



The Morton Partnership
Structural Engineers

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**SCHEDULE AND SPECIFICATION
FOR
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
Drysedale Street
London N1 6ND

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MANCHESTER
CITY COUNCIL



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Rev	Comments	Engineer	Date
0	Initial issue	RGR	29/08/24
1	Revised Issue Following Comments	RGR	12/09/24

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 is 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 Southern Gable end at the Clayton Hall site, Manchester to facilitate access for re-building and repairs to this elevation. This is to include:
- Suitable working access for the repairs to the southern gable end as included within the schedule.
 - Suitable working access for the repairs to the western exposed timber frame 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.
- 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 However 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 to the southern gable should be designed to support one lift fully loaded to 3.0kN/m² and one further lift for access at 0.75kN/m².
 - That the scaffold to the western and eastern elevations 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;

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 contractor'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. As noted, bearings onto the race structures may be permitted.

150 SITE INVESTIGATION REPORT: A report is not available. However, the contractor should assume a minimum ground bearing pressure of 90kN/m². 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 SCAFFOLDING: 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 not 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.
- 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 90kN/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.

C10 DEMOLISHING STRUCTURES

To be read with Preliminaries/General conditions.

GENERAL REQUIREMENTS

- 110 SURVEY: Before starting work, examine all available information, carry out a survey of the structure(s), site and surrounding area, and submit a survey report and method statements to the CA covering all relevant matters listed below and in the Health and Safety Executive Guidance Note GS29/1 paragraph 32:
 - The form, condition and demolition methods of the structure(s).
 - The form, location and removal methods of any toxic or hazardous materials.
 - The type and location of adjoining or surrounding premises which may be adversely affected by noise, vibration, dust or removal of structure.
 - The identification and location of services above and below ground.
- 120 EXTENT OF DEMOLITION: Upper section of southern gable to bearing position of first floor lintel at eastern side as marked on drawing information.
The hall is grade I listed and upon a Scheduled Ancient Monument site. Therefore, due care is to be taken whilst undertaking the demolition.
Under no circumstances are any elements of the hall to be taken down, demolished or removed unless specified or confirmed by written instruction.
The existing brickwork is to be taken down and cleaned down and stored for reuse within the reconstruction.
- 140 BENCH MARKS: Report to the CA any bench marks and other survey information found on structure(s) to be demolished. Do not remove or destroy unless instructed.

- 150 FEATURE(S) TO BE RETAINED: The following are to be kept in place and adequately protected: South Gable Chimney Stack and all other areas identified in drawing.

SERVICES AFFECTED BY DEMOLITION

- 210 SERVICES REGULATIONS: Any work carried out to or which affects new or existing services must be in accordance with the byelaws or regulations of the relevant statutory authority.
- 220 LOCATION OF SERVICES: Locate and mark the positions of services affected by the work. Arrange with the appropriate authorities for the location and marking of the positions of mains services.
- 230 DISCONNECTION OF SERVICES: Before starting demolition arrange with the appropriate authorities for the disconnection of services and removal of fittings and equipment.
- 250 DRAINS IN USE: Protect drains, manholes, gullies, vent pipes and fittings still in use and ensure that they are kept free of debris at all times. Make good any damage arising from demolition work and leave clean and in working order at completion.
- 260 BYPASS CONNECTIONS: Provide as necessary to maintain continuity of services to occupied areas of the same and adjoining properties. Give a minimum 72 hours notice to occupiers if shutdown is necessary during changeover.
- 270 SERVICES WHICH ARE TO REMAIN: Notify the CA and service authority or owner of any damage. Make all arrangements for repair to the satisfaction of the CA and service authority or owner. Bear any costs arising.

DEMOLITION WORK

- 310 WORKMANSHIP GENERALLY:
- Demolish structure(s) in accordance with BS 6187 and Health and Safety Executive Guidance Notes GS29/1, 3 and 4.
 - Operatives must be appropriately skilled and experienced for the type of work and hold or be training to obtain relevant CITB Certificates of Competence.
 - Site staff responsible for supervision and control of the work are to be experienced in the assessment of the risks involved and in the methods of demolition to be used.
 - All items shall be taken as including carefully removing, basketing out, barrowing, lowering or raising to ground level including any double handling of same and removing from site.
 - Employ methods that cause no shocks or vibration likely to damage surrounding property or equipment housed therein.
 - The use of explosives is forbidden.
 - Ensure there are no risks of uncontrolled collapse, leave partly demolished structures secure.
- 320 GAS OR VAPOUR RISKS: Take adequate precautions to prevent fire or explosion caused by gas or vapour.
- 330 DUST: Reduce dust by periodically spraying demolition works with water.
- 340 HEALTH HAZARDS: Take adequate precautions to protect site operatives and the general public from health hazards associated with dangerous fumes and dust arising during the course of the Works.
- 350 ADJOINING PROPERTY:
- When demolishing structure(s) against adjoining property leave adequate temporary support and protection at each stage and arrange for inspection by the CA. Maintain and alter temporary supports and protection as necessary as work progresses.
 - Demolish structure(s) causing a minimum of damage to adjoining property and leave no unnecessary or unstable projections.
 - Do not disturb support to foundations of adjoining property unless otherwise instructed.

- Report to the CA any defects exposed or becoming apparent in adjoining property.
 - Promptly repair any damage caused to adjoining property by demolition work. Make good to ensure safety, stability, weather protection and security.
- 360 STRUCTURE(S) TO BE RETAINED:
- Adequately protect parts of existing structure(s) which are to be kept in place.
 - Cut away and strip out the minimum necessary and with care to reduce the amount of making good to a minimum.
 - Prevent debris from overloading any part of the structure which is not to be demolished.
- 370 PARTLY DEMOLISHED STRUCTURE(S):
- Leave partly demolished structure(s) in a stable condition, with adequate temporary support at each stage to prevent risk of uncontrolled collapse.
 - Prevent debris from overloading scaffolding platforms.
 - Prevent access of unauthorised persons to partly demolished structure(s). Leave safe outside working hours.
- 410 UNKNOWN HAZARDS: Inform the CA of any unrecorded voids, tanks, chemicals, etc. discovered during demolition work. Agree with the CA, methods for safe removal, filling, etc.
- 440 COMPLETION: Clear away all debris and leave the site in a tidy condition on completion.

MATERIALS ARISING

- 510 OWNERSHIP: Components and materials arising from the demolition are to be reused as far as reasonably possible. Otherwise, they will become the property of the Contractor to be removed from site only at the completion of the fabric repairs.
- 511 OWNERSHIP: Where to remain in the Clients ownership these should be stored for inspection by the Clients representatives. Materials will be re-used where possible. Where unsalvageable or of no value they will be carted from site and disposed of by the Contractor.
- 520 HARDCORE: Brick, stone and concrete rubble or other hard materials arising from demolition work may be reused as hardcore subject to compliance with section D20.

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.
 - Where needling is to take place to form replacement lintels to the southern gable, needle locations are to be marked clearly for approval from the CA/Engineer.
 - Do note that lintel replacement could take place with a careful and staged approach
- 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.

285B BED JOINT REINFORCEMENT / WALL TIES TO INSITU MASONRY

- Manufacturer: Bekaert or similar approved.
- Product reference: Bricktor SBT180CCR
- Material: Austentic Stainless steel.
- Width: 180mm
- Laying: As per manufacturer's instructions.
- Laps: 50mm laps at joints and full laps at angles.
- Position: Centrally to bed joint and bed in mortar 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 brush to remove laitance and reveal aggregates and give a coarse texture to the mortar and achieve good compaction.
- Agree samples of pointing and finish.

D20 EXCAVATING AND FILLING

To be read with Preliminaries/General conditions, and to be guided by Urban Greens information.

CLEARANCE/EXCAVATING**168 SITE CLEARANCE**

- Timing: Before topsoil stripping, if any.
- General: Stockpile in temporary spoil heaps not exceeding 1500mm high. Keep separate from other materials and prevent from becoming compacted, contaminated or buried. Surplus Excavated Materials to be removed from site.
- Many of the tree Root Protection Zones (RPAs) that are being retained are close to or within the excavation areas so any excavations will need to be carried out by hand or with an airspade to ensure the roots are not damaged.
- Clear site of rubbish, debris and vegetation. Do not compact topsoil.

220 STRIPPING TOPSOIL

- General: Before beginning general excavation or filling, strip topsoil from areas where there will be regrading, buildings, paving/ roads and other areas shown on drawings.
- Depth:
 - Remove to an average depth of 300 mm.
- Around trees: Do not remove topsoil from below the spread of trees to be retained.
- Site storage: Within site boundaries and keep separate from excavated sub-soil.

221 TREATING TOPSOIL

- Treatment: Apply the use of hand weeding, hot water or hot foam to kill any weeds within the excavated and stored topsoil and as part of the clearance works.
- Timing: Not less than two weeks before excavating topsoil.

225 HANDLING TOPSOIL

- Standard: To BS 3882.
- Aggressive weeds:
 - Species: Included in the Weeds Act, section 2 or the appropriate Wildlife and Countryside Act for the relevant jurisdiction.
 - Give notice: Obtain instructions before moving topsoil.
- Contamination: Do not mix topsoil with:
 - Subsoil, stone, hardcore, rubbish or material from demolition work.
 - Other soil or material containing aggressive weeds, sharps, plastics and non-soil forming materials and notifiable animal or plant diseases.
 - Oil, fuel, cement or other substances harmful to plant growth.
 - Other classifications of topsoil.
- Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.

250 PERMISSIBLE DEVIATIONS FROM FORMATION LEVELS

- Beneath mass concrete foundations: ± 25 mm.
- Beneath ground bearing slabs and r.c. foundations: ± 15 mm.
- Embankments and cuttings: ± 50 mm.
- Ground abutting external walls: ± 50 mm, but such as to ensure that finished level is not less than 150 mm below dpc.

260 INSPECTING FORMATIONS

- Give notice: Make advance arrangements for inspection of formations for foundations and filling formations and service trenches.
 - Notice (minimum): 5 days.
- Preparation: Just before inspection remove the last 150 mm of excavation.
- Trim to required profiles and levels, and remove.
 - Loose material: Remove.
- Seal: Within 4 hours of inspection, seal formations with blinding concrete.

267 INSPECTIONS OF FORMATIONS IN SHRINKABLE SOILS

- Inspect formation: For signs of conducting and fine moisture absorbing roots.
- Give notice: If significant quantities of roots are visible in the formation or in the bottom 75 mm of the walls of the excavation.

270 FOUNDATIONS GENERALLY

- Give notice if:
 - A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.
 - The formation contains soft or hard spots or highly variable material.

280 TRENCH FILL FOUNDATIONS

- Excavation: Form trench down to formation in one operation.
- Safety: Prepare formation from ground level.
- Inspection of formations: Give notice before commencing excavation.
 - Period of notice: Five working days.
- Shoring: Where inspection of formation is required, provide localised shoring to suit ground conditions.
- Concrete fill: Place concrete immediately after inspection and no more than four hours after exposing the formation.

310 UNSTABLE GROUND

- Generally: Ensure that the excavation remains stable at all times.
- Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
- Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

320 RECORDED FEATURES

- Recorded foundations, beds, drains, manholes, etc: Break out and seal drain ends.
- Contaminated earth: Remove and disinfect as required by local authority.
- Ensure archaeological watching brief as necessary through duration of the works.

330 UNRECORDED FEATURES

- Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

360 EXCESS EXCAVATION

- Excavation taken wider than required:
 - Backfill: With concrete as part of trench foundation casting.
- Excavation taken deeper than required:
 - Backfill: Under foundations: Concrete as part of trench foundation casting.
 - Backfill: [Under Ground Bearing Slabs and External Paving: well compacted hardcore in max 150mm layers].

DISPOSAL OF MATERIALS

410 EXCAVATED TOPSOIL STORAGE

- Storage: Stockpile in temporary storage heaps within site boundaries - location to be agreed with Client and landscape Architect and to be away from tree protection area.

415 SURPLUS TOPSOIL - REMOVAL

- General: Remove from site and dispose of according to WAC recommendations.

450 WATER

- Generally: Keep all excavations free from water until:
 - Formations are covered.
 - Below ground constructions are completed.
- Drainage: Form surfaces of excavations and fill to provide adequate falls.
- Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute

watercourses with silt laden water.

- 454 GROUND WATER LEVEL, SPRINGS OR RUNNING WATER
- Give notice: If it is considered that the excavations are below the water table.
 - Springs/ Running water: Give notice immediately if encountered.

FILLING

- 500 PROPOSED FILL MATERIALS
- Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:
 - Type and source of imported fill.
 - Proposals for processing and reuse of material excavated on site.
 - Test reports as required elsewhere.
 - Materials Providing Support: gravel or sandy soil free from fines, clay or other harmful materials and approved by Contract Administrator
 - Timing: At least 21 days before starting filling.

GROUNDWORK

- 510 HAZARDOUS, AGGRESSIVE OR UNSTABLE MATERIALS
- General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:
 - Frozen or containing ice.
 - Organic.
 - Contaminated or noxious.
 - Susceptible to spontaneous combustion.
 - Likely to erode or decay and cause voids.
 - With excessive moisture content, slurry, mud or from marshes or bogs.
 - Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
 - Unacceptable, class U2 as defined in the Highways Agency 'Specification for highway works', clause 601.
- 512 LIMITATION OF SULFATE CONTENT IN FILL MATERIALS
- Test specification: To BRE Report 279.
 - Sulfate content: Expressed as SO₄.
 - Water soluble sulfate (maximum): Within DS-2 class.
 - Total potential sulfate (maximum): Within DS-2 class.
 - Oxidizable sulfides (maximum): Within DS-2 Class.
 - Certificates of test result: Submit.
- 520 FROST SUSCEPTIBILITY
- General: Except as allowed below, fill must be non-frost-susceptible as defined in Highways Agency 'Specification for highway works', clause 801.8.
 - Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non-frost-susceptible:
 - Fine grained soil with a plasticity index less than 20%.
 - Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
 - Crushed chalk.
 - Crushed limestone fill with average saturation moisture content in excess of 3%.
 - Burnt colliery shale.
 - Frost-susceptible fill: May only be used:
 - At depths below the finished ground surface greater than 500 mm.
 - Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
 - Where frost heave will not affect structural elements.

530 PLACING FILL

- Surfaces of excavations and areas to be filled: Free from loose soil, topsoil, organic material, rubbish and standing water.
- Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.
- Adjacent structures, membranes and buried services:
 - Do not overload, destabilise or damage.
 - Submit proposals for temporary support necessary to ensure stability during filling.
 - Allow 14 days (minimum) before backfilling against in situ concrete structures.
- Layers: Place so that only one type of material occurs in each layer.
- Earthmoving equipment: Vary route to avoid rutting.

