Building Regulation Specification for loft conversion and extension at [redacted address]

Part A: Structure

2004 edition incorporating 2004, 2010 and 2013 amendments – for use in England.

[redacted address] is a 1930's detached bungalow. It is being extended to the rear, as well as having the eaves and ridge raised to accommodate rooms in the roof.

Alterations and additions to the structure and foundations shall be designed, manufactured, and installed in accordance with Part A.

The following documents have been submitted to Building Control for review and approval.

- PP.04 Proposed Plans
- 9692 Structural Details and Calculations
- P16923-Easi-Joists
- EEWFSD.02 Existing External Wall/Foundation/Slab detail
- NEWFSD.02 New External Wall/Foundation/Slab detail
- IWFSD.02 Internal Wall/Foundation/Slab detail
- WRD.01 Wall/Roof detail
- DCRD.01 Dormer Cheek/Roof detail
- EWIPRO-A025 External Wall Insulation Specification

Part B: Fire safety

2019 edition incorporating 2020 and 2022 amendments – for use in England.

Part B1: Means of warning and escape

Section 1: Fire detection and alarm systems

A Grade D Category LD2 system shall be installed. The system shall be as described in BS 5839-6:2019, with detectors sited in accordance with the recommendations of BS 5839-1:2017 for a Category LD2 system.

- Multi Sensor Alarms located:
    - Ground floor hallway
    - First floor hallway
    - Lounge
- Heat Alarm located:
    - Kitchen

The power supply for the smoke alarm system shall be derived from the dwelling's main electricity supply, with a means of isolating power to the smoke alarms without isolating lighting, if they are supplied from a local lighting circuit. The electrical installation shall comply with Approved Document P (Electrical Safety - Dwellings)

The following documents have been submitted to Building Control for review and approval.

- SHDL.01 Smoke/Heat Detector Layout

Section 2: Means of escape – dwellinghouses

Systems shall be provided for giving early warning in the event of fire (see above) and the dwelling shall be constructed so that suitable means are provided for emergency egress from each storey via windows or doors.

All habitable rooms on the Ground Floor shall open directly onto the hallway leading to the entrance and shall be provided with a door or window which complies with Part B, Section 2, paragraph 2.10

All habitable rooms on the First Floor shall have a window which complies with Part B, Section 2, paragraph 2.10

Part B2: Internal fire spread (linings)

Section 4: Wall and ceiling linings

Ground floor walls will either be constructed of

- (non-load bearing) timber studwork, regular 12.5mm plasterboard and skim.
- (load bearing) concrete blockwork, regular 12.5mm plasterboard and skim.

First floor walls will be constructed of timer studwork, regular 12.5mm plasterboard and skim.

All ground floor ceilings will be constructed of regular 15mm plasterboard and skim, to provide 30 minutes fire resistance.

All first floor ceilings will be constructed of regular 12.5mm plasterboard and skim.

All steels will be protected by 12.5mm fire rated plasterboard and skim.

All rooflights will be timber framed Velux MK08.

Part B3: Internal fire spread (structure)

Section 5: Internal fire spread – dwellinghouses

All elements of the structure will have at least the fire resistance given in Appendix B, Table B3.

- Walls will be constructed of brick or concrete block.
- Roof will be constructed of timber.
- Steel will be protected by fire rated plasterboard.
- First Floor joists will be posi-joists.

Cavity barriers (closers) shall be installed to all open cavities around doors and windows, as well as the top of the walls.

Section 9: Protection of openings and fire-stopping

Pipes passing through a fire-separating element will meet alternative B and not exceed the relevant dimension given in Table 9.1.

Ducts for the Mechanical Ventilation Heat Recovery (MVHR) system that pass through a fire-separating element will meet method 3 and be constructed of stainless steel.

Part B4: External fire spread

Section 10: Resisting fire spread over external walls

The external surfaces (i.e. outermost external material) of external walls will comply with the provisions in Table 10.1. The Northeast wall will be, once covered in External Wall Insulation (EWI), 1030mm from the boundary. Therefore, no provisions will be applied.

