

DEVELOPMENT  
MANAGEMENT  
04 DEC 2023

## Building Regulation Notes: WOODWARD/BRN

Building regulation and general construction notes for works in side extension and loft conversion incorporating a raised ridge.

1 Halfrey Road, Fishbourne, Chichester, PO18 8BU

Rev A – 24.11.2023

Building Specification notes to be used in conjunction with [Drg:WOODWARD\\_01A](#).

Block & Location Plan drawings attached, Directional North indicated

**Note:**

Details and dimensions of DPC, wall plate, ridge levels of proposed plans to be checked on site by appointed contractor prior to any commencement/ordering of materials of work and any queries, variations or discrepancies directed to client - **DM Designs accepts no responsibility in any part on drawings issued unless otherwise agreed.**

The following notes and associated drawings do not constitute a full specification of work as this has been solely produced for the purpose of obtaining the necessary local authority consents/approvals.

**DM Designs**  
TO BE USED IN CONJUNCTION WITH  
DRG No:  
**WOODWARD-JIA**

[www.dmdesign.uk.com](http://www.dmdesign.uk.com)  
[danny@dmdesign.uk.com](mailto:danny@dmdesign.uk.com)

07906 702 625



## Quick guide to the 2022 changes to Building Regulations as they affect existing domestic dwelling extensions and alterations

### Introduction

The governments Future Homes standard takes its first step with the implementation of the 2022 changes to Parts F and L of the Building Regulations. These changes affect all applications submitted to your Building Control Body on or after the 15th June 2022.

There are transitional arrangements for applications submitted before the 15th June where the previous versions of the Parts F and L will apply to the work. However if the work has not commenced before 15th June 2023 then the work will be subject to the new requirements automatically on that date.

### Headline issues to note

There are some headline issues that we think you should be aware of and may affect work that you have been priced for or have priced before the critical 15th June date. These changes may apply additional requirements to the work that ultimately may affect that pricing. It is important to note that this only affects projects you have submitted to your Building Control Body on or after the 15th June.

This document is focussed on the changes to Part F, dealing with Ventilation and Part L, dealing energy efficiency issues. We have also focussed on the changes as they relate to the extension and alteration of domestic dwellings only.

### Key changes to Part F – Ventilation in Dwellings

1. Trickle (background) ventilators must have been “equivalent area” performance tested to BS EN 13141. The ventilators must be marked with their equivalent area to aid verification
2. Windows with secondary opening i.e. Night latches, cannot be used in place of trickle (background) vents
3. Open plan kitchen dining areas will need a minimum of 3 trickle ventilators in the room
4. Minimum requirement for trickle ventilators to habitable rooms in extensions and loft conversions is now 12000mm<sub>2</sub>
5. Minimum requirement for wet rooms in extensions and loft conversions is the required mechanical extract fan rate and 5000mm<sub>2</sub> of trickle ventilator
6. All replacement windows must have trickle ventilators with equivalent area of 8000mm<sub>2</sub> in habitable rooms and kitchens and 4000mm<sub>2</sub> in bathrooms. Doors should be undercut by 10mm to the finished floor level
7. Flexible ducts for extractors are now limited to a maximum of 1.5m in length and must be installed to ensure flow resistance is minimised
8. Improving energy efficiency measures in existing dwellings requires an assessment of ventilation provision and a new checklist is provided in the approved document
9. Information about new ventilation systems must be provided to the homeowner when work is undertaken to an existing dwelling. The Governments Home User Guide can be used for this

<https://www.gov.uk/government/publications/home-user-guide-template>

### Key changes to Part L – Energy Efficiency in Dwellings

10. New, replacement, thermal elements, and glazing need to meet new U-Values
11. The maximum opening areas limit of 25% of the floor area of extension plus any existing covered openings remains.
12. Where sub-glazed SAP calculations or area weighted U value calculations are required these must be submitted before starting works.
13. Ground floor perimeter upstand insulation is required as 25mm standard
14. There are changes to efficiency requirements when replacing or extending the existing space heating systems in an existing dwelling. A minimum gas boiler SEDBUK rating of 92% is required with enhanced controls; additional requirements for combi boilers are also included
15. Replacing a flat roof waterproofing membrane now requires upgrading of the insulation to achieve a 0.16 U value
16. Exempt structures such as conservatories and porches under 30m<sup>2</sup> will not be classed as exempt if they are provided with any form of fixed heating.

**Changes to U values for extensions and loft conversions**

Whilst they have their critics U values remain one of the principal tools that the building regulations use to limit heat loss. Unlike new build dwellings, where U values are expressed as a target in a wider energy efficiency calculation for the dwelling, U values for extensions and alterations to existing dwellings are given as fixed figures which must, in general, be achieved.

In simple terms a U value is the term used to describe the thermal performance of all the component parts of a thermal element, for instance an external wall. It's not just about the insulation, albeit that is the most important part. The calculation of a U value involves a measure of how all the component parts contribute to the element's performance. The key thing to remember is that when the U value decreases this means that less energy is able to travel through the materials, so the lower the U value the better the thermal performance.

- External wall 0.28 0.18
- Floor 0.22 0.18
- Roof 0.16-0.18 0.15
- Windows (including roof windows and curtain walling) 1.6 1.4
- Timber windows N/A 1.6
- External doors >60% glazed 1.8 (Band E) 1.4 (Band C)
- Other external doors 1.8 (Band E) 1.4 (Band B)
- External fire doors N/A 1.8
- Roof light and any kerb/upstand 1.6 2.2
- Rooflight upstand built on site N/A 0.35

**Indicative insulation thickness's for various standard thermal elements**

The tables below provide some general guidance as to material requirements to achieve the new U values for extensions and alterations to existing dwellings. These are indicative only and should not be relied upon. Installers must satisfy themselves as to a products fitness to achieve the required standard.

- PIR (0.02 conductivity) 100mm between and 60mm under
- Mineral wool (0.04 conductivity) 100mm between and 90mm under
- Pitched roof with insulation at rafter level
- PIR 100mm between and 60mm under
- 140mm over rafters
- 75mm between and 75mm over
- Multifoil & PIR Dependant on type and location of multifoil

## PLANNING NOTE

### SINGLE-STOREY EXTENSION

An extension or addition to your house is considered to be permitted development, not requiring an application for planning permission, provided certain limits and conditions are met.

1. On designated land\* - no cladding of the exterior. \*Designated land (Article 2(3)) includes national parks and the Broads, Areas of Outstanding Natural Beauty, conservation areas and World Heritage Sites.
2. On designated land\* - no side extensions. Rear extension - No permitted development for rear extensions of more than one storey. The regime for larger single-storey rear extensions (see point 9) does NOT apply to houses on designated land.
3. No more than half the area of land around the "original house" would be covered by additions or other buildings. Sheds and other outbuildings must be included when calculating the 50 per cent limit.
4. No extension forward of the principal elevation or side elevation fronting a highway. 5. Materials to be similar in appearance to the existing house.
6. Side extensions to be single storey. Width of side extension must not have a width greater than half the width of the original house.
7. Side extensions to have a maximum height of four metres and width no more than half that of the original house.
8. If the extension is within 2m of a boundary, maximum eaves height should be no higher than 3m to be permitted development.
9. Single-storey rear extensions must not extend beyond the rear wall of the original house by more than 4m if a detached house; or more than 3m for any other house. Where not on designated land (Article 2(3)) or a Site of Special Scientific Interest, this limit is increased to 8m if a detached house; or 6m for any other house.
10. Maximum height of a single-storey rear extension of 4m. Maximum eaves and ridge height of extension no higher than existing house.

## LOFT CONVERSION PLANNING NOTE

It is recommended that the Agent contact the local planning authority for advice on all matters concerning permitted development.

A loft conversion for your house is considered to be permitted development and not requiring an application for planning permission, subject to the following limits and conditions:

- Materials must be similar in appearance to the existing house.
- Volume of enlargement (including any previous enlargement) must not exceed the original roof space by more than:
  - 40 cubic metres for terraced houses; or
  - 50 cubic metres otherwise.
- Must not exceed the height of the existing roof.
- On the principal elevation of the house (where it fronts a highway), must not extend beyond the existing roof slope.
- Must not include:
  - verandas, balconies\* or raised platforms; or
  - installation, alteration or replacement of any chimney, flue, or 'soil and vent pipe'.
- Side-facing windows must be obscure-glazed; and, if opening, to be 1.7 metres above the floor of the room in which they are installed.
- Construction must ensure that:
  1. The eaves of the original roof are maintained (or reinstated)
  2. Any enlargement is set back, so far as practicable, at least 20cm from the original eaves
  3. The roof enlargement does not overhang the outer face of the wall of the original house

With the exceptions that:

Points 1 and 2 do not apply to the relevant parts of any hip-to-gable enlargement

None of these three points apply to the relevant parts of any enlargement that joins the original roof to the roof of a side or rear extension.

(Ref - <https://www.planningportal.co.uk>)

## Loft extension/conversion

### Enclosed “protected” staircase solution

There are two potential scenarios:

☑ A protected stairway should be provided throughout the height of the building to a final exit and a place of safety.

☑ **Alternatively** a protected stair giving access to two separate unprotected escape routes at ground floor level, both of which lead to suitable final exits that are separated from one another.

All stairway enclosure walls, including glazing must be to a 30 minute fire resisting standard, with minimum FD20 rated fire doors. If existing doors are to be retained they **must** be suitably upgraded and certificated to provide the required 20 minute standard.

The existing first and new second floor construction must achieve a full 30 minutes fire resistance. Subject to the conditions listed below the first floor construction can be reduced to a modified 30/15 minute standard, for further explanation of this standard See AD B table A1, Appendix A:

☑ A maximum of one additional storey and 2 rooms are to be provided in the new loft; and

☑ The floor area of the new storey is not more than 50m<sup>2</sup>; and

☑ Where the first floor landing is directly above a habitable room this must be upgraded to achieve the full 30-minute fire standard.

Smoke detectors connected to the dwellings mains electrical system must be installed. These can be wired to the existing lighting circuits and should be provided in the circulation areas on all floors. The detectors must be interlinked, but this can be a radio link rather than a wired link. This is commonly referred to as a Grade D LD3 system under BS 5839 -6:2013

## Variations using an enhanced AFD system as a compensatory feature

Early warning, using automatic smoke and heat detection can achieve much shorter reaction and movement times hence when providing such systems there may be some scope to modify certain elements of the above protected stair solution. If a **Grade D Category LD2**

(including bedrooms) AFD system is provided throughout the property, installed in

Technical Note 1

Domestic Loft Conversions to

existing 2 storey dwelling houses

accordance with BS 5839-6:2013, then the following variations may be considered

acceptable:

☑ A Reduced level of structural fire resistance to both the existing and the new floor structure from a full 30 minutes to a modified 30/15 minutes in all areas. It is considered acceptable to retain existing lath & plaster or 9mm plasterboard ceilings, in good condition.

☑ Retention of the existing doors to the staircase. Certain rules must be observed to achieve this, see our guidance below on existing door retention.

## Enclosed “unprotected” staircase solution

In some circumstances adopting the following guidance will allow the acceptance of an existing non fire rated staircase enclosure including existing doors and existing glazing in walls:

☑ Provide a minimum **Grade B Category LD2** (including bedrooms) AFD system throughout the property. The installation must be certificated by a suitable BS 5839 Part 6 certificate from the installer. (Note this is not suitable for properties with card operated meters or similar).

☑ Heat detection to the kitchen

☑ First and second floor construction to be modified 30/15 minutes fire resisting

☑ This proposal relies solely on the AFD system for protection from fire and therefore the type of door fitted and any glazing in doors and walls is not considered. The door retention guidance below is therefore not applicable.

## Open plan ground floor solution

Where the existing property currently has an open plan arrangement at ground floor level, or as part of the loft conversion work it is proposed to create an open plan arrangement at ground floor level the guidance offers an alternative solution to that described above:

- ☑ Provide Automatic Water Fire Suppression System (AWFSS) protection to the open plan area. The system should be designed and installed to the relevant British Standard, see below
- ☑ Provide Smoke detectors to a minimum **Grade D LD2** (including bedrooms) AFD system throughout the property
- ☑ First and second floor construction to be modified 30/15 minutes fire resisting
- ☑ Provide a 30 minute protected stairway on the 1st and 2nd floors
- ☑ Provide a suitable compliant escape window in a first floor room with access to a suitable place of safety

## Certification required for the AWFSS system

Where it is proposed to use an AWFSS adopting the following guidance will meet compliance:

- ☑ The system is designed, installed and commissioned by a suitably competent company/person
- ☑ The system is designed and installed in accordance with the guidance provided in BS 9251:2005; BS 8458: Part 1 2015; or is suitably third party tested and certificated by a UKAS body



## CDM REGULATIONS 2015

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

### Domestic clients

The domestic client is to appoint a principal designer and a principal contractor when there is more than one contractor, if not your duties will automatically transferred to the contractor or principal contractor.

