BUILDING REGULATIONS DETAILS FOR LOFT CONVERSION AND REAR EXTENSION AT CHELMSFORD

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Change Control:

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GENERAL NOTES

1. These notes are to be read in conjunction with the latest revision of the architectural and structural drawings and calculations and provide details necessary for planning purposes and to show compliance with the building regulations. The notes do not provide details that show how to undertake construction work in a safe manner – the client and contractor is referred to the Construction and Development management (CDM) 2015 regulations for details of their obligations with regards to ensuring health and safety during and after construction.
2. Immediately prior to commencement always check that the latest plans are being used – please call GPO Designs on 01245 835855 to confirm drawing numbers of the most recent plans and specification;
3. Do not scale drawings. All dimensions to be checked by contractor on site prior to commencement of works. Room sizes and stair geometry must be checked at commencement.
4. Dimensions of any bought in items to be checked on site by contractor prior to ordering. The specification of all materials shall be agreed by the contractor with the client (including agreement of brick and tile samples).
5. All details to be checked and approved by Building Control Authority prior to commencement. Additional details may be required to completely address building control requirements and will be provided by GPO Designs Ltd on receipt of any comments from the Building Control Authority or contractor. Any work undertaken prior to the receipt by GPO Designs of any plan review comments issued by the Building Control Authority shall be at the clients own risk. Where a building notice application has been submitted all works should be agreed on site in advance with the building control authority. The contractor must ensure all necessary building control inspections are undertaken before work proceeds to the next inspection stage.
6. Details contained in the Chartered Structural Engineer's calculations shall take precedence over these notes in the event of any discrepancy. Ensure that the plans have been reviewed by the Engineer prior to commencement and that the engineer has supplied all details for the necessary structural elements and steelwork. Alternative connection and beam details shall not be used unless otherwise agreed in writing with the Structural Engineer.
7. All products to be used and installed in accordance with the manufacturer's requirements and recommendations. Manufacturer's safety requirements must be followed at all times.
8. All work shall be in accordance with the granted Planning Permission, and any differences are to be agreed with the Local Authority in advance in writing. Pre-commencement conditions (including the approval of material samples) must be discharged before work starts. Where the building regulation plans include changes for which planning approval has not yet been received – the client is advised that they proceed at risk with those changes until approval for the revisions has been received.
9. Ensure that tree protection areas are installed and documented prior to commencement of work where trees are protected by Tree Preservation orders or where a tree protection plan has been mandated by the planning authority.
10. All parts of the building shall be entirely within the site boundary, the positions of which are to be agreed with the client at commencement and independently from the information provided by GPO Designs Ltd. If any Party Walls or their foundations are to be constructed astride the boundary ensure that the written permission of the owner of the neighbouring property has been obtained prior to commencement.
11. The building or site insurer should be consulted regarding the proposed changes to ensure that the proposed works are acceptable and sufficient for them and that the building and site remains adequately insured during and after the works.
12. Contractor to determine the type, capacity and exact position of any buried or overhead utilities prior to commencing work. Any required permissions from the utility owners should be obtained in advance.
13. Any errors or omissions in the plans should be brought to the attention of GPO Designs Ltd immediately and, where reasonable, prior to work proceeding further.
14. It is recommended that all work is overseen by an independent inspector or Engineer independent of the prime contractor to ensure that the work is undertaken to an adequate standard and to ensure any deficiencies are rectified prior to completion.
15. Where these notes refer to "Constructive Details" or drawings referenced CD XXXX. This refers to the details contained within "A handbook of thermal bridging details incorporating aircrete blocks", published by Constructive Details Ltd and available from http://www.constructivedetails.co.uk/
16. No changes to the thermal efficiencies of the different construction elements shall be undertaken without considering the effect on the thermal performance of the building.
17. Where these notes refer to British Standards the current version of the standards that applies at the time of construction shall be used, even where these notes refer to an earlier version.
18. Where the proposed works may impact on the Right to Light of neighbouring properties a survey by a Chartered Surveyor experienced in Right to Light matters should be undertaken and the results considered prior to commencement.
19. Borehole soil testing should be undertaken prior to commencement to confirm the ground conditions to be expected below the foundations.
20. The contractor must check the site for hazards including buried or overhead utilities, and contaminants (e.g. Asbestos or other hazardous chemicals) prior to commencement.
21. The details provided within this document and the associated plans are for the use of the client for whom it was undertaken and should not be reproduced in whole or in part or relied upon by third parties or for use on other works without the express written authority of GPO Designs Ltd.
22. Where timbers are to be fixed together this shall be in accordance with TRADA guidelines unless otherwise specified. Notching and drilling of timbers shall be in accordance with TRADA guidelines with notches and holes only permitted in the locations allowed for within the guidelines.
23. Where existing structures are to be demolished notice to the council and gas electricity suppliers must be given in accordance with the Building Act 1984 at least six weeks prior to demolition.

GENERAL NOTES EXTENSIONS

1. External surfaces of the development shall be constructed from materials which match the existing dwelling (with the exception of materials used for flat roofs) or which are agreed in writing with the Planning Authority.

PUBLIC SEWERS

The contractor is advised to check for any buried utilities prior to commencement. Any sewer or drain positions shown on the plans are approximate and to be confirmed on site. Ensure foundations are deeper than the invert level of any sewers within 3m. An application to the Sewerage undertaker may be required if it is necessary to build over or within 3m of the public

sewer.

The proposed rear extension builds over a public sewer that the previous extension already builds over. Anglian Water have confirmed that, whilst more than 6m of sewer has been built over they do not require a build over application as the proposed extension itself does not build over more than 6m of the sewer.

PLANNING NOTE
All work to be undertaken in accordance with the planning approval. Where planning approval has not been obtained the client is advised that they proceed at their own risk.
For work which may be considered to be "Permitted Development" the client is advised to obtain a "Lawful Development Certificate" prior to commencement to establish that the "Permitted Development" rules have been met.

The contractor is advised to refer to the plans approved by the Planning Authority and to ensure that all external heights, dimensions and detailing are as approved by the application. Where these building regulations details differ from the approved plans further planning applications may be required and the client is advised that they proceed with such differences at their own risk.

