

Side extension  
Roof alteration  
Loft conversion

for

Mr. Amudhah

at

140 Reepham Road, Norwich

## GENERAL NOTES

No building works to be commenced until full planning permission has been granted or permitted development has been confirmed by local authority. Any and all conditions specified on the certificate of Planning Decision should be adhered to in order that a situation of a breach of planning condition does not arise.

All works to be carried out in accordance with best practice, current British Standards and the requirements of the Building Act 1984 and current Building Regulations, to the satisfaction of the Building Control Body.

All works to be carried out in accordance with safe working practices and in accordance with CDM 2015 regulations. Ensure that all materials used internally and externally, e.g. paving slabs, board or sheet materials etc. are selected on the basis of ease of lifting by operatives or specify means of safe lifting and positioning in all cases.

Due regard to the provisions of the Party Wall Act 1996 must be made where the proposed building may affect adjacent or attached buildings and structures; including service of all relevant notices etc.

The property owner shall take all reasonable steps to protect the property of the neighbouring properties during the construction works.

Generally before commencement of building works we recommend that the client ensures that no easements and/or conditions have been defined which may affect the permission to construct the proposed building work over existing services and rights of access to the site.

All critical dimensions, drainage positions/levels/falls, services locations, boundaries etc. to be verified on site before construction commences to ensure that any errors, omissions etc. are identified.

## EXISTING SERVICES

**Existing Electrical Supplies:** Prior to commencement of all building works, positions of all cables and apparatus should be identified and marked on site, recorded on plans and made available in the health and safety file. Where electrical mains run close (normally within 3 metres) to the proposed building line consent must be obtained to carry out the building works.

**Existing Gas Supplies:** Prior to commencement of all building works, positions of all pipes, conduits and apparatus should be identified and marked on site, recorded on plans and made available in the health and safety file. Where gas mains run close (normally within 3 metres) to the proposed building line we advise the supervising authority before carrying out the building works.

**Existing Water Supplies:** Prior to commencement of all building works, positions of all pipes, conduits and apparatus should be identified and marked on site, recorded on plans and made available in the health and safety file. Where water mains run close (normally within 3 metres) to the proposed building line consent must be obtained to carry out the building works.

**Existing Telecoms and Cabling:** Prior to commencement of all building works, positions of all pipes, conduits and apparatus should be identified and marked on site, recorded on plans and made available in the health and safety file. In the case of major Telecoms and Cabling infrastructure we advise you to contact the owners of the apparatus prior to commencement of building works.

Existing Public Drains and Sewers: Prior to commencement of all building works, positions of all Drains and Sewers (both public and private) should be identified and marked on site, recorded on plans and made available in the health and safety file. Where public sewers run close (normally within 3 metres) to the proposed building line a building over agreement with the Water Authority must be obtained to carry out the building works and a copy provided to the Building Control Body. Formal consultation with the Water Authority will be conducted at the Building Control application stage. Any alteration, modified or re-siting of existing services to facilitate the proposed works, should be conducted by a suitably qualified and/or registered competent person.

#### SITE PREPARATION

All vegetable matter to be stripped from site of building and treated with proprietary weed killer where required. Topsoil to be set aside for reuse if suitable and free of contamination.

#### BUILDING REGULATIONS PART M: ACCESS TO AND USE OF BUILDINGS

All existing access to and use of buildings provisions given under Part M of the building regulations must not materially alter the existing building and features so that access to and use of building is made worse than before the proposed building work is carried out.

#### BUILDING REGULATIONS PART F

Under Regulation 4(3) of the Building Regulations there is a requirement that the ventilation for a building not being made less satisfactory as a result of the work and that new works comply with the requirements of Part F 1 - Ventilation, this including any works certified by members of an relevant competent person schemes.

When building work in an existing dwelling includes work on ventilation by adding a habitable room, adding a wet room or replacing part of the ventilation system, including extract fans; the work should meet the relevant guidance given in approved document F1.

When other building work is carried out that will affect the ventilation of the existing dwelling, by replacing a window or door or carrying out energy efficiency/improvement work; the ventilation of the dwelling should meet the relevant guidance given in approved document F1 and/or not be less satisfactory than before the work was carried out.

Each dwelling should have a suitable ventilation strategy which should include a combination of extract ventilation either intermittent or continuous operation, whole dwelling ventilation to provide fresh air to the dwelling and purge (rapid) ventilation to quickly pollutants and/or water vapour. The required ventilation can be provided by natural ventilation, mechanical ventilation or a combination of both.

Internal doors should allow air to flow through the dwelling by providing a minimum free area equivalent to a 10mm undercut in a 760mm wide door. Doors should be undercut to achieve either of the following: if the floor finish is fitted the bottom edge of the door should be 10mm above the floor finish; or if the floor finish is not fitted the bottom edge of the door should be 20mm above the floor surface (Fire Doors -

please note that the provision of any door undercut is subject to compliance with any recommendations in relation to the allowable bottom edge gap/undercut allowance given by the relevant fire door manufacturer; also to be subject to agreement with your building control body).

#### BACKGROUND VENTILATION

Background ventilation to the whole multi storey dwelling is to be at least equivalent to min 8000mm<sup>2</sup> to all habitable rooms and 4000mm<sup>2</sup> to kitchens, utility rooms and bathrooms with external walls.

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#### EXTRACT VENTILATION

1). Mechanical extract ventilation (either intermittent or continuous) should be provided to kitchens, utility rooms, bathrooms (and similar rooms) and sanitary accommodation and be ducted to outside air. Mechanical ventilation fans and terminals should be installed/located a maximum of 400mm below the ceiling and as high as is practicable in the room.

2). Intermittent extract fans should be tested in accordance with BS EN 13141-4 and cooker hoods should be tested in accordance with BS EN 13141-3. Continuous mechanical extract ventilation systems should be tested in accordance with BS EN 13141-6.

3). Mechanical ventilation systems should be designed and installed to minimise noise, with correctly sized and jointing ducts, appropriate fixings and mountings provided to ventilation equipment. Any mechanical extraction fans should be appropriately sized to prevent excessive noise.

4). Suitable access for maintenance should be provided to ventilation systems, in order to readily replace filters, fans and coils, carry out cleaning of any ductwork and to conduct general maintenance of the system/equipment.

#### REPLACEMENT WINDOWS

1). Where the existing windows which are to be replaced have background ventilators, any replacement windows should have background ventilators provided, which are not smaller than the background ventilators in the original window and be controllable either automatically or by the occupant. If the size of the background ventilators in the existing window is not known, new background ventilators with the following equivalent area should be provided:

- a) Habitable rooms minimum 8000mm<sup>2</sup>
- b) Kitchen minimum 8000mm<sup>2</sup>
- c) Bathroom (with or without a toilet) minimum 4000mm<sup>2</sup>.

If the dwelling has or will have continuous mechanical extract ventilation, background ventilators to any replacement windows in each habitable room (which are not in wet rooms), should have a minimum equivalent area of 4000mm<sup>2</sup>.

2). Where the existing windows which are to be replaced do not have background ventilators, the replacement windows should have background ventilators with an equivalent area (relevant to the room/space) of:

a) Habitable rooms minimum 8000mm<sup>2</sup>

b) Kitchen minimum 8000mm<sup>2</sup>

c) Bathroom (with or without a toilet) minimum 4000mm<sup>2</sup>.

If the dwelling has or will have continuous mechanical extract ventilation, background ventilators to any replacement windows in each habitable room (which are not in wet rooms), should have a minimum equivalent area of 4000mm<sup>2</sup>.

3). Replacement window/s to a room which already has a through wall ventilator which has the minimum equivalent area/s as given in Approved Document F, no additional background ventilation is required.

