Plans

PROJECT ADDRESS

SCOPE OF WORK

PROJECT INFORMATION

Company	**Go Plans**
Project Manager	**Oliver Newell**
Building Regulations	**Joe Mooney**
Structural Engineer	**Patrycja Perlińska**
Architectural Designer	**Ahmed Afzal**
Client	**Client Name**

JOB DESCRIPTION

Single storey rear extension
New kitchen, shower room & utility and all associated works

This package contains the scope of works and mechanical and electrical design documents required for construction pricing.

For any further questions, please refer to Go Plans immediately.

CONTENTS

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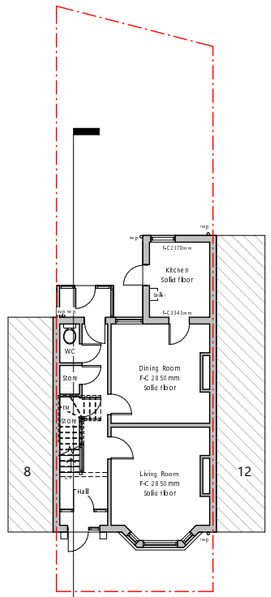
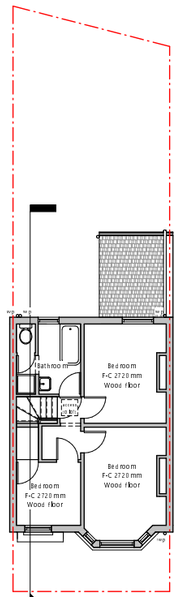
PROJECT ADDRESS

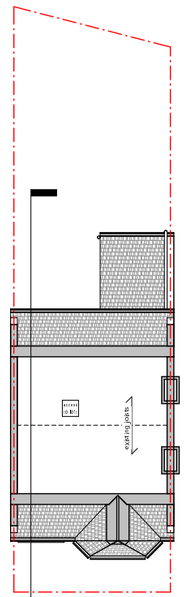
PLANNING PROPOSAL



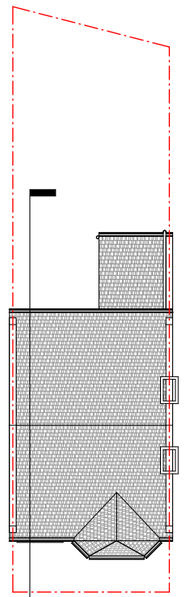
1 Existing Ground Floor
1 : 100



2 Existing First Floor
1 : 100



3 Existing Loft
1 : 100



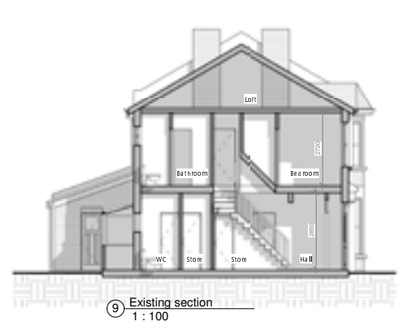
4 Existing Roof
1 : 100

5 Ex Front Elevation
1 : 100

6 Ex Rear Elevation
1 : 100

7 Ex Side Elevation (From no.12)
1 : 100

8 Ex Side Elevation (From no.8)
1 : 100



9 Existing section
1 : 100

0m 2m 4m 6m 8m 10m

VISUAL SCALE 1:100

PROJECT
Rear Extension & Internal Reconfigurations

ADDRESS
10 Trelawn Road, London E10 5QD

CLIENT NAME
D. Verrall

PROJECT STATUS
Project Status

SHEET N.	DRAWING TITLE	
A001 - 2D	Existing Drawings	
DESIGNED BY: Goplans	DRAWN BY: KC	CHECKED BY: Goplans
DATE: 05/11/2024	SCALE: As Indicated @ A1	

Demolished existing
Item above cut
Headheight of 1.8m (estimated)
Roof lights

All dimensions to be cross-checked on site prior to completing drawings for a party wall process, ordering and/or structural purposes

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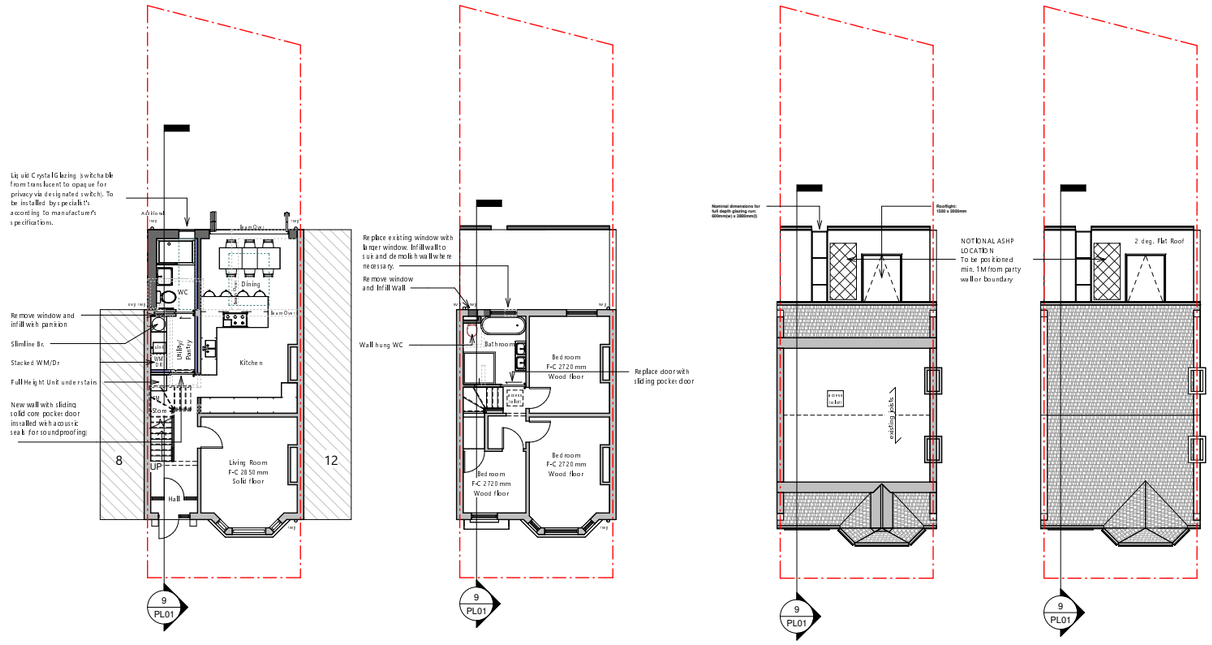
PROPOSED PLAN



1 Proposed Ground Floor
1 : 100

2 Proposed First Floor
1 : 100

3 Existing Loft (no change)
1 : 100

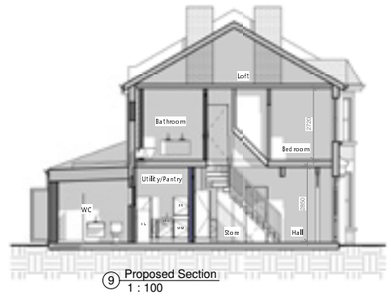
4 Proposed Roof
1 : 100

5 Ex Front Elevation (no change)
1 : 100

6 Proposed Rear Elevation
1 : 100

7 Proposed Side Elevation (From no.12)
1 : 100

8 Proposed Side Elevation (From no.8)
1 : 100



9 Proposed Section
1 : 100

0m 2m 4m 6m 8m 10m

VISUAL SCALE 1:100

Rev:	Description:	Drawn by:	Date:
PL1	External glazing to GF bathroom incorporated. Previous proposed window removed. Bathroom reconfigured.	AA	22.01.25

PROJECT
Single Storey Rear Extension and Internal Reconfiguration

ADDRESS
10 Trelawn, London, E10 5QD

CLIENT NAME
D.Verrall

PROJECT STATUS
Planning

SHEET N.	DRAWING TITLE	
PL01	Proposed Drawings	
DESIGNED BY: Goplans	DRAWN BY: AA	CHECKED BY: Goplans
DATE: 17/12/2024	SCALE: As Indicated @ A1	

Demolished existing
Item above cut
Headheight of 1.8m (estimated)
Roof lights
Soundproofing
Units below

All dimensions to be cross-checked on site prior to completing drawings for a party wall process, ordering and/or structural purposes

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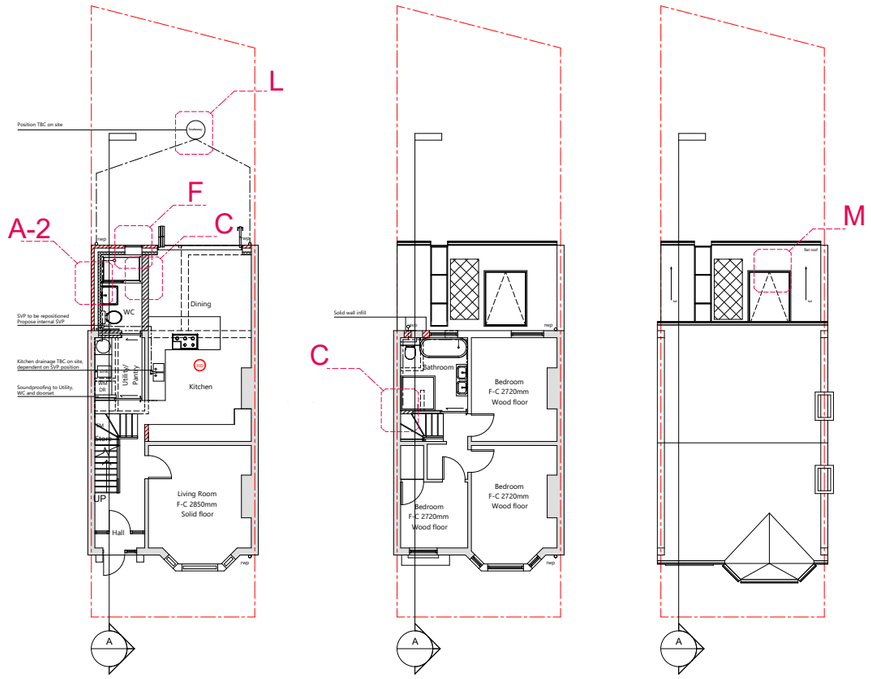
PROJECT ADDRESS

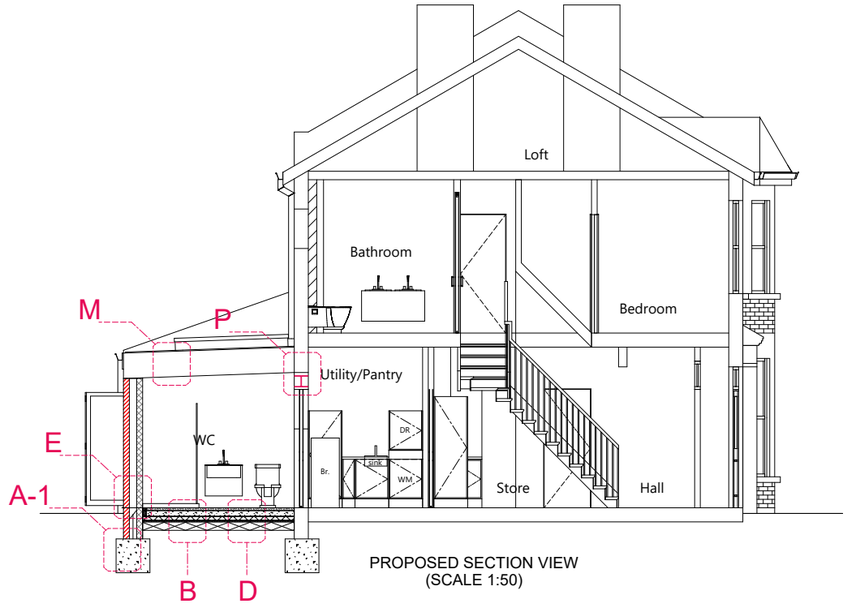
BUILDING REGULATIONS



PROPOSED GROUND FLOOR
(SCALE 1:100)

PROPOSED FIRST FLOOR
(SCALE 1:100)

PROPOSED ROOF
(SCALE 1:100)



PROPOSED SECTION VIEW
(SCALE 1:50)

NOTE:
All steel positions indicative ONLY
Please refer to Engineering documents

GENERAL NOTES

1. CHECK ALL DIMENSIONS ON SITE.
2. ALL NOTES IN STRUCTURAL CALCULATIONS TO BE READ BEFORE ANY WORK DONE IN THE SITE. THIS IS MANDATORY.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
4. ALL VERTICAL MEASUREMENTS ASSUME GROUND TO BE LEVEL UNLESS OTHERWISE STATED.
5. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE GENERAL NOTES.
6. WORKS TO BE CARRIED OUT WITH MATERIALS AND WORKMANSHIP IN COMPLIANCE WITH APPROVED DOCUMENT FOR REGULATION 7 (THE AMENDED BUILDING REGULATIONS 2010)
7. WORKS TO BE CARRIED OUT IN A SAFE MANNER IN ACCORDANCE WITH CDM REGULATIONS 2007.
8. OPEN UP EXISTING STRUCTURE AS REQUIRED BY THE BUILDING INSPECTOR
9. THIRD PARTY SUPPLIER TO MEASURE ON SITE BEFORE MANUFACTURING.
10. GENERAL CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO COMMENCEMENT OF EACH PORTION OF THE WORK.
11. ANY DISCREPANCIES IN DRAWINGS SHOULD BE NOTIFIED PRIOR PROCEEDING ANY WORKS.
12. UNLESS OTHERWISE INDICATED, PLAN DIMENSIONS ARE TO COLUMN GRID ON CENTERLINES; NOMINAL SURFACE OF MASONRY, FACE OF STUDS AND FACE OF CONCRETE WALLS AND BEAM CENTRE TO CENTRES.
13. "FLOOR LINE" REFERS TO TOP OF CONCRETE SLABS; FINISH FLOORING IS INSTALLED ABOVE THE FLOOR LINE. FOR DEPRESSED FLOORS AND CURBS, SEE STRUCTURAL DRAWINGS.
14. REPETITIVE FEATURES ARE NOT ALWAYS DRAWN IN THEIR ENTIRETY AND SHALL BE COMPLETELY PROVIDED AS IF DRAWN IN FULL.
15. WHERE A DOOR IS LOCATED NEAR CORNER OF ROOM AND IS NOT LOCATED BY DIMENSION ON PLAN OR DETAILS, DIMENSION SHALL BE 100MM FROM FACE OF STUD (WALL).
16. LINE OF EXISTING FLOOR SLABS, AS SHOWN ON THE BUILDING ELEVATIONS AND SECTIONS ARE APPROXIMATE.
17. FLOOR LEVELS AND BOUNDARIES ASSUMED WHERE NOTED. DEPICTED BY LINE DASH LINES.
18. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, GENERAL SPECIFICATION AND OTHER CATEGORIES OR DRAWINGS FOR ADDITIONAL NOTES.
19. VERIFY SIZE/LOCATION/FINISH/FIRE-RATING, ETC. AND PROVIDE COMPLETE AND REQUIRED OPENINGS THROUGH FLOORS AND WALLS, ACCESS DOORS, FURRING, CURBS, ANCHORS & INSERTS.
20. CONTRACTOR TO CARRY OUT MOST LOGICAL SOLUTION BUT TO CHECK WITH ARCHITECT OR ENGINEER IF UNSURE, REQUESTS BY CLIENTS THAT DEVIATE FORM DESIGN VOID THE DESIGN LIABILITY
21. SEE STRUCTURAL GENERAL NOTES AND PLANS TO COMPLEMENT ARCHITECTURAL PLANS AT ALL TIMES, DO NOT ASSUME ANYTHING.

LINTELS

UNLESS OTHERWISE STATED LINTELS TO BE CATNIC COMBINED STEEL TO BS5977 (SIZES AS RECOMMENDED BY MANUFACTURER), PROVIDE MIN. 150MM END BEARING WHERE BEARING IS LESS THAN 150MM CONCRETE PADSTONES ARE TO BE PROVIDED(SIZES TO SUIT LOAD AND DETAIL).
ALL LINTEL BACKS AND SOFFITS TO HAVE MIN. HALF HOUR FIRE RESISTANCE AND BE INSULATED TO PREVENT COLD BRIDGING WHERE NECESSARY. WHERE STEEL LIBS ARE USED THEY ARE TO BE BRACED TOGETHER 300MM FROM EACH BEARING POINT AND AT MID SPAN & SET TO CONCRETE PADSTONES EACH END. HALF HOUR FIRE PROTECTION TO STEELWORK AS ABOVE.
FOR UNIFORMLY DISTRIBUTED LOADS AND STANDARD 2 STOREY DOMESTIC LOADINGS ONLY.
LINTEL WIDTHS ARE TO BE EQUAL TO WALL THICKNESS. ALL LINTELS OVER 750MM SIZED INTERNAL DOOR OPENINGS TO BE 65MM DEEP PRE-STRESSED CONCRETE PLANK LINTELS. 150MM DEEP LINTELS ARE TO BE USED FOR 900MM SIZED INTERNAL DOOR OPENINGS. LINTELS TO HAVE A MINIMUM BEARING OF 150MM ON EACH END. ANY EXISTING LINTELS CARRYING ADDITIONAL LOADS ARE TO BE EXPOSED FOR INSPECTION AT COMMENCEMENT OF WORK ON SITE. ALL PRE-STRESSED CONCRETE LINTELS TO BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH BS 8110, WITH A CONCRETE STRENGTH OF 50 OR 40 N/MM * AND INCORPORATING STEEL STRANDS TO BS 5896 TO SUPPORT LOADINGS ASSESSED TO BS 5977 PART 1.
FOR OTHER STRUCTURAL OPENINGS PROVIDE PROPRIETARY INSULATED STEEL LINTELS SUITABLE FOR SPANS AND LOADINGS IN COMPLIANCE WITH APPROVED DOCUMENT A AND LINTEL MANUFACTURES STANDARD TABLES. STOP ENDS, DPC TRAYS AND WEEP HOLES TO BE PROVIDED ABOVE ALL EXTERNALLY LOCATED LINTELS.

ALL STEEL ELEMENTS TO BE STEEL GRADE S355 AND GALVANIZED

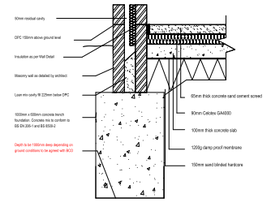
SUPPLY AND INSTALL NEW STRUCTURAL ELEMENTS SUCH AS NEW BEAMS, ROOF STRUCTURE, FLOOR STRUCTURE, BEARINGS, AND PADSTONES IN ACCORDANCE WITH THE STRUCTURAL ENGINEER'S CALCULATIONS AND DETAILS. NEW STEEL BEAMS TO BE ENCASED IN 12.5MM GYPROC FIRELINE BOARD WITH STAGGERED JOINTS NAILED TO TIMBER CRADLES OR PAINTED IN NULLIFIRE S-CM SIMILAR INTUMESCENT PAINT TO PROVIDE 1/2 HOUR FIRE RESISTANCE.

EXISTING STRUCTURE INCLUDING FOUNDATIONS, BEAMS, WALLS AND LINTELS CARRYING NEW AND ALTERED LOADS ARE TO BE EXPOSED AND CHECKED FOR ADEQUACY PRIOR TO COMMENCEMENT OF WORK AND AS REQUIRED BY THE BUILDING CONTROL OFFICER.

STEELWORK TO BE TEMPORARILY BRACED DURING CONSTRUCTION. A TEMPORARY WORKS DESIGN MAY BE REQUIRED.

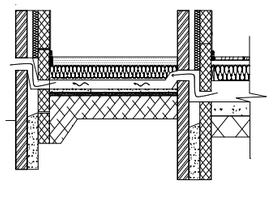
DETAIL - A-1

TRENCH FOUNDATION



DETAIL - B

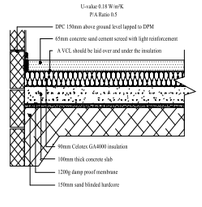
VENT TO TIMBER SUSPENDED FLOOR



DETAIL - D

SOLID GROUND FLOOR

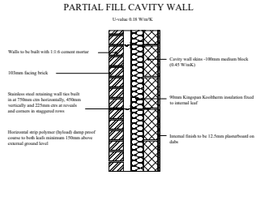
U-value 0.18 W/m²K
P/A Ratio 0.5



DETAIL - E

PARTIAL FILL CAVITY WALL

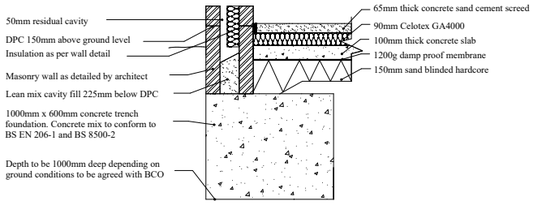
U-value 0.18 W/m²K



DETAIL - A-2

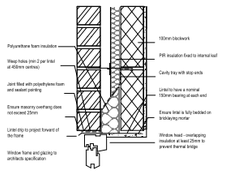
ECCENTRICALLY LOADED FOUNDATION

Structural Engineer's design and details to be followed



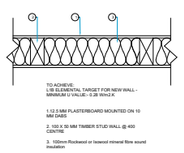
DETAIL - F

WINDOW HEAD AND LINTEL



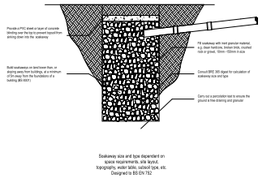
DETAIL - C

NEW INTERNAL STUD WALL



DETAIL - L

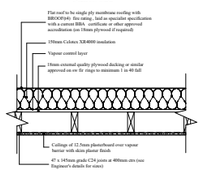
SOAKAWAY



DETAIL - M

WARM FLAT ROOF

U-value 0.15 W/m²K



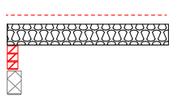
DETAIL - P

FIRE PROTECTION OF STEEL BEAM

(Knauf fire board - as section 6 :2012 of manufacturer's details)

Key plan:

Steel		Protected fire route	
Drainage 100mm SVP		Insulation	
Solid wall		Brick work	
Internal partition wall		Block work	



Site address: 10 Trelawn Road, London, E10 5QD

project details	As Per Planning
drawn by	J.W.M.
date	February 2025
checked by	K.E.S.
version	A
drawing type	Building Regulations
drawing no	BR 01 - 10 TR - A
client ref	-

0 1 2 3 4 5m

SCALE 1:100

1:100 1:50 @ A1 page

Go Plans
hello@goplans.co.uk

20-22 Wenlock Rd
London
N1 7GU

BUILDING REGULATIONS NOTES

NOTICE OF COMMENCEMENT
A notice of commencement is to be submitted to Building Control within 5 days of work being regarded as commenced, under regulation 16 of The Building Regulations etc. (Amendment) (England) Regulations 2010.

Work will be deemed to have commenced when the build has progressed to at least one of the following:

For complex buildings – Foundations are constructed, and the structure of the lowest floor level is complete.
For new buildings and horizontal extensions - Sub surface structure of the building or the extension including all foundations and the structure of the ground floor level is completed.
For all other works – constructed 15% of the overall work.

NOTICE OF COMPLETION
A Notice of Completion to be given to Building Control not more than 5 days after the work has been completed. The notice to contain the following information:
• The name, address, telephone number and (if available) email address of the client, principal contractor, and principal designer.
• A statement from the applicant to say that the works have been completed and complies with all the applicable regulations to the best of their knowledge.
• A statement from both the principal contractor and principal designer to confirm they have fulfilled their duties under Part 2A (duty holders and competence).

CDM REGULATIONS 2015
The client must abide by the Construction Design and Management Regulations 2015. The Client must appoint a Contractor, if more than one Contractor is to be involved, the Client will need to appoint (in writing) a Principal Designer (to plan, manage and coordinate the planning and design work), and a Principal Contractor (to plan, manage and coordinate the construction and ensure there are arrangements in place for managing and organising the project).

Domestic Clients
The Domestic Client is to appoint a Principal Designer and a Principal Contractor when there is more than one Contractor, if not your duties will automatically be transferred to the Contractor or Principal Contractor.

The Designer can take on the duties, provided there is a written agreement between you and the Designer to do so.

The Health and Safety Executive is to be notified as soon as possible before construction work starts if the works:

(a) Last longer than 30 working days and has more than 20 workers working simultaneously at any point in the project.
Or
(b) Exceeds 500 person days.

PARTY WALL ACT
Should they need to do so under the requirements of the Party Wall Act 1996, the owner has a duty to serve a Party Structure Notice on any adjoining owner if the building work involves any of the following to a Party Wall:
- Support of beam
- Insertion of DPC through wall
- Raising a wall or cutting off projections
- Demolition and rebuilding
- Underpinning
- Insertion of lead flashings

A Party Wall Notice is also required for:
- Any excavtions within 3 metres of any part of a neighbouring owner's building or structure, where any part of that work will go deeper than the neighbour's foundations; or
- Any excavations for a new building or structure, within 6 metres of any part of a neighbouring owner's building or structure, where any part of that work will meet a line drawn downwards at 45° in the direction of the excavation from the bottom of the neighbour's foundations, see diagram 7 in the following Government guidance,
https://www.gov.uk/government/publications/preventing-and-resolving-disputes-in-relation-to-party-walls/the-party-wall-etc-act-1996-explanatory-booklet#para_28

A Party Wall Agreement is to be in place prior to start of works on site.