The proposed works may be liable to the Community Infrastructure Levy (CIL) Tax. Exemptions from this tax may be available but must be correctly claimed prior to commencement and there may be post completion conditions to be complied with. The applicant is advised to contact the Council prior to commencement to agree any liabilities to the CIL tax.

HEALTH AND SAFETY
The contractor is reminded of their liability to ensure due care, attention and consideration is given in regard to safe practice in compliance with the Health and Safety at Work Act 1974. Contractors must ensure that the building and site remain safe during the course of all work and left safe on completion of work. Asbestos containing materials may be found within the existing building. See also note regarding CDM regulations.

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.

CDM REGULATIONS
The client and contractor must abide by the Construction Design and Management Regulations 2015. GPO Designs Ltd understands that all work will be undertaken and managed by a single building contractor (the "Principal Building Contractor") who will be responsible for co-ordinating the health and safety aspects of the project. Contractors are responsible for undertaking their own hazard identification and risk assessments for their work and documenting this in a method statement which shall be followed by their operatives. The Principal Building Contractor must prepare a construction phase plan for the work, undertake a site health and safety survey and manage the health and safety risks of the site and other contractors.

GPO Designs Ltd work as a "CDM 2015 Designer" but not a "CDM 2015 Principal Designer" in accordance with the CDM 2015 definitions and provide design information to the client, principal contractor and CDM Principal Designer to help them comply with their duties. The client or contractor must appoint a CDM Principal Designer to manage the pre-construction and construction health and safety aspects of the works as required by the CDM 2015 regulations.

The contractor should identify and document risks in relation to the proposed works. Possible significant risks associated with the proposed works, are not limited to but include:

- **Site access** -Safe route to works to be put in place by contractor
- **Demolition** - Contractor to survey existing building plan sequencing, demolition and temporary support. Ensure temporary support and access is provided where workforce requires access to partially demolished structure. Ensure vehicles and heavy machinery are segregated from personnel areas. All partitions and walls to be removed must be assessed by the contractors on site to determine whether or not they are load bearing and must be demolished with extreme caution – refer to structural engineer if walls are found to be load bearing in the situation where the engineer has not provided details for the support of those walls. Demolition, dismantling and structural alterations should be carefully planned and carried out by a competent contractor.
- **Temporary support –** Contractor to provide all necessary temporary support for vertical and lateral loads and to ensure the stability of both existing and proposed structures including for partially assembled structures. Temporary support may be required for foundations or retained building elements. Contractor should consider the base of any supports since existing floor structures (e.g. beam and block floors) or ground conditions (e.g. soft subsoil) may not be adequate. Ensure that structural details provided within the plans and by the Engineer correspond with the structure found on site. Check structure for any additional point loads and confirm direction of joists is as assumed by the Engineer. Partially built structures may be laterally unstable prior to the completion of wind posts, wall and roof structures. Contact the structural engineer immediately if unsure or should concerns regarding stability of any structures arise.
- **Manual handling** – Contractor to ensure safe lifting practices are adopted and provide mechanical lifting equipment for heavy or awkward items or awkward tasks. Where steel work is to be positioned ensure appropriate lifting equipment is available and ensure that temporary supports are not moved or damaged during the lifting process. Ensure lifting equipment has the required certification.
- **Working at height** - Ensure suitable scaffolding, working platforms and fall protection systems are utilised and that these are erected by competent persons and inspected each time before use. Safety nets or fall arrest systems where properly used can be used to minimise the distance of a fall.
- **Services** – The location of all existing services (including underground and overhead services, are to be confirmed by contractor prior to the start of works independently of any information provided by GPO Designs Ltd. The location of existing services may not be shown on plans or may be shown approximately or based on assumptions. Overhead electrical services adjacent to works may require insulating by the supplier prior to commencement. Ensure contractors understand the safe digging practices contained within the Health and Safety document HS(G) 47 entitled "Avoiding Danger from Underground Services" (available from http://www.hse.gov.uk/pubns/books/hsg47.htm). Utility searches should commence with a search to BS PAS 128 type D, which should be arranged by the

CD0022).

All new walls below ground to have Class A blockwork below ground level or alternatively semi engineering brickwork in 1:4 masonry cement or equal approved specification. Cavities below ground level to be filled with lean mix concrete min 225mm below damp proof course laid to fall towards outside of building.

All blockwork used below ground and below DPC to have minimum compressive strength of 7.0N/mm² and be suitable for below ground use (as stated by block manufacturer).

High strength grade Celcon Foundation blocks may be used and should be installed in accordance with manufacturer's instructions.
A minimum of one Celcon high strength block shall be used in the wall immediately below beam and block floors (to minimise thermal bridging). Ensure wall insulation continues to at least 215mm below the top of the floor.

Note: Where stanchions are specified by the engineer these are to be bolted to the foundation concrete and not to the sub DPC wall.

FULL FILL CAVITY WALL -see Detail Drawing A and Constructive Details Handbook Drawings CD0026, CD0027, CD0028, CD0031, CD0033, CD0035 & CD0036
Target U Value of 0.24W/m²K
Construction to minimise thermal bridging (thermal transmittance Ψ) at junctions as per Constructive Details checklists and drawings for example:

- Catnic thermally broken lintels, Target Ψ= 0.05W/m/K (thermally broken but otherwise similar to CD0026)
- Steel lintel with perforated base plate and insulated soffit, target Ψ= 0.40W/m/K – as per drawing CD0026
- Window and Door sills, target Ψ= 0.395W/m/K, as per drawing CD0027.
- Window and Door Jambs, target Ψ= 0.040W/m/K, as per drawing CD0028.
- External gable wall/Ceiling junction, target Ψ= 0.069W/m/K, as per drawing CD0031.
- External wall eaves/Ceiling junction, target Ψ= 0.105W/m/K, as per drawing CD0033.
- External wall normal corner, target Ψ= 0.058W/m/K, as per drawing CD0035.
- External wall inverted corner, target Ψ= -0.069W/m/K, as per drawing CD0036

New cavity wall to comprise external leaf of 102.5mm facing brick as agreed with planning authority or otherwise to match existing or where render finish agreed 100mm of medium density blocks (e.g. Fenlite 1500) and internal leaf of 100mm lightweight block (thermal conductivity K value 0.15W/mK, compressive strength 3.6N/mm² e.g. Celcon Standard – unless higher strength blocks are specified by the engineer) with 100mm cavity. Full fill cavity with 100mm Isover CWS32 cavity slabs (or equivalent as manufacturer's details (see BBA Cert 90/2465). (Cavity slabs with a lower thermal resistance (e.g. 0.04W/mK cavity slabs) should not be used without the prior written agreement of GPO Designs Ltd. Note that frost resistant F2,S1 bricks are required to exposed sections of chimney.

