature of the works, so that falling materials shall be prevented so far as reasonably practicable, or to ensure that no person can be struck by any falling object.

1.10 Careful attention needs to be made for the encapsulation, over boarding of the scaffold boards to prevent materials falling from the scaffold, as well as weather getting into encapsulated area.

A11 SCHEDULE OF SCAFFOLDING

100 SERVICES: The scaffold should be based out to ensure that no damage to the drainage or other services occurs. All service access points should remain clear. It will remain the contactor's responsibility to ascertain service locations. The Contractor should carry out an inspection and check the location of all drains to avoid any known services etc.

120 DESCRIPTION OF THE WORKS: Refer to the main contract documents in addition.

130 APPROVAL: the design of a scaffold to a historic building, and especially a Scheduled Ancient Monument and Listed Building needs special care and consideration. The Contract Administrator's approval MUST be sought BEFORE any work starts on site.

140 LOADINGS TO EXISTING STRUCTURES: No loading on the existing structure will be permitted unless otherwise indicated. However, it is accepted that there will be a need to bear onto the roof structure adjacent to the belltower, as well as the chimney stacks with well spread scaffolding.

150 SITE INVESTIGATION REPORT: A report is not available. However, the contractor should assume a minimum ground bearing pressure of 110kN/m^2. The scaffold at ground level should be spread to achieve less than this bearing pressure. In addition, all scaffold will be based out on doubled up continuous scaffold boards with lapped joints or sleepers and the scaffolding standards will have longitudinal ladders beams at low level to help spread the load further. Do note that there are a number of constraints to the site which create difficulties in providing access. Note that there is a moat located around the hall, however this is located at suitable distance away from the building not to be of concern.

160 PROGRAMME: The Contractor must submit full details of the scaffolding programme for erection of the scaffold and subsequent maintenance regime. List main stages of activities with anticipated start and finish dates for each stage.

170 DRAWINGS, ETC. SUBMITTED FOR COMMENT: Accept responsibility for the accuracy of all drawings and documents submitted for the Contract Administrator's comments. Comments by the Contract Administrator's in no way diminishes the Scaffolding Contractor's responsibility for any errors or omissions contained in such drawings or documents nor for their other contractual and legal obligations. Where changes are required to drawings previously submitted arrange for the changes to be made and submit revised drawings for comment with changes clearly identified and 'bubbled'. The Scaffolding Contractor is to bear all costs for drawings and revisions.

180 TAKING DIMENSIONS FROM DRAWINGS: When taking dimensions from drawings, at any stage of the work, including before work is commenced:
- DO NOT TAKE DIMENSIONS FROM DRAWINGS;
- Do not scale drawings provided by the Contract Administrator or others;
- Check their compatibility with each other with the site and work completed to date;
- Inform the Contract Administrator of any discrepancy and seek their instructions

190 SPECIFICATION REFERENCES ON DRAWINGS: Where specification references are given on drawings to define the clause (or clauses) applicable to that part of the construction drawn, they must not be taken as excluding any other relevant information contained in other clauses of this Specification.

200 SITE MEETINGS AND MANAGEMENT: Hold such regular site meetings as are necessary for the proper management and co-ordination of the scaffold works. Due to the complexity of the scaffold the proper management of the erection is vital. The Contractor should include with the method statement an indication of the management re-sources to be utilised for this element of works.

205 ACCESS: Access to the site will be as set out the main preliminaries.

210 INDUCTION: Due to the status of the building, an induction will be given to by the Contractor to all site workers. The Contractor should allow for arrangement and attendance.

220 METHOD STATEMENT: The Contractor will be required to produce a detailed method statement for the erection of the scaffold, and its dismantling.

230 ATTENDANCE: The Contractor to be in attendance during erection of scaffold at all times, and at time of deliveries to site, including all out of hours deliveries.

B11 SCAFFOLDING

100 TO BE READ: With general conditions and preliminaries and other Contract Documents.

110 GENERALLY: Where the Contractor is required by the specification to provide details of sub-contractors and suppliers these must be supplied with the tender. Where method statements, drawings, calculations, samples or approvals are required, a minimum of one week should be allowed. These periods should be indicated on the Contractor's programme.

Materials

115 FITNESS FOR PURPOSE: Due to the duration that the scaffold will be erected all materials will be chosen to be fit for purpose and to last for the period.

120 METAL SCAFFOLDING: To BS EN39:2001 Loose steel tube and coupler scaffold. All scaffolding and couplings to be hot dip galvanised to BS 729. Note aluminium scaffold is required for the internal scaffold.

130 TIMBER SCAFFOLD BOARDS: To BS 2482:2009, 38 x 225 softwood with metal end caps. Supply stable boards of moisture content to suit situation. Discard twisted or damaged boards.

140 LADDERS: To BS 1129: 1990 and BS 2037: 1990. All ladders to be in good repair and not in timber.

150 SHEETING: Side Sheeting to be flame retardant flexible sheeting, or similar approved. The sheeting may be required to be temporary lifted for access, ventilation, curing of mortars etc.

160 NETTING: Nylon woven green debris netting, with neoprene rubber anchor straps.

170 ROOFING SHEETS: Where applicable to be to CP 143 or alternative proprietary system as agreed with the Contract Administrator in writing and during the tender period. The type of sheeting should minimise wind noise.

180 PLYWOOD SHEETING: Exterior quality WBP 19mm thick to BS 6566. To be fire retardant or treated to be fire retardant.

190 ANCHOR SOCKETS: Will not be permitted to the buildings or structures in any form unless specifically where indicated on the drawings.

195 BUTTS: Will be not be permitted.

198 TIES: Reveal Ties will be not be acceptable.

200 WARNING TAPES AND STRIPS: Fluorescent and/or stripped plastic tape and self-adhesive strips.

210 KENTLEDGE: Where required the scaffold will be held down with kentledge. The Contractor should provide details for the proposed kentledge for approval. The following will not be acceptable: scaffold tubes, water containers, ground anchors.

Design

310 SCAFFOLD DRAWINGS BY CONTRACTOR: The Contractor is required to prepare proposals, submit full details in duplicate to the Employer, and Contract Administrator based on the parameters set out in this specification including drawings in an agreed format in AutoCAD. The proposals are to be of an extent and detail commensurate with the complexity of the Contract and with the degree to which they are critical. Indicate levels of working platforms in relation to the existing building. Submit drawings of any proposals to vary those approved where required.

Indicate with the tender the name of the scaffolding designer, who is required to inspect the design and then on completion of the scaffold to verify to the Employer and Contract Administrator's that the scaffolding has been erected in accordance with his proposals.

Details of the design proposal drawings, loadings to the surrounding ground or building including kentledge and design calculations should be submitted prior to erection and for comment by the Contract Administrator.

330 CONTRACTOR DESIGN:

- The Contractor will be responsible for providing a documented design with calculations for the erection, use and dismantling of scaffold structures and for the integration of these activities within the overall work programme. The Contractor must submit details of the following, when requested to do so:
- Design
- Full set of drawings
- Calculations
- Number and location of working levels
- Loading bays

- Manufacturer's details for specialist equipment such as ladder beams and cluster props, roofing sheets, side sheeting, hoists, running rails etc.
- Risk assessments;
- Programme;
- Method statements covering erection, use and dismantling.

340 SCAFFOLDING CONTRACTOR:

- The scaffolding contractor should be members of the National Association of Scaffolding Contractors (NASC) or equivalent status.
- Scaffolding Contractors would have to demonstrate:
- A sound Health and Safety Policy
- Adequate Employers and Public Liability Insurance
- Scaffolding operatives should be registered under the Construction Industry Training Board (CITB)
- Scaffolder's Record Scheme to Identify the level of competence
- All operatives are fully trained, registered and competent in activities undertaken
- All work is adequately supervised by competent trained Supervisors.
- Materials conform to the specified standards and are regularly checked and maintained
- Work is carried out in accordance with relevant codes of practice

350 ACCESS AND WORKING SCAFOLDING: Access and working scaffolding should be designed, constructed and used in accordance with BS EN 12811: 2003 Temporary Works equipment. Scaffolds, Performance requirements and general design and TG20:13 Technical Guidance on the use of BS EN 12811-1, associated supplements and all statutory regulations. Scaffold structures will normally fall into one of two categories:

- Standard scaffolds.
- Special scaffolds.

360 STANDARD SCAFFOLDS

- **This category includes putlog and independent tied scaffolds. Putlog scaffolds will <u>not</u> be permitted.**
- Un-sheeted independent scaffolds, where no loading rating is specified, may be constructed up to a height of 50m without calculations providing they are constructed in accordance with BS EN 12811: 2003 and that they do not carry greater loads nor have greater bay lengths than those given in the table below.

Table 1. Load classes for access and working scaffolds made from tube and fittings

Duty	Use of Platform	Load on Platform kN/m^2	Max No of Platforms	Max numbers of boards	Max Bay Length (m) and max spacings of board transoms
Inspection and very light duty	Inspection, painting, stone cleaning, light cleaning and access	0.75	1 full (0.75) and one 50% (0.375)	3 boards	2.7m 1200mm
Light Duty	Plastering, painting, stone cleaning, glazing and pointing.	1.50	1 full (1.50) and one 50% (0.75)	4 boards	2.4m 1200mm
General Purpose	General building work including brickwork, window and mullion fixing, rendering, and plastering.	2.00 (inside boards 0.75)	1 full (2.00) and one 50% (1.00)	5 boards or 4 boards + 1 inside	2.1m 1200mm
Heavy Duty	Masonry work, concrete blockwork, and very heavy cladding	3.00 (inside boards 0.75)	1 full (3.00) and one 50% (1.5)	6 to 7 boards	1.8 900mm

TG20:13 Table 1
Note: This table should be read in conjunction with the remainder of TG20:13 including notes and supplements

370 SPECIAL SCAFFOLDS

- These will include all access and working scaffolds other than those identified under standard scaffold limitations. All special scaffolds should be designed by a competent person.

The Morton Partnership
Structural Engineers

- These will generally cover:
- Cantilever scaffolds
- Protection fans
- Cantilever loadings bays
- Truss out scaffolds
- Freestanding towers
- Guys and struts
- Access birdcages
- Hoist towers
- Ladder towers
- Stair towers
- Slung scaffolds
- Pedestrian bridges and walkways
- Temporary ramps and elevated roadways
- Masts
- Lighting towers Transmission towers
- Lifting gantries
- Temporary buildings
- Temporary roofs
- Spectator terraces and seating stands
- Temporary storage on site
- Sheeted scaffolds including open mesh sheeting
- Scaffolds deriving lateral support from buttressing
- Scaffolds including a standard bearing on a bridging beam or bracing.

380 WIND LOADING: To be in accordance with BS 6399-2:1997. It is anticipated that the scaffold could be in position for up to 4 months and therefore should be designed as a permanent structure.

385 SNOW LOADS: To be in accordance with BS 6399.

390 PLATFORM LOADS: Shall be appropriate to the designation of the scaffold. Co-ordinate with sub-contractors at design and tender stages the loadings required for working platforms and storage of materials on the scaffold.

400 ROOF LOADS: to be in accordance with BS 6399: part 1: 1996.

420 LOADING ON EXISTING STRUCTURES: Generally, the scaffolding may not take bearing from the building/structure.

430 SUPPORT STRUCTURE OF SCAFFOLD: The support structure of the scaffold should be concentrated as necessary to leave the area adjacent to the building as free as possible for use by other parties wishing access to the building. All entrances must be maintained unless otherwise indicated in the main preliminaries.

440 SHEETING ENVELOPE: (see clauses B11 150) If to be proposed sides are to be enclosed in Monarflex air flow fire retardant sheeting for the working lifts or similar approved. This should be removable to allow ventilation and access where appropriate/required.

460 PLATFORMS: The scaffold is to be completely boarded out at each lift level required for works and to facilitate repairs shown. Around the exterior envelope hand rails and toe boards will be required. Set out lifts to suit works. Ensure that boards are fully supported and lie flush, to prevent traps, particularly at ladder holes. Allow boards immediately adjacent to walls to lift out. All perimeter scaffold to be a bricklayer's scaffold, i.e. two clear boards inside the inner standard. Include for plywood to any gaps greater than 75mm against the building.

470 LADDERS and STAIRS: Provide stair access as shown on drawings and ladder access at one further position to be agreed, and not located to interfere with access to the face of the building. Positions to be agreed with the Contract Administrator. Ladders to extend a single lift at one time. All ladders openings to have ladder guards.

480 LIGHTNING PROTECTION: Bond scaffold to suitable lightning conductor terminal(s). The Contractor to confirm details of their proposal with the tender. If new terminals are required to be driven into the ground or in pits, positions to be agreed with the Contract Administrator to comply with the requirements of BS 6651. In either case test connection(s) and continuity through scaffold on completion of the contract.