610 COMPACTED FILLING FOR LANDSCAPE AREAS

- Fill: Material capable of compaction by light earthmoving plant.
- Filling: Layers not more than 100 mm thick. Lightly compact each layer to produce a stable soil structure.

626 COMPACTED GENERAL FILL

- Suitable material: Any inorganic material excavated on the site.
- Excavated material: Select suitable material and keep separate.
- Filling: Spread and level material in layers. As soon as possible thoroughly compact each layer.
- Required compaction: To suit use of fill as bearing stratum.
- Proposals: Well in advance of starting work submit details of proposed:
 - Materials to be used, including quantities of each type.
 - Type of plant.
 - Maximum depth of each compacted layer.
 - Minimum number of passes per layer.

700 BACKFILLING AROUND FOUNDATIONS

- Under oversite concrete and pavings: Hardcore.
- Under grassed or soil areas: Material excavated from the trench, laid and compacted in 100 mm maximum layers.

710 HARDCORE FILLING

- Fill: Granular material, free from excessive dust, well graded, all pieces less than 75 mm in any direction, Type 2 MOT to be utilised:
 - Test requirements:
 - Minimum 10% fines value tested in a soaked condition to BS 812-111 Not required.
 - Impact value SZ tested to BS EN 1097-2 Not required.
- In any one layer only one of the following:
 - Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together.
 - Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
 - Crushed non-expansive slag.
 - Gravel or hoggins with not more clay content than is required to bind the material together, and with no large lumps of clay.
 - Well-burned non-plastic colliery shale.
 - Natural gravel.
 - Natural sand.
- Filling: Spread and level in 100 mm maximum layers. Thoroughly compact each layer.

E05 IN SITU CONCRETE CONSTRUCTION GENERALLY

To be read with Preliminaries/General conditions.

- 110 ARRANGEMENT OF INFORMATION: The different parts of in situ concrete construction are specified in separate sections as follows:
E10 In situ concrete mixes, casting and curing
E20 Formwork
E30 Reinforcement
Clauses dealing with particular aspects of certain types of construction may thus be dispersed over several sections.
- 300 LEVELS OF STRUCTURAL CONCRETE FLOORS: Maximum tolerances for designed levels to be as follows:
- Floors which are to be self-finished, and floors to receive sheet or tile finishes directly bedded in adhesive: +/-10 mm.
 - Floors to receive fully bonded screeds/toppings/beds: +/-15 mm.
 - Floors to receive unbonded or floating screeds/beds: +/-20 mm.
- 310 SURFACE REGULARITY OF CONCRETE STRUCTURAL FLOORS:
Sudden irregularities not permitted. When measured with a slip gauge to BS 8204: Part 1 or 2, Figure 3 or equivalent, the variation in gap under a straightedge (with feet) placed anywhere on the surface to be not more than the following:
- Floors which are to be self-finished, and floors to receive sheet or tile finishes directly bedded in adhesive
5 mm under a 3 m straightedge
2 mm under a 1 m straightedge
 - Floors to receive screeds/toppings/beds up to 50 mm thick:
10 mm under a 3 m straightedge.
 - Floors to receive mastic asphalt flooring to underlay laid over mastic asphalt levelling coat(s): 10 mm under a 3 m straightedge.
 - Floors to receive mastic asphalt flooring or underlay laid direct: To the same surface regularities as defined in clause M11/760.
- 320 CONCRETE TOLERANCES GENERALLY:
All concrete tolerances are to comply with the limitations and recommendations as set out in BS 8000 parts 1-16 inclusive.

E10 IN SITU CONCRETE MIXES, CASTING AND CURING

To be read with Preliminaries/General conditions.

CONCRETE MIXES

All concrete in contact with the ground shall comply with ACEC Class AC-1 Design Chemical Class DC-1, BS8500.

100 DESIGNATED MIX FOR MASS FOUNDATION CONCRETE

- Mix C25/30 to BS 5328 as shown on the drawings.
- The concrete will be un-reinforced.
- Nominal maximum size of aggregate: 20 mm.
- Admixtures: An accelerator or retarder may not be used.

102 DESIGNATED MIX FOR REINFORCED CONCRETE FOUNDATIONS

- Mix C25/30 to BS 5328.
- The concrete will be reinforced.
- Nominal maximum size of aggregate: 20 mm.
- Admixtures: An accelerator or retarder may not be used.

125 SUBSTITUTION OF STANDARD FOR DESIGNATED MIXES:

- Where appropriate, Standard mix(es) to BS 5328: Part 2, Section 4 will be permitted in substitution for specified Designated mixes in accordance with BS 5328: Part 1, Table 13 and in each case subject to approval.
- If Standard mixes are made on site comply with BS 8000: Section 2.1, Subsections 2, 3 and 4.

180 MIXES FOR SUNDRY TYPES OF IN SITU WORK are specified in other sections of this specification.

Mixes specified in this section which are equivalent to or better than the above may be used in lieu, subject to approval.

MATERIALS, BATCHING AND MIXING

215 READY-MIXED CONCRETE must be used for all elements and must be obtained from a plant which holds current certification meeting the requirements of the NACCB, Category 2 for product conformity. Each mix must be obtained from only one source unless otherwise approved. Confirm name and address of depot(s) to CA before any concrete is delivered. Retain all delivery notes for inspection.

255 CEMENTS:

- The following abbreviations apply:
PC42.5 - Portland cement, Class 42.5 (in lieu of OPC)
Ggbs - Ground granulated blast furnace slag
Pfa - Pulverized fuel ash
- Cements, ggbs and pfa must comply with the relevant British Standards. Portland cements must have cement certification meeting the requirements of the NACCB, Category 2 for product conformity.

305 NATURAL AGGREGATES FOR DESIGNED/PREScribed MIXES: To give a drying shrinkage of concrete not exceeding 0.075% when tested to BS 812: Part 120.

490 PROPERTIES OF FRESH CONCRETE to be determined by the Contractor in consultation with the concrete supplier to suit the on site circumstances and methods, but in all respects maintaining compliance with this Specification.

TESTING/CERTIFICATION

510 COMPLETE CORRELATED RECORDS must be maintained for each Designed and Prescribed

- mix including:
- Information in accordance with BS 5328: Part 3, clauses 3.1 and 3.2.
 - All sampling, site tests and identification numbers of all specimens tested in the laboratory.
 - The location of the part(s) of the structure represented by each sample.
 - The location in the structure of the batch from which each sample is taken.
- 520 TEST LABORATORY: All specified testing for cube strength to be carried out by one NAMAS accredited laboratory. Submit the name of the selected laboratory to CA as soon as possible and in any case before making trial mixes or concrete for use in the works.
- 530 TEST REPORTS: 1 copy of reports to be despatched to CA within one day of completion of each test.
Keep a complete set of reports on site.
- 550 BROKEN CUBES: Keep separately the pieces of each cube which fails to meet the compliance requirements for individual results. Obtain agreement of CA before discarding.
- 580 FAILURES:
- If a concrete sample fails to achieve specified criteria or to pass specified tests, inform the CA without delay and submit:
 - Confirmation of the validity of the test results, and/or
 - Proposals for further tests to assess the strength of the concrete in the structure, as set out in BS 6089, and/or
 - Proposals for rectification.
 - Obtain approval of all such evidence and proposals before proceeding. The CA may issue instructions for the work to be stopped or delayed until reasons for the failure have been established, possible consequences assessed and appropriate preventative and remedial measures taken.
- 581 FAILURES: Wherever the specified sampling, testing and compliance procedures show that a concrete mix is not in accordance with the specification (even if the work is eventually accepted), and measures are taken to help in establishing whether or not the work is acceptable, such measures:
- will be at the expense of the Contractor, and
 - will not be considered as grounds for extension of time.

PLACING AND COMPACTING

- 640 CONSTRUCTION JOINTS:
- Submit details of proposed locations and obtain approval before proceeding.
 - Carefully brush and spray surface while concrete is still green to remove surface laitance and expose aggregate finish. Obtain approval for any alternative method.
 - Surface to be clean and damp when fresh concrete is placed against it.
- 650 CLEANING: At time of placing ensure that all surfaces on which concrete is to be placed are clean, with no debris, tying wire clippings, fastenings or free water.
- 660 INSPECTION: Inform CA before each pour of concrete to allow inspection of reinforcement and surfaces against which concrete is to be placed. Agree with CA the period of notice to be given.
- 670 TRANSPORTING:
- Avoid contamination, segregation, loss of ingredients, excessive evaporation and loss of workability. Cover concrete during heavy rain.
 - Clean equipment immediately after use and whenever cement or aggregate is changed.
 - Use suitable walkways and barrow runs for traffic over reinforcement and freshly placed concrete.
- 680 PLACING:
- Record time, date and location of all pours.
 - Place as soon as practicable after mixing and while sufficiently plastic for full compaction.

- After discharge from the mixer do not add water or retemper mixes.
 - Ensure that temperature of concrete is not more than 30°C in hot weather and not less than 5°C in cold weather. Do not place against frozen or frost covered surfaces.
 - Place in final position in one continuous operation up to construction joints. Avoid formation of cold joints.
 - Do not discharge from an excessive height or through reinforcement or other obstructions in a way which may cause uneven dispersal, segregation or loss of ingredients or adversely affect the formwork or formed finishes. Use suitable chutes or trunking where necessary.
 - Place in layers no thicker than can be effectively compacted with the equipment being used, without delay between layers. Merge together by compaction.
 - Do not use vibrators to make concrete flow horizontally into position, except where necessary to achieve full compaction under void formers and cast in accessories and at vertical joints.
- 690 COMPACTING: Fully compact concrete to full depth (until air bubbles cease to appear on the top surface), especially around reinforcement, cast-in accessories, into corners of formwork and at joints. Ensure amalgamation with previous batches, but do not damage adjacent partly hardened concrete. Use appropriate type(s) of mechanical vibration for all concrete in reinforced concrete.
- 720 VIBRATORS: Inform CA of the number and type of vibrators to be used. Provide standby vibrators. Do not use external vibrators without approval.

CURING AND PROTECTION

- 810 CURING:
- Prevent surface evaporation from concrete throughout the period(s) specified below by:
 - Retaining formwork in position and, if necessary, covering surfaces immediately after striking, and
 - Covering top surfaces immediately after placing and compacting each bay, removing covering only to permit any finishing operations and replacing immediately thereafter.
 - Maintain surface temperature above 5°C throughout the periods specified below or four days, whichever is the longer
 - Maintain detailed records of location and timing of casting of individual batches, removal of formwork and removal of coverings. Keep on site, available for inspection.
- 811 CURING:
- Coverings for curing may be suitable impervious sheet materials or a suitable curing compound containing a fugitive dye and with an efficiency of at least 75%. (90% for surfaces exposed to abrasion). They:
 - Must be effective in preventing evaporation, particular attention being paid to sealing at edges and junctions.
 - Must not disfigure permanently exposed surfaces.
 - Must not affect the satisfactory bond of subsequent construction and finishes.
 - Curing compounds applied to surfaces which will be exposed in the finished work or which are to receive bonded finishes must be removed by light, even grit blasting.
 - Until the exposed top faces of fresh concrete are in a state suitable to receive sheets in direct contact or a sprayed curing compound as applicable, cover with waterproof sheeting held clear of the surface and well sealed against draughts at edges and junctions.
- 812 PREVENTING EARLY AGE THERMAL CRACKING:
- Deep lifts or large volume pours: Submit proposals for curing to prevent early age thermal cracking, taking account of:
- Temperature differentials across sections .
 - Coefficient of thermal expansion of the concrete .
 - Strain capacity of the concrete mix (aggregate dependent) .
 - Restraint .

- 822 CURING PERIODS, not less than:
- Surfaces which in the finished building will be exposed to the elements, and wearing surfaces of floors and pavements, regardless of weather conditions 10 days
 - Other structural concrete surfaces 5 days
- 840 PROTECTION: Prevent damage to concrete, including:
- Surfaces generally: From rain, indentation and other physical damage.
 - Surfaces to be exposed in the finished work: From dirt, staining, rust marks and other disfiguration.
 - Immature concrete: From thermal shock, physical shock, overloading, movement and vibration.
 - In cold weather: From entrapment of water in pockets, etc. and freezing expansion thereof.

E20 FORMWORK FOR IN SITU CONCRETE

To be read with Preliminaries/General conditions.

GENERALLY /PREPARATION

- 110 LOADINGS: Design and construct formwork to withstand the worst combination of:
- Total weight of formwork, reinforcement and concrete.
 - Construction loads including dynamic effects of placing, compacting and construction traffic.
 - Wind and snow loads.
- 120 DETAILS: Provide details of forms as follows:
Form type for floor and other formed concrete faces.
- 130 PROPPING: Provide adequate propping to prevent excessive deflection and damage to the structure. Carry down such props to bearings strong enough to provide adequate support.
- 145 PERMANENT FORMWORK:
Location and materials: Submit proposals.
- 150 BEARINGS:
- Prop through other decks if construction load on a particular deck exceeds:
 - the design loading, or
 - where less than 28 days have elapsed from casting, a reduced loading agreed with CA.
 - Submit details of proposed prop bearings and through propping to CA. Accept responsibility for cost of checking the affects on structure.
- 170 WORK BELOW GROUND
- Casting vertical faces of footings, bases and slabs against faces of excavation: Obtain consent.
 - Casting walls against faces of excavation: Use formwork on both sides.

CONSTRUCTION

- 310 ACCURACY: Construct formwork accurately and robustly with adequate supports to produce finished concrete to the required dimensions. Formed surfaces must be free from twist and bow (other than any required cambers), all intersections, lines and angles being square, plumb and true.
- 320 JOINTS IN FORMS: Construct formwork, including joints in form linings and between forms and completed work, to prevent loss of grout, using seals when necessary. Secure formwork tight against adjacent concrete to prevent formation of steps.
- 350 FORM TIES: No metal part of any device for securing forms is to remain within the specified concrete cover.

- 470 RELEASE AGENTS: Type(s) which are suitable for use with the type(s) of formwork, formed finishes and specified applied finishes. Use the same type and make throughout the entire area of any one finish. Apply evenly to form faces, from top downwards, and to horizontal surfaces last. Use the minimum amount necessary to obtain a clean release and prevent excessive local collection. Prevent release agent touching the reinforcement, hardened concrete, other materials not part of the form face, and permanent forms.
- 480 SURFACE RETARDERS: Do not use without approval. Prevent retarder from touching the reinforcement.