Depending on the grading of ground levels that are undertaken on the site some of the walls may be retaining walls. Increase thickness of wall leaf that acts as a retaining wall in accordance with the structural engineer's details.

Refer to Engineer's calculations for details of any padstones or higher strength blocks that may have been specified by the Engineer. For large openings refer to details of stanchions and beams specified by the Engineer, any stanchions must be bolted to the foundations and beams exactly as specified by the Engineer
Internal finish to be plasterboard on dabs with the perimeter and any penetrations well sealed with continuous adhesive dab. Apply 3mm skim plaster finish. Mechanically anchor floor and ceiling vapour barriers behind plasterboard and use sealant to ensure robustness of air barrier at junction.
Walls to be built with 1:1 5.5 (cement: mixed sand) or 1:5.5 (cement: sand with air entraining plasticiser) mortar. Ensure that all openings within the plasterboard (e.g. for pressure boxes) have a continuous adhesive dab to the perimeter or provide a render coat to the wall before fixing the plasterboard to minimise air leakage.

Where external render finish required provide minimum 2 coat waterproof render to match existing (smooth finish only- pargeting not required unless requested by the client). Alternative proprietary render systems may be used if preferred and if agreed with the client

Provide movement joints and bed joint reinforcement to masonry walls as per BSI Published Document document PD 6697. Continuity of the air-barrier must be maintained at any internal movement joints. Debonding ties to be used at contraction joints within blockwork. Ties should not be provided across brickwork movement joints. Where movement joints are not shown on the plans refer to GPO Designs Ltd for further details prior to construction.

Ensure wall insulation continues to at least 215mm below the top of the floor. Wall insulation within gable walls to continue full height of wall (thus ensuring that a cavity tray over the insulation is not required.

DPC
Provide horizontal strip polymer damp proof course (e.g. Visqueen Zedex) to both internal and external skins minimum 150mm above external ground level. 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 (e.g. 225mm (for 100mm cavities) Ancon Staifix RT2 these wall ties have a thermal conductivity of 17W/m/K, and a cross sectional area of 7.5mm².)

Build in with a horizontal spacing of 750mm and a vertical spacing of 450mm, which is equivalent to 2.5 ties per square metre. Wall ties should also be provided, spaced not more than 300mm apart vertically, within a distance of 225mm from the vertical edges of all openings, movement joints and roof verges.

CAVITIES
Provide cavity trays over openings (including over airbrick sleeves and meter cupboards) within cavity walls and over structural steel beams to cavity walls. All cavities to be closed at eaves

(unless cavity fully filled with non combustible insulation) and closed around openings using Kingspan Thermabate or similar non combustible insulated cavity closers with maximum thermal conductivity 0.038$Wm^{-1}K^{-1}$. Provide vertical DPCs around openings and abutments. All cavity trays must have 150mm upstands, stop ends, and suitable cavity weep holes (min 2) at max 900mm centres. Cavity trays should continue uninterrupted over piers less than 600mm wide. Cavity trays to be installed into cavity walls where roofs abut cavity walls with linked roof flashing immediately below.

EXISTING TO NEW WALL
Cavities in new cavity walls to be made continuous with existing (if present) where possible to ensure continuous weather break. If a continuous cavity cannot be achieved, where new walls abut the existing walls provide a movement joint with vertical insulated DPC (e.g. Insulated Cavity Trays Ltd, Type B) -i.e. a vertical cut should be made within the existing external leaf of the wall and an insulated DPC inserted and fixed in place with sealant). All tied into existing construction with suitable proprietary stainless steel profiles (e.g. Catnic Stronghold).

INSULATION OF EXISTING WALLS WITHIN LOFT
The existing walls must be checked for stability and be free from defects as required by the Building Control Officer.

Where existing wall is a Party Wall:
Seal wall with plaster or render scratch coat. Line walls with independent timber stud framework (with min 2cm gap between timber stud and existing wall). Frame work constructed with 100x50 timber studs @400c/c. Insulate wall with 100mm mineral wool insulation between studs and 25mm Celotex PL4025 insulated plasterboard over studs.

INTERNAL NON LOAD BEARING STUD PARTITIONS
100mm x 50mm C24 softwood treated timber studs at 400mm ctrs with 50 x 100mm head and sole plates and solid intermediate horizontal noggins at 1/3 height or 450mm. Provide min 10kg/m³ density acoustic soundproof quilt (Isover Acoustic Partition roll APR 1200) tightly packed in all voids the full depth of the stud. Ground floor partitions built off doubled up floor beams or as otherwise specified by the beam supplier or off DPC off ground floor slab. First floor walls built off doubled up joists or off noggins. Walls faced throughout with 12.5mm plaster board with skim plaster finish or finished with tile backing board (e.g. Knauf aqua panel) for areas to be tiled. Taped and jointed complete with beads and stops.
Provide restraint straps between walls and ceilings at 1.5m centres.

TIMBER FRAMED WALL TO NEW GABLE WITH RENDER FINISH

Target U Value of 0.21W/m²K
First floor wall to be timber stud wall with external render finish built off ground floor masonry cavity wall.

Timber stud wall constructed from 150mm x 50mm treated timbers with head & sole plates and noggins at 400mm ctrs. Provide post to support ridge beam as per Engineer's details. Insulation between and over studs; 100mm Celotex GA4000 between and 37.5mm Celotex PL4025 insulated plaster board with joints taped to form VCL. Finished with 3mm skim coat of finishing plaster. All junctions to have water tight construction, seal all perimeter joints with tape internally and with silicon sealant externally. Screw fix at 150mm centres, 12mm thick WBP external quality plywood sheathing (or other approved) to timber stud wall. Provide breathable membrane (having a vapour resistance of not more than 0.6 MNs/g) (e.g. Tyvek Supro) over sheathing. Walls within 1m of boundary should be finished with 9mm Promat Supalux board over the plywood sheathing and below the breathable membrane. Supalux board fitted in accordance with manufacturer's instructions including fixing with 65mm round head nails at nominal 300mm centres.