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

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

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

Or:

(b) Exceeds 500 person days

## PARTY WALL ACT

The owner, should they need to do so under the requirements of the Party Wall Act 1996, has a duty to serve a Party Structure Notice on any adjoining owner if building work on, to or near an existing Party Wall involves any of the following:

- Support of beam
- Insertion of DPC through wall
- Raising a wall or cutting off projections
- Demolition and rebuilding
- Underpinning
- Insertion of lead flashings
- Excavations within 3 metres of an existing structure where the new foundations will go deeper than adjoining foundations, or within 6 metres of an existing structure where the new foundations are within a 45 degree line of the adjoining foundations.

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

## HEALTH AND SAFETY

The contractor is reminded of their liability to ensure due care, attention and consideration is given in regard to safe practice in compliance with the Health and Safety at Work Act 1974.

## MATERIALS AND WORKMANSHIP

All works are to be carried out in a workmanlike manner. All materials and workmanship must comply with Regulation 7 of the Building Regulations, all relevant British Standards, European Standards, Agreement Certificates, Product Certification of Schemes (Kite Marks) etc. Products conforming to a European technical standard or harmonised European product should have a CE marking.

## BASIC RADON PROTECTION

Provide a 1200g (300 um) radon membrane over existing floor slab, lapped 300mm, double welted and taped with gas proof tape at joints and service entry points. Carry membrane over cavity and provide suitable cavity tray and weep holes.

## FULL RADON PROTECTION

Ensure existing floor is of good quality, not severely cracked and there is permeable fill below the floor slab. All minor cracks to be sealed using suitable propriety sealant as recommend in BRE Report on sealing cracks in solid floors. Provide a 1200g (300 micrometer) continuous polythene DPM radon-proof barrier over the slab, lapped and sealed at all joints and around service penetrations with radon gas proof tape and linked to DPC's in the external wall.

Install a radon sub floor sump, depressurization pipe with up stand beneath the floor slab and ensure upstand is extended above ground level, all in accordance with sump manufacturers' details. Radon test to be undertaken, if required by building control, after completion, and if unacceptably high levels of radon are found, provide an electrically powered fan to the pipework.

## CONDENSATION

Walls, floors and roof of the building to be designed and constructed so that their structural and thermal performance will not be adversely affected by interstitial condensation, surface condensation or mould growth. Account to be taken of the building's form and orientation in relation to topography, prevailing winds, sunlight and over-shadowing, and the rate at which humidity is generated.

Materials with the highest vapour resistance should be located on the warm side of a thermal element. VCLs to be provided where necessary.

The junctions between elements are designed to Accredited Construction Details or guidance of BRE IP17/01] and BS 5250:2011+A1:2016 Code of practice for control of condensation in buildings to be followed.

## DEMOLITION

Measures to be put in place during and after the demolition to ensure the protection of the public, public amenities and adjoining properties.

Such measures to include:

- The shoring of adjoining buildings.
- The control of dust and noise generation.
- The weatherproofing of any parts of adjoining buildings which are left exposed by the demolition.
- The repairing and making good any damage to any adjacent building effected by the demolition.
- The removal of material or rubbish resulting from the clearance and demolition of the site.
- The disconnection, sealing or removal of any drain or sewer, as required.
- The making good of any disturbed ground.
- Any arrangements necessary for the disconnection off all services (e.g. gas, water, electricity).

Consultation with the Health and Safety Executive, and Fire Authority should be sought if burning structures or materials on site.

If the demolition is more than 50m<sup>3</sup> in volume a formal notice of demolition is to be given to building control at least six weeks before any demolition work starts, in accordance with The Building Act 1984: Sections 80-83.

Consultation to be undertaken with the occupiers of adjacent buildings where applicable and a Party Wall agreement put in place. A planning application to demolish to be made where required.

All demolition work to comply with the Construction (Design and Management) Regulations 1994 and a Health and Safety plan is to be provided by the principal contractor.

## SITE INVESTIGATION – Independent to DM Designs

A survey of the site is to be carried out by a suitably qualified person including an initial ground investigation, a desk study and a walk over survey. A copy of all reports and surveys to be sent to building control for approval before works commence on site.

Any asbestos, contaminated soil or lead paint found on the site is to be removed by a specialist. Asbestos is to be dealt with in accordance with the Control of Asbestos Regulations 2006.

## THERMAL BRIDGING

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

## SITE PREPARATION

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

## 1. EXISTING STRUCTURE

Existing structure including foundations, floor, beams, walls, roof and lintels are to be exposed and checked for adequacy prior to commencement of work and as required by the Building Control Officer. Levels stated on the plans are to be checked by approved appointed contractor. Particular care must be taken if the existing external wall is single leaf construction with piers, checks for stability and defects must be performed.

## 2. BEAMS AND STRUCTURE

Engineer's Structural calculations and details are to be provided for all beams, roof, lintels, joists, bearings, padstones and any other load bearing elements before works commence on site. New steel beams to be encased in 12.5mm Gyproc FireLine board with staggered joints, Gyproc FireCase or painted in Nullifire S or similar intumescent paint to provide 1/2 hour fire resistance as agreed with Building Control. All fire protection to be installed as detailed by specialist manufacturer. Levels stated on the plans are to be checked by approved appointed contractor.

**All structural details on drawings to be checked and approved by qualified structural engineer and signed off accordingly by the appointed building control officer. DM Designs accepts no responsibility in any part on structural details on drawings issued.**

## 3. LINTELS

For uniformly distributed loads and standard 2 storey domestic loadings only

Lintel widths are to be equal to wall thickness. All lintels over 750mm sized internal door openings to be 65mm deep pre-stressed concrete plank lintels. 150mm deep lintels are to be used for 900mm sized internal door openings. Lintels to have a minimum bearing of 150mm on each end. Any existing lintels carrying additional loads are to be exposed for inspection at commencement of work on site. All pre-stressed concrete lintels to be designed and manufactured in accordance with BS 8110, with a concrete strength of 50 or 40 N/mm<sup>2</sup> and incorporating steel strands to BS 5896 to support loadings assessed to BS 5977 Part 1.

For other structural openings provide proprietary insulated steel lintels suitable for spans and loadings in compliance with Approved Document A and lintel manufacture standard tables. Stop ends, DPC trays and weep holes to be provided above all externally located lintels. **All structural steel sizes stated on drawings to be checked and approved by qualified structural engineer and signed off accordingly by appointed Building Control Officer. DM Designs accepts no responsibility in any part on structural details on drawings issued.**

### CG50/100 – Standard Duty

Standard Lengths	900 - 1500	1800	2100	2400	2700	3000-3600
SWL (kN) 1:1/3:1	15	18	20	22	26	26
Weight (kg/m)	5.8	7.3	8.0	8.6	9.8	12.3
Nominal height 'h' (mm)	140	140	160	180	220	220

### CH50/100 – Heavy Duty

Standard Lengths	900 - 1800	1950 - 2100	2250 - 2400
SWL (kN) 1:1/19:1	32	48	45
Weight (kg/m)	10.5	13.1	13.1
Nominal height 'h' (mm)	157	157	157

### CX50/100 – Extra Heavy Duty

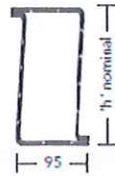
Standard Lengths	900 - 2700	2850 - 3000	3300 - 3900	4200 - 4800
SWL (kN) 1:1/19:1	60	55	50	32
Weight (kg/m)	16.0	16.0	19.4	19.4
Nominal height 'h' (mm)	232	232	232	232

## BOX 100

Manufactured length 150mm increments	600- 1500	1650- 2100	2250- 2400	2550- 2700	2850- 3600	3750- 4200	4350- 4800
Height 'h'	75	150	150	150	215	215	215
Thickness	1.6	2.0	2.0	2.0	2.5	2.5	2.5
Total UDL kN	15	30	25	20	30	25	20

Used to support openings in 100mm wide walls.

## Standard Load

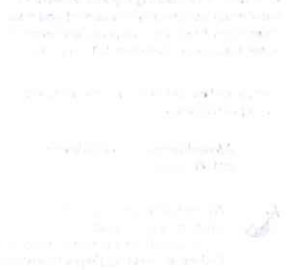
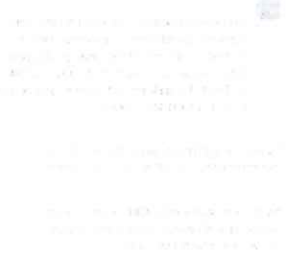
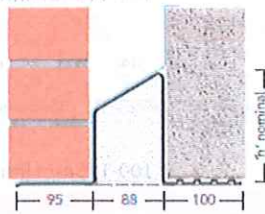


## L1/S 100

For cavity widths 90-105mm

Manufactured length 150mm increments	600- 1200	1350- 1500	1650- 1800	1950- 2100	2250- 2400	2550- 2700	2850- 3000	3150- 3600	3750- 4050	4200- 4800
Height 'h'	88	88	107	125	150	162	171	200	200	200
Thickness	1.6	2.0	2.0	2.0	2.0	2.6	2.6	3.2	3.2	3.4
Total UDL kN 3:1	12	16	19	21	23	27	27	27	26	27
Total UDL kN 19:1	10	13	16	17	18	22	20	20	19	22

90-105mm cavity



## Cavity Wall Lintel - CXL

### Extreme load lintel



#### Benefits

**Material used**  
Supplied in post galvanised finish. Lintels manufactured from a universal beam section and 6mm structural grade steel plate Grade S275 to BS EN 10025: 2004 and hot dip galvanised after manufacture to BS EN 601461: 1999.

**Standard increment lengths**  
Overall lengths are available in 50mm increments for lengths up to 6600mm.

**Optional extras**  
As an optional extra, CXL lintels can be supplied with expanded metal mesh secured to the base plate.

**Load ratios**  
To achieve the loading figures shown, the lintel must be laterally restrained and have 200mm end bearing supports and inner to outer load ratios between 5:1 and 19:1.

**Separate DPC**  
A separate flexible DPC must be installed during construction.

**Note:** Allowable reaction of 66 kN for all CXL lintels.

Where lintels are required to support greater loads than the figures published please contact our Technical Services Department on **029 2033 7900**

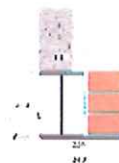
Catnic  
Pontypandy Industrial Estate  
Caerphilly  
CF83 3GL  
T: 029 2033 7900  
F: 029 2086 7796

01/2015

### 50-65mm Cavity 100-115mm Inner Leaf

#### CXL240

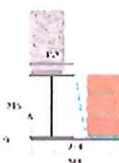
Standard lengths (mm)	2100-3000	3300-4800	5100	5400	5700	6000	6300	6600
SWL 5:1/19:1 (kN)	88	83	78	71	64	56	52	47
Weight (kg/m)	41.1	40.5	40.1	39.7	39.3	38.9	38.5	38.1
Serviceability moment (kNm)	50.0							



### 70-85mm Cavity 100-115mm Inner Leaf

#### CXL265

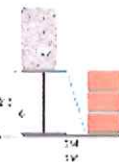
Standard lengths (mm)	2100-3000	3300-4800	5100	5400	5700	6000	6300	6600
SWL 5:1/19:1 (kN)	88	83	78	71	64	56	52	47
Weight (kg/m)	42.3	41.9	41.5	41.1	40.7	40.3	39.9	39.5
Serviceability moment (kNm)	50.3							



### 90-105mm Cavity 100-115mm Inner Leaf

#### CXL290

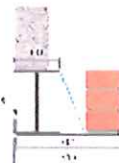
Standard lengths (mm)	2100-3000	3300-4800	5100	5400	5700	6000	6300	6600
SWL 5:1/19:1 (kN)	88	83	78	71	64	56	52	47
Weight (kg/m)	43.5	43.2	42.9	42.5	42.1	41.7	41.3	40.9
Serviceability moment (kNm)	50.6							



### 110-125mm Cavity 100-115mm Inner Leaf

#### CXL310

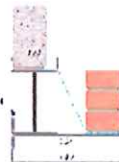
Standard lengths (mm)	2100-3000	3300-4800	5100	5400	5700	6000	6300	6600
SWL 5:1/19:1 (kN)	88	83	78	71	64	56	52	47
Weight (kg/m)	44.3	44.0	43.7	43.3	42.9	42.5	42.1	41.7
Serviceability moment (kNm)	50.8							



### 130-145mm Cavity 100-115mm Inner Leaf

#### CXL330

Standard lengths (mm)	2100-3000	3300-4800	5100	5400	5700	6000	6300	6600
SWL 5:1/19:1 (kN)	88	83	78	71	64	56	52	47
Weight (kg/m)	45.3	45.0	44.7	44.3	43.9	43.5	43.1	42.7
Serviceability moment (kNm)	51.0							



### 150-165mm Cavity 100-115mm Inner Leaf

#### CXL350

Standard lengths (mm)	2100-3000	3300-4800	5100	5400	5700	6000	6300	6600
SWL 5:1/19:1 (kN)	88	83	78	71	64	56	52	47
Weight (kg/m)	46.2	45.9	45.6	45.2	44.8	44.4	44.0	43.6
Serviceability moment (kNm)	51.1							



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## **5. PARTIAL FILL CAVITY WALL – Brick & Block - BRN 5B**

**Post June 2022 353mm Thick**

**To achieve minimum U Value of 0.18 W/m<sup>2</sup>K**

Provide 103mm suitable facing brick. Ensure a 50mm clear residual cavity and provide 85mm Celotex CW4000 insulation fixed to internal leaf constructed of 100mm, 0.15 W/m<sup>2</sup>K lightweight block, e.g. Celcon solar, Thermalite turbo. Internal finish to be 12.5mm plasterboard on dabs. Walls to be built with 1:1:6 cement mortar.