STRIKING

- 510 RESPONSIBILITY: Strike formwork without disturbing, damaging or overloading structure, and without disturbing props. Notwithstanding other clauses in this specification and any checking or approvals by the CA, the responsibility for safe removal of any part of the formwork and any supports without damaging the structure rests with the Contractor.
- 520 MINIMUM PERIODS: The following periods (in days) for retaining formwork in position before striking apply to class 42.5 or sulfate-resisting Portland cement concrete with no cement replacement materials or admixtures:

Type of Average mean of daily minimum and formwork and maximum air temperatures during the period:

	16°C	7°C	3°C
Vertical formwork to columns, walls and beams	1	0.75	1
Soffit forms to slabs	4	6	8
Props to slabs and soffit forms to beams	10	15	20
Props to beams	14	21	28

Submit details of proposed periods for mixes using admixtures or other types of cement.

- 521 MINIMUM PERIODS: Alternative methods of determining minimum periods for retaining formwork in position may be submitted for approval. Accept responsibility for cost of checking of proposals by CA and for any testing.

FORMED FINISHES

- 610 BASIC FINISH: (TO BE USED UNLESS SPECIFIED OTHERWISE BY ARCHITECT)
- Fix formwork to be rigid to prevent bowing and steps between sheets of no more than 5 mm.
 - No other specific requirements except those for achieving full compaction of concrete.

- E30 REINFORCEMENT FOR IN SITU CONCRETE
To be read with Preliminaries/General conditions.

REINFORCEMENT

- 110 QUALITY ASSURANCE: All steel reinforcement specified to comply with BS 4449 or BS4482, BS4483 or BS6744 cut and bent to BS 8666 is to be obtained from firm(s) holding a valid certificate of approval for the manufacture and/or fabrication of steel reinforcement issued under a third party quality assurance scheme operated by a certification body approved by the National Accreditation Council.

140 PLAIN BAR REINFORCEMENT: To BS 4482, Grade 250.

150 RIBBED BAR REINFORCEMENT: To BS 4449, Grade 500.

210 FABRIC REINFORCEMENT: To BS 4483.

CUTTING AND BENDING

310 CUT AND BEND reinforcement to schedules and to BS 8666:2005. Do not bend when below 5°C without approval. Steel may be warmed to not more than 100°C. Do not rebend bars without approval. Tag bundles of reinforcement with labels to BS 8666.

317 MECHANICAL DAMAGE: Reinforcement must not be roughly handled, dropped from a height, or subjected to shock loading or mechanical damage.

325 CLEANLINESS: At time of placing concrete, reinforcement to be clean and free of corrosive pitting, loose millscale, loose rust, ice, oil and other substances which may adversely affect the reinforcement, concrete, or bond between the two.

410 LAPS OR SPLICES: Obtain instructions if details are not shown on drawings.

420 LAPS in nominal bar reinforcement to be not less than 300 mm.

421 LAPS in fabric reinforcement, where not detailed, to be not less than 250 mm. Where necessary seek instructions to avoid a four layer build-up at corners.

444 MECHANICAL JOINTS will not be permitted other than in precast concrete.

451 FIXING GENERALLY:

- Unless otherwise permitted fix reinforcement in position before placing concrete. In addition to any spacers and chairs shown on drawings or schedules, provide adequate support, tie securely and maintain the specified cover. Comply generally with Concrete Society Report CS 101 'Spacers for reinforced concrete' 1989.
- Unless otherwise specified tie using 16 swg annealed tying wire. Ensure that tying wire does not intrude into the concrete cover. Do not tack weld unless authorised by the CA and recommended by the reinforcement manufacturer.
- Do not fix or place reinforcement in contact with nonferrous metals.

470 COVER:

- Not less than the nominal cover minus 5 mm.
- Where reinforcement is located in a particular direction in relation to only one face of a member, not more than the nominal cover plus:
5 mm on bars up to and including 12 mm size.
10 mm on bars over 12 mm up to and including 25 mm size.
15 mm on bars over 25 mm size.
- Before concreting check thoroughly that the specified cover dimensions have been obtained.

491 SPACERS to formed concrete finishes, if permitted (see section E20) to be approved type(s) which are dense precast concrete or proprietary plastic.

500 DAMAGE: Prevent damage to and disfigurement of forms, form linings and adjacent work.

510 RUST STAINING: Prevent rust staining of surfaces of concrete which will be exposed to view in the finished work, caused by e.g. rust stained formwork or unprotected projecting reinforcement.

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.

150 PREPARATION FOR GALVANISED MILD STEEL BEAM SECTIONS

- Batch hot dip galvanize to BS EN ISO 1461 : 2009 after grit blasting to Sa 2½ with G24 chilled angular iron grit to achieve a nominal coating thickness of: 85 (internal) or 100 (external) micrometres by a member of Galvanizers Association.

COATING THICKNESS

The coating thickness requirements for work batch hot dip galvanizing to BS EN ISO 1461 : 2009 are summarised in the table below:

Steel Section Thickness /mm	Coating Weight /gm-2	Coating Thickness /□m
> 6	610	85
> 3 and ≤ 6	505	70
≥ 1.5 and ≤ 3	395	55
< 1.5	325	45

Note that for heavy steel sections (e.g. > 10 mm thick) a coating thickness in excess of the 85 micrometres requirement (say > 100 □m and up to 140 □m) may be produced.

The table below summarises the maximum coating thickness that may be achieved on various steel section thicknesses by grit blasting prior to galvanizing.

Steel Section Thickness /mm	Coating Weight /gm-2	Coating Thickness /□m
≥ 6	1000	140
≥ 3 and < 6	715	100
≥ 1.5 and < 3	610	85
< 1.5	505	70

Note that for heavy steel sections (e.g. > 10 mm thick) a coating thickness in excess of 140 □m may be produced by grit blasting prior to galvanizing.

BOLT ASSEMBLIES

- 305 GALVANISED BOLTS AND NUTS:
Manufacturer and reference: Contractor's choice, Minimum galvanising thickness 0.005".
- 310 INSTALLATION:
- Position members accurately, using steel packs of adequate area as necessary to achieve a true line and level.
 - Fix securely using washers under bolt heads and nuts.
 - Use suitably tapered, correctly aligned washers under bolt heads and nuts which bear on sloping surfaces.
 - Bolts: Galvanised with diameter to suit drawing information.
- 370 GALVANISED FINISH TO BOLT ASSEMBLIES:
- * To BS 729, applied by fastening manufacturer and passivated when no additional coatings are specified. Nuts to be tapped after galvanizing.
- * Use/location: See repair schedule

PAINTING

- 800 PAINT MANUFACTURERS
Paint system to be obtained from the following supplier:
Type 1. Repair – Navy Steel
D. ADAM & ASSOCIATES,
1 West End Units,
Charlesfield Industrial Estate,
St. Boswells TD6 0HH,
Scotland, UK
Tel : +44(0) 1835 268120, Mob : 07880 805478
- 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 all repairs will be undertaken in air dried oak.
- 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)

- 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
 - Carriage beams to be boxed heart with the 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.

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.



M60 PAINTING/ CLEAR FINISHING/ SPECIALIST COATINGS**190 IRON AND STEEL ELEMENTS:**

- Manufacturer: Hammerite Products Ltd. ICI Paints, Wexham Road Slough, Berkshire, SL2 5DS. Telephone (01753) 5500555. Similar approved may be considered.
- Product Reference: Hammerite Matt Finish.
- Colour: Black.
- Surfaces: New metal elements.
- Preparation for Bare Metal Surfaces: Degrease with Hammerite brush cleaner.
- Preparation for stainless steel or galvanised mild steel : Allow to apply 1No. coat of hammerite special metals primer
- Film Thicknesses:
 - o Minimum 200 microns wet.
 - o Minimum 100 microns dry.
 - o The number of coats required to achieve this will vary depending on substrate and method of application.
- Application: Apply at least 2 coats leaving at least 4 hours between coats. Minimum application temperature: 3°C above dew point Ideal application temperature: 8-30°C (46-86°F) Maximum relative humidity: 85%.
- Brush Application:
 - o Stir before use.
 - o At least two coat coverage is essential to bare or rusty metal to achieve film thickness for corrosion resistance, however Hammerite paint will take longer to dry and sag if over applied.
 - o Ensure edges and corners are adequately covered, these are at greatest risk of premature rusting.
- Drying Time:
 - o Touch/Surface Dry 2 hours approximately.
 - o Intercoat Period After 4 hours.
 - o Note: Times may change depending on weather conditions

197 WOOD TAR COATING ON EXPOSED TIMBER FRAME SPLICE/REPLACEMENT POSITIONS:

- Principle/ objective of wood tar coatings: The objective is to build up multiple layers over time, as thick as possible, not to impregnate the wood.
- Manufacturer: Trilanco
- Product reference: Gold Label Stockholm Tar Thick Formula, available in 450g tins.
- Surfaces: New oak.
- Preparation: The surface should be clean and dry: Maximum moisture content 15%.
- Preparation of wood tar: As clause 665.
- Coating: Single coat as clause 715.
- Second coat: If necessary, a second coat may be applied when the surface has dried, especially if matte sections occur quickly.
- Future coats by employer at 3-5 year intervals under separate contracts.

GENERAL**215 HANDLING AND STORAGE:**

- Coating materials: Deliver in sealed containers, labelled clearly with brand name, type of material and manufacturer's batch number.
- Materials from more than one batch: Store separately. Allocate to distinct parts or areas of the work.

240 SURFACES NOT TO BE COATED:

- To all exposed faces of new timbers to the external timber frame of the building.
- Avoid dribbles down faces onto adjacent wall fabric.
- Allow for 1No. coat (dried) to be applied prior to the fitting of timbers to the external elevation.

280 PROTECTION:

- 'Wet paint' signs and barriers to be provided where necessary to protect other operatives and general public, and to prevent damage to freshly applied coatings.

291 SAFETY

- Be careful when working with hot tar.
- Wear full-coverage clothing, gloves and, if necessary, eye protection / visor.

300 CONTROL SAMPLES:

- See schedule of works section 4.2.4 and 4.2.7.
- Inspection: Give notice when each stage is ready for inspection.
- Approval of appearance: Obtain before commencement of general coating work.

321 INSPECTION OF WORK STAGES:

- Programme of inspections: After initial coat and then each subsequent coat.
- Inspection: Give notice when each stage is ready for inspection.

PREPARATION

400 PREPARATION GENERALLY:

- Standard: In accordance with BS 6150.
- Refer to any pre-existing CDM Health and Safety File – none available.
- Refer to CDM Construction Phase Plan (see appendix D).
- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
- Substrates: Sufficiently dry in depth to suit coating.
- Efflorescence salts: Remove.
- Dirt, grease and oil: Remove. Give notice if contamination of surfaces/ substrates has occurred.
- Surface irregularities: Remove.
- Joints, cracks, holes and other depressions: Fill flush with surface, to provide smooth finish.
- Dust, particles and residues from preparation: Remove and dispose of safely.
- Water based stoppers and fillers.
 - o Apply before priming unless recommended otherwise by manufacturer.
 - o If applied after priming: Patch prime.
- Oil based stoppers and fillers: Apply after priming.
- Doors, opening windows and other moving parts
 - o Ease, if necessary, before coating.
 - o Prime resulting bare areas.

420 FIXTURES AND FITTINGS:

- Before work commences identify any where removal is considered necessary, provide list and and seek approval.
- Due to Scheduled Ancient Monument Status no elements should be removed prior to formal agreement. Note requirements in schedule of works item 4.1.3.
- In line with above identify, seek approval and remove any ironmongery to door etc. and replace on completion including cleaning and painting of this with Matt Black Hammerite.

440 PREVIOUSLY COATED SURFACES GENERALLY:

- Preparation: In accordance with BS 6150, clause 11.5.
- Contaminated or hazardous surfaces: Give notice of:
 - Coatings suspected of containing lead.
 - Substrates suspected of containing asbestos or other hazardous materials.
 - Significant rot, corrosion or other degradation of substrates.
- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.

- Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
 - Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
 - Alkali affected coatings: Completely remove.
 - Retained coatings:
 - Thoroughly clean to remove dirt, grease and contaminants.
 - Gloss-coated surface: Provide key.
 - Partly removed coatings:
 - Additional preparatory coats: Apply to restore original coating thicknesses.
 - Junctions: Provide flush surface.
 - Completely stripped surfaces: Prepare as for uncoated surfaces.
- 461 PREVIOUSLY COATED WOOD:
- Degraded or weathered surface wood: Take back to provide suitable substrate.
 - Degraded substrate wood: Repair with sound material of same species.
 - Exposed resinous areas and knots: Apply two coats of knotting.
- 490 PREVIOUSLY COATED IRON/STEEL:
- Defective paintwork: Remove to leave a firm edge and clean bright metal.
 - Sound paintwork: Provide key for subsequent coats.
 - Corrosion and loose scale: Take back to bare metal.
 - Residual rust: Treat with proprietary removal solution.
 - Bare Metal: Apply primer as soon as possible.
 - Remaining areas: Degrease.
- 521 UNCOATED STEEL – MANUAL CLEANING:
- Oil and grease: Remove.
 - Corrosion, loose scale, welding slag, and spatter: Remove.
 - Residual rust: Treat with proprietary removal solution.
 - Primer: Apply as soon as possible.
- 622 ORGANIC GROWTHS:
- Dead and loose growths and infected coatings: Scrape off and remove from site.
 - Treatment biocide: Apply appropriate solution to growth areas and surrounding surfaces.
 - Residual effect biocide: Apply appropriate solution to inhibit re-establishment of growths.
- 665 PREPARATION OF WOOD TAR FOR COATING WOOD SUBSTRATES
- Scope: Wood tar as delivered is thick and dense, and to be able to apply tar correctly it needs to be heated. Heated it gets thinner and more applicable.
 - Heating: Heat the tar to approximately 50°C (subject to trials) in a steel bucket with an immersion heater, or using the metal delivery tin placed directly on a hot plate. Take care not to heat the tar too hot, just so that it can be applied with a stiff brush.
 - Caution: Be careful not to keep it too hot for a long time. If it starts to smoke heavily, the temperature is too high.

APPLICATION

- 711 COATING GENERALLY:
- Application standard: In accordance with BS 6150, clause 9.
 - Conditions: Maintain suitable temperature, humidity and air quality during application and drying.
 - Surfaces: Clean and dry at time of application.
 - Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
 - Overpainting: Do not paint over intumescent strips or silicone mastics.
 - Priming coats
 - o Thickness: To suit surface porosity.
 - o Application: As soon as possible on same day as preparation is completed.

