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59 STRAND STREET
SANDWICH

FLOOR STRENGTHENING

STRUCTURAL ENGINEERING DESIGN STATEMENT

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**59 STRAND STREET, SANDWICH
FLOOR STRENGTHENING WORKS
STRUCTURAL ENGINEERING DESIGN STATEMENT**

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2. Notes to Client

The design is based on assumptions listed in the Design Assumptions section below. The Client should check these assumptions and advise the Engineer if any are incorrect before any materials are ordered or construction work begins. If the Client is unsure about any of the assumptions, they should instruct their Architect or Contractor to advise them.

The design has been prepared in accordance with Approved Document A (Structure) of the Building Regulations. All other parts of the Building Regulations are outside our expertise. We therefore recommend that you ensure that all necessary design work has been carried out by suitably qualified professionals before any materials are ordered or construction work commences, to ensure that all requirements of the Building Regulations will be met to the satisfaction of Building Control.

Please note that if the works are not constructed in accordance with all requirements of this design statement, or any changes subsequently agreed with us in writing, then our design is invalidated and we accept no responsibility or liability for it.

We strongly recommend that this and any associated documents issued by us are provided to potential contractors before they quote for the works to ensure that all works necessary, including elements to be designed and/or detailed by contractors, suppliers and/or fabricators, are allowed for in their quotations. It is essential that the Client provides these documents to the appointed Contractor before they commence works or order any materials.

The Client should note that the Construction (Design & Management) Regulations 2015 “the CDM Regulations” apply to this project. For full details of the duties imposed on the Client and others by the CDM Regulations please refer to guidance published by the Health and Safety Executive, including document reference L153 entitled ‘Managing health and safety in construction’ which is free to download at www.hse.gov.uk/pUbns/priced/l153.pdf. In particular, note Regulation 7 (page 21) and Appendix 6 which explain the duties of domestic clients and what they should do. See also the section below titled ‘Health and Safety including the CDM Regulations’.

No ‘opening up’ or testing has been carried out to establish full details of the existing structure. The structural design has therefore been based on various assumptions which are listed below in the Existing Structure section. It is possible that when construction starts the existing structure is found to differ from that assumed, which may necessitate changes to our design. Please contact the Engineer if such changes are necessary. Our design is invalid and must not be used if the existing structure is found to differ from that assumed.

The Client should note that new structural elements will deflect under initial dead load (material weights) and further due to subsequent imposed load (snow, wind, room finishes and contents etc.). This is likely to cause some cracking of new and existing finishes which may require repair and redecoration. Minor cracking is not a cause for concern and is entirely normal when both new works and structural alterations are carried out.

The existing and new floor structure is supporting by the external masonry walls that have timber elements embedded within them. It is important that these elements are inspected by a specialist contractor to ensure that there are no underlying structural issues with the external walls. There is also evidence of roof spread to the external walls and remedial measures installed internally. It is assumed that any issues regrading roof spread have been dealt with and that the works will not materially affect the stability of the existing walls.

3. Construction Information

This design statement is to be read in conjunction with our Drawing J127-1.

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Do not refer to the calculations or use any details from them as they may have been superseded by details in this design statement or on the drawings. The calculations are solely for submission to Building Control in support of the Building Regulations application.

4. Design Assumptions

The design is based on the following assumptions. If any of these assumptions are incorrect then the calculations, this design statement and the drawings are invalid and must not be used - refer to the Engineer before proceeding. If in doubt refer to the Engineer.

1. Details of the existing structure are as set out in the Existing Structure section below.
2. The whole building will be kept weather tight, continuously heated and generally well maintained throughout its life (to prevent the reduction of safety factors through deterioration).
3. The whole building will be used in accordance with the design assumptions. Standard loadings for normal domestic use have been assumed throughout - no unusual loading has been allowed for. Unusual loading may be caused by, but is not limited to:
 - water storage tanks, large baths, hot tubs, jacuzzis and the like
 - thick stone or ceramic floor or wall finishes
 - heavy storage such as extensive shelving for books or anything heavier than normal domestic wardrobes for clothing
4. Roof voids will be used for normal domestic light storage only, not exceeding 25 kg/m². No water storage tanks or other similar heavy objects will be located in the roof voids.
5. All works, including materials and workmanship, are to comply with the recommendations and requirements of the relevant current Building Regulations, European Standards, British Standards, NHBC requirements and manufacturer's recommendations as appropriate and shall be in accordance with good practice.
6. Construction will be carried out by personnel having the appropriate skill and experience.
7. Adequate supervision and quality control will be provided throughout construction.