4). Replacement window/s to a room which has an existing open-flued appliance (which requires a permanent air supply the air for combustion), additional background ventilation is required e.g. by way of background ventilators or through wall ventilators; which have the required minimum equivalent areas as given in Approved Document F. Any existing permanent air supply the air for a combustion appliance must remain and suitability for the existing combustion air requirement should be checked by a member of a relevant competent person scheme, such as Gas Safe, OFTEC etc.

#### ADDITION OF A HABITABLE ROOM

1). Where additional habitable room/s are to be added to an existing dwelling which is connected to an existing habitable room which now has no windows/doors opening to the outside as a result of the works; the additional habitable room should have purge ventilation with a minimum total area of 1/20, based on the combined floor area of the both habitable rooms and background ventilation of at least 10,000mm<sup>2</sup> equivalent area. Also there should be a permanent opening with a minimum area of 1/20 of the combined floor area of the two rooms between the two rooms and/or the conservatory (if applicable).

2). Where additional rooms are added to an existing dwelling which is connected to an existing habitable room that still has windows opening to the outside, which have at total background ventilation with an equivalent area of less than 5000mm<sup>2</sup>, the additional habitable room should have purge ventilation with a minimum total area of 1/20 (based on the combined floor area of the both habitable rooms) and background ventilation of at least 10,000mm<sup>2</sup> equivalent area.

3). Where additional room/s are added to an existing dwelling which is connected to an existing habitable room that still has window/s opening to the outside, which have at total background ventilation equivalent area of at least 5000mm<sup>2</sup>, then background ventilators of at least 12,000mm<sup>2</sup> equivalent area should be provided between the two rooms and background ventilators of at least 12,000mm<sup>2</sup> equivalent area between the additional room and the outside.

#### ADDITION OF A WET ROOM

Where a wet room is added to an existing dwelling, extract ventilation should be provided by either intermittent extract to outside of 15 litres per second (l/s) and a background ventilator with at least 5000mm<sup>2</sup> equivalent area or continuous extract, as specified in Table 1.2 of Approved Document F1, or single room heat recovery ventilator/system (background ventilator is not required in the same room as the single room heat recovery ventilator).

Where a wet room is added to an existing dwelling, purge ventilation in a new wet room should be 1/10th of the floor area of the room for hinged or pivot windows with an opening angle of 15 to 30 degrees or 1/20th of the floor area of the room for hinged or pivot windows with an opening angle of greater than or equal to 30 degrees.

#### REFURBISHING A KITCHEN OR BATHROOM

Where building work is carried out in a kitchen or bathroom, any existing fans (including cooker hoods, where they extract to the outside) should be retained or replaced. Appropriate checks should be made to determine whether any retained ventilation devices are working correctly.

Where there are no ventilation system in the original room, it is not necessary to provide one in the refurbished room. However, additional ventilation may be necessary if refurbishment work is likely to make the building less compliant with the ventilation requirements of the Building Regulations than it was before the work was carried out. If an extractor fan or cooker hood is replaced and it uses the existing cabling, this does not need to be notified to a building control body.

VENTILATION REQUIREMENTS FOR OTHER BUILDING WORKS (i.e. when installing energy efficiency measures i.e. insulating suspended ground floor, removing or sealing a chimney etc.)

1). Many existing dwellings are ventilated through infiltration through the existing building fabric. Any proposed energy efficiency improvement measures to be carried to an existing dwellings, should not reduce the overall level of ventilation. Any building work should not reduce the ventilation provisions of the existing dwelling unless suitable evidence is provided to demonstrate that on completion of the building work that the ventilation provisions meet the minimum standards required for Part/Approved Document F1.

2). When carrying out energy efficiency measures (building work) to an existing dwelling, an assessment should be carried out in order to determine if any additional ventilation provision is needed, based on the estimated impact of the work.

3). Ventilation assessment (prior to energy efficiency measures being carried out) should be conducted either in accordance with the simplified method approach given in Approved Document F or by a suitably qualified expert, following the guidance and principles given in BSI PAS 2035 - Retrofitting dwellings for improved energy efficiency (also see Appendix D of Approved Document F - a checklist for determining the ventilation provision in an existing dwelling).

#### VENTILATION ASSESSMENT

1). If the simplified method is to be used in providing a ventilation assessment for works to existing dwellings, the guidance within paragraphs 3.8 to 3.13 and table 3.1 of Approved Document F should be followed. Noting that this simplified method assumes that the existing dwelling has adequate means of ventilation through a combination of purposely provided ventilation and infiltration, if the dwelling does not have suitable ventilation in these terms expert advice/report should be sought/provided.

In general the simplified method of ventilation assessment includes a calculation of the number of major and minor energy efficiency measures involved (both planned energy efficiency measures and those measures fitted since the original dwelling was constructed i.e. the accumulation of measures).

2). The ventilation assessment (simplified method) will provide confirmation of the category of building works e.g. Category A, B or C.

i). For Category A works - it is likely that the energy efficiency measures (existing and planned) will not have reduced the ventilation provision of the dwelling, below the requirements of Part F1 so no further ventilation provision is likely to be necessary.

ii). For Category B works - it is likely that the ventilation provision of the dwelling has been reduced below the requirements of Part F1, therefore further ventilation provisions are required:

a). Natural ventilation - by following the system specific guidance in paragraphs 1.47 to 1.59 in Approved Document F1 i.e. natural ventilation with background ventilators and intermittent extract fans (where any existing purpose built ventilators are in working order and that the equivalent area/s has not been reduced).

b). Continuous mechanical extract ventilation - by following the system specific guidance in paragraphs 1.60 to 1.66 in Approved Document F1.

c). Mechanical ventilation with heat recovery - by following the system specific guidance in paragraphs 1.67 to 1.73 in Approved Document F.

iii). For Category C works - it is likely that the ventilation provision of the dwelling has been reduced significantly below the requirements of Part F1, therefore further ventilation should be provided by one of the following means:

a). Natural ventilation - by following expert advice for the design, sizing and positioning of ventilators to ensure adequate ventilation provision.

b). Continuous mechanical extract ventilation - by following the system specific guidance in paragraphs 1.60 to 1.66 in Approved Document F.

c). Mechanical ventilation with heat recovery - by following the system-specific guidance in paragraphs 1.67 to 1.73 in Approved Document F.

## CONTROL OF VENTILATION

1). All systems of providing ventilation should be controllable, with either manual or automatic controls provided.

2). Continuously running fans should be set up to operate without occupant intervention but may have manual or automatic controls for selecting the high rate of operation, with manual high rate controls provided locally to the spaces they served, e.g. bathrooms; these automatic controls can include sensors for humidity in moisture generating rooms. Humidity sensors should not be used for sanitary accommodation (WCs).

3). Where a combustion appliance is installed, any automatic ventilation controls must also ensure that the combustion air provided meets the requirements of Part J of the Building Regulations. An assessment should be carried out by a member of a relevant competent person scheme, such as Gas Safe, OFTEC etc.

#### INSTALLATION OF VENTILATION SYSTEMS

1). All ductwork should be appropriately sized ducts for the required air flow rate. Rigid ductwork should be used wherever possible, any flexible ductwork to the standards of BSRIA's BG 43/2013, where installed, should only be used for final connections, have a maximum length of 1.5m, the full internal diameter should be maintained and flow resistance is minimised. Ductwork connections should be both mechanically secured and adequately sealed to prevent leaks. Rigid connectors and jubilee clips should be used for flexible ducting to ensure a good seal.

2). All ductwork installations should be designed and installed to minimise the overall length of the duct and the number of bends in order to minimise the overall pressure losses within the ventilation system. All external air terminals should have a free area of at least 90% of the free area of the connected duct.

3). Mechanical ventilation systems must be commissioned in accordance with an approved procedure, including a completion checklist and commissioning sheet completed by the system installer.