490 CLEARANCES: Clear access is to be provided to all doorways at all times unless otherwise agreed with the Contract Administrator in writing. Where the scaffold passes over entrances the decks will be double boarded with polythene sheeting between.

500 FIXINGS/TIES: All scaffold to be fully independent with no physical fixings into the fabric unless specifically indicated within this specification or in section 1.0. See also B11 190.

510 CONTROL OF WORK ON SITE:

- Supervision must be provided by the Contractor at all times during erection and dismantling of scaffolding and temporary structures.
- Designers of special scaffolds should, under the terms of contract, be required to attend site on the first day of erection to liaise, and brief the Scaffolding Supervisor on the requirements of the design.
- Any variations to the design will not be permitted, without the designer's written authority. Any agreed variations must be clearly documented, checked by a competent person with details passed to the Contract Administrator.
- Designers should also be required to visit the site at least weekly during erection. On completion the Designer should certify (on F91 part 1 section A) to the Employer that the scaffold has been erected fully in accordance with the design and any approved variations. Copies of the certification should be passed to the Contract Administrator's.
- All scaffolds should be inspected at least every seven days (and after weather conditions likely to have affected their strength or stability) by a competent person.
- Records of such inspections together with necessary action must be made in register F91 and signed by the person making the inspection.
- No alterations must be made at any time without written authority from the Designer and with the Contract Administrator informed.
- At all times during erection, dismantling or alteration to scaffold structures, access to the working areas needs to be clearly defined by suitable barriers and notices. Notices stating "incomplete scaffold" should be secured as necessary in an appropriate place.
- It is a wise precaution to stop all work on external scaffolding during a thunderstorm.

520 PROTECTION:

- Tubes bearing on masonry should be provided with suitable timber bearers;
- All scaffold tube ends which are near or likely to come into contact with the fabric of the building during erection, dismantling or as a consequence of lateral movement must be provided with plastic end caps;
- All scaffolding and temporary structures must be adequately earthed against lightning strikes, or bonded into the existing installation and is to be carried out by an approved lightning conductor specialist. Provide proposals on request including drawings;
- Any scaffold based out internally must have carpet underlay to protect the existing floor from damage;
- All windows to be protected as the scaffold is erected;
- Protection for the internal work – contractor to provide method statement.

530 PUBLIC ACCESS:

- During erection, modification or dismantling, care must be taken to exclude the public and staff from a clearly defined area around the work.
- Authorised access thoroughfares must have effective protection in the form of fans, netting, sheeting, brickguards, etc., to protect persons from falling objects. Scaffolding Contractor to provide and include as necessary to maintain public access.
- Ladders must not be left unattended when accessible to the public.
- Ladders at ground floor level and other risk areas must be removed and securely locked away at the end of each working day.

540 MOBILE SCAFFOLD TOWERS:
- Mobile scaffold towers should be designed and used in accordance with HSE Guidance Note GS42.
- If a static tower is to be free standing (that is not tied to a building), the maximum height to base ratio, is 4:1 for use inside a building and 3:5:1 for use outside buildings.
- If a mobile tower is to be free standing, the maximum height to base ratio, is 3:5:1 for use inside a building and 3:0:1 for use outside the building.
- The minimum base dimensions can be increased, and stability improved, by the use of outriggers or stabilisers.
- The recommended maximum height for a free-standing tower is 9.6m when mobile and 12m when static.

550 PROVIDE, MAINTAIN AND ADAPT: All platforms, ladders, hoists, scaffolding, sheeting, hoarding, temporary roofs and protection as necessary for the proper execution of the works including that required for sub-contractors. Inspect regularly in accordance with the regulations and maintain records of these inspections on site. Co-ordinate the design and erection of scaffolding with general and sub-contractors programme and working requirements.

560 TAKE CARE: To prevent damage to the existing buildings, its fittings and furniture. Any damage caused to the building is to be made good to the approval of the Contract Administrator at the Scaffolding Contractor's expense. Listed Buildings are of national historical and cultural importance and the historic fabric is vulnerable to damage and much of it irreplaceable. All personnel should be made aware of this and treat the building with great care.

570 PERMISSIBLE BEARING PRESSURE: Ensure that the permissible bearing pressure of the ground or of the building below the structure is not exceeded past the 110kN/m2 indicated. Set standards on scaffold boards to spread the load, taking care not to block access to drains, rainwater channels, outlets etc. Where founded on soil, set out on appropriate spreaders as soleplates.

580 SCAFFOLD TUBE ENDS: All to be covered with plastic caps where within 75mm of the building. All ends to be kept a minimum of 120mm back from any glazing. Where butting is permitted provide detail of padding to butt to avoid damage to fabric. Assume minimum of 50mm polystyrene and 19mm plywood. Wrap any vulnerable carvings or fittings with bubble wrap and cover glass or decorations in rigid sheeting where adjacent to scaffolding.

600 UNAUTHORISED ACCESS: Take all reasonable precautions to ensure that unauthorised persons cannot gain access to scaffolds. Remove and lock up all ladders from the bottom lift of scaffolding and secure all gates each night.

610 PROJECTIONS: Ensure all projections to scaffold, hoardings etc are kept to a minimum.

C30 SHORING

110 GENERALLY: Before starting work:
- Examine all available information.
- Survey the structure, site and surrounding area.
- Submit method statements to the CA covering any relevant matters raised in the design brief.
- Ensure that all statutory notices have been given and licenses obtained.

120 COMMENCEMENT CONDITION SURVEY:
- Before starting work, survey the existing state of structure to be kept in place to locate and record the magnitude and extent of all cracks, spalling, flaking and other irregularities of the fabric.
- Agree the commencement condition survey record with the CA.

125 GENERAL:

- All items of pulling down, cutting openings and any other demolition items, alterations, etc., to the existing works shall include shoring, strutting and propping to support the super incumbent and adjacent work likely to be injured or affected by the operations and construction of the new Works and also for maintaining, easing and adjusting, striking and removing same when no longer required and making good all work disturbed.
- Provide any necessary load spreading detail at ground level, with temporary footings unacceptable due to the area being under SMC.
- Particular care must be exercised to ensure that every part of the structure requiring needling, shoring, etc., is carefully and sufficiently supported before demolition, pulling down and alterations and construction and re-erection commences.

220 ERECTING SUPPORT SYSTEMS:
- Locate positions of existing and new services which may be affected by support systems. Provide any necessary temporary diversions.
- Prevent excessive loadings from foundations of support systems being imposed onto foundations of structure to be kept in place.
- Erect support systems and connect to structure to be kept in place taking all necessary precautions to prevent damage, and taking due account of movement of structure which may occur before, during and after demolition.
- Promptly repair any damage caused to adjoining property by erection or connection of support systems. Make good to ensure safety, stability, weather protection and security.
- Report to the CA any damage caused to retained facades by erection or connection of support systems. Agree methods of repair with the CA.
- Check support systems at agreed stages during erection for compliance with design proposals.

240 LOADING SUPPORT SYSTEMS:
- Complete erection and connection of the following support systems before commencement of the demolition of adjoining structure: Nib walls adjacent to party wall.
- When support systems are erected and all connections are made to structure to be kept in place inform the CA and obtain any required permission to load systems.

320 MAINTAINING SUPPORTED STRUCTURE:
- Regularly inspect and monitor supported structure to ensure stability. Report any significant movement or deterioration of the fabric of supported structure to the CA.
- Agree any necessary remedial work with the CA.
- Adequately protect supported structure from damage by site operations and from staining due to corrosion of support systems.

410 DISMANTLING SUPPORT SYSTEMS: When all permanent connections between supported structure and new construction have been made inform the CA and obtain any required permission to disconnect and dismantle support systems.

430 MAKING GOOD: Repair any connection holes made in the structure kept in place.

440 COMPLETION: Clear away all support systems and leave the site and any working areas beyond the site boundary in a tidy condition on completion.

C41 REPAIRING/ RENOVATING/ CONSERVING MASONRY

To be read with Preliminaries/ General Conditions

GENERALLY/ PREPARATION

110 SCOPE OF WORK
- Repairs to walls.as identified in the schedule of works in main document.

120 REVIEWING SCOPE OF THE WORK
- Inspection: Arrange before starting work. Confirm type and extent of work required.

- Marking: Mark clearly, but not indelibly, on face of masonry units or parts of units to be cut out and replaced.
- Identification of masonry units to be removed, replaced or repaired: Code number cross-referenced to drawings/ photographs.
- Records of masonry to be repaired: Before starting work, use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.

WORKMANSHIP GENERALLY

150 POWER TOOLS FOR REMOVAL OF MORTAR
- Usage: Not permitted unless approved by CA.

155 PUTLOG SCAFFOLDING
- Usage: Not permitted.

160 PROTECTION OF MASONRY UNITS
- Masonry units: Prevent overstressing during transit, storage, handling and fixing. Store on level bearers clear of the ground, separated with resilient spacers. Protect from adverse weather and keep dry. Prevent soiling, chipping and contamination. Lift units at designated lifting points, where provided.
- Masonry: prevent mortar/grout splashes and other staining and marking on facework. Protect using suitable non-staining slats, boards, tarpaulins etc. Remove protection on completion of the work.

165 STRUCTURAL STABILITY
- General: Maintain stability of masonry. Report defects, including signs of movement that are exposed or become apparent during the removal of masonry units.

170 DISTURBANCE TO RETAINED MASONRY
- Retained masonry in the vicinity of repair works: Disturb as little as possible.
- Existing retained masonry: Do not cut or adjust to accommodate new or reused units.
- Retained loose masonry units and those vulnerable to movement during repair works: Prop or wedge so as to be firmly and correctly positioned.

180 OPERATIVES
- General: Skilled and experienced with the materials and procedures required.
- Evidence of training and previous experience: Provide on request.

185 ADVERSE WEATHER
- Frozen materials: Do not use. Do not lay masonry units on frozen surfaces.
- Air temperature: Do not bed masonry units or repoint:
- In hydraulic lime:sand or lime:earth mortars when at or below 5°C and falling or unless it is at least 3°C and rising.
- In non-hydraulic lime:sand or lime:sand mortars in cold weather without approval.
- Temperature of the work: Maintain above freezing until mortar has fully set.
- Rain and snow: Protect masonry by covering during precipitation and at all times when work is not proceeding.
- Hot conditions and drying winds: Prevent masonry from drying out too rapidly.
- New mortar damaged by frost: Rake out and replace.
- Provide ongoing protection and insulation to mortar work at all times when temperatures are less than 5 C°. See additional guidance on protection below.

Ongoing Protection:
- Provide well-detailed protection from vertically and horizontally driven rain by overlapping the topmost lift of the scaffolding with impervious sheeting. Carried to the outside face of the scaffolding the sheeting will ensure any rainfall or run-off from roofs can be safely discharged clear of the new work without causing incidental splash zones at the wall base or at abutting roof lines.
- Provide well-detailed wind and rain screening to the outside face of the scaffolding so warm

air heating can combat temperature variations and maintain a temperature of 15-20C°. Ideally use propane gas heating as this provides a good level of humidity along with a higher level of carbon dioxide in conjunction with heat generated.

- Record minimum and maximum temperature and RH levels throughout the curing period. (Digital readers can be purchased for around £7-8 each).
- Ensure that induced heating adequately circulates to avoid the creation of cold zones – particularly at the base of walls – and that venting is available to regulate temperatures at the top of walls to avoid over-rapid drying.
- Sands and aggregates should be stored on hard standings that are capable of free draining, and covered to maintain a consistent condition. Never use frozen sand and ensure it has reached at least 3°C before using.
- NLHs and HLs should be kept in dry conditions, off the ground and away from walls. Quicklime and Lime putty should be kept in sealed containers and not allowed to freeze.
- Water for mixing should be clean and potable, uncontaminated and free of ice. Do not use additions to keep water ice-free and ideally use a piped water supply.
- Provide close covering for the new works throughout the application and initial curing stages, preferably closely woven hessian haps hung within 100mm of the wall face.
- If using hydraulic limes (NHLs or HLs), new work should be kept damp – not wet – for at least 72 hours to ensure adequate hydration of the mortar.
- At night, when it is not possible to provide background heating, make a ‘sandwich’ of hessian haps with bubble wrap in the middle as an insulated close covering. Hay bales can also be used as very good insulating materials adjacent to the walls.

MATERIALS/ PRODUCTION/ ACCESSORIES

215 SAMPLES

- Inspection: Make arrangements for the inspection of samples of the following materials as schedule of works, as well as architects’ information. Note that mortar testing required in numerous locations, with this to be utilised as a guide for any mortar mixes.
- Samples: Representative of the range of variation in appearance for each type of material to be matched.
- Appearance: Obtain approval before placing orders with suppliers or proceeding with production.
- Approved samples: Keep samples for reference purposes. Protect from damage.