THERMAL BRIDGING
Care shall be taken to limit the occurrence of thermal bridging in the insulation layers caused by gaps within the thermal element, (i.e. around windows and door openings). Reasonable provision shall also be made to ensure the extension is constructed to minimise unwanted air leakage through the new building fabric.

MATERIALS AND WORKMANSHIP
All works are to be carried out in a workmanlike manner. All materials and workmanship must comply with Regulation 7 of the Building Regulations, all relevant British Standards, European Standards, Agreement Certificates, Product Certification of Schemes (Kite Marks) etc. Products conforming to a European technical standard or harmonised European product should have a CE marking.
The latest edition of the British Standard (including any amendments) applies to any undated references within these specifications.

SITE PREPARATION
Ground to be prepared for new works by removing all unsuitable material, vegetable matter and tree or shrub roots to a suitable depth to prevent future growth. Seal up, cap off, disconnect and remove existing redundant services as necessary. Reasonable precautions must also be taken to avoid danger to health and safety caused by contaminants and ground gases, e.g. landfill gases, radon, vapours etc. on or in the ground covered, or to be covered by the building.

EXISTING STRUCTURE
Existing structure including foundations, beams, walls and lintels carrying new and altered loads are to be exposed and checked for adequacy prior to commencement of work and as required by Building Control.

BEAMS
Supply and install new structural elements such as new beams, roof structure, floor structure, bearings, and padstones in accordance with the Structural Engineer's calculations and details. New steel beams to be encased in 12.5mm Gyproc FireLine board with staggered joints, Gyproc FireCase or painted in Nullifire S or similar intumescent paint to provide 1/2 hour fire resistance, as agreed with Building Control. All fire protection to be installed as detailed by specialist manufacturer.

STRAPPING OF FLOORS
Lateral restraint to be provided where joists run parallel to walls. Floors to be strapped to walls at max 2.0m centres with 1200mm x 30mm x 5mm galvanised mild steel straps or other approved, in compliance with BS EN 845-1 (+A1:2016). Straps to be taken across minimum of 3 joists and built into walls. Provide 38mm wide x ¾ depth solid noggins between joists at strap positions.

FLAT ROOF RESTRAINT
100m x 50mm C16 grade timber wall plates to be strapped to walls using 1200mm x 30mm x 5mm galvanised mild steel straps at maximum 2.0m centres, straps to be fixed to internal wall faces.

OPENINGS AND RETURNS
An opening or recess greater than 0.1m² shall be at least 550mm from the supported wall (measured internally).

LINTELS
- For uniformly distributed loads and standard 2 storey domestic loadings only
Lintel widths are to be equal to wall thickness. All lintels over 750mm sized internal door openings to be 65mm deep pre-stressed concrete plank lintels. 150mm deep lintels are to be used for 900mm sized internal door openings. Lintels to have a minimum bearing of 150mm on each end. Any existing lintels carrying additional loads are to be exposed for inspection at commencement of work on site. All pre-stressed concrete lintels to be designed and manufactured in accordance with BS EN 1992-1-1:2023 Eurocode 2, with a concrete strength of 50 or 40 N/mm² and incorporating steel strands to BS 5896 to support loadings assessed to BS EN 845-2:2013.
For other structural openings provide proprietary insulated steel lintels suitable for spans and loadings in compliance with Approved Document A and lintel manufacturer's standard tables.
Stop ends, DPC trays and weep holes to be provided above all externally located lintels.
Independent lintels to have an insulated cavity closure between the inner and outer lintel.
Unless only supporting a roof, lintels to be encased in 12.5mm Gyproc FireLine board with staggered joints, Gyproc FireCase or painted in Nullifire S or similar intumescent paint to provide 1/2 hour fire resistance. All fire protection to be installed as detailed by specialist manufacturer.

STEEL LINTELS
Lintel and lintel installation to be in accordance with BS 5977-1 Lintels. Method of assessment of load and BS EN 845-2 Specification for ancillary components for masonry.
Lintel to be galvanised steel, powder coated lintel, such as Catnic, with a built-in damp-proof course.
The lintel to be wide enough to provide adequate support to the walling above, to be installed with a nominal 150 mm bearing area at each end and be fully bedded on a solid bed of mortar. Only full bricks or blocks to be part of the bearing area - lintels not to be placed directly onto part bricks. Padstones and spreaders to be provided under the bearings, where required. Installation to be in accordance with manufacturer's recommendations.
Overhang of any masonry to be a maximum of 25mm and lintel toe to project beyond window head externally.
Risk of condensation at potential cold bridges to be minimised, wall insulation should abut the head of the window frame and insulation to be provided at the underside of the lintel unless the manufacturer produces an alternative.
(In severely exposed locations or where the lintel does not offer a built-in DPC, a separate membrane to be fitted, turned up at the edge to ensure the water is not directed into the cavity.
For coastal areas, the use of soffit cladding to also be considered to provide further protection).
Unless only supporting a roof, lintels to be encased in 12.5mm Gyproc FireLine board with staggered joints, Gyproc FireCase or painted in Nullifire S or similar intumescent paint to provide 1/2 hour fire resistance. All fire protection to be installed as detailed by specialist manufacturer.

TRENCH FOUNDATION
Provide 750mm thick trench fill concrete foundations with a minimum width equal to the width of the wall plus 300mm. Concrete mix to conform to BS EN 206:2013 (+A2:2021) and BS 8004:2015 Code of practice for foundations (+A1:2020). All foundations to be a minimum of 1000mm below ground level, depth and size of foundation to be approved on site by Building Control to suit site conditions. All constructed in accordance with 2010 Building Regulations A1/2 and BS 8004 Code of Practice for Foundations (+A1:2020). Ensure foundations are constructed below invert level of any adjacent drains. Base of foundations supporting internal walls to be min 600mm below ground level. Sulphate resistant cement to be used if required. Please note that should any adverse soil conditions or difference in soil type be found, or any major tree roots in excavations, Building Control to be contacted and the advice of a Structural Engineer should be sought.

PIPES PASSING THROUGH TRENCH FOUNDATIONS
The load-bearing capability of foundations must not be affected where services pass through.
The pipe work to be sleeved. Flexible material to be provided around pipe and flexible joints to be provided where pipes exit the foundation.
Alternatively
Pipework should pass through a suitably strengthened opening in the foundation, i.e. foundation shuttered and a provided with suitable lintel over the pipe allowing for sufficient space for movement to ensure that the drain is capable of maintaining line and gradient. Opening should be masked with granular backfill (pea shingle) around pipe.
DPC to be provided, as required by Building Control.
Advice from the Structural Engineer to be sought on suitability of pipe running through foundation before construction.

PIPES PASSING THROUGH WALLS
Walls above pipes passing through substructure walls to be supported on suitable lintel on semi-engineering bricks. Pipe to be provided with a 50mm clearance all round, opening to be masked with granular backfill (pea shingle) around pipe. DPC to be provided, as required by Building Control.
Alternatively
Where new pipework passes through external walls the pipe work is to be provided with 'rocker pipes' at a distance of 150mm either side of the wall face. The 'rocker pipes' must have flexible joints and be a maximum length of 600mm.

SOLID FLOOR INSULATION OVER SLAB
To meet min U value required of 0.18 W/m²K
P/A ratio 0.5
Solid ground floor to consist of 150mm consolidated well-rammed hardcore, blinded with 50mm sand blinding. Provide 100mm ST2 or Gen2 ground bearing slab concrete mix to conform to BS 8500-2:2023 and BS EN 206 over a 1200 gauge polythene DPM. DPM to be lapped in with DPC in walls. Floor to be insulated over slab and DPM with min 90mm thick Celotex GA4000 insulation.
25mm insulation to continue around floor perimeters to avoid thermal bridging. A VCL should be laid over the insulation boards and turned up 100mm at room perimeters behind the skirting, all joints to be lapped by 150mm and sealed. Finish with 65mm sand/cement finishing screed with light mesh reinforcement.
Where drain runs pass under new floor, provide A142 mesh 1.0m wide and min 50mm concrete cover over length of drain.

WALLS BELOW GROUND
All new walls below ground to be constructed using blockwork compliant with BS EN 771 and suitable for below ground level or semi engineering brickwork. Walls to be built using 1:4 masonry mortar mix or equal approved specification to BS EN 1996-1-1. Cavities below ground level to be filled with lean mix concrete min 225mm below damp proof course. Or provide lean mix backfill at base of cavity wall (150mm below damp course) laid to fall to weepholes.

PARTIAL FILL CAVITY WALL
To achieve minimum U Value of 0.18 W/m²K
Provide 103mm suitable facing brick. Ensure a 50mm clear residual cavity and provide 90mm Kingspan Kooltherm insulation fixed to internal leaf. Inner leaf constructed using 100mm, 0.45 W/m²K standard block. Internal finish to be 12.5mm plasterboard on dabs. Walls to be built with 1:1:6 cement mortar.

DPC
Provide horizontal strip polymer (hyload) damp proof course to both internal and external skins, DPC to be placed a minimum 150mm above external ground level. New DPC to be made continuous with existing DPC's and with floor DPM. Vertical DPC to be installed at all reveals where cavity is closed.

WALL TIES
All walls constructed using stainless steel vertical twist type retaining wall ties built in at 750mm ctrs horizontally, 450mm vertically and 225mm ctrs at reveals and corners in staggered rows. Wall ties to be suitable for cavity width and in accordance with BS EN 845-1:2013.
Wall ties for cavities over 150mm to be suitable for cavity width, and installed as manufacturer's details.

CAVITIES
Provide cavity trays over openings and where roofs abut walls. All cavities to be closed at eaves and around openings using Thermabate or similar non combustible insulated cavity closers. Provide vertical DPCs around openings and abutments. All cavity trays must have 150mm upstands and suitable cavity weep holes (min 2) at max 900mm centres.

CAVITY BARRIERS
30 minute fire resistant cavity barriers to be provided around openings, at tops of walls, gable end walls, vertically at junctions with separating walls and horizontally at separating floors. Cavity trays to be provided over barriers where required. Trays and cavity barriers to be installed according to manufacturer's details.

MOVEMENT JOINTS
Movement joints to be provided at the following maximum spacing:
Clay brickwork - 12m.
Calcium silicate brick - 7.5-9m.
Lightweight concrete block - density not exceeding 1,500kg/m³ - 6m.
Dense concrete block - density exceeding 1,500kg/m³ – 7.5-9m.
Any masonry in a parapet wall (length to height ratio greater than 3:1) - half the above spacings and 1.5m from corners.
Movement joint widths for clay bricks to be not less than 1.3mm/m i.e. 12m - 16mm and for other masonry not less than 10mm.
Additional movement joints may be required where the aspect ratio of the wall (length :height) is more than 3:1.
Considerations to be given to BS EN 1996-1-2:2005 Eurocode 6. Design of masonry structure.

WARM FLAT ROOF
(imposed load max 1.0 kN/m² - dead load max 0.75 kN/m²)
To achieve U value 0.15 W/m²K
Flat roof covering to be single ply roofing membrane with BROOF(t4) fire rating in accordance with BS EN 13501-1:2018 and with a current BBA or other approved accreditation. Roof covering to be laid in compliance with manufacturer's details by flat roofing specialist. Single ply membrane to be fixed to 18mm exterior quality plywood (if required by manufacturer) over 150mm Celotex XR4000 insulation.
Insulation bonded to vcl on 18mm external quality plywood decking or similar approved on sw firings to minimum 1 in 40 fall on sw treated 47 x 145mm flat roof C24 timber joists at 400mm ctrs to give a max span of 3.22m or as Structural Engineer's details and calculations. Fix 12.5mm plasterboard over vapour barrier to underside of joists, finish a with plaster skim. Provide cavity tray where new roof abuts existing house.
Provide restraint to flat roof by fixing of 30 x 5 x 1200mm ms galvanised lateral restraint straps at maximum 2000mm centres fixed to 100 x 50mm wall plates and anchored to wall.
THIS IS A GENERAL GUIDE BASED ON NORMAL LOADING CONDITIONS FOUND IN DOMESTIC CONSTRUCTION. IT IS YOUR RESPONSIBILITY TO ASSESS YOUR DESIGN TO ASCERTAIN WHETHER ENGINEER'S DETAILS/CALCULATIONS ARE REQUIRED. PLEASE REFER TO THE TRADA DOCUMENT – 'SPAN TABLES FOR SOLID TIMBER MEMBERS IN FLOORS, CEILINGS AND ROOFS FOR DWELLINGS' OR ASK YOUR STRUCTURAL ENGINEER FOR ADVICE.

LEAD WORK AND FLASHINGS
All lead flashings, any valleys or soakers to be Code 5 lead and laid in accordance with BS 5534 and BS EN 12588. Flashings to be provided to all jambs and below window openings with welded upstands. Joints to be lapped min 150mm and lead to be dressed 200mm under tiles, etc.

INTERNAL STUD PARTITIONS
100mm x 50mm softwood treated timbers studs at 400mm ctrs with 50 x 100mm head and sole plates and solid intermediate horizontal noggins at 1/3 height or 450mm c/cs. Provide min 10kg/m² density acoustic soundproof quilt tightly packed (e.g.100mm Rockwool or Isowool mineral fibre sound insulation) in all voids the full depth of the stud. Partitions to be built off doubled up joists where partitions run parallel or provide noggins where at right angles, or to be built off DPC on thickened concrete slab if solid ground floor. Walls faced throughout with 12.5mm plasterboard with skim plaster finish. Plasterboard to be taped and jointed complete with beads and stops.

ELECTRICAL
All electrical work required to meet the requirements of Part P (electrical safety) must be designed, installed, inspected and tested by a Competent Person registered under a Competent Person Self Certification Scheme such as BRE certification Ltd, BSI, NICEIC Certification Services or Zurich Ltd. An appropriate BS7671 Electrical Installation Certificate is to be issued for the work by a person competent to do so. A copy of a certificate will be given to Building Control on completion.

INTERNAL LIGHTING
Install low energy light fittings that only take lamps having a luminous efficiency better than 80 lumens per circuit watt. All fixed to have lighting capacity (lm) 185 x total floor area, to comply with Part L of the current Building Regulations and the Domestic Building Services Compliance Guide.

HEATING
Extend all heating and hot water services from existing and provide new TRVs to radiators. Heating system to be designed, installed, tested and fully certified by a GAS SAFE registered specialist. All work to be in accordance with the Local Water Authorities bye laws, the Gas Safety (Installation and Use) Regulations 1998 and IEE Regulations.
The energy performance of the new components to be assessed. The results should be recorded and given to the building owner.
All accessible pipes to be insulated to the standards in Table 4.4 Approved Document L.

SMOKE DETECTION
Provide a linked smoke alarm detection system to BS EN 14604 and BS 5839-6:2019 to at least a Grade D2 category LD3 standard. System to be mains powered with battery back up. At least one smoke detector to be provided in each hallway and landing. In hallways exceeding 7.5m in length, no point within the hallway should exceed 7.5m from the nearest detector and no bedroom door should be further than 3m from the nearest smoke alarm. If ceiling mounted they should be 300mm from the walls and light fittings. Where the kitchen area is not separated from the stairway or circulation space by a door, there should be an interlinked heat detector in the kitchen.
Mains-wired, interlinked heat detector to be provided to the kitchen and smoke detectors to principal living rooms, if required by Building Control.
A design, installation, and commissioning certificate for the fire detection and alarm system to be issued to Building Control upon completion of the works.

ACCEPTABLE UNPROTECTED AREAS
Unprotected areas more than 1m from the boundary.
The unprotected area should not exceed the following:

Minimal distance from the boundary	Maximum unprotected area (m²)
1	5.6
2	12
3	18
4	24
5	30
6	No limit

ROOF LIGHTS
Min U-value of 2.2 W/m²K.
Roof-lights to be double glazed with16mm argon gap and soft low-E glass. Roof lights to be fitted in accordance with manufacturer's instructions, with rafters doubled up to sides and suitable flashings provided.

SAFETY GLAZING
All glazing in critical locations to be toughened or laminated safety glass to BS EN 12600:2002, BS EN 14179 or BS EN ISO 12543-1 and Part K of the current Building Regulations, i.e. within 1500mm above floor level in doors and side panels within 300mm of door opening and within 800mm above floor level in windows.

NEW AND REPLACEMENT WINDOWS
New and replacement windows to be double glazed with 16-20mm argon gap and soft coat low-E glass. Window Energy Rating to be Band B or better and to achieve U-value of 1.4 W/m²K. The door and window openings should be limited to 25% of the extension floor area plus the area of any existing openings covered by the extension.
Insulated plasterboard to be used in reveals to abut jambs and to be considered within reveal soffits. Fully insulated and continuous cavity closers to be used around reveals.
Windows and door frames to be taped to surrounding openings using air sealing tape.
Windows to be fitted with trickle vents to provide adequate background ventilation in accordance with Approved Document F.

NEW AND REPLACEMENT DOORS
New and replacement doors to achieve a U-Value of 1.4W/m²K. Glazed areas to be double glazed with 16-20mm argon gap and soft low-E glass. Glass to be toughened or laminated safety glass to BS 6206, BS EN 14179 or BS EN ISO 12543-1 and Part K of the current Building Regulations.
Insulated plasterboard to be used in reveals to abut jambs and to be considered within reveal soffits. Fully insulated and continuous cavity closers to be used around reveals.
Windows and door frames to be taped to surrounding openings using air sealing tape.

EXTRACT TO BATHROOM
Bathroom to have mechanical vent ducted to external air to provide min 15 l/s. Vent to be connected to light switch and to have 15 minute over run if no window in room. Internal doors should be provided with a 10mm gap below the door to aid air circulation. Intermittent extract fans to BS EN 13141-4. All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

EXTRACT TO WC
WC to have mechanical ventilation ducted to external air with an extract rating of 15 l/s operated via the light switch. Vent to have a 15min overrun if no window in room. Internal doors should be provided with a 10mm gap below the door to aid air circulation. Intermittent extract fans to BS EN 13141-4. All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

EXTRACT TO UTILITY ROOM
To utility room provide mechanical ventilation ducted to external air capable of extracting at a rate of 30 l/s. Internal doors should be provided with a 10mm gap below the door to aid air circulation. Intermittent extract fans to BS EN 13141-4. All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

EXTRACT TO KITCHEN
Kitchen to have mechanical ventilation with an extract rating of 60 l/s, or 30 l/s if adjacent to hob to external air. Internal doors should be provided with a 10mm gap below the door to aid air circulation. Intermittent extract fans to BS EN 13141-4. Cooker hoods to BS EN 13141-3. All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

PURGE VENTILATION
Minimum total area of opening in accordance with Table 1.4 Approved Document F1.
Hinged or pivot windows with an opening angle of 15 to 30 degrees to have an openable area in excess 1/10 of the floor area of the room.
External doors and sash, hinged or pivot windows with an opening angle of equal to or greater than 30 degrees to have an openable area in excess of 1/20 of the floor area of the room.
Purge ventilation should be capable of extracting at least 4 air changes per hour per room directly to the outside.
Internal doors should be provided with a 10mm gap below the door to aid air circulation.

BACKGROUND VENTILATION
Controllable background ventilation at least 1700mm above floor level to be provided to habitable rooms and kitchens at a rate of min 8,000mm², and to bathrooms at a rate of min 4000mm².
Total number of ventilators installed in a dwellings habitable rooms to be at least 4 ventilators for one bedroom dwellings and 5 ventilators for dwellings with more than one bedroom.
Background ventilators to be tested to BS EN 13141-1.
Background ventilator equivalent area and operation to be measured and recorded.
Noise attenuating background ventilators should be fitted to facades with sustained loud noise.

Where the extension connects to in an existing room and as a result the existing room is left with no windows or background ventilation less than 5000mm², then the new room background ventilation to be at least 10,000mm² equivalent area.
Where the extension connects to in an existing room and as a result the existing room is left with background ventilation at least 5000mm², then both the following is to be provided:
- Background ventilators of at least 12,000mm² equivalent area should be provided between the two rooms.
- Background ventilators of at least 12,000mm² equivalent area between the additional room and the outside.

C2. CONDENSATION
Walls, floors and roof of the building to be designed and constructed so that their structural and thermal performance will not be adversely affected by interstitial condensation, surface condensation or mould growth. Account to be taken of the building's form and orientation in relation to topography, prevailing winds, sunlight and over-shadowing, and the rate at which humidity is generated.
Materials with the highest vapour resistance should be located on the warm side of a thermal element. VCLs to be provided where necessary.
The junctions between elements are designed to Accredited Construction Details or guidance of BRE IP17/01] and BS 5250:2021 Management of moisture in buildings to be followed.

RAINWATER DRAINAGE
New rainwater goods to be new 110mm UPVC half round gutters taken and connected into 68mm dia UPVC downpipes. Rainwater taken to new soakaway, situated a min distance of 5.0m away from any building, via 110mm dia UPVC pipes surrounded in 150mm granular fill. Soakaway to be min of 1 cubic metre capacity (or to depth to Local Authority approval), filled with suitable granular fill and provided with geotextile surround to prevent migration of fines. If necessary carry out a porosity test to determine design and depth of soakaway.

UNDERGROUND FOUL DRAINAGE
Underground drainage to consist of 100mm diameter UPVC proprietary pipework to give a 1:40 fall. Surround pipes in 100mm pea shingle. Provide 600mm suitable cover (900mm under drives). Shallow pipes to be covered with 100mm reinforced concrete slab over compressible material. Provide rodding access at all changes of direction and junctions. All below ground drainage to comply with BS EN 1401-1 (+A1:2023).

ABOVE GROUND DRAINAGE
All new above ground drainage and plumbing to comply with BS EN 12056-2 for sanitary pipework. All drainage to be in accordance with Part H of the Building Regulations. Wastes to have 75mm deep anti-vac bottle traps and rodding eyes to be provided at changes of direction.

Size of wastes pipes and max length of branch connections (if max length is exceeded then anti-vac traps to be used).
Wash basin - 1.7m for 32mm pipe 3m for 40mm pipe.
Bath/shower - 3m for 40mm pipe 4m for 50mm pipe.
WC - 6m for 100mm pipe for single WC.
All branch pipes to connect to 110mm soil and vent pipe terminating min 900mm above any openings within 3m.
Or to 110mm upvc soil pipe with accessible internal air admittance valve complying with BS EN 12380, placed at a height so that the outlet is above the trap of the highest fitting.
Waste pipes not to connect on to SVP within 200mm of the WC connection.
Supply hot and cold water to all fittings as appropriate.

SOIL AND VENT PIPE
Svp to be extended up in 110mm dia UPVC and to terminate min 900mm above any openings within 3m. Provide a long radius bend at foot of SVP.

H4 BUILDING OVER OR NEAR PUBLIC SEWERS
The developer is to consult the Local Sewers Undertaker when constructing, extending or underpinning over a sewer or within 3m of the centreline of sewer shown on the sewerage undertakers sewer records and when the following applies:
- The building or extension is to be constructed over a manhole or inspection chamber or other access fitting on a sewer.
- The length of the drain or sewer under the proposed building or extension will exceed 6m.
- The Building or extension is to be constructed over or within 3m of any drain or sewer more than 3m deep or greater than 225m in diameter.

PUBLIC SEWER REQUIREMENTS

Special measures may be required for the following:

- Soils easily eroded by ground water leaking into the drain or sewer, e.g. silty sands, saturated silts and peat.
- A rising main (except those used for the building only).
- Any sewer or drain constructed from brick or masonry.
- Drains or sewers in poor condition.
- Sites prone to subsidence.

(Advice to be sought from the Sewerage undertaker).

Other provisions that may apply to Sewers:

- Any repairs or replacements of a sewer public or drain is to be carried out by the sewerage undertaker.
- Access points to sewers to be in places where they are accessible and apparent for use in a emergency.
- All drains or sewers running under a building to be provided with a minimum of 100mm of granular fill around the pipe.
- The crown of a pipe is within 300mm of the underside of a floor slab special protection to be provided.
- Where a pipe runs less than 2m below a building the foundation is to be extended so that the pipe passes through the wall.
- Where the pipe is more than 2m deep to the invert and passes beneath the foundation, the foundation is to be designed as a lintel, spanning over the drain, the lintel should span 1.5m either side of the pipe.
- A drain trench is not to be excavated lower than the foundations of any building nearby.

FIXED EXTERNAL LIGHTING
Install low energy light fittings that only take lamps having a luminous efficiency better than 80 lumens per circuit watt.
External light fittings to have both the following:
- Automatic controls which switch luminaires off in response to daylight.
- If luminous efficacy is 75 light source lumens or less, provide automatic controls which switch luminaires off after the lit area becomes unoccupied, if luminous efficacy is greater than 75 light source lumens, manual control can be installed.