#### MINIMISING THE INGRESS OF EXTERNAL POLLUTANTS

1). All ventilation systems should be designed to minimise the intake of external air pollutants where the pollutant values in the location of the dwelling exceed any of the limits in Table 2.1 given in Approved Document F1 (this may have been determined through an air quality assessment) and where the dwelling is located near to any sources of significant local pollution, such as road traffic, including traffic junctions and underground car parks, combustion appliances, other combustion processes, discharges from industrial processes, exhaust discharges from building ventilation systems, construction and demolition sites; which are a source of particles and vaporous discharges and any other significant sources of local air pollution which may be detrimental to health.

2). All ventilation intakes should be located away from the direct impact of the sources of local pollution (CIBSE's TM64 and TM40 gives further guidance in this regard).

3). Any air intakes for dwellings next to busy urban roads should be as high as possible, located on the less polluted side of the building, they should not be located in courtyards or enclosed urban spaces where air pollutants are discharged. Air intakes should be located as far as possible from the source of pollutants and in an open or well ventilated area. In areas where wind comes from opposing directions (e.g. a valley), any air intakes should point in the opposite direction to the exhaust outlets.

4). Exhaust outlets/terminals should be located so that re-entry of exhaust air into a building, or entry into nearby buildings, is minimised; where there are no harmful effects on the surrounding area and should be downwind of intakes. Exhaust outlets should not discharge into courtyards, enclosures or Architectural screens.



## COMMISSIONING AND PROVIDING INFORMATION

- 1). Commissioning of a mechanical ventilation system and the provision of information for a new and/or an existing dwelling, is required in order to achieve, demonstrate etc. that all fixed mechanical ventilation systems for which testing and adjustment is possible are tested and commissioned. The commissioning results should show that systems are operating as required to achieve adequate ventilation and that any controls are operating as required to achieve adequate ventilation.
- 2). The person carrying out any ventilation work should give notice to the building control body that commissioning has been carried either not later than the date on which the notice required by regulation 16(4) is required to be given; or not more than 30 days after completion of the work; or in accordance with regulation 20 of the Building (Approved Inspectors etc.) Regulations 2010 (as amended). A copy of the completed commissioning information should be given to the owner of the dwelling.
- 3). The person carrying out the work shall not later than five days after the work has been completed give sufficient information to the owner about the building's ventilation system and its maintenance requirements, so that the ventilation system can be operated in such a manner as to provide adequate means of ventilation. The installer should provide clear and simple written guidance to the building owner on how to operate and maintain the ventilation system.
- 4). Regulation 42 - new dwellings. The air flow rates for mechanical ventilation in new dwellings must be measured. A notice of the measured air flow rates must be given to the building control body either not later than five days after the final test is carried out or in accordance with regulation 20 of the Building (Approved Inspectors etc.) Regulations 2010 (as amended).

## AIR FLOW RATE TESTING, COMMISSIONING AND INSPECTION OF VENTILATION SYSTEMS

- 1). Mechanical ventilation systems (both intermittent extract continuous mechanical ventilation systems) must be commissioned to provide adequate ventilation. A commissioning notice must be given to the building control body. The air flow rates for mechanical ventilation in new dwellings must be measured. A notice of the measured air flow rates must be given to the building control body.
- 2). Ventilation systems should be inspected and tested. For background ventilators, the minimum and actual equivalent area for background ventilators should be identified and recorded, along with the location of installed background ventilators, suitable checks should be made to determine that the background ventilator controls work and that they open and close correctly and the quality of the installation should be checked to ensure it is correctly mounted within the wall or window aperture.
- 3). Ventilation systems should be inspected and tested. For intermittent extract fans, the installer should carry out checks to establish that the fans operate correctly, that the fans respond correctly to the controls provided with the installation and that any overrun timers are set to at least 15 minutes.
- 4). For ducted systems - for all ductwork and terminals, the installer should check that the system has been installed to achieve the design criteria, that the number, size and location of the air terminals provide effective air distribution in the space, that all ductwork and terminals are in good condition with no obvious defects that will affect the performance of the system, that the air flow direction is correct at each

room terminal and that there are no abnormal noises from the ventilation system. (For ducted systems in continuous mechanical ventilation systems, the system should be balanced to achieve design air flow rates at each room terminal).

## TESTING AND CONTROLS

The air flow rate of all mechanical ventilation fans/terminals using a calibrated air flow device with a proprietary hood, should be tested/measured including cooker hoods, continuous extract fans and/or terminals, continuous supply fans and/or terminals etc.

The correct operation of each control function should be tested where it is practical. Ventilation controls should be inspected to ensure that they have been installed in accordance with the manufacturer's instructions, that they are labelled to clearly indicate their function, any sensors are operational and that any automatic controls are configured to ensure that they do not disturb occupants.

Operating and maintenance instructions for existing dwellings

1). Sufficient information about the ventilation system and its maintenance requirements must be given to the building owner to allow the system to be operated effectively. This should include both design flow rates and maintenance requirements. The information should be provided in a clear manner, for a non-technical audience. The operation and maintenance information should contain specific instructions for the end user on how and when to use the ventilation system, including information on the intended uses for the available fan settings. Information should also be provided to suggest when, and how, the system components should be cleaned and maintained.

This information is likely to include:

- a). Manufacturer's contact details.
- b). That background ventilators allow fresh air into the home and should be left open.
- c). The location of automatic controls and how to set them.
- d). The location of manual controls for the on/off and high rate settings for a mechanical ventilation system and how to use them.
- e). How cleaning and maintenance of the system and its components should be carried out. This includes the location and specification of filters and how to assess when to replace filters.
- f). How to access ducts for cleaning, how to undertake cleaning of plant and ducts and the intervals at which cleaning should be undertaken.
- g). The location of sensors and how to recalibrate them.
- h). Design flow rates.

The operation and maintenance information should also contain relevant manufacturers' literature, including the following, where relevant.

- a). Component specifications.
- b). Installation guidance.
- c). Operating instructions.
- d). Maintenance schedules.
- e). Guarantees.
- f). Registration card.

- g). Spare parts lists.
- h). Instructions for obtaining spare parts.

#### **BUILDING REGULATIONS PART A: STRUCTURE**

Thicknesses of walls, general arrangement and piers sizes to comply with Part A1/2 with buttresses and openings to comply with Diagrams 13 and 14 unless justification is provided by structural calculations.

#### **BUILDING REGULATIONS PART J: COMBUSTION APPLICANCES AND FUEL STORAGE SYSTEMS**

Gas Boilers may only be installed (including relocation and reinstallation) and commissioned by a member of a relevant 'Competent Person' Scheme and the installation must be registered with the relevant scheme, the property owner should be provided with a copy of the Gas Safe Building Regulation Compliance Certificate within 30 days of the installation.

#### **BUILDING REGULATIONS PART L**

The total area of windows, roof windows, rooflights and doors in the extensions should not exceed the 25% of the floor area of the extension plus the total area of any windows and doors which no longer exist or are no longer exposed due to the extension.

If the maximum proposed area of glazing to an extension exceeds 25% of the floor area plus the area of any windows, doors and roof windows which are to be removed or will no longer be exposed as a result of the proposed extension; the following options are available:

- a). Reduce the area of glazing to within the maximum allowed. Or,
- b). An area weighted u-value calculation is required in order to demonstrate that the area weighted u value of all of the thermal/fabric elements of the extension is no greater than that of an extension of the same size and shape that does comply with all elements of the guidance. Or,
- c). Submit a whole building SAP calculation to show that the dwelling primary energy rate, the dwelling emission rate and the dwelling fabric energy efficiency rate for the dwelling and proposed extension do not exceed those for the dwelling plus a notional extension.

#### **MAJOR RENOVATION HIGH-EFFICIENCY ALTERNATIVE SYSTEMS**

When a dwelling undergoes a major renovation, the technical, environmental and economic feasibility of installing high-efficiency alternative systems should be considered, by the person undertaking the building work. The building control body should be notified that the analysis of high-efficiency alternative systems has been undertaken, that it is documented and is available to be verified.