Section 11: Resisting fire spread from one building to another

The building will comply with the provisions in Diagram 11.7

As above, the northeast wall will be a minimum of 1030mm from the boundary. No more than 5.6m2 of unprotected area will be present on this wall.

- Playroom window, 1350h x 1350w = 1.82m2
- Bathroom window, 1350h x 675w = 0.91m2
- Utility door, 2190h x 930w = 2.03m2
- Total = 4.76m2

The southwest wall will be a minimum of 3000mm from the boundary. No more than 18m2 of unprotected area will be present on this wall.

- Lounge window, 1350h x 1350w = 1.82m2
- Study window, 1350h x 1350w = 1.82m2
- Front door, 2190h x 930w = 2.03m2
- Kitchen/Dining/Living, 1350h x 1350w = 1.82m2 x 2
- Total = 9.31m2

The front and rear walls will be more than 6m from the boundary, so there is no limit to the unprotected areas on these walls.

Section 12: Resisting fire spread over roof coverings

The roof will be covered in slate effect concrete tiles and have timber Velux rooflights and conform to Table 12.1, in that the roof covering will be designated B_{ROOF}(t4).

The southwest roof will have 20 solar panels

Part C: Site preparation and resistance to contaminants and moisture

2004 edition incorporating 2004, 2010 and 2013 amendments – for use in England.

Section 1: Clearance or treatment of unsuitable material

A survey of the site has been carried out by a suitably qualified person including an initial ground investigation, a desk study and a walk over survey.

Section 2: Resistance to contaminants

The Ground has been prepared for new works by removing all unsuitable material, vegetable matter and tree or shrub roots to a suitable depth to prevent future growth. Existing redundant services have been sealed up, capped off, disconnected and removed as necessary. Reasonable precautions shall 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.

The site is in a low risk area for radon.

Section 3: Subsoil drainage

The dwelling is not subject to general flooding. Adequate sub-soil drainage shall be provided, if it is needed, to avoid:

- The passage of ground moisture to the interior of the dwelling:
- damage to the building through the transport of water-borne contaminants to the foundations of the dwelling.

Section 4: Floors

Existing Ground Floor build up will be (from bottom to top)

- 100mm hardcore
- Sand Blinding
- DPM (at least 1200 gauge) lapped up to DPC
- 100mm PIR insulation
- Polythene membrane
- 100mm reinforced self-compacting concrete
- Floor finish

Extension Ground Floor build up will be (from bottom to top)

- Existing Sub-Floor
- Sand Blinding
- DPM (at least 1200 gauge) lapped up to DPC
- 100mm PIR insulation
- Polythene membrane
- 100mm reinforced self-compacting concrete
- Floor finish

Section 5: Walls

All existing walls already have a DPC, new walls will include a new DPC. All DPC to be at least 150mm above external ground level.

Cavity of external walls continues at least 225mm below DPC.

Section 6: Roof

Roof will be finished with slate effect concrete tiles, resistant to moisture outside as per 6.6b.

It will also meet the requirement of 6.14, in that 120mm of PIR between the joists and 50mm of PIR below the joists will result in a U value of 0.14 W/(m^2k)

Part D: Toxic Substances

1992 edition incorporating 2002, 2012 and 2013 amendments – for use in England.

Cavities shall be filled with EPS beads that are non-toxic.

Part E: Resistance to the passage of sound

2003 edition incorporating 2004, 2010, 2013 and 2015 amendments – for use in England.

The dwelling is a single detached house for residential purposes. The dwelling shall be designed and constructed in such a way that:

- internal walls between a bedroom or a room containing a water closet, and other rooms provide reasonable resistance to sound.
- internal floors provide reasonable resistance to sound.