- Finish
 - o Even, smooth and of uniform colour.
 - o Free from brush marks, sags, runs and other defects.
 - o Cut in neatly.
- Doors, opening windows and other moving parts: Ease before coating and between coats.

715 WOOD TAR COATING ON WOOD

- Site setup, safety and post-completion: Be prepared for the tar to run and drip for a long time after application, especially if it is applied in cold weather as it tends to become a thicker layer.
- Application: Work tar well into the surface using a stiff brush, stirring the hot tar regularly.
- Time of year: To build up a thicker film, it can be an advantage to apply in late autumn so the tar has the winter season to stabilize before the hot spring / summer sun. Warmer temperatures in spring and summer will cause the tar to run and drip before it is "cemented" to the wood substrate.

740 CONCEALED METAL SURFACES:

- General: Apply additional coatings to surfaces that will be concealed when component is fixed in place.

Q10 KERBS/ EDGINGS/ CHANNELS/ PAVING ACCESSORIES

To be read with Preliminaries/General conditions.

TYPES OF KERBS/EDGINGS AND CHANNELS

Edgings as existing.

LAYING**510 LAYING KERBS, EDGINGS AND CHANNELS**

- Cutting: Neat, accurate and without spalling. Form neat junctions.
- Bedding of units: Positioned true to line and levelled along top and front faces, in a mortar bed on accurately cast foundations or on a race of fresh ST 4 concrete.
- Securing of units: After bedding has set, secured with a continuous haunching of concrete or on a race of fresh concrete with backing concrete cast monolithically.

520 ADVERSE WEATHER

- Conditions: Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.

530 CONCRETE FOR FOUNDATIONS, RACES AND HAUNCHING

- Standard: To BS 8500-2.
- Designated mix: Standard mix ST4.
- Workability: Very low.

620 ACCURACY

- Deviations (maximum):
 - Level: ± 6 mm.
 - Horizontal and vertical alignment: 3 mm in 3 m.

Q20 GRANULAR SUB-BASES TO ROADS / PAVINGS

To be read with Preliminaries/ General conditions.:

- 110 THICKNESSES OF SUB-BASE/ SUBGRADE IMPROVEMENT LAYERS:
 • Thicknesses: As specified in the relevant drawings.
- 120 CHECKING OF SUBGRADES:
 • Anticipated subgrade conditions:
 • Soil type: As site investigation.
 • Submit: Results and obtain instructions before proceeding.
- 140 EXCAVATION OF SUBGRADES:
 • Final excavation to formation or subformation level: Carry out immediately before compaction of subgrade.
 • Soft spots and voids: Give notice.
 • Old drainage and service trenches: Seek instructions from CA.
 • Wet conditions: Do not excavate or compact when the subgrade may be damaged or destabilized.
- 145 PREPARATION AND COMPACTION OF SUBGRADES:
 • Timing: Immediately before placing sub-base.
 • Soft or damaged areas: As agreed with CA excavate and backfill with Type 1 sub- base.
 • Compaction: Thoroughly, by roller or other suitable means, adequate to resist subsidence or deformation of the subgrade during construction and of the completed pavings when in use. Take particular care to compact fully at intrusions, perimeters and where local excavation and backfilling has taken place.
- 170 GEOTEXTILE FILTER/ SEPARATOR MEMBRANE
 • Use where shown on the Drawings.
 • Manufacturer: Terram.
 • Product reference: 1000 or equivalent.
 • Jointing: To manufacturer's requirements.
 Protect from:
 • Exposure to light, except during laying (maximum five hours).
 • Contaminants.
 • Materials listed as potentially deleterious by geotextile manufacturer.
 • Damage, until fully covered by fill.
 • Wind uplift, by laying not more than 15 m before covering with fill.
 • Preparation: Remove humps and sharp projections and fill hollows before laying.
- 210 HIGHWAYS AGENCY TYPE 1 UNBOUND MIXTURE FOR SUB-BASE:
 Material: Type 1 unbound mixture to Highways Agency 'Specification for highway works', clauses 801 and 803.
 • Recycled aggregate: Permitted subject to advance agreement of CA. Submit proposals to CA. Note that existing concrete slab if of sufficient quality could be reused as crush material.
- 240 LAYING GRANULAR SUB-BASES:
 • General: Spread and levelled in layers. As soon as possible thereafter compact each layer.
 • Standard: To Highways Agency 'Specification for highway works' clause 802.
 • At drainage fittings, inspection covers, perimeters and where local excavation and backfilling has taken place: Take particular care to compact fully.
- 310 ACCURACY:
 Permissible deviation from required levels, falls and cambers (maximum):
 • Subgrades:
 • Footways and recreation areas: ± 20 mm.
- 330 COLD WEATHER WORKING:
 • Frozen materials: Do not use.

- Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.
- 340 PROTECTION:
- Sub-bases: As soon as practicable, cover with subsequent layers, specified elsewhere.
 - Subgrades and sub-bases: Prevent degradation by construction traffic, construction operations and inclement weather.

Q22 ASPHALT ROADS/ PAVINGS

TYPES OF PAVING

- 140 HOT ROLLED ASPHALT PAVING
- Description: TO PAVEMENT AREAS WHERE NECESSARY
 - Standard: To MCHW Volume 1 'Specification for highway works'
 - Base: Existing Sub - base
 - Surface course: Hot rolled asphalt to MCHW Volume 1 'Specification for highway works', clause 910
 - Paving grade: 40/60
 - Compacted thickness: 35 mm nominal, 30 mm minimum at any point
 - Reclaimed content
 - Standard: To BS EN 13108-8.
 - Value (maximum): Surface course 10%
 - Surface treatment: 6mm hardstone bitmac surface
- 180 SURFACE TREATMENT TO EXISTING PAVING
- Description: TO PAVEMENT AREAS WHERE NECESSARY
 - Base: Existing hot rolled asphalt
 - Preparation: Plane surface as necessary. Cut out depressions, fill to match existing surface and compact. Allow to pressure wash clean existing surface prior to tack coat.
 - Surface to receive dressing: Clean and dry. All patching complete.
 - Binder: Bitumen emulsion
 - Finish: Supply, lay and compact 30-40mm of 6mm hardstone bitmac surface course to falls and levels.
 - Slip/ skid resistance: PTV to BS 7976-2 of 45 (water) wet

PREPARATORY WORK/ REQUIREMENTS

- 220 BITUMINOUS MATERIALS GENERALLY (I.E. AREAS FOR COLD LAY REPAIRS)
- Suppliers' names: Submit.
 - Timing (minimum): Two weeks before starting work.
 - Test certificates: At the time of delivery for each manufacturing batch submit certificate:
 - Confirming compliance with this specification and the relevant standard.
 - Stating full details of composition of mix.
- 230 SAMPLES
- Submit: Representative samples of coated chippings in-situ
- 240 ACCEPTANCE OF SURFACES
- Surface: Sound, clean and suitably close textured.
 - Level tolerances: To BS 594987.
 - Kerbs and edgings: Complete, adequately bedded and haunched and to the required levels.
- 250 ABUTMENTS
- Vertical edges of manholes, gullies, kerbs and other abutments: Clean and paint with a thin uniform coating of Polymer modified bitumen emulsion bond coat.
 - Finishing: Tamp surface around projections.
 - Level: Flush or not more than 3 mm above projections.

LAYING**310 LAYING GENERALLY**

- Preparation: Remove all loose material, rubbish and standing water.
- Adjacent work: Form neat junctions. Do not damage.
- Channels, kerbs, inspection covers etc: Keep clean.
- New paving
- Keep traffic free until it has cooled to prevailing atmospheric temperature.
- Do not allow rollers to stand at any time.
- Prevent damage.
- Lines and levels: With regular falls to prevent ponding.
- Overall texture: Smooth, even and free from dragging, tearing or segregation.
- State on completion: Clean.

320 ADVERSE WEATHER

- Frozen materials: Do not use.
- Suspend laying
- During freezing conditions
- If the air temperature reaches 0°C, or in calm dry conditions -3°C, on a falling thermometer.
- Hot rolled asphalt: During periods of continuous or heavy rain or if there is standing water on the base.

330 LEVELS

- Permissible deviation from the required levels, falls and cambers (maximum): In accordance with BS 594987, clause 5.2.

340 FLATNESS/ SURFACE REGULARITY

- Deviation of surface: Where appropriate in relation to the geometry of the surface, the variation in gap under a 3 m straightedge placed anywhere on the surface to be not more than:
- Binder course: Existing planed and infilled to suit.
- Surface course: Machine laid, 7 mm
- Where a straightedge cannot be used the surface must be of a comparable standard of accuracy when judged by eye.

360 UNCOATED CHIPPINGS FOR SURFACE TREATMENT

- Chippings: Clean aggregate to BS EN 13043 and PD 6682-2, size 2.8/6.3, grading category Gc85/15.
- Type/ Source: Submit proposals
- Colour: Grey
- Binder
- Cutback bitumen to BS EN 12591 or bitumen emulsion to BS 434-1.
- Do not use cut-back bitumen at temperatures below 15°C.
- Do not use modified binders without prior approval.
- Application
- Binder application rate: In accordance with TRL Road Note 39. Adjust rate for modified binders in accordance with manufacturer's instructions.
- Coverage: 100–105% shoulder to shoulder to BS 598-1.
- Compaction: Roll. Do not crush chippings.
- Completion
- Before trafficking, remove excess chippings.
- Carry out further removal of loose chippings disturbed by traffic as necessary.

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 (CL80): 2.5 parts (Sharp Sand): 5% (Coal Ash) (Hot mixed mortar)
- 110B** MORTAR MIXES (Subject to testing of samples) – FOR DEEP PACKING MORTAR, STRUCTURAL MORTAR OR WEATHERING MORTAR TO WALL TOPS, TORCHING ETC. (as directed):
 - Mix: 1-part (Prompt): 1-part (CL90): 4-parts (Sand): 2-parts (Crushed Limestone Aggregate (Whiting) 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.
- 142** QUICK LIME: CL80 to be powdered Otterbein quicklime. 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

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**SPECIFICATION
CARRIED TO SUMMARY**

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2.0 SCHEDULE OF WORKS		
2.1 <u>General</u>		
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 to prepare a detailed method statement for the works with associated programme. This should include the sequence of work for the following areas: - Boundary fence works inclusive of pavement closures - Southern gable end high level rebuilding works	
2.1.5	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.	
2.1.6	Allow for forming a corner crack monitor to the south abutment to the bridge at its eastern side, where some lateral movement is noted to the parapet under instruction by the Engineer, this is to be monitored throughout the project.	
2.2 <u>Samples</u>		
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	
2.2.2	Allow to provide pointing samples over 0.5m x 0.5m for approval in the following areas: - South elevation – Chimney Stack - South elevation - Brickwork	
2.2.3	Lime mortar trials/testing in accordance to architects' specifications and schedule.	
2.3 <u>External Boundary Works</u>		
2.3.1 <u>General</u>		
2.3.1.1	All dimensions provided on the drawings in Appendix A are approximate dimensions and these must be checked on site to the satisfaction of the Contractor prior to pricing. Where the Contractor believes actual quantities to exceed those stated herein, the increased quantity must be stated by the Contractor and priced.	
2.3.1.2	Ensure that clear safe access is maintained along the nearby roads, and ensure that a banksman is provided to escort plant and vehicles along these if necessary. The contractor is to cover all road/pavement closures as part of the works.	

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2.3.1.3		
2.3.1.4		
2.3.1.5		
2.3.1.6		
2.3.2 Demolition & Temporary Works		
2.3.2.1		
2.3.2.2		
2.3.2.2		
2.3.2.3		
2.3.2.4		
2.3.3 Proposed Works (Allow to co-ordinate with drawings 16076-01-02)		
2.3.3.1		
South, West and Inner Moat (Orange Areas): Axial Force = 1.5kN (Unfactored Dead) Moment = 3.5kNm (Unfactored)		
East (Blue Area) Axial Force = 1.5kN (Unfactored Dead) Moment = 4kNm (Unfactored)		
North (Green Area) Axial Force = 17.5kN (Unfactored Dead)		



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	Moment = 5kNm (Unfactored)		
2.3.3.2	Allow for the formation of the ground beam detail, alongside associated connection detail into the screw pile foundations as necessary to each area as the following: South, West and Inner Moat (Orange Areas): 100 x 65 x 10 Rolled Steel Angle in Galvanised Mild Steel East (Blue Area) 100 x 100 x 10 Rolled Steel Angle in Galvanised Mild Steel North (Green Area) Inverted T-Shaped reinforced concrete ground beam in C25/30 Concrete 200mm height x 150mm width Upper projection with 450mm width x 100mm depth base. To be reinforced with H10 bars top and bottom with H8 links at 150mm centres. A193 mesh to be utilised at the base, see detail 3 for further information.		
2.3.3.3	To the south elevation where this has been marked in purple. Allow for the formation of 400mm sq. x 300mm depth C25/30 Concrete pad footings at approx. 1.3m centres in correspondence to the proposed boundary fence principal posts.		
2.3.3.4	To all areas where there are screw piles, other than the North, allow for utilisation of connection detail 2 between the principal railing posts and the steel angle support beam. This is to be formed with a 6mm thick baseplate of 100 x 150mm fillet welded onto the principal posts. This baseplate is then to be secured onto the below angle section with 4No. 10mm diameter galvanised mild steel bolts.		
2.3.3.5	To the North elevation, the principal posts are to fix onto the reinforced concrete ground beam again with a 150 x 100mm baseplate of 6mm fillet welded onto the principal post sections in accordance to detail 4. These are to fix into the reinforced concrete below with 2No. 10mm diameter galvanised mild steel grade 8.8 bolt fixings resin fixed to a 150mm depth.		
2.3.3.6	To the South elevation, where posts are to be founded by pad foundations. The principal posts are to fix onto a 150 x 100mm baseplate of 6mm fillet welded onto the principal post sections in accordance to detail 4. These are to fix into the concrete below with 2No. 12mm diameter galvanised mild steel grade 8.8 bolt fixings resin fixed to a 150mm depth.		
2.3.3.7	To the 110 x 110 cast iron post to be retained at the south east corner of the boundary make allowance for removal of its existing 4No. 5mm thick x 45mm width x 75mm leg length angle connections, cleaning these down to ST2. Then redecorating in paint system to match that of the new galvanised mild steel railings. Allow to refit to suit new railings with 12mm dia, galvanised mild steel bolts drilled and tapped to 15mm.		
2.3.3.8	To the existing gate entrances located to the south west and north east corners, make allowance for 6No. new 5mm thick x 45mm width x 75mm leg length angle connections, with these securing into the existing posts with 12mm diameter grade 8.8 galvanised mild steel bolts, decorated to suit adjacent fencing.		
2.3.4	Making Good Works		
2.3.4.1	Refer to the planting proposals in (2407-CWS-XX-XX-DR-L-200) for the slopes backfill/topsoil as necessary to the entire perimeter.		
2.3.4.2	To the south elevation, generally it is expected that the works will take place upon the slope/soft landscaping. However, make an allowance for the making good at		