220 RECORDING PROFILES

- Profiles: Take measurements from existing masonry units, as instructed, to allow accurate matching of replacements.
- Recording in situ: If there are no suitable joints to allow use of inserts, seek instructions.
- Drawings and templates: Prepare as necessary. Templates must be clearly and indelibly marked to identify use and location.

281 FIXINGS

- Type: Submit proposals.
- Material: Stainless steel.
- Size, strength and number: As necessary to resist loads likely to occur during the life of the building, and to prevent lateral displacement or pulling apart of the construction.

285A BED JOINT REINFORCEMENT / WALL TIES TO INSITU MASONRY

- Manufacturer: Helifix or similar approved.
- Product reference: HeliBar, - 6mm diameter.
- Material: Austentic Stainless steel.
- Width: As indicated in scheduled of work or agreed on site but no less than 5000mm either side of the structural defect, i.e. minimum 1000mm.
- Laying: As per manufacturer’s instructions.
- Laps: 225mm laps at joints and full laps at angles.
- Position: 50mm from back from face of masonry and re-point as 810, 8410, 850 and 860.

REPLACEMENTS AND INSERTIONS

330 PREPARATION FOR REPLACEMENT MASONRY

- Defective material: Carefully remove to the extent agreed. Do not disturb, damage or mark adjacent retained masonry.
- Existing metal fixings, frame members, etc: Report when exposed.
- Redundant metal fixings: Remove completely.
- Recesses: Thoroughly clean to remove loose material and leave joint surfaces in a suitable condition to receive replacement units. Protect from adverse weather.

360 CRACK ANCHORS

- Drill at positions agreed with Contract Administrator, but to avoid all windows, doors and other features, and to length specified.
- Provide temporary restraint locally as necessary to area around drilling to retain core insitu.
- Clean out hole thoroughly and flush through with water and allow to dry.
- Insert crack anchor (threaded rod) and set in resin.

365 REPLACEMENT OF STONEWORK

- Stones: stone as clause 240.
- Mortar: As section Z21 for bedding/core and re-pointing.
- Fixings: not required unless indicated in schedule or agreed on site by CA.
- Joints: to match existing.
- Other requirements: none.

385 LAYING REPLACEMENT MASONRY

- Exposed faces of new material: Keep to approved face lines.
- Faces, angles and features: Accurately align. Set out carefully to ensure satisfactory junctions with existing masonry and maintain existing joint widths.
- Joint surfaces: Dampen to control suction as necessary.
- Laying: On a full bed of mortar, all joints filled.
- Exposed faces: Keep clear of mortar and grout.

390 GROUTING JOINTS

- Grout mix: air lime with pozzolanic admixture for binder; mix subject to site trials. Suitable mixes proposed in main document.
- Joints that cannot be fully filled with bedding mortar: Grout thoroughly around replacement masonry units.
- Grouting: Keep grout back from exposed face to allow for the depth of pointing, using an approved temporary sealing material. Prevent grout staining exposed face.

395 INSTALLING STONE INSERTS

- Pockets to receive inserts:
- Cut out accurately. Undercut sides of pocket where necessary to provide space for bonding material.
- Adjust depth so that insert stands proud of existing stone for finishing in situ.
- Clean out thoroughly.
- Inserts: Cut to the smallest rectangular shape necessary to replace the defective area and provide a firm seating. Install accurately and securely.
- Exposed faces: Keep clear of bonding material.
- Existing joint widths: Maintain. Do not bridge joints.

405 BONDED DOWELS/PINS. WIRE AND FIXINGS

- Dowels: Stainless steel grade 18/8 Austentic.
- Adhesive: to be Exchem Resifix 3S (base pin grout); Hilti-HIT 270 or similar approved.
- Holes for dowels: Suitably sized and accurately aligned in masonry background and in rear of replacement/ insert stone; clean and dry.
- Other requirements: Do not use adhesive to bond stones at joints unless instructed.

410 CORRODED METAL FIXINGS
- Removal: Cut out carefully, causing the least possible disturbance to surrounding masonry. Remove associated rust debris.
- Replacement: Compatible fixings as clause 281.

420 TEMPORARY DISTANCE PIECES FOR JOINTS IN ASHLAR STONEWORK
- Material: Lead or stainless steel.
- Removal: When mortar/ grout is sufficiently strong to take loading without compression.

TOOLING/ DRESSING STONE IN SITU

450 WEATHERING LEDGES AT JOINTS
- Locations: Where stones project or are recessed.
- Requirement: Carefully weather the ledge, to approval.
- Method: Suitably graded carborundum blocks or tooling as appropriate.

455 DESCALING STONE
- Requirement: Carefully remove loose scaling and powdering from stones to the extent agreed.
- Method: Suitable bristle brushes or carborundum blocks. Do not use wire brushes.

458 REDRESSING STONE
- Requirement: Carefully dress back stones to the extent agreed.
- Method: Suitably graded carborundum blocks or tooling as appropriate.

CRACK REPAIRS/ TIES/ REINFORCEMENT

610 MORTAR REPAIR OF CRACKS As directed on site
- Mortar: As section Z21.
- Preparation: Clean out cracks to remove loose debris, dust and dirt. Dampen joints to control suction as necessary.
- Applying mortar: Press well into joints so that they are fully filled. Ensure that no mortar encroaches upon exposed faces. Finish flush.
- Other requirements: None.

650 CRACK ANCHORS:
- Existing construction:
- Wall type/ thickness: Existing walls
- Preparation:
- Before commencing insertion of each tie, ensure that there are no service pipes, electrical cables or other obstructions in its path.
- Tie system:
- Manufacturer: Helifix or Spiroties or similar approved. Product reference: Helibar or Spiroties
- Tie installation: Insert ties accurately and securely to cracks as indicated in schedule of works.
- Bonded type fixings: Thoroughly grouted.
- Making good: As agreed with CA.

690 MAKING GOOD OF INJECTION/ INSERTION HOLES
- Preparation: Clean out holes thoroughly.
- Repair mortar: To match existing masonry units/ joints in colour and texture. Fully fill holes and finish neatly and flush.
- Give notice: Before starting and obtain approval of appearance of first few holes before completing the remainder.

POINTING/ REPOINTING

810 PREPARATION FOR REPOINTING

- Removing mortar:
- Work from the top of structure downwards.
- Remove carefully and without damaging adjacent masonry, arrises or widening joints.
- Recess for repointing: Form a neat recess of depth not less than 30mm or twice joint thickness whichever is the greater.
- When mortar beyond this depth is loose and friable and/ or cavities are found seek instructions.
- Dust and loose debris. Remove. Dampen joints to control suction as necessary.

820 POINTING

- Preparation of joints: as clause 810.
- Mortar: As section Z21.
- Joints profile/ finish: To match existing.

840 POINTING WITH TOOLS/ IRONS

- General: Press mortar well into joints using pointing tools/ irons that fit into the joints, so that they are fully filled.
- Face of masonry: Keep clear of mortar. Use suitable temporary adhesive tape on each side of joints where necessary. Finish joints neatly.

860 BRUSHED FINISH TO JOINTS

- General: After initial mortar set has taken place, tamp joints with a broad bladed natural church bristle brush to remove laitance and reveal aggregates and give a course texture to the mortar and achieve good compaction.
- Agree samples of pointing and finish.

G12 ISOLATED STRUCTURAL METAL MEMBERS

To be read with Preliminaries/General conditions.

110 FABRICATION OF MEMBERS:

- Steel sections: To BS 4:Part 1 or BS 4848 as appropriate, made from steel to BS EN 10025, grade S275.
- Do not use sections which are heavily pitted or rusted.
- Make cuts and holes neatly and accurately. Remove burrs, sharp edges and dross caused by flame cutting.
- Welding: Metal arc method to BS 5135 to form fully fused joints with mechanical properties not less than those of the parent metal. Do not weld on site.

125 SPECIFICATION:

- Comply with the latest edition of the National Structural Steelwork Specification (hereinafter called the NSSS) unless specified otherwise in this section.
- Ensure that a copy of the NSSS is available at all times during the course of the Works at the fabrication shop and on site.
- Galvanised steelwork based upon thickness of members and in accordance to (BS) EN ISO 1461
- Corrosion protection - Batch hot dip galvanize to BS EN ISO 1461: 2009 by a member of Galvanizers Association. – Min coating thickness of 85 micrometres for internal. Min coating thickness of 100 micrometres for external.
- For new steelwork, for plate repairs etc. allow for 2No. coats of primer to be utilised with Dacrylate - Dacprime 95 - – Min dry coating thickness of 40 micrometres

PAINTING

800 PAINT MANUFACTURERS

Paint system to be obtained from the following supplier:
Dacrylate
Lindley's Lane

The Morton Partnership
Structural Engineers

Kirkby-in-Ashfield
Nottinghamshire
NG17 8AL. UK
+44 (0) 1623 753845
enquiries@dacrylate.co.uk

810 SUITABILITY OF CONDITIONS:

- Do not apply coatings:
  - To surfaces affected by moisture or frost.
  - Unless the steel temperature is at least 3 degC above the dew point with conditions stable or improving.
  - Unless the relative humidity is below 85%.
  - When heat is likely to cause blistering or wrinkling.
- Take all necessary precautions including restrictions on working hours, providing temporary protection and allowing extra drying time, to ensure that coatings are not adversely affected by climatic conditions before, during and after application.
- Application of coatings will be taken as joint acceptance by the Main Contractor and Subcontractor of the suitability of surfaces and conditions within any given area.

815 APPLYING COATINGS:

- Multiple coats of the same material must be of a different tint to ensure that each coat provides complete coverage.
- Apply coatings to clean, dust free, suitably dry surfaces in dry atmospheric conditions and after any previous coats have cured adequately.
- Apply coatings evenly to give a smooth finish of uniform thickness and colour, free from brush marks, nibs, sags, runs and other defects.
- Keep all surfaces clean and free from dust during coating and drying. Adequately protect completed work from damage.

820 FILM THICKNESS:

- Check the thickness of each coat during application using a wet film thickness wheel or comb gauge in accordance with BS 3900:Part C5.
- After each coat has dried measure the total accumulated dry film thickness using a magnetic or electromagnetic meter, checked against standard shims and recalibrated regularly against a smooth steel reference plate, the number and position of measurements to be as directed by the CA. Carry out all measurements in the presence of the CA unless otherwise directed.
- Over any square metre of coating the average accumulated dry film thickness must equal or exceed the specified thickness, with no reading less than 75% of the specified thickness.
- If at any stage the accumulated dry film thickness is deficient, the CA may require application of additional coat(s) at no extra cost.
- The dry film thickness of the top coat must be sufficient to give an even, solid, opaque appearance.
- Metalwork is to have a dry film thickness of no less than 250 microns

G20 CARPENTRY/ TIMBER FRAMING/ FIRST FIXING

GENERAL INFORMATION/ REQUIREMENTS

100 DRAWINGS – refer to The Morton Partnership Ltd drawings

120 REPAIR PHILOSOPHY - This summarises the repair philosophy and approach to repairs to be followed when determining the scope and method.

- Generally, and in line with accepted practice the policy of minimal intervention will be followed, retaining as much as possible of the original historic fabric. Therefore, where defects are noted introduction of a further scarf joint is proposed.
- Repairs to principal structural members will be designed on a case-by-case basis, and approved by CA for adequacy.
- Timber for repairs will be undertaken in air dried heartwood oak, however for common rafter where these have been replaced in more modern times, where needing replaced this is to be done in heartwood douglas fir.

The Morton Partnership Structural Engineers

- Otherwise, the condition of the timbers will be respected, in order to conserve as much of the surface as possible; loose frass from decayed areas will be removed carefully, whilst not attempting to remove all evidence of the general condition of the timbers as found.
- All new steel fixings will be in stainless steel bolts or coach screws, the nuts or bolt heads to be flush to the face of the timber as existing.
- Where a steel repair is deemed preferable to a carpentry repair, stainless steel will be used, designed to suit each application, and approved by CA for adequacy.
- Carpentry or steel repairs will be considered on a case-by-case basis treating each member on its merits, bearing in mind authenticity, cost effectiveness, aesthetic appeal, structural requirements and the maximum retention of the historic fabric.
- Accurate records of all repairs and intervention will be made by the Contractor and registered with the CA for the benefit of recording all restoration activity.

150 STRENGTH GRADING OF TIMBER

- Grader: Any company currently registered under a third-party quality assurance scheme operated by a certification body approved by the UK Timber Grading Committee.
- Grading and marking of timber:
  - Timber of a target/finished thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20% with no reading being in excess of 24% and clearly marked as 'DRY' or 'KD' (kiln dried).
  - Timber graded undried (green) and specified for installation at higher moisture contents: Clearly marked as 'WET' or 'GRN'.
  - Structural timber members cut from large graded sections: Re-graded to approval and marked accordingly.