#### **THERMAL BRIDGING/AIRTIGHTNESS IN EXISTING DWELLINGS**

1). When carrying out work in existing dwellings, care should be taken to reduce unwanted heat loss through thermal bridging. Thermal bridges can be limited in an existing dwelling by following the junction details from a reputable non-government database containing independently assessed thermal junction details and following the guidance given in paragraph 4.17 of Approved Document L1 (where appropriate).

2). When carrying out work in existing dwellings, care should be taken to reduce unwanted heat loss through air infiltration by ensuring the following:

a). When installing pipework or services, taping and sealing around service penetrations.

b). When installing or renovating thermal elements, the element being installed should be draughtproofed, and air-leakage gaps should be filled.

c). When installing windows, roof windows, rooflights or doors (controlled fittings), the controlled fitting should be well fitted and reasonably draught-proof.

### CHANGE OF ENERGY STATUS

Where existing thermal/fabric elements are retained and are to become thermal elements e.g. a loft or garage conversion, then these retained elements with a u value greater than the threshold u values of:

Walls	0.7 W/(m <sup>2</sup> K)
Floors	0.7W/(m <sup>2</sup> K)
Roofs	0.35W/(m <sup>2</sup> K)

should be upgraded to achieve the following u-values:

Walls (with internal or external insulation)	0.3 W/(m <sup>2</sup> K)
Cavity Walls	0.55W/(m <sup>2</sup> K)
Floors	0.25W/(m <sup>2</sup> K)
Roofs	0.16W/(m <sup>2</sup> K)

### CONSERVATORIES AND PORCHES

1). In order to be considered as being exempt from the energy efficiency requirements any conservatory or porch must have thermal separation from the existing dwelling and the dwelling's heating system must not be extended into the conservatory or porch. The conservatory or porch must not have its own fixed heating appliance.

2). If a conservatory or porch is not exempt from the energy efficiency requirements the new and replacement thermal elements should achieve the following u values:

Walls	0.18 W/(m <sup>2</sup> K)
Floors	0.18W/(m <sup>2</sup> K)
Roofs	0.15W/(m <sup>2</sup> K)

The controlled fittings should achieve the following u values:

Windows (including roof windows)	1.4 W/(m <sup>2</sup> K)
External doors	1.4W/(m <sup>2</sup> K)
Rooflights	2.2W/(m <sup>2</sup> K)

The 25% limit on openings does not apply. Any walls, doors and windows should be insulated and draught-proofed to at least the same extent as in the existing dwelling and any fixed building services and/or on-site electricity generation within the conservatory or porch should meet the relevant standard and have independent temperature and on/off controls.

#### REPLACEMENT WINDOWS, DOORS AND ROOFLIGHTS

- 1). For windows, roof windows, rooflights and doors, when the entire unit/assembly is replaced, the units should be draught-proofed, achieve a maximum u value of 1.4 W/(m<sup>2</sup>K) (2.2W/(m<sup>2</sup>K) for rooflights), and have insulated cavity closers installed (where appropriate). Suitable evidence of compliance should be provided to the Building Control Body and could include a copy Window Energy Rating and/or Doorset Energy Rating from a recognised quality assured and audited certification scheme.
- 2). If an existing window is enlarged and/or a new one is created, the total area of windows, roof windows, rooflights and doors should not exceed 25% of the total floor area of the dwelling otherwise suitably compensating measures should be taken to improve the energy efficiency of the dwelling.

#### RENOVATION OF THERMAL ELEMENTS

- 1). The following activities are considered as being a renovation of a thermal element;
  - a). if a new layer is provided through cladding.
  - b). rendering the external surface of a thermal element.
  - c). a new layer is provided through dry-lining the internal surface of a thermal element.
  - d). an existing layer is replaced through stripping down the element to expose basic structural components (e.g. bricks, blocks, rafters, joists, frame) and then rebuilding.
  - e). cavity wall insulation is provided.

If more than 50% of the surface of the individual thermal element is renovated or the work constitutes a major renovation (as per the list above) e.g. a major renovation is when more than 25% of the surface area of the external building envelope is renovated; the whole of the thermal element should be improved/upgraded to achieve at least the following u values:

Walls (with internal or external insulation)	0.3 W/(m <sup>2</sup> K)
Cavity Walls	0.55 W/(m <sup>2</sup> K)
Floors	0.25W/(m <sup>2</sup> K)
Roofs	0.16W/(m <sup>2</sup> K)

If the improvement/upgrade of the thermal is not considered technically, functionally or economically feasible, then evidence should be provided to the Building Control Body.

#### CONSEQUENTIAL IMPROVEMENTS

For any existing dwelling with a total useful floor area of over 1000m<sup>2</sup>, additional work (consequential improvements) may be required (to the extent that they are technically, functionally and economically feasible), to improve the overall energy

efficiency of the dwelling; if proposed work consists of an extension, providing any fixed building service in the dwelling for the first time or increasing the capacity of any fixed building service.

#### MATERIAL CHANGE OF USE

1). Material change of use, is when a building is to be used as a dwelling, where previously it was not or the building contains a flat, where previously it did not or the building contains a greater or lesser number of dwellings than it did, having previously contained at least one dwelling.

2). When there is a material change of use to a building the existing thermal elements (retained thermal elements) should meet or be lower than the limiting u value standards given by column (a) of Table 4.3 of Approved Document L1 or where the retained elements have a u value greater than the u value given in column (a);

Walls 0.7 W/(m<sup>2</sup>K),

Floors 0.7W/(m<sup>2</sup>K),

Roofs 0.35W/(m<sup>2</sup>K)

those elements should be upgraded to achieve the u - values in Table 4.3, column (b);

Walls (with internal or external insulation) 0.3 W/(m<sup>2</sup>K)

Cavity Walls 0.55 W/(m<sup>2</sup>K)

Floors 0.25W/(m<sup>2</sup>K)

Roofs 0.16W/(m<sup>2</sup>K)

3). If the existing windows, roof windows, rooflights and doors (controlled fittings), separate a conditioned space from an unconditioned space or the external environment and they have a u value higher than 3.30/(m<sup>2</sup>K) for windows, roof windows and doors and 3.80 W/(m<sup>2</sup>K) for rooflights they should be replaced with controlled fitting which have a u value of 1.4 W/(m<sup>2</sup>K) for windows (including roof windows) and external doors and 2.2W/(m<sup>2</sup>K) for rooflights.

4). New thermal/fabric elements and controlled fittings i.e. windows, doors etc. Should meet the limiting standards given by Table 4.2 of Approved Document L1;

Walls (including dormer cheeks) 0.18 W/(m<sup>2</sup>K)

Floors 0.18W/(m<sup>2</sup>K)

Pitched roofs (including dormer roofs) 0.15W/(m<sup>2</sup>K)

Flat roofs 0.15W/(m<sup>2</sup>K)

Windows (including roof windows) 1.4 W/(m<sup>2</sup>K)

External doors 1.4W/(m<sup>2</sup>K)

Rooflights 2.2W/(m<sup>2</sup>K)

5). The total area of openings in the newly created dwelling should not be more than 25% of the total floor area.

6). Any fixed building services including building automation and control systems and/or on site electricity generation that are provided or extended should meet the standards in Sections 5 and 6 of Approved Document L1.

#### BUILDING REGULATIONS PART P: ELECTRICAL SAFETY

Any controllable electrical installation should be undertaken by a person who is a member of a Part P Competent Person Scheme and that the installation is

registered with the relevant scheme, the property owner should be provided with a copy of the Building Regulation Compliance Certificate within 30 days of the installation.

## PLUMBING

New waste connections to have air admittance valves, where required and rodding access points and access point at base.