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	the existing edge perimeter of the adjacent tarmac surfacing, with a provisional allowance of 10m length x 100mm depth x 150mm width of cold lay tarmac.		
2.3.4.3	To the full east elevation, in accordance with detail 5 allow for the formation of concrete ST4 haunching to provide batter against the existing kerb line.		
2.3.4.4	As well as the above make provisional allowance for repairs as necessary to the existing tarmac pavement surfacing in alignment with MCHW Series 90. This would include recompacting the sub base then a 100mm layer of ac32 dense base 40/60 rec, then 100mm layer of ac20 dense bin 40/60 rec and a surface layer of ac10 close surf 100/150. Make provisional allowance for 40m length over 0.5m width x 0.3m depth.		
2.3.4.5	To the North elevation make an allowance for the making good at the existing edge perimeter of the adjacent tarmac surfacing, with a provisional allowance of 30m length x 100mm depth x 200mm width of cold lay tarmac.		
2.4	<u>Main Hall Works</u>		
2.4.1	West Elevation – South Range		
2.4.1.1	Allow for checking all joints between existing members throughout the exposed timber frame wall structure, and secure with new tapered oak peg to replace the existing redundant ones.		
2.4.1.2	Frame repairs will need to be reviewed by Engineer once an access/working platform is present to the south range of the west elevation. 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.		
2.4.1.3	Allow to form 3No. Metal repair brackets of 6mm thickness x 25mm width to stud to horizontal rail connections. These are to be in accordance with detail T1, with the legs of the T bracket to be 300mm and secured with 5No. 8mm diameter bolts. All to be in stainless steel and painted with 2No. coats of black hammerite paint in accordance with manufacturers guidelines.		
2.4.1.4	Allow to form 7No. splice repairs to the feet of the studwork to this elevation (210w x 190 d), these are to be undertaken over an approximate length of 670mm with 3-year air dried heartwood oak. Allow to secure into existing and retained stud with 3No. 16mm diameter coach bolts with penny washers recessed and plugged. Allow to form new mortice and tenon connection into the soleplate beneath, secured with tapered oak peg. Repair to be in accordance with detail T2.		
2.4.1.5	Make provisional allowance to form 5No. further splices (1No. currently marked) to the feet of the studwork to this elevation (210w x 190 d), these are to be undertaken over an approximate length of 670mm with 3-year air dried heartwood oak. Allow to secure into existing and retained stud with 3No. 16mm diameter coach bolts with penny washers recessed and plugged. Allow to form new mortice and tenon connection into the soleplate beneath, secured with tapered oak peg. Repair to be in accordance with detail T2.		
2.4.1.6	Allow to form 1No. piecing in repair to a stud at its connection with a horizontal rail in accordance with detail T3. This is to be formed over an approximate 300mm length to half the width of the stud, securing in the new 3-year air dried heartwood oak with 2No. 8mm diameter stainless steel coach screws (recessed and plugged). Make allowance for the formation of a blind tenon as part of the repair.		

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2.4.1.10		
2.4.1.11		
2.4.1.12		
2.4.2		
2.4.2.1		
2.4.3		
2.4.3.1		
2.4.3.2		
2.4.3.3		
2.4.3.4		

		£	p
	(however where mortar courses align). Allow for 500mm turn round the corner as part of detail, with this to be formed to full height of elevation. Allow to form detail in accordance to M03. All joints where helibar installed are to be repointed in agreed lime mortar mix. Internally, make allowance for making good of the plastered finish at ground floor level.		
2.4.3.5	At high level between the masonry and the timber roof frame make allowance for the tying together of these with stainless steel helical ties at every 3no. masonry course.		
2.4.3.6	Internally, to a length of 5m allow for the formation of restraint strapping (28 x 1200 x 4mm) between the attic floor structure and the gable end masonry and its supporting beams. This is to be formed in accordance to M04, with 6mm diameter resin bolt fixings into the gable, and securing the restraint straps into the attic joists with all supplied fixings.		
2.4.3.7	Internally, to the 2No. oak supporting timbers within the attic space allow for strengthening of these through the formation of a 171 x 178 x 23 UB galvanised mild steel T section between these where a gap is present. This is to be in accordance to detail M05, with 12mm diameter bolt fixings able to be formed between the sections at least to the eastern side of the gable. The steel section is a cut from a 356x171x45 UB section and therefore it would be expected for economy and practicality of placement that a number of splices, allow for 2No. of these for the purpose of pricing.		
2.4.3.8	At the eaves bearing positions of the strengthening beam, allow for these to fix into the below timber eaves plate section, again through the detail as shown in M05. Allow for a 12mm thick galvanised mild steel plate of 175mm width x 175mm leg length. Allow for 2No. 16mm diameter bolt grade 8.8 fixings into the steel beam section above and 4No. 16mm diameter ss coach screw fixings into the eaves plate. Note at the western side, these can be through bolts with 4mm thick ss washer plates to the back face of the eaves plate.		
2.4.3.9	Provisionally allow for the full replacement of the packer section that sits tight against the 2No. oak beam sections to be strengthened. This should be undertaken in a 70mm (w) x 230mm (d) 3-year air dried heartwood oak section.		
2.4.3.10	Provisionally allow for the formation of a dog legged stainless steel bracket to be formed between the raised collar tie (min 100 w x 120mm d) and principal rafter (125 w x 200mm d) at the western side. This should be 8mm thickness, with 175mm projections onto each member and secured with 2No. 16mm diameter ss coach screw fixings (100mm length) into each structural timber section, refer to detail T4. This detail is to be profiled in mdf or similar for approval by CA/Engineer prior to fabrication.		
2.4.3.11	Provisionally allow for the formation of 2No. stainless steel angle brackets between the raised collar to the south gable and the bracing timber which spans in alignment with the ridge line. These are to be formed from 6mm thick plate and are to be 100 d x 100 & 150mm leg length and secured with 2No. 12mm diameter ss coach screws (100mm length) into the raised collar and with 2No. 12mm diameter ss coach bolts into the bracing timber, refer to detail T5.		
2.5	<u>Completion</u>		
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.

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**

£ p

COLLECTION

1.0 Specification (pages 1/1 to 1/46)

£

2.0 Schedule of Works (pages 2/1 to 2/7)

£

TOTAL

£

APPENDIX A

Drawings – The Morton Partnership Ltd.

NOTE : ALONG EAST SIDE
RE-ORIENTATE ANGLE TO
ALLOW 100mm DEPTH TO
PROVIDE SOIL RETENTION

GALVANISED 100x65x10RSA
FIXED TO PILE HEADPLATE
USING M20 BOLT. TO BE
CONFIRMED WITH PILE
MANUFACTURER

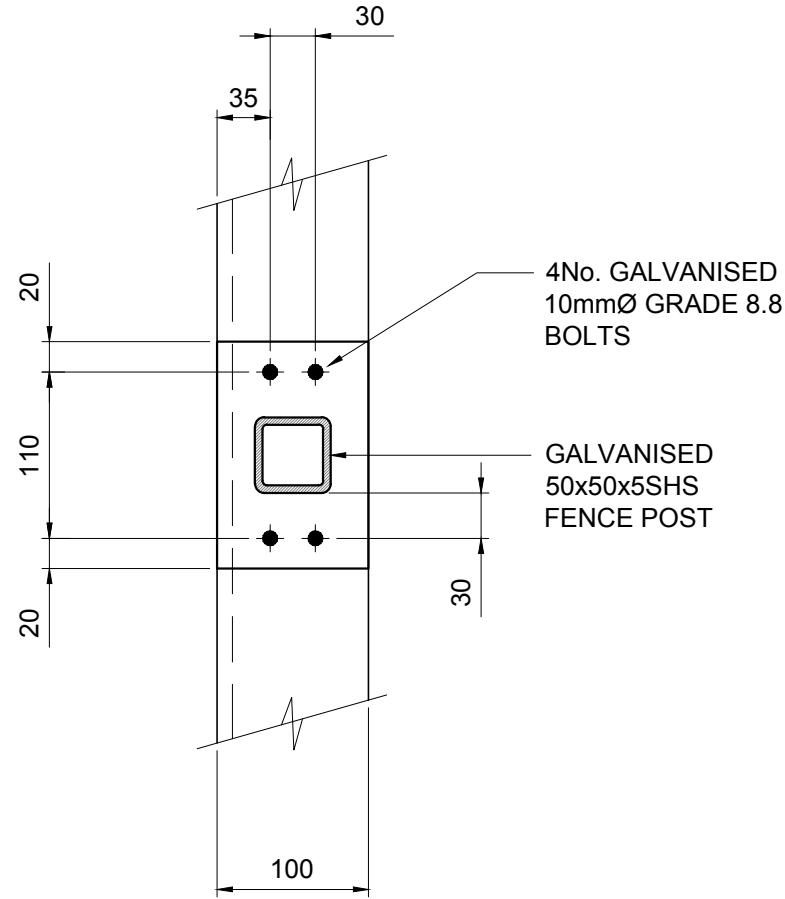
SCREW PILES INSTALLED
AT MAXIMUM 3M CENTRES
AROUND BOUNDARY FENCE

DETAIL 1

LOWER CHORD TO SCREW PILE CONNECTION

GALVANISED
50x50x5SHS
FENCE POST

GALVANISED
100x65x10RSA



DETAIL 2
FENCE TO LOWER CHORD FIXING

500x600mm ONCE
WEATHERED CONCRETE
COPING STONE. COLOUR
SUBJECT TO APPROVAL.

EXISTING 80x160mm STONE
SECTIONS REUSED SET IN
CLASS III MORTAR AND TIED
TO RC BEAM USING S/S
WALL CRAMPS AT 600mm
HORIZONTAL CENTRES

REINFORCED GROUND BEAM
SECTION FROM C25/30 GRADE
CONCRETE. 35mm COVER TO
ALL REINFORCEMENT

DETAIL 3
NORTH BOUNDARY FENCE AT SCREW PILE LOCATION

ST1 LEAN MIX
CONCRETE INFILL

2No. H10 BARS
TOP & BOTTOM
H8 LINKS @ 150
CENTRES

A193 MESH TO BASE

SCREW PILES
INSTALLED AT
MAXIMUM 3M CENTRES.
LINK DETAIL TO
CONTRACTOR DESIGN

500x600mm ONCE WEATHERED
CONCRETE COPING STONE CORE
DRILLED TO ACCEPT POST. SEALANT UP
TO SQUARE POST TO BE CONFIRMED

GALVANISED
50x50x5SHS
FENCE POST

ST1 LEAN MIX
CONCRETE INFILL

150 LONG x 100 WIDE x
6mm THICK BASEPLATE

EXISTING 80x160mm STONE
SECTIONS REUSED SET IN
CLASS III MORTAR AND TIED
TO RC BEAM USING S/S
WALL CRAMPS AT 600mm
HORIZONTAL CENTRES

2No. M12 GALVANISED
STEEL ANCHOR BOLTS.
150mm EMBEDMENT IN
HILTI HIT RESIN.

REINFORCED GROUND
BEAM SECTION AS DETAIL 3

GALVANISED
50x50x5SHS
FENCE POST

MINIMUM SLUMP ST4
CONCRETE HAUNCHING
AT APPROX 45° BATTER

GALVANISED 100x65x10RSA
FIXED TO PILE HEADPLATE.
TO BE CONFIRMED WITH PILE
MANUFACTURER

SCREW PILES INSTALLED AT
MAXIMUM 3M CENTRES
AROUND BOUNDARY FENCE

EXISTING KERB

BUILD UP MADE GOOD AS
EXISTING. ALLOW TO RE
COMPACT SUB BASE THEN
100mm LAYER OF AC32 DENSE
BASE 40/60 REC (CLAUSE 908)
THEN 100mm LAYER OF AC20
DENSE BIN 40/60 REC
(CLAUSE 901) AND SURFACE
LAYER OF AC10 CLOSE SURF
100/150 (CLAUSE 912)

GALVANISED 50x50x5SHS FENCE POST

150 LONG x 100 WIDE x
6mm THICK BASEPLATE

2No. M12 GALVANISED
STEEL ANCHOR BOLTS.
150mm EMBEDMENT IN
HILTI HIT RESIN.

C25/30 MASS CONCRETE
PAD FOUNDATION.
400mm SQUARE x 300mm
HIGH

DETAIL 4
NORTH BOUNDARY FENCE - RAILING POST FIXING DETAIL

DETAIL 5
EAST BOUNDARY LOWER CHORD

DETAIL 6
PAD FOUNDATION FOR RAILING POST

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 SERVICES ENGINEER'S DETAILS, DRAWINGS AND SPECIFICATIONS

REV	AMENDMENT	CHK	DATE
A	PILE LOADINGS OMITTED	RR	11.09.24
-	PRELIMINARY ISSUE	RR	29.08.24

CLAYTON HALL CLAYTON PARK MANCHESTER BOUNDARY FENCE STRUCTURAL DETAILS



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DRG No. 16076-01 A

KEY

NORTH SIDE - HELIX SCREW PILES AND RC GROUND BEAM

WEST, SOUTH SIDE & INNER MOAT- BASIC SCREW PILES AND STEEL GROUND BEAM

SOUTH SIDE - PAD FOOTINGS

EAST SIDE - LOWER CHORD TO BE ORIENTATED TO RETAIN GROUND

NOTES

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INDIVIDUAL SCREW PILE LOADINGS
(BASED ON 3M CENTRES)
SOUTH, WEST AND INNER MOAT (ORANGE AREAS) :

AXIAL FORCE = 1.5kN (UNFACTORED DEAD)
MOMENT = 3.5kNm (UNFACTORED)

EAST (BLUE AREA)
AXIAL FORCE = 1.5kN (UNFACTORED DEAD)
MOMENT = 4kNm (UNFACTORED)
NORTH (GREEN AREA)
AXIAL FORCE = 17.5kN (UNFACTORED DEAD)
MOMENT = 5kNm (UNFACTORED)

NOTE : REFER TO URBAN GREENS LANDSCAPING
DRAWINGS FOR PRECAUTIONS WITH REGARD TO
BADGER HABITATS AND TREE ROOT PROTECTION AREAS.
TO INNER MOAT AREA, THIS IS WITHIN SCHEDULED
MONUMENT THEREFORE ANY EXCAVATIONS HAVE TO BE
UNDER AN ARCHAEOLOGICAL WATCHING BRIEF.