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Key plan:

Steel		Protected fire route	
Drainage 100mm SVP		Insulation	
Solid wall		Brick work	
Internal partition wall		Block work	

Site address: 10 Trelawn Road, London, E10 5QD

project details	As Per Planning
drawn by	J.W.M.
date	February 2025
checked by	K.E.S.

version	A
drawing type	Building Regulations
drawing no	BR 02 - 10 TR - A
client ref	-

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1:100 1:50 @ A1 page

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N1 7GU

PROJECT ADDRESS

ENGINEERING PLANS

Project	10 Trelawn, London E10 5QD	
Subject	Structural Calculations	
Calc. No.	Rev	Date
K-25-02-80-C01	0	24.02.25

Note to Contractor: **PLEASE READ BEFORE COMMENCING ON SITE**

1. If you require any additional information before starting the works please email us.
2. Whilst carrying out the works, if you uncover any additional structural elements not noted within this calculation package please contact us as this may require a check and revised structural calculations
3. The contractor should carry out their own measured survey and investigations prior to starting works on site and ordering materials to confirm any critical assumptions noted in this document on page 3!
4. Please carefully read all notes on next two pages.
5. These calculations should be submitted for a full plans submission to building control prior to starting the works, a compliance report must be issued to the structural engineer prior to the works commencing on site. If you proceed with the works using a Building Notice, you are assuming the risk for the project and we will not accept responsibility or liability for any delays on site or associated costs or damages in connection with the delay or materials and labour cost associated with the re-design.

IMPORTANT NOTES

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PROJECT No.	DATE	REV
K-25-02-80-C01	**24.02.25**	**0**
ENG.	CHD.	CHD.
PP	**KJ**	**KJ**

PROJECT
10 Trelawn, London E10 5QD

General Notes

1. All works are to be in accordance with the current British Standard and Building Regulations.
2. This document to be read in conjunction with all relevant drawings issued by the Architect and specialist sub-contractors together with the specifications. Any discrepancies to be reported to Engineer.
3. Please note that the lengths of structural elements indicated in these calculations are not for fabrication purposes. The length of elements may differ slightly to allow for bearing, etc. The lengths of elements should always be based on onsite measurements. If the lengths of elements should differ from these calculations by more than 10%, please contact Engineer.
4. All setting out, levels, DPC, insulation, fire protection & waterproofing information is to be obtained from the Architect.
5. The Party Wall Act may apply.
6. Structural elements not shown in this document are out of scope and to be designed by others.
7. Balustrade and balustrade fixing details to be provided by manufacturer.
8. Off-the-shelf items to be installed as per manufacturer's details/recommendations.
9. All specified structural elements (i.e. steel beams & columns, timber beams&posts, etc.) are to be installed in a single continuous length unless stated otherwise.
10. No holes, chases, cut-outs, existing or proposed services or the like may be formed in or pass through any beam, column, or load bearing wall.
11. This document is intended to be printed in colour.
12. CALCULATIONS ARE SUBJECT TO BUILDING CONTROL APPROVAL. ANY WORKS CARRIED OUT PRIOR TO APPROVAL OF CALCULATIONS BY BUILDING CONTROL ARE AT OWN RISK. WE WILL NOT ACCEPT LIABILITY FOR ANY REQUIREMENTS, ALTERNATIONS, COSTS OR DELAYS RESULTING FROM THIS.

Construction Notes / Health & Safety Notes

1. We do not provide monitoring on site and the experience, diligence and management of the building contractor's team must be relied on. The Contractor must provide permanent, experienced site managers capable of understanding the requirements of our specifications and design.
2. The Contractor shall ensure that stability of the building and adjacent premises is maintained at all stages of construction. The contractor is to design, install and maintain all necessary temporary works and programme the work accordingly.
3. In addition to the usual risks associated with building works and materials, of which competent builder should be aware, the following site and work specific health and safety risks have been identified: demolition, excavation, drilling and cutting into existing structure or materials should be carried out carefully in case there are any unknows services hidden in the area.
4. The project requires the introduction of heavy structural elements such as steel beams or concrete lintels. Builder is to take into consideration the placement of all structural elements, ensuring that the method of lifting and placement is safely carried out. Responsibility for this element lies with the Contractor. As the existing walls need to be propped in order to introduce some of the lintels, this should also be considered in relationship to the risk assessment of the Contractor. Safe working procedures must be adopted. Responsibility for this element lies with the Contractor. Splice details for long-span beams can often be accommodated if required.
5. The design has been based on the assumption that the construction will be undertaken by a Competent Building Contractor used to undertaking this form of building works, of this type and complexity, and in accordance with Good Building Practice and general accepted standards and methods of construction.

Steelwork Notes

1. All steel beams / columns to be of steel grade min. S355. All plates to be of steel grade min. S275.
2. All bolts to be grade 8.8 unless noted otherwise.
3. All welds to be min 6mm fillet welds unless noted otherwise.
4. Steel elements end bearing to be equal to full width of any spreader or post / min. 100mm end bearing unless noted otherwise.
5. Corus "The Prevention of corrosion on structural steelwork" to be used as a guidance for steelwork finish/paint system.
6. Design of all connections is the responsibility of the steelwork sub-contractor unless noted otherwise.
7. Steel fabricator drawings to be submitted to engineer for checking before fabrication begins.
8. Padstones and steel beams to avoid clashes with chimney breast. Please contact Engineer if otherwise.
9. All padstones to be C35 grade.
10. As an alternative to padstones, 25mm thick steel spreader plates for padstones less than 440mm long can be used and 45mm thick steel spreader plates for padstones longer or equal than 440mm long but shorter than 700mm can be used. Steel plates plan dimensions to be the same as padstones plan dimensions.
11. Provide clearance to under-side of steelwork at intersecting wall locations where no bearing information is shown to prevent unintended load transfer.
12. Where pair of beams is presented, steel beams to be bolted together with M16 bolts @ spacer tubes @max 600mm centres.
13. Beams and columns to be placed centrally on bearings, ie beams/posts/padstones unless noted otherwise. Beams to be located centrally under walls, unless they are working as lintels on external cavity walls.
14. All steelwork below ground to have a minimum of 50mm concrete encasement unless noted otherwise.
15. All new columns to be tied to walls using shot fired wall ties or galvanized frame cramps at 450mm centres.
16. In places where beam is located parallel to padstone, beam must be centralized on the padstone. End bearing length of the beam to be equal to half padstone length. In places where beam is located perpendicular to padstone, end bearing length to be equal to padstone width. See drawings for details.
17. Site welding is not allowed unless noted otherwise.
18. Site modifications to structural steelwork shall not be carried out.

Timber Notes

1. All structural timber to be grade C24 unless noted otherwise.
2. All bolts to be grade 8.8 unless noted otherwise.
3. All timbers to be treated with an approved preservative to BS 5268 PT5
4. All cut ends to be retreated before fixing.
5. Timber elements end bearing length to be equal to full width of any spreader or post / min. 100mm end bearing unless noted otherwise.
6. All joist hangers are to be galvanised mild steel with minimum thickness of 2.5mm specified and designed by the specialist manufacturer. Timber joints between members are to be created using either traditional joinery techniques or proprietary fixings. Where input is required contact with engineer.
7. Floor and roof constructions, walls require lateral restraints by straps in accordance with the provisions in Building Regulation requirements.
8. Where two or more pieces of timber are specified in one element the timbers are to be fixed together to Building Control Officer approval.
9. New timber joists spanning more than 2.5m to be restrained by solid noggins in 1/3 of their length.
10. Provide clearance to under-side of timber joists at intersecting wall locations where no bearing information is shown to prevent unintended load transfer.
11. Double joists shall be provided under non-load bearing studwork partitions running parallel with joists spans, under baths and under airing cupboards.
12. Using notch for timber elements at support is not permitted. If it is required then contact engineer.
13. Timber post adjacent to existing masonry wall need to be resin anchored into the masonry using min M12 anchors @ max 450mm CTRS or angle brackets (if preferred).
14. Timber to timber/steel connections to be specified by others.

Masonry Notes

1. All proposed bricks to be standard format clay 20N/mm2 bricks unless noted otherwise.
2. All proposed blockwork to be 7.3N blocks unless noted otherwise.
3. Mortar below DPC to be designation M6 (ii), above designation M4 (iii).
4. Existing loadbearing masonry wall to be minimum 100mm thick wall.
5. 100mm wide blocks shall not be laid flat if load bearing.
6. Any disturbed and loose masonry should be removed and rebuilt.
7. Wall ties to be provided in accordance with the provisions in Building Regulation requirements.
8. Movement joints to be provided in accordance with masonry manufacturers recommendations.

Foundation Notes

1. For calculation purposes allowable bearing capacity of 100kN/m2 is assumed. Building Control Officer or other suitably qualified individual to ensure that formation level bearing stratum is valid.
2. Concrete to be grade C28/35, reinforcement to be high yield (fy = 500 N/mm2) unless noted otherwise.
3. All new foundations to be mass concrete strip footing - minimum width 0.6m, minimum depth 1.0m (final depth to building control officer) unless noted otherwise.These depths may need to be increased in order to transfer the loading onto satisfactory ground, or where there are trees nearby.
4. Minimum cover to reinforcement to be 50mm unless noted otherwise.
5. Existing foundations are assumed sufficient to carry the existing building.
6. Main contractor to check condition of existing walls and foundations prior to construction.
7. When additional load is added onto existing foundations , the existing foundations to be exposed and inspected by the Building Control Officer to checked/approved if adequate prior to commencement of works.
8. If soil is found to be shrinkable clays and trees are located nearby, foundations depth may need to be calculated in accordance with NHBC standard chapter 4.2. Spread foundations may not be suitable to use.
9. Pad footing to be placed centrally under columns/piers unless noted otherwise.
10. Pad footing near existing foundations should be at least equal in depth to existing foundation depth. Local underpinning may be required to prevent undermining if new pad footing proposed formation level is deeper than adjacent existing footing.
11. Footing near existing foundations should be at least equal in depth to existing foundation depth. Local underpinning may be required to prevent undermining if new footing proposed formation level is deeper than adjacent existing footing. New foundations to be excavated in 1.0m long bays; bays being excavated at the same time must not be adjacent to each other.
12. New foundations to be connected to existing foundations to Building Control Officer approval.
13. OBTAIN APPROVAL FROM LOCAL AUTHORITY BUILDING CONTROL BEFORE CASTING ANY FOUNDATIONS.

IMPORTANT NOTES

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PROJECT No.	DATE	REV
K-25-02-80-C01	**24.02.25**	**0**
ENG.	CHD.	CHD.
PP	**KJ**	**KJ**
PROJECT		
10 Trelawn, London E10 5QD		

SYMBOL KEY

- LOAD BEARING MASONRY WALL
- LOAD BEARING STUD / DORMER WALL
- APPROX LINE OF LOAD BEARING STUD / DORMER WALL OVER SHOWN DASHED
- NON-LOADBEARING TIMBER PARTITION WALL SHEATHED IN PLYWOOD / OSB EITHER SIDE. WALL TO BE STRAPPED TO WALLS AND FLOORS. SEE SUMMARY PAGE FOR DETAILS.
- OSB BOARDED JOISTS WITH ADDITIONAL LATERAL RESTRAINT BY STRAPS. SEE PLYBOARDING OF TIMBER JOISTS NOTE ON GENERAL ARRANGEMENT PAGE.
- STEEL BEAM ON PLAN/ COLUMN ON SECTION / ELEVATION
- STEEL UB / UC COLUMN ON PLAN / STEEL BEAM ON SECTION / ELEVATION
- STEEL UB / UC COLUMN OVER SHOWN DASHED
- STEEL SHS COLUMN
- STEEL SHS COLUMN OVER SHOWN DASHED
- TIMBER BEAM ON PLAN / TIMBER POST ON SECTION / ELEVATION
- TIMBER POST / RAKING STRUT
- APPROX BEARING OF TIMBER POST / RAKING STRUT OVER SHOWN DASHED
- LINTEL
- EXISTING BEAM / EXISTING LINTEL
- EXISTING JOISTS SPAN DIRECTION UNLESS NOTED OTHERWISE
- FLEXIBLE ENDPLATE CONNECTION. SEE DRAWING DETAILS
- RAF — NEW RAFTERS SPAN DIRECTION
- RJ — NEW FLAT ROOF JOISTS SPAN DIRECTION
- CJ — NEW CEILING JOISTS SPAN DIRECTION
- FJ — NEW FLOOR JOISTS SPAN DIRECTION
- GFJ — NEW GROUND FLOOR JOISTS SPAN DIRECTION
- PADSTONE SHAPE
- 1 — BEARING DETAIL NUMBER

DOCUMENT CONTROL

Document Prepared by:	Patrycja Perlińska MEng
Document Checked by:	Katarzyna Jaworska-Kanarek MEng
Document Approved by:	Katarzyna Jaworska-Kanarek MEng
Revision:	0
Date:	24.02.25

1. WE DO NOT PROVIDE MONITORING ON SITE AND THE EXPERIENCE, DILIGENCE AND MANAGEMENT OF THE BUILDING CONTRACTOR'S TEAM MUST BE RELIED ON. THE CONTRACTOR MUST PROVIDE PERMANENT, EXPERIENCED SITE MANAGERS CAPABLE OF UNDERSTANDING THE REQUIREMENTS OF OUR SPECIFICATIONS AND DESIGN.

2. THE CONTRACTOR SHALL ENSURE THAT STABILITY OF THE BUILDING AND ADJACENT PREMISES IS MAINTAINED AT ALL STAGES OF CONSTRUCTION. THE CONTRACTOR IS TO DESIGN, INSTALL AND MAINTAIN ALL NECESSARY TEMPORARY WORKS AND PROGRAMME THE WORK ACCORDINGLY.

3. THE DESIGN HAS BEEN BASED ON THE ASSUMPTION THAT THE CONSTRUCTION WILL BE UNDERTAKEN BY A COMPETENT BUILDING CONTRACTOR USED TO UNDERTAKING THIS FORM OF BUILDING WORKS, OF THIS TYPE AND COMPLEXITY, AND IN ACCORDANCE WITH GOOD BUILDING PRACTICE AND GENERAL ACCEPTED STANDARDS AND METHODS OF CONSTRUCTION.

DESIGN APPROACH

BS 6399 P1/P2/P3	Loading for Building. Code of practice for dead and imposed loads. Code of practice for wind loads. Code of practice for imposed roof loads.
BS 8103 P3	Structural design of low-rise buildings. Code of practice for timber floors and roofs for housing.
BS 5950 P1	Structural use of steelwork in building. Code of practice for design – Rolled and welded sections
BS 8110 P1	Structural use of concrete. Code of practice for design and construction
BS 5628 P1	Code of practice for the use of masonry. Structural use of unreinforced masonry.
BS 5268 P2	Structural use of timber.

INPUT REQUIRED BY 3rd PARTIES / OTHER CONTRACTORS

- Liquid Crystal Glazing and trimmers design and specification
- Foundation design; verification of Presumed Allowable Bearing Pressure.
- Acceptability of ground bearing slab / foundations depth with local ground conditions.
- Steelwork connections (Steel fabricator drawings to be submitted to us for checking before fabrication begins).
- Timber connections to contractor (if any guidance required, please come back to us)

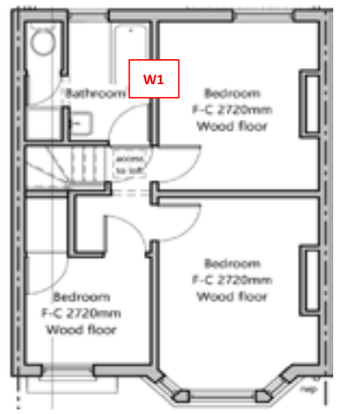
DESIGN ASSUMPTIONS

CRITICAL ASSUMPTIONS - THESE MUST BE CONFIRMED BY CONTRACTOR BEFORE COMMENCING THE WORK ON SITE AS DESIGN MAY NEED TO CHANGE:

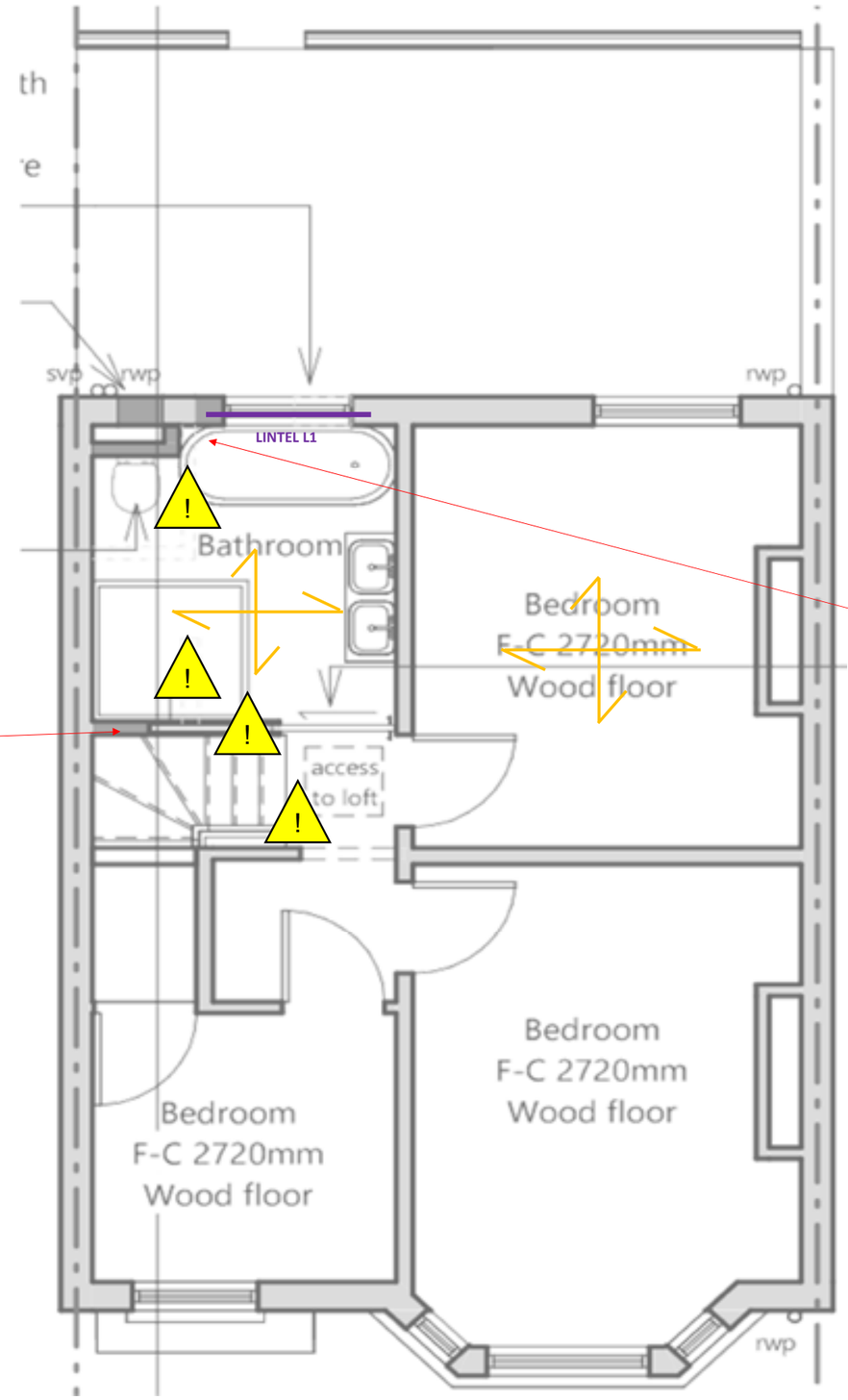
1. Masonry load-bearing wall locations (hatched on general arrangement / steel beam bearing positions). Existing walls to be min. 100mm wide loadbearing masonry walls (and not 65mm "brick on edge" walls) with foundations underneath.
2. Existing floors above the ground floor are timber construction (with no concrete screed on top).
3. If ground is shrinkable clay and there are trees within 30m of the proposed development, then a tree survey to be forwarded to engineer, as foundations may need to be updated.
4. The existing ground floor is a ground-bearing slab.
5. Allowable bearing capacity of 100kN/m2. Building Control Officer or other suitably qualified individual to ensure that formation level bearing stratum is valid.
6. Air source heat pump total weight does not exceed 200kg.

CONSERVATIVE ASSUMPTIONS - THESE CAN BE CONFIRMED BY CONTRACTOR TO POTENTIALLY OPTIMISE DESIGN BUT ARE NOT CRUCIAL:

1. The existing masonry is assumed to be poor-quality brickwork/stonework for padstone design, where relevant.
2. The existing floor joists span direction is unknown (worst case assumed).
3. Existing walls marked below as W1 is 100mm wide masonry walls.



1st FLOOR PLAN



WALL TO BE DEMOLISHED AND REBUILD AS TIMBER PARTITION WALL.

OPENING TO BE BRICKED UP WITH 20N/mm2 BRICKWORK WITH MORTAR M4 (iii). NEW MASONRY TO BE KEYED INTO EXISTING MASONRY.

1st FLOOR PLAN
(SHOWING STRUCTURE ABOVE)

SYMBOL KEY

! REMOVED WALL IS NON-LOADBEARING (TBC BY CONTRACTOR ON-SITE PRIOR TO REMOVAL)

FOR ELEMENT SPECIFICATIONS REFER TO THE SUMMARY PAGE.
FOR DESIGN ASSUMPTIONS REFER TO PAGE 3.

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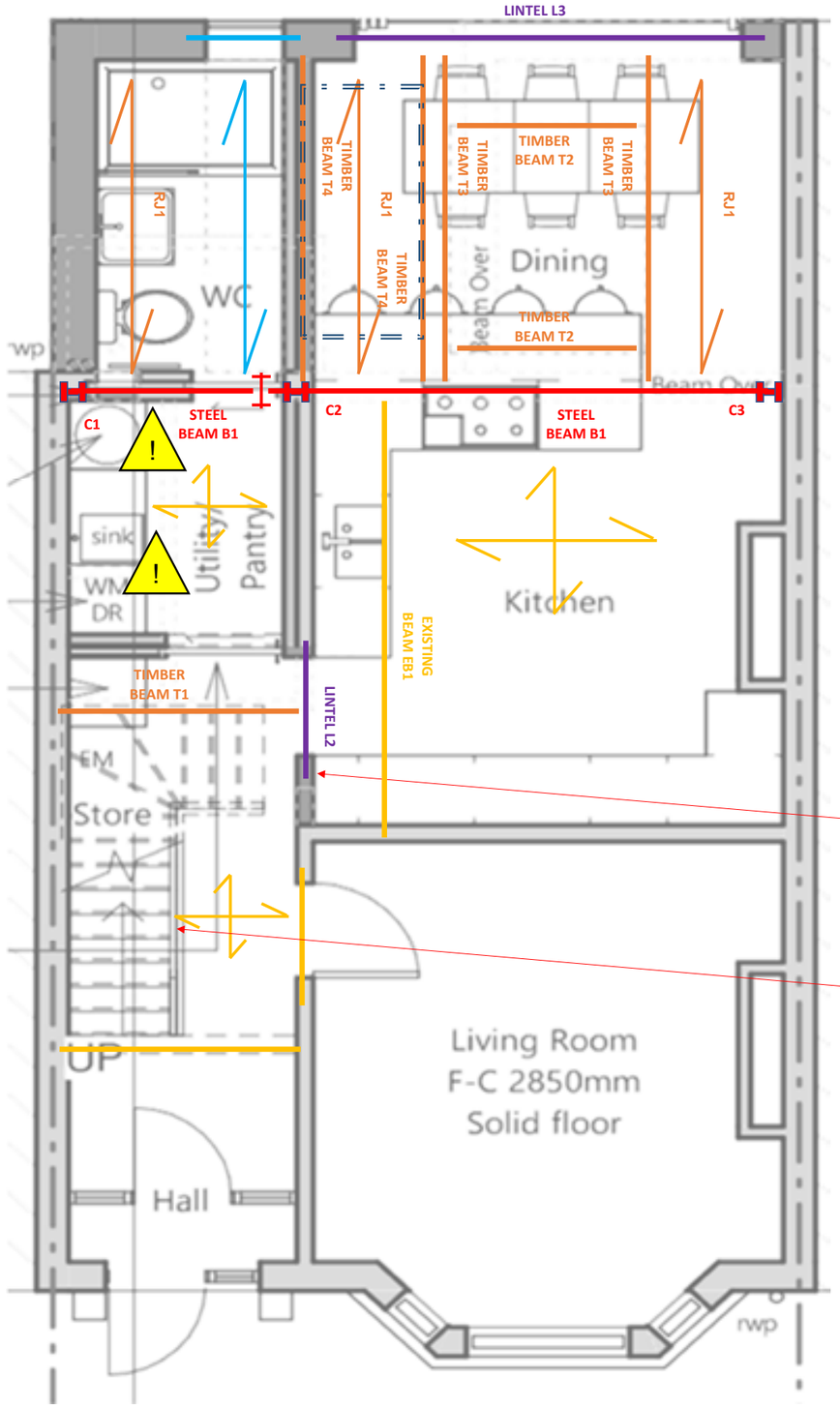

GROUND FLOOR PLAN
(SHOWING STRUCTURE ABOVE)

SYMBOL KEY

! REMOVED WALL IS NON-LOADBEARING (TBC BY CONTRACTOR ON-SITE PRIOR TO REMOVAL)

AIR SOURCE HEAT PUMP ABOVE

LIQUID CRYSTAL GLAZING AND ITS TRIMMERS TO MANUFACTURER DESIGN AND SPECIFICATION

TIMBER BEAM T4 TO BE PROVIDED UNDER EACH LEG/SUPPORT LINE OF THE AIR SOURCE HEAT PUMP.

NO MASONRY WALL ABOVE TIMBER BEAM T1.