The requirements to satisfy the requirement for providing reasonable resistance to sound shall be met by constructing new walls and floors that provide laboratory sound insulation values set out in of Part E, Section 0: Performance. Table 0.2. No onsite testing shall be undertaken

Part F: Ventilation

2021 edition – for use in England

A whole house mechanical ventilation and extract with heat recovery system (MVHR) shall be installed, capable of providing air flow rates in excess of the minimum required by Part F, Section 1, Table 1.2 . Continuous Mechanical Ventilation and Extract with Heat Recovery System (MVHR) Air flow rates will be verified during commissioning of the MVHR system in accordance with Table 1.3.

Part G: Sanitation, hot water safety and water efficiency

2015 edition with 2016 amendments – for use in England

Part G1: Cold water supply

There shall be a suitable installation for the provision of a wholesome water supply in accordance with Approved Document G. Cold water supply shall be provided to washbasins, bidets, baths, W/Cs, showers, any place when drinking water is drawn off and to any sink provided in areas where food is prepared. Supply of cold water shall comply with section 67 of the water industry act 1991 and the Water Supply Regulations 2009.

Part G2: Water Efficiency

The estimated water consumption shall not to exceed 125 litres per person per day in accordance with Approved Document G2.

Part G3: Hot water supply and systems

All bathrooms, washbasins, bidet, baths and showers shall be provided with adequate hot and cold water supply in accordance with Approved Document G3. A washbasin with hot and cold water supply to be provided in or adjacent to all rooms containing a W/C. A sink with hot and cold water also to be provided to any area where food is being prepared.

The installation of the hot water supply shall comply with Approved Document G3. All baths and showers are to be fitted with an inline thermostatic mixing valve to ensure that the temperature of the water delivered to the bath is limited to 48°C.

Hot water storage systems shall be designed and installed in accordance with BS 12897 2006. Hot water vessels, cisterns etc shall be adequately supported.

The hot water storage system including any cistern or other vessel shall incorporate precautions to ensure suitable pressure relief and that any discharge from any safety devices is safely conveyed to where it is visible but will not cause harm to persons in or about the building. Precautions shall be in place to prevent stored water exceeding 100°C. Hot water vessels shall be fitted with a non self resetting energy cut out to instantly disconnect the power supply.

Outlets from domestic hot water storage vessels shall be fitted with an in line valve to prevent water temperatures exceeding 60°C. All pipes carrying hot water shall be insulated where they pass through unheated spaces. Hot water storage system shall be provided with suitable warning labels. Relevant certificates for the heating system i.e. Benchmark certificate, and commissioning certificates for fixed building services are to be given to the building owner and a copy provided to Building Control on completion.

Part G4: Sanitary conveniences and washing facilities

There shall be adequate and suitable sanitary conveniences in accordance with Approved Document G4. Hand washing facilities shall be provided to rooms containing sanitary conveniences.

Part G5: Bathrooms

All bathrooms will contain a wash basin and either a fixed bath or a shower in accordance with Approved Document G5.

Part G6: Food preparation areas

A suitable sink will be provided in any area where food is prepared in accordance with Approved Document G6.

Part H: Drainage and waste disposal

2015 edition – for use in England

The following document has been submitted to Building Control for review and approval.

- PDL.01 Proposed Drainage Layout

Part H1: Foul water drainage

All new above ground drainage and plumbing shall comply with BS EN 12056-2:2000 for sanitary pipework. All drainage shall be in accordance with part H of the Building Regulations. Wastes to have 75mm deep anti vacuum 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 vacuum traps to be used) shall be in accordance with Table 2.

All branch pipes shall 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 shall not connect within 200mm of the W/C connection.

Hot and cold water shall be supplied to all fittings as appropriate.

Underground drainage shall consist of 100mm internal diameter UPVC pipe, to give a minimum 1:80 fall, as per Table 6. Flow rates will be in excess of 2.5 litres/sec, as per table 5.

Pipes will be to Class N bedding, that is, bedded on 100mm of 10mm pea shingle, and have a minimum 150mm cover, as per Diagram 10.

Rodding access shall be provided at all changes of direction greater than 30 degrees and junctions. All below-ground drainage shall comply with BS EN 1401-1: 2009.

Part H2: Wastewater treatment systems and cesspools

None will be installed.