Where stud wall to be faced with render. Provide 20mm sand cement render to BS EN 13914-1 or Monocouche Monoflex TXF render system (or equivalent) finish installed in accordance with manufacturer's installation instructions on render board/lath. Render board/ lath fixed over DPC to vertical 50 x 50mm ACQ preservative treated battens to provide 50mm vented and drained cavity with weepholes to base of cavity. Undertake pull out test to confirm adequacy of fixings.

Provide cripple studs below window opening and jack studs to side and below window opening with double sill plate (all 150x50mm C16). Over windows or doors provide timber lintels to Engineer's specification.

Sole plate to be strapped to wall with 1000 x 30 x 5mm galvanized straps or other approved to BS EN 845-1 at 2m centres.

Close wall cavities at top of wall and around openings using proprietary cavity barriers.

NEW SECOND FLOOR
Floor joist cases (as per Engineer's layout drawing).

Floor joists to suppliers specifications where engineered joists are used. Existing first floor lintels to be exposed and checked for adequacy with the chartered structural engineer to the satisfaction of the building control authority.

Where existing ceiling to be retained existing ceiling joists to be fixed to new floor joists to ensure the existing ceiling remains supported. Ensure min 1cm gap between bottom of joists and existing plasterboard ceiling to avoid cracking of existing plaster finish

Provide trimmers to stairs as per Engineer's details.

Floor to be 22mm moisture resistant tkg flooring grade P5 chipboard (in accordance with BS EN 312 with identification marking laid upper most to allow easy identification) joints glued, and screwed to joists. Ensure ends of rafters remain adequately restrained by fixing to new floor joists (or where retained ceiling joists provide this restraint by fixing ceiling joists to floor joists).

Lay 100mm Rockwool mineral fibre quilt insulation min 10kg/m³ or equivalent between floor joists (270mm required to first floor ceiling area outside of dwarf (ashlar) walls supporting rafters).

Ceiling below to be min 12.5mm plasterboard supported with continuous noggins around board edges with 3mm skim plaster finish – existing ceiling may be retained if it meets this specification. If the existing ceiling does not meet this specification (e.g. if there is not a continuous perimeter noggin around board edges) underline or replace the existing ceiling with 12.5mm of Fireline plasterboard with 3mm skim (if existing ceiling has lathe and plaster then the existing ceiling may

WARM FLAT ROOF

U-value calculation
by BRE U-value Calculator version 2.04
Printed on 27 Jul 2014 at 13:58

Element type: Roof - Flat roof - warm deck
Calculation Method: BS EN ISO 6946

Warm Flat Roof

Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	12.5	0.210			0.060		Plasterboard ceiling
2	170	R-value	0.130	0.0900	0.160	1.308	Air layer unventilated / joist
3	18	0.130			0.138		Plywood roof deck
4							Vapour control layer
5	120	0.022			5.455		Celotex Insulation
6	18	0.130			0.138		Plywood
7	2	0.200			0.010		GRP or EPDM
					0.040		Rse
	341 mm				6.101		

Total resistance: Upper limit: 6.189 Lower limit: 6.115 Ratio: 1.012 Average: 6.152 m²K/W

U-value (uncorrected) 0.1626

U-value corrections
Air gaps in layer 5 ΔU = 0.0000 (Level 0)
Fixings in layer 5 ΔU = 0.0048 (7.000 per m², 7.5 mm² cross-section, λ = 17.0)

Total ΔU 0.0048

U-value (corrected) 0.167
U-value (rounded) 0.17 W/m²K

PITCHED ROOF INSULATION (INSULATED SLOPING CEILING)

U-value calculation
by BRE U-value Calculator version 2.04

Element type: Roof - Pitched roof - insulated slope, sloping ceiling
Calculation Method: BS EN ISO 6946

Pitched roof with K107

Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	12.5	0.210			0.060		Plasterboard
2	25	0.018			1.389		Insulation
3	100	0.018	0.130	0.0800	5.556	0.769	Insulation board / rafters
4	50	R-value					Air layer ventilated
5		0.230					Sarking Felt
6	25	R-value					Air layer ventilated
7	15	1.000					Tiles (clay)
					0.100 #		Rse
	229 mm (total roof thickness)				7.204		

this resistance substitutes for Rse and the resistance of layers 4-7 because of the ventilated air layer (layer 4)

Total resistance: Upper limit: 6.219 Lower limit: 5.358 Ratio: 1.161 Average: 5.788 m²K/W

U-value (uncorrected) 0.173

U-value corrections
Air gaps in layer 3 ΔU = 0.006 (Level 1)
No fixings in layer 3

Total ΔU 0.006

U-value (corrected) 0.179
U-value (rounded) 0.18 W/m²K

DORMER WALLS

U-value calculation
by BRE U-value Calculator version 2.04

Element type: Wall - Timber framed - insulation between studs
Calculation Method: BS EN ISO 6946

Dormer wall

Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.130		Rsi
1	12.5	0.210			0.060		Plasterboard
2	25	0.022			1.136		Insulation
3							Vapour control layer
4	100	0.022	0.120	0.125	4.545	0.833	Celotex GA4000 / timber frame
5	12	0.160			0.092		Plywood sheathing
6							Breather membrane
7	50	R-value					Cavity ventilated
8	10	1.000					External finish
					0.130 #		Rse
	210 mm (total wall thickness)				6.094		

this resistance substitutes for Rse and the resistance of layers 7-8 because of the ventilated air layer (layer 7)

Total resistance: Upper limit: 5.100 Lower limit: 4.468 Ratio: 1.141 Average: 4.784 m²K/W

U-value (uncorrected) 0.209

U-value corrections
Air gaps in layer 4 ΔU = 0.006 (Level 1)

Total ΔU 0.006

U-value (corrected) 0.215 (0.2146)
U-value (rounded) 0.21 W/m²K

EXISTING WALLS WITHIN LOFT (WHERE PARTY WALL)

U-value calculation
by BRE U-value Calculator version 2.04

Element type: Wall - Masonry cavity wall (unfilled)
Calculation Method: BS EN ISO 6946