OPENING TO BE BLOCKED/BRICKED UP WITH 3.6N BLOCKWORK / 20N/mm2 BRICKWORK WITH MORTAR M4 (iii). NEW MASONRY TO BE KEYED INTO EXISTING MASONRY.

WALL BELOW STAIRS REMAIN UNCHANGED.

FOR ELEMENT SPECIFICATIONS REFER TO THE SUMMARY PAGE.
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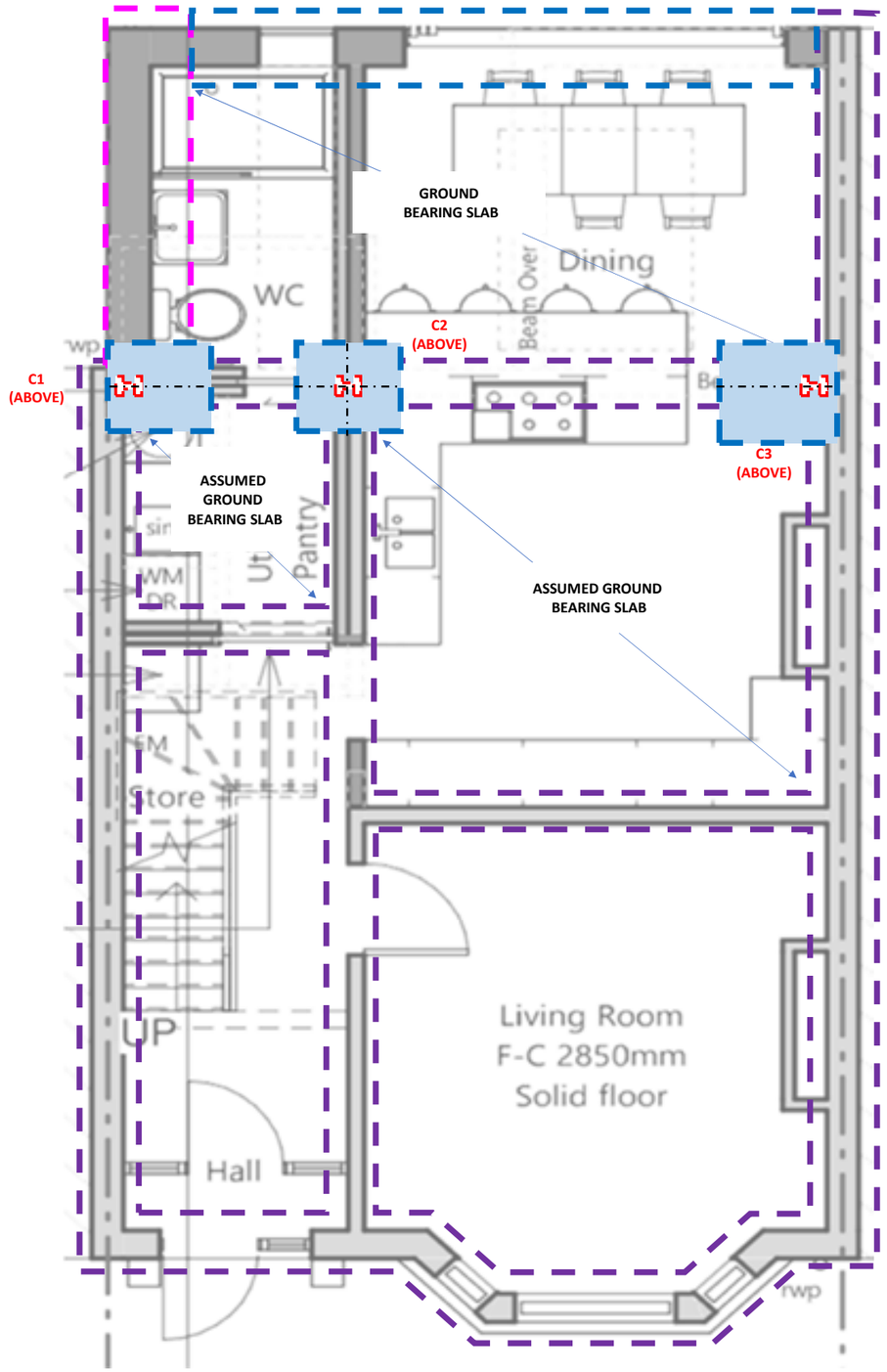

FOUNDATION PLAN

SYMBOL KEY

EXISTING STRIP FOUNDATION (SEE TABLE FOUNDATIONS FOR DETAILS). IF FOUND TO BE DIFFERENT THAN STRIP/TRENCH COME BACK TO THE ENGINEER

PROPOSED CONCRETE TRENCH FILL FOUNDATION F1

PROPOSED ECCENTRIC CONCRETE TRENCH FILL FOUNDATION F2

PROPOSED PAD FOUNDATION (IF REQUIRED - SEE TABLE FOUNDATIONS FOR DETAILS)

TREES IN SHRINKAGE CLAYS

NO TREES/SHRINKABLE SOILS ARE ASSUMED (REFER TO THE ASSUMPTIONS ON PAGE 3)

DRAIN

PUBLIC SEWER AND DRAINAGE INFORMATION WAS NOT PROVIDED TO THE ENGINEER. IT IS ASSUMED THAT THERE IS NO PUBLIC SEWER IN CLOSE PROXIMITY TO OR CROSSING THE PROPOSED FOUNDATIONS.

FOR ELEMENT SPECIFICATIONS REFER TO THE SUMMARY PAGE.
FOR DESIGN ASSUMPTIONS REFER TO PAGE 3.

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SUMMARY PAGE

IF EXISTING ELEMENT MATCHES SPECIFICATION OF NEW STRUCTURAL ELEMENT, RE-USE IS OK SUBJECT TO BUILDER CONFIRMATION / CHECKING QUALITY OF ELEMENT.

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STEEL ELEMENTS

B1 = 203 x 203 x 46 UKC (BEAM WITH PLATE, SEE DETAILS BELOW)

C1 = 152 x 152 x 23 UKC (GROUND FLOOR TO 1st FLOOR LEVEL) (SATISFACTORY BY INSPECTION)
C2 = 152 x 152 x 23 UKC (GROUND FLOOR TO 1st FLOOR LEVEL)
C3 = 152 x 152 x 23 UKC (GROUND FLOOR TO 1st FLOOR LEVEL) (SATISFACTORY BY INSPECTION)

STEELWORK GRADE: S355

BEAMS WITH PLATE:
- FOR BEAMS PLACED CENTRALLY UNDER 215mm THICK WALL / CAVITY WALL / CHIMNEY: PROVIDE 10mm THICK AND WALL WIDTH / CHIMNEY WIDTH PLATE 6mm FILLET WELDED TO TOP FLANGE OF BEAM.

LINTELS

L1 = CATNIC CN71A EXTERNAL SOLID WALL LINTEL
L2 = 140x100 R6 HI-SPEC NAYLOR LINTEL OR SIMILAR
L3 = CATNIC CG CAVITY WALL LINTEL

TIMBER ELEMENTS

RJ1 - FLAT ROOF JOIST = 150 x 50 C24 @ 400mm CTRS

T1 = 3No 150x50 C24
T2 = 2No 150x50 C24
T3 = 2No 150x50 C24
T4 = 3No 150x50 C24

WHERE TWO OR MORE PIECES OF TIMBER ARE SPECIFIED IN ONE ELEMENT THE TIMBERS TO BE FIXED TOGETHER TO BCO APPROVAL

NON-LOADBEARING TIMBER PARTITION WALL (MARKED AS GREEN ON GENERAL ARRANGEMENT) TO BE 100x50 C24 @400mm C/C SHEATHED IN 9.5mm PLYWOOD / 9mm OSB EITHER SIDE. WALL TO BE STRAPPED TO WALLS AND FLOORS.

OSB BOARDING OF TIMBER JOISTS - YELLOW SHADED AREA

ROOF JOISTS WITH 11mm OSB3 SHEATING REQUIRE LATERAL RESTRAINTS BY STRAPS IN ACCORDANCE WITH THE PROVISIONS IN BUILDING REGULATION REQUIREMENTS

WALLS

ALL NEW EXTERNAL WALLS TO BE CAVITY MASONRY WALL CONSTRUCTION:

- INNER SKIN TO BE CONSTRUCTED USING 3.6N BLOCKS WITH MORTAR M4 (iii).

- OUTER SKIN TO BE CONSTRUCTED USING 20N/mm2 BRICKS WITH MORTAR M4 (iii).

ALL NEW INTERNAL WALLS TO BE TIMBER PARTITION WALL CONSTRUCTION UNLESS NOTED OTHERWISE.

FOUNDATIONS

ALLOWABLE BEARING CAPACITY OF 100kN/m2 ASSUMED.

UNDER C1:
- STRIP FOUNDATION: MIN DISTANCE MEASURED FROM BASEPLATE TO UNDERSIDE OF FOOTING LEVEL: 0.60m / MIN WIDTH: 0.45m / CONCRETE PADSTONE UNDER COLUMN: 300x(WALL WIDTH)x215mm
OR
- PAD FOUNDATION: 0.80mx0.80m MINIMUM 0.30m THICK WITH A393 MESH (TOP AND BOTTOM)

UNDER C2:
- STRIP FOUNDATION: MIN DISTANCE MEASURED FROM BASEPLATE TO UNDERSIDE OF FOOTING LEVEL: 1.00m / MIN WIDTH: 0.45m / CONCRETE PADSTONE UNDER COLUMN: 700x(WALL WIDTH)x300mm
OR
- PAD FOUNDATION: 1.00mx1.00m MINIMUM 0.40m THICK WITH A393 MESH (TOP AND 2 BOTTOM)

UNDER C3:
- STRIP FOUNDATION: MIN DISTANCE MEASURED FROM BASEPLATE TO UNDERSIDE OF FOOTING LEVEL: 1.20m / MIN WIDTH: 0.45m / CONCRETE PADSTONE UNDER COLUMN: 440x(WALL WIDTH)x215mm
OR
- PAD FOUNDATION: 1.40mx1.40m MINIMUM 0.60m THICK WITH A393 MESH (TOP AND 2 BOTTOM)

PROPOSED CONCRETE TRENCH FILL FOUNDATION (F1):
600mm WIDE, MIN 600mm CONCRETE THICKNESS, MIN 1000mm DEPTH (SATISFACTORY BY INSPECTION)

PROPOSED ECCENTRIC CONCRETE TRENCH FILL FOUNDATION (F2):
600mm WIDE, MIN 600mm CONCRETE THICKNESS, MIN 1000mm DEPTH (SATISFACTORY BY INSPECTION)

PLEASE ALSO NOTE:

- SEVERAL FOUNDATION OPTIONS ARE SHOWN FOR EACH ELEMENT. THE MOST SUITABLE OPTION TO BE CHOSEN ON THE SITE.

- EXPOSE EXISTING FOUNDATIONS; IF THEY MEET THE SPECIFICATIONS, REUSE THEM WITH ON-SITE APPROVAL FROM THE BUILDING CONTROL INSPECTOR.

- PAD FOUNDATION TO BE PLACED CENTRALLY UNDER COLUMN/PIER (EXCEPT FOR COLUMNS C1 AND C3). TO POUR PAD FOUNDATION, EXISTING FOUNDATIONS SHOULD BE REMOVED ENTIRELY IN PAD LOCATION.

- DEPTH OF FOUNDATIONS TO BE MEASURED FROM GROUND LEVEL.

- FINAL DEPTH TO BE AGREED WITH BUILDING CONTROL OFFICER ON SITE.

GENERIC DETAILS

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3. STEEL FABRICATOR DRAWINGS TO BE SUBMITTED TO ENGINEER FOR CHECKING BEFORE FABRICATION BEGINS.
4. ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE
5. ALL STEEL BEAMS / COLUMNS TO BE OF STEEL GRADE MIN. S355. ALL PLATES TO BE OF STEEL GRADE MIN. S275
6. PLEASE NOTE THOSE ARE TYPICAL DETAILS, SEVERAL OPTIONS MAY BE SHOWN FOR EACH ELEMENT. THE MOST SUITABLE OPTION TO BE CHOSEN ON THE SITE
7. ALL EXPOSED STEELWORK OR STEELWORK IN CAVITIES TO BE GALVANISED

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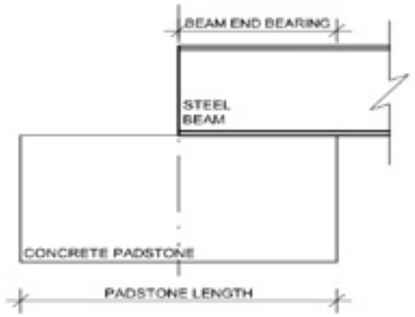
PADSTONE DETAILS

IN PLACES WHERE BEAM IS LOCATED PARALLEL TO PADSTONE, BEAM MUST BE CENTRALIZED ON THE PADSTONE. END BEARING LENGTH OF THE BEAM TO BE EQUAL TO HALF PADSTONE LENGTH. IN PLACES WHERE BEAM IS LOCATED PERPENDICULAR TO PADSTONE, END BEARING LENGTH TO BE EQUAL TO PADSTONE WIDTH. SEE SKETCHES.

BEAM PARALLEL TO PADSTONE

BEAM END BEARING = HALF PADSTONE LENGTH



NOTE: SECTION INDICATIVE ONLY

BEAM PERPENDICULAR TO PADSTONE

BEAM END BEARING = PADSTONE WIDTH

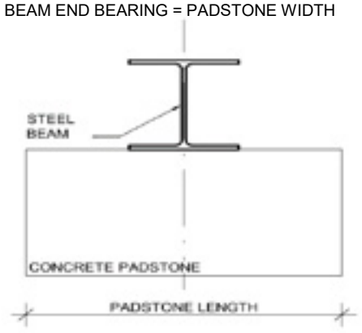
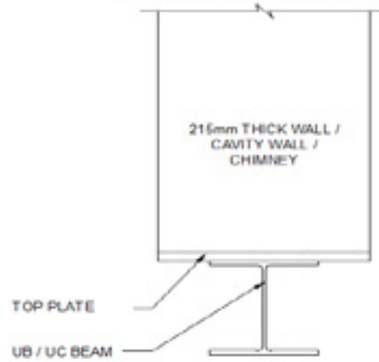


PLATE DETAILS

BEAMS WITH PLATE:

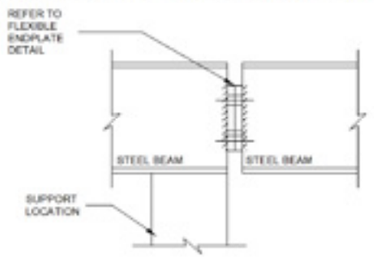
- FOR BEAMS PLACED CENTRALLY UNDER 215mm THICK WALL / CAVITY WALL / CHIMNEY: PROVIDE 10mm THICK AND WALL WIDTH / CHIMNEY WIDTH PLATE 6mm FILLET WELDED TO TOP FLANGE OF BEAM.

UB / UC STEEL BEAM WITH TOP PLATE DETAIL (FOR BEAMS PLACED CENTRALLY UNDER 215mm THICK WALL / CAVITY WALL / CHIMNEY)



FLEXIBLE ENDPLATE CONNECTIONS (BEAM TO BEAM OVER SUPPORT)

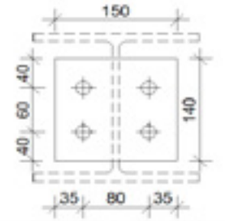
FLEXIBLE ENDPLATE CONNECTION DETAIL



SUITABLE FOR: B1 TO B1

203 UC BEAM FLEXIBLE ENDPLATE DETAIL

4No M16 8.8 BOLTS
10mm THICK ENDPLATE (GRADE S275) WELDED TO 203 UC WITH 6mm FWFP



B1

GENERIC DETAILS

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5. ALL STEEL BEAMS / COLUMNS TO BE OF STEEL GRADE MIN. S355. ALL PLATES TO BE OF STEEL GRADE MIN. S275
6. PLEASE NOTE THOSE ARE TYPICAL DETAILS, SEVERAL OPTIONS MAY BE SHOWN FOR EACH ELEMENT. THE MOST SUITABLE OPTION TO BE CHOSEN ON THE SITE
7. ALL EXPOSED STEELWORK OR STEELWORK IN CAVITIES TO BE GALVANISED

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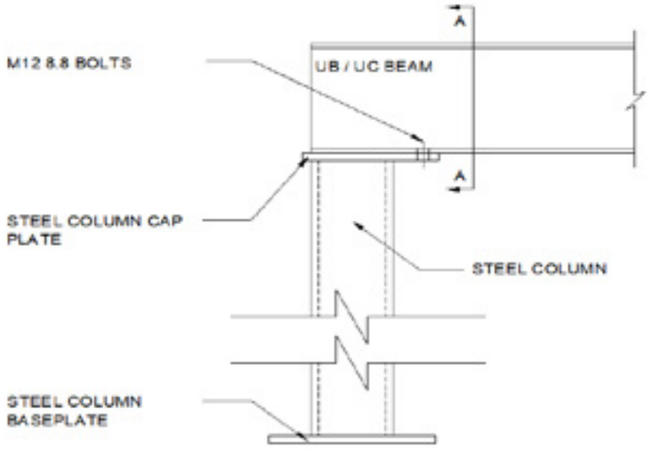
UB / UC COLUMNS CONNECTIONS

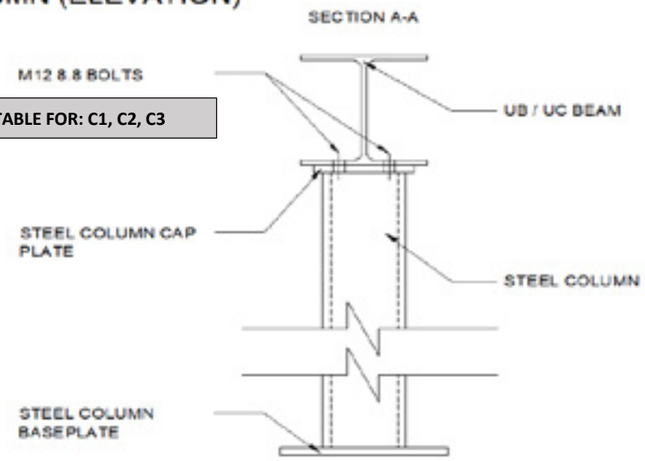
ALL NEW COLUMNS TO BE TIED TO WALLS USING SHOT FIRED WALL TIES OR GALVANIZED FRAME CRAMPS AT 450MM CENTRES.

STEEL UB / UC BEAM SUPPORTED ON STEEL COLUMN (ELEVATION)

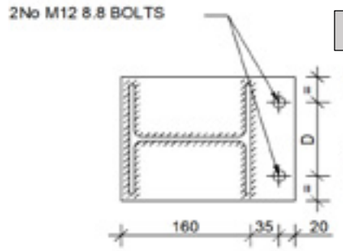


SUITABLE FOR: C1, C2, C3

SECTION A-A



152 UC CAP PLATE DETAIL (SUPPORTING UC BEAM)

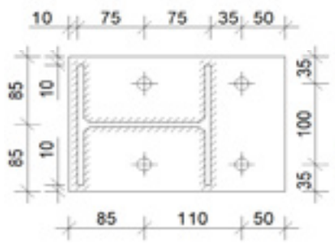


SUITABLE FOR: C1, C2, C3

15mm THICK CAP-PLATE WELDED TO 152 UC WITH 6mm FWFP

DIMENSION D:
FOR SUPPORTING 152 UC = 60mm
FOR SUPPORTING 203 UC = 80mm
FOR SUPPORTING 254 UC = 100mm

152 UC COLUMN BASEPLATE DETAIL (COLUMN SUPPORTED ON STRIP FOUNDATIONS OR TRENCH FILL FOUNDATIONS)

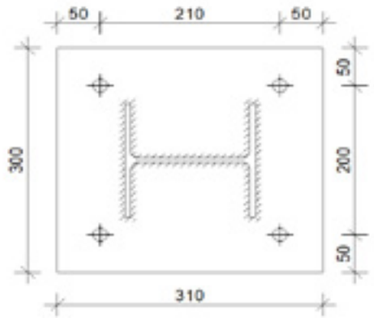


15mm THICK BASEPLATE WELDED TO 152 UC WITH 6mm FWFP WITH 4No M12 8.8 RESIN ANCHOR BOLTS

FOR TRENCH FILL FOUNDATION, COLUMN NEEDS TO BE PROVIDED DIRECTLY TO CONCRETE.

SUITABLE FOR: C1, C2, C3

152 UC COLUMN BASEPLATE DETAIL (COLUMN SUPPORTED ON PAD FOUNDATION)



4No M16 8.8 RESIN ANCHOR BOLTS (MINIMUM EMBEDMENT 200mm)

20mm THICK BASEPLATE WELDED TO 152 UC WITH 6mm FWFP

SUITABLE FOR: C1, C2, C3

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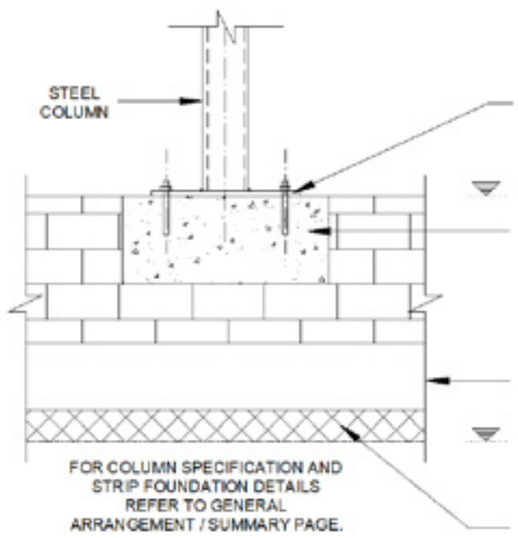
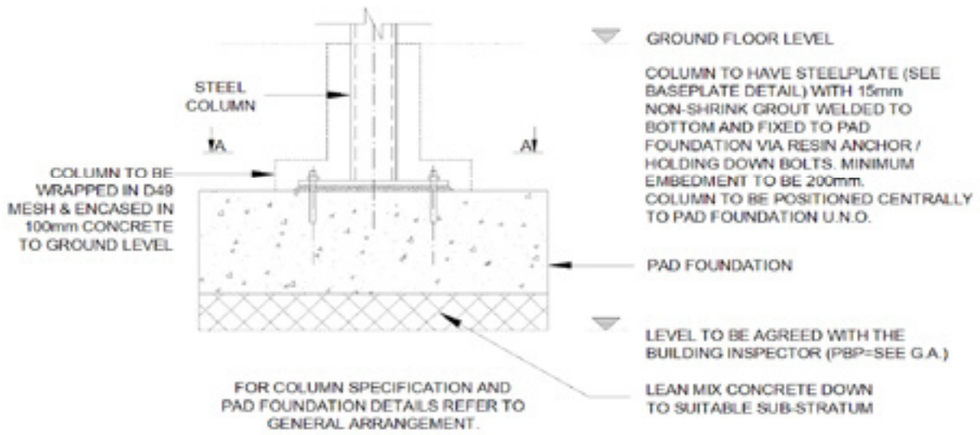
FOUNDATIONS

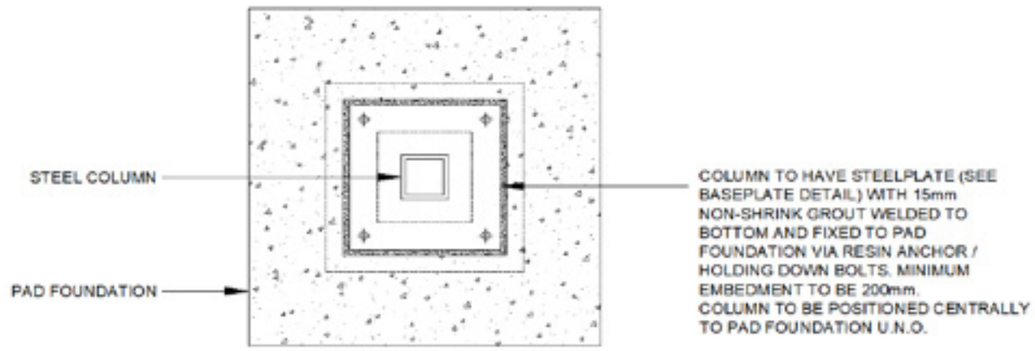
COLUMN SUPPORTED ON EXISTING STRIP FOUNDATION



COLUMN SUPPORTED ON NEW PAD FOUNDATION



COLUMN SUPPORTED ON NEW PAD FOUNDATION A-A ELEVATION



FOR COLUMN SPECIFICATION AND PAD FOUNDATION DETAILS REFER TO GENERAL ARRANGEMENT.