In general , Bath and Shower should be provided with 40mm diameter wastes and 50mm traps.

In general Sinks and Wash Basins should be provided with 32mm diameter wastes and 75mm traps.

W.C. should be connected to 100mm diameter branch connections.

(The above diameter pipes are subject to maximum distances reference to tables 1 and 2 of Approved Document H should be made).

All above ground drainage to comply with BS EN12056-2:2000.

Re-sealing traps where applicable.

Head of drainage runs to be vented via soil and vent pipes or similar, terminating a minimum of 900mm above any adjacent opening in the building within 3m. For maximum lengths of branches see diagram 3 or Table 2 of Approved Document H.

## LIGHTING EFFICIENCY

Controlled services including Heating, Cooling and Lighting for new houses, alterations or extension of the existing lighting system will be carried out in accordance with the current guidance contained within the Domestic Building Services Compliance Guide.

## LIGHTING

1). Any fixed lighting should achieve lighting levels appropriate to the activity in the space and spaces should not be over illuminated. Each internal light fitting should have lamps with a minimum luminous efficacy of 75 light source lumens per circuit-watt and have local controls to allow for the separate control of lighting in each space or zone; these controls may be manual, automatic or a combination of both.

2). Any fixed external lighting should have automatic controls which switch luminaires off in the hours of daylight and when the luminous efficacy is 75 light source lumens per circuit-watt or less, have automatic controls which switch luminaires off after the area lit becomes unoccupied (where luminous efficacy is greater than 75 light source lumens per circuit-watt, manual control can be provided acceptable).

## HEATING SYSTEMS

The suitability of the existing boiler is to be assessed and discussed prior to commencement of work. All new radiators are to be fitted with thermostatic valves.

## REPLACEMENT BUILDING SERVICES IN EXISTING DWELLINGS

- 1). Any replacement fixed building service (heating and hot water boiler/system etc.) should have an efficiency of at least 92% for gas, 86% for oil combination boiler and 100% for electric heating systems (other than heat pump systems). (Where work is carried out on a system which includes a boiler, a boiler interlock should be installed). If the replacement fixed building service (e.g. boiler) uses the same fuel as the one being replaced, it should also have an efficiency that is not worse than that of the boiler being replaced. (If the efficiency of the appliance being replaced is not known, the Standard Assessment Procedure (SAP), Tables 4a and 4b with primary energy factors taken from the SAP Table 12). If the replacement fixed building service (e.g. boiler) uses a different fuel than the boiler being replaced, the replacement system should not produce more CO<sub>2</sub> emissions per kWh of heat than the boiler being replaced and not have a higher primary energy demand per kWh of heat than the boiler being replaced (where a heat pump is installed which meets the minimum efficiency standards given in Approved Document L1 it should be deemed to be compliant with the above without further calculation).
- 2). When a gas fired combination boiler is installed in an existing dwelling, at least one of the following energy efficiency measures (as appropriate to the system), should be installed:
  - a). Flue gas heat recovery.
  - b). Weather compensation.
  - c). Load compensation.
  - d). Smart thermostat with automation and optimisation.
- 3). When any renewable technology such as a wind turbine or photovoltaic array is to be replaced, the new system should have an electrical output that is at least the same as that of the original installation.
- 4). For an existing system, when a boiler or hot water storage vessel is replaced, any accessible pipes in the dwelling should be suitably insulated.

#### SYSTEM CONTROLS AND ZONING

- 1). When a boiler is replaced in an existing dwelling, each room should be provided with thermostatic room controls. These controls should be capable of being used to separately modify the heating output in each room served by the heating appliance.
- 2). Thermostatic radiator valves should not be used in the same room as a room thermostat.
- 3). Controls in existing heating and domestic hot water systems, when domestic hot water and space heating are controlled by a single time controller in the existing system (which is to be replaced), then these types of control may remain on completion of the works. If the existing system has separate time controls for domestic hot water and space heating then on completion of the works the separate time controls should be maintained.
- 4). When replacing a hot water cylinder, the replacement cylinder should have an electronic temperature control e.g. cylinder thermostat.
- 5). When replacing a boiler, the boiler controls should meet the standards given by Section 6 of Approved Document L1 for the relevant wet heating system (as the boiler controls are considered to be part of the boiler installation.)

#### FIXED GAS FIRED SPACE HEATING



- 1). When a gas fired fixed independent space heating appliance is installed in an existing dwelling installation should meet the applicable standard(s) as follows:
  - a). An appliance for primary space heating should meet the following standards: i). BS EN 1266, ii). BS 7977-1, iii). BS EN 613, iv). BS EN 13278. Or,
  - b). An appliance for secondary space heating should meet one or more of the following standards: i). BS EN 1266, ii). BS 7977-1, iii). BS EN 613, iv). BS EN 13278, v). BS EN 14829, vi). BS EN 449.
- 2). When a gas fire is provided as a secondary heat source as part of a combined fire and back boiler unit in an existing system, the installation should meet the standards in BS 7977-2.
- 3). When a gas fired fixed decorative fuel effect fire is installed in an existing dwelling, the installation should meet the requirements/standards in BS EN 509 and the number of appliances should not exceed one per 100m<sup>2</sup> of dwelling floor area.

### COMFORT COOLING (HEAT PUMPS)

The specification of any comfort cooling systems should be based on a heat gain calculation for the dwelling, the calculations should be in accordance with CIBSE's Guide A and the manufacturer's guidance. The seasonal energy efficiency ratio of an air conditioner working in cooling mode should be a minimum of 4.0. If it is intended to install comfort cooling systems, specialist advice and designs should be provided.

### SOLAR WATER HEATING SYSTEMS

- 1). Any solar collector should have an area of less than 20m<sup>2</sup> and a heated water storage volume of less than 440 litres. Any new solar hot water collectors should be independently certified as complying with all tests required by BS EN 12975-1 and BS EN ISO 9806. The electrical input power of the primary pump in the solar water heating system measured in watts should be less than the higher of either of the following 50W or 2% of the peak thermal power of the collector. If it is intended to install Solar water heating systems, specialist advice and designs should be provided.
- 2). The dedicated storage volume of solar heated water relative to the area of the collector should be either a minimum volume of 25 litres for every 1m<sup>2</sup> of the net absorber area or a volume equivalent to at least 80% of the daily hot water demand (as defined by the Standard Assessment Procedure).

### SOLAR WATER HEATING SYSTEMS

For work on an existing solar water heating system, controls should be fitted to or upgraded in solar domestic hot water systems to achieve all of the following:

- a). Maximise the useful energy gain from the solar collectors.
- b). Minimise the accidental loss of stored energy.
- c). Ensure that hot water produced by back-up sources is not used when adequate solar pre-heated water is available.
- d). Provide a means to control the adverse effects of excessive temperatures and pressures.

e). Where a separate domestic hot water heating appliance is pre-heated by a solar system, the appliance should be controlled to add no extra heat if the target temperature is met from the solar pre heated vessel.

#### UNDERFLOOR HEATING SYSTEMS

- 1). All underfloor heating systems should have controls to adjust the operating temperature, with room thermostats that have a manual override provided for electric underfloor heating systems. Any underfloor heating systems within a screed floor which has a thickness greater than 65mm should automatically reduce the room temperature at night or when the room is unoccupied.
- 2). Measures should be incorporated in order to limit heat loss, such as ground floors being insulated to limit heat losses to not more than 10W/m<sup>2</sup>. Any underfloor heating systems intended for intermittent use and/or installed over unheated rooms should be separated from the structural floor by a layer of suitable insulation, with any pipework which does not provide heat to a room being suitably insulated.
- 3). Electric underfloor heating; any electric cables for underfloor heating installed within screeds should be as follows, for direct electric systems; within screeds not exceeding 60mm and for night energy storage systems, within screeds of at least 65mm.
- 4). Programmable room thermostats with an override feature should be provided for all direct electric zones of the electric underfloor heating system. Thermostats should have air and floor temperature sensing capabilities which may be used individually or in combination.
- 5). All installed equipment in underfloor heating systems should be commissioned in accordance with BS EN 1264-4. If it is intended to install electric underfloor heating, specialist advice and designs should be provided.