Layer	d (mm)	λ layer	λ bridge	Fraction	R layer	R bridge	Description
					0.130		Rsi
1	13	0.180			0.072		Plaster (lightweight)
2	100	1.130			0.088		Concrete block (dense)
3	50	R-value			0.180		Cavity unventilated
4	100	1.130			0.088		Concrete block (dense)
5	100	0.040	0.130	0.140	2.500	0.769	Independent timber stud wall
6	25	0.022			1.136		Celotex insulated plasterboard (ins)
7	12.5	0.210			0.060		Celotex insulated plasterboard (board)
					0.040		Rse
	401 mm (total wall thickness)				4.295		

Total resistance: Upper limit: 3.924 Lower limit: 3.696 Ratio: 1.062 Average: 3.810 m²K/W

U-value 0.262
U-value (rounded) 0.26 W/m²K

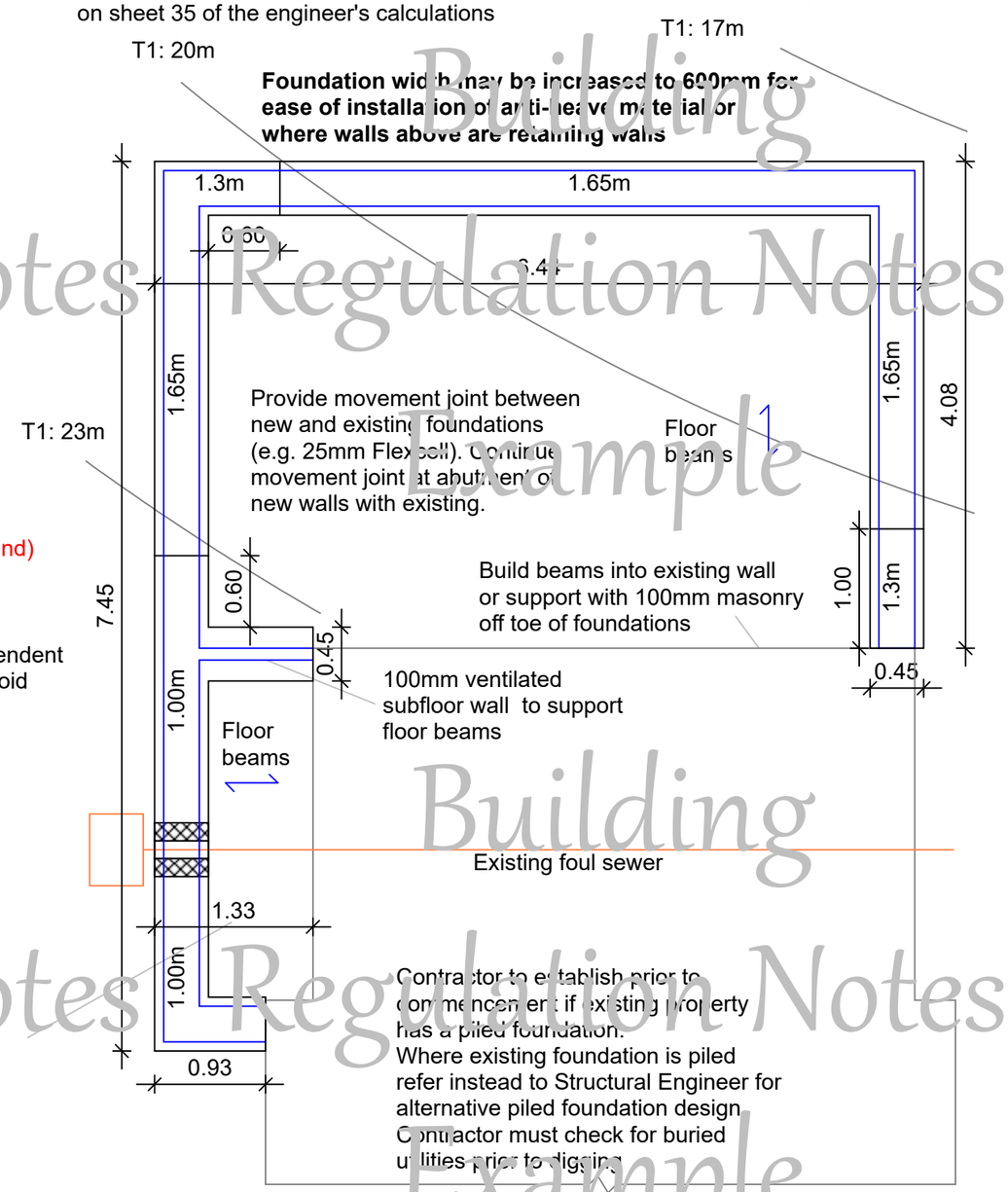
Due to varying ground levels some below ground walls may be retaining wall. Increase wall thickness below ground on retaining side in accordance with the engineer's details on sheet 35 of the engineer's calculations

Where sewer or drain passes through foundations provide Min 150mm clearance all around sewer. Provide pre-stressed concrete lintels (150mm high x 100mm wide with min 150mm bearing) min 150mm above sewer

Foundations all into original unmade/ unfilled ground. (the existing raise patio area is presumed filled ground)

Foundations must be independent of manhole structure -infill void between structures with compressible material (e.g. Flexcell or sand)

Less than 6m of sewer to be built over by new extension and therefore works comply with Anglian Water's standard criteria