Part H3: Rainwater drainage

Section 1: Gutters and rainwater pipes

The rainfall intensity of the site for design of gutter and rainfall pipes is 0.02 litres per second per quare metre, as per Diagram 1.

The effective area of the southwest roof being drained is 77.6m, calculated using BS EN 12056-3:2000.

The flow capacity needs to be 1.552 litres/sec.
The southwest roof shall therefore have 120mm deep gutter with a 68mm round outlet at the end of the run capable of 2.05 litres/sec as per BS EN 12056-3:2000.

The effective area of the northeast roof being drained is 77.6m, calculated using BS EN 12056-3:2000.
The flow capacity needs to be 1.552 litres/sec.
The northeast roof shall therefore have 120mm deep gutter with a 68mm round outlet at the end of the run capable of 2.05 litres/sec as per BS EN 12056-3:2000.

The effective area of the southeast roof being drained is 36.85m, calculated using BS EN 12056-3:2000.
The flow capacity needs to be 0.737 litres/sec.
Half shall be drained into the outlet of the southwest roof, and half shall be drained into the outlet of the northeast roof.
Both outlets will be capable of handling the additional 0.3685 litres/sec each.

Section 2: Drainage of paved areas

The curtilage of the dwelling shall be pervious.

Section 3: Surface water drainage

Rainfall intensity of the site for design of drainage from paved areas and underground water drainage is 0.012 litres per second per square metre.

Inflow to the soakaway

Area to be drained = 123m2

D	M5-D min mm	M10-D min mm	Inflow m3
10	7.4	8.8	1.08
15	12.6	15.5	1.9
30	16	19.2	2.36
60	20	24.8	3.05
120	24.2	30	3.69
240	29.6	36.1	4.44
360	32.4	39.5	4.85
600	36.4	43.7	5.37
1440	45.6	53.8	6.61

Outflow from the soakaway

Based on 2.4m (w) x 2.5m (l) x 1m (h)

Surface area at 50% depth = 10.5m2

Soil infiltration rate = 1 x 10^{-4}, tested onsite according to BRE Digest 365.

Outflow = 0.1 x 10^{-3}

D	Outflow m3
10	0.6
15	0.9
30	1.8
60	3.6
120	7.2
240	14.4
360	21.6
600	36
1440	86.4

Required storage volume of the soakaway

D	Storage m3
10	0.48
15	1
30	0.56
60	0
120	0
240	0
360	0
600	0
1440	0

A soakaway 2.4m wide x 2.5m long x 1m effective depth filled with rubble with 30% void (2.34m2) is more than sufficient for the design, with the critical storm duration around 15 minutes for 10-year events.

Drains from the guttering shall be 110mm laid at a minimum 1:100 fall.

Part H4: Building over sewers

Not applicable.

Part H5: Separate systems of drainage

Not applicable.

Part H6: Solid waste storage

Not applicable.

Part J: Combustion appliances and fuel storage systems

2010 edition incorporating 2012, 2013 and 2022 amendments.

No combustion or fuel storage systems shall be installed.

Part K: Protection from falling, collision and impact

2013 edition – for use in England

Part K1: Stairs, ladders and ramps

Timber stairs shall comply with BS585 and with Part K1 of the Building Regulations.

- Max rise 220mm, min going 220mm. Two risers plus one going should be between 550 and 700mm.
- Tapered treads shall have going in centre of tread at least the same as the going on the straight.
- Min 50mm going of tapered treads measured at narrow end.
- Pitch not to exceed 42 degrees.
- The width and length of every landing shall be at least as great as the smallest width of the flight.
- Doors which swing across a landing at the bottom of a flight shall leave a clear space of at least 400mm across the full width of the flight.
- Min 2.0m headroom measured vertically above pitch line of stairs and landings.
- Handrail on staircase to be 900mm above the pitch line, handrail shall be at least one side if stairs are less than 1m wide and on both sides if they are wider.
- A clear width shall be ensured between handrails of minimum 600mm.

Part K2: Protection from falling

In addition to Part K1, stairs shall comply with Part K2 of the Building Regulations.