5. Existing Structure

The Contractor is to expose all elements of the existing structure which are subject to additional loads e.g. walls, beams, lintels and foundations. If there is any doubt as to their adequacy to support the additional loads consult the Engineer before proceeding. No elements of the existing structure which are subject to additional loads are to be retained without the express permission of Building Control.

No 'opening up' or testing has been carried out to establish full details of the existing structure. The structural design has therefore been based on the following assumptions. Before ordering any materials or commencing work the Contractor is to survey the existing building, including opening up and digging trial holes where necessary, to confirm whether these assumptions are correct and is to advise the Engineer before proceeding in the event of any differences between the assumed and actual construction:

- The existing structure is structurally sound, true and free from any significant movement or cracking.

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- Elements of the existing structure are arranged as shown on Drawing J127-1 and as described below.
- The external walls are constructed of 215 (1 brick) thick sound and true brickwork of minimum compressive strength 7 N/mm² in type M2/(iv) mortar (1 part cement : 2 parts lime : 8 parts sand, or 1 part masonry cement : 4½ parts sand) or better.
- The ground floors are ground-bearing concrete slabs i.e. not suspended timber or precast concrete.
- The foundations are shallow spread foundations bearing on firm natural non-shrinkable ground of minimum ground bearing capacity 100 kN/m².

6. General

For the purposes of this document, the term “Architect” is used to refer to the Principal Designer as defined by the CDM Regulations, which in this case is the Architectural Designer.

The scope of the work covered by these documents is only that specifically shown – for all other aspects of the proposed works refer to the Architect’s details. See Architect’s drawings for fire, damp, rot, corrosion and insect protection details and measures to prevent thermal bridging.

All lintels not specified below are to be specified by the Architect.

Refer to the Engineer before proceeding in the event of any discrepancy between the Engineer’s details and the existing or new structure (as appropriate). In the event of any confusion over materials or details to be used the Contractor is to refer to the Engineer before ordering materials or proceeding with the affected elements of the works.

No works are to be varied from that detailed by the Engineer without his express permission.

The Contractor shall verify the dimensions on the Engineer’s details by obtaining accurate dimensions from the site. Lengths and other dimensions given in the Engineer’s details are approximate and must not be used as the basis for ordering materials. No materials should be ordered until site dimensions have been measured and confirmed as consistent with the requirements of the Engineer’s and Architect’s details.

All dimensions are in millimetres and all levels are in metres unless noted otherwise. The ‘clear span’ of beams etc. is the distance between the faces of structural supports (walls, posts etc.), excluding any plaster or other finishes and excludes any bearings specified.

If any part of the works are not constructed in accordance with all requirements of this design statement, including any changes subsequently agreed with us in writing, then our design is invalidated and we accept no responsibility or liability for it.

Structural members are to be positioned as shown on the Architect’s drawings, our drawings and in accordance with the details in this design statement.

Structural members are to be fixed together in accordance with normal good practice using nails, screws, joist hangers, proprietary steel framing plates and the like to ensure that all members are securely held in place, can transfer dead, live and wind loads as required and can resist being displaced under normal and accidental loading, all to the satisfaction of the Architect and Building Control.

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All fixings, including hangers, plates, nails and screws, in contact with oak members are to be stainless steel.

Proprietary joist hangers, steel framing plates, wall ties and other builder's metalwork are to be UKCA marked and have current BBA Agrément certificates and are to be supplied by BAT, Ancon, Expamet or other approved supplier. See the following websites for product details:

- www.batmetalwork.com
- www.ancon.co.uk
- www.expamet.co.uk/product-category/builders-metalwork

7. Health and Safety including the CDM Regulations

The Construction (Design & Management) Regulations 2015 apply to this project. We have assumed the following roles and responsibilities under the CDM Regulations:

- The Architect has been appointed by the Client as Principal Designer.
- We are a Designer (not the Principal Designer) and no Client duties have been or will be transferred to us.
- The appointed main contractor (indicated in this and associated documents issued by us as "the Contractor") will be the Principal Contractor.
- Any other contractors, sub-contractors, suppliers or fabricators who design or detail any part of the works will be Designers.

Please advise us if any of the above assumptions are incorrect before the Contractor is appointed.

The Contractor is responsible for:

- complying with all current legislation relating to health and safety, including the Health and Safety at Work etc. Act and the Construction (Design & Management) Regulations.
- the stability of all permanent and temporary works on this property and affecting adjacent properties, including all precautions necessary to safeguard their stability.
- ensuring that during construction the loading on all structural elements, including walls, floors, ceilings and roofs, does not exceed the maximum design loads for which the structure was intended.
- the location and identification of all services, including buried services, potentially affected by the works. Where new or existing services which may conflict with the works are found they shall immediately be reported to the Engineer and his instructions obtained before proceeding.
- obtaining the approval of the Local Authority (or other Approved Inspector) and all relevant Statutory Undertakers, in accordance with their requirements and as required to obtain approval under the Full Plans Building Regulation Application.