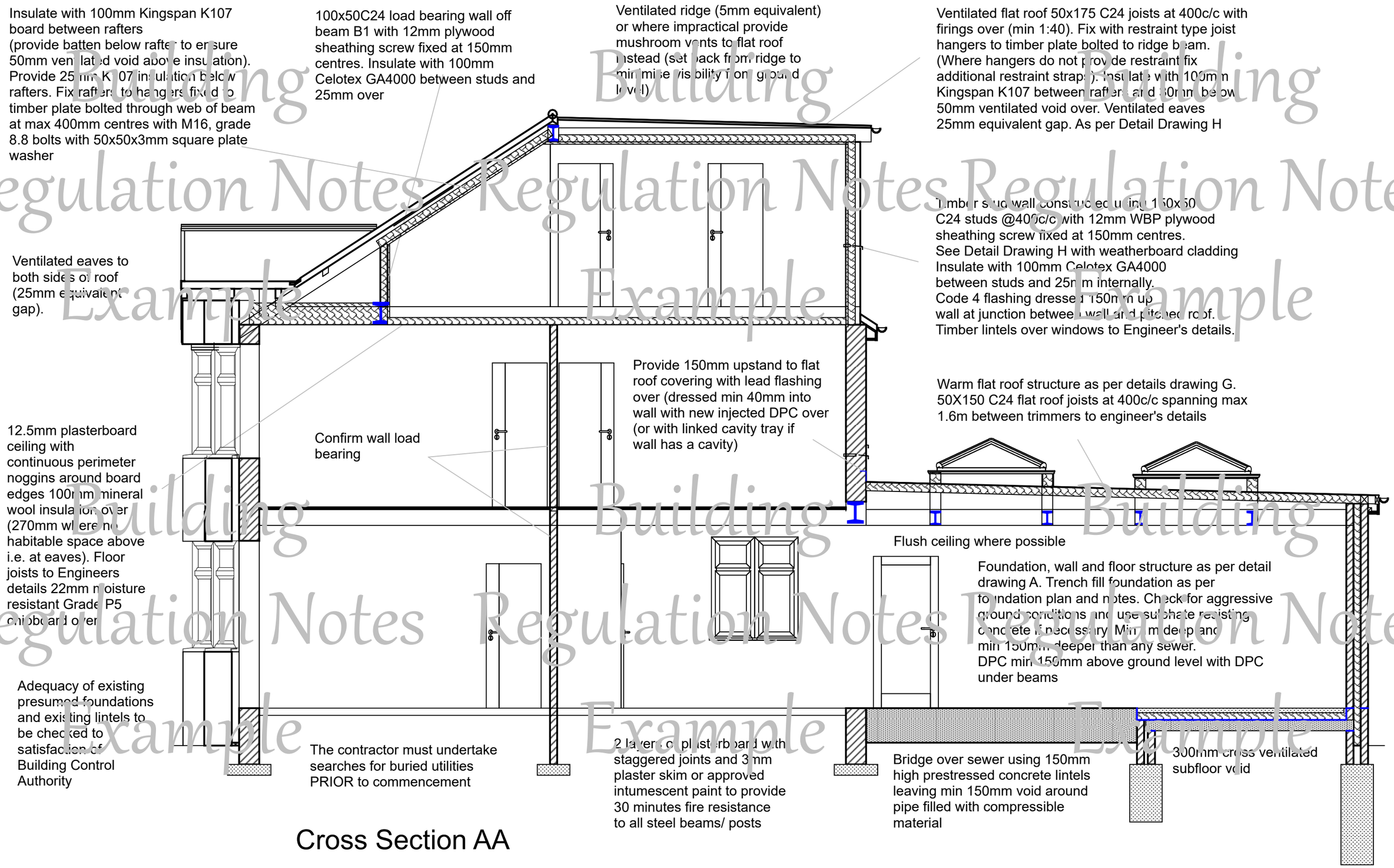
No inspection chambers are to be built over by the proposed works.
The contractor shall ensure that the works comply with Anglian Water's "Standard Criteria" for building over the sewer – including ensuring that no loads are transferred to the sewer and ensuring that the foundations are deeper than the sewer. Confirm exact sewer position and depth on site

The contractor must undertake searches for buried utilities PRIOR to commencement

When setting out ensure that no part of extension (including the roof) will project over the boundaries with the adjacent properties. Agree boundary positions on site prior to commencement

All structural work and alterations under on site supervision of Structural Engineer or other competent person.
See Detail Drawing A and building regulation notes for foundation specfication and floor details.
Stated minimum foundation depths to be agreed on site with Building Control Authority.
Trench fill foundation may be provided as shown however due to the depth a piled foundation to details provided by the structural engineer may alternatively be provided if preferred.
Footings must be as deep as existing footings and deeper than invert of any drains or sewers within 3m.
CDM 2015 regulations (Health and Safety) apply to the proposed works.
Ensure appropriate Health and Safety measures are taken around footings and excavations.
Ensure all footings are as deep as the existing footings and deeper than the invert of any drains or sewers within 3m.
The contractor is advised to check sub-soil conditions at and below the foundation depth and to check for chemically agressive ground prior to commencement.
Party wall agreements to be in place prior to commencement.
Provide copy of floor beam manufacturer's layout for the prior approval of the building control authority

Proposed Foundation Plan



Cross Section AA

Proposed Second Floor

SD Smoke Detector (interlinked)

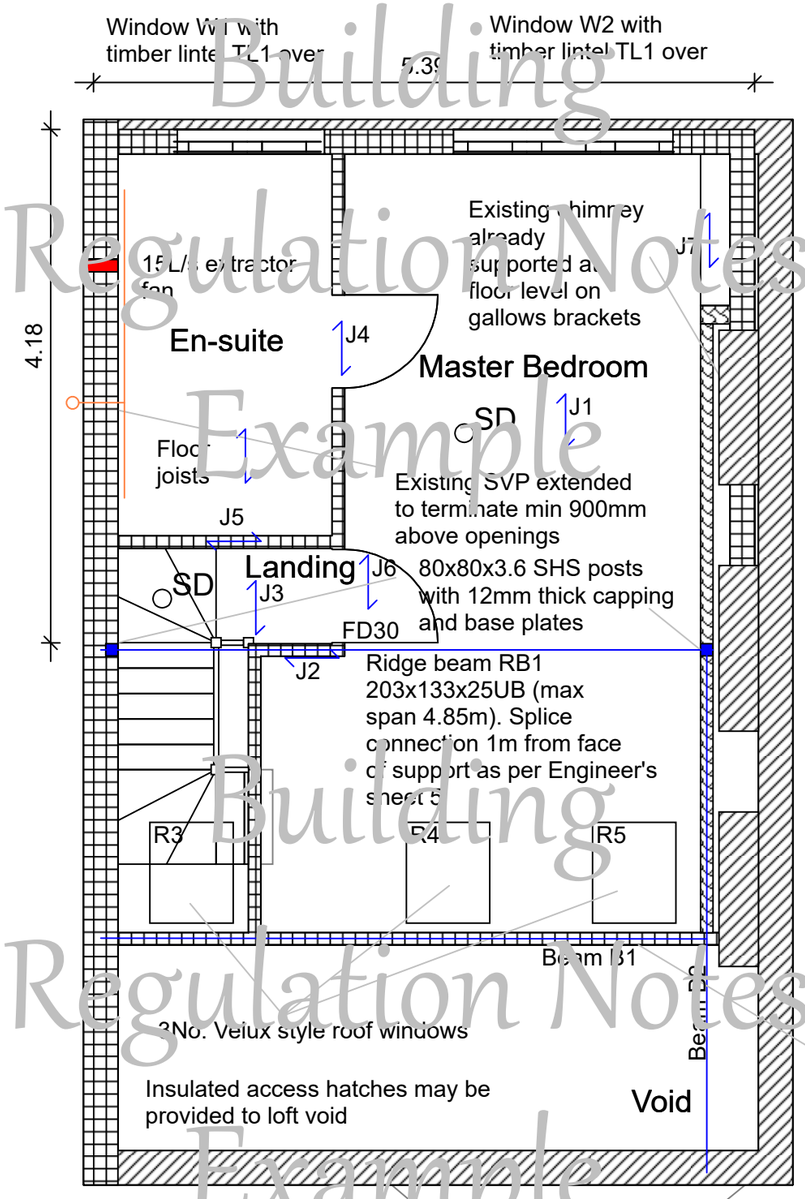
New gable wall constructed with 150x50 C24 timber studs @400c/c with 12mm plywood sheathing externally. Insulate with 100mm Celotex GA4000 between studs and 25mm internally and finished with 12.5mm plasterboard and plaster skim. Externally finish with breathable membrane, 50mm deep battens (to create 50mm deep ventilated and drained cavity), render mesh and sand/cement render