TYPES OF TIMBER

260 GRADED HARDWOOD (To be used for all repairs apart from specified areas)

- Species and origin: European Oak, Quercus robur.
- Grading standard: Equivalent to or exceeding good quality THB (BS 5756:2007), to a minimum strength class D30 with the following qualification
  - Heart to be located as close to the centre as possible.
  - Braces and other curved members to be cut from appropriate curved stock.
  - Live knots may not exceed 30% of any face.
  - Small sound dead knots allowed < 50mm diameter, not allowed in the middle 50% of the length of beams and bending members.
  - Slope of grain typically 1:8 (12%) and not to exceed 1:5 (20%).
  - Sap is allowed on arrises but will account for no more than 15% of face or edge.
  - On larger section tie beams sap or wane may occur on all four corners.
  - Wane not to exceed 10% of face or edge.
  - Fungal attack shall not be allowed.
  - Small heart shakes are allowed, but should not extend beyond 25% of the radius of the beam in any direction.
  - Ring shake shall be graded out.
  - Surface fissures not to exceed half the length of the piece.
  - Bow should be less than 3mm per metre run.
- Surface finish: New Sawn with arrisses generally taken off with a draw knife or similar and with timber checked to reduce likelihood of splinters.
- Note some timbers are chamfered with stop ends.
- Moisture content at time of erection: As clause 450.
- Inspection: Structural timber to be inspected at timber yard by CA or Structural Engineer prior to delivery to site. Timber to be free from defects which in the opinion of the CA or Structural Engineer render it unsuitable for its purpose.
- To be sourced from renewable source with FSC Certificates or Chain of Custody Certificates to be provided.

260A GRADED SOFTWOOD FOR STRUCTURAL USE (ROOF STRUCTURES)

- Stress graded to BS 4978 or other national equivalent and so marked.
- Alternate Softwood is to be utilised, Strength class to BS EN 519 or EN 338:C24 (SC4)
- Slow grown Doulgas Fir grade 2 or clear from North America or Canada – 3 year air dried.
- Surface finish: sawn generally, regularised for ceiling joists.
- The following required:
- More modern common rafter replacements
- Live knots may not exceed 50% of any face.
- Small sound dead knots allowed < 50mm diameter, not allowed in the middle 50% of the length of beams and bending members.
- Slope of grain typically 1:8 (12%) and not to exceed 1:5 (20%).
- Sap is allowed on arrises than 15% of face or edge.
- On larger section posts sap but will account for no more or wane may occur on all four corners.
- Wane not to exceed 10% of face or edge.
- Fungal attack shall not be allowed.
- Small heart shakes are allowed, but should not extend beyond 25% of the radius of the beam in any direction.
- Ring shake shall be graded out.
- Surface fissures not to exceed half the length of the piece.
- Bow should be less than 3mm per metre run.
- Surface finish: New Sawn.
- Treatment: No finish.
- Moisture content at time of erection: As clause 450.
- Inspection: Structural timber to be inspected at timber yard by CA or Structural Engineer prior to delivery to site. Timber to be free from defects which in the opinion of the CA or Structural Engineer render it unsuitable for its purpose.
- For any sections less than 50mm provide kiln dried timber.
- To be sourced from renewable source with FSC Certificates or Chain of Custody Certificates to be provided.

260B GRADED SOFTWOOD FOR STRUCTURAL USE (New timber strengthening elements)

- Stress graded to BS 4978 or other national equivalent and so marked.
- Alternate Softwood is to be utilised, Strength class to BS EN 519 or EN 338:C24 (SC4)
- Slow grown Scots Pine/Redwood from Sweden, Russia, Finland or Scotland – 3 year air dried.
- Surface finish: sawn generally.
- The following required:
- New posts, raised collars and binder elements to strengthen existing.
- Live knots may not exceed 50% of any face.
- Small sound dead knots allowed < 50mm diameter, not allowed in the middle 50% of the length of beams and bending members.
- Slope of grain typically 1:8 (12%) and not to exceed 1:5 (20%).
- Sap is allowed on arrises but will account for no more than 15% of face or edge.
- On larger section posts sap or wane may occur on all four corners.
- Wane not to exceed 10% of face or edge.
- Fungal attack shall not be allowed.
- Small heart shakes are allowed, but should not extend beyond 25% of the radius of the beam in any direction.
- Ring shake shall be graded out.
- Surface fissures not to exceed half the length of the piece.
- Bow should be less than 3mm per metre run.
- Surface finish: New Sawn.
- Treatment: Tanalised
- Moisture content at time of erection: As clause 450.
- Inspection: Structural timber to be inspected at timber yard by CA or Structural Engineer prior to delivery to site. Timber to be free from defects which in the opinion of the CA or Structural Engineer render it unsuitable for its purpose.
- For any sections less than 50mm provide kiln dried timber.
- To be sourced from renewable source with FSC Certificates or Chain of Custody Certificates to be provided.

315 SCREWS:
- Material: Stainless steel.
- Grade: 304
- Type: Wood screws to BS 1210.
- Sizes: Various as detailed in specification or on drawings.

316 BOLTS and TIE BARS:
- Material: Stainless steel.
- Grade: 304.
- Type: Hexagonal head to BS 3692.
- Sizes: Various as detailed in specification or on drawings.

317 WASHERS:
- Material: Stainless steel or neoprene.
- Grade: 304.
- Type: Gauge to BS 4320.
- Sizes: Various to match existing or as detailed in specification or on drawings.

318 PLATES, BRACKETS ETC:
- Material: Stainless steel
- Grade: 304.
- Type: Fabricated from standard plate.
- Sizes: Various as detailed in specification or on drawings.

WORKMANSHIP GENERALLY

400 SEQUENCE OF WORK
- Allow for engineers review of structures once accessible, allow for temporary propping/support where necessary. Where new douglas fir structure indicated work to be carried out in a sequence to allow use of traditional jointing as detailed.

401 CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD AND HARDWOOD TIMBER
- Dimensions: Dimensions in this specification and shown on drawings are target sizes as defined in BS EN 336.
- Tolerances: The tolerance indicators (T1) and (T2) specify the maximums permitted deviations from target sizes as stated in BS EN 336, clause 5.3:
  - Tolerance class 1 (T1) for sawn surfaces.
  - Tolerance class 2 (T2) for further processed surfaces.

420 WARPING OF TIMBER
- Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 519 for softwood, or BS 5756 for hardwood.

430 SELECTION AND USE OF TIMBER
- Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.
- Notches and holes: Position in relation to knots or other defects such that the strength of members will not be reduced.
- Scarf joints, finger joints and splice plates: Do not use without approval.

450 MOISTURE CONTENT
- Moisture content of timber and wood-based products at time of installation: 3-year air dried. 18% or less, but as consistent as possible to existing timber.

451 MOISTURE CONTENT TESTING
- Procedure: When instructed, test timber sections with an approved electrical moisture meter.

- Test sample: Test 5% but not less than 10 lengths of each cross-section in the centre of the length.
- Test results: 90% of values obtained to be within the specified range. Provide records of all tests.

500 RECORD DRAWINGS: On completion of the works the Contractor shall provide the CA with a set of record drawings. The drawings are to include, plans and details of all works.

510 PROTECTION
- Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- Timber and components: Store under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack.

520 EXPOSED END GRAIN
- Components: Seal exposed end grain of the following before delivery to site: all timbers.
- Sealer: clear end grain sealer.

540 CLEAR FINISHES
- Structural timber to be clear finished: Keep clean and apply first coat of specified finish before delivery to site.

550 EXPOSED TIMBER
- Prevent damage to and marking of surfaces and arrises.

JOINTING TIMBER

580 JOINTS:
- Finish joint surfaces to all joints so that adjoining surfaces are in full contact over the whole of the surface of the joints.
- Cut all mortice and tenons so that adjoining surfaces are good fit with maximum cumulative gap in one direction of 5mm.
- Pre-drill pilot holes in timbers.
- All to be traditional joints to be replications of the existing present, with formation of subtle washer detailing or use of paint treatment between members.
- Joints which will be concealed upon fabrication and erection to be painted for additional protection.

630 BOLTED JOINTS
- Bolt spacings (minimum): To BS 5268-2, table 81.
- Holes for bolts: Located accurately and drilled to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger.
- Washers: Placed under bolt heads and nuts that would otherwise bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building.
- Bolt tightening: So that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut.
- Inspection: Inspect all accessible bolts at the end of the Defects Liability Period and tighten if necessary.

750 MODIFICATIONS/REPAIRS
- Defects due to detailing or fabrication errors: Report without delay.
- Methods of rectification: Obtain approval of proposals before starting modification or remedial work.
- Defective/damaged components: Timber members/ components may be rejected if the nature and/or number of defects would result in an excessive amount of site repair.

760 TEMPORARY BRACING
- Provision: As necessary to maintain structural timber components in position and to ensure complete stability during construction.

775 BEARINGS

- Timber surfaces which are to transmit loads: Finished to ensure close contact over the whole of the designed bearing area.

Z21 LIME AND EARTH MORTARS

To be read with Preliminaries/ General Conditions

100 MORTAR MIX PROPORTIONS and other particular requirements are specified elsewhere. Note that Mortar mix will be determined through the results of mortar testing in accordance to the architect's specification.

110A MORTAR MIXES (Subject to testing of samples) – LIME MORTAR FOR GENERAL BEDDING AND POINTING:
- Mix: The mix will need to be determined through trials but the following general mix proportions are suggested: 1-part (CL90): 2.5 parts (Sharp Local Sand): (Hot mixed mortar)

110B MORTAR MIXES (Subject to testing of samples) – FOR DEEP PACKING MORTAR, STRUCTURAL MORTAR OR WEATHERING MORTAR TO WALL TOPS, FLAUNCHING ETC. (as directed):
- Mix: 1-part (Prompt): 1-part (CL90): 4-parts (Sand): 2-parts (Crushed Limestone Aggregate 0-4mm)

110 SAND FOR MORTAR:
- To BS 1200 unless specified otherwise.
- Sand for facework mortar to be from one source different loads to be mixed if necessary to ensure consistency of colour and texture.
- When a range is specified (e.g. 1:1:5-6) use lower proportion of sand for Grade G sands and higher proportion for Grade S to be clean washed very sharp pit sand free from loam and other impurities. Colour should be correct for mortar colour matching with existing, to be matched to approved sample insitu.

Suitable local supplier on approval

140 LIME PUTTY: Not expected to be used, however, to be obtained from:
- Wormsley's, Ravensthorpe Industrial Estate, Low Mill Ln, Ravensthorpe, Dewsbury WF13 3LN

141 QUICK LIME: CL90 to be powdered Calbux quicklime from Tarmac or Singleton Birch or lump lime from an approved source. The choice to be agreed prior to order and use.

153 NATURAL HYDRAULIC LIME to be mixed in accordance with manufacturer's instructions. With hydraulic limes performance is variable because it gradually carbonates. Obtain fresh and do not store. Unless otherwise specified, to be obtained from:
- Wormsley's, Ravensthorpe Industrial Estate, Low Mill Ln, Ravensthorpe, Dewsbury WF13 3LN
- Reference : St Astier natural hydraulic lime type NHL2.0.

180 ADMIXTURES:
- Do not use in mortar unless specified or approved.
- Do not use calcium chloride or any admixtures containing calcium chloride (if specified to BS 4887).

190 WATER: Clean and uncontaminated. Obtain approval for other than mains supply. Test to BS 3148 if instructed.

300 EARTH:
- Subject to trials the local earth is assumed to be local to site and either light brown sandy soils or alkali/lime rich soils, free of organic material.
- Remove stones, except nominal sized stones, prior to mixing.
- Earth assumed to be available free of charge from neighbouring fields but contractor to

arrange excavation and transport to site, sorting and stockpiling.
- On completion of excavation allow to re-grade field, compacting the holes in 150mm layers.
- Soil to be confirmed and subject to testing.

310 EARTH:LIME MORTAR MIXES FOR CORE AND BEDDING WORK
- Specification: Proportions and additional requirements for mortar materials as below:
- Earth Mortar for be 1 part by volume quicklime to 6 parts by volume of earth with small ironstone inclusions if found naturally occurring.

350 STORAGE OF MORTAR MATERIALS
- Sands and aggregates and earth: Keep different types/ grades in separate stockpiles on hard, clean, free-draining bases.
- Ready prepared non-hydraulic lime putty: Prevent drying out and protect from frost.
- Non-hydraulic lime:sand mortar: Store on clean bases or in clean containers that allow free drainage. Prevent drying out or wetting and protect from frost.
- Bagged hydrated hydraulic lime: Store off the ground in dry conditions.

360 MAKING LIME:EARTH MORTARS GENERALLY
- Batching: By volume. Use clean and accurate gauge boxes or buckets.
- Equipment: Use roller-pan mixer for all earth mortar mixing. Do not use cement/concrete barrel mixer.
- Water quantity: Soak overnight and mix over-wet. Add quicklime in powder form to allow workable mix.
- Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
- Contamination: Prevent intermixing with other materials, including cement.