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LOAD SUMMARY

Beam & Block Floor

Finishes	0.20	kN/m2
75mm Screed	1.80	kN/m2
Insulation	0.10	kN/m2
150mm B&B Floor	2.20	kN/m2
Total Dead load	**4.30**	**kN/m2**
Imposed load	**1.50**	**kN/m2**

Balcony

Finishes & Boarding	1.00	kN/m2
Insulation	0.10	kN/m2
Joists	0.10	kN/m2
Ceiling / Plasterboard	0.20	kN/m2
Total Dead load	**1.40**	**kN/m2**
Imposed load	**1.50**	**kN/m2**

Timber Floor

Finishes & Boarding	0.20	kN/m2
Insulation	0.10	kN/m2
Joists	0.10	kN/m2
Ceiling / Plasterboard	0.20	kN/m2
Partition Walls	0.50	kN/m2
Total Dead load	**1.10**	**kN/m2**
Imposed load	**1.50**	**kN/m2**

Ceiling

Finishes	0.05	kN/m2
Insulation	0.10	kN/m2
Joists	0.10	kN/m2
Ceiling / Plasterboard	0.20	kN/m2
Total Dead load	**0.45**	**kN/m2**
Imposed load	**0.25**	**kN/m2**

Pitched Roof

Finishes / Tiles	0.50	kN/m2
Battens / Felt / Insulation	0.10	kN/m2
Structure	0.20	kN/m2
Ceiling / Plasterboard	0.20	kN/m2
Total Dead load	**1.00**	**kN/m2**
Imposed load	**0.75**	**kN/m2**

Flat Roof

Finishes	0.50	kN/m2
Felt / Insulation	0.10	kN/m2
Joists	0.20	kN/m2
Ceiling / Plasterboard	0.20	kN/m2
Total Dead load	**1.00**	**kN/m2**
Imposed load	**0.75**	**kN/m2**

WALLS

Dormer Wall / External Timber Wall	**1.00 kN/m2**
Timber Partition Wall	**0.35 kN/m2**
Solid 215mm Masonry Wall / Cavity Wall	**4.20 kN/m2**
100mm Brickwork /Dense Blockwork Wall	**2.10 kN/m2**
100mm Lightweight Blockwork Wall	**0.90 kN/m2**
New Cavity Wall	**4.20 kN/m2**

OTHERS

Bi-folds Doors	**0.50 kN/m2**
Glazing	**0.50 kN/m2**
Chimney	**2.10 kN/m2**
PV Panels	**0.30 kN/m2**
Balustrade	**0.50 kN/m2**

Site altitude Δs	=	13 m
Snow zone	=	B

goplans	PROJECT No.	DATE	REV
	K-25-02-80-C01	**24.02.25**	**0**
	ENG.	CHD.	CHD.
	PP	**KJ**	**KJ**
	PROJECT		
	10 Trelawn, London E10 5QD		

ALLOWABLE JOISTS SPAN DUE TO TRADA

Flat Roof Joists

For Dead Load more than 0.75kN/m2 but not more than 1.00 kN/m2 ; For Imposed Load 0.75 kN/m2

Section (RJ):	**150 x 50 C24 @400mm c/c**	Span	2.70	m	<=	Allowable Span	3.11 m	OK

goplans	PROJECT No.	DATE	REV
	K-25-02-80-C01	24.02.25	0
	ENG.	CHD.	CHD.
	PP	KJ	KJ
	PROJECT		
	10 Trelawn, London E10 5QD		

TIMBER BEAM T1

Beam Span L = 1.75 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Timber floor (1st)	0.00	1.75	5.50 m	/	2.00	=	2.75 m
-	0.00	1.75	0.00 m	/	1.00	=	0.00 m
-	0.00	1.75	0.00 m	/	1.00	=	0.00 m
-	0.00	1.75	0.00 m	/	1.00	=	0.00 m
-	0.00	1.75	0.00 m	/	1.00	=	0.00 m
-	0.00	1.75	0.00 m				
-	0.00	1.75	0.00 m				

UDL LOADING

UDL Dead Loading

Beam Self Weight						0.08 kN/m	x	1.00	= 0.08 kN/m
Timber floor (1st)	1.10 kN/m2	x	2.75 m	=	3.03 kN/m	x	1.00	=	3.03 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
					3.11 kN/m				**3.11 kN/m**

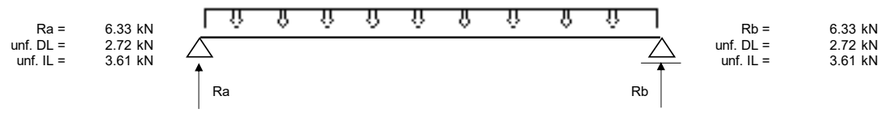
UDL Imposed Loading

Timber floor (1st)	1.50 kN/m2	x	2.75 m	=	4.13 kN/m	x	1.00	=	4.13 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
					4.13 kN/m				**4.13 kN/m**

Point Load P1 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN

Point Load P2 @ 0.00 m
From Beam = 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN

Point Load P3 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN



FORCES IN BEAM

Moment = 2.77 kNm
Shear Force = 6.33 kN
Axial Force = 0.00 kN

DEFLECTION CRITERIA

0.003L / 14mm

DURATION OF LOADING

Long-term

USAGE OF TIMBER BEAM T1

Compression perpendicular to grain	18.16 %
Shear parallel to grain	63.49 %
Bending parallel to grain	66.96 %
Vertical deflection	63.76 %

TIMBER BEAM T1 = 3No 150x50mm C24

BEARING CHECK

Beam No	Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength yb*fk/ym N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
T1 (LHS):	T1	9.58	Ex. Historic Brick	2.25	1.25xfk/3.5 0.80	100	132	0.73	-	-	-	-	Satisfactory
T1 (RHS):	T1	9.58	Ex. Historic Brick	2.25	1.25xfk/3.5 0.80	100	132	0.73	-	-	-	-	Satisfactory

Beam Support Summary:

T1 (LHS): Provide Minimum 100mm End Bearing Length
T1 (RHS): Provide Minimum 100mm End Bearing Length
Refer To G.A. for more details.

goplans	PROJECT No.	DATE	REV
	K-25-02-80-C01	24.02.25	0
	ENG.	CHD.	CHD.
	PP	KJ	KJ
	PROJECT		
	10 Trelawn, London E10 5QD		

TIMBER BEAM T1 - DESIGN DUE TO BS 5268

Properties of 3No 150x50mm

Depth h =	145 mm	Timber grade:	C24
Overall breadth of member b =	132 mm	Service Class:	1
Length of bearing lb_l =	100 mm	Load Duration:	Long-term
Length of bearing lb_r =	100 mm	Loadsharing system:	No
Area of beam A =	19140 mm^2	Depth to Breadth Ratio:	5
Min modulus of elasticity Emin =	7.20 GPa		
Modified min modulus of elasticity E =	8.71 GPa	K2 =	1.00 (Service class 1)
Modulus of rigidity G =	0.54 Gpa	K3 =	1.00 (Long-term)
Moment of inertia Iy =	3353 cm^4	K4 =	1.00 (Conservative approach)
Section modulus Zy =	463 cm^3	K5 =	1.00 (Beam without notch)
Root radius ry =	4.19 cm	K7 =	1.08 (72mm < h ≤ 300mm)
		K8 =	1.10 (3No element)
		K9 =	1.21 (3No softwoods element)

Forces in beam

Moment = 2.77 kNm
Shear Force = 6.33 kN
Axial Force = 0.00 kN

Lateral support

Ends held in position and members held in line, as by direct connection of sheathing, deck or joists.
Permissible depth-to-breadth ratio = 5.000
Actual depth-to-breadth ratio = 1.098 **OK**

Compression perpendicular to grain

Permissible bearing stress σc_adm = 2.640 N/mm^2
Applied bearing stress σc_a = 0.479 N/mm^2 **OK**

Shear parallel to grain

Permissible shear stress τadm = 0.781 N/mm^2
Applied shear stress τa = 0.496 N/mm^2 **OK**

Bending parallel to grain

Permissible bending stress σm_adm = 8.937 N/mm^2
Applied bending stress σm_a = 5.984 N/mm^2 **OK**

Vertical deflection

Total dead and imposed load = 12.65 kN
Shear area for beam Ay = 15950 mm
Beam effective span leff = 1.85 m
Shear deflection δv= 0.319 mm
Bending deflection δb= 3.028 mm
Total deflection δa= 3.347 mm
Limiting deflection = 5.250 mm (0.003L / 14mm) **OK**

TIMBER BEAM T1 TO BE 3No 150x50mm C24

goplans	PROJECT No.	DATE	REV
	K-25-02-80-C01	24.02.25	0
	ENG.	CHD.	CHD.
	PP	KJ	KJ
	PROJECT		
	10 Trelawn, London E10 5QD		

TIMBER BEAM T2

Beam Span L = 1.50 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Roof (flat)	0.00	1.50	2.50 m	/	2.00	=	1.25 m
-	0.00	1.50	0.00 m	/	1.00	=	0.00 m
-	0.00	1.50	0.00 m	/	1.00	=	0.00 m
-	0.00	1.50	0.00 m	/	1.00	=	0.00 m
-	0.00	1.50	0.00 m	/	1.00	=	0.00 m
-	0.00	1.50	0.00 m				
-	0.00	1.50	0.00 m				

UDL LOADING

UDL Dead Loading

Beam Self Weight					0.05 kN/m	x	1.00	=	0.05 kN/m
Roof (flat)	1.00 kN/m2	x	1.25 m	=	1.25 kN/m	x	1.00	=	1.25 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
					1.30 kN/m				**1.30 kN/m**

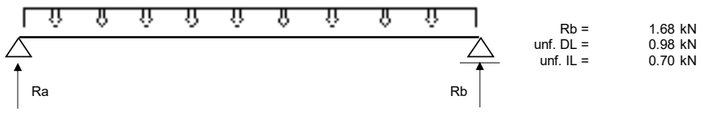
UDL Imposed Loading

Roof (flat)	0.75 kN/m2	x	1.25 m	=	0.94 kN/m	x	1.00	=	0.94 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
					0.94 kN/m				**0.94 kN/m**

Point Load P1 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN

Point Load P2 @ 0.00 m
From Beam = 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN

Point Load P3 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN



FORCES IN BEAM

Moment = 0.63 kNm
Shear Force = 1.68 kN
Axial Force = 0.00 kN

DEFLECTION CRITERIA

0.003L

DURATION OF LOADING

Medium-term (K3 = 1.25)

USAGE OF TIMBER BEAM T2

Compression perpendicular to grain	5.79 %
Shear parallel to grain	20.24 %
Bending parallel to grain	18.30 %
Vertical deflection	20.50 %

TIMBER BEAM T2 = 2No 150x50mm C24

BEARING CHECK

Beam No	Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength γb*fk/γm N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
T2 (LHS):	T2	2.49	Beam Connection										
T2 (RHS):	T2	2.49	Beam Connection										

Beam Support Summary:

T2 (LHS): Provide Steel Beam/Column/Timber Post Connection
T2 (RHS): Provide Steel Beam/Column/Timber Post Connection
Refer To G.A. for more details.

goplans	PROJECT No.	DATE	REV
	K-25-02-80-C01	24.02.25	0
	ENG.	CHD.	CHD.
	PP	KJ	KJ
	PROJECT		
	10 Trelawn, London E10 5QD		

TIMBER BEAM T2 - DESIGN DUE TO BS 5268

Properties of 2No 150x50mm

Depth h =	145 mm	Timber grade:	C24
Overall breadth of member b =	88 mm	Service Class:	1
Length of bearing lb_l =	100 mm	Load Duration:	Medium-term
Length of bearing lb_r =	100 mm	Loadsharing system:	No
Area of beam A =	12760 mm^2	Depth to Breadth Ratio:	5
Min modulus of elasticity Emin =	7.20 GPa		
Modified min modulus of elasticity E =	8.21 GPa	K2 =	1.00 (Service class 1)
Modulus of rigidity G =	0.51 Gpa	K3 =	1.25 (Medium-term)
Moment of inertia Iy =	2236 cm^4	K4 =	1.00 (Conservative approach)
Section modulus Zy =	308 cm^3	K5 =	1.00 (Beam without notch)
Root radius ry =	4.19 cm	K7 =	1.08 (72mm < h ≤ 300mm)
		K8 =	1.10 (2No element)
		K9 =	1.14 (2No softwoods element)

Forces in beam

Moment = 0.63 kNm
Shear Force = 1.68 kN
Axial Force = 0.00 kN

Lateral support

Ends held in position and members held in line, as by direct connection of sheathing, deck or joists.
Permissible depth-to-breadth ratio = 5.000
Actual depth-to-breadth ratio = 1.648 **OK**

Compression perpendicular to grain

Permissible bearing stress σc_adm = 3.300 N/mm^2
Applied bearing stress σc_a = 0.191 N/mm^2 **OK**

Shear parallel to grain

Permissible shear stress τadm = 0.976 N/mm^2
Applied shear stress τa = 0.198 N/mm^2 **OK**

Bending parallel to grain

Permissible bending stress σm_adm = 11.171 N/mm^2
Applied bending stress σm_a = 2.044 N/mm^2 **OK**

Vertical deflection

Total dead and imposed load = 3.36 kN
Shear area for beam Ay = 10633 mm
Beam effective span leff = 1.60 m
Shear deflection δv= 0.116 mm
Bending deflection δb= 0.807 mm
Total deflection δa= 0.922 mm
Limiting deflection = 4.500 mm (0.003L) **OK**

TIMBER BEAM T2 TO BE 2No 150x50mm C24

goplans

PROJECT No.	DATE	REV
K-25-02-80-C01	24.02.25	0
ENG.	CHD.	CHD.
PP	KJ	KJ

PROJECT
10 Trelawn, London E10 5QD

TIMBER BEAM T3
Beam Span L = 2.70 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Roof (flat)	0.00	2.70	1.90 m	/	2.00	=	0.95 m
-	0.00	2.70	0.00 m	/	1.00	=	0.00 m
-	0.00	2.70	0.00 m	/	1.00	=	0.00 m
-	0.00	2.70	0.00 m	/	1.00	=	0.00 m
-	0.00	2.70	0.00 m	/	1.00	=	0.00 m
-	0.00	2.70	0.00 m				
-	0.00	2.70	0.00 m				

UDL LOADING
UDL Dead Loading

Beam Self Weight						0.05 kN/m	x	1.00	= 0.05 kN/m
Roof (flat)	1.00 kN/m2	x	0.95 m	=	0.95 kN/m	x	1.00	=	0.95 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
					1.00 kN/m				**1.00 kN/m**

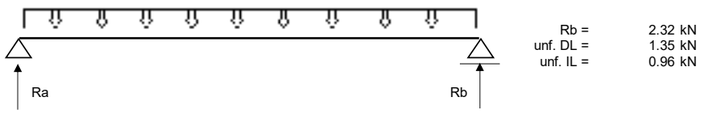
UDL Imposed Loading

Roof (flat)	0.75 kN/m2	x	0.95 m	=	0.71 kN/m	x	1.00	=	0.71 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
					0.71 kN/m				**0.71 kN/m**

Point Load P1 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN

Point Load P2 @ 0.00 m
From Beam = 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN

Point Load P3 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN



FORCES IN BEAM

Moment	=	1.56 kNm
Shear Force	=	2.32 kN
Axial Force	=	0.00 kN

DEFLECTION CRITERIA
0.003L

DURATION OF LOADING
Medium-term (K3 = 1.25)

USAGE OF TIMBER BEAM T3

Compression perpendicular to grain	7.98 %
Shear parallel to grain	27.90 %
Bending parallel to grain	45.40 %
Vertical deflection	83.60 %

TIMBER BEAM T3 = 2No 150x50mm C24

BEARING CHECK

Beam No	Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength γb*fk/γm N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
T3 (LHS):	T3	3.44	3.6N Blocks	3.5	1.25xfk/3.5 1.25	100	88	0.39	-	-	-	-	Satisfactory
T3 (RHS):	T3	3.44	Beam Connection										

Beam Support Summary:
T3 (LHS): Provide Minimum 100mm End Bearing Length
T3 (RHS): Provide Steel Beam/Column/Timber Post Connection
Refer To G.A. for more details.

goplans

PROJECT No.	DATE	REV
K-25-02-80-C01	24.02.25	0
ENG.	CHD.	CHD.
PP	KJ	KJ

PROJECT
10 Trelawn, London E10 5QD

TIMBER BEAM T3 - DESIGN DUE TO BS 5268

Properties of 2No 150x50mm

Depth h =	145 mm	Timber grade:	C24
Overall breadth of member b =	88 mm	Service Class:	1
Length of bearing lb_l =	100 mm	Load Duration:	Medium-term
Length of bearing lb_r =	100 mm	Loadsharing system:	No
Area of beam A =	12760 mm^2	Depth to Breadth Ratio:	5
Min modulus of elasticity Emin =	7.20 GPa		
Modified min modulus of elasticity E =	8.21 GPa	K2 =	1.00 (Service class 1)
Modulus of rigidity G =	0.51 Gpa	K3 =	1.25 (Medium-term)
Moment of inertia Iy =	2236 cm^4	K4 =	1.00 (Conservative approach)
Section modulus Zy =	308 cm^3	K5 =	1.00 (Beam without notch)
Root radius ry =	4.19 cm	K7 =	1.08 (72mm < h ≤ 300mm)
		K8 =	1.10 (2No element)
		K9 =	1.14 (2No softwoods element)

Forces in beam

Moment	=	1.56 kNm
Shear Force	=	2.32 kN
Axial Force	=	0.00 kN

Lateral support
Ends held in position and members held in line, as by direct connection of sheathing, deck or joists.
Permissible depth-to-breadth ratio = 5.000
Actual depth-to-breadth ratio = 1.648 **OK**

Compression perpendicular to grain
Permissible bearing stress σc_adm = 3.300 N/mm^2
Applied bearing stress σc_a = 0.263 N/mm^2 **OK**

Shear parallel to grain
Permissible shear stress τadm = 0.976 N/mm^2
Applied shear stress τa = 0.272 N/mm^2 **OK**

Bending parallel to grain
Permissible bending stress σm_adm = 11.171 N/mm^2
Applied bending stress σm_a = 5.071 N/mm^2 **OK**

Vertical deflection
Total dead and imposed load = 4.63 kN
Shear area for beam Ay = 10633 mm
Beam effective span leff = 2.80 m
Shear deflection δv= 0.287 mm
Bending deflection δb= 6.484 mm
Total deflection δa= 6.771 mm
Limiting deflection = 8.100 mm (0.003L) **OK**

TIMBER BEAM T3 TO BE 2No 150x50mm C24

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	K-25-02-80-C01	24.02.25	0
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	PROJECT		
	10 Trelawn, London E10 5QD		

TIMBER BEAM T4

Beam Span L = 2.70 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Roof (flat)	0.00	2.70	1.20 m	/	2.00	=	0.60 m
Roof (flat)	0.00	2.70	0.70 m	/	2.00	=	0.35 m as Glazing
-	0.00	2.70	0.00 m	/	1.00	=	0.00 m
-	0.00	2.70	0.00 m	/	1.00	=	0.00 m
-	0.00	2.70	0.00 m	/	1.00	=	0.00 m
-	0.00	2.70	0.00 m				
-	0.00	2.70	0.00 m				

UDL LOADING

UDL Dead Loading

Beam Self Weight						0.08	kN/m	x	1.00	=	0.08 kN/m
Roof (flat)	1.00	kN/m2	x	0.60	m =	0.60	kN/m	x	1.00	=	0.60 kN/m
Roof (flat)	1.00	kN/m2	x	0.35	m =	0.35	kN/m	x	1.00	=	0.35 kN/m
-	0.00	kN/m2	x	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
						1.03	**kN/m**				**1.03 kN/m**

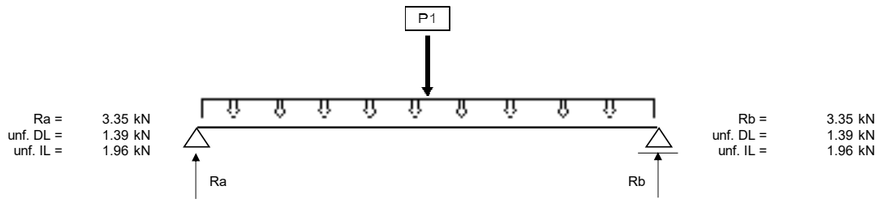
UDL Imposed Loading

Roof (flat)	0.75	kN/m2	x	0.60	m =	0.45	kN/m	x	1.00	=	0.45 kN/m
Roof (flat)	0.75	kN/m2	x	0.35	m =	0.26	kN/m	x	1.00	=	0.26 kN/m
-	0.00	kN/m2	x	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m =	0.00	kN/m	x	1.00	=	0.00 kN/m
						0.71	**kN/m**				**0.71 kN/m**

Point Load P1 @ 1.35 m (CONSERVATIVE APPROACH)
From Beam = 1.00 x AIR SOURCE HEAT PUMP(MAX) + 1.00 x (MAX) + 1.0
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 2.00 kN x 1.00 = 2.00 kN

Point Load P2 @ 0.00 m
From Beam = 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN

Point Load P3 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN



FORCES IN BEAM

Moment = 2.94 kNm
Shear Force = 3.35 kN
Axial Force = 0.00 kN

DEFLECTION CRITERIA

0.003L

DURATION OF LOADING

Long-term

USAGE OF TIMBER BEAM T4

Compression perpendicular to grain	9.63 %
Shear parallel to grain	33.65 %
Bending parallel to grain	71.08 %
Vertical deflection	90.08 %

TIMBER BEAM T4 = 3No 150x50mm C24

BEARING CHECK

Beam No	Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength yb*fk/ym N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
					1.25xfk/3.5								
T4 (LHS):	T4	5.09	3.6N Blocks	3.5	1.25	100	132	0.39	-	-	-	-	Satisfactory
T4 (RHS):	T4	5.09	Beam Connection										

Beam Support Summary:

T4 (LHS): Provide Minimum 100mm End Bearing Length
T4 (RHS): Provide Steel Beam/Column/Timber Post Connection
Refer To G.A. for more details.

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TIMBER BEAM T4 - DESIGN DUE TO BS 5268

Properties of 3No 150x50mm

Depth h =	145 mm	Timber grade:	C24
Overall breadth of member b =	132 mm	Service Class:	1
Length of bearing lb_l =	100 mm	Load Duration:	Long-term
Length of bearing lb_r =	100 mm	Loadsharing system:	No
Area of beam A =	19140 mm^2	Depth to Breadth Ratio:	5
Min modulus of elasticity Emin =	7.20 GPa		
Modified min modulus of elasticity E =	8.71 GPa	K2 =	1.00 (Service class 1)
Modulus of rigidity G =	0.54 Gpa	K3 =	1.00 (Long-term)
Moment of inertia Iy =	3353 cm^4	K4 =	1.00 (Conservative approach)
Section modulus Zy =	463 cm^3	K5 =	1.00 (Beam without notch)
Root radius ry =	4.19 cm	K7 =	1.08 (72mm < h ≤ 300mm)
		K8 =	1.10 (3No element)
		K9 =	1.21 (3No softwoods element)

Forces in beam

Moment = 2.94 kNm
Shear Force = 3.35 kN
Axial Force = 0.00 kN

Lateral support

Ends held in position and members held in line, as by direct connection of sheathing, deck or joists.
Permissible depth-to-breadth ratio = 5.000
Actual depth-to-breadth ratio = 1.098 **OK**

Compression perpendicular to grain

Permissible bearing stress σc_adm = 2.640 N/mm^2
Applied bearing stress σc_a = 0.254 N/mm^2 **OK**

Shear parallel to grain

Permissible shear stress τadm = 0.781 N/mm^2
Applied shear stress τa = 0.263 N/mm^2 **OK**

Bending parallel to grain

Permissible bending stress σm_adm = 8.937 N/mm^2
Applied bending stress σm_a = 6.352 N/mm^2 **OK**

Vertical deflection

Total dead and imposed load = 6.71 kN
Shear area for beam Ay = 15950 mm
Beam effective span leff = 2.80 m
Shear deflection δv= 0.338 mm
Bending deflection δb= 6.958 mm
Total deflection δa= 7.296 mm
Limiting deflection = 8.100 mm (0.003L) **OK**

TIMBER BEAM T4 TO BE 3No 150x50mm C24

goplans

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ENG.	CHD.	CHD.
PP	KJ	KJ

PROJECT
10 Trelawn, London E10 5QD

LINTEL L1

Clear Span L = 1.00 m
Total Span = 1.30 m
Effective Span = 1.15 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Ceiling	0.00	1.00	3.70 m	/	2.00	=	1.85 m
Roof (sloping)	0.00	1.00	2.15 m	/	2.00	=	1.08 m
215mm/Cavity Wall	0.00	1.00	0.40 m	/	1.00	=	0.40 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m				
-	0.00	1.00	0.00 m				

UDL LOADING
UDL Dead Loading

Ceiling	0.45 kN/m2	x	1.85 m	=	0.83 kN/m
Roof (sloping)	1.00 kN/m2	x	1.08 m	=	1.08 kN/m
215mm/Cavity Wall	4.20 kN/m2	x	0.40 m	=	1.68 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
					3.59 kN/m

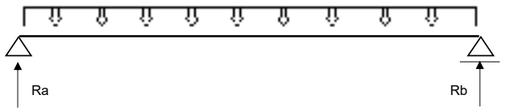
UDL Imposed Loading

Ceiling	0.25 kN/m2	x	1.85 m	=	0.46 kN/m
Roof (sloping)	0.75 kN/m2	x	1.08 m	=	0.81 kN/m
215mm/Cavity Wall	0.00 kN/m2	x	0.40 m	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
					1.27 kN/m

