

# Construction Specification 2016

## Dorchester Living

### Heyford Park – Phase \_

Rev 17

#### Revisions

##### Rev 11

- Section 2.6 Building Regulations 2013 added
- Location of cavity tray in Section 4.2.2 added
- Cavity width corrected to 150mm in Section 4.9
- Artex option removed from Section 5.3
- Party wall blockwork specification added in Section 7.2

##### Rev 12

- Premier Manual ref updated from v10 to v11 on page 2
- Fixing for **all** roof tiles amended to **double** mechanical fix on page 18
- A.D Q added too reference material in 7.6 on page 25
- Reference added to AD Q and The Regulatory Reform (Fire Safety) Order 2005 added to and Section 16B Notice amended to Reg 38 in Section 8.13 on page 31
- AD K added to Electric Gate spec on page 32
- Volume 1, 2015 added to reference to Part M on page 34
- Rigid ducting note added on page 33

##### Rev 13

- Plaster board ceiling to three storey properties clarified in Section 5.3 to only be fireline over stairwells
- “Lining” note removed from Section 7.5
- Option added to Section 7.5 to use either 15mm Soundblock with no acoustic insulation or 12.5mm wall board with 25mm acoustic roll
- 12.5mm fire resisting plaster board amended to 15mm plasterboard in Section 9.4

Rev 14

- 5.3 Battens and counter battens specified
- 5.3 "F1 removed from underlay description
- 5.3 Wall plate depth increased to 75mm
- 5.3 Vapour permeable underlay added
- 5.5 Counter battens added
- 5.5 plasterboard added to description
- 5.5 Ventilation to room in the roof construction clarified

Rev 15

- 11.4 Air Admittance valve added to combined waste pipes on page 41

Rev 16

- Flat roofs and Balconies added and ref clauses updated at 5.6 on page 21

Rev 17

- 7.4 Internal wall 48mm studs replaced with 70mm studs on page 26

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# 1. Introduction

This construction specification has been produced by Dorchester Living to ensure all new build homes comply with the current Building Regulations and are built to the requirements set out in the current Premier Guarantee Technical Manual (v10). Premier Guarantee is the nominated structural warranty provider and plan checker for Dorchester Living therefore all homes built by Dorchester Living must adhere to their requirements.

The chapters in this document specify the best practice construction methods and materials to use when building compliant, quality homes. Further information is available from the current Building Regulations and the current Premier Technical Manual (v10), the particular documents can be found under **Reference Material** in each chapter.

Where applicable, British Board of Agreement Certificates (BBA) have been collated for materials and products that will be used in Dorchester Living homes. BBA is a nationally recognised body that offer approval, certification and testing of products specifically on materials for the construction industry. A hard copy of the certificates can be found in the appendix of this document.

## 2. Foundations

### 2.1 General

- All sites are to be properly assessed and investigated. Foundations and substructure designs shall be suitable for the ground conditions and where necessary sites shall be remediated and precautions taken in accordance with Environment Agency and Premier requirements, appropriate documentation and validation to be provided on request. Foundations shall be designed by a suitably qualified person on all developments
- Concrete mixes for housing application in non-hazardous ground conditions are specified in the table under “Premier Standards”. These are general purpose designated mixes and specify unreinforced concrete in strip and mass concrete foundations including trench fill as “Gen 1 mix”.
- For Dorchester Living specification purposes in non-aggressive soils use a “Gen 3 mix” to replace Gen 1 in these applications. Engineer to confirm soil conditions and recommendations.
- Soil condition shall be assessed in accordance with BRE Special Digest 1 to determine the soil and groundwater classification, including inter-alia, sulphate, chlorides, acidity and chemical content.
- The company has several preferred options and the following hierarchy should be considered when making the final decision and subject to ground conditions and limitations. Details of types of foundations can be found within the standard details pack.
  - Strip Foundations
  - Trench Fill
  - Raft
  - Pile

### 2.2 Strip Foundations

- All foundations must be designed by a suitably qualified & approved person and will be subject to site conditions and constraints. Variation may therefore be required at the request of the suitably qualified & approved person
- Strip foundations to be suitable at depths between 450mm to 900mm to the underside of the foundations.
- Strip foundation should be a minimum of 150mm thick but could increase up to 500mm depending on structural requirements.
- The depth to the underside of the foundation in frost susceptible soils should be at least 450mm below finished ground level.
- Minimum widths of strip foundations are to be 450mm wide but may vary due to structural design on a site by site basis.
- Foundation depths are also influenced by the shrink ability of the soils; please refer to the table below. These depths may be reduced further in accordance with Premier chapter 5.5. This must be agreed with Premier and suitably qualified & approved person.