370 SITE PREPARED LIME PUTTY:SILVER SAND POINTING MORTAR
- Mixing: Mix materials thoroughly by compressing, beating and chopping. Do not add water.
- Knocking up before and during use: Achieve and maintain a workable consistency by compressing, beating and chopping. Do not add water.
- Equipment: Roller pan mixer or submit proposals.

375 SHRINKAGE and GENERAL PERFORMANCE TRIALS FOR EARTH MORTARS:
- All testing to be carried out at commencement of contract and prior to commencement of repairs on the ruins.
- For each sample allow to manufacture 2 No. timber moulds for shrinkage 50 x 50mm x 600mm long and 2 No. timber moulds for general performance 50 x 300mm x 300mm.
- Mix earth mortar with roller-pan mixer and once at uniform consistency fill moulds. Leave to dry, if necessary in dry heated space and for minimum of 14 days, and return to site for inspection by Contract Administrator and Historic England.

380 EARTH MORTAR SAMPLES: A palette of mortars shall be prepared from the base mixes with different quantities of soil. Biscuits to be prepared for samples for review for colour, texture and strength. Samples as per schedule of work.

COLLECTION

Page No. 1/1
Page No. 1/2
Page No. 1/3
Page No. 1/4
Page No. 1/5
Page No. 1/6
Page No. 1/7
Page No. 1/8
Page No. 1/9
Page No. 1/10
Page No. 1/11
Page No. 1/12
Page No. 1/13
Page No. 1/14
Page No. 1/15
Page No. 1/16
Page No. 1/17
Page No. 1/18
Page No. 1/19
Page No. 1/20
Page No. 1/21
Page No. 1/22
Page No. 1/23

SPECIFICATION
CARRIED TO SUMMARY

The Morton Partnership
Structural Engineers

	£	p

2.0 SCHEDULE OF WORKS

2.1 General

2.1.1 Carry out photographic schedule of the structures, surrounding area of the site including the fencing, pathways, roads, carpark and adjacent areas, providing one digital copy to Contract Administrator and Employer.

2.1.2 For the purpose of this schedule the halls elevation facing the Main Road A662 is referred to as South. Directional notations are taken in relation to this convention whether strictly correct by compass.

2.1.3 Allow to provide all scaffold and temporary access structures to undertake the works. The scaffold should not be fixed to or abut the existing building in any way, should be a brick layers scaffold at minimum (i.e. 2 + 5 boards), and sheeted as necessary with a fire-retardant material. If interaction or temporary dismantling is required then this should be highlighted.

2.1.4 Allow for providing a suitable temporary roof, in accordance with Specification (Section 1.0). Noting that this needs to have suitable clearance to extend over the chimney stack and bell tower protrusions to the roof, as well as not clash wit any trees to the east of the hall.

2.1.5 Allow for all adaptations necessary to the scaffold for the completion of works and dismantling removal on completion.

2.1.6 It is assumed that all works will be carried out using conservation best practice and within the tender return it is expected that suitable case studies of experience are brought forward to show suitable competency for the works.

2.1.7 Allow for forming a corner crack monitor to the south abutment to the bridge at its eastern side, where some lateral movement in noted to the parapet under instruction by the Engineer, this is to be monitored throughout the project.

2.1.8 On stripping of the roof areas allow to provide suitable access to all areas. Allow for cleaning, vacuuming and de-nailing the roof structure to enable inspection, removal of frass on timber sections is advised in accordance with the schedule of works.

2.1.9 Allow for checking all joints between existing members throughout the roof and wall structures, and secure with bolts or screws (stainless) as necessary to ensure these are appropriately fixed.

2.1.10 The full extent of timbers throughout the building could not be investigated fully due to the presence of roof coverings, therefore an assumption of the extent of repair has been made in some instances.

2.1.11 Roof repairs will need to be reviewed by Engineer once the roof covering has been removed prior to reroofing works being undertaken. Suitable allowance within the programme is to be made for this review and time to adapt schedule. The Contractor Administrator/engineer should be provided with 5 working days to update the schedule of works following this opening up.

2.1.12 Ensure provision is made for any necessary temporary support to the roof structure to enable its repairs is accommodated for throughout the works. This should include provision of temporary support to the supporting frameworks once roof repairs have taken place as defects may be present within these as indicated within the internal repairs and alterations/strengthening section.

The Morton Partnership
Structural Engineers

	£	p

2.1.13 Allow to dispose of redundant and deteriorated materials in accordance to the schedule, as well as any subsequent review of the structure by the CA and Engineer.

2.1.14 Allow for the removal of all insulation and vacuum clean all of the existing roof structures ceiling joist arrangement once the above roof has been exposed to allow for close inspection by the Structural Engineer and architect.

2.1.15 Allow for all timber repairs to the structure of the whole roof in the works area as detailed in section 2.3 whilst the roof coverings are removed.

2.2 **Samples**

2.2.1 Provide sample of the following timber sections in 50(w) x 150mm sections for approval prior to use/installation:
- Oak – General timber Replacement
- Douglas Fir – General timber Replacement

2.2.2 Lime mortar trials/testing in accordance to architects' specifications and schedule.

2.3 **Main Hall Works**

2.3.1 **North Range**

2.3.1.1 Frame and bay repairs based on inspection of exposed timber and masonry:

Frame / Bay	Element	Size (wxd)	Repair specification	Ref
Bay 1	Ridge Beam	160 x 230mm	Allow for the temporary removal of the existing steel plate repair to the ridge beam to facilitate engineers' inspection and the full replacement of the ridge beam to a length of circa. 4.6m	-
	Purlin	160 x 230mm	To the purlin i at the western slope, where this comes over Truss A, allow to clean and remove the pocket of decay and frass, then allow for engineer's review. Allow for the formation of 4No. 20mm dia. drilled holes into the adjacent purlin section and the setting of 4No. 500mm length 12mm diameter GRP rods in Rotafix RSA resin. To decay pocket form 2No. further 12mm diameter rods, to enable overlap and build-up the infill in layers with rotafix TG6.	NR-03
	Purlin	160 x 230mm	To purlins v and iv, allow for the splicing in of 1.5m length replacement section in air dried heartwood oak with formation of 2No. splice connections into the adjacent sound timber to enable projection at north gable. Splice should be of 620mm length with diagonal skew cut and secured by 6No. 20mm diameter stainless steel bolts plugged and recessed. Ensure splice is internal rather than external.	NR-02
	Common Rafters	70 x 90mm at 400mm Centres	To be undertaken at the following areas: Splices (400 overlap, new timber in douglas fir, secure at overlap with 3No. 10mm diameter stainless steel coach screw fixings) West Pitch – Common Rafters 3,4, 7 and 8. East Pitch - Common Rafters 7,8 and 9.	NR-01

The Morton Partnership Structural Engineers

				£	p
			Replacement East Pitch - Common Rafter 4		
Truss A	Diagonal Strut	100 x 140mm	To West side allow for the removal of frass to the outer diagonal strut with engineers review following. Allow for replacement in air dried heartwood oak section with formation of mortice and tenon connections with tapered oak pegs into principal members of the roof truss.	-	
Bay 2	Common Rafters	70 x 90mm at 400mm Centres	To be undertaken at the following areas: Splices (400 overlap, new timber in douglas fir, secure at overlap with 3No. 10mm diameter stainless steel coach screw fixings) West Pitch – Common Rafter 1 East Pitch - Common Rafter 3.	NR-01	
	Wind Brace	Take as 60 x 140mm	All to reinsert new air-dried heartwood oak replacement oak section with pegged half lapped connections into top face of purlin and principal rafter sections.		
	Ridge Beam	160 x 230mm	Allow for the removal of frass and decay to the timber ridge beam section followed by inspection by structural engineer.	NR-02	
Bay 3	Ridge Beam	160 x 230mm	Allow for the temporary removal of the existing steel plate repair to the ridge beam to facilitate engineers' inspection with removal of frass and decay as necessary. Allow to form 2m length replacement section in air dried heartwood oak with formation of 2No. splice connections into the adjacent sound timber. Splice should be of 620mm length with diagonal skew cut and secured by 6No. 20mm diameter stainless steel bolts plugged and recessed.	NR-02	
	Common Rafters	70 x 90mm at 400mm Centres	To be undertaken at the following areas: Splices (400 overlap, new timber in Douglas fir, secure at overlap with 3No. 10mm diameter stainless steel coach screw fixings) West Pitch – Common Rafters 3,4, 5 and 7. East Pitch - Common Rafters 4, 6, 7, 10 and 11.	NR-01	
	Principal Ceiling Beam Section	170 x 190mm	Allow to form steel plate repair to decayed ceiling beam. Remove frass and clean down timber section down to sound timber to enable inspection. Fix 2No. 8mm thick x110mm depth steel plate onto sides of timber section, fixing into section with 12mm diameter bolts. At the trusses tie beam bearing allow for the formation of 2No. further 110 x 125mm wide leg x 8mm thick steel angle brackets, with 2No. 12mm dia. coach screw fixings (per side) into tie beam and 2No. 12mm dia. bolts fixings into beam section. Note that angle brackets could be welded onto steel plates if preferred by contractor.	NR-04	

The Morton Partnership
Structural Engineers

					£	p
South Wall	9" brickwork wall structure	2m length cracking	Alongside works at the South elevation, allow to undertake temporary propping of the purlin truss support which bears into the wall. Allow to form 100 x 65mm dp precast concrete lintel to 750mm length across crack and to act as bearing for truss. In co-ordination with the works at the southern side of the wall allow for the building up and toothing in of soft red bricks like for like match with existing set in hot lime mortar. In 2No. locations incorporate 1m length stainless steel helibar into the coursing, set in hilti hit resin where brickwork at either side.	SR-01		

2.3.1.2 Provisionally allow for 10No. common rafter splice repairs in new douglas fir timber, with an allowance of 1.5m new length in accordance to detail NR-01.

2.3.1.3 Provisionally allow for 3No. further purlin splice repairs with a 3m replacement length in accordance to detail NR-02 for the splice detail.

2.3.1.4 Provisionally allow for 17m length of replacement eaves plate in air dried heartwood oak, allowing for half lap splice connections between new and old timber sections. This allows for the full length of the eastern elevation and half of the western. For the purposes of costing take eaves plate as 100 x 200mm (d) in air dried heartwood oak, remeasure prior to material order.

2.3.1.5 To the high-level masonry to the external skin and adjacent to the eaves plate, allow for the dismantle and rebuild/making good of this over 17m length, with this generally the upper 3No. courses to full width of wall . Allow for rebedding existing brickwork in approved lime mortar mix and incorporate stainless steel helical ties at 600mm horizontal centres between skins as necessary.

2.3.1.6 It is envisioned that once the stone slates have been stripped from the roof, the common rafters will be recorded and lifted as part of the process to enable repairs to principal framework. In addition, this will allow for the formation of firrings to the purlin sections to an agreed level. Once all repair work has taken place, the common rafters can then be refixed into place.

2.3.1.7 To the full length of all 4No. purlin sections allow for the removal of existing block firrings and formation of solid section firring in accordance to Detail NR-05. This will involve the setting of string lines to an agreed level and then the scribing in of a 150mm wide air dried oak section with a depth varying from 20-60mm and secured down into the existing purlin with 6mm diameter countersunk stainless steel screws at 150mm centres.

2.3.1.8 Provisionally allow for the formation of raised collar ties to every third rafter set within bays 1 and 3 in accordance to detail NR-06. This would be with 47 x 150mm c16 timber sections bolt fixed into the common rafters, secured by 2No. 10mm diameter stainless steel bolts with 40mm square ss washer plates.

2.3.1.9 Provisionally allow for the installation of 4No. circa 5m length 75 x 225mm binder sections in C24 section to fix onto all ceiling joists with Light reinforced angle brackets (42 x 42 x40) to provide additional strengthening. These would span north to south within Bays 1 and 3.

2.3.1.10 Allow for the formation of a new 21mm depth x 0.6m wide plywood timber walkway within the roof space of 15m length, fixing into joists with screw fixings as necessary.

The Morton Partnership
Structural Engineers

£ p

2.4.2 **South Range**

2.4.2.1 Frame and bay repairs based on inspection of exposed timber and masonry:

Frame / Bay	Element	Size (wxd)	Repair specification	Ref
South Wall	9" brickwork wall structure	2m length cracking	Alongside works at the North elevation, allow to undertake temporary propping of the purlin which bears into the wall. Allow to form 100 x 75mm dp heartwood oak spreader plate (removing exiting small length) to 750mm length. In co-ordination with the works at the northern side of the wall allow for the building up and toothing in of soft red bricks like for like match with existing set in hot lime mortar. In 2No. locations incorporate 1m length stainless steel helibar into the coursing, set in hilti hit resin where brickwork at either side.	SR-01
Bay 5	Purlin Post Support	New 75 x 150mm C24	To western side, directly below the purlin and in alignment with the tie beam section allow for formation of a timber post support, secured onto the tie beam with 2No. AB90 simpson strong tie angle brackets utilising all fixings holes.	SR-05

2.4.2.2 Note that although the stone slate roofing will remain in place to the eastern roof pitch for the duration of the works, there is no need for the formation of ballast to the eastern side due to the relatively short period in which this would be the case and create disproportionate loading onto the roof structure.