Emergency egress from upper stories via 30 minute fire protected escape route. Ensure FD30, 30 minute fire door sets (including approved frame, hinges and latch) are installed to all doors off escape route. Infill any over door fanlights and ensure all partitions and ceilings achieve 30 minutes fire resistance.

Internal partitions to be insulated timber stud (100x50 C16 timber studs @400c/c with 100mm mineral wool insultion, 12.5mm plasterboard with plaster skim each side (or tile backing board)

All joists to engineer's details and engineer's joist plan:
J1: 50x200 C24 @400c/c
J2: 2No. 50x200 C24
J3: 2No. 50x200 C24
J4: 2No. 50x200 C24
J5: 2No. 75x200 C24 (fixed together)
J6: 3No. 75x200 C24 (bolted together)
J7: J3: 2No. 50x200 C24

Lintel TL1: 2No. 75x125 C16 timbers with 150x100 C16 posts as bearings (timbers are upright (i.e. 125mm high) not laid flat)



Ridge beam RB1, bearing and splice details as per engineer's details.
Provide splice joints exactly as per the engineer's details.
Post to left hand end to have min 100x100x12mm thick mild steel plate to base on centre line of post. At right hand end base plate to post to be connected to top flange of beam B2 with 4No. M12 diameter bolts

Timber stud dormer wall as per detail drawing H. Flank wall (to Party Wall side) is within 1m of boundary wall and requires 9mm Promat Supalux board externally over plywood sheathing fixed at 150mm centres as per notes

Moisture resistant Grade P5 flooring chipboard (22mm) glued and screwed with 100mm mineral wool insulation (300mm in eaves void). Ceiling below to be 12.5mm plasterboard with perimeter noggins. Ensure ceiling is imperforate (no gaps) and provides 30minutes fire resistance

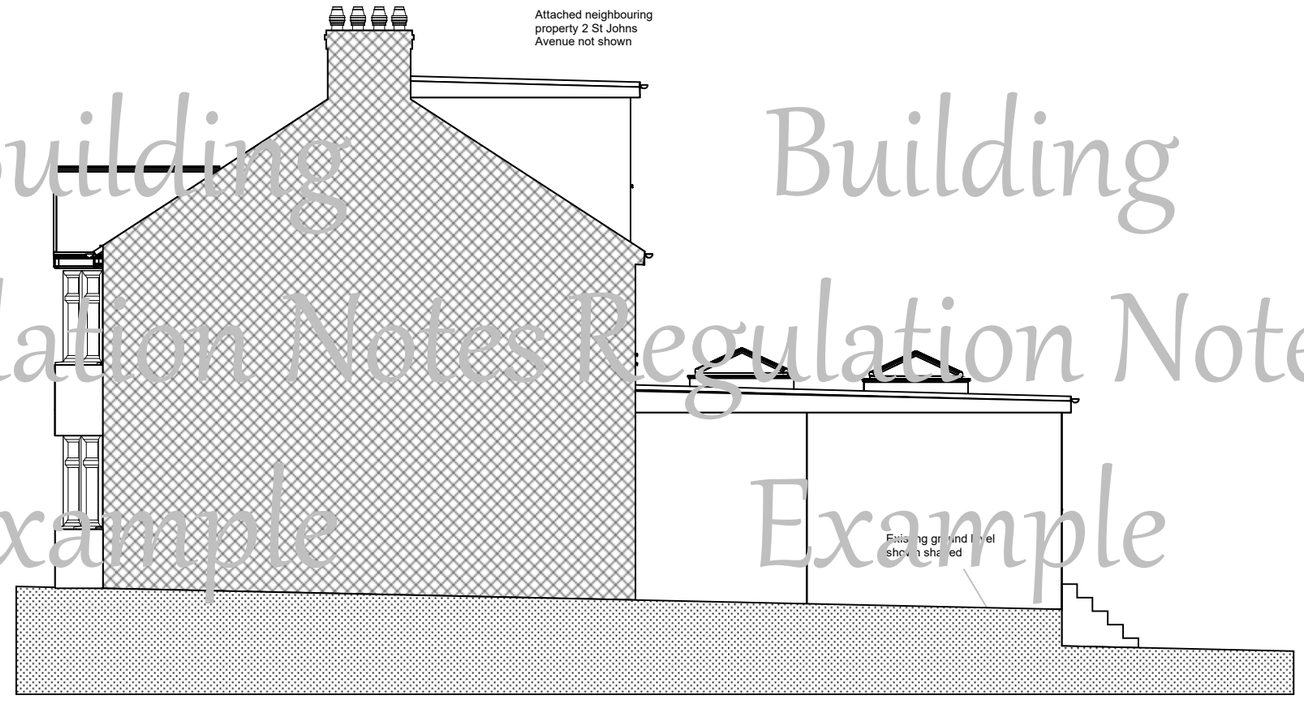
Existing loft Party Wall must be insulated as per notes section "Insulation of existing walls within loft". Ensure min 40mm clearance around chimney breasts

Beam B1: 254x146x31 kg/m with min 100mm bearing on 1:3 mortar bed to left hand end. At right hand end bolt to beam B2 with 4No. M12 bolts through flanges. Splice joins as per engineer's sheet 17.