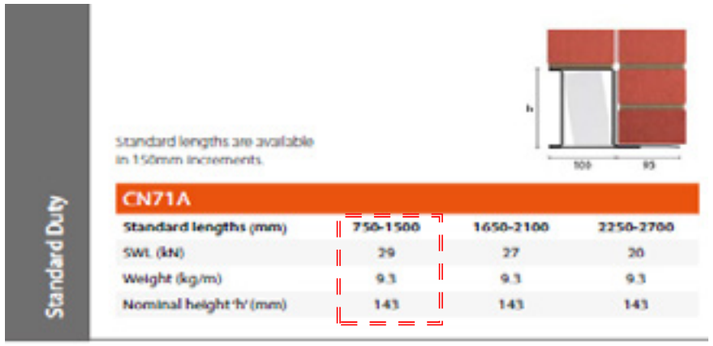
Total Loads = **4.86 kN/m**

Total Loads acting on Lintel	=	1.15 m	x	4.86 kN/m	=	**5.58 kN**	<	**29.00 kN**	Satisfactory

Ra = 2.43 kN
unf. DL = 1.79 kN
unf. IL = 0.63 kN



Rb = 2.43 kN
unf. DL = 1.79 kN
unf. IL = 0.63 kN



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K-25-02-80-C01	24.02.25	0
ENG.	CHD.	CHD.
PP	KJ	KJ

PROJECT
10 Trelawn, London E10 5QD

LINTEL L2

Clear Span L = 0.90 m
Total Span = 1.10 m
Effective Span = 1.00 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Timber floor (1st)	0.00	0.90	3.60 m	/	2.00	=	1.80 m
Ceiling	0.00	0.90	5.50 m	/	2.00	=	2.75 m
Roof (sloping)	0.00	0.90	5.50 m	/	2.00	=	2.75 m
100mm Thick Wall	0.00	0.90	2.70 m	/	1.00	=	2.70 m
-	0.00	0.90	0.00 m	/	1.00	=	0.00 m
T1	0.00	0.90	1.50 m				(RHS)
	0.00	0.90	0.00 m				

UDL LOADING
UDL Dead Loading

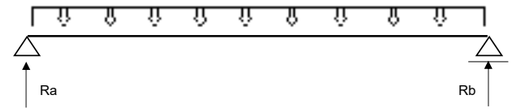
Timber floor (1st)	1.10 kN/m2	x	1.80 m	=	1.98 kN/m
Ceiling	0.45 kN/m2	x	2.75 m	=	1.24 kN/m
Roof (sloping)	1.00 kN/m2	x	2.75 m	=	2.75 kN/m
100mm Thick Wall	2.10 kN/m2	x	2.70 m	=	5.67 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
T1	2.72 kN	/	1.50 m	=	1.81 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
					13.45 kN/m

UDL Imposed Loading

Timber floor (1st)	1.50 kN/m2	x	1.80 m	=	2.70 kN/m
Ceiling	0.25 kN/m2	x	2.75 m	=	0.69 kN/m
Roof (sloping)	0.75 kN/m2	x	2.75 m	=	2.06 kN/m
100mm Thick Wall	0.00 kN/m2	x	2.70 m	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
T1	3.61 kN	/	1.50 m	=	2.41 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
					7.86 kN/m

Total Loads acting on Lintel = **21.31 kN/m** < **30.87 kN/m** Satisfactory

Ra = 9.59 kN
unf. DL = 6.05 kN
unf. IL = 3.54 kN



Rb = 9.59 kN
unf. DL = 6.05 kN
unf. IL = 3.54 kN

Hi-Spec Range		S4	R6	R9	R12
Load Table Units suitable for 100mm wide walls					
Fire Resistance Available (mins)		30	30	30	30
Suitable For Foundation Use		Yes	Yes	Yes	Yes
Maximum Stock Length Available		3000mm	3000mm	3600mm	3600mm
Available Range Finish		Faced	Faced	Faced	Faced
		UNFACTORED LOADS IN kN/m			
Length	Clear Span	100x100	100x140	100x215	100x290
900mm	700mm	15.77	38.73	96.25	127.77
1200mm	1000mm	10.90	30.87	62.92	83.26

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LINTEL L3

Clear Span L = 3.00 m
Total Span = 3.30 m
Effective Span = 3.15 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Roof (flat)	0.00	3.00	2.70 m	/	2.00	=	1.35 m
-	0.00	3.00	0.00 m	/	1.00	=	0.00 m
215mm/Cavity Wall	0.00	3.00	0.65 m	/	1.00	=	0.65 m
-	0.00	3.00	0.00 m	/	1.00	=	0.00 m
-	0.00	3.00	0.00 m	/	1.00	=	0.00 m
T4	0.00	3.00	3.00 m				(MAX)
-	0.00	3.00	0.00 m				

UDL LOADING
UDL Dead Loading

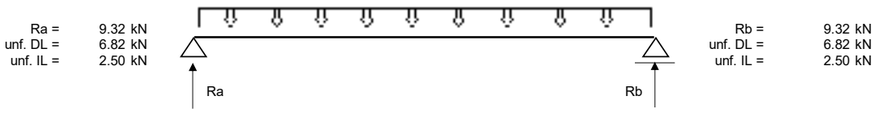
Roof (flat)	1.00 kN/m2	x	1.35 m	=	1.35 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
215mm/Cavity Wall	4.20 kN/m2	x	0.65 m	=	2.73 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
T4	1.39 kN	/	3.00 m	=	0.46 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
					4.54 kN/m

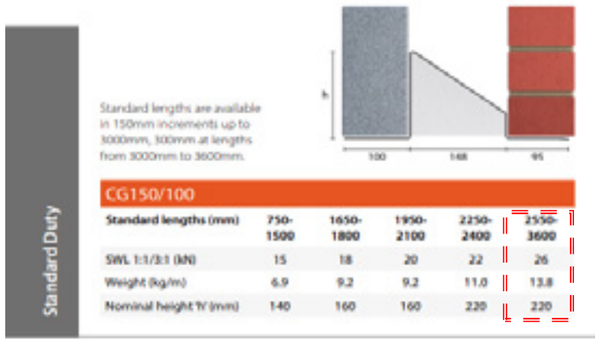
UDL Imposed Loading

Roof (flat)	0.75 kN/m2	x	1.35 m	=	1.01 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
215mm/Cavity Wall	0.00 kN/m2	x	0.65 m	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m
T4	1.96 kN	/	3.00 m	=	0.65 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m
					1.67 kN/m

Total Loads = **6.21 kN/m**

Total Loads acting on Lintel = 3.15 m x 6.21 kN/m = **19.56 kN** < **26.00 kN** Satisfactory





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	K-25-02-80-C01	24.02.25	0
	ENG.	CHD.	CHD.
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	PROJECT		
	10 Trelawn, London E10 5QD		

BEAM EB1 **(Calculated For Loading Purposes Only)**

Beam Span L = 3.70 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
100mm Thick Wall	0.00	3.70	2.70 m	/	1.00	=	2.70 m
Roof (sloping)	0.00	3.70	5.50 m	/	2.00	=	2.75 m
-	0.00	3.70	0.00 m	/	1.00	=	0.00 m
-	0.00	3.70	0.00 m	/	1.00	=	0.00 m
-	0.00	3.70	0.00 m	/	1.00	=	0.00 m
-	0.00	3.70	0.00 m				
-	0.00	3.70	0.00 m				

UDL LOADING
UDL Dead Loading

Beam Self Weight					0.23 kN/m	x	1.40	=	0.32 kN/m
100mm Thick Wall	2.10 kN/m2	x	2.70 m	=	5.67 kN/m	x	1.40	=	7.94 kN/m
Roof (sloping)	1.00 kN/m2	x	2.75 m	=	2.75 kN/m	x	1.40	=	3.85 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
					8.65 kN/m				**12.11 kN/m**

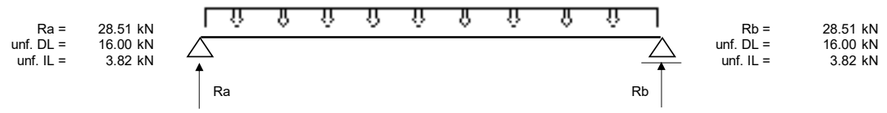
UDL Imposed Loading

100mm Thick Wall	0.00 kN/m2	x	2.70 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
Roof (sloping)	0.75 kN/m2	x	2.75 m	=	2.06 kN/m	x	1.60	=	3.30 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN/m2	x	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
					2.06 kN/m				**3.30 kN/m**

Point Load P1 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.40 = 0.00 kN
IL = 0.00 kN x 1.60 = 0.00 kN

Point Load P2 @ 0.00 m
From Beam = 1.00 x (MAX)
DL = 0.00 kN x 1.40 = 0.00 kN
IL = 0.00 kN x 1.60 = 0.00 kN

Point Load P3 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.40 = 0.00 kN
IL = 0.00 kN x 1.60 = 0.00 kN



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	ENG.	CHD.	CHD.
	PP	KJ	KJ
	PROJECT		
	10 Trelawn, London E10 5QD		

BEAM B1

Beam Span L = 3.75 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Roof (flat)	0.00	3.75	2.70 m	/	2.00	=	1.35 m
Timber floor (1st)	0.00	3.75	3.70 m	/	2.00	=	1.85 m
Ceiling	0.00	3.75	3.70 m	/	2.00	=	1.85 m
Roof (sloping)	0.00	3.75	2.15 m	/	2.00	=	1.08 m
215mm/Cavity Wall	0.00	3.75	3.00 m	/	1.00	=	3.00 m
-	0.00	3.75	0.00 m				
-	0.00	3.75	0.00 m				

Avg. - due to window openings

UDL LOADING

UDL Dead Loading

Beam Self Weight						0.46 kN/m	x	1.40	=	0.65 kN/m
Roof (flat)	1.00 kN/m2	x	1.35 m	=	1.35 kN/m	x	1.40	=	1.89 kN/m
Timber floor (1st)	1.10 kN/m2	x	1.85 m	=	2.04 kN/m	x	1.40	=	2.85 kN/m
Ceiling	0.45 kN/m2	x	1.85 m	=	0.83 kN/m	x	1.40	=	1.17 kN/m
Roof (sloping)	1.00 kN/m2	x	1.08 m	=	1.08 kN/m	x	1.40	=	1.51 kN/m
215mm/Cavity Wall	4.20 kN/m2	x	3.00 m	=	12.60 kN/m	x	1.40	=	17.64 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
					18.35 kN/m				**25.69 kN/m**

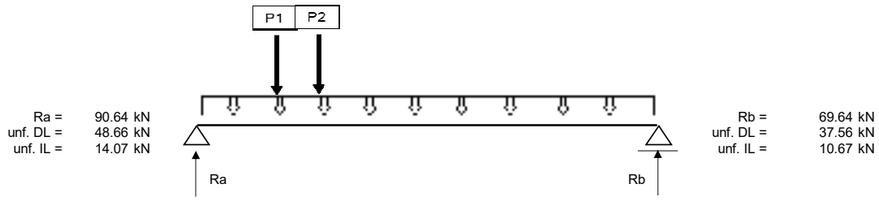
UDL Imposed Loading

Roof (flat)	0.75 kN/m2	x	1.35 m	=	1.01 kN/m	x	1.60	=	1.62 kN/m
Timber floor (1st)	1.50 kN/m2	x	1.85 m	=	2.78 kN/m	x	1.60	=	4.44 kN/m
Ceiling	0.25 kN/m2	x	1.85 m	=	0.46 kN/m	x	1.60	=	0.74 kN/m
Roof (sloping)	0.75 kN/m2	x	1.08 m	=	0.81 kN/m	x	1.60	=	1.29 kN/m
215mm/Cavity Wall	0.00 kN/m2	x	3.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
					5.06 kN/m				**8.09 kN/m**

Point Load P1 @ 0.65 m
From Beam = 1.00 x EB1(MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 16.00 kN x 1.40 = 22.40 kN
IL = 3.82 kN x 1.60 = 6.11 kN

Point Load P2 @ 1.00 m
From Beam = 1.00 x T4(RHS)
DL = 1.39 kN x 1.40 = 1.95 kN
IL = 1.96 kN x 1.60 = 3.14 kN

Point Load P3 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.40 = 0.00 kN
IL = 0.00 kN x 1.60 = 0.00 kN



FORCES IN BEAM

Moment = 71.78 kNm
Shear Force = 90.64 kN
Axial Force = 0.00 kN

DEFLECTION CRITERIA

L/300; Brittle finishes (all loads)
L/360 (imposed loads only)

USAGE OF STEEL BEAM B1

Shear capacity	29.09 %
Moment capacity	44.94 %
Buckling resistance moment	57.91 %
Vertical deflection	63.15 %

STEEL BEAM B1 = 203 x 203 x 46 UKC S355 *BEAM WITH PLATE, SEE DETAILS ON SUMMARY PAGE*

BEARING CHECK

Beam No	Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength γb*fk/γm N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
B1 (LHS):	B1	90.64	Beam Connection										
B1 (RHS):	B1	69.64	Beam Connection										

Beam Support Summary:
B1 (LHS): Provide Steel Beam/Column/Timber Post Connection
B1 (RHS): Provide Steel Beam/Column/Timber Post Connection
Refer To G.A. for more details.

Beam bearing design details:
Restraint Condition Coef. Support A: 1.0 + 2 x D
Restraint Condition Coef. Support B: 1.0 + 2 x D

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	10 Trelawn, London E10 5QD		

STEEL BEAM B1 - DESIGN DUE TO BS 5950-1

Properties of 203 x 203 x 46 UKC Section

Design strength of steel py =	355.00 N/mm^2	Total beam span L =	3.75 m
Half of flange b =	101.80 mm	Web depth d =	160.80 mm
Flange thickness T =	11.0 mm	Web thickness t =	7.2 mm
Area of cross-section A =	58.7 cm^2	Overall depth D =	203.2 mm
Rad of gyration (minor axis) r =	5.13 cm	Overall breadth B =	203.6 mm
Modulus of elasticity E =	205.00 GPa	Moment of inertia Ix =	4570 cm^4
Elastic modulus Zx =	450 cm^3	Plastic modulus Sx =	497 cm^3
		Root radius r =	10.20 mm

Forces in beam

Moment = 71.78 kNm
Shear Force = 90.64 kN
Axial Force = 0.00 kN

Beam bearing design details

Restraint Condition Coef. Support A: 1.0 + 2 x D
Restraint Condition Coef. Support B: 1.0 + 2 x D

Classification of cross-section

Parameter ε = 0.880

Web d/t = 22.33
Web (d/t)/ε = 25.37 ≤ 80 Class 1 plastic

Flanges b/t = 9.25
Flanges (b/t)/ε = 10.51 ≤ 15 Class 3 semi-compact

Section is class 3 semi-compact

Shear capacity

Shear area Av = 1463.04 mm (Av = tD, UC section)
Web (d/t)/ε = 25.37 ≤ 70 (Web does not need to be checked for shear buckling)
Shear capacity Pv = 311.63 kN
Design shear force = 90.64 kN OK

Moment capacity

Design bending moment M= 71.78 kNm
Moment capacity low shear Mc = 159.75 kNm (Mc = py*Z) OK

Effective length for lateral-torsional buckling

Total Beam Span = 3750 mm
Effective length Le = 4156 mm
Slenderness ratio λ = 81.02

Equivalent slenderness

Buckling parameter u = 0.847
Torsional index x = 17.7
Slenderness factor v = 0.836
Ratio βw = 0.905 (Z/S)
Equivalent slenderness λLT = 54.59
Limiting slenderness λL0 = 30.20
λLT > λL0 (Allowance should be made for lateral-torsional buckling)

Bending strenght

Bending strenght ρb = 275.48 N/mm^2 (With Table 16)

Buckling resistance moment

Equivalent uniform moment factor mLT = 1.00 (Conservative approach)
Buckling resistance moment Mb = 123.97 kNm
Design bending moment = 71.78 kNm OK

Vertical dead & imposed load deflection

Limiting deflection = 12.500 mm (L/300; Brittle finishes)
Maximum deflection = 7.893 mm OK

Vertical imposed load deflection

Limiting deflection = 10.417 mm (L/360)
Maximum deflection = 1.783 mm OK

STEEL BEAM B1 = 203 x 203 x 46 UKC

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PROJECT No.	DATE	REV
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ENG.	CHD.	CHD.
PP	KJ	KJ

PROJECT
10 Trelawn, London E10 5QD

BEAM B1. **(Calculated For Loading Purposes Only)**

Beam Span L = 1.70 m

Load	Load Positioned from (m)	to (m)	Element Span/Height				
Roof (flat)	0.00	1.70	2.70 m	/	2.00	=	1.35 m
Timber floor (1st)	0.00	1.70	2.60 m	/	2.00	=	1.30 m
Ceiling	0.00	1.70	3.70 m	/	2.00	=	1.85 m
Roof (sloping)	0.00	1.70	2.15 m	/	2.00	=	1.08 m
215mm/Cavity Wall	0.00	1.70	3.20 m	/	1.00	=	3.20 m Avg, due to window opening
-	0.00	1.70	0.00 m				
-	0.00	1.70	0.00 m				

UDL LOADING

UDL Dead Loading

Beam Self Weight					0.46 kN/m	x	1.40	=	0.65 kN/m
Roof (flat)	1.00 kN/m2	x	1.35 m	=	1.35 kN/m	x	1.40	=	1.89 kN/m
Timber floor (1st)	1.10 kN/m2	x	1.30 m	=	1.43 kN/m	x	1.40	=	2.00 kN/m
Ceiling	0.45 kN/m2	x	1.85 m	=	0.83 kN/m	x	1.40	=	1.17 kN/m
Roof (sloping)	1.00 kN/m2	x	1.08 m	=	1.08 kN/m	x	1.40	=	1.51 kN/m
215mm/Cavity Wall	4.20 kN/m2	x	3.20 m	=	13.44 kN/m	x	1.40	=	18.82 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.40	=	0.00 kN/m
					18.59 kN/m				**26.02 kN/m**

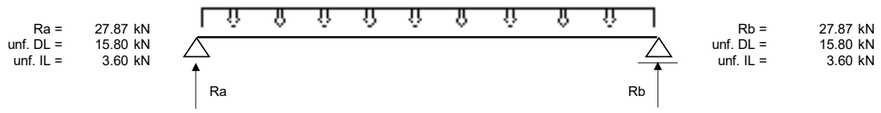
UDL Imposed Loading

Roof (flat)	0.75 kN/m2	x	1.35 m	=	1.01 kN/m	x	1.60	=	1.62 kN/m
Timber floor (1st)	1.50 kN/m2	x	1.30 m	=	1.95 kN/m	x	1.60	=	3.12 kN/m
Ceiling	0.25 kN/m2	x	1.85 m	=	0.46 kN/m	x	1.60	=	0.74 kN/m
Roof (sloping)	0.75 kN/m2	x	1.08 m	=	0.81 kN/m	x	1.60	=	1.29 kN/m
215mm/Cavity Wall	0.00 kN/m2	x	3.20 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
-	0.00 kN	/	0.00 m	=	0.00 kN/m	x	1.60	=	0.00 kN/m
					4.23 kN/m				**6.77 kN/m**

Point Load P1 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.40 = 0.00 kN
IL = 0.00 kN x 1.60 = 0.00 kN

Point Load P2 @ 0.00 m
From Beam = 1.00 x (MAX)
DL = 0.00 kN x 1.40 = 0.00 kN
IL = 0.00 kN x 1.60 = 0.00 kN

Point Load P3 @ 0.00 m
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.40 = 0.00 kN
IL = 0.00 kN x 1.60 = 0.00 kN



BEARING CHECK

Beam No	Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength γb*fk/γm N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
B1. (LHS):	B1.	27.87	Beam Connection										
B1. (RHS):	B1.	27.87	Beam Connection										

Beam Support Summary:
B1. (LHS): Provide Steel Beam/Column/Timber Post Connection
B1. (RHS): Provide Steel Beam/Column/Timber Post Connection
Refer To G.A. for more details.

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ENG.	CHD.	CHD.
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PROJECT
10 Trelawn, London E10 5QD

COLUMN C2 **DESIGN DUE TO BS 5950-1:2000**

Column Height, L = 3.35 m

SECTION 152 x 152 x 23 UKC S355 E = 205.00 kN/mm2
D = 152.4mm ; B = 152.2mm ; rx = 6.54cm ; ry = 3.70cm ; Ag = 29.2cm2 ; Ix = 1250cm4 ; Iy = 400cm4 ; Zx = 164cm3 ; Zy = 52.6cm3 ; u = 0.842 ; x = 20.6

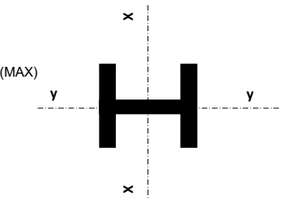
Major Axis x-x: Lex = 1.5 * L = 5.03 m Slenderness: λx = Lex / rx = 76.83 OK
Minor Axix y-y: Ley = 1.5 * L = 5.03 m Slenderness: λy = Ley / ry = 135.81 OK

Slenderness factor: v = 1/ [1 + 0.05 (λy /x)^2]^0.25 = 0.75
Equiv. Slenderness: λLT = u v λy √βw = 85.68

VERTICAL LOAD

From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN
IL = 0.00 kN
Eccentricity = B/2 = 76.10 mm

From Beam = 1.00 x B1.(RHS) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 15.80 kN
IL = 3.60 kN
Eccentricity = D/2 = 76.20 mm



From Beam = 1.00 x B1(LHS) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 48.66 kN
IL = 14.07 kN
Eccentricity = D/2 = -76.20 mm

From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN
IL = 0.00 kN
Eccentricity = B/2 = -76.10 mm

HORIZONTAL LOAD
Wind Load = 0.00 kN/m2
Area = 0.00 m2
Total Horizontal Load = 0.00 kN
Construction = Simply Supported
Wind Load Applied in = Major Axis (x-x)

DESIGN LOADING AND MOMENT **BS 5950 2.4.1.2**

Load Combination 1 1.4 DL + 1.6 IL			Load Combination 2 1.4 DL + 1.4 WL			Load Combination 3 1.2 DL + 1.2 IL + 1.2 WL		
Axial Force	=	118.52 kN	Axial Force	=	90.25 kN	Axial Force	=	98.56 kN
Shear Force	=	0.00 kN	Shear Force	=	0.00 kN	Shear Force	=	0.00 kN
Moment x-x	=	4.78 kNm	Moment x-x	=	3.51 kNm	Moment x-x	=	3.96 kNm
Moment y-y	=	0.00 kNm	Moment y-y	=	0.00 kNm	Moment y-y	=	0.00 kNm

Factored Forces			**Unfactored Forces**		
Max. Axial Force, Fc	=	118.52 kN	Max. Axial Force DL	=	64.46 kN
Max. Shear Force	=	0.00 kN	Max. Axial Force IL	=	17.67 kN
Max. Major Moment x-x, Mx	=	4.78 kNm	Max. Shear Force	=	0.00 kN
Max. Minor Moment y-y, My	=	0.00 kNm	Max Moment x-x	=	3.30 kNm
			Max Moment y-y	=	0.00 kNm

ALLOWABLE STRESSES

Design Strength of Steel	py	=	355.00 N/mm2	
Compressive Strength	pcy	=	87.00 N/mm2	(table 24, curve c)
Bending Strength	pb	=	175.00 N/mm2	(table 16 for I-sections, pb = py for SHS sections)

ACTUAL

Compression Resistance	Pcy = Ag * pcy	=	254.04 kN	
Moment Capacity (Major Axis)	Mc,x = py * Zx	=	58.22 kNm	
Moment Capacity (Minor Axis)	Mc,y = py * Zy	=	18.67 kNm	
Buckling Resistance Moment	Mb= pb * Zx	=	28.70 kNm	(For SHS Sections Mb = Mc,x)

SUMMARY

[1] Fc / Pcy	=	0.47	OK
[2] mLT * Mx / Mb ; mLT = 1.0	=	0.17	OK
[3] my * My / Mc,y ; my = 1.0	=	0.00	OK
[1] + [2] + [3] =	0.63	< 1.00	OK

DEFLECTIONS

Allowable Deflection	L/300	=	11.17 mm	
Moment from vertical loads: x-x	M	=	3.30 kNm	
Vertical loads max deflection: x-x	M*L^2 / 16EI	=	0.90 mm	
Moment from vertical loads: y-y	M	=	0.00 kNm	
Vertical loads max deflection: y-y	M*L^2 / 16EI	=	0.00 mm	
Wind load Horizontal force	H	=	0.00 kN	
Wind loads maximum deflection	H * L^3 / 48EI	=	0.00 mm	
Max Deflection		=	0.90 mm	OK

STEEL COLUMN C2 = 152 x 152 x 23 UKC (S355)

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	K-25-02-80-C01	24.02.25	0
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	PROJECT		
	10 Trelawn, London E10 5QD		

LOADS ACTING ON THE FOOTING (BELOW COLUMN C1)

Load	Load Positioned from (m)	to (m)	Element Span/Height				
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m				
-	0.00	1.00	0.00 m				

UDL LOADING

UDL Dead Loading

Selfweight	24.00	kN/m3	x	0.10	m2	=	2.43 kN/m	x 1.00 =	2.43 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
							2.43 kN/m		**2.43 kN/m**

UDL Imposed Loading

-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
							0.00 kN/m		**0.00 kN/m**