## **FULL FILL CAVITY WALL - Brick & Block - BRN 5B**

**Post June 2022 353mm Thick**

**To achieve minimum U Value of 0.18 W/m<sup>2</sup>K**

New cavity wall to comprise of 105mm suitable facing brick. Full fill the cavity with 150mm Dritherm 32 insulation as manufacturer's details. Inner leaf constructed using 100mm lightweight block, 0.15 W/m<sup>2</sup>K, e.g. Celcon solar, Thermalite turbo. Internal finish to be 12.5mm plasterboard on dabs. Walls to be built with 1:1:6 cement mortar.

## **WALLS BELOW GROUND**

All new walls to have Class A blockwork below ground level or alternatively semi engineering brickwork in 1:4 masonry cement or equal approved specification. Cavities below ground level to be filled with lean mix concrete min 225mm below damp proof course. Or provide lean mix backfill at base of cavity wall (150mm below damp course) laid to fall to weepholes.

## **MOVEMENT JOINTS**

Movement joints to be provided at the following maximum spacing:

Clay brickwork - 12m.

Calcium silicate brick - 7.5-9m.

Lightweight concrete block - density not exceeding 1,500kg/m<sup>3</sup> - 6m.

Dense concrete block - density exceeding 1,500kg/m<sup>3</sup> - 7.5-9m.

Any masonry in a parapet wall (length to height ratio greater than 3:1) - half the above spacings and 1.5m from corners.

Movement joint widths for clay bricks to be not less than 1.3mm/m i.e. 12m = 16mm and for other masonry not less than 10mm.

Additional movement joints may be required where the aspect ratio of the wall (length :height) is more than 3:1.

Considerations to be given to BS EN 1996-1-2:2005 Eurocode 6. Design of masonry structure.

## **6. WALL TIES**

All walls constructed with stainless steel vertical twist type retaining wall ties built in at 750mm ctrs horizontally, 450mm vertically and 225mm ctrs at reveals and corners in staggered rows. Wall ties to be suitable for cavity width and in accordance with BS 1243.

## **7. CAVITIES**

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

## **CAVITY BARRIERS**

30 minute fire resistant cavity barriers to be provided at at tops of walls, gable end walls and vertically at junctions with separating walls & horizontally at separating walls with cavity tray over installed according to manufacturers details.

## 10. EXISTING TO NEW WALL

Cavities in new wall to be made continuous with existing where possible to ensure continuous weather break. If a continuous cavity cannot be achieved, where new walls abuts the existing walls provide a movement joint with vertical DPC. All tied into existing construction with suitable proprietary stainless steel profiles.

## 11. LEAD WORK AND FLASHINGS

All lead flashings, any valleys or soakers to be Code 5 lead and laid according to Lead Development Association. Flashings to be provided to all jambs and below window openings with welded upstands. Joints to be lapped min 150mm and lead to be dressed 200mm under tiles, etc. All work to be undertaken in accordance with the Lead Development Association recommendations.

## 13. UPGRADE OF PITCHED ROOF max span 4+m – BRN 13e

(imposed load max 0.75 kN/m<sup>2</sup> - dead load max 0.75 kN/m<sup>2</sup>)

Vented roof – pitch 22-45°

To achieve U-value 0.16 W/m<sup>2</sup>K

Existing roof structure to be assessed by a structural engineer and any alterations to be carried out in strict accordance with structural engineer's details and calculations which must be approved by building control before works commence on site. The existing roof condition must be checked and be free from defects as required by the Building Control Officer any defective coverings or felt to be replaced in accordance with manufacturer's details.

Roof construction - **47 x 195mm** Grade C24 rafters at max 400mm centres span to engineer's details. Insulation to be 110mm foiled rigid insulation such as Kingspan or Celotex between rafters and one layer Super Quilt (or other approved multifoil) under rafters attached to 25mm deep counter battens to create air space.

Maintain a 50mm air gap above insulation to ventilate roof. Provide opening at eaves level at least equal to continuous strip 25mm wide and opening at ridge equal to continuous strip 5mm wide to promote ventilation or provide equivalent high and low level tile vents in accordance with manufacturer's details. Fix 12.5mm foil backed plasterboard (joints staggered) and 5mm skim coat of finishing plaster to the underside of all ceilings using galvanized plasterboard nails.

THIS IS A GENERAL GUIDE BASED ON NORMAL LOADING CONDITIONS FOUND IN DOMESTIC CONSTRUCTION. IT IS YOUR RESPONSIBILITY TO ASSESS YOUR DESIGN TO ASCERTAIN WHETHER ENGINEER'S DETAILS/CALCULATIONS ARE REQUIRED. PLEASE REFER TO THE TRADA DOCUMENT – 'SPAN TABLES FOR SOLID TIMBER MEMBERS IN FLOORS, CEILINGS AND ROOFS FOR DWELLINGS' OR ASK YOUR BUILDING CONTROL OFFICER FOR ADVICE.



## 15. END SOFFITS AND BARGE BOARDS

To match existing with 25mm continuous patented vent to u/s to provide adequate cross flow ventilation. 100mm half round UPVC gutter (or to match existing).

**Fascias, bargeboards and soffits shall be selected, fixed and treated against decay in accordance with the design**

Items to be taken into account include:

### (a) timber quality

Timber for external feature work should be free from waney edges, large knots and resinous pockets, splits and other unsightly defects.

### (b) fixing

All joints should be cut and fixed neatly. Mitred angles and splay joints should be used to prevent exposure of endgrain. Butt joints to fascias should be splayed. Fascia boards should have two fixings into each rafter and be fixed at a height that maintains the correct pitch in accordance with the tile manufacturer's recommendations.

### (c) treatment against decay

Where preservative treated timber is cut or planed, a liberal brush coating of preservative should be applied. All untreated timber that is to be painted should be knotted and primed all round before fixing. When timber requires a stained finish, one coat of stain should be applied before fixing.

## 17. INSULATION AT CEILING LEVEL – BRN 17A

Pitch 22-45° (imposed load max 0.75 kN/m<sup>2</sup> - dead load max 0.75 kN/m<sup>2</sup>)

To achieve U value of 0.15 W/m<sup>2</sup>K

Timber roof structures to be designed by an Engineer in accordance with NHBC Technical Requirement R5 Structural Design. Calculations to be based on BS EN 1995-1-1. Roofing tiles to match existing on 25 x 38mm tanalised sw treated battens on sarking felt supported on 47 x 100mm grade C24 rafters at max 400mm centres max span 2.12m. Rafters supported on 100 x 50mm sw wall plates. Insulation at ceiling level to be 150mm GA4000 Celotex between ceiling joists with a further 40mm TB4000 over joists. 18mm chipboard to be provided over insulation.

Construct ceiling using sw joists at 400mm centres, finished internally with 12.5mm plasterboard and min 3mm thistle multi-finish plaster. Provide polythene vapour barrier between insulation and plasterboard. Provide opening at eaves level at least equal to continuous strip 25mm wide on two opposite sides to promote cross-ventilation. Mono pitched roofs to have ridge/high level ventilation equivalent to a 5mm gap via proprietary tile vents spaced in accordance with manufacturer's details.

Restraint strapping - 100mm x 50mm wall plate strapped down to walls. Ceiling joists and rafters to be strapped to walls and gable walls, straps built into cavity, across at least 3 timbers with noggins. All straps to be 1000 x 30 x 5mm galvanized straps or other approved to BSEN 845-1 at 2m centres.

Loft hatches should be suitable designed and installed to ensure optimum air tightness

THIS IS A GENERAL GUIDE BASED ON NORMAL LOADING CONDITIONS FOUND IN DOMESTIC CONSTRUCTION. IT IS YOUR RESPONSIBILITY TO ASSESS YOUR DESIGN TO ASCERTAIN WHETHER ENGINEER'S DETAILS/CALCULATIONS ARE REQUIRED. PLEASE REFER TO THE TRADA DOCUMENT – 'SPAN TABLES FOR SOLID TIMBER MEMBERS IN FLOORS, CEILINGS AND ROOFS FOR DWELLINGS' OR ASK YOUR BUILDING CONTROL OFFICER FOR ADVICE.

## 18. PITCHED ROOF VENTILATION

Maintain a 50mm air gap above insulation in the roof pitch to ventilate roof. Provide opening at eaves level at least equal to continuous strip 25mm wide and opening at ridge equal to continuous strip 5mm wide to promote ventilation.

The contractor shall allow for making good of all disturbed works

## 19. DORMER CONSTRUCTION - Tile Hung – 150 x 50mm Timbers – BRN 19D

To achieve minimum U Value of 0.28W/m<sup>2</sup>K

Structure to engineer's details and calculations. Tiles hung vertically on 25 x 38mm preservative treated battens (vertical counter battens to be provided to ensure vented and drained cavity if required) fixed to breathable membrane (having a vapour resistance of not more than 0.6 MNs/g) on 12mm thick WPD external quality plywood sheathing (or other approved). Ply fixed to treated timber frame studs constructed using: 150mm x 50mm head & sole plates and vertical studs (with noggins) at 400mm centres or to structural engineer's details & calculations. Insulation between studs to be 60mm Celotex FR4000, provide VCL and 37.5 Celotex PL4000 insulated plasterboard over studs. Finish with 3mm skim coat of finishing plaster.

All junctions to have water tight construction, seal all perimeter joints with tape internally and with silicon sealant externally. Dormer walls built off existing masonry walls to have galvanised mild steel straps placed at 900 centres. Dormer cheeks within 1m of the boundary to be lined externally with 12.5mm Supalux and 12.5mm fire line board internally to achieve 1/2 hour fire resistance from both sides.

**23. DORMER WINDOW(s)** – 150mm x 47mm C16 ceiling joists at 400mm ctrs. 125Mm x 50mm cls studwork forming cheeks with rigid 120mm Celotex insulation, 18mm WBP plywood lining to receive expamet breathable felt, finish to be as per clients requirements (Render/Tiles). Code 5 leadwork around window, stepped where required, lead to treated softwood valley boards to form valley. Code 5 lead soakers dressed to existing roof tiles and behind dormer tiles. Fix rafters to ceiling collars using M16 Gr8.8 bolts. A proprietary eaves vent system comprising of a 10mm wide continuous strip ventilator secured to the outer edge of the soffit board, running the entire length of the eaves.

## 24. ROOF LIGHTS

Roof-lights to be double glazed with 16mm argon gap and soft low-E glass. Window Energy Rating to be Band C or better. Roof lights to be fitted in accordance with manufacturer's instructions with rafters doubled up to sides and suitable flashings etc. Roof lights to have double rafters each side. (Supplied by Velux Ltd. or similar approved).

Min U-value of 1.6 W/m<sup>2</sup>K.

**Technical data – GGL (Centre-Pivot)**

W x H

M06 780 x 1178

**Flat Roof Window - CFP/CVP - U-value of 1.4W/m<sup>2</sup>K.**

Double glazed glass unit has a toughened outer pane and laminated inner pane for additional safety.

Sound insulation, Rw[dB] 27

060060 780 x 780

060090 780 x 1080

080080 980 x 980

090090 1080 x 1080

090120 1080 x 1380

100150 1180 x 1680

100100 1180 x 1180

120120 1380 x 1380

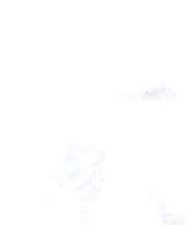
Top-hung white polyurethane finish roof window – GPU 0059, 0034, 0073, 0060, 0065

## VELUX glazing options


- (--59) Toughened outer pane.
- (--34) Obscure glazing, toughened outer pane.
- (--73) Toughened outer pane with clear and clean coating and laminated inner pane for additional safety.
- (--60) Improved U-value and greater noise reduction. Toughened outer pane with clear and clean coating and laminated inner pane for additional safety.
- (--65) Triple glazing, lowest U-value and noise reduction. Toughened outer pane with clearview coating to minimise the formation of condensation on the external pane, 3mm middle pane and laminated inner pane for additional safety.

Option	U-value	g-value	Sound reduction
(--59)	1.1	0.75	25dB
(--34)	1.1	0.25	25dB
(--73)	1.1	0.75	25dB
(--60)	1.1	0.75	25dB
(--65)	0.8	0.75	30dB


Option	U-value	g-value	Sound reduction
(--59)	1.1	0.75	25dB
(--34)	1.1	0.25	25dB
(--73)	1.1	0.75	25dB
(--60)	1.1	0.75	25dB
(--65)	0.8	0.75	30dB



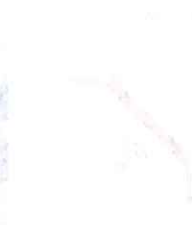
Clear view through the glass.




Obscure glazing for privacy.



Clear view through the glass.



Clear view through the glass.



Clear view through the glass.