2.4.2.3 Provisionally allow for 6No. common rafter splice repairs in new heartwood oak timber, with an allowance of 1.5m new length in accordance to detail NR-01. Rafter sections are the following dimensions:
- Bay 4 – 125 x 155 (d) ***(2No.)***
- Bay 5 (lower) – 145 x 145 (d) ***(2No.)***
- Bay 5 (Upper West) – 70 x 130 (d) Softwood ***(2No.)***

2.4.2.4 Provisionally allow for 3No. further purlin splice repairs with a 3m replacement length in accordance to detail NR-02 for the splice detail. Purlin section in 140 x 250mm depth.

2.4.2.5 Provisionally allow for 4m length of replacement eaves plate in air dried heartwood oak, allowing for half lap splice connections between new and old timber sections. Take eaves plate as 220 x 200mm.

2.4.2.6 Allow for the formation of restraint strapping between tie beam sections within the South Range 5No. onto the adjacent eave plate in accordance to Detail SR-07. Utilise 1m length 30 x 5mm ss strap with no.4-gauge ss screw fixings into all elements to East. To the west, utilise 2m length 30 x 5mm bent ss strap with no.4-gauge ss screw fixings into all timber elements.

The Morton Partnership Structural Engineers

£ p

2.4.3 **Bell Tower – Western roof projection**

2.4.3.1 Frame and bay repairs based on inspection of exposed timber and masonry:

Frame / Bay	Element	Size (wxd)	Repair specification	Ref
Western Projection	Spreader Beam	Take as 140 x 200mm	Allow for the removal of frass and decay to the side of the spreader beam to enable engineers' inspection. Then allow for formation of side face repair over 1.2m length (take as 60mm width) with new heartwood oak scribed in to suit, fixing the 2No. sections together with 16mm diameter bolts at 250mm staggered centres, plugged and recessed.	SR-03
	Purlin	Take as 180 x 180mm	Allow for the splice repair of the purlin where this has fractured at an empty mortice position. Allow to form replacement heartwood oak section where fracture and mortice present and splice onto adjacent sound purlins timber with 400mm skew cut scarf joints secured with 4No. 12mm dia countersunk ss bolts.	SR-02
	Common Rafters	70 x 130mm (d)	Skew cut splices (400 overlap, new timber in Douglas fir, secure at overlap with 3No. 10mm diameter stainless steel coach screw fixings) North Pitch – Common Rafters 1No. South Pitch - Common Rafters 2No.	NR-01
Bell Tower	Horizontal braces	Take as 60 x 125mm	To both horizontal braces which fix into the 4No. posts of the bell tower, allow to temporarily remove these and refix into place utilising 3No. 100mm length stainless steel rosehead nails at each joint.	-
	Eaves Plate	Take as 125 x 125	Allow for the installation of 200mm leg x 100mm depth x 4mm thickness stainless steel reinforcement brackets to each corner of the bell tower. Allow for 2No. 8mm diameter ss coach screw fixing per leg.	SR-04

2.4.3.2 Provisionally allow for 3m length of replacement eaves plate in air dried heartwood oak, allowing for half lap splice connections between new and old timber sections. Take eaves plate as 180 x 180mm.

2.4.3.3 Provisionally allow for 4No. common rafter splice repairs in new doulas fir timber, with an allowance of 1.5m new length in accordance to detail NR-01. Rafter sections are to be taken as the following dimension 70 x 130 (d).

2.4.3.4 Provisionally allow for the splice repair of the central post to the bell tower roof (note splice will require dismantling of the upper roof, leadwork and rafters to access post section). Form new 750mm length post section in 180 x 180mm with a 400mm skew lap splice connection with remaining sound timber, secured with 4No. 16mm diameter stainless steel bolts plugged and recessed.

2.4.3.5 Allow for full replacement of diagonal raker gutter supports through full eastern elevation. These are to be in 75 x 75mm air dried oak sections, at maximum

The Morton Partnership Structural Engineers

		£	p
	600mm centres. Allow for skew cut at fixing onto external timber frame and secure with skew fixed stainless steel screws.		
2.5	Completion		
2.5.1	On completion of works clean site of all debris etc, including any scaffold support etc.		
2.5.2	On completion provide detailed digital images record images of works etc. and provide to the Contract Administrator on memory stick.		
2.5.3	Provide conservation record of all materials, including supplier names and addresses (sands, limes, oak etc.) used and mix proportions. Include detailed description of timber repairs carried out, source of timber etc. cross referenced to photos and or marked up drawings.		

The Morton Partnership
Structural Engineers

	£	p

COLLECTION

Page No. 2/1

Page No. 2/2

Page No. 2/3

Page No. 2/4

Page No. 2/5

Page No. 2/6

Page No. 2/7

SCHEDULE OF WORKS
CARRIED TO MAIN SUMMARY

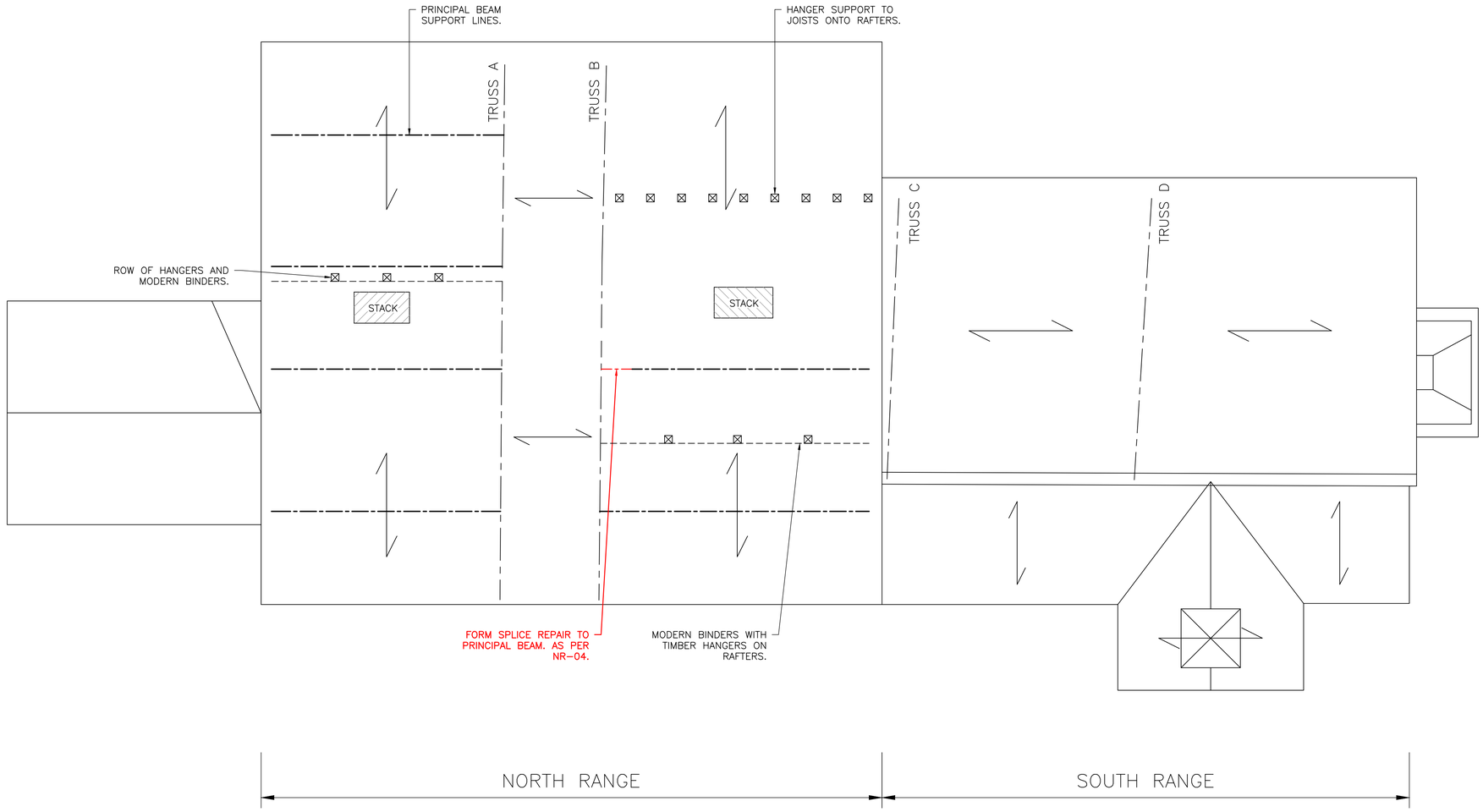
The Morton Partnership
Structural Engineers

COLLECTION

1.0	**Specification (pages 1/1 to 1/23)**	**£**
2.0	**Schedule of Works (pages 2/1 to 2/7)**	**£**
	TOTAL	**£**

APPENDIX A

Drawings – The Morton Partnership Ltd.



NOTES:-

1. ALL DIMENSIONS TO BE CHECKED ON SITE AND NO MEASUREMENTS TO BE SCALED OFF THIS DRAWING.
2. IN CASE OF ANY DISCREPANCY THE ENGINEERS ARE TO BE NOTIFIED IMMEDIATELY.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND SERVICE ENGINEER'S DRAWINGS AND SPECIFICATIONS.

CARPENTRY SPECIFICATION

-MOISTURE CONTENT NOT TO EXCEED 20%.
-ALL TIMBERS TO BE FREE OF BOW, SPRING, TWIST, AND CUP. NOT GREATER THAN LIMITS SET DOWN IN BS4978.
-ALL BOLT FIXINGS TO BE DRILLED FOR PLUMB AND TRUE AND NOT EXCEED FIXING DIMENSIONS PLUS 1mm FOR THROUGH BOLTS. PILOT DRILL HOLES TO BE DRILLED FOR COACH SCREWS.
-ALL FIXINGS TO BE STAINLESS STEEL AND TO BE FITTED WITH SUITABLE WASHERS WITH THREAD EXTENDING THROUGH.
-RESIN TO BE TWO PART EPOXY.
-ENSURE TIMBERS ARE TEMPORARILY PROPPED AND SUPPORTED TO AVOID OVER-STRESSING CONNECTIONS DURING ASSEMBLY/CONSTRUCTION. DO NOT OVER TIGHTEN FIXINGS. ANY DAMAGE TO BE REPORTED AND RECTIFIED.
-IT IS IMPERATIVE THAT ALL TIMBERS ARE ACCURATELY CUT TO EXACT ANGLES AND DIMENSIONS AND ACCORDINGLY THAT BUTTED AND SCREWED JOINTS ARE IN TIGHT BEARING.
-ALL JOINTS ARE TO BE SCREWED THROUGH, SKEW SET AS APPROPRIATE AND TYPICALLY USING SCREWS OF 5mmø.

CONTRACTOR TO SUBMIT PROPOSALS FOR TEMPORARY SUPPORT WORKS AND FOR SEQUENCE OF DISMANTLING/CONSTRUCTION.

CONTRACTOR TO ALLOW FOR STRUCTURAL ENGINEER TO INSPECT THE EXISTING FLOOR AND ROOF BEAMS PRIOR TO ANY RECONSTRUCTION WORKS.