#### WET HEATING SYSTEM

Where a wet heating system is fully replaced in an existing dwelling, including the heating appliance, emitters and associated pipework. All parts of the system including pipework and emitters (radiators) should be sized to allow the space heating system to operate effectively and in a manner that meets the heating needs of the dwelling, at a maximum flow temperature of 55°C or lower. Where it is not feasible to install a space heating system that can operate at 55°C or lower, the space heating system should be designed to the lowest design temperature possible that will still meet the heating needs of the dwelling.

#### BUILDING AUTOMATION AND CONTROL SYSTEMS

Where a building automation and control system is installed, it should have appropriate control capabilities for the dwelling, based on the type of building, its expected use and potential energy savings. Any system should be specified and installed according to the manufacturer's instructions to ensure that its overall performance meets a reasonable standard.

#### ON-SITE GENERATION OF ELECTRICITY

Any on site electricity generation should be appropriately sized and provided with suitable controls. When replacing an existing system, the installed generation capacity of the new system should be no less than that of the existing system, except where a smaller system can be demonstrated to be more appropriate or effective (e.g. replacing an existing system with one which is better matched to the dwelling's energy demand).

## COMMISSIONING

- 1). Any fixed building services must be commissioned to ensure that they use no more fuel and power than is reasonable in the circumstances.
- 2). A commissioning plan should be provided, stating which systems (fixed building services) have been tested and how these systems were tested. For new dwellings, the commissioning plan should be given to the building control body with the design stage dwelling primary energy rate, dwelling emission rate and dwelling fabric energy efficiency rate calculations. (Noting that any fixed building service that, by design, cannot be adjusted, or for which commissioning would not affect energy use, does not need to be commissioned, this information should be included in the commissioning plan).
- 3). A commissioning notice must be given to the relevant building control body confirming that suitable commissioning has been carried out for any fixed building services. The notice should confirm that the commissioning plan has been followed, that all systems have been inspected in an appropriate sequence and to a reasonable standard and that test results confirm that performance is reasonably in accordance with the design requirements.
- 4). The notice of completion of commissioning should be given within five days of the commissioning work being completed. Where fixed building services that require commissioning are installed by a person registered with a competent person scheme, that person may give the notice of completion of commissioning 30 days of the work being completed. Until the building control body receives the notice of completion of commissioning, it may decide not to give a completion/final certificate.

## GENERAL GUIDANCE FOR COMMISSIONING

Before a new heating appliance is installed, all central heating and primary hot water circuits should be thoroughly cleaned and flushed out. A suitable chemical inhibitor should be added to the primary heating circuit to protect against scale and corrosion. In hard water areas, suitable measures should be taken to treat the feed water to water heaters and the hot water circuit of combination boilers to reduce limescale accumulation. Domestic central heating systems should be prepared and commissioned to BS 7593.

## HEAT PUMP HEATING SYSTEMS - COMMISSIONING

Heat pumps and any dedicated ancillary products, e.g. integrated hot water cylinders, should be commissioned in accordance with both the manufacturer's instructions and the appropriate system design parameters.

## GROUND SOURCE HEAT PUMP - COMMISSIONING

- 1). The commissioning procedure for the ground source heat pump array should include the ground arrays (including header pipes and manifolds), being flushed as one system to remove all debris and purged to remove all air. The heat pump (including its accompanying pipework) should be flushed and purged as a separate system while isolated from the ground array system. A pressure test in accordance with BS EN 805 should be conducted on all closed loop ground source heat pump installations to prove the integrity of the systems and antifreeze and biocide should be added to ground heat exchangers as appropriate, in line with manufacturer's instructions.
- 2). Commissioning information provided to the dwelling owner and should include details of the fluids used and their commissioned concentrations.

## SOLID FUEL CERTIFICATIONS

New solid fuel appliances should be installed and commissioned by a member of a relevant 'Competent Person' Scheme (e.g. HETAS, Blue Flame Certification etc) and the installation must be registered with the relevant scheme, the property owner should be provided with a copy of the Building Regulation Compliance Certificate within 30 days of the installation.

## OPERATING AND MAINTENANCE INSTRUCTIONS

- 1). Operating and maintenance instructions which are in an accessible format, durable, easy to understand and specific to the dwelling should be given to the owners of the dwelling for any fixed building services and on site electricity generation installed as part of the work. These instructions should contain sufficient information to help the occupiers achieve the expected level of energy efficiency and to verify that any fixed building services and on site electricity generation comply with the energy performance requirements of the Building Regulations. They should explain what the fixed building services and on site electricity generation are, what they are for, where they are located, using a floor plan, how to operate them, and how to maintain them etc.
- 2). For existing dwellings, when any building work is carried to fixed building services, the energy performance of the fixed building services and/or on site electricity generation affected by the work should be assessed and documented.
- 3). When installing a complete new or replacement system (e.g. replacing a heating system including the heating appliance, pipework and heat emitters), the energy performance of the whole system should be assessed using SAP and/or by a suitably qualified person. The results should be recorded and given to the building owner with the manufacturer's supporting literature.
- 4). When carrying out work on an existing system, such as installing or replacing components (e.g. replacing a boiler but retaining the pipework and heat emitters), the energy performance of the new components should be assessed. The results should be recorded and given to the building owner.
- 5). Any fixed building services must be commissioned to ensure that they use no more fuel and power than is reasonable in the circumstances, with full records of commissioning the system provided to the homeowner.

## **Walls**

Generally construct facing brick in flush pointed 6:1 sand/cement mortar (unless matching into other jointing/pointing systems), and 3:1 sand/cement mortar below DPC, pointing joints appropriate to the conditions of exposure (See table 4 and Diagram 12 of Approved Document C). Lean mix concrete cavity fill to 225 mm below DPC. All internal joints to be left smooth and flush pointed. All openings around windows, doors etc. to be provided with proprietary vertical and horizontal cavity insulated cavity closers to prevent cold bridging and suitable for the exposure zone of the property. All masonry walls to include a horizontal DPC at least 150mm above ground level with the DPC to the inner leaf of any cavity wall lapped into adjacent damp proof membranes to floors. Builder to ensure that all cavities and flashings on the existing building are identified and integrated with new extension to prevent moisture and water ingress into the extension or existing building. Walls to achieve U-value of 0.18 W/m<sup>2</sup>K. Cavity width as shown on plan and/or section, insulation as specified in individual wall specifications. Movement joints to be provided at 12 metre centres for clay bricks and 6 metre centres for concrete blocks. Where extension walls are constructed on top of existing walls, existing foundations and walls to be inspected by Structural Engineer and/or Building Control Body and design prepared for strengthening or replacement of existing foundations and walls if required (note that a cavity tray may be required at the intersection of the existing and proposed cavity walls).