VELUX INTEGRA<sup>®</sup> solar and electric centre-pivot roof windows

External frame size (nominal w x h) cm		55x78	55x98	55x118	78x98	66x118	78x118	78x140	134x98	94x140	114x118	94x160	134x140
Code	Glazing	CK02	CK04	CK06	MK04	FK06	MK06	MK08	UK04	PK08	SK06	PK10	UK08
<b>VELUX INTEGRA<sup>®</sup> electric</b>													
<b>White painted</b>													
<b>GGL 207021U</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane.	£520	£532	£542	£552	£570	£584	£616	£662	£668	£678	£688	£742
<b>GGL 206021U</b> U-value 1.2 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£580	£592	£602	£612	£630	£644	£676	£722	£728	£738	£748	£802
<b>GGL 206621U</b> U-value 1.0 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£670	£682	£692	£702	£720	£734	£766	£812	£818	£828	£838	£892
<b>White polycarbonate</b>													
<b>GGU 007021U</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane.	£568	£582	£596	£608	£628	£648	£684	£742	£748	£762	£774	£838
<b>GGU 006021U</b> U-value 1.2 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£628	£642	£656	£668	£688	£708	£744	£802	£808	£822	£834	£898
<b>GGU 006621U</b> U-value 1.0 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£718	£732	£746	£758	£778	£798	£834	£892	£898	£912	£924	£988
<b>GGL 307021U</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane.	£520	£532	£542	£552	£570	£584	£616	£662	£668	£678	£688	£742
<b>VELUX INTEGRA<sup>®</sup> solar powered</b>													
<b>White painted</b>													
<b>GGL 207030</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane.	£554	£566	£576	£586	£604	£618	£650	£696	£702	£712	£722	£776
<b>GGL 206030</b> U-value 1.2 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£614	£626	£636	£646	£664	£678	£710	£756	£762	£772	£782	£836
<b>GGL 206630</b> U-value 1.0 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£704	£716	£726	£736	£754	£768	£800	£846	£852	£862	£872	£926
<b>White polycarbonate</b>													
<b>GGU 007030</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane.	£602	£616	£630	£642	£662	£682	£718	£776	£782	£796	£808	£872
<b>GGU 006030</b> U-value 1.2 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£662	£676	£690	£702	£722	£742	£778	£836	£842	£856	£868	£932
<b>GGU 006630</b> U-value 1.0 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£752	£766	£780	£792	£812	£832	£868	£926	£932	£946	£958	£1,022
<ul style="list-style-type: none"> <li>All roof windows have a delivery time of 2 days except '66' pane windows and GGL 206030 which are 11 days.</li> <li>Delivery time is in working days from receipt of orders placed before 4pm.</li> </ul>													

Roof pitch



Suitable for roof pitches between 15° and 90°.

Operation



**ELECTRIC**

- Control pad operation can be used within 20m of roof windows.
- Fully integrated motor which runs almost without a sound.

Features



**SOLAR POWERED**

- All the same features as VELUX INTEGRA<sup>®</sup> electric roof windows, but powered by the sun.
- PV solar cell on external window frame requires direct exposure to sunlight.



Rain sensors feature on all VELUX INTEGRA<sup>®</sup> roof windows, closing automatically in the event of rain.



The VELUX INTEGRA<sup>®</sup> control pad with touch screen and swipe function uses icons for easy and intuitive control. Included with every VELUX INTEGRA<sup>®</sup> roof window.

# VELUX centre-pivot roof windows



External frame size (nominal w x h) cm      55 x 78   55 x 98   55 x 118   78 x 98   66 x 118   78 x 118   78 x 140   134 x 98   94 x 140   114 x 118   94 x 160   134 x 140

Code      Glazing      CK02   CK04   CK06   MK04   FK06   MK06   MK08   UK04   PK08   SK06   PK10   UK08

## White painted

<b>GGL 2070</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane.	£220	£232	£242	£252	£270	£284	£316	£362	£368	£378	£388	£442
<b>GGL 2060</b> U-value 1.2 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£280	£292	£302	£312	£330	£344	£376	£422	£428	£438	£448	£502
<b>GGL 2066</b> U-value 1.0 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£370	£382	£392	£402	£420	£434	£466	£512	£518	£528	£538	£592
<b>GGL 2062</b> U-value 0.83 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer with anti-dew coating. Further enhanced noise reduction.	£470	£482	£492	£502	£520	£534	£566	-	£618	£628	£638	-
<b>GGL 2070Q</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Enhanced security.	£368	£380	-	£400	£418	£432	£464	£510	£516	£526	£536	£590

## White polyurethane

<b>GGU 0070</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane.	£268	£282	£296	£308	£328	£348	£384	£442	£448	£462	£474	£538
<b>GGU 0060</b> U-value 1.2 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£328	£342	£356	£368	£388	£408	£444	£502	£508	£522	£534	£598
<b>GGU 0066</b> U-value 1.0 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£418	£432	£446	£458	£478	£498	£534	£592	£598	£612	£624	£688
<b>GGU 0062</b> U-value 0.81 W/m <sup>2</sup> K	Triple glazed. Laminated inner, toughened outer with anti-dew coating. Further enhanced noise reduction.	£518	£532	£546	£558	£578	£598	£634	-	£698	£712	£724	-
<b>GGU 0034</b> U-value 1.2 W/m <sup>2</sup> K	Obscure laminated inner, toughened outer pane.	£308	£322	£336	£348	£368	£388	£424	£482	£488	£502	£514	£578
<b>GGU 0070Q</b> U-value 1.3 W/m <sup>2</sup> K	Laminated inner, toughened outer pane. Enhanced security.	£416	£430	-	£456	£476	£496	£532	£590	£596	£610	£622	£686

## Pine

<b>GGL 3070</b> U-value	Laminated inner, toughened outer pane.	£220	£232	£242	£252	£270	£284	£316	£362	£368	£378	£388	£442
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## VELUX top-hung roof windows (open to 45°)

External frame size (nominal w x h) cm		55 x 98	55 x 118	78 x 98	66 x 118	78 x 118	78 x 140	134 x 98	94 x 140	114 x 118	94 x 160	134 x 140
Code	Glazing	CK04	CK06▲	MK04▲	FK06▲	MK06▲	MK08▲	UK04▲	PK08▲	SK06▲	PK10▲	UK08▲
<b>White painted</b>												
<b>GPL 2070</b> U-value 1.3 W/m²K	Laminated inner, toughened outer pane.	£320	£334	£348	£372	£392	£434	£500	£508	£522	£536	£608
<b>GPL 2060</b> U-value 1.2 W/m²K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£380	£394	£408	£432	£452	£494	£560	£568	£582	£596	£668
<b>GPL 2066</b> U-value 1.0 W/m²K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£470	£484	£498	£522	£542	£584	£650	£658	£672	£686	£758
<b>White polyurethane</b>												
<b>GPU 0070</b> U-value 1.3 W/m²K	Laminated inner, toughened outer pane.	£370	£388	£404	£432	£456	£504	-	£588	£604	£620	£706
<b>GPU 0060</b> U-value 1.2 W/m²K	Laminated inner, toughened outer pane. Easy-to-clean coating, enhanced noise reduction.	£430	£448	£464	£492	£516	£564	-	£648	£664	£680	£766
<b>GPU 0066</b> U-value 1.0 W/m²K	Triple glazed. Laminated inner, toughened outer pane. Anti-dew and easy-to-clean coating.	£520	£538	£554	£582	£606	£654	-	£738	£754	£770	£856
<b>GPU 0062</b> U-value 0.85 W/m²K	Triple glazed. Laminated inner, toughened outer pane with anti-dew coating. Further enhanced noise reduction.	£620	£638	£654	£682	£706	£754	-	£838	£854	£870	-
<b>GPU 0034</b> U-value 1.2 W/m²K	Obscure laminated inner, toughened outer pane.	£410	£428	£444	£472	£496	£544	-	£628	£644	£660	£746
<b>GPL 3070</b> U-value 1.3 W/m²K	Laminated inner, toughened outer pane.	£320	£334	£348	£372	£392	£434	£500	£508	£522	£536	£608

▲ Sizes suitable for emergency escape requirements.

▶ All roof windows have a delivery time of 2 days except GPU 0066 and GPU 0062 which are 7 days and GPL 2066 windows which are 11 days.

▶ Delivery time is in working days from receipt of orders placed before 4pm.

### 24A. ROOF LANTERN

Roof-lanterns to be double glazed with 16mm argon gap and soft low-E glass. Window Energy Rating to be Band C or better. Roof lanterns to be fitted in accordance with manufacturer's instructions with rafters doubled up to sides and suitable flashings etc. Roof lanterns to have double rafters each side. (As per Str. Eng. Details/Clacs).

Min U-value of 1.6 W/m²K.

### 25. NEW FLOOR

22mm T&G flooring grade chipboard on 50 x 175mm C24 grade floor joist at 400mm centres positioned between existing ceiling joists as per 'beam' calculation.

Only use if not using UB's and joists hangers

The condition of the existing ceiling joists may be suitable as the new floor but if the condition of the existing ceiling joist are not suitable then double up the ceiling joists by fitting new 47x 100mm C24 grade timber beside the existing ceiling joists. Between floor joists insulated with 100mm Rockwall insulation plus two layers of 100mm Rockwool insulation over joists. U Value = min. 0.16W/Sqm K.

### UPGRADE OF EXISTING FLOORS - Intermediate

Ensure first floor achieves modified half-hour fire resistance. New second floor –Joists to be 50mm minimum from chimney breasts. (joist size to structural engineer's details and calculations) Provide min 20mm t and g chipboard or timber board flooring. In areas such as kitchens, utility rooms and bathrooms flooring to be moisture resistant grade in accordance with BS7331:1990). Identification marking must be laid upper most to allow easy identification. To upgrade to half hour fire resistance and provide adequate sound insulation lay minimum 150mm Rockwool insulating material or equivalent on chicken wire between joists and extended to eaves. Chicken wire to be fixed to the joists with nails or staples these should penetrate the joists side to a minimum depth of 20mm, in accordance with BRE-Digest 208 1988. Joists spans over 2.5m to be strutted at mid span use 38 x 38mm herringbone strutting or 38mm solid strutting (at least 2/3 of joist depth). Provide lateral restraint where joists run parallel to walls. Floors are to be strapped to walls with 1000mm x 30mm x 5mm galvanised mild steel straps or other approved in compliance with BS EN 845-1 at max 2.0m centres, straps to be taken across minimum 3 no. joists. Straps to be built into walls. Provide 38mm wide x ¾ depth solid noggins between joists at strap positions

### 26. STRAPPING OF FLOORS

Provide lateral restraint where joists run parallel to walls, floors are to be strapped to walls with 1000mm x 30mm x 5mm galvanised mild steel straps or other approved in compliance with BS EN 845-1 at max 2.0m centres, straps to be taken across minimum of 3 joists. Straps to be built into walls. Provide 38mm wide x ¾ depth solid noggins between joists at strap positions.

### 27. NEW CEILINGS

All new ceilings to be constructed with 12.5mm plasterboard ceilings and skimmed using multi-finish plaster

### 28. STAIRS

Dimensions to be checked and measured on site prior to fabrication of stairs. Timber stairs to comply with BS585 and with Part K of the Building Regulations. Max rise 220mm, min going 220mm. Two risers plus one going should be between 550 and 700mm. **WIDTH:800mm**. Tapered treads to 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 should be at least as great as the smallest width of the flight. Doors which swing across a landing at the bottom of a flight should 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 pitchline, handrail to be at least one side if stairs are less than 1m wide and on both sides if they are wider. Ensure a clear width between handrails of minimum 600mm. Balustrading designed to be unclimbable and should contain no space through which a 100mm sphere could pass. Allow for all structure as designed by a Structural Engineer.

### 30. INTERNAL STUD PARTITIONS

100mm x 50mm softwood treated timbers studs at 400mm cts with 50 x 100mm head and sole plates and solid intermediate horizontal noggins at 1/3 height or 450mm. Provide min 10kg/m³ density acoustic soundproof quilt tightly packed (eg. 100mm Rockwool or Isowool mineral fibre sound insulation) in all voids the full depth of the stud. Partitions built off doubled up joists where partitions run parallel or provide noggins where at right angles, or built off DPC on thickened concrete slab if solid ground floor. Walls faced throughout with 12.5mm plaster board with skim plaster finish. Taped and jointed complete with beads and stops.

### **31. EXISTING DOOR(s)**

All doors entering the stairwell except bathroom to be FD30 half hour fire resisting doors. Existing doors can have panels removed and fitted with 6mm calcium silicate board. Note – Self closing devices are not required.

### **32. SMOKE DETECTION**

Mains operated linked smoke alarm detection system to BS 5446 - 1:2000 and BS5839-6:2004 to at least a Grade D category LD3 standard and to be mains powered with battery back up. Smoke alarms should be sited so that there is a smoke alarm in the circulation space on all levels/ storeys and within 7.5m of the door to every habitable room. If ceiling mounted, they should be 300mm from the walls and light fittings. Where the kitchen area is not separated from the stairway or circulation space by a door, there should be an interlinked heat detector in the kitchen.

### **34. ELECTRICAL**

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

### **35. INTERNAL LIGHTING**

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

#### **35a. FIXED EXTERNAL LIGHTING**

External light fittings to be fitted as calculated in the DER and in compliance with the Domestic Building Services Compliance Guide.