Point Load P1

From Beam	=	1.00 x B1.(LHS) + 1.00 x (MAX) + 1.00 x (MAX)						
DL	=	15.80 kN	x	1.00	=	15.80 kN		
IL	=	3.60 kN	x	1.00	=	3.60 kN	SUM:	19.40 kN

Point Load P2

From Beam	=	1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)						
DL	=	0.00 kN	x	1.00	=	0.00 kN		
IL	=	0.00 kN	x	1.00	=	0.00 kN	SUM:	0.00 kN

DESIGN FORCES

STRIP FOOTING OPTION

Vertical Force	N	=	20.85 kN	1*B1. (LHS)+UDL*Load Dispersion Length

PAD FOUNDATION OPTION

Vertical Force	Pz	=	19.40 kN	1*B1. (LHS)+UDL*Pad Dimension
Horizontal Force in x direction	Fx	=	0.00 kN	
Horizontal Force in y direction	Fy	=	0.00 kN	
Major axis moment x-x	Mxx	=	0.00 kNm	
Major axis moment y-y	Myy	=	0.00 kNm	
Eccentricity x-x	ex	=	225.00 mm	
Eccentricity y-y	ey	=	0.00 mm	

Allowable Bearing Capacity of Soil = 100.00 kN/m2

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	10 Trelawn, London E10 5QD		

LOCATION: COLUMN C1
STRIP FOOTING OPTION

Plan Area Required	N/Allowable Bearing Capacity of Soil	=	0.21 m2	
Minimum Footing Width	W	=	0.45 m	
Minimum Footing Depth	D	=	0.60 m	
Plan Area Provided	W*(D)	=	0.27 m2	
Plan Area Required	**<**	**Plan Area Provided**	Satisfactory	(0.77)

BEARING CHECK BELOW COLUMN C1 PADSTONE @ GROUND FLOOR LEVEL

Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength γb*fk/γm N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
				1.25xfk/3.5								
C1	27.87	Ex. Historic Brick	2.25	0.80	-	-	-	300	215	0	0.43	Satisfactory

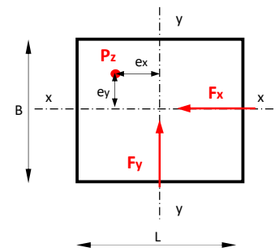
COLUMN C1 Padstone Summary:
Provide MIN 300x(Wall Width)x215 Concrete Padstone

STRIP FOOTINGS ARE SATISFACTORY IF BELOW CRITERIA ARE FULFILLED:
- DISTANCE MEASURED FROM BASEPLATE TO UNDERSIDE OF FOOTING LEVEL IS NOT LESS THAN 0.60m
- FOOTING WIDTH IS NOT LESS THAN 0.45m; FOOTING THICKNESS IS NOT LESS THAN 0.225m FOR NEW STRIP FOOTING

PAD FOUNDATION OPTION

FOUNDATION DIMENSIONS

Length of Pad Footing	L	=	0.80 m	
Width of Pad Footing	B	=	0.80 m	
Depth of Pad Footing	H	=	0.30 m	
Pad Foundation Selfweight	Sf	=	7.20 kN/m2	
Area of Pad Foundation	A=L*B	=	0.64 m2	
Bearing Pressure	(Pz+Sf)/A	=	37.51 kN/m2	Satisfactory



CHECK STABILITY AGAINST OVERTURNING IN X-DIRECTION

Total Overturning Moment	Mox=Myy+Fx*H	=	0.00 kNm	
Total Restoring Moment	Mrx=Pz*(L/2-ex)+Sf*A*L/2	=	5.24 kNm	
Overturning Safety Factor	FOS=Mrx/Mox	=	Correct	

CHECK STABILITY AGAINST OVERTURNING IN Y-DIRECTION

Total Overturning Moment	Moy=Mxx+Fy*H	=	0.00 kNm	
Total Restoring Moment	Mry=Pz*(B/2-ey)+Sf*A*B/2	=	9.60 kNm	
Overturning Safety Factor	FOS=Mry/Moy	=	Correct	

PAD FOUNDATION BASE REACTIONS AND BASE PRESSURES IN X-DIRECTION

Total Pad Base Reaction	T=Pz+Sf*A	=	24.00 kN		
Total Pad Base Moment	Mbx=Myy+Pz*ex+Fx*H	=	4.36 kNm		
Maximum Base Pressure	qxmax=T/A+6*Mbx/(B*L*L)	=	88.65 kN/m2	Satisfactory	(0.89)
Minimum Base Pressure	qxmin=T/A-6*Mbx/(B*L*L)	=	-13.64 kN/m2	Uplift	

PAD FOUNDATION BASE REACTIONS AND BASE PRESSURES IN Y-DIRECTION

Total Pad Base Reaction	T=Pz+Sf*A	=	24.00 kN		
Total Pad Base Moment	Mby=Mxx+Pz*ey+Fy*H	=	0.00 kNm		
Maximum Base Pressure	qymax=T/A+6*Mby/(L*B*B)	=	37.51 kN/m2	Satisfactory	(0.38)
Minimum Base Pressure	qymin=T/A-6*Mby/(L*B*B)	=	37.51 kN/m2	Satisfactory	(0.38)

CHECK PAD BASE REACTION ECCENTRICITY AND BEARING PRESSURE IN X-DIRECTION

Half of base	l=L/2	=	0.40 m		
Middle Third of Base	tx=L/6	=	0.13 m		
Eccentricity of Base Reaction	ebx=Mbx/T	=	0.18 m	Outside Middle Third of Base	
				Need to Check Critical Edge Pressure	

CRITICAL EDGE PRESSURE IN X-DIRECTION

Length of Base in Contact	Le=3*(l-ebx)	=	0.65 m		
Critical Bearing Pressure	Qx=2*T/(B*Le)	**=**	**91.68 kN/m2**	Satisfactory	(0.92)

CHECK PAD BASE REACTION ECCENTRICITY AND BEARING PRESSURE IN Y-DIRECTION

Half of base	b=B/2	=	0.40 m		
Middle Third of Base	ty=B/6	=	0.13 m		
Eccentricity of Base Reaction	eby=Mby/T	=	0.00 m	Within Middle Third of Base	
Bearing Pressure	Qy=qymax	**=**	**37.51 kN/m2**	Satisfactory	(0.38)

PROVIDE 0.80m x 0.80m PAD FOOTING WITH 0.30m PAD THICKNESS
AND 2No A393 MESH (1 TOP & 1 BOTTOM)

goplans

PROJECT No.	DATE	REV
K-25-02-80-C01	24.02.25	0
ENG.	CHD.	CHD.
PP	KJ	KJ

PROJECT
10 Trelawn, London E10 5QD

LOADS ACTING ON THE FOOTING (BELOW COLUMN C2)

Load	Load Positioned from (m)	to (m)	Element Span/Height				
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m				
-	0.00	1.00	0.00 m				

UDL LOADING
UDL Dead Loading

Selfweight	24.00	kN/m3	x	0.10	m2	=	2.43 kN/m	x	1.00	=	2.43 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
							2.43 kN/m				**2.43 kN/m**

UDL Imposed Loading

-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x	1.00	=	0.00 kN/m
							0.00 kN/m				**0.00 kN/m**

Point Load P1
From Beam = 1.00 x B1.(RHS) + 1.00 x B1(LHS) + 1.00 x (MAX)
DL = 64.46 kN x 1.00 = 64.46 kN
IL = 17.67 kN x 1.00 = 17.67 kN SUM: 82.13 kN

Point Load P2
From Beam = 1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)
DL = 0.00 kN x 1.00 = 0.00 kN
IL = 0.00 kN x 1.00 = 0.00 kN SUM: 0.00 kN

DESIGN FORCES

STRIP FOOTING OPTION

Vertical Force	N	=	86.99 kN	1*B1. (RHS) +1*B1 (LHS)+UDL*Load Dispersion Length

PAD FOUNDATION OPTION

Vertical Force	Pz	=	82.13 kN	1*B1. (RHS) +1*B1 (LHS)+UDL*Pad Dimension
Horizontal Force in x direction	Fx	=	0.00 kN	
Horizontal Force in y direction	Fy	=	0.00 kN	
Major axis moment x-x	Mxx	=	0.00 kNm	
Major axis moment y-y	Myy	=	0.00 kNm	
Eccentricity x-x	ex	=	0.00 mm	
Eccentricity y-y	ey	=	0.00 mm	

Allowable Bearing Capacity of Soil = 100.00 kN/m2

goplans

PROJECT No.	DATE	REV
K-25-02-80-C01	24.02.25	0
ENG.	CHD.	CHD.
PP	KJ	KJ

PROJECT
10 Trelawn, London E10 5QD

LOCATION: COLUMN C2
STRIP FOOTING OPTION

Plan Area Required	N/Allowable Bearing Capacity of Soil	=	0.87	m2
Minimum Footing Width	W	=	0.45	m
Minimum Footing Depth	D	=	1.00	m
Plan Area Provided	W*(2*D)	=	0.90	m2

Plan Area Required < Plan Area Provided Satisfactory (0.97)

BEARING CHECK BELOW COLUMN C2 PADSTONE @ GROUND FLOOR LEVEL

Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength γb*fk/γm N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
				1.25xfk/3.5								
C2	118.52	Ex. Historic Brick	2.25	0.80	-	-	-	700	215	0	0.79	Satisfactory

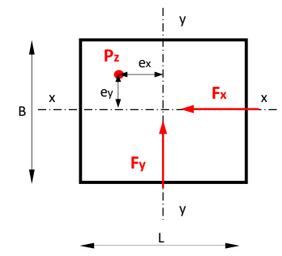
COLUMN C2 Padstone Summary:
Provide MIN 700x(Wall Width)x300 Concrete Padstone

STRIP FOOTINGS ARE SATISFACTORY IF BELOW CRITERIA ARE FULFILLED:
- DISTANCE MEASURED FROM BASEPLATE TO UNDERSIDE OF FOOTING LEVEL IS NOT LESS THAN 1.00m
- FOOTING WIDTH IS NOT LESS THAN 0.45m; FOOTING THICKNESS IS NOT LESS THAN 0.225m FOR NEW STRIP FOOTING

PAD FOUNDATION OPTION

FOUNDATION DIMENSIONS

Length of Pad Footing	L	=	1.00	m
Width of Pad Footing	B	=	1.00	m
Depth of Pad Footing	H	=	0.40	m
Pad Foundation Selfweight	Sf	=	9.60	kN/m2
Area of Pad Foundation	A=L*B	=	1.00	m2
Bearing Pressure	(Pz+Sf)/A	=	91.73 kN/m2	Satisfactory



CHECK STABILITY AGAINST OVERTURNING IN X-DIRECTION

Total Overturning Moment	Mox=Myy+Fx*H	=	0.00	kNm
Total Restoring Moment	Mrx=Pz*(L/2-ex)+Sf*A*L/2	=	45.87	kNm
Overturning Safety Factor	FOS=Mrx/Mox	=	Correct	

CHECK STABILITY AGAINST OVERTURNING IN Y-DIRECTION

Total Overturning Moment	Moy=Mxx+Fy*H	=	0.00	kNm
Total Restoring Moment	Mry=Pz*(B/2-ey)+Sf*A*B/2	=	45.87	kNm
Overturning Safety Factor	FOS=Mry/Moy	=	Correct	

PAD FOUNDATION BASE REACTIONS AND BASE PRESSURES IN X-DIRECTION

Total Pad Base Reaction	T=Pz+Sf*A	=	91.73 kN		
Total Pad Base Moment	Mbx=Myy+Pz*ex+Fx*H	=	0.00 kNm		
Maximum Base Pressure	qxmax=T/A+6*Mbx/(B*L*L)	=	91.73 kN/m2	Satisfactory	(0.92)
Minimum Base Pressure	qxmin=T/A-6*Mbx/(B*L*L)	=	91.73 kN/m2	Satisfactory	(0.92)

PAD FOUNDATION BASE REACTIONS AND BASE PRESSURES IN Y-DIRECTION

Total Pad Base Reaction	T=Pz+Sf*A	=	91.73 kN		
Total Pad Base Moment	Mby=Mxx+Pz*ey+Fy*H	=	0.00 kNm		
Maximum Base Pressure	qymax=T/A+6*Mby/(L*B*B)	=	91.73 kN/m2	Satisfactory	(0.92)
Minimum Base Pressure	qymin=T/A-6*Mby/(L*B*B)	=	91.73 kN/m2	Satisfactory	(0.92)

CHECK PAD BASE REACTION ECCENTRICITY AND BEARING PRESSURE IN X-DIRECTION

Half of base	l=L/2	=	0.50	m	
Middle Third of Base	tx=L/6	=	0.17	m	
Eccentricity of Base Reaction	ebx=Mbx/T	=	0.00	m	Within Middle Third of Base
Bearing Pressure	Qx=qxmax	**=**	**91.73 kN/m2**	Satisfactory	(0.92)

CHECK PAD BASE REACTION ECCENTRICITY AND BEARING PRESSURE IN Y-DIRECTION

Half of base	b=B/2	=	0.50	m	
Middle Third of Base	ty=B/6	=	0.17	m	
Eccentricity of Base Reaction	eby=Mby/T	=	0.00	m	Within Middle Third of Base
Bearing Pressure	Qy=qymax	**=**	**91.73 kN/m2**	Satisfactory	(0.92)

PROVIDE 1.00m x 1.00m PAD FOOTING WITH 0.40m PAD THICKNESS
AND 3No A393 MESH (1 TOP & 2 BOTTOM)

goplans	PROJECT No.	DATE	REV
	K-25-02-80-C01	24.02.25	0
	ENG.	CHD.	CHD.
	PP	KJ	KJ
	PROJECT		
	10 Trelawn, London E10 5QD		

LOADS ACTING ON THE FOOTING (BELOW COLUMN C3)

Load	Load Positioned from (m)	to (m)	Element Span/Height				
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m	/	1.00	=	0.00 m
-	0.00	1.00	0.00 m				
-	0.00	1.00	0.00 m				

UDL LOADING

UDL Dead Loading

Selfweight	24.00	kN/m3	x	0.10	m2	=	2.43 kN/m	x 1.00 =	2.43 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
							2.43 kN/m		**2.43 kN/m**

UDL Imposed Loading

-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN/m2	x	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
-	0.00	kN	/	0.00	m	=	0.00 kN/m	x 1.00 =	0.00 kN/m
							0.00 kN/m		**0.00 kN/m**

Point Load P1

From Beam	=	1.00 x B1(RHS) + 1.00 x (MAX) + 1.00 x (MAX)						
DL	=	37.56 kN	x	1.00	=	37.56 kN		
IL	=	10.67 kN	x	1.00	=	10.67 kN	SUM:	48.22 kN

Point Load P2

From Beam	=	1.00 x (MAX) + 1.00 x (MAX) + 1.00 x (MAX)						
DL	=	0.00 kN	x	1.00	=	0.00 kN		
IL	=	0.00 kN	x	1.00	=	0.00 kN	SUM:	0.00 kN

DESIGN FORCES

STRIP FOOTING OPTION

Vertical Force	N	=	51.14 kN	1*B1 (RHS)+UDL*Load Dispersion Length

PAD FOUNDATION OPTION

Vertical Force	Pz	=	48.22 kN	1*B1 (RHS)+UDL*Pad Dimension
Horizontal Force in x direction	Fx	=	0.00 kN	
Horizontal Force in y direction	Fy	=	0.00 kN	
Major axis moment x-x	Mxx	=	0.00 kNm	
Major axis moment y-y	Myy	=	0.00 kNm	
Eccentricity x-x	ex	=	517.50 mm	
Eccentricity y-y	ey	=	0.00 mm	

Allowable Bearing Capacity of Soil = 100.00 kN/m2

goplans	PROJECT No.	DATE	REV
	K-25-02-80-C01	24.02.25	0
	ENG.	CHD.	CHD.
	PP	KJ	KJ
	PROJECT		
	10 Trelawn, London E10 5QD		

LOCATION: COLUMN C3
STRIP FOOTING OPTION

Plan Area Required	N/Allowable Bearing Capacity of Soil	=	0.51 m2	
Minimum Footing Width	W	=	0.45 m	
Minimum Footing Depth	D	=	1.20 m	
Plan Area Provided	W*(D)	=	0.54 m2	

Plan Area Required < Plan Area Provided Satisfactory (0.95)

BEARING CHECK BELOW COLUMN C3 PADSTONE @ GROUND FLOOR LEVEL

	Total Vertical Load From	kN	Type of Support	Charact. Compr. Strength fk, N/mm2	Local Strength γb*fk/γm N/mm2	Bearing Length mm	Bearing Width mm	Stress Below Bearing N/mm2	Padstone Length mm	Padstone Width mm	Ecc mm	Stress Below Padstone N/mm2	Summary
					1.25xfk/3.5								
C3	69.64		Ex. Historic Brick	2.25	0.80	-	-	-	440	215	0	0.74	Satisfactory

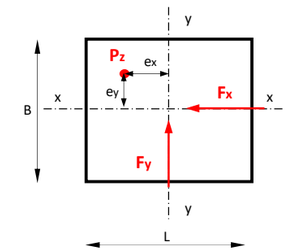
COLUMN C3 Padstone Summary:
Provide MIN 440x(Wall Width)x215 Concrete Padstone

STRIP FOOTINGS ARE SATISFACTORY IF BELOW CRITERIA ARE FULFILLED:
- DISTANCE MEASURED FROM BASEPLATE TO UNDERSIDE OF FOOTING LEVEL IS NOT LESS THAN 1.20m
- FOOTING WIDTH IS NOT LESS THAN 0.45m; FOOTING THICKNESS IS NOT LESS THAN 0.225m FOR NEW STRIP FOOTING

PAD FOUNDATION OPTION

FOUNDATION DIMENSIONS

Length of Pad Footing	L	=	1.40 m	
Width of Pad Footing	B	=	1.40 m	
Depth of Pad Footing	H	=	0.60 m	
Pad Foundation Selfweight	Sf	=	14.40 kN/m2	
Area of Pad Foundation	A=L*B	=	1.96 m2	
Bearing Pressure	(Pz+Sf)/A	=	39.00 kN/m2	Satisfactory



CHECK STABILITY AGAINST OVERTURNING IN X-DIRECTION

Total Overturning Moment	Mox=Moy+Fx*H	=	0.00 kNm	
Total Restoring Moment	Mrx=Pz*(L/2-ex)+Sf*A*L/2	=	28.56 kNm	
Overturning Safety Factor	FOS=Mrx/Mox	=	Correct	

CHECK STABILITY AGAINST OVERTURNING IN Y-DIRECTION

Total Overturning Moment	Moy=Mxx+Fy*H	=	0.00 kNm	
Total Restoring Moment	Mry=Pz*(B/2-ey)+Sf*A*B/2	=	53.51 kNm	
Overturning Safety Factor	FOS=Mry/Moy	=	Correct	

PAD FOUNDATION BASE REACTIONS AND BASE PRESSURES IN X-DIRECTION

Total Pad Base Reaction	T=Pz+Sf*A	=	76.45 kN		
Total Pad Base Moment	Mbx=Myy+Pz*ex+Fx*H	=	24.96 kNm		
Maximum Base Pressure	qxmax=T/A+6*Mbx/(B*L*L)	=	93.57 kN/m2	Satisfactory	(0.94)
Minimum Base Pressure	qxmin=T/A-6*Mbx/(B*L*L)	=	-15.56 kN/m2	Uplift	

PAD FOUNDATION BASE REACTIONS AND BASE PRESSURES IN Y-DIRECTION

Total Pad Base Reaction	T=Pz+Sf*A	=	76.45 kN		
Total Pad Base Moment	Mby=Mxx+Pz*ey+Fy*H	=	0.00 kNm		
Maximum Base Pressure	qymax=T/A+6*Mby/(L*B*B)	=	39.00 kN/m2	Satisfactory	(0.39)
Minimum Base Pressure	qymin=T/A-6*Mby/(L*B*B)	=	39.00 kN/m2	Satisfactory	(0.39)

CHECK PAD BASE REACTION ECCENTRICITY AND BEARING PRESSURE IN X-DIRECTION

Half of base	l=L/2	=	0.70 m		
Middle Third of Base	tx=L/6	=	0.23 m		
Eccentricity of Base Reaction	ebx=Mbx/T	=	0.33 m	Outside Middle Third of Base	
				Need to Check Critical Edge Pressure	

CRITICAL EDGE PRESSURE IN X-DIRECTION

Length of Base in Contact	Le=3*(l-ebx)	=	1.12 m		
Critical Bearing Pressure	Qx=2*T/(B*Le)	**=**	**97.45 kN/m2**	Satisfactory	(0.97)

CHECK PAD BASE REACTION ECCENTRICITY AND BEARING PRESSURE IN Y-DIRECTION

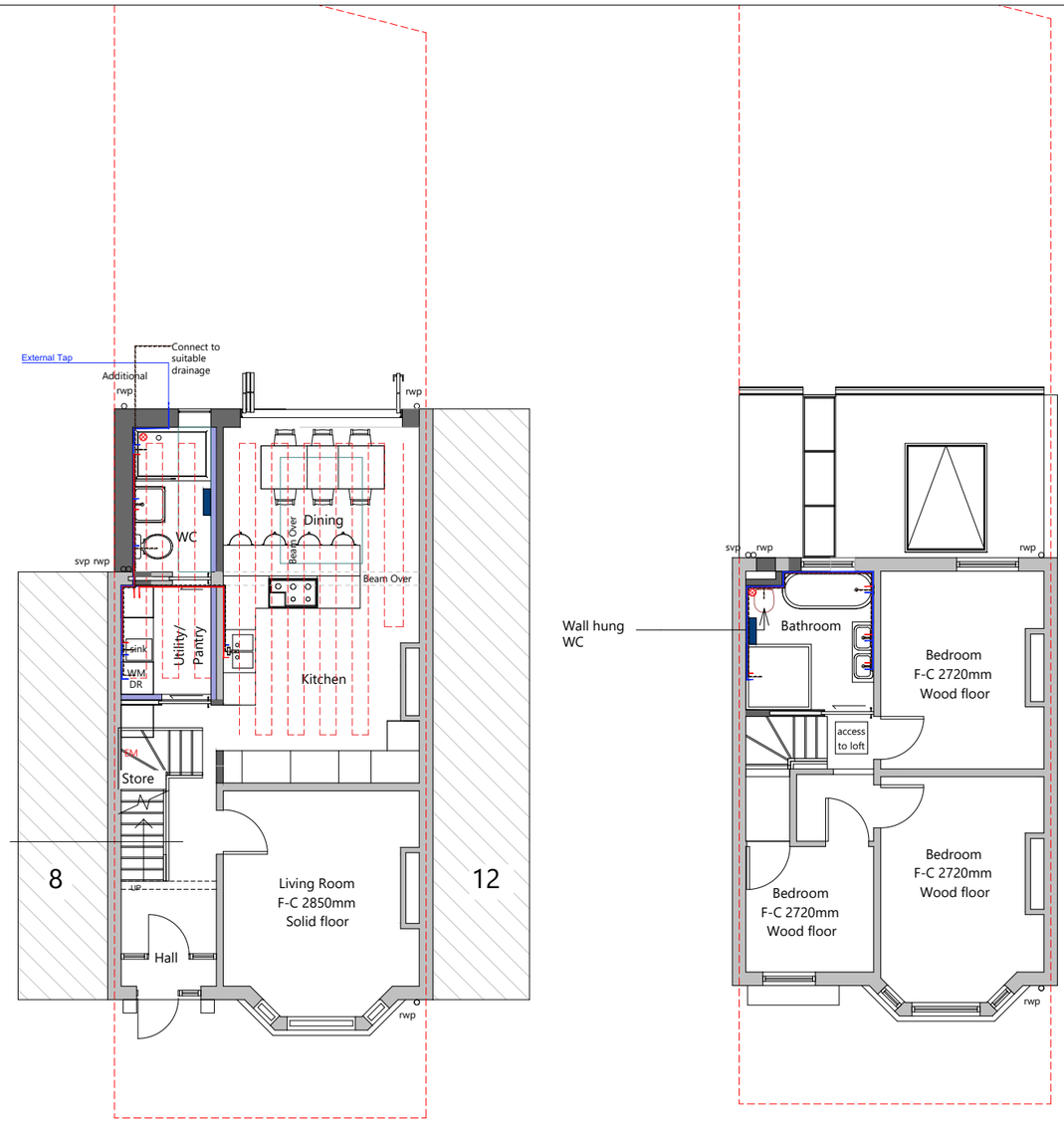
Half of base	b=B/2	=	0.70 m		
Middle Third of Base	ty=B/6	=	0.23 m		
Eccentricity of Base Reaction	eby=Mby/T	=	0.00 m	Within Middle Third of Base	
Bearing Pressure	Qy=qymax	**=**	**39.00 kN/m2**	Satisfactory	(0.39)

PROVIDE 1.40m x 1.40m PAD FOOTING WITH 0.60m PAD THICKNESS
AND 3No A393 MESH (1 TOP & 2 BOTTOM)

PROJECT ADDRESS

M&E PLANS

PLUMBING PLAN



EXISTING SEWER

PROPOSED SEWER

HOT WATER

COLD WATER

EXISTING RADIATOR

NEW RADIATOR

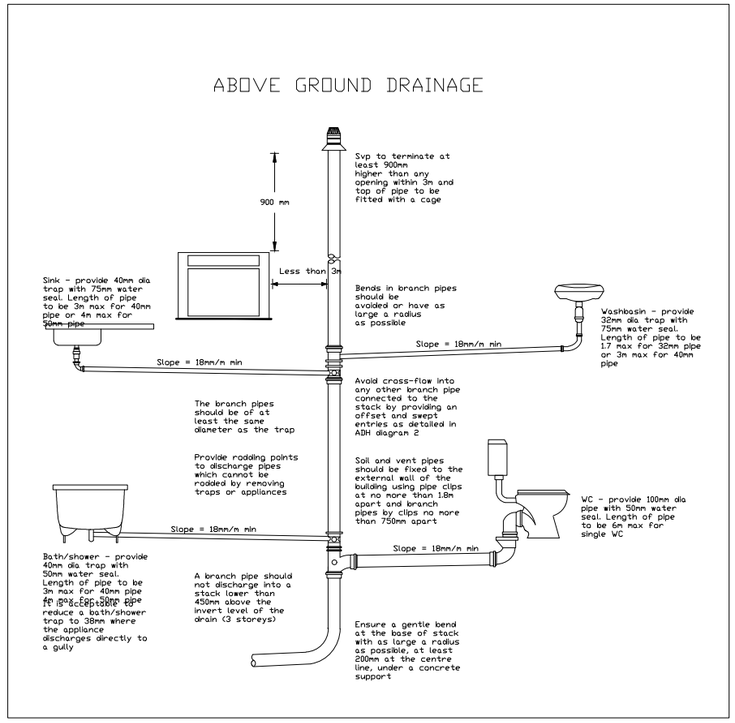
NEW TOWEL RAIL

MECHANICAL EXTRACTION UNIT

UNDERFLOOR HEATING

New Radiator BTU calculation to be carried out by heating engineer

Final positioning to be adjusted accordingly with the existing, new furniture and in conjuction with the manufacturers specifications.