- Balustrading shall be designed to be unclimbable and should contain no space through which a 100mm sphere could pass. The structure shall be as designed by a Structural Engineer.

Part K4: Protection against impact with glazing

All glazing in critical locations shall be toughened or laminated safety glass to BS 6206, BS EN 14179 or BS EN ISO 12543-1:2011 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. See also, Part Q Security

Part L: Conservation of fuel and power

2021 edition incorporating 2023 amendments – for use in England

Section 4: Limiting heat gains and losses

U values to new elements shall meet or exceed the u values provided in Table 4.2

- Roof 0.15
- Wall 0.18
- Floor 0.18
- Window 1.4
- Rooflight 2.2
- Doors 1.4

U values to retained elements being renovated shall meet or exceed the u values provided in Table 4.3 (b)

- Wall 0.55
- Floor 0.25

The following documents have been submitted to Building Control for review and approval.

- EFTC.01 Existing Floor Thermal Calculations
- NFTC.01 New Floor Thermal Calculations
- EWTC.01 Existing Wall Thermal Calculations
- NWTC.01 New Wall Thermal Calculations
- NRTC.01 New Roof Thermal Calculations
- DCTC.01 Dormer Cheek Thermal Calculations
- DRTC.01 Dormer Roof Thermal Calculations

The building fabric shall be constructed so that the insulation is reasonably continuous across newly built elements.

The building fabric shall be constructed so that thermal bridging is reasonably limited.

Care shall be taken to reduce unwanted heat loss through air infiltration by doing all the following:

- When installing pipework or services, taping and sealing around service penetrations.
- When installing or renovating thermal elements, the element being installed should be draughtproofed, and air-leakage gaps should be filled.
- When installing windows, roof windows, rooflights or doors (all of which are controlled fittings), the controlled fitting should be well fitted and reasonably draught-proof.
-

New pipework for hot water services and space heating shall be insulated in accordance with Table 4.4

The unvented hot water cylinder shall have standing losses that do not exceed those in Table 4.5 and comply with BS EN 12897.

Section 5: Minimum building services efficiencies and controls – general guidance

The existing oil boiler shall be replaced with a heat pump that meets the minimum efficiency standards.

The heat pump has been sized based on heat loss calculations and anticipated domestic hot water demand of the dwelling, based on BS EN 12831-3.
A minimum of two independently controlled heating circuits should be provided.

System controls shall be wired so that when there is no demand for space heating or hot water the heating appliance and pump are switched off.

Thermal controls shall not be provided to every room given the underfloor heating system shall be installed into a high thermal mass concrete slab.

Section 6: System specific guidance

100mm of PIR Insulation shall be provided below the underfloor heating system.

The COP of the heat pump shall be a minimum of 2.0 for domestic hot water and 3.0 for space heating and be located and installed subject to the manufacturer's guidance.

The Mechanical Ventilation Heat Recovery (MVHR) system shall not have a power of more than 1.5W/(l.s) and have a heat recovery system with a minimum efficiency of 73%, a summer bypass and variable speed controls.

Light fitting shall have lamps with a minimum luminous efficacy of 75 light source lumens per circuit-watt, with separate controls for each space.

Solar PV panels shall be appropriately sized and installed according to manufacturer's instructions.

Section 10: New elements in existing dwellings, including extensions

The area of windows, roof windows, rooflights and doors shall not exceed 25% of the total floor area of the dwelling.

Part P: Electrical safety – Dwellings

2013 edition – for use in England.

All electrical work required shall meet the requirements of Part P (electrical safety) and 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 etc.

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

Part Q: Security – Dwellings

Reasonable provision shall be made to prevent unauthorised access to the dwelling. Accessible doors and windows shall be designed to resist physical attack by a casual or opportunist burglar by being both:

- sufficiently robust
- fitted with appropriate hardware.

Approved Document 7: Materials and workmanship

2013 edition incorporating 2018 amendments – for use in England

All works shall be carried out in a workmanlike manner. All materials and workmanship shall 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 shall have a CE marking.