Light fitting to be either:

a. lamp capacity not greater than 100 lamp-watts per light fitting and provided with automatic movement detecting devices (PIR) and automatic daylight sensors ensuring lights shut off automatically when not required.

Or

b. lamp efficacy greater than 45 lumens per circuit-watt; fitted with manual controls and automatic day light cut-off sensors so that lights switch off when daylight is sufficient.

### **36. HEATING**

Extend all heating and hot water services from existing and provide new TVRs to radiators. Heating system to be designed, installed, tested and fully certified by a GAS SAFE registered specialist. All work to be in accordance with the Local Water Authorities bye laws, Gas safety requirements and IEEE regulations.

#### **37. NEW GAS BOILER (If req'd depending on output to allow for additional radiators)**

Heating and hot water will be supplied via a wall mounted condensing vertical balanced flue pressurised boiler with a min SEDBUK rating of 88%. No combustible materials within 50mm of the flue. System to be fitted with thermostatic radiator valves and all necessary zone controls and boiler control interlocks. The system will be installed, commissioned and tested by a "competent person" and a certificate issued that the installation complies with the requirements of PART L.

**The following information/certification will be required upon the completion of works before a final certificate can be issued:**

1. Part P and gas safe certificates as applicable



### **38. EXISTING FOUNDATIONS - Designed by qualified Str. Eng and signed off by local authority Building Control Officer (BCO)**

Foundations that will be taking additional loads from the room in the roof to be exposed and checked by Structural Engineer/Building Control Officer to ascertain its suitability.

Concrete strip foundation to be taken to 900mm Min. or suitable loadbearing strata. Building control officer to approve prior to filling trench. To meet local authorities satisfaction.

### **39. TRENCH FOUNDATION Designed by qualified Str. Eng and signed off by local authority Building Control Officer (BCO)**

750mm x 600mm trench fill foundations, concrete mix to conform to BS EN 206-1 and BS 8500-2. All foundations to be a minimum of 1000mm below ground level, exact depth to agreed on site with Building Control Officer to suit site conditions. All constructed in accordance with 2004 Building Regulations A1/2 and BS 8004:1986 Code of Practice for Foundations. Ensure foundations are constructed below invert level of any adjacent drains. Base of foundations supporting internal walls to be min 600mm below ground level. Sulphate resistant cement to be used if required. Please note that should any adverse soil conditions or difference in soil type be found or any major tree roots in excavations, the Building Control Officer is to be contacted and the advice of a structural engineer should be sought.

### **40. STRUCTURAL STEELS**

To be connected on site to manufactures details, loading and guage details determined by str.eng. All steels to be encased with plasterboard to achieve min.30mins fire resistance. Where steel beams terminate on a wall plate, 500mm x 100mm x 10mm thk. Bearer plate to be used. Connection of beams to manufacturers details and approved by str. Eng. Grade 8.8 M16 connection bolts to be used. **All structural steel sizes stated on drg's to be checked and signed off by qualified Str. Eng/local authority Building Control Officer (BCO). Client to source Str. Eng.**

### **41. DAMP PROOF COURSES**

DPC in approved felt (BS743 – pitch polymer) and to be 150mm above Grd level. Vertically built into jambs of all external openings and horizontally stepped to all external openings.

### **42. SOLID FLOOR INSULATION OVER SLAB - BRN 42 OVER**

To meet min U value required of 0.18 W/m<sup>2</sup>K  
P/A ratio 0.5

Solid ground floor to consist of 150mm consolidated well-rammed hardcore. Blinded with 50mm sand blinding. Provide 100mm ST2 or Gen2 ground bearing slab concrete mix to conform to BS 8500-2 over a 1200 gauge polythene DPM. DPM to be lapped in with DPC in walls. Floor to be insulated over slab and DPM with min 90mm thick Celotex GA4000.

25mm insulation to continue around floor perimeters to avoid thermal bridging. A VCL should be laid over the insulation boards and turned up 100mm at room perimeters behind the skirting, all joints to be lapped 150mm and sealed. Finish with 65mm sand/cement finishing screed with light mesh reinforcement.

Where drain runs pass under new floor, provide A142 mesh 1.0m wide and min 50mm concrete cover over length of drain.

Where existing suspended timber floor air bricks are covered by new extension, ensure cross-ventilation is maintained by connecting to 100mm dia UPVC pipes with 100mm concrete cover laid under the extension. Pipes to terminate at new 65mm x 215mm air bricks with cavity tray over.

## SOLID CARPORT FLOOR

Solid garage floor to consist of 150mm consolidated well-rammed hardcore. Blinded with 50mm sand blinding. Provide 150mm ST2 or Gen1 ground bearing slab thickened 300mm at garage entrance, concrete mix to conform to BS EN 1992-1-1:2004 with 1 layer of 252 steel mesh positioned mid span. Slab to be laid over a 1200mm gauge polythene DPM as required. DPM to be lapped in with DPC in walls. Ensure a 1:80 fall is provided to floor from back of garage to front garage door.

75MM Celotex GS4000 above with 65mm screed

## 43. VENTILATED FLAT ROOF - max span 3.22m – BRN 43a (To Str. Eng. Details)

(imposed load max 1.0 kN/m<sup>2</sup> - dead load max 0.75 kN/m<sup>2</sup>)

## WARM FLAT DORMER ROOF - BRN 43E

(imposed load max 1.0 kN/m<sup>2</sup> - dead load max 0.75 kN/m<sup>2</sup>)

To achieve U value 0.15 W/m<sup>2</sup>K

Rubber EPDM membrane installed on 22mm exterior quality ply over 125mm Celotex TA4000. (All as per suppliers installation requirements/specifications) to achieve a designated fire rating for surface spread of flame bedded in bitumen on three layer felt to BS 6229 on 22mm exterior quality ply (ply optional, see manufacturer's details) over 165mm Celotex XR4000 insulation.

Insulation bonded to VCL which is bonded to 22mm exterior grade plywood on firings to give 1:60 fall on 47 x 195mm C24 timber joists at 400 centres max span 4.51m (see engineer's details for sizes). Ceilings of 12.5mm plasterboard over vapour barrier with skim plaster finish.

Provide restraint to flat roof by fixing of 30 x 5 x 1000mm ms galvanised lateral restraint straps at maximum 2000mm centres fixed to 100 x 50mm wall plates and anchored to wall.

THIS IS A GENERAL GUIDE BASED ON NORMAL LOADING CONDITIONS FOUND IN DOMESTIC CONSTRUCTION. IT IS YOUR RESPONSIBILITY TO ASSESS YOUR DESIGN TO ASCERTAIN WHETHER ENGINEER'S DETAILS/CALCULATIONS ARE REQUIRED. PLEASE REFER TO THE TRADA DOCUMENT – 'SPAN TABLES FOR SOLID TIMBER MEMBERS IN FLOORS, CEILINGS AND ROOFS FOR DWELLINGS' OR ASK YOUR BUILDING CONTROL OFFICER FOR ADVICE

## 45. PITCHED ROOF – Insulation at rafter level - max span 3.47m – BRN 45E

Pitch 22-45°

To achieve min U-value required of 0.15 W/m<sup>2</sup>K

Timber roof structures to be designed by an Engineer in accordance with NHBC Technical Requirement R5 Structural Design. Calculations to be based on BS EN 1995-1-1. Roofing tiles to match existing fixed to tile battens secured over breathable sarking felt to relevant BBA Certificate allowing the breather felt to sag at least 10mm over preservative-treated counter battens (min 38mm x 50mm). Provide 100mm Celotex GA4000 insulation boards under the counter battens and 40mm Celotex TB4000 between 47 x 195mm timber rafters strength class C24 at 400 c/c – span to engineer's details. A vapour control layer should be provided to the underside of the rafters. Finish with 12.5mm plasterboard and skim.

Restraint strapping - Ceiling joists tied to rafters (if raised collar roof consult structural engineer). 100mm x 50mm wall plate strapped down to walls. Ceiling joists and rafters to be strapped to walls and gable walls, straps built into cavity, across at least 3 timbers with noggins. All straps to be 1000 x 30 x 5mm galvanized straps or other approved to BSEN 845-1 at 2m centres.

THIS IS A GENERAL GUIDE BASED ON NORMAL LOADING CONDITIONS FOUND IN DOMESTIC CONSTRUCTION. IT IS YOUR RESPONSIBILITY TO ASSESS YOUR DESIGN TO ASCERTAIN WHETHER ENGINEER'S DETAILS/CALCULATIONS ARE REQUIRED. PLEASE REFER TO THE TRADA DOCUMENT – 'SPAN TABLES FOR SOLID TIMBER MEMBERS IN FLOORS, CEILINGS AND ROOFS FOR DWELLINGS' OR ASK YOUR BUILDING CONTROL OFFICER FOR ADVICE.

#### **45g – LEAD VALLEY DETAIL – BRN 45g**

Lead-lined valleys to be formed using Code 5 lead sheet. Valley lead and two tiling fillets to be supported on min 19mm thick and 225mm wide marine ply valley boards on either side of the rafters. Lead to be laid in lengths not exceeding 1.5m with min 150mm lap joints and be dressed 200mm under the tiles.

Roofing tiles to be bedded in mortar placed on a tile slip to prevent direct contact. Valley to have a minimum 100mm wide channel (125mm minimum for pitches below 30°).

All work to be in accordance with the roof cladding manufacturers and the Lead Development Association recommendations.

#### **46. FLAT ROOF RESTRAINT**

100mm x 50mm C16 grade timber wall plates to be strapped to walls with 1000mm x 30mm x 5mm galvanised mild steel straps at maximum 2.0m centres fixed to internal wall faces.

#### **47. STRAPPING FOR PITCHED ROOF**

Gable walls should be strapped to roofs at 2m centres. All external walls running parallel to roof rafters to be restrained at roof level using 1000mm x 30mm x 5mm galvanised mild steel horizontal straps or other approved to BSEN 845-1 built into walls at max 2000mm centres and to be taken across minimum 3 rafters and screw fixed. Provide solid noggins between rafters at strap positions. All wall plates to be 100 x 50mm fixed to inner skin of cavity wall using 30mm x 5mm x 1000mm galvanised metal straps or other approved to BSEN 845-1 at maximum 2m centres.

#### **48. RAINWATER DRAINAGE**

New rainwater goods to be new 110mm UPVC half round gutters taken and connected into 68mm dia UPVC downpipes. UPVC underground pipework to connect into the existing surface water drain or to new soakaway, situated a min distance of 5.0m away from any building, via 110mm dia UPVC pipes surrounded in 150mm granular fill. Soakaway to be min of 1 cubic metre capacity (or to depth to Local Authorities approval) with suitable granular fill and with geotextile surround to prevent migration of fines. If necessary carry out a porosity test to determine design and depth of soakaway. Where rigid pipes of less than 150mm dia. have less than 300mm cover, or rigid pipes of 150mm or more have less than 600mm of cover, the pipes should be encased in 150mm of concrete. Where flexible pipes are not under a road or have less than 600mm cover, they should be encased in 150, concrete. Where drainage runs within 1 metre of any foundation and the level of the drain is below the level of the foundation, then the drain trench should be backfilled to the found level of the concrete. Any pipe penetrating through a structure below ground level, should have a lintel above opening and a settlement gap of 50mm corkpack or similar flexible material should be inserted to provide protection to the drain. All gravity drainage should have a 1:40 min. fall requirement to provide self cleaning velocities. All gullies will be back inlet trapped gullies with rodding facilities unless otherwise stated. Inspection chambers of upto 900mm depth may be of UPVC or GRP material or constructed of 150mm concrete base slab with benching formed in 1:2 cement mortar to 1:12 gradient trowelled smooth with all channels, branches and connecting bends 225mm, class 'B' engineering brick to BS3921 to the required invert depth. 150mm concrete over slab with hand chiselling forming the cover level complete with frame and lid.

#### **49. UNDERGROUND FOUL DRAINAGE**

Underground drainage to consist of 100mm diameter UPVC proprietary pipe work to give a 1:40 fall. Surround pipes in 100mm pea shingle. Provide 600mm suitable cover (900mm under drives). Shallow pipes to be covered with 100mm reinforced concrete slab over compressible material. Provide rodding access at all changes of direction and junctions. All below ground drainage to comply with BS EN 1401-1: 2009.

Consult Southern Water to ascertain if the drain(s) passes through the site and therefore Southern Water standard conditions may apply.

Southern Water Build over agreement form: Build Over SN18

## Your application

If you need to complete an application form, please print it out and send your complete submission to:

**Developer Services**  
**Southern Water**  
**Southern House**  
**Sparrowgrove**  
**Otterbourne**  
**Hampshire, SO21 2SW**

### Sewerage application fees and estimated turnaround times

	Fee (inc VAT)	VAT @ 20%	Fee (exc VAT)	Estimated turnaround time
Capacity Check	See application form	See application form	See application form	15 or 25 working days*
Build Over	£948.00	£158.00	£790.00	20 working days

There are three different ways you can pay for water and sewerage connection applications.

#### By Cheque

Please make cheques payable to Southern Water Services Ltd. Your completed application form and cheque should then be sent to:

Developer Services  
Southern Water  
Southern House  
Sparrowgrove  
Otterbourne  
Hampshire, SO21 2SW.