STAGE 4

REV	AMENDMENT	CHK	DATE
-	STAGE 4 ISSUE	RR	02.06.26

The Morton Partnership
Structural Engineers

OLD TIMBER YARD HOUSE
55 THE TIMBER YARD
DRYSDALE STREET, LONDON N1 6ND
TELEPHONE: 0207 324 7270
EMAIL: london@themortonpartnership.co.uk

BRUNEL HOUSE
NORWICH ROAD
HALESWORTH, SUFFOLK, IP19 8HX
TELEPHONE: 01986 875651
EMAIL: halesworth@themortonpartnership.co.uk

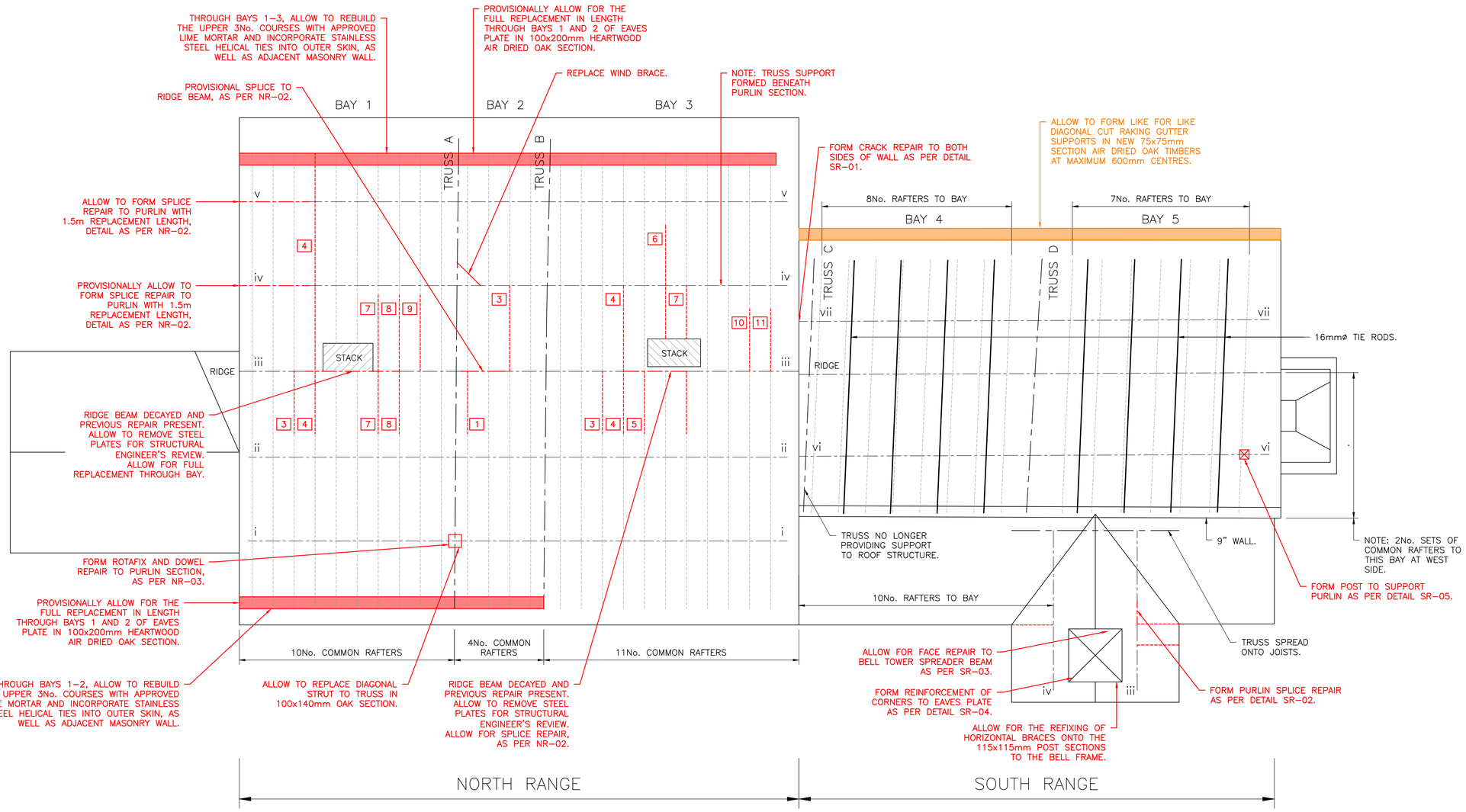
8 CHURCH STREET
COGGESHALL ESSEX CO6 1TU
TELEPHONE: 01376 563883
EMAIL: coggeshall@themortonpartnership.co.uk

PROJECT:
CLAYTON HALL
CLAYTON PARK
MANCHESTER

TITLE:
ROOF SPACE FLOOR STRUCTURE REPAIRS LOCATION PLAN

SCALE: 1:50 (A1) DRAWN BY: CJS
DATE: MAY 2026 CHECKED BY: RR

DRG No.
16076/09 (REV -)



NOTES:–

1. ALL DIMENSIONS TO BE CHECKED ON SITE AND NO MEASUREMENTS TO BE SCALED OFF THIS DRAWING.
2. IN CASE OF ANY DISCREPANCY THE ENGINEERS ARE TO BE NOTIFIED IMMEDIATELY.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND SERVICE ENGINEER'S DRAWINGS AND SPECIFICATIONS.

CARPENTRY SPECIFICATION

–MOISTURE CONTENT NOT TO EXCEED 20%.
–ALL TIMBERS TO BE FREE OF BOW, SPRING, TWIST, AND CUP. NOT GREATER THAN LIMITS SET DOWN IN BS4978.
–ALL BOLT FIXINGS TO BE DRILLED FOR PLUMB AND TRUE AND NOT EXCEED FIXING DIMENSIONS PLUS 1mm FOR THROUGH BOLTS. PILOT DRILL HOLES TO BE DRILLED FOR COACH SCREWS.
–ALL FIXINGS TO BE STAINLESS STEEL AND TO BE FITTED WITH SUITABLE WASHERS WITH THREAD EXTENDING THROUGH.
–RESIN TO BE TWO PART EPOXY.
–ENSURE TIMBERS ARE TEMPORARILY PROPPED AND SUPPORTED TO AVOID OVER–STRESSING CONNECTIONS DURING ASSEMBLY/CONSTRUCTION. DO NOT OVER TIGHTEN FIXINGS. ANY DAMAGE TO BE REPORTED AND RECTIFIED.
–IT IS IMPERATIVE THAT ALL TIMBERS ARE ACCURATELY CUT TO EXACT ANGLES AND DIMENSIONS AND ACCORDINGLY THAT BUTTED AND SCREWED JOINTS ARE IN TIGHT BEARING.
–ALL JOINTS ARE TO BE SCREWED THROUGH, SKEW SET AS APPROPRIATE AND TYPICALLY USING SCREWS OF 5mmø.

CONTRACTOR TO SUBMIT PROPOSALS FOR TEMPORARY SUPPORT WORKS AND FOR SEQUENCE OF DISMANTLING/CONSTRUCTION.

CONTRACTOR TO ALLOW FOR STRUCTURAL ENGINEER TO INSPECT THE EXISTING FLOOR AND ROOF BEAMS PRIOR TO ANY RECONSTRUCTION WORKS.

STAGE 4

REV	AMENDMENT	CHK	DATE
–	STAGE 4 ISSUE	RR	08.06.26

The Morton Partnership
Structural Engineers

OLD TIMBER YARD HOUSE
55 THE TIMBER YARD
DRYSDALE STREET, LONDON N1 6ND
TELEPHONE: 0207 324 7270
EMAIL: london@themortonpartnership.co.uk

BRUNEL HOUSE
NORWICH ROAD
HALESWORTH, SUFFOLK, IP19 8HX
TELEPHONE: 01986 875651
EMAIL: halesworth@themortonpartnership.co.uk

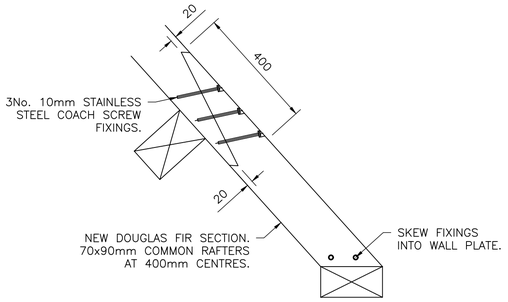
8 CHURCH STREET
COGGESHALL ESSEX CO6 1TU
TELEPHONE: 01376 563883
EMAIL: coggeshall@themortonpartnership.co.uk

PROJECT:
CLAYTON HALL
CLAYTON PARK
MANCHESTER

TITLE:
ROOF REPAIRS
REPAIRS LOCATION PLAN

SCALE: 1:50 (A1) DRAWN BY: CJS
DATE: MAY 2026 CHECKED BY: RR

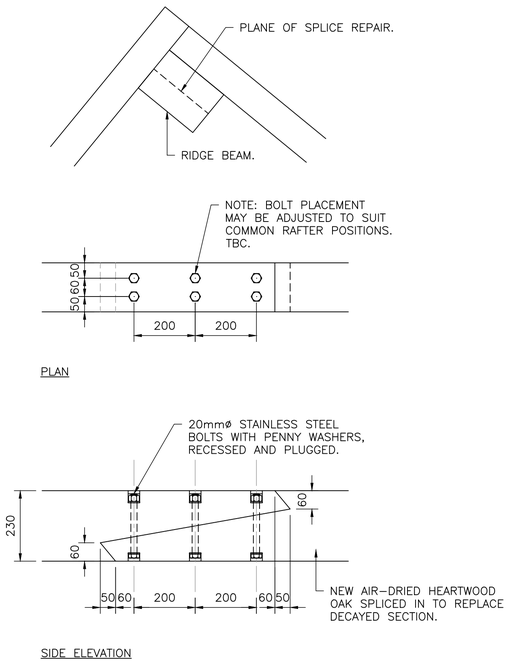
DRG No.
16076/10 (REV –)



COMMON RAFTER SPLICE REPAIR DETAIL

DETAIL NR–01

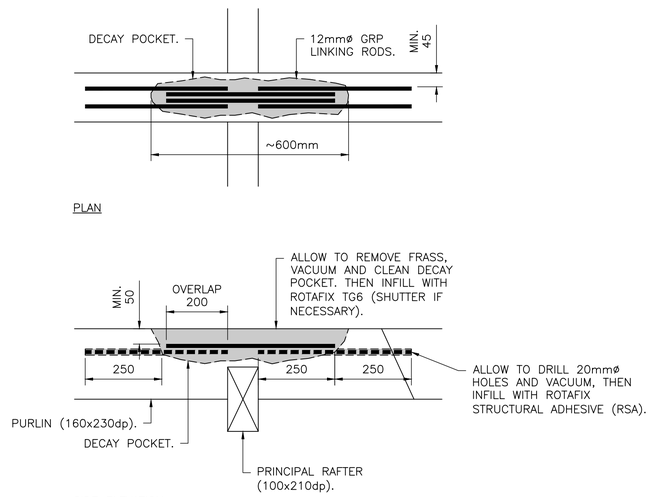
SCALE 1:10



RIDGE BEAM SPLICE REPAIR DETAIL

DETAIL NR–02

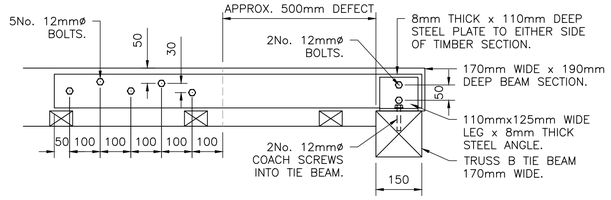
SCALE 1:10



PURLIN ROTAFIX REPAIR DETAIL

DETAIL NR–03

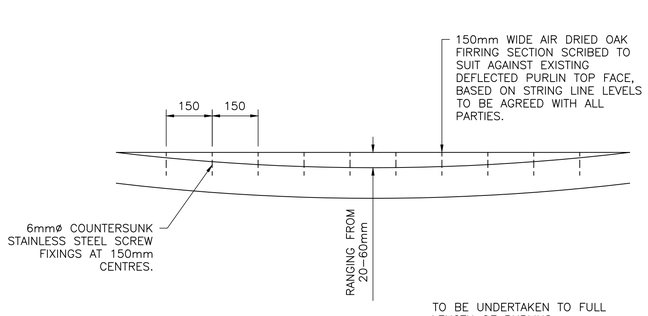
SCALE 1:10



PRINCIPAL FLOOR BEAM SPLICE REPAIR DETAIL

DETAIL NR–04

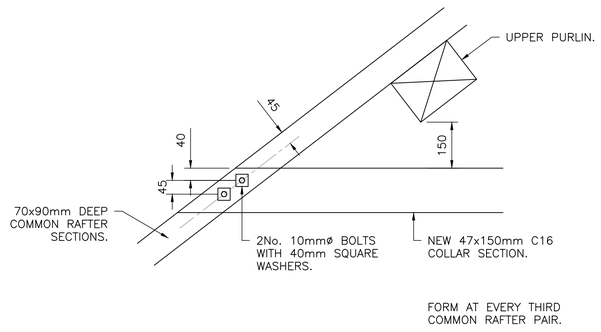
SCALE 1:10



PURLIN FIRRING DETAIL

DETAIL NR–05

SCALE 1:10



INSTALLATION OF RAISED COLLARS BETWEEN COMMON RAFTER PAIRS

DETAIL NR–06

SCALE 1:10

NOTES:–

1. ALL DIMENSIONS TO BE CHECKED ON SITE AND NO MEASUREMENTS TO BE SCALED OFF THIS DRAWING.
2. IN CASE OF ANY DISCREPANCY THE ENGINEERS ARE TO BE NOTIFIED IMMEDIATELY.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND SERVICE ENGINEER'S DRAWINGS AND SPECIFICATIONS.