Modified Plasticity	Volume Change Potential	Minimum Depth (m)
40% & Greater	High	1.0
20% to less than 40%	Medi	0.9
10% to less than 20%	Low	0.75

- Reinforced strip foundations may be considered in line with recommendations from a suitably qualified & approved person

### 2.3 Trench Fill Foundations

- Trench Fill foundations are suitable for depths between 900mm – 2500mm to the underside of the foundation, subject to site conditions.
- Can be used as an alternative to other forms of foundation where the depth of foundation starts to become excessive and trench support is required e.g. on depths in excess of 1.2m to the top of the foundation.
- Trench fill foundations should be a minimum of 450mm wide subject to structural calculations.
- Foundations beyond 2500mm in depth must be designed by an Engineer in accordance with Premier Technical Requirements.

### 2.4 Raft Foundations

- To be used in favour of pile foundations where ground conditions and costs permit.
- All raft foundations to be designed by a suitably qualified & approved person.
- Elaborate or expensive raft designs may have to be reviewed once received to ensure they remain cost effective against pile design.
- Designs are based on the following specification but should be approved by a suitably qualified structural engineer for each project.
- Minimum 65mm thick power floated screed of grade C25 concrete with 14mm aggregate reinforced with either D98 mesh or FIBRIN of 0.9 kg/m<sup>3</sup> mix proportion. Screed laid on 75mm thick rigid urethane insulation (0.022W/mK) on a Damp Proof Membrane (DPM).
- Power floated RC35/ST53 reinforced concrete raft top of slab at 150mm below finished floor level (FFL) on 50mm, 75mm max, oversite concrete blinding - mix Gen 1, laid on a smooth level finish on DoT Type 1 well compacted fill down to strip level to engineers approval. Raft foundations to be protected with plastic sheeting until cured.
- Raft foundations can be susceptible to thermal bridging issues and deviations from the standard detail will have to be modelled and factored into the SAP calculations

### 2.5 Pile Foundation

- Pile foundations will be site specific but generally considered for depths below 2500mm and or poor ground.
- Various types can be considered and a list of the most common are noted below
  - Vibro (subject to soils)
  - Mini Piles
  - Short Bore Piles
  - Pre-cast
  - Auger
- All piles to be designed by a suitably qualified & approved person which may in this instance be the manufacturer/supplier of the system
- Ring beam design will be subject to the system employed, but in any event must be designed by a suitably qualified & approved person.

## 2.6 Reference Material

### **Building Regulations 2013**

Approved Document A (Structure)

Approved Document C (Site preparations & resistance to contaminants and moisture)

### **Premier Technical Manual V10:-**

Chapter 4.5 – 4.4 – Phase 1 – Geo Environmental Assessment (Desk Study)

4.5 – Phase 2 – Geo Environmental Assessment (Ground Investigation)

5.1 – Ground Improvement

5.2 – Foundations, Trees and Clay

5.3 – Strip and Mass filled Foundations

5.5 – Raft Foundations

### **Codes of Practice & BS EN Standards**

BS 8500-1:2006 – Concrete (complementary standard to BS EN 206-1)

BS 8500-2:2006 – Concrete (complementary standard to BS EN 206-1)

BS EN 206-1:200 – Concrete

BS EN 206-9:2010 – Concrete

BS 8000 1.1 – Workmanship excavation and filling

BS 8000 2.1 – Workmanship mixing and transporting concrete

BS 8000 2.2 – Workmanship site work with in-situ and precast concrete

BS 8004 - Code of Practice for foundations

# 3. Ground Floors

## 3.1 General

- The type and design of floors slabs will be dependent on site conditions but in the first instance ground bearing slabs should be considered.
- Where sites are contaminated or where there is a surplus of arising's it may be prudent to use a suspended floor and backfill with non-structural arisings. This however should be read in conjunction with the general floor hierarchy.
- Similar to foundations the type of floor is subject to ground conditions and as such it is recommended that the following hierarchy is used when considering floor designs:
- Ground bearing slab up to 600mm structural fill. This should always be the starting point for any design solution
- Reinforced cast in situ slab
- Suspended floor with ventilated void, generally beam and proprietary infill or beam and block suspended floor
- Raft design may be considered as part as part of the overall foundation and floor design. Please refer to Foundations section
- Detached garage slabs to be ground bearing wherever possible.
- The void below suspended slabs can be filled with any type of inert material (need not be structural) including some contaminated material. This should be considered on a site by site basis and agreed with Premier Building Control
- Limiting Thermal Bridging is a key part within floor designs and the following principles should apply.
  - Install continuous perimeter insulation with a min R value of 0.75m<sup>2</sup>K/W. Floor insulation must tightly abut the blockwork wall.
  - Seal all penetrations through the floor (air barrier) with a flexible sealant.
  - 225 x 30mm thick threshold insulation (SD expanded polystyrene board (0.038 w/mK) to be inserted below all external door entry positions to outer face of cavity and filled behind and below with Gen 1 cavity fill – ensure Damp Proof Course (DPC) is inserted and laps with DPM and outer wall DPC at cill level to prevent bridging of the cavity.