## **Block Wall**

Block Wall Comprising:

### **Ground Floor**

Readymix Concrete GEN 1, 50 - 70mm slump (Structural concrete), Solid Dense Concrete Block 7N 440 x 215 x 100mm (Blockwork below dpc), Class A Engineering Brick Blue (Bricks for use in splash course), Solid Lightweight Aggregate Block 3.5N 440 x 215 x 100mm (max conductivity 0.15W/mK) (Partition blocks above dpc less openings), Insulation Coursing Block 3.5N 100mm (Coursing blocks above dpc), Solid Dense Concrete Coursing Brick 7N 215 x 65 x 100mm (Coursing blocks to inner leaf below dpc), Pitch Polymer DPC 100mm (DPC to blockwork), Building Sand (Sand below dpc in brickwork, Sand below dpc in blockwork, Sand above dpc in blockwork), Cement (Cement below dpc in brickwork, Cement below dpc in blockwork, Cement above dpc in blockwork), Board Finish Plaster (Plaster finish to walls), 12.5mm Square Edge Plasterboard (Plastering to inner blockwall), Plasterboard Adhesive (Wall plastering fixing system / basecoat), Plasterboard Tape (Wall plastering joint treatment)

## **Roofing**

Rafters, purlins and ceiling joists and binders as specified at centres shown on drawing. To be in accordance with TRADA Technology Design Aid DA 1/2004 and TRADA Technology Span Table (current edition). Lateral restraint straps to all 100 x 75 mm wall plates and rafter/gable junctions at 1500 mm centres. Ventilation of roof space via 25mm fly proof ventilation strip. All roof areas insulated between ceiling joists, secondary insulation counter laid above to achieve a maximum U-value of 0.15 W/m<sup>2</sup>K. Where sloping ceilings required insulation board to be laid between rafters with minimum 50mm clear air gap over to underside of roof felt with insulation

board and plasterboard and finish fixed to underside of rafters to achieve max U-value of 0.15 W/m<sup>2</sup>K. Vertical studs within attic design to receive insulation within studding plus insulation board over the face of the studs with taped joints and finished with plasterboard and skim, to achieve max U-value of 0.18 W/m<sup>2</sup>K. Provide draught stripping and bolts to all roof access hatches. Nail all tiles/slates and provide clips where necessary in accordance with BS5534. Roof tiles to be checked for suitability once roof is constructed and actual pitch confirmed. All fixings to be in accordance with tile/slate manufacturer's recommendations and instructions. Ridge and hip tiles to be mechanically fixed. All roof works to be carried out in accordance with BS5534. Code 4/5 lead flashing to roof junctions. Dormer walls should be provided with suitable cladding, battens and breathable membrane and if the dormer walls are within 1000mm of a boundary they are required to achieve a minimum period of 30 minutes fire resistance (subject to the height of the building), with vertical studs to receive insulation within studding plus insulation board over the face of the studs with taped joints and finished with plasterboard and skim to achieve max U-value of 0.18 W/m<sup>2</sup>K. All leadwork to be installed in accordance with BS EN12588 and Lead Sheet Association publications, Leadwork and Control of Lead at Work. Soakers to be formed in code 3/4 lead. Flashings to be formed in code 4/5 lead and to feature minimum 100 mm upstands. Valleys to be formed in either code 5, 6 or 7 in line with recommendations. Cavity trays to be provided where the roof abuts cavity walls, this may not be required if the existing walls are of solid construction. Where roof lights or dormers are installed into the roof all rafters surrounding roof windows to be doubled up (Dormer roofs and associated roof construction to be designed by Structural Engineer). Where the ceilings follow the line of the rafters, insulation to be installed between and under the rafters using sizes provided in the attached schedule. Roof void ventilation to be in accordance with the recommendations of BS5250 and generally ventilation to the bottom of the pitched roof should be provided which have an equivalent ventilation area to a continuous opening of not less than 25,000mm<sup>2</sup>/M, along with 5000mm<sup>2</sup>/M (equivalent ventilation area) ridge ventilation and/or abutment ventilation. There should be a minimum of 50mm ventilated air space above the insulation and a vapour control layer with a vapour resistance of at least 250 MN·s/g is required to the underside of the roof prior to plasterboarding. Gaps in the ceiling should be minimized and service openings should be avoided; if they cannot be avoided it is essential that they are sealed. Where mono pitch roof abuts an external wall and whenever cross flow from opposing sides is not possible provide either a breathable roof membrane or high level traditional ventilation, coupled with the specified ventilated soffit. Prefabricated roof trusses by specialist, designed in accordance with PD6639-1:2012 and erected and braced in strict accordance with manufacturer's and designer's instructions. Please forward the manufacturers roof truss layout and calculations when possible to the Building Control Body, this information should include lateral restraint positions and bracing to BS 5268 (Part 3). Method statement to be prepared to ensure safe lifting, handling and erection of roof.

## **Tiled Cut Roof**

Rafters, purlins and ceiling joists and binders as specified at centres shown on drawing.

## **Main Roof**

Sawn Dry Graded Structural Softwood Treated 47 x 150mm (General roof rafters, General roof gable Ladder Rafters, Lean to roof apex wall plate), Sawn Softwood Kiln Dried Treated 47 x 50mm (Noggings between rafters, Gable ladder noggings), Sawn Batten Treated 25 x 38mm (Soffit carriers, Lathe, Tile undercloak valley strip), Sawn Dry Graded Structural Softwood Treated 75 x 100mm (Wall plate, Monopitch roof ridge wall plate), Sawn Dry Graded Structural Softwood Treated 25 x 200mm (Apex roof ridge), Sawn Dry Graded Structural Softwood Treated 25 x 150mm (Valley lay boards, Valley boards), Sawn Dry Graded Structural Softwood Treated 47 x 200mm (Hip ridge rafter), Sawn Dry Graded Structural Softwood Treated 47 x 100mm (Hip corner ties), White 175mm Square Fascia x 16mm (Eaves fascia, Bargeboard), Sawn Firing Treated 47 x 50mm (Tilting fillets), Cement Soffit Strip (Tilting fillet support board, Tile undercloak 1), Soffit Vent (Eaves ventilator), White 400mm PVC Board x 9mm (Gable soffits, Eaves soffits), Breather Membrane Heavy Weight (Roofing felt), Plain Clay Tile (Tiles), Half Round Clay Ridge (300mm) (Ridge tile, Hip ridge tile), Clay Mono Ridge Tile 300mm (Mono ridge tiles), Clay Eaves Tile (Eaves tiles, Top tiles), Clay Tile & Half (Verge tiles, Valley tile and halves, Hip tile and halves), PVC Dry Ridge Vent System (Proprietary ridge fixing system, Proprietary hip ridge fixing system), PVC Dry Verge System (Proprietary gable fixing system), Lead Flashing Code 4 - 450mm (Valley Lining (Tile, Lead or preformed)), Building Sand (Sand pointing/bedding to valley), Cement (Cement in pointing/bedding to valley), Scrolled Hip Iron (Hip Irons), Lead Flashing Code 4 - 300mm (Lean to roof flashing), Horizontal Cavity Tray 440mm (Lean to roof cavity tray), Plastic Half Round Gutter 112mm (Gutter), Lateral Restraint Strap (Wallplate straps, Gable straps at joist level, Gable straps at verge level)

## **Flat Roofing**

Roof joists as specified. Joists generally at 400mm centres unless otherwise specified. Lateral restraint straps to all 100 x 75mm wall plates and wall junctions at 1500mm centres. All roof areas insulated above the roof deck (warm deck construction) to achieve a maximum U-value of 0.15 W/m<sup>2</sup>K, ensure that beam fill insulation is installed internally between the top of the cavity wall and the underside of the deck material. Vapour control layer to be provided above deck material and below insulation. Flashings to be formed in code 4/5 lead s. Cavity trays to be provided where the roof abuts cavity walls, this may not be required if the existing walls are of solid construction. Where roof lights (suitable for installation to flat roofs) are to be installed into the roof all joists surrounding roof windows to be doubled up or suitable trimmers supplied (associated roof construction to be designed by Structural Engineer). Waterproofing system by specialist. Provide furring/diminishing strips laid to fall at min 1 in 80 to suit.