A	NOTES ADDED AS CLOUDED	RR	11.09.24
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CLAYTON HALL

CLAYTON PARK

MANCHESTER

BOUNDARY FENCE

SITE PLAN

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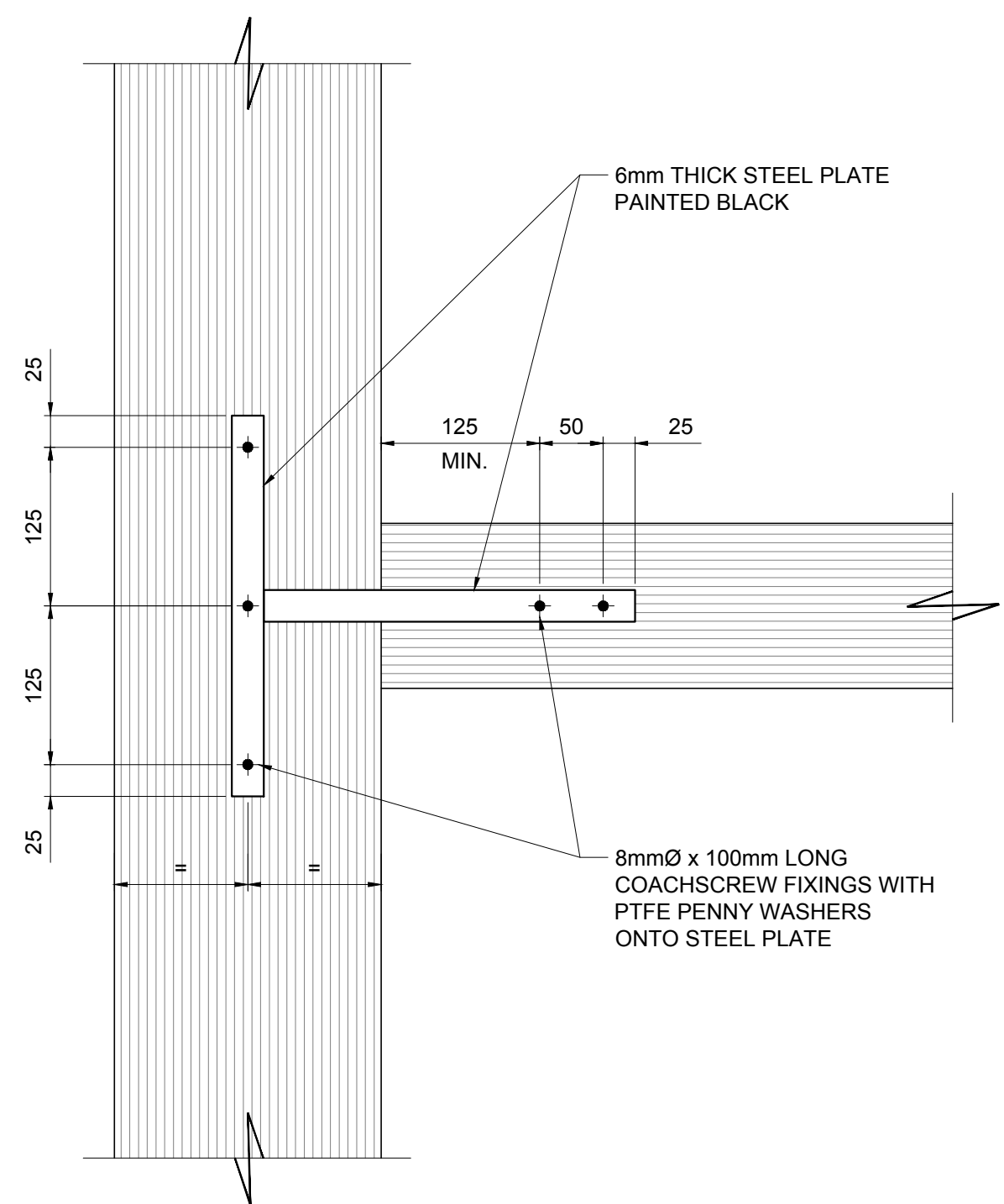
DRAWN BY: TC

DATE: AUG 24

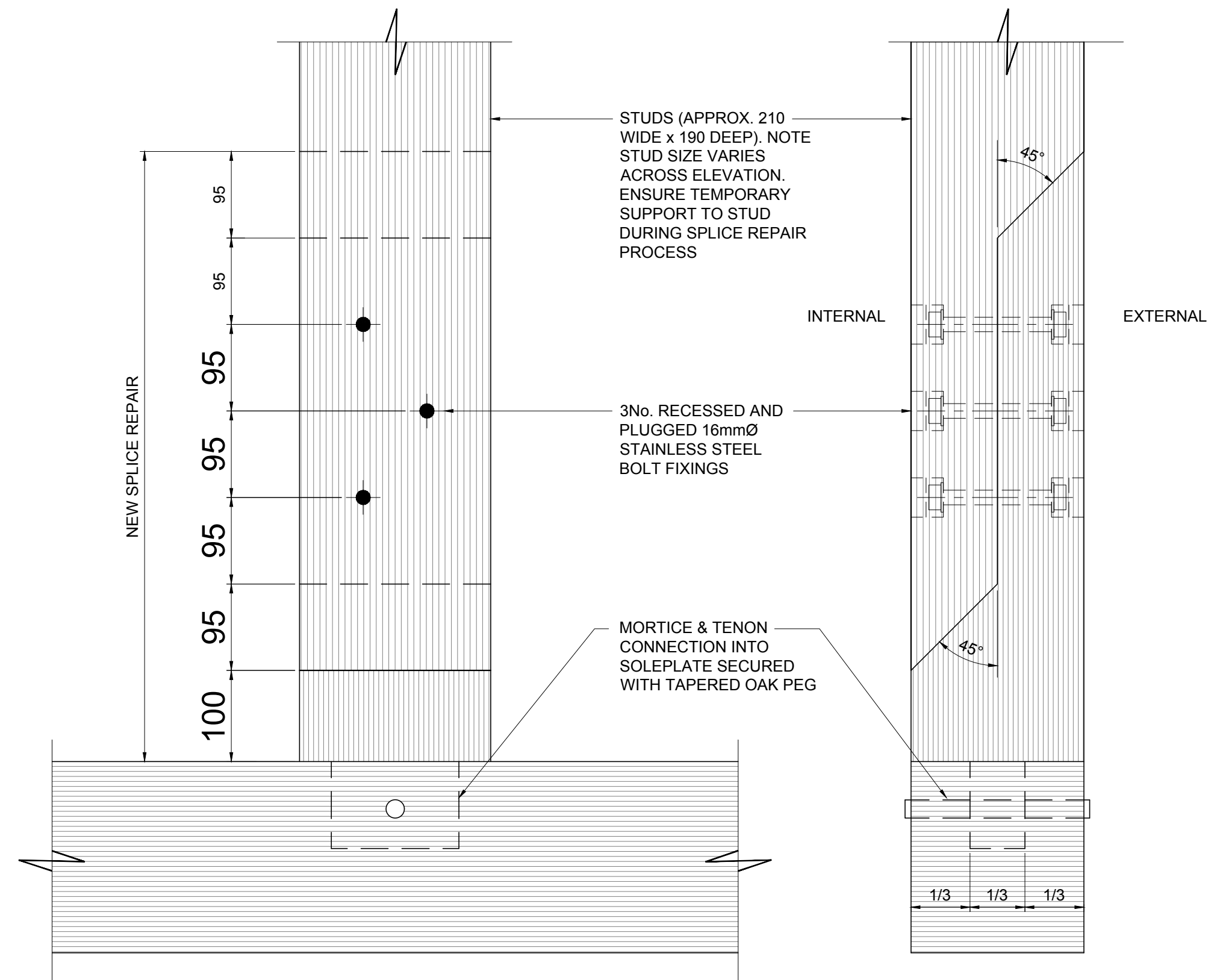
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DRG No.