#### By BACS

Payments can be made directly via BACS transfer to:

Southern Water Services Ltd  
Miscellaneous Income Account  
National Westminster Bank Plc  
South Street Branch  
Worthing

**Sort Code** – 60-24-31

**Account No** – 73840548

***However please ensure that you confirm in your payment either the Southern Water reference number (if known) or site address and postcode that you are making payment for. This will aid matching the payment to your application and avoid a delay in processing your application***

Your completed application form should be sent to:

Developer Services  
Southern Water  
Southern House  
Sparrowgrove  
Otterbourne  
Hampshire, SO21 2SW.

## **By Credit Card**

If you wish to make a credit card payment for either a completed application form or for an estimate/quote, please ensure that you first send your completed application form or signed customer acceptance form to [developerservices@southernwater.co.uk](mailto:developerservices@southernwater.co.uk) stating you wish to pay by credit card.

A member of the Developer Services team will contact you within 24-hours (between Monday to Friday) to collect the payment in full.

**Please note, if your payment is greater than £9,999.99 then you will need to pay by either BACS or cheque.**

## **50. INSPECTION CHAMBERS**

Underground quality proprietary UPVC 450mm diameter inspection chambers to be provided at all changes of level, direction, connections and every 45m in straight runs. Inspection chambers to have bolt down double sealed covers in buildings and be adequate for vehicle loads in driveways.

## **51. ABOVE GROUND DRAINAGE**

All new above ground drainage and plumbing to comply with BS EN 12056-2:2000 for sanitary pipework. All drainage to be in accordance with Part H of the Building Regulations. Wastes to have 75mm deep anti vac bottle traps and rodding eyes to be provided at changes of direction.

Size of wastes pipes and max length of branch connections (if max length is exceeded then anti vacuum traps to be used)

Wash basin - 1.7m for 32mm pipe 4m for 40mm pipe

Bath/shower - 3m for 40mm pipe 4m for 50mm pipe

W/c - 6m for 100mm pipe for single WC

All branch pipes to connect to 110mm soil and vent pipe terminating min 900mm above any openings within 3m.

Or to 110mm upvc soil pipe with accessible internal air admittance valve complying with BS EN 12380, placed at a height so that the outlet is above the trap of the highest fitting.

Waste pipes not to connect on to SVP within 200mm of the WC connection.

Supply hot and cold water to all fittings as appropriate.

## **52. SOIL AND VENT PIPE**

Svp to be extended up in 110mm dia UPVC and to terminate min 900mm above any openings within 3m.

Provide a long radius bend at foot of SVP.

## **53. PIPEWORK THROUGH WALLS**

Where new pipework passes through external walls form rocker joints either side wall face of max length 600mm with flexible joints with short length of pipe bedded in wall.

Alternatively provide 75mm deep pre-cast concrete plank lintels over drain to form opening in wall to give 50mm space all round pipe: mask opening both sides with rigid sheet material and compressible sealant to prevent entry of fill or vermin.

## **54. LATERAL RESTRAINT TO FLOOR AND ROOF**

All floors and roofs to be anchored by bat or Catnic metal anchors (30x5mm mild steel). Straps to be secured to timber and walls min. Provide lateral restraint where joists run parallel to walls, floors are to be strapped to walls with 1000mm x 30mm x 5mm galvanised mild steel straps or other approved in compliance with BS EN 845-1 at max 2.0m centres, straps to be taken across minimum of 3 joists. Straps to be built into walls. Provide 38mm wide x ¾ depth solid noggins between joists at strap positions.

## 55. GLAZING - NEW WINDOWS

New windows to be double glazed with 16mm argon gap and soft coat low-E glass. Window Energy Rating to be Band C or better and to achieve U-value of 1.6 W/m<sup>2</sup>K.

All new/replacement windows to have FENSA certificate provided to BC

## GLAZING - NEW EXTERNAL DOORS

New external doors to achieve a U-Value of 1.80W/m<sup>2</sup>K. Glazed areas to be double glazed with 16mm argon gap and soft low-E glass. Glass to be toughened or laminated safety glass to BS 6206, BS EN 14179 or BS EN ISO 12543-1:2011 and Part K (Part N in Wales) of the current Building Regulations.

New doors with more than 50% internal glazed area to have a U-Value of 2.2 or 3.0 if less than 50%. Max. area of windows, doors and roof lights should not exceed 25% of floor area of extension. Vertical DPC's to all jambs with patented insulated cavity.

## 56. SAFETY GLAZING

All glazing in critical locations to be toughened or laminated safety glass to BS 6206 and Part N 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.

### 56a. ESCAPE WINDOWS

Provide emergency egress windows to any newly created first floor habitable rooms and ground floor inner rooms. Windows to have an unobstructed openable area of 450mm high x 450mm wide, minimum 0.33m sq, the bottom of the openable area should be not more than 1100mm above the floor. The window should enable the person to reach a place free from danger from fire.

### 56b. FIRE DOORS

If the dwelling has a protected route for means of escape or is a 3 storey house new doors on to the hallway are to be half hour fire doors.

### 56d. GLASS BALUSTRADING

All balcony balustrades to be min 1.1m in height. Balustrades to be in toughened glass in accordance with Part K (Part N in Wales) of the Building Regulations and designed to resist the horizontal force given in BS 6180:2011. No openings in any balustrading should allow the passage of a 100mm sphere and children should not readily be able to climb the guarding.

## 57. NATURAL & MECHANICAL VENTILATION

- Habitable room – Rapid ventilation 1/20<sup>th</sup> of floor area – for a hinged or pivot window that opens 30Deg or more, or for sliding sash windows. 1/10<sup>th</sup> of floor area – for a hinged or pivot window that opens less than 30Deg.

background ventilation – 5000mmSq

- Kitchen – Rapid ventilation – opening window

Background ventilation – 2500mmSq

Extract ventilation rates – 30l/s adjacent to hob or 60l/s elsewhere

Extracts as above required for extended kitchen.

Location of mechanical ventilation in rooms:

- Cooker hoods should be 650-750mm above the hob surface
- Mechanical extract fans should be placed as high as possible and preferably less than 400mm below the ceiling. Refer to appendix E. approved document F for further guidance of installation of fans in dwellings.

## 58. EXTRACT FOR SHOWER ROOM

Provide mechanical extract ventilation to shower room ducted to external air capable of extracting at a rate of not less than 15 litres per second. Vent to be connected to light switch and to have 15 minute over run if no window in the room. Internal doors should be provided with a 10mm gap below the door to aid air circulation. Ventilation provision in accordance with the Domestic ventilation compliance guide. Intermittent extract fans to BS EN 13141-4. All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

## 59. EXTRACT TO BATHROOM

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

## 60. EXTRACT TO W/C

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

## 63. OPENINGS AND RETURNS

An opening or recess greater than 0.1m<sup>2</sup> shall be at least 550mm from the supported wall (measured internally).

### Unprotected areas

Please note the extent of unprotected area on an external wall, i.e. windows, doors, timber cladding etc, should not exceed:

- 5.6m<sup>2</sup> when the minimum distance between side of the building and the relevant boundary is 1m
- 12m<sup>2</sup> when the minimum distance between the side of the building and the relevant boundary is 2m
- 18m<sup>2</sup> when the minimum distance between the side of the building and the relevant boundary is 3m
- 24m<sup>2</sup> when the minimum distance between the side of the building and the relevant boundary is 4m
- 30m<sup>2</sup> when the minimum distance between the side of the building and the relevant boundary is 5m
- no limit when the minimum distance between the side of the building and the relevant boundary is 6m

(The above applies only to buildings which are 1m or more from any point of a relevant boundary)  
Other methods of calculation are given in Approved Document B1.

## 65. STUD ASHLAR/DWARF WALL – BRN 65

To achieve minimum U Value of 0.28W/m<sup>2</sup>K

Construct stud wall using 100mm x 50mm head and sole plates and vertical studs (with noggins) at 400mm centres or to structural engineer's details and calculations. Insulation between and over studs; 60mm Celotex FR4000 between plus 37.5mm Celotex PL4000 insulated plasterboard with VCL.

Finish with 3mm skim coat of finishing plaster. All junctions to have water tight construction, seal all perimeter joints with tape internally and with silicon sealant externally.



## NOTES:

1. All foundations, beams and/or lintels accepting additional load are to be exposed if necessary for consideration by the building control officer and upgrade if found necessary. **DM Designs unable to check at time of survey**
2. All U-values to comply with current legislation and checked/approved by qualified thermal eng.
3. All structural steel/joists sizes stated on drawings to be checked and approved by qualified structural engineer/Building Control and signed off accordingly. **DM Designs accepts no responsibility in any part on structural details/joist sizes on drawings issued.**

**Approved appointed contractor to work to signed off structural calculations/sizes by qualified structural engineer/Building Control**

3. All details including brickwork opening sizes to be checked on site prior to ordering/manufacturing of any structure by approved appointed contractor
5. **Client to provide**

a) All structural calculations (to be paid by the client) to be provided by qualified structural engineer and passed to local building control –

Stroma Building Control  
Barnes Wallis House,  
25 Barnes Wallis Road,  
Segensworth East,  
Fareham,  
Hampshire,  
PO15 5TT

<https://sbc-enquiry.stroma.com>

Contact Tel No. 01489 663373

Email: [Sarah.Salussolia@stromabc.com](mailto:Sarah.Salussolia@stromabc.com)

b) **Any specialist suppliers manufacturing details/loadings**

Recommended Structural Engineers/Calculations

FastCalc

FCL House,  
Rodney Road,  
Southsea,  
PO4 8SY

Tel:02392 814544

02380 01 2892

01483 361 827

Email: [office@fastcalconline.com](mailto:office@fastcalconline.com)

Bruce Duff  
BD Structural Calcs  
78 Lichfield Road  
Portsmouth  
Hampshire  
P03 6DF  
Phone: 07738 050 760  
Email : [Calcs@bduff.co.uk](mailto:Calcs@bduff.co.uk)

**Table 5 Summary of Tables 6-45**

Construction	Timber members	Imposed loading not exceeding kN/m <sup>2</sup>	Strength classes	
			C16	C24
Floors	Joists	1.50	Table 6	Table 7
Ceilings	Joists	0.25	Table 8	Table 9
	Binders	0.25	Table 10	Table 11
Pitched roofs with slope of 15° or more but less than 22.5°	Rafters	0.75	Table 12	Table 13
	Purlins	0.75	Table 14	Table 15
	Rafters	1.00	Table 16	Table 17
	Purlins	1.00	Table 18	Table 19
Pitched roofs with slope of 22.5° or more but less than 30°	Rafters	0.75	Table 20	Table 21
	Purlins	0.75	Table 22	Table 23
	Rafters	1.00	Table 24	Table 25
	Purlins	1.00	Table 26	Table 27
Pitched roofs with slope of 30° to 45°	Rafters	0.75	Table 28	Table 29
	Purlins	0.75	Table 30	Table 31
	Rafters	1.00	Table 32	Table 33
	Purlins	1.00	Table 34	Table 35
Flat roofs: access for maintenance only	Joists	0.75	Table 36	Table 37
		1.00	Table 38	Table 39
Flat roofs: full access allowed		1.50	Table 40	Table 41
Roof sheeting or cladding for roofs with a slope of 10° - 35° inclusive	Purlins	0.75	Table 42	Table 43
		1.00	Table 44	Table 45

**Table 41 - Permissible clear spans for joists for flat roofs with unlimited access**

Imposed load 1.50 kN/m<sup>2</sup>

Strength Class C24

Service Class 1 or 2

		Dead loads (kN/m <sup>2</sup> ) excluding self-weight of joist								
		Not more than 0.50			More than 0.50 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of joist		Spacing of joists (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	97	1.43	1.42	1.40	1.40	1.39	1.36	1.37	1.36	1.32
38	120	1.95	1.94	1.90	1.90	1.88	1.83	1.85	1.83	1.77
38	145	2.55	2.53	2.47	2.47	2.44	2.36	2.39	2.36	2.27
38	170	3.19	3.15	3.06	3.06	3.02	2.91	2.96	2.91	2.79
38	195	3.84	3.79	3.55	3.67	3.62	3.41	3.53	3.47	3.28
38	220	4.51	4.40	4.00	4.29	4.22	3.84	4.12	4.04	3.70
47	97	1.60	1.59	1.56	1.56	1.55	1.51	1.53	1.51	1.47
47	120	2.17	2.15	2.10	2.10	2.08	2.02	2.05	2.02	1.95
47	145	2.83	2.80	2.73	2.73	2.69	2.60	2.64	2.60	2.50
47	170	3.51	3.48	3.33	3.37	3.32	3.20	3.25	3.20	3.06
47	195	4.22	4.17	3.81	4.03	3.97	3.66	3.87	3.80	3.53
47	220	4.91	4.72	4.29	4.70	4.54	4.13	4.51	4.39	3.98
63	97	1.85	1.84	1.80	1.80	1.78	1.74	1.76	1.74	1.68
63	120	2.50	2.48	2.42	2.42	2.39	2.31	2.35	2.31	2.23
63	145	3.24	3.20	3.11	3.11	3.07	2.96	3.01	2.96	2.84
63	170	4.01	3.96	3.67	3.83	3.78	3.53	3.69	3.63	3.41
63	195	4.79	4.62	4.20	4.57	4.44	4.04	4.38	4.29	3.90
63	220	5.40	5.20	4.73	5.20	5.00	4.55	5.02	4.83	4.39
75	120	2.71	2.68	2.62	2.62	2.59	2.50	2.54	2.50	2.41
75	145	3.50	3.46	3.32	3.36	3.32	3.19	3.25	3.19	3.06
75	170	4.32	4.27	3.89	4.13	4.07	3.74	3.97	3.90	3.61
75	195	5.07	4.88	4.45	4.88	4.70	4.28	4.70	4.54	4.13
75	220	5.70	5.49	5.01	5.49	5.29	4.82	5.31	5.11	4.66
ALS/CLS										
38	140	2.43	2.41	2.35	2.35	2.32	2.25	2.28	2.25	2.17
38	184	3.55	3.51	3.35	3.40	3.35	3.22	3.28	3.22	3.08
38	235	4.89	4.70	4.27	4.67	4.52	4.10	4.47	4.36	3.95