CARPENTRY SPECIFICATION

–MOISTURE CONTENT NOT TO EXCEED 20%.
–ALL TIMBERS TO BE FREE OF BOW, SPRING, TWIST, AND CUP. NOT GREATER THAN LIMITS SET DOWN IN BS4978.
–ALL BOLT FIXINGS TO BE DRILLED FOR PLUMB AND TRUE AND NOT EXCEED FIXING DIMENSIONS PLUS 1mm FOR THROUGH BOLTS. PILOT DRILL HOLES TO BE DRILLED FOR COACH SCREWS.
–ALL FIXINGS TO BE STAINLESS STEEL AND TO BE FITTED WITH SUITABLE WASHERS WITH THREAD EXTENDING THROUGH.
–RESIN TO BE TWO PART EPOXY.
–ENSURE TIMBERS ARE TEMPORARILY PROPPED AND SUPPORTED TO AVOID OVER–STRESSING CONNECTIONS DURING ASSEMBLY/CONSTRUCTION. DO NOT OVER TIGHTEN FIXINGS. ANY DAMAGE TO BE REPORTED AND RECTIFIED.
–IT IS IMPERATIVE THAT ALL TIMBERS ARE ACCURATELY CUT TO EXACT ANGLES AND DIMENSIONS AND ACCORDINGLY THAT BUTTED AND SCREWED JOINTS ARE IN TIGHT BEARING.
–ALL JOINTS ARE TO BE SCREWED THROUGH, SKEW SET AS APPROPRIATE AND TYPICALLY USING SCREWS OF 5mmø.

CONTRACTOR TO SUBMIT PROPOSALS FOR TEMPORARY SUPPORT WORKS AND FOR SEQUENCE OF DISMANTLING/CONSTRUCTION.

CONTRACTOR TO ALLOW FOR STRUCTURAL ENGINEER TO INSPECT THE EXISTING FLOOR AND ROOF BEAMS PRIOR TO ANY RECONSTRUCTION WORKS.

STAGE 4

REV	AMENDMENT	CHK	DATE
–	STAGE 4 ISSUE	RR	02.06.26

The Morton Partnership
Structural Engineers

OLD TIMBER YARD HOUSE
55 THE TIMBER YARD
DRYSDALE STREET, LONDON N1 6ND
TELEPHONE: 0207 324 7270
EMAIL: london@themortonpartnership.co.uk

BRUNEL HOUSE
NORWICH ROAD
HALESWORTH, SUFFOLK, IP19 8HX
TELEPHONE: 01986 875651
EMAIL: halesworth@themortonpartnership.co.uk

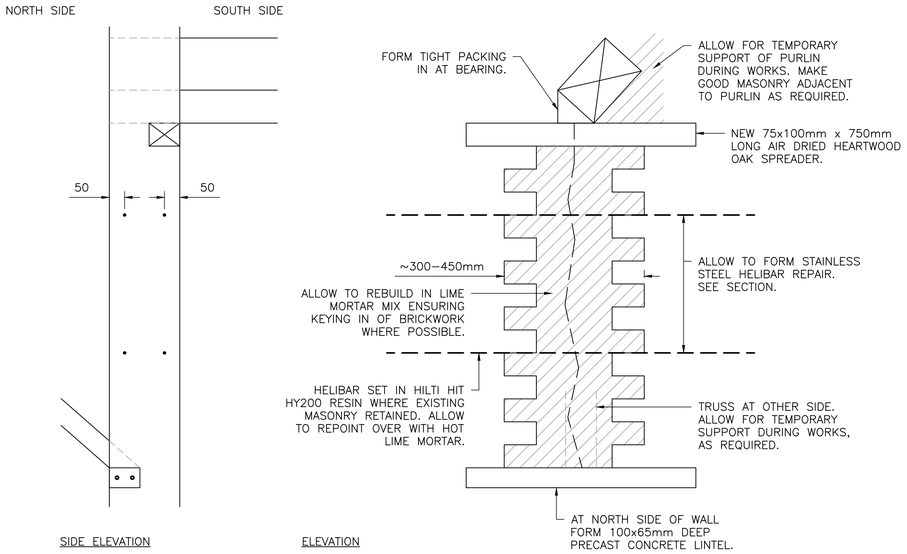
8 CHURCH STREET
COGGESHALL ESSEX CO6 1TU
TELEPHONE: 01376 563883
EMAIL: coggeshall@themortonpartnership.co.uk

PROJECT:
CLAYTON HALL
CLAYTON PARK
MANCHESTER

TITLE:
NORTH RANGE ROOF REPAIRS
REPAIR DETAILS

SCALE: 1:10 (A1) DRAWN BY: CJS
DATE: MAY 2026 CHECKED BY: RR

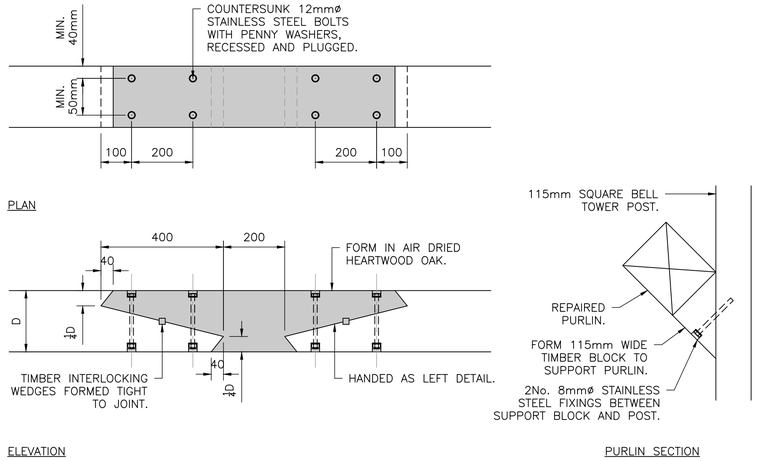
DRG No.
16076/11 (REV –)



CRACK REPAIR DETAIL – 9" WALL

DETAIL SR–01

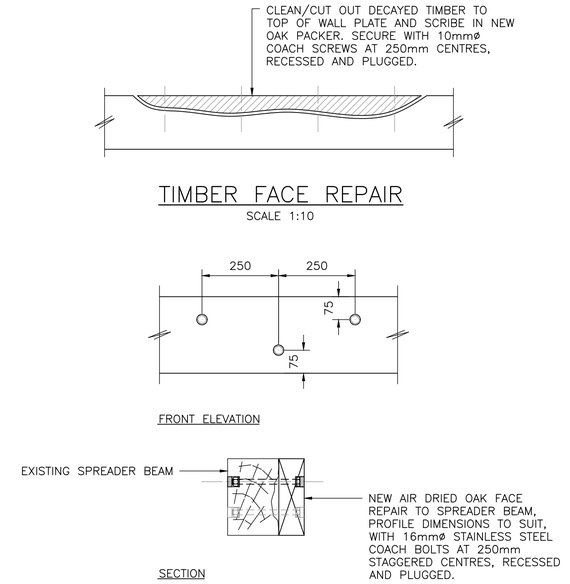
SCALE 1:10



PURLIN SPLICE REPAIR

DETAIL SR–02

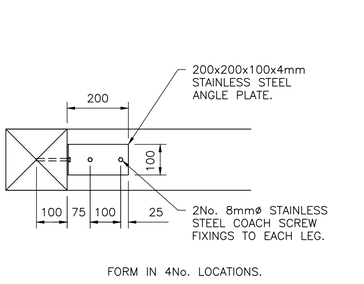
SCALE 1:10

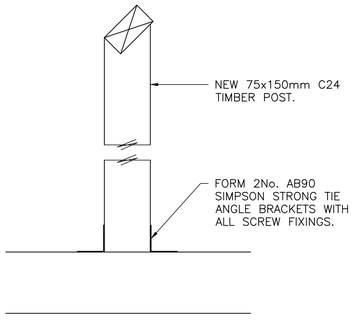


SPREADER BEAM REPAIR DETAIL

DETAIL SR–03

SCALE 1:10





BELL TOWER: EAVES PLATE STRENGTHENING AT CORNER POSITIONS

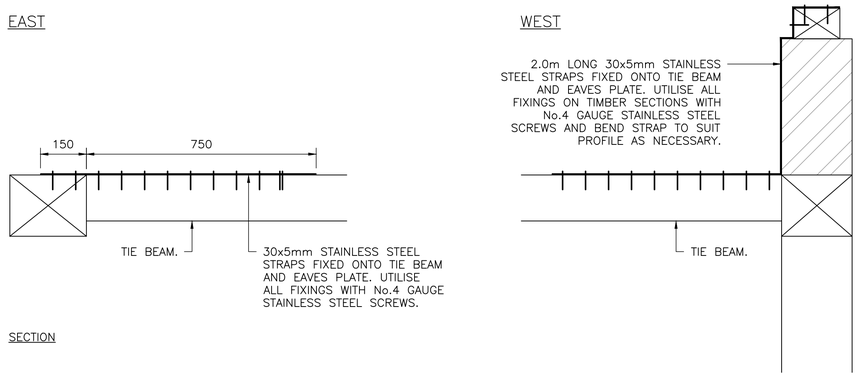
DETAIL SR–04

SCALE 1:10

NEW POST DETAIL

DETAIL SR–05

SCALE 1:10



STRAPPING TO EAVES PLATE FROM TIE BEAM SECTIONS

DETAIL SR–07

SCALE 1:10

NOTES:–

1. ALL DIMENSIONS TO BE CHECKED ON SITE AND NO MEASUREMENTS TO BE SCALED OFF THIS DRAWING.
2. IN CASE OF ANY DISCREPANCY THE ENGINEERS ARE TO BE NOTIFIED IMMEDIATELY.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND SERVICE ENGINEER'S DRAWINGS AND SPECIFICATIONS.

CARPENTRY SPECIFICATION

–MOISTURE CONTENT NOT TO EXCEED 20%.
–ALL TIMBERS TO BE FREE OF BOW, SPRING, TWIST, AND CUP. NOT GREATER THAN LIMITS SET DOWN IN BS4978.
–ALL BOLT FIXINGS TO BE DRILLED FOR PLUMB AND TRUE AND NOT EXCEED FIXING DIMENSIONS PLUS 1mm FOR THROUGH BOLTS. PILOT DRILL HOLES TO BE DRILLED FOR COACH SCREWS.
–ALL FIXINGS TO BE STAINLESS STEEL AND TO BE FITTED WITH SUITABLE WASHERS WITH THREAD EXTENDING THROUGH.
–RESIN TO BE TWO PART EPOXY.
–ENSURE TIMBERS ARE TEMPORARILY PROPPED AND SUPPORTED TO AVOID OVER–STRESSING CONNECTIONS DURING ASSEMBLY/CONSTRUCTION. DO NOT OVER TIGHTEN FIXINGS. ANY DAMAGE TO BE REPORTED AND RECTIFIED.
–IT IS IMPERATIVE THAT ALL TIMBERS ARE ACCURATELY CUT TO EXACT ANGLES AND DIMENSIONS AND ACCORDINGLY THAT BUTTED AND SCREWED JOINTS ARE IN TIGHT BEARING.
–ALL JOINTS ARE TO BE SCREWED THROUGH, SKEW SET AS APPROPRIATE AND TYPICALLY USING SCREWS OF 5mmø.

CONTRACTOR TO SUBMIT PROPOSALS FOR TEMPORARY SUPPORT WORKS AND FOR SEQUENCE OF DISMANTLING/CONSTRUCTION.

CONTRACTOR TO ALLOW FOR STRUCTURAL ENGINEER TO INSPECT THE EXISTING FLOOR AND ROOF BEAMS PRIOR TO ANY RECONSTRUCTION WORKS.

STAGE 4

REV	AMENDMENT	CHK	DATE
–	STAGE 4 ISSUE	RR	02.06.26

The Morton Partnership
Structural Engineers

OLD TIMBER YARD HOUSE
55 THE TIMBER YARD
DRYSDALE STREET, LONDON N1 6ND
TELEPHONE: 0207 324 7270
EMAIL: london@themortonpartnership.co.uk

BRUNEL HOUSE
NORWICH ROAD
HALESWORTH, SUFFOLK, IP19 8HX
TELEPHONE: 01986 875651
EMAIL: halesworth@themortonpartnership.co.uk

8 CHURCH STREET
COGGESHALL ESSEX CO6 1TU
TELEPHONE: 01376 563883
EMAIL: coggeshall@themortonpartnership.co.uk

PROJECT:
CLAYTON HALL
CLAYTON PARK
MANCHESTER

TITLE:
SOUTH RANGE ROOF REPAIRS
REPAIR DETAILS

SCALE: 1:10 (A1) DRAWN BY: CJS
DATE: MAY 2026 CHECKED BY: RR

DRG No.
16076/12 (REV –)