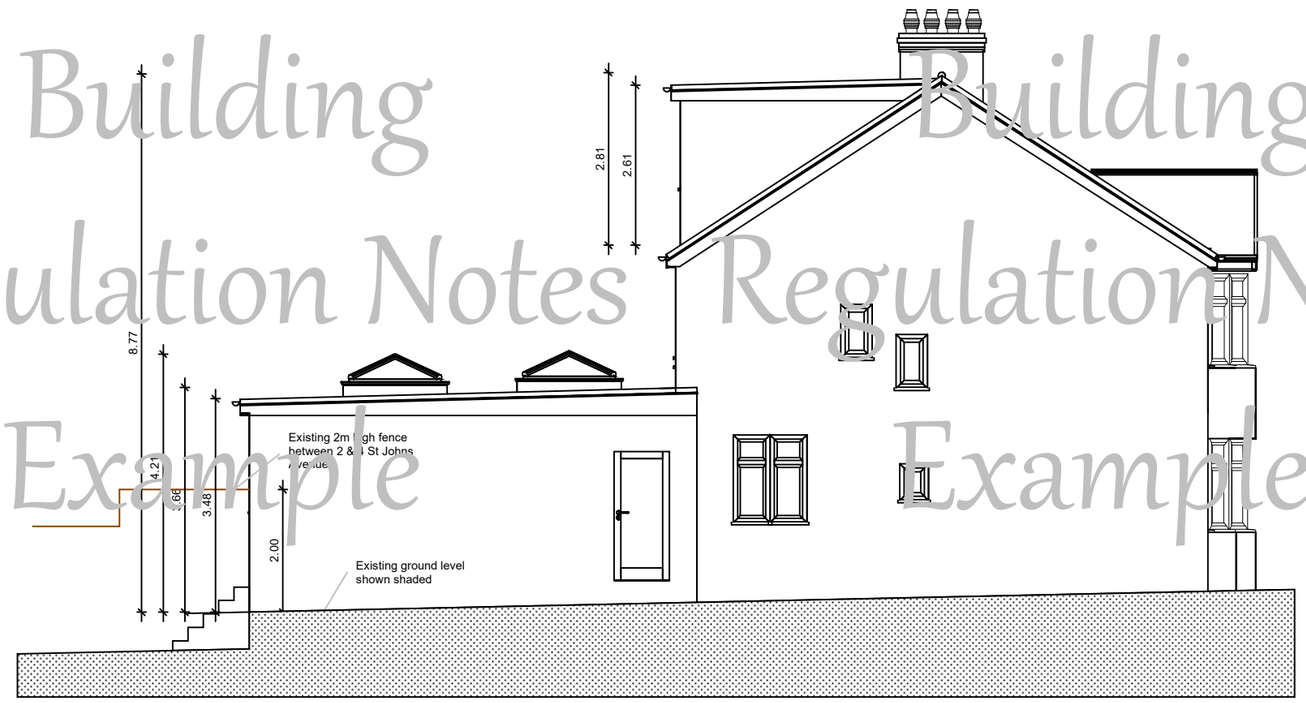
Load bearing timber stud wall off beam B1 constructed with 100x50 C24 timbers with 12mm plywood sheathing, insulated with 100mm Celotex GA4000 between studs and 25mm internally and finished with 12.5mm plasterboard and plaster skim

Beam B2: 203x133x25 UB, at front min 100mm bearing on 1:3 mortar bed at rear bear on to min 200mm long x 100mm x 12mm thick mild steel plate on centre line of beam

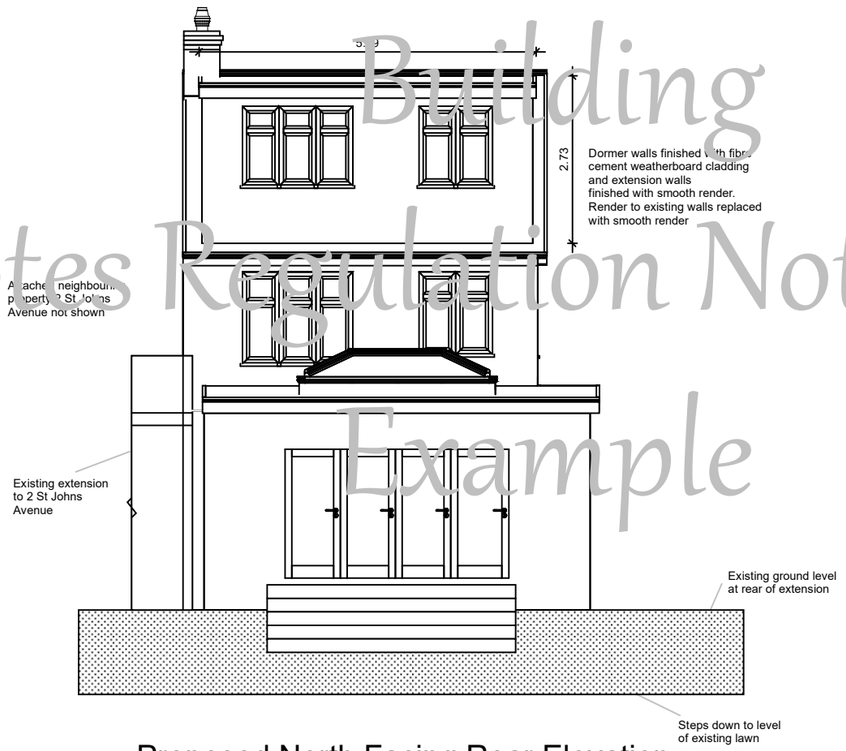
Proposed South East Facing Front Elevation



Proposed North East Facing Side Elevation



Proposed South West Facing Side Elevation



Proposed North Facing Rear Elevation