No hazards have been identified during the design which a competent Contractor cannot deal with in the normal course of his work. However, the following hazards and suggestions for mitigation measures are specifically drawn to the attention of the Contractor:

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- There is a risk of further destabilisation of the external walls. The Contractor should exercise due diligence and monitor the external walls throughout the duration of the works.
- Although not a structural issue and therefore not strictly within the scope of the structural engineering design and this design statement, it is clear from the age of the property that asbestos may be present. The Contractor should exercise due diligence and ensure that all identification, assessment, containment, removal and other works related to asbestos are carried out in accordance with current legislation and guidance, particularly the Control of Asbestos Regulations 2012. If in any doubt the Contractor should ensure that an Asbestos Management Survey is completed and any recommendations implemented before any construction works begin.

8. Timber In General

All aspects of the works, including but not limited to materials and workmanship, are to comply with the current edition of the National Structural Timber Specification published by TRADA. The Contractor's responsibility for design of the permanent works shall generally be as set out in Table 3.5 for the 'connection design' system, except for any connection details that may have been provided in this document i.e. the Contractor is responsible for durability and connection design. For roof trusses, engineered joists and other supplier-designed timber elements the Contractor's responsibility extends to member design i.e. the 'member and connection design' system applies. For the purposes of this section EPS Design Ltd are the Project Engineer.

All structural timber is to be Grade C24 unless specified otherwise below in the section for each member and is to be stress graded and stamped in accordance with BS 5268 : Part 2 and associated codes.

All timber sizes specified indicate the size required (target sizes) as defined in BS 5268 Part 2, to tolerances specified in BS EN 366.

Horizontal timber members such as joists and beams may be notched on the top and/or bottom at supports if necessary. The total depth of any notch is not to exceed 20% of the depth of the timbers, unless agreed otherwise by the Engineer. The length of any notch must not exceed 10 (measured from the face of the support to the end of the notch within the span of the member), unless agreed otherwise by the Engineer. No other notches or holes are permissible unless agreed with the Engineer.

All structural timber is to be supplied dry, protected from moisture, stored flat and shall only be installed if still dry and free from distortion.

Fire, damp and rot protection measures to be as detailed by the Architect.

9. Floor Joists

- Location – first floor
- New floor joists are to be provided above the existing floor joists
- All existing joists are to be retained below the new floor joists
- It is for the contractor to liaise with the client regarding the level at which the new floor joists are to be installed and whether the floor structure is to be provide level or to follow the existing undulation floor
- Provide 47 x 175 Grade C24 joists @ 400 c/c maximum
- Maximum clear span 3500
- Provide treble (3 No.) or quadruple (4 No.) joists where indicated on Drawing J127-1

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- All multiple joists are to be bolted together with M12 bolts @ 300 c/c maximum on the joist centre-lines throughout their length
- At all supports ensure joists are well restrained and spike well to timber plates
- Position a single row of blocking at mid-span for joist spans between 2500 and 4500. Blocking is to be 47 thick solid timber extending to at least three-quarters of joist depth
- Joists may be notched on the top and/or bottom at supports. The total depth of any notch is not to exceed 20 unless agreed otherwise by the Engineer. The length of any notch must not exceed 10 (measured from the face of the support to the end of the notch within the span of the member), unless agreed otherwise by the Engineer
- Any notches within the span must not be deeper than joist depth / 8 and must be positioned between span / 14 and span / 4 from a support. No other notching is permissible
- Any holes must have a diameter less than joist depth / 4 and must be centred on the joist centre-line. They must be at least 3 diameters apart (measured between hole centres) and must be positioned between span / 4 and span / 3 from a support. No other holes are permissible
- It will be necessary for the contractor to move the existing low-level services to enable the floor joists to be installed.
- The new floor joists are to be supported on joist hangers secured to a new perimeter wall plate. Wall plate to be bolted to the wall with M12 bolts @ 400 centres using RAWL R-KEM II. Bolts to be staggered above and below the centreline of the plate. Bolts to be embedded 110mm into the brickwork and to manufacturers requirements.

10. Rafter Ties

- Move any existing rafter ties so that they are positioned above the existing purlins and that adequate head height is achieved
- Where no ties are present, ensure that all opposing rafters are tied together with 38x150 ceiling ties. Connect the ties to the rafters with M12 bolts and 51 diameter toothed-plate connections positioned on the rafter and tie centre-lines

END