**Table 40 Permissible clear spans for joists for flat roofs with unlimited access**

Imposed load 1.50 kN/m<sup>2</sup>

Strength Class C16

Service Class 1 or 2

		Dead loads (kN/m <sup>2</sup> ) excluding self-weight of joist								
		Not more than 0.50			More than 0.50 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of joist		Spacing of joists (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	97	1.21	1.20	1.18	1.18	1.17	1.13	1.15	1.13	1.09
38	120	1.76	1.74	1.69	1.69	1.67	1.61	1.64	1.61	1.54
38	145	2.31	2.29	2.24	2.24	2.21	2.14	2.17	2.14	2.05
38	170	2.89	2.86	2.78	2.78	2.75	2.65	2.69	2.65	2.54
38	195	3.49	3.45	3.31	3.35	3.30	3.17	3.22	3.17	3.03
38	220	4.11	4.06	3.73	3.92	3.86	3.58	3.77	3.70	3.45
47	97	1.44	1.43	1.41	1.41	1.40	1.36	1.38	1.36	1.31
47	120	1.96	1.95	1.90	1.90	1.89	1.83	1.86	1.83	1.77
47	145	2.56	2.54	2.48	2.48	2.45	2.37	2.40	2.37	2.28
47	170	3.19	3.16	3.07	3.07	3.03	2.92	2.97	2.92	2.79
47	195	3.85	3.80	3.55	3.68	3.63	3.41	3.54	3.48	3.29
47	220	4.52	4.41	4.01	4.30	4.24	3.85	4.13	4.05	3.71
63	97	1.67	1.66	1.63	1.63	1.62	1.58	1.59	1.58	1.53
63	120	2.26	2.24	2.19	2.19	2.17	2.11	2.13	2.11	2.03
63	145	2.94	2.92	2.84	2.84	2.80	2.71	2.75	2.71	2.60
63	170	3.65	3.61	3.43	3.50	3.45	3.29	3.38	3.32	3.17
63	195	4.38	4.31	3.92	4.18	4.12	3.77	4.02	3.95	3.64
63	220	5.05	4.86	4.42	4.86	4.67	4.25	4.67	4.51	4.10
75	120	2.46	2.44	2.38	2.38	2.35	2.28	2.31	2.28	2.20
75	145	3.19	3.16	3.07	3.07	3.03	2.92	2.97	2.92	2.80
75	170	3.95	3.90	3.63	3.78	3.72	3.49	3.64	3.58	3.37
75	195	4.72	4.57	4.16	4.50	4.39	4.00	4.32	4.24	3.86
75	220	5.34	5.14	4.68	5.14	4.95	4.50	4.97	4.78	4.35
ALS/CLS										
38	140	2.20	2.18	2.13	2.13	2.11	2.04	2.07	2.04	1.95
38	184	3.22	3.19	3.10	3.10	3.05	2.94	2.99	2.94	2.81
38	235	4.48	4.38	3.98	4.27	4.20	3.82	4.10	4.02	3.67

**Table 33 Permissible clear spans (mm) for common or jack rafters**

Slope of roof 30.0° to 45.0°

Imposed load 1.00 kN/m<sup>2</sup>

Strength Class C24

Service Class 1 or 2

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.50	2.41	2.19	2.37	2.28	2.07	2.26	2.17	1.97
38	125	3.12	3.00	2.73	2.95	2.84	2.58	2.82	2.71	2.45
38	150	3.74	3.60	3.27	3.54	3.40	3.09	3.37	3.24	2.94
47	100	2.69	2.58	2.35	2.54	2.44	2.22	2.42	2.33	2.11
47	125	3.35	3.22	2.93	3.17	3.05	2.77	3.02	2.91	2.64
47	150	4.01	3.86	3.51	3.79	3.65	3.32	3.62	3.48	3.16
ALS/CLS										
38	89	2.23	2.14	1.95	2.11	2.03	1.84	2.01	1.93	1.75
38	140	3.49	3.36	3.05	3.30	3.18	2.88	3.15	3.03	2.75

**Table 32 Permissible clear spans for common or jack rafters**

Slope of roof 30.0° to 45.0°

Imposed load 1.00 kN/m<sup>2</sup>

Strength Class C16

Service Class 1 or 2

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.30	2.24	2.04	2.11	2.06	1.91	1.97	1.91	1.77
38	125	2.92	2.80	2.55	2.76	2.65	2.40	2.63	2.52	2.27
38	150	3.49	3.36	3.05	3.30	3.18	2.88	3.15	3.03	2.70
47	100	2.51	2.41	2.19	2.37	2.28	2.07	2.26	2.17	1.97
47	125	3.13	3.01	2.73	2.96	2.85	2.58	2.82	2.71	2.46
47	150	3.74	3.60	3.28	3.54	3.41	3.10	3.38	3.25	2.95
ALS/CLS										
38	89	1.92	1.88	1.78	1.78	1.74	1.63	1.67	1.63	1.51
38	140	3.26	3.14	2.85	3.08	2.97	2.69	2.94	2.83	2.53

**Table 29 Permissible Clear Spans for Common or Jack Rafters**

Slope of roof 30.0° to 45.0°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C24

Service Class 1 or 2

		Dead loads (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.65	2.55	2.32	2.48	2.39	2.17	2.35	2.26	2.05
38	125	3.30	3.18	2.89	3.10	2.98	2.71	2.93	2.82	2.56
38	150	3.95	3.81	3.46	3.71	3.57	3.24	3.51	3.38	3.07
47	100	2.84	2.73	2.49	2.66	2.56	2.33	2.52	2.43	2.20
47	125	3.54	3.41	3.10	3.32	3.20	2.91	3.15	3.03	2.75
47	150	4.23	4.08	3.71	3.97	3.82	3.48	3.77	3.62	3.29
ALS/CLS										
38	89	2.36	2.27	2.06	2.21	2.13	1.93	2.09	2.01	1.83
38	140	3.69	3.56	3.23	3.46	3.33	3.03	3.28	3.16	2.86

**Table 28 Permissible clear spans for common or jack rafters**

Slope of roof 30.0° to 45.0°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C16

Service Class 1 or 2

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.30	2.24	2.11	2.11	2.06	1.91	1.97	1.91	1.77
38	125	3.09	2.97	2.70	2.89	2.78	2.52	2.67	2.58	2.36
38	150	3.70	3.56	3.23	3.46	3.33	3.03	3.28	3.15	2.86
47	100	2.66	2.55	2.32	2.47	2.39	2.17	2.29	2.22	2.04
47	125	3.31	3.18	2.90	3.10	2.98	2.71	2.94	2.83	2.57
47	150	3.96	3.81	3.47	3.71	3.57	3.25	3.52	3.39	3.08
ALS/CLS										
38	89	1.92	1.88	1.78	1.78	1.74	1.63	1.67	1.63	1.51
38	140	3.45	3.32	3.02	3.24	3.11	2.83	3.06	2.95	2.67

**Table 25 Permissible clear spans for common or jack rafters**

Slope of roof 22.5° or more but less than 30.0°

Imposed load 1.00 kN/m<sup>2</sup>

Strength Class C24

Service Class 1 or 2

		Dead loads (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.42	2.32	2.11	2.29	2.20	2.00	2.18	2.10	1.90
38	125	3.01	2.90	2.63	2.86	2.74	2.49	2.73	2.62	2.38
38	150	3.61	3.47	3.15	3.42	3.29	2.99	3.26	3.14	2.85
47	100	2.59	2.49	2.26	2.46	2.36	2.14	2.35	2.25	2.05
47	125	3.23	3.11	2.83	3.06	2.95	2.68	2.93	2.81	2.55
47	150	3.87	3.72	3.38	3.67	3.53	3.21	3.50	3.37	3.06
ALS/CLS										
38	89	2.15	2.07	1.88	2.04	1.96	1.78	1.95	1.87	1.69
38	140	3.37	3.24	2.94	3.19	3.07	2.79	3.05	2.93	2.66

**Table 24 Permissible clear spans for common or jack rafters**

Slope of roof 22.5° or more but less than 30.0°

Imposed load 1.00 kN/m<sup>2</sup>

Strength Class C16

Service Class 1 or 2

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.19	2.14	1.97	2.02	1.96	1.83	1.88	1.83	1.69
38	125	2.81	2.70	2.45	2.67	2.56	2.31	2.54	2.44	2.15
38	150	3.37	3.24	2.94	3.19	3.07	2.74	3.05	2.93	2.56
47	100	2.42	2.33	2.11	2.29	2.21	2.00	2.19	2.10	1.91
47	125	3.02	2.90	2.64	2.86	2.75	2.50	2.73	2.63	2.38
47	150	3.61	3.48	3.16	3.43	3.29	2.99	3.27	3.15	2.85
ALS/CLS										
38	89	1.83	1.80	1.70	1.70	1.66	1.55	1.60	1.55	1.44
38	140	3.15	3.03	2.75	2.98	2.87	2.57	2.85	2.73	2.40

**Table 21 Permissible clear spans for common or jack rafters**

Slope of roof 22.5° or more but less than 30.0°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C24

Service Class 1 or 2

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.56	2.46	2.24	2.40	2.31	2.10	2.28	2.19	1.99
38	125	3.19	3.07	2.79	3.00	2.88	2.62	2.84	2.73	2.48
38	150	3.82	3.68	3.34	3.59	3.45	3.14	3.41	3.28	2.97
47	100	2.75	2.64	2.40	2.58	2.48	2.25	2.45	2.35	2.14
47	125	3.42	3.29	3.00	3.22	3.09	2.81	3.05	2.94	2.67
47	150	4.09	3.94	3.59	3.85	3.70	3.37	3.65	3.52	3.19
ALS/CLS										
38	89	2.28	2.19	1.99	2.14	2.06	1.87	2.03	1.95	1.77
38	140	3.57	3.44	3.12	3.35	3.23	2.93	3.18	3.06	2.78

**Table 20 Permissible clear spans for common or jack rafters**

Slope of roof 22.5° or more but less than 30.0°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C16

Service Class 1 or 2

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.19	2.14	2.02	2.02	1.96	1.83	1.88	1.83	1.69
38	125	2.98	2.87	2.61	2.76	2.68	2.44	2.55	2.47	2.26
38	150	3.57	3.44	3.12	3.35	3.23	2.93	3.18	3.06	2.73
47	100	2.57	2.47	2.24	2.36	2.29	2.10	2.20	2.13	1.96
47	125	3.20	3.08	2.80	3.01	2.89	2.63	2.85	2.74	2.49
47	150	3.83	3.68	3.35	3.60	3.46	3.15	3.41	3.28	2.98
ALS/CLS										
38	89	1.83	1.80	1.70	1.70	1.66	1.55	1.60	1.55	1.44
38	140	3.34	3.21	2.92	3.13	3.01	2.73	2.96	2.86	2.56



**Table 17 Permissible clear spans for common or jack rafters**

Slope of roof 15.0° or more but less than 22.5°

Imposed load 1.00 kN/m<sup>2</sup>

Strength Class C24 Service Class 1 or 2.

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.36	2.27	2.06	2.24	2.15	1.95	2.14	2.05	1.86
38	125	2.94	2.83	2.57	2.79	2.68	2.43	2.66	2.56	2.32
38	150	3.52	3.38	3.07	3.34	3.21	2.91	3.19	3.07	2.78
47	100	2.53	2.43	2.21	2.40	2.31	2.09	2.29	2.20	2.00
47	125	3.15	3.03	2.76	2.99	2.88	2.61	2.86	2.75	2.50
47	150	3.77	3.63	3.30	3.58	3.45	3.13	3.43	3.29	2.99
ALS/CLS										
38	89	2.10	2.02	1.83	1.99	1.91	1.74	1.90	1.83	1.66
38	140	3.29	3.16	2.87	3.12	3.00	2.72	2.98	2.87	2.60

**Table 16 Permissible clear spans for common or jack rafters**

Slope of roof 15° or more but less than 22.5°

Imposed load 1.00 kN/m<sup>2</sup>

Strength Class C16 Service Class 1 or 2.