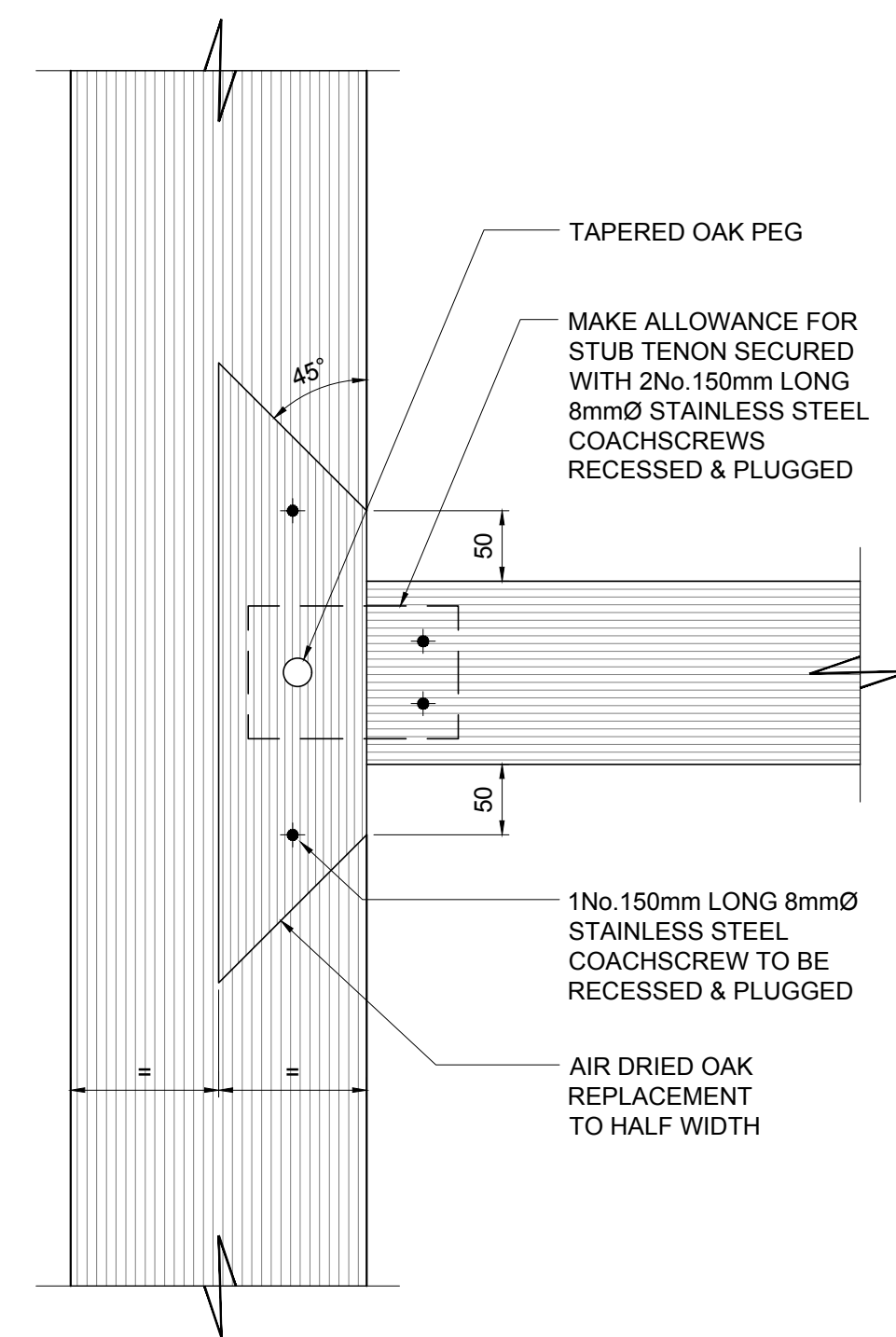
16076-02 A



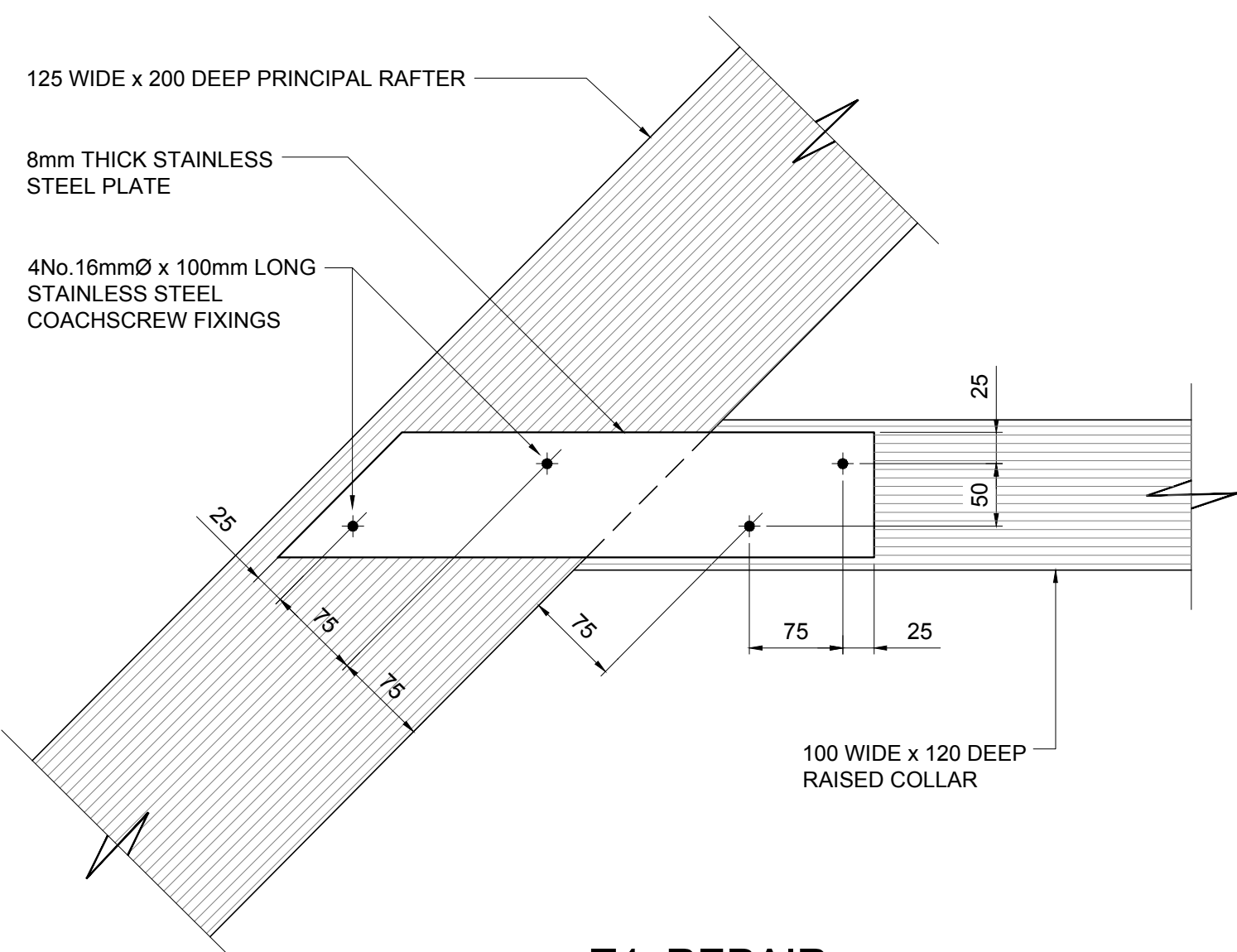
T1 REPAIR
SURFACE MOUNTED 'T' BRACKET



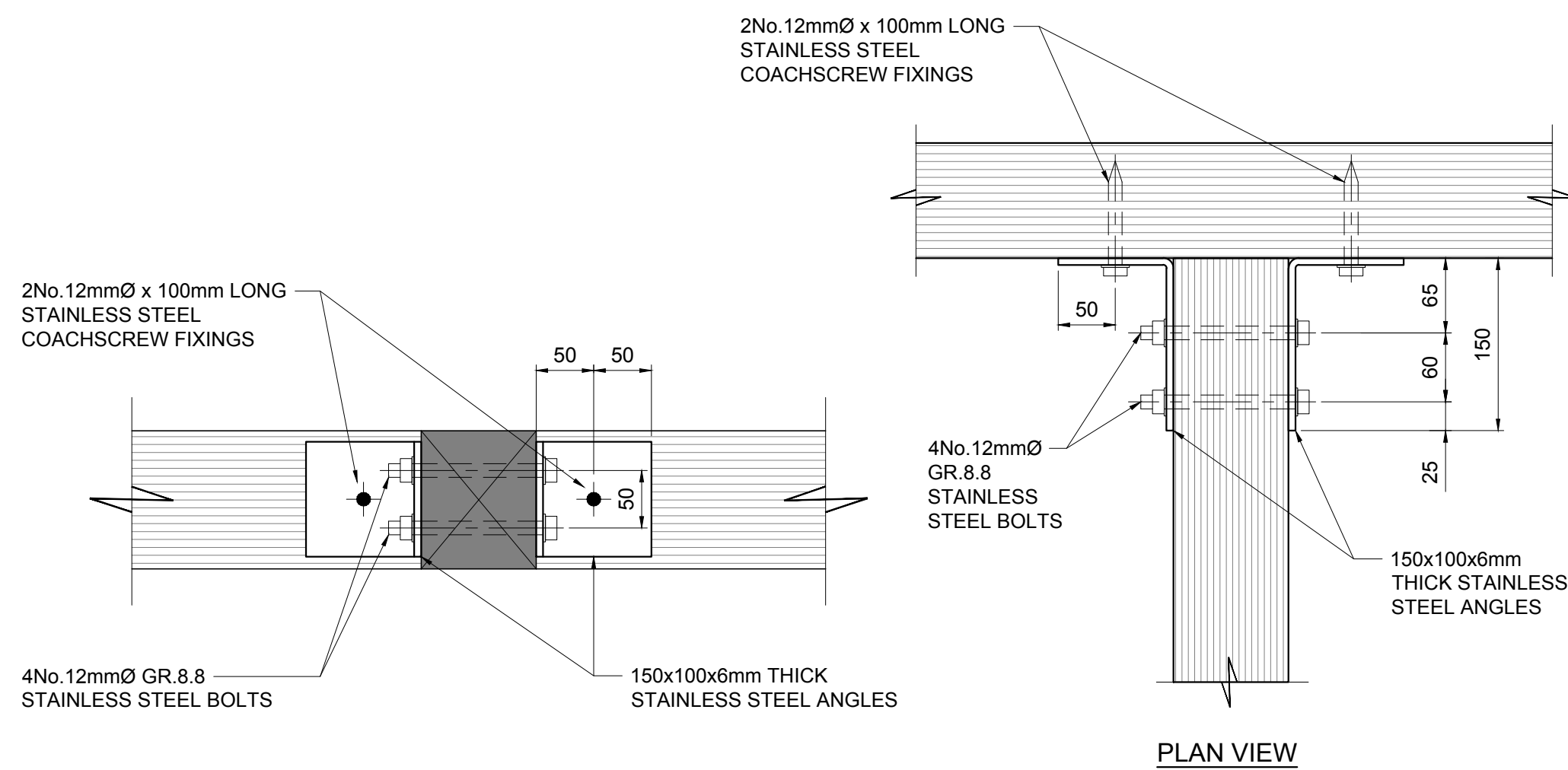
T2 REPAIR
STUD SPLICE DETAIL



T3 REPAIR
PIECING IN REPAIR



T4 REPAIR
SOUTH GABLE RAFTER TO COLLAR PLATE REPAIR



T5 REPAIR
SOUTH GABLE RAISED COLLAR TO BRACING TIMBER

NOTES

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A	T4 & T5 REPAIRS ADDED	RR	11.09.24
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CLAYTON PARK
MANCHESTER

REPAIR DETAILS
SHEET 1



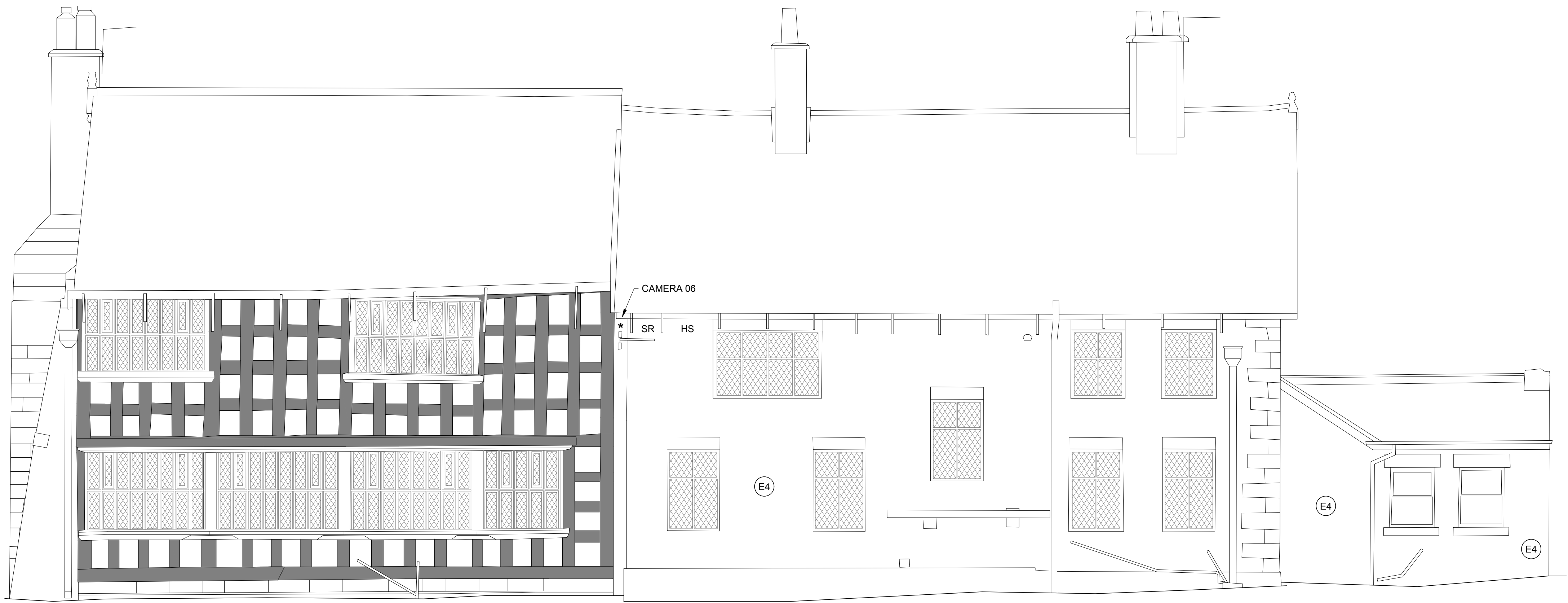
- OLD TIMBER YARD HOUSE
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DRG No. 16076-03 A



WEST ELEVATION AS PROPOSED



EAST ELEVATION AS PROPOSED

REPAIR KEY

- T1 REPAIR - METAL BRACKET
- a T2 REPAIR - STUD SPLICE
- b T3 REPAIR - PIECING IN REPAIR
- FULL REPLACEMENT OF SOLEPLATE 175x225 DEEP IN AIR DRIED OAK.
- PROVISIONAL STUD SPLICE 210x175 DEEP IN AIR DRIED OAK.
- STUD REPAIR

NOTE : REFER TO DRAWING No.16076-03 FOR T1, T2 & TS DETAIL

NOTES

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A	SCOPE OF WORKS OMITTED	RR	11.09.24
-	PRELIMINARY ISSUE	RR	29.08.24
REV	AMENDMENT	CHK	DATE