LINEAR SCALE 1:50 & 1:100

0 1 2 3 4 5m 1:50
0 1 2 3 4 5 6 7 8 9 10m 1:100

Site address	10 Trelawn, London, E10 5QD	project details	M & E	revision No.	B		
		drawn by	SB	drawing type	SOW		
		date	Mar 03	drawing no	MEC 01 - 10 TR - B	1:100 @ A3 page	
		checked by	O.P.N	client ref			

Go Plans
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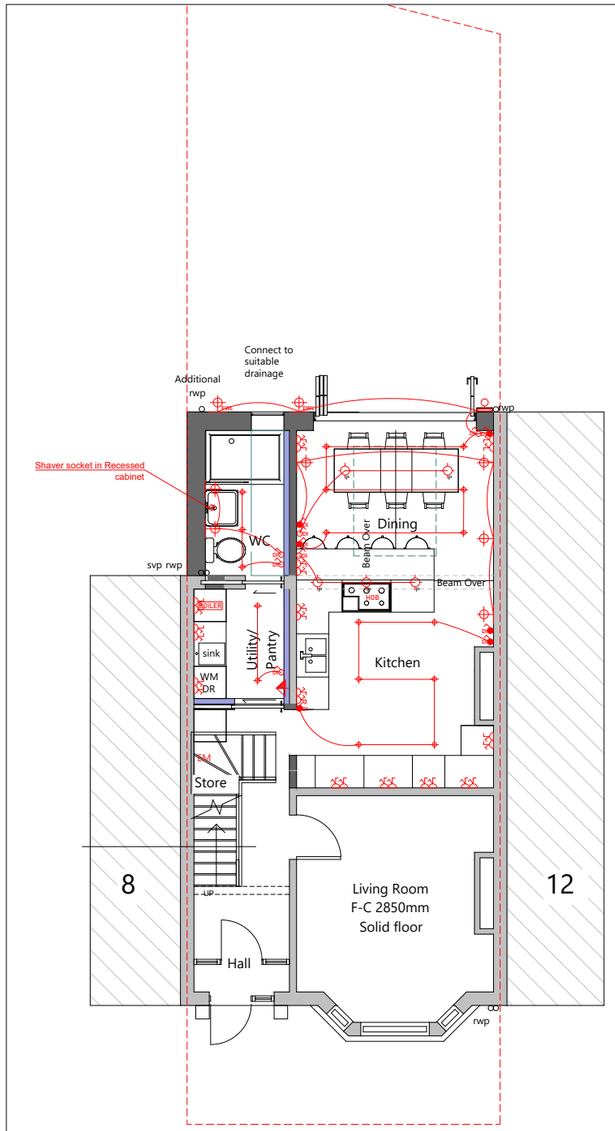
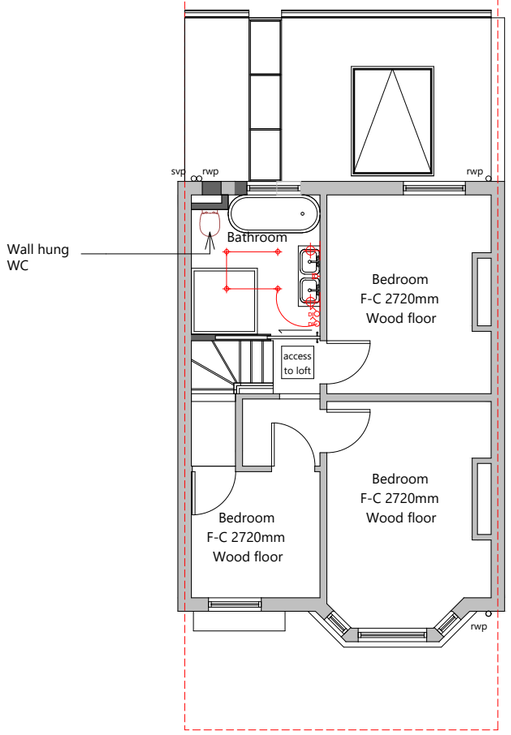
ELECTRICAL PLAN





ELECTRICAL
All electrical work required to meet the requirements of Part P (electrical safety) must be designed, installed, inspected and tested by a competent person registered under a competent person self certification scheme such as BRE certification Ltd, BSI, NICEIC Certification Services or Zurich Ltd. An appropriate BS7671 Electrical Installation Certificate is to be issued for the work by a person competent to do so. A copy of a certificate will be given to Building Control on completion.

INTERNAL LIGHTING
Install low energy light fittings that only take lamps having a luminous efficiency greater than 45 lumens per circuit watt and a total output greater than 400 lamp lumens. Not less than three energy efficient light fittings per four of all the light fittings in the main dwelling spaces to comply with Part L of the current Building Regulations and the Domestic Building Services Compliance Guide.

	2 GANG SWITCHED-SOCKET OUTLETS KITCHEN - SOCKET/SWITCH IN WALL AT NORMAL HEIGHT DINING - SOCKET/SWITCH IN WALL AT BENCH HEIGHT
	SHAVER ONLY SOCKET
D	DIMMABLE MULTIPLE WAY SWITCH
D	DIMMABLE 1 WAY SWITCH
	SPOTLIGHT
	WALL SCONCE LIGHT
P	PENDANT LIGHT
WL	EXTERNAL WALL LIGHT
	EXTRACTOR FAN
HOOD	ELECTRIC HOOD
HOB	ELECTRIC HOB
BOILER	ELECTRIC BOILER
EM	ELECTRIC METER
	Electrical Circuit Box - for future use. EWL above
	UTILITY - SOCKET/SWITCH IN WALL ABOVE SKIRTING LEVEL. DIMMABLE 1 WAY SWITCH TO BE PLACED DIRECTLY ABOVE, AT NORMAL HEIGHT.

LINEAR SCALE 1:50 & 1:100

0 1 2 3 4 5m 1:50
0 1 2 3 4 5 6 7 8 9 10m 1:100

Site address	10 Trelawn, London, E10 5QD	project details	M & E	revision No.	C		
		drawn by	SB	drawing type	SOW		
		date	Mar 04	drawing no	EL 01 - 10 TR - C	1:100 @ A3 page	
		checked by	O.P.N	client ref			

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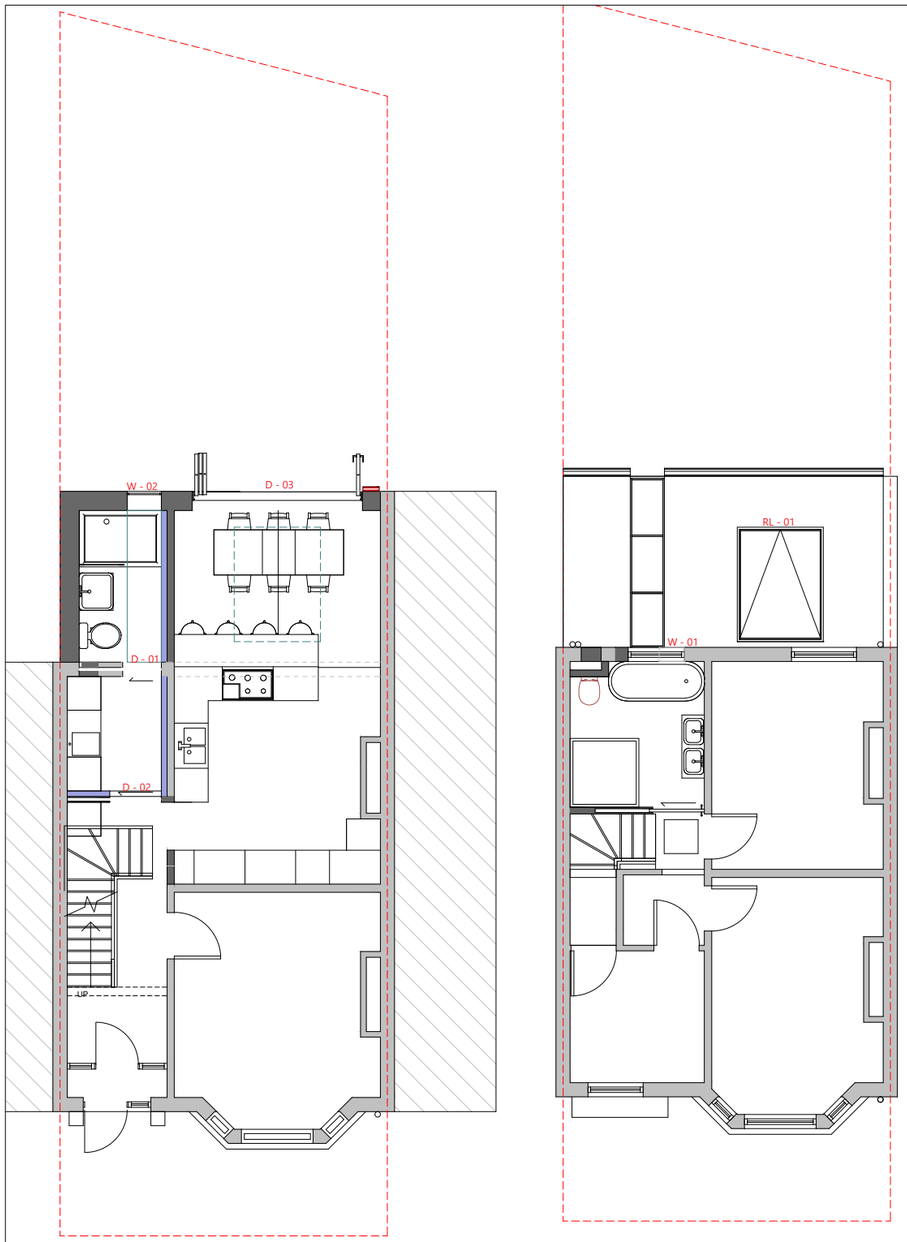
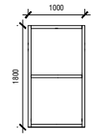
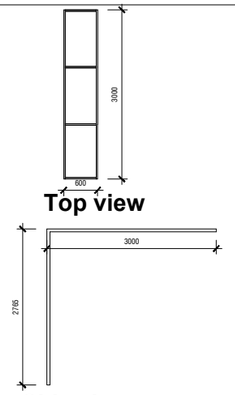
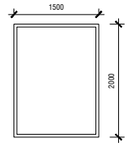
DOOR & WINDOW PLAN



Proposed Windows Schedule

Scale - 1: 100

(Final Measurements TBC On Site)

W - 01	W - 02	RL - 01
 Plan view  Elevation view	 Plan view  Rear view  Top view Side view	
Quantity x 01	Quantity x 01	Quantity x 01
New External Glass Window	New External Glass Window	New Rooflight
Window Size - 1000mm x 1800mm Style and color TBC with SOW	Style and color TBC with SOW	

LINEAR SCALE 1:50 & 1:100

5m 1:50
10m1:100

Site address	10 Trelawn, London, E10 5QD	project details	DaW	revision No.	A		
		drawn by	SB	drawing type	SOW		
		date	Mar 14	drawing no	EL 01 - 10 TR - A	1:100 @ A3 page	
		checked by	O.P.N	client ref		This drawing is protected under copyright	

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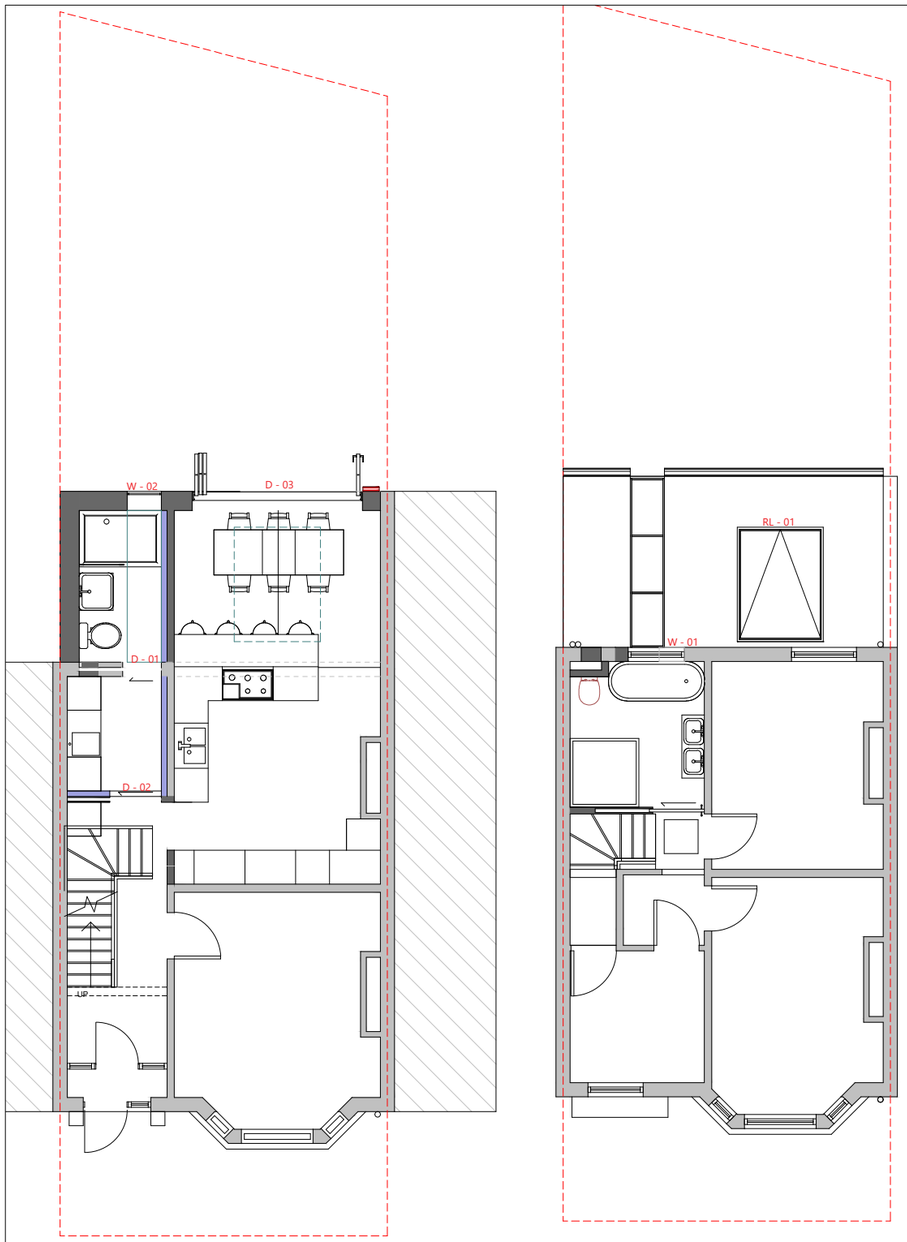
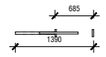
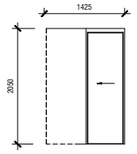
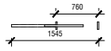
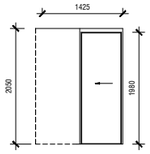
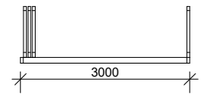
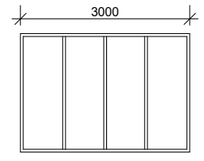
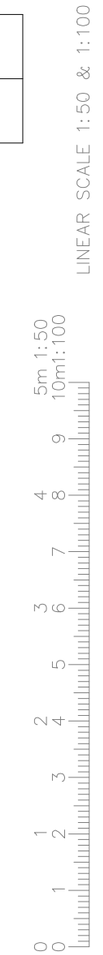


Proposed Doors Schedule Scale - 1: 100 (Final Measurements TBC On Site)

(Fire Rated Door TBC On Site With Building Regulation)

D - 01	D - 02	D - 03
 Plan view  Elevation view	 Plan view  Elevation view	 Plan view  Elevation view
Quantity x 01 New Internal Single Panel Pocket Door Door Size - 686mm x 1981mm Clear Opening - 635mm x 1970mm Structural Opening - 1390mm x 2050mm Style and color TBC with SOW	Quantity x 01 New Internal Single Panel Pocket Door Door Size - 762mm x 1981mm Clear Opening - 711mm x 1970mm Structural Opening - 1545mm x 2050mm Style and color TBC with SOW	Quantity x 01 New External Bi - Fold Door Structural Opening - 3000mm x 2100mm Style and color TBC with SOW



Site address	10 Trelawn, London, E10 5QD	project details	DaW	revision No.	A		
		drawn by	SB	drawing type	SOW		
		date	Mar 14	drawing no	EL 01 - 10 TR - A	1:100 @ A3 page	
		checked by	O.P.N	client ref			

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FIXTURES, FITTINGS & FINISHES

GROUND FLOOR

GF Kitchen/Dining Room

GF Utility Room

GF Bathroom

KITCHEN/DINING ROOM

PRODUCT	PRODUCT NAME	PRODUCT LINK	BUILDER SUPPLY?
	**InfiniGlide6 Sliding Doors**	https://www.finepoint.glass/aluminium-sliding-doors-london/#infiniglide-6	YES
	**COR Vision Plus Sliding(alternative door option)**	https://www.cortizo.com/en/sistemas/quenecesitas/grandes_dimensiones/93/cor-vision-plus-sliding.html	YES
	**Double Socket with USB-C Fast Charge**	https://www.corston.com/products/double-socket-with-usb-c-fast-charge-antique-brass-white	NO
	**Antique Brass triple dimmer switch**	https://www.dowsingandreynolds.com/shop/antique-brass-triple-dimmer-switch/	NO
LIGHTING	**LED downlights (white), task lighting (pendants) over kitchen peninsula & dining table and wall sconces**		NO
HEATING	**Underfloor Heating**		N/A
	**Victorian 1 MDF Skirting Board**	https://mdfskirtingworld.co.uk/victorian-1-mdf-skirting-board/	YES
	**Victorian 1 MDF Architrave**	https://mdfskirtingworld.co.uk/victorian-1-mdf-architrave/	YES

KITCHEN/DINING ROOM

PRODUCT	PRODUCT DESCRIPTION	PRODUCT LINK	BUILDER SUPPLY?
	**Sandbank Engineered Wooden Floor (Plank Style)**	https://www.tedtodd.co.uk/product/sandbank/	NO
WALLS	**Plasterboard & skimmed**		YES
CEILING	**Plasterboard & skimmed**		YES
CABINETRY	**No cabinets (we will source via family)**		N/A

UTILITY ROOM

PRODUCT	PRODUCT DESCRIPTION	PRODUCT LINK	BUILDER SUPPLY?
DOORS	**Pocket Door**		YES
	**Regent Recessed Small Pull**	https://www.corston.com/products/regent-recessed-small-pull-antique-brass	NO
	**Double Socket with USB-C Fast Charge**	https://www.corston.com/products/double-socket-with-usb-c-fast-charge-antique-brass-white	NO
	**Antique Brass double dimmer switch**	https://www.dowsingandreynolds.com/shop/antique-brass-double-dimmer-switch/	NO
	**Calla - 2 light Calacatta marble and aged brass wall light**	https://lightsandlamps.com/products/calla-2-light-calacatta-marble-and-aged-brass-wall-light	NO
LIGHTING	**LED Downlights**		YES
HEATING	**Underfloor Heating**		N/A
FLOORING	**TBC**		

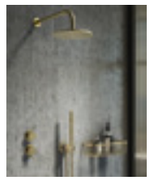
UTILITY ROOM

PRODUCT	PRODUCT DESCRIPTION	PRODUCT LINK	BUILDER SUPPLY?
	**Victorian 1 MDF Skirting Board**	https://mdfskirtingworld.co.uk/victorian-1-mdf-skirting-board/	YES
	**Victorian 1 MDF Architrave**	https://mdfskirtingworld.co.uk/victorian-1-mdf-architrave/	YES
FLOORING	**Calacatta Amber Honed Marble**	https://www.mandarinstone.com/product/calacatta-amber-honed-marble/	NO
WALLS	**Plasterboard & skimmed**		YES
CEILING	**Plasterboard & skimmed**		YES
CABINETRY	**No cabinets**		N/A

BATHROOM

PRODUCT	PRODUCT DESCRIPTION	PRODUCT LINK	BUILDER SUPPLY?
DOORS	**Pocket door with lock**		YES
	**Regent Recessed Small Pull**	https://www.corston.com/products/regent-recessed-small-pull-antique-brass	NO
	**Regent Recessed Thumbturn**	https://www.corston.com/products/regent-recessed-thumbturn-antique-brass	NO
	**50mm Hook Lock**	https://www.corston.com/products/50mm-hook-lock-antique-brass	NO
	**Shaver Socket**	https://www.corston.com/products/shaver-socket-antique-brass-white	NO
	**Antique Brass double dimmer switch**	https://www.dowsingandreynolds.com/shop/antique-brass-double-dimmer-switch	NO
	**Calla - 2 light Calacatta marble and aged brass wall light**	https://lightsandlamps.com/products/calla-2-light-calacatta-marble-and-aged-brass-wall-light	NO
LIGHTING	**LED Downlights**		YES

BATHROOM

PRODUCT	PRODUCT DESCRIPTION	PRODUCT LINK	BUILDER SUPPLY?
HEATING	**Underfloor Heating**		N/A
	**Victorian 1 MDF Skirting Board**	https://mdfskirtingworld.co.uk/victorian-1-mdf-skirting-board/	YES
	**Victorian 1 MDF Architrave**	https://mdfskirtingworld.co.uk/victorian-1-mdf-architrave/	YES
	**Arezzo Brushed Brass Concealed Individual Diverter + Thermostatic Control Valve with Handset + Wall Mounted Shower Head**	https://www.victorianplumbing.co.uk/arezzo-brushed-brass-concealed-individual-diverter-thermostatic-control-valve-with-handset-wall-mounted-shower-head	YES
	**Arezzo Round Brushed Brass Wall Mounted (2TH) Basin Mixer Tap**		YES
WALL HUNG WC	**TBC**		YES
WALL HUNG VANITY	**TBC**		YES
CEILING	**Plasterboard & skimmed**		YES

BATHROOM

PRODUCT	PRODUCT DESCRIPTION	PRODUCT LINK	BUILDER SUPPLY?
FLOORING	**Calacatta Amber Honed Marble**	https://www.mandarinstone.com/product/calacatta-amber-honed-marble/	NO
WALLS	**Calacatta Amber Honed Marble**	https://www.mandarinstone.com/product/calacatta-amber-honed-marble/	NO

ADDITIONAL INFORMATION

- The client is only proceeding with the ground floor works at this stage, please exclude the first floor bathroom renovation.

- Garden works: External Tap (plumbing) and Lights, along with electrical box for future landscaping lighting (these lights have not been incorporatred on M&E drawings).

SITE INFORMATION

PRE-CONSTRUCTION	
Can the contractor use site utilities (water/electric)?	YES
Builder to provide welfare facilities (inc. toilet)?	YES
Do you require a temporary kitchen setting up?	NO
Does the site require hoarding?	NO

EXTERNAL FINISHES	
Garden works?	YES
Make good around extension?	YES
Tarmac?	NO
Grass?	NO
Artificial grass?	NO

WALLS	
Brick finish?	YES
Render?	NO
Does the extension match?	YES

ROOFING	
Pitched roof tile type?	N/A
Flat roof type?	FELT

FASCIA AND GUTTER	
Would you like to match the existing fascia and guttering? If no, please specify desired finish	YES

SKYLIGHTS	
Does the project have skylights?	YES

EXTERNAL DOORS	
Which type of door would you like? Please specify	W&D PLANS
Would you prefer to supply the doors?	YES

WINDOWS	
Which type of windows would you like? Please specify	W&D PLANS
Would you prefer to supply the windows?	YES

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