		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.11	2.06	1.91	1.94	1.89	1.75	1.81	1.75	1.62
38	125	2.74	2.64	2.36	2.60	2.50	2.18	2.45	2.35	2.04
38	150	3.29	3.16	2.80	3.12	2.99	2.59	2.96	2.80	2.42
47	100	2.36	2.27	2.06	2.24	2.15	1.95	2.11	2.04	1.83
47	125	2.94	2.83	2.57	2.79	2.69	2.42	2.67	2.57	2.27
47	150	3.52	3.39	3.08	3.35	3.22	2.88	3.20	3.08	2.69
ALS/CLS										
38	89	1.76	1.73	1.63	1.63	1.59	1.49	1.53	1.49	1.38
38	140	3.07	2.95	2.63	2.91	2.80	2.43	2.78	2.62	2.27

**Table 15 Permissible clear spans for purlins supporting rafters**

Slope of roof 15° or more but less than 22.5°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C24 Service Class 1 or 2.

Size of purlin		Dead load (kN/m <sup>2</sup> ) excluding self weight of purlin and rafters																	
		Not more than 0.5						More than 0.5 but not more than 0.75						More than 0.75 but not more than 1.00					
Spacing of purlins (mm)		Maximum clear span (m)																	
B (mm)	D (mm)	1500	1800	2100	2400	2700	3000	1500	1800	2100	2400	2700	3000	1500	1800	2100	2400	2700	3000
63	150	2.24	2.10	1.99	1.90	1.82		2.11	1.98	1.87			2.00	1.87					
63	175	2.62	2.45	2.32	2.21	2.12	2.04	2.46	2.30	2.18	2.08	1.99	1.91	2.33	2.18	2.06	1.96	1.88	1.80
63	200	2.99	2.80	2.65	2.53	2.42	2.33	2.81	2.63	2.49	2.37	2.27	2.18	2.66	2.49	2.36	2.24	2.15	2.06
63	225	3.36	3.15	2.98	2.84	2.72	2.62	3.16	2.96	2.80	2.67	2.55	2.45	2.99	2.80	2.65	2.52	2.41	2.32
63	275	4.10	3.84	3.64	3.47	3.32	3.20	3.85	3.61	3.42	3.25	3.12	3.00	3.65	3.42	3.23	3.08	2.95	2.83
75	125	1.99	1.87					1.87											
75	150	2.38	2.24	2.12	2.02	1.94	1.87	2.24	2.10	1.99	1.90	1.82	2.13	1.99	1.89				
75	175	2.78	2.61	2.47	2.36	2.26	2.17	2.61	2.45	2.32	2.21	2.12	2.04	2.48	2.32	2.20	2.09	2.00	1.93
75	200	3.17	2.98	2.82	2.69	2.58	2.48	2.98	2.80	2.65	2.53	2.42	2.33	2.83	2.65	2.51	2.39	2.29	2.20
75	225	3.57	3.35	3.17	3.03	2.90	2.79	3.35	3.15	2.98	2.84	2.72	2.62	3.18	2.98	2.82	2.69	2.57	2.48

**Table 14 Permissible clear spans for purlins supporting rafters**

Slope of roof 15° or more but less than 22.5°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C16 Service Class 1 or 2.

Size of purlin		Dead load (kN/m <sup>2</sup> ) excluding self weight of purlin and rafters																	
		Not more than 0.5						More than 0.5 but not more than 0.75						More than 0.75 but not more than 1.00					
Spacing of purlins (mm)		Maximum clear span (m)																	
B (mm)	D (mm)	1500	1800	2100	2400	2700	3000	1500	1800	2100	2400	2700	3000	1500	1800	2100	2400	2700	3000
63	150	2.09	1.95	1.85				1.96	1.83				1.85						
63	175	2.43	2.28	2.15	2.05	1.97	1.89	2.28	2.14	2.02	1.92	1.84	2.16	2.02	1.91	1.82			
63	200	2.78	2.60	2.46	2.34	2.24	2.16	2.61	2.44	2.31	2.20	2.10	2.00	2.47	2.31	2.18	2.07	1.95	1.85
63	225	3.12	2.92	2.77	2.64	2.52	2.43	2.93	2.74	2.59	2.47	2.35	2.23	2.77	2.60	2.45	2.31	2.18	2.06
63	275	3.81	3.57	3.38	3.22	3.08	2.95	3.58	3.35	3.17	3.01	2.84	2.69	3.39	3.17	2.99	2.79	2.63	2.49
75	125	1.85																	
75	150	2.22	2.08	1.97	1.88			2.08	1.95	1.85			1.97	1.85					
75	175	2.58	2.42	2.29	2.19	2.10	2.02	2.43	2.28	2.15	2.05	1.96	1.89	2.30	2.15	2.04	1.94	1.86	
75	200	2.95	2.77	2.62	2.50	2.39	2.30	2.77	2.60	2.46	2.34	2.24	2.16	2.63	2.46	2.33	2.21	2.12	2.02
75	225	3.32	3.11	2.95	2.81	2.69	2.59	3.12	2.92	2.76	2.63	2.52	2.42	2.95	2.77	2.62	2.49	2.38	2.26

**Table 13 Permissible clear spans for common or jack rafters**

Slope of roof 15° or more but less than 22.5°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C24

Service Class 1 or 2

Size of rafter		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.50	2.41	2.18	2.35	2.26	2.05	2.23	2.14	1.95
38	125	3.12	3.00	2.73	2.93	2.82	2.56	2.78	2.68	2.43
38	150	3.73	3.59	3.27	3.51	3.38	3.07	3.33	3.21	2.91
47	100	2.68	2.58	2.35	2.52	2.43	2.20	2.40	2.30	2.09
47	125	3.34	3.22	2.93	3.15	3.03	2.75	2.99	2.87	2.61
47	150	4.00	3.85	3.50	3.76	3.62	3.29	3.58	3.44	3.13
ALS/CLS										
38	89	2.23	2.14	1.95	2.10	2.01	1.83	1.95	1.89	1.73
38	140	3.49	3.35	3.05	3.28	3.15	2.87	3.11	2.99	2.72

**Table 12 Permissible clear spans for common or jack rafters**

Slope of roof 15° or more but less than 22.5°

Imposed load 0.75 kN/m<sup>2</sup>

Strength Class C16

Service Class 1 or 2

Size of rafter		Dead load (kN/m <sup>2</sup> ) excluding self weight of rafter								
		Not more than 0.5			More than 0.5 but not more than 0.75			More than 0.75 but not more than 1.00		
		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.11	2.06	1.94	1.94	1.89	1.75	1.81	1.75	1.62
38	125	2.91	2.80	2.54	2.65	2.57	2.35	2.45	2.37	2.16
38	150	3.49	3.35	3.05	3.28	3.15	2.80	3.10	2.98	2.59
47	100	2.48	2.41	2.19	2.27	2.20	2.04	2.11	2.04	1.88
47	125	3.12	3.01	2.73	2.94	2.83	2.57	2.79	2.68	2.42
47	150	3.74	3.60	3.27	3.52	3.38	3.08	3.34	3.21	2.87
ALS/CLS										
38	89	1.76	1.73	1.63	1.63	1.59	1.49	1.53	1.49	1.38
38	140	3.26	3.13	2.85	3.06	2.95	2.62	2.84	2.74	2.42

**Table 6 Permissible clear spans for domestic floor joists**

Imposed load not exceeding 1.5 kN/m<sup>2</sup>

Strength Class C16

Service Class 1 or 2

Size of joist		Dead load (kN/m <sup>2</sup> ) excluding self-weight of joist								
		Not more than 0.25			More than 0.25 but not more than 0.50			More than 0.50 but not more than 1.25		
		Spacing of joists (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	97	1.84	1.70	1.31	1.73	1.56	1.22	1.43	1.31	1.04
38	120	2.45	2.34	1.88	2.33	2.17	1.72	1.91	1.76	1.42
38	145	2.96	2.84	2.49	2.83	2.69	2.30	2.43	2.26	1.84
38	170	3.46	3.33	2.89	3.30	3.12	2.70	2.82	2.66	2.28
38	195	3.96	3.78	3.28	3.75	3.54	3.07	3.21	3.03	2.62
38	220	4.46	4.23	3.67	4.20	3.96	3.44	3.59	3.39	2.93
47	97	2.03	1.92	1.59	1.93	1.82	1.47	1.67	1.53	1.23
47	120	2.63	2.53	2.26	2.52	2.42	2.05	2.22	2.05	1.66
47	145	3.17	3.05	2.77	3.04	2.92	2.59	2.70	2.55	2.15
47	170	3.71	3.57	3.21	3.55	3.42	3.00	3.14	2.96	2.56
47	195	4.25	4.09	3.64	4.07	3.91	3.41	3.56	3.36	2.91
47	220	4.75	4.61	4.08	4.58	4.39	3.82	3.99	3.76	3.26
63	97	2.33	2.21	1.93	2.20	2.09	1.83	1.94	1.85	1.54
63	120	2.90	2.79	2.54	2.78	2.67	2.42	2.50	2.40	2.05
63	145	3.50	3.36	3.06	3.35	3.22	2.92	3.01	2.89	2.56
63	170	4.09	3.93	3.58	3.91	3.77	3.42	3.52	3.39	2.97
63	195	4.67	4.50	4.10	4.48	4.31	3.92	4.03	3.88	3.37
63	220	5.10	4.96	4.61	4.94	4.80	4.41	4.54	4.34	3.77
75	120	3.07	2.96	2.69	2.94	2.83	2.57	2.65	2.54	2.29
75	145	3.70	3.56	3.24	3.54	3.41	3.10	3.19	3.07	2.78
75	170	4.32	4.16	3.79	4.14	3.99	3.63	3.73	3.59	3.23
75	195	4.87	4.73	4.34	4.72	4.56	4.15	4.27	4.11	3.67
75	220	5.32	5.17	4.82	5.15	5.01	4.67	4.77	4.63	4.11
	ALS/CLS									
38	140	2.86	2.74	2.41	2.73	2.60	2.18	2.34	2.16	1.76
38	184	3.74	3.58	3.11	3.56	3.36	2.91	3.04	2.87	2.48
38	235	4.73	4.50	3.91	4.46	4.21	3.66	3.82	3.60	3.12
		See Clause 4.1.4								

**Table 7 Permissible clear spans for domestic floor joists**

Imposed load not exceeding 1.5 kN/m<sup>2</sup>

Strength Class C24 Service Class 1 or 2

Size of joist		Dead load (kN/m <sup>2</sup> ) excluding self-weight of joist								
		Not more than 0.25			More than 0.25 but not more than 0.50			More than 0.50 but not more than 1.25		
		Spacing of joists (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	97	2.03	1.91	1.66	1.92	1.82	1.58	1.70	1.62	1.36
38	120	2.63	2.52	2.25	2.51	2.41	2.12	2.22	2.11	1.83
38	145	3.17	3.05	2.76	3.03	2.91	2.64	2.72	2.61	2.36
38	170	3.71	3.56	3.23	3.55	3.41	3.09	3.18	3.06	2.74
38	195	4.24	4.08	3.71	4.06	3.90	3.54	3.65	3.50	3.12
38	220	4.75	4.60	4.17	4.57	4.40	3.99	4.11	3.95	3.49
47	97	2.24	2.12	1.85	2.12	2.01	1.75	1.87	1.78	1.56
47	120	2.82	2.71	2.46	2.70	2.59	2.34	2.42	2.31	2.05
47	145	3.40	3.27	2.97	3.25	3.13	2.84	2.92	2.81	2.54
47	170	3.98	3.83	3.48	3.81	3.66	3.32	3.42	3.29	2.98
47	195	4.55	4.38	3.98	4.36	4.19	3.81	3.92	3.77	3.41
47	220	5.00	4.86	4.48	4.84	4.70	4.29	4.41	4.24	3.85
63	97	2.52	2.42	2.13	2.41	2.29	2.01	2.12	2.01	1.78
63	120	3.11	2.99	2.72	2.97	2.86	2.60	2.67	2.57	2.32
63	145	3.74	3.60	3.28	3.58	3.45	3.13	3.22	3.10	2.81
63	170	4.37	4.21	3.83	4.19	4.03	3.67	3.77	3.63	3.29
63	195	4.91	4.77	4.39	4.76	4.61	4.20	4.32	4.15	3.77
63	220	5.36	5.21	4.86	5.19	5.05	4.71	4.81	4.67	4.25
75	120	3.29	3.16	2.88	3.15	3.03	2.75	2.83	2.73	2.47
75	145	3.96	3.81	3.47	3.79	3.65	3.32	3.42	3.29	2.98
75	170	4.62	4.45	4.06	4.43	4.27	3.88	4.00	3.84	3.49
75	195	5.12	4.98	4.64	4.96	4.82	4.45	4.57	4.40	4.00
75	220	5.59	5.43	5.07	5.41	5.26	4.91	5.02	4.88	4.51
ALS/CLS										
38	140	3.06	2.94	2.67	2.93	2.81	2.55	2.63	2.52	2.25
38	184	4.01	3.85	3.50	3.83	3.69	3.34	3.44	3.31	2.95
38	235	4.98	4.84	4.46	4.82	4.68	4.26	4.39	4.21	3.71
		See Clause 4.1.4								