## **Universal Flat Roof**

PlansXpress Universal Flat Roof comprising:

### **Flat Roof**

Sawn Dry Graded Structural Softwood Treated 47 x 200mm (Flat roof joists), Sawn Softwood Kiln Dried Treated 47 x 50mm (Noggings between flat roof joists, Counter batten to flat roof), Sawn Firing Treated 47 x 50mm (Flat roof firrings or diminishing strips), 18mm Hardwood Ply WBP (Flat roof deck 1), Lateral Restraint Strap (Flat roof restraint straps to joists), White 400mm PVC Board x 9mm (Flat roof fascias, Flat roof soffits), GRP Fibreglass Fabric 450g Chopped Strand Mat (Flat roof waterproofing system layer 1), GRP Fibreglass Resin (Flat roof waterproofing system layer 2), GRP Fibreglass Catalyst (Flat roof waterproofing system layer 3), GRP Fibreglass Topcoat (Flat roof waterproofing system layer 4), GRP Fibreglass External Corner Fillet (Flat roof waterproofing corner detail), PIR Flat Roof Insulation Board 140mm (max conductivity 0.022W/mK) (Insulation to flat roofs), Polythene DPM Blue 300mu (Vapour barrier to flat roofs)

## **Internal Door**

Internal Door comprising:

## **Internal Walls**

Internal Door 6 Panel Textured Undercoated 762 x 1981mm (Door), Internal Latch Pack (Door furniture), Butt Hinge Brassed 102mm (Hinges), Prestressed Concrete Lintel to Manufacturer's Recommendations (External/Combination lintel), Steel Lintel to Manufacturer's Recommendations (External/Combination lintel), Sawn Softwood Kiln Dried Treated 47 x 75mm (Door former), Cavity closer 140mm (Cavity closer), 12mm Hardwood Ply WBP (Internal door threshold board), 12.5mm Square Edge Plasterboard (Reveal plaster finish), Plasterboard Adhesive (Reveal plastering fixing system / basecoat), Plasterboard Tape (Reveal plaster joint treatment), Board Finish Plaster (Reveal finish to plaster)

## **French Door**

French Door comprising:

### **House**

PVC-U French Door 1200mm Wide with 2 x 745mm Side Lights (Door), Steel Lintel to Manufacturer's Recommendations (External/Combination lintel), Sawn Softwood Kiln Dried Treated 47 x 75mm (Door former), Cavity closer 140mm (Cavity closer), Cavity Trays Standard (Allowance £6.50 Each) (Cavity tray), 12mm Hardwood Ply WBP (Internal threshold board), 12.5mm Square Edge Plasterboard (Reveal and cill plaster finish), Plasterboard Adhesive (Reveal and cill plastering fixing system / basecoat), Plasterboard Tape (Reveal and cill plaster joint treatment), Board Finish Plaster (Reveal and cill finish to plaster), PVC Plastering Corner Bead (Corner Bead)

## **Sliding Patio Door**

Sliding Patio Door comprising:

### **Rear**

PVC-U 3 Pane Patio Door 2690mm (Door), Steel Lintel to Manufacturer's Recommendations (External/Combination lintel), Sawn Softwood Kiln Dried Treated 47 x 75mm (Door former), Cavity closer 140mm (Cavity closer), Cavity Trays Standard (Allowance £6.50 Each) (Cavity tray), 12mm Hardwood Ply WBP (Internal threshold board), 12.5mm Square Edge Plasterboard (Reveal and cill plaster finish), Plasterboard Adhesive (Reveal and cill plastering fixing system / basecoat), Plasterboard Tape (Reveal and cill plaster joint treatment), Board Finish Plaster (Reveal and cill finish to plaster), PVC Plastering Corner Bead (Corner Bead)

## **Doors (Custom Size)**

All doors to achieve max U-value 1.4 W/m<sup>2</sup>K. Glazing to all doors and sidelights less than 1500mm above FFL, glazing within 300mm horizontally of doors and glazing less than 800mm above FFL are to be either laminated or toughened glass to BS6206:1981 or BS EN 12600. All cavities to be closed around openings with proprietary insulated horizontal and vertical insulated cavity closers incorporating DPC. Lintels to specialist design to openings to have minimum 150mm end bearings with stop ends and are to be factory insulated, depending on the location of the project, its exposure zone and the type of lintel selected, there may be a need for separate cavity trays above the lintel in accordance with the manufacturer's guidance. Weep holes above openings at maximum 450mm centres, minimum of 2 per opening. Each room to be provided with minimum 5000mm<sup>2</sup> trickle ventilation and opening door or window to provide minimum 5% of floor area purge ventilation or equivalent mechanical ventilation if no door or window provided. (Ventilation to existing rooms must not be made less satisfactory in relation to Building Regulation



requirements before the improvement works are carried out (BUILDING REGULATIONS PART F Approved Document Part F Section 3 Work on existing buildings).

## **Windows**

Double glazed windows. All to achieve max U-value 1.4 W/m<sup>2</sup>K. Where opening light opens more than 30 degrees or are sash windows, the opening lights are to be at least 1/20th of the room floor area to all habitable rooms. Where opening lights open less than 30 degrees, the opening lights are to be at least 1/10th of the room floor area to all habitable rooms. (Note that in order to demonstrate compliance with Part O Overheating of the Building Regulations it is likely that higher purge ventilation rates than those given above will be required).

Provide draught seals to all windows, doors and roof lights. Glazing to all doors and sidelights less than 1500mm above FFL, glazing within 300mm horizontally of doors and glazing less than 800mm above FFL are to be either laminated or toughened glass to BS6206:1981 or BS EN 12600. All habitable rooms (unless the rooms open directly on to the ground floor hallway which leads to the final exit) are to have egress windows with a clear egress opening of 0.33m<sup>2</sup>, min 450mm wide by 450mm high, with the cill height 800-1100mm above FFL. First floor windows with a cill height less than 800mm above FFL are to have a suitable guarding in accordance with Part K of the Building Regulations. Controls for all openable windows and skylights are to be located so that they may be opened, closed or adjusted safely. All cavities to be closed around openings with proprietary horizontal and vertical insulated cavity closers incorporating DPC or blockwork and insulated DPC.

Lintels to specialist design to openings to have minimum 150mm end bearings with stop ends and are to be factory insulated. Weep holes above openings at maximum 450mm centres, minimum of 2 per opening.

Each room to be provided with minimum 8000mm<sup>2</sup> trickle ventilation equivalent area as measured in accordance with BS EN 13141-1 and opening door or window to provide minimum 5% or 10% of floor area purge ventilation or equivalent mechanical ventilation (design required) if no door or window provided. (Ventilation to existing rooms must not be made less satisfactory in relation to Building Regulation requirements before the improvement works are carried out (BUILDING REGULATIONS PART F Approved Document Part F Section 3 Work on existing buildings)).

## **Stairs**

Width of staircase and landings to be minimum 800mm. Width and length of any landing to be at least the same width as the staircase. Landing to be clear of door swings at top and bottom of each flight. Maximum pitch 42 degrees, minimum headroom of 2m above pitch line to be maintained throughout the stair flight, height of handrails to be a minimum 900mm above the pitchline, handrails to be provided to both sides of any stairflight which is greater than 1000mm wide; 100mm maximum spacing to balustrading/guarding, minimum rise 150mm, maximum rise 220mm, minimum going 220mm maximum going 300mm (the normal relationship between the dimensions of the rise and going is that twice the rise plus the going (2R + G))

should be between 550mm and 700mm). Minimum 50mm going on tapered treads at newel.

## **Straight Flight Staircase**

Construct Staircase comprising:

### **Hall**

Straight Flight Staircase (Staircase), Softwood Staircase Turned Newel Post (Full newel posts), Softwood Staircase Newel Cap Acorn (Full newel post caps), Softwood Staircase Floor Rail (Baserail), Softwood Staircase Georgian Baluster (Spindles), Softwood Staircase Hand Rail (Balustrade), 12.5mm Square Edge Plasterboard (Plaster to underside of staircase), Plasterboard Tape (Plaster joint treatment), Board Finish Plaster (Plaster finish to underside of staircase)