CLAYTON HALL

CLAYTON PARK

MANCHESTER

REPAIR WORKS

EAST & WEST

ELEVATIONS



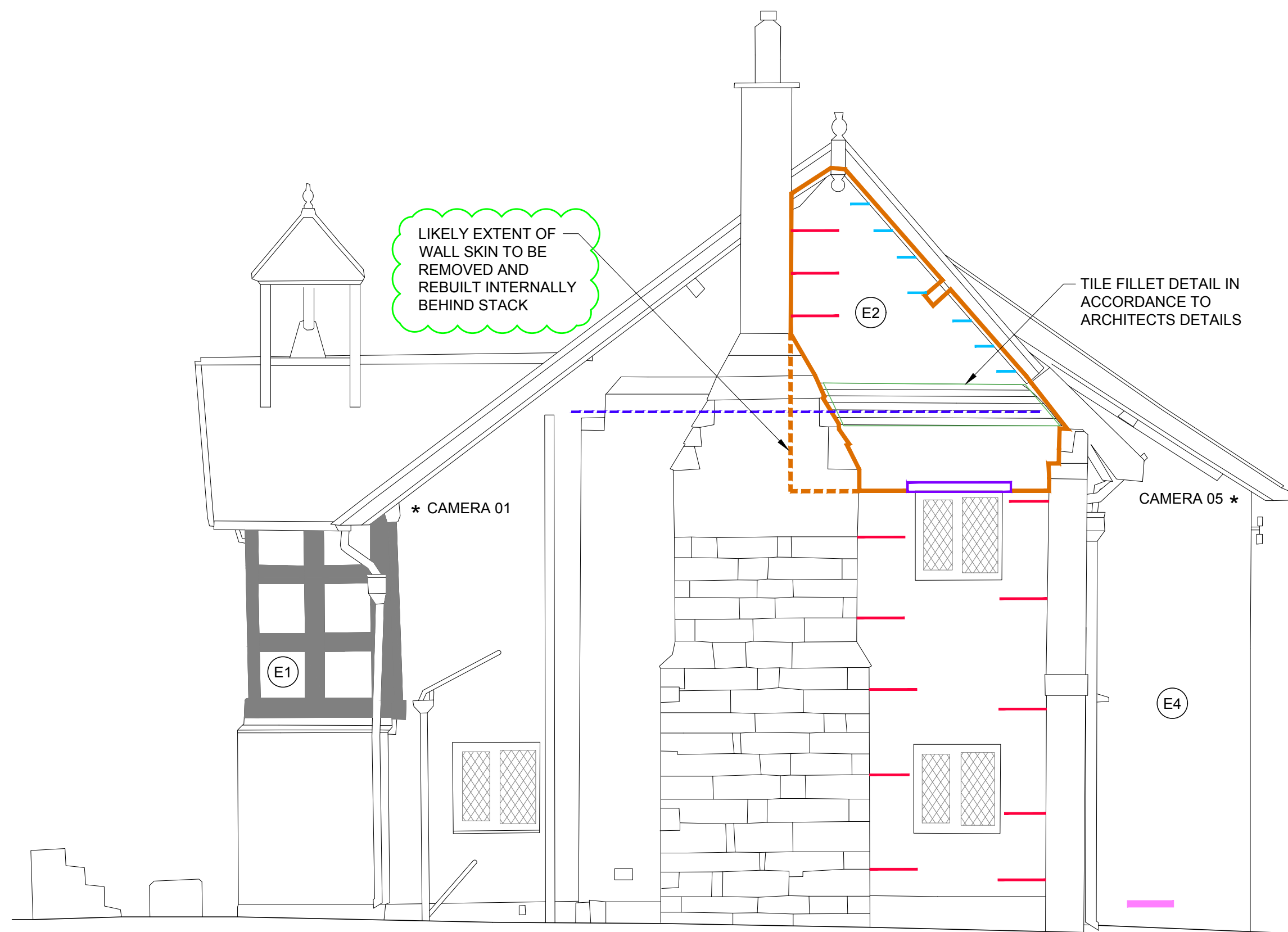
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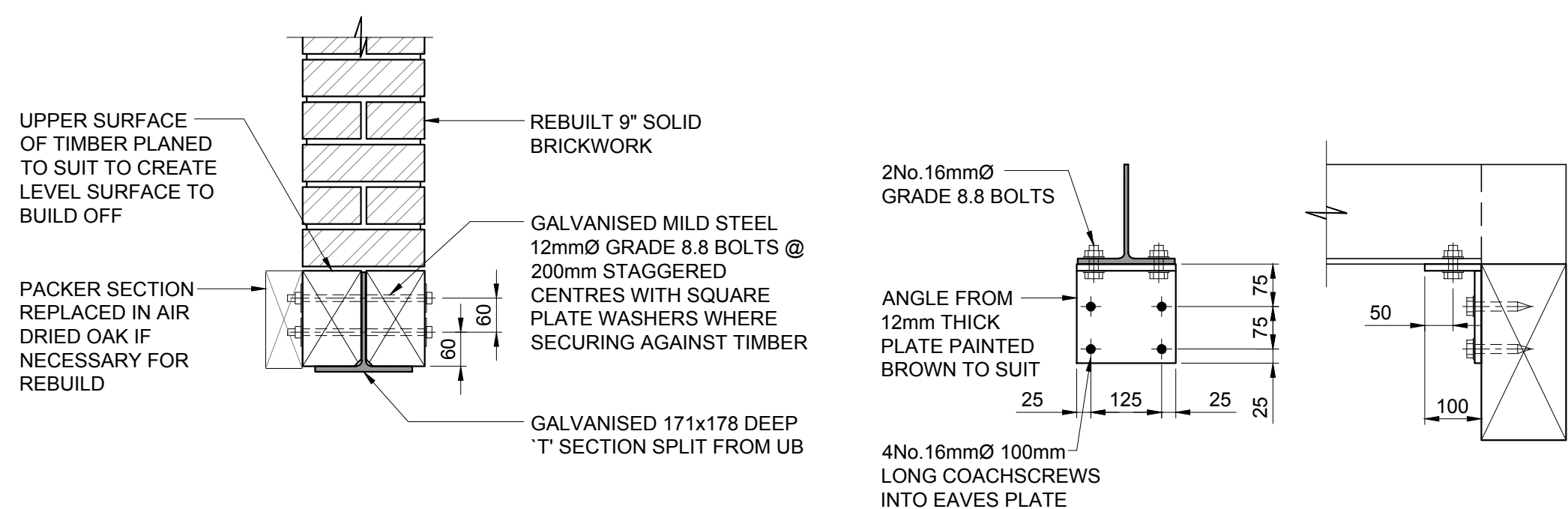
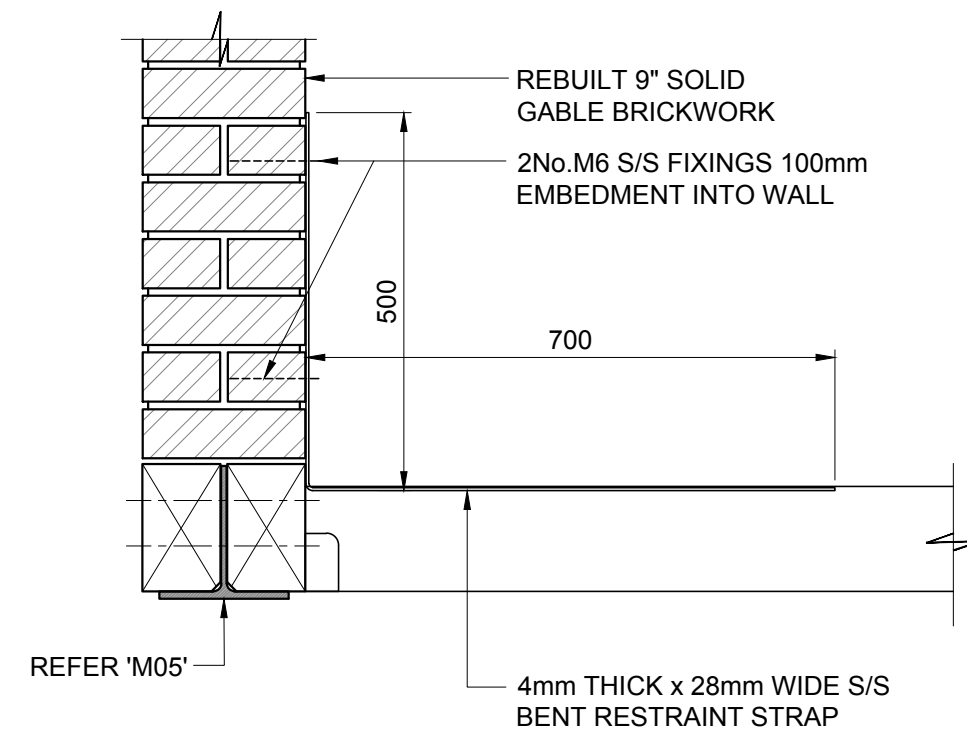
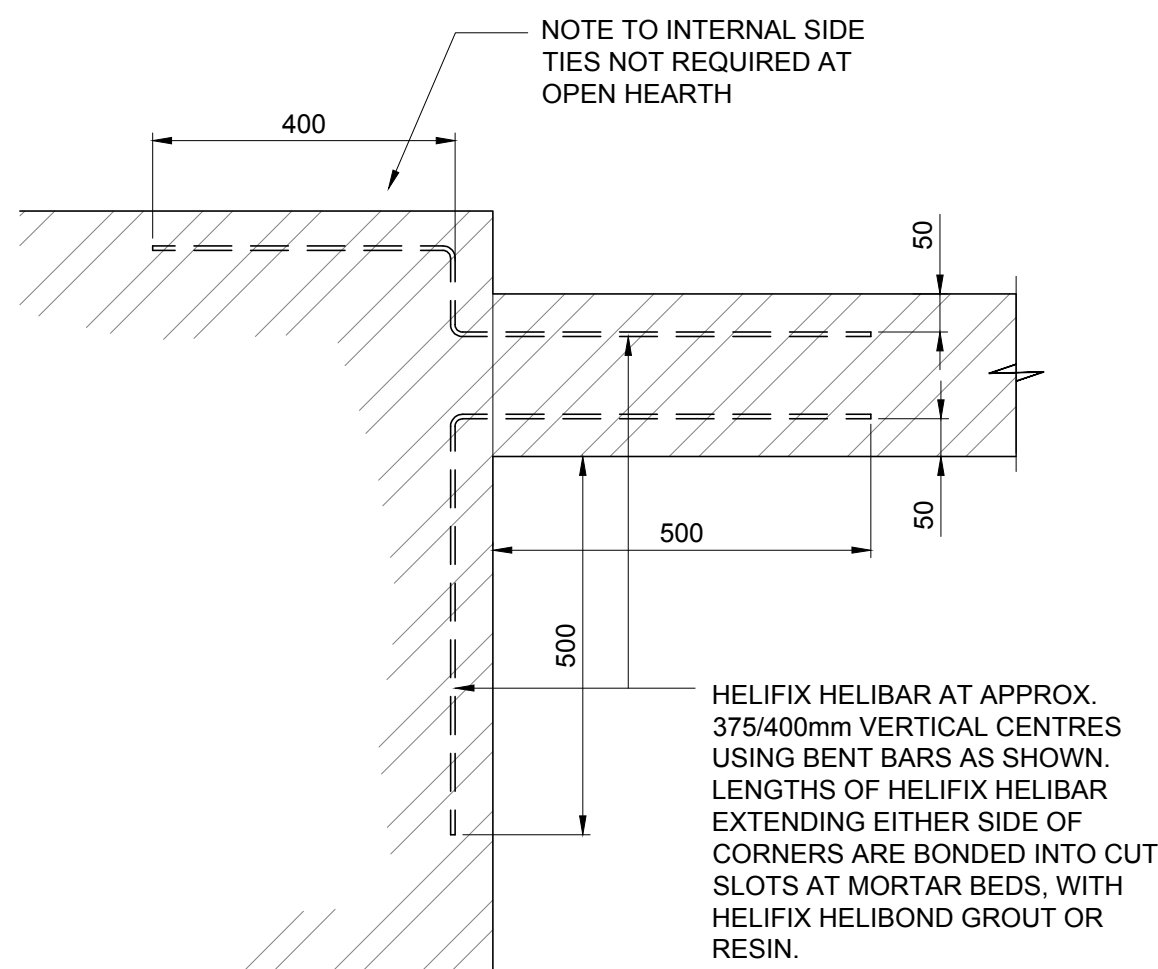
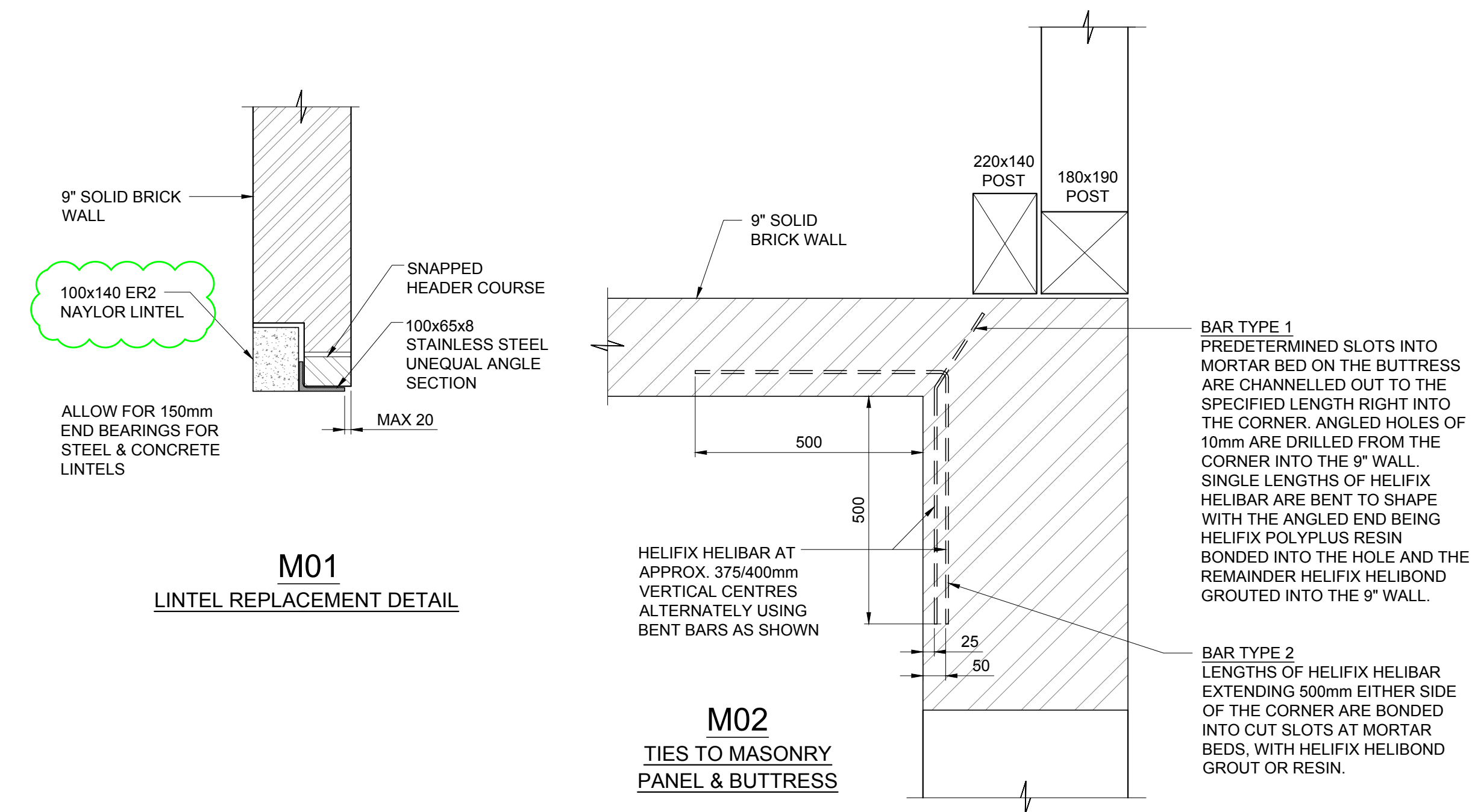
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DRG No. 16076-04 A



SOUTH ELEVATION AS PROPOSED



REPAIR KEY

- AREA OF 9" MASONRY TO BE FULLY REBUILT
- LINTEL REPLACEMENT IN ACCORDANCE TO M01
- TIES TO BE FORMED INTO ADJACENT FABRIC IN ACCORDANCE TO M02 & M03
- FORM STAINLESS STEEL FRAME HELICAL TIES BETWEEN TIMBER ROOF FRAME MEMBERS AND REBUILT MASONRY WALL
- ALLOW FOR REMOVAL OF EXISTING TIMBER SPREADER EMBEDDED WITHIN WALL STRUCTURE IN HIT AND MISS SEQUENCE WITH REPLACEMENT IN LIKE FOR LIKE MASONRY
- ALLOW TO FORM RESTRAINT STRAPPING TO ATTIC FLOOR STRUCTURE AS PER M04, AS WELL AS THE STRENGTHENING OF THE EXISTING OAK EDGE BEAM SECTIONS AS PER M05.

PROPOSED SCOPE OF WORKS

- A) CCTV SECURITY INSTALLATION (SEE CCTV PROPOSALS)
6No. CAMERAS (3No.DOME CAMERAS & 3No. BULLET CAMERAS)
2No. SECURITY RADARS (SR)
2No.HORN SPEAKERS (HS)
- B) REPLACEMENT FENCING TO OUTER MOAT BOUNDARY (REFER TO DRAWING AL(05)020 FOR DETAILS)
- C) VEGETATION REMOVAL & REINSTATEMENT TO OUTER & INNER MOAT BOUNDARY.
- D) ALTERATIONS TO INNER MOAT BOUNDARY FENCING (REFER TO DRAWING AL(05)021 FOR DETAILS)
- E) FABRIC REPAIRS TO THE HALL (REFER TO TMP REPORT AND D&H STATEMENT)
E1 : REPAIRS TO TIMBER FRAME
E2 : REPAIRS TO SOUTH GABLE END
E3 : PATCH ROOF REPAIRS
E4 : REMOVAL OF WHITE MASONRY PAINT

NOTE :

MORTAR SPECIFICATION TO BE CONFIRMED FOLLOWING SAMPLING AS INDICATED WITHIN ARCHITECT INFORMATION, HOWEVER, AT PRESENT BRICK AND RED SANDSTONE TO BE REPOINTED/REBEDDED WITH THE FOLLOWING MIX : OTTERBEIN CL80 1 : LOCAL SAND 2.5 (60% SHARP/40% FINE) : 5% COAL ASH SUBJECT TO SAMPLE.
ALLOW FOR REUSE OF MASONRY AS FAR AS POSSIBLE.
REPLACEMENT BRICK AND SANDSTONE IN ACCORDANCE TO ARCHITECTS SPECIFICATION.

NOTES

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A	MINOR UPDATE AS CLOUDED	RR	11.09.24
-	PRELIMINARY ISSUE	RR	29.08.24

CLAYTON HALL
CLAYTON PARK
MANCHESTER
REPAIR WORKS
SOUTH ELEVATION



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