## 3.2 Drainage below Ground

- Adoptable sewers to section 104 (of the Water Industry Act) requirements in accordance with "Sewers for Adoption".
- Where not adopted, to be constructed to the referenced Premier Standards and Building Regulations.
- All drainage schemes require the approval of the Sewerage Undertaker and/or Building Control.
- Soakaways and drainage running at the rear of extendable properties are required to be positioned a minimum of 5 metres from the building.
- Ground floor soil drains serving kitchen, bathrooms, en-suites and cloaks to discharge directly to sub floor drainage connections or to dedicated soil stack in areas where pipework can be hidden behind kitchen units. Ground floor wastes should not be connected to soil stacks serving upper floors due to the risk of contamination of ground floor appliances should blockages occur in multi storey units.
- Apartment ground floor drainage may be connected to soil stacks similar to that of upper floors provided they do not exceed 4 storeys in height. For 5 storeys and above this should be treated as multi storey for the purposes of this section.
- Where drainage pipes pass through wall provide either:
  - Concrete lintels to each leaf of wall over pipes. Short length of pipe bedded in wall - joints to be within 150mm of either wall face, with 600mm maximum length rocker pipe either side. All pipes to have flexible joints.



- Short length of clayware pipe sleeve bedded in wall through which drainage pipe runs.

### 3.3 Suspended Floor with Ventilated Void (Typical U value of 0.15W/m<sup>2</sup>K)

- A variety of manufacturers make proprietary systems comprising of Blocks and expanded polystyrene infill blocks.
- The Litecast XT system is a similar system whereby polystyrene infill panels are contained within and beneath the floor beams, thus eliminating any cold bridging and achieving high thermal efficiency. The XT15 system will achieve a U Value of 0.15W/m<sup>2</sup>K. The system is available with both the 150mm and 225mm floor beams and can be used in situations where the Imposed Load does not exceed 5.0kN/m<sup>2</sup> (Domestic Liveload = 1.5kN/m<sup>2</sup>). The system is to be used at ground floor level, achieving thermal efficiency to the property in which it is being applied.
- The ground beneath the floor should be free of topsoil and vegetation, leaving a subsoil base, over site concrete or blinding is not required. Typically a minimum void of 150mm (225mm in heavy clay soils) must be maintained between the underside of the polystyrene and the ground surface. This should be confirmed with local authority building control and/or Premier inspector.
- A suspended concrete floor should incorporate:
- A damp-proof membrane (to be provided if the ground below the floor has been excavated below the lowest level of the surrounding ground and will not be effectively drained) and
- In those situations where there is a risk of an accumulation of gas which might lead to explosion, a ventilated air space. This should measure at least 150mm clear from the ground to the underside of the floor (or insulation if provided).
- Where the ventilation referred to above is provided, two opposing external walls should have ventilation openings placed so that the flow of air will have a free path between opposite sides and all parts. The openings should be large enough to give an actual opening of at least equivalent to 1500mm<sup>2</sup> for each metre run of wall or 500mm<sup>2</sup> per square metre of floor whichever is the greater.
- No oversite or other seal is required. The only requirement is the removal of top soil and vegetable matter and the provision of a void to accommodate any likely ground movement.

### 3.4 Reference Material

#### Building Regulations

Approved Document C (Site preparations & resistance to contaminants and moisture)

Approved Document H (Drainage & Waste Disposal)

#### Premier Technical Manual V10

Chapter 6 - 6.4 – Ground Floors

Chapter 9 - 9.1 – Drainage below Ground

#### Codes of Practice & BS EN Standards

BS 6891 – Installation of low pressure gas pipework of up to 35mm in domestic premises.

BS EN 13163 – Manufacture of EPS insulation

BS 8103-4 – Design of suspended ground floors

BS 8110-1 – Reinforcement

BS 6700 – Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages

BS 8500 2003 – Concrete mixes

EN 206 – Concrete mixes

BS 8000 4 – Workmanship waterproofing

BS 8000 2.1 – Workmanship mixing and transporting concrete

BS 8000 2.2 – Workmanship site work with in-situ and precast concrete

BS EN 752 1-7 – Building drainage

BS EN 295 1 / BS EN 1401 / BS 4660 – Pipes and fittings

BS 5955 – Special protection may be required where pipes are near the ground surface or where they could be damaged by the weight of backfill or traffic load from above.

Geographic areas where measures are required are listed in the BRE document “Radon; Guidance on protective measures for new dwellings” (BRE 211) and defined as either requiring “Full” or “Basic” protection.

**Manufacturers Information**

Combined Thermal Solutions Ltd (Litecast) Tdeck EPS Panel System – BBA certificate 06/4369.

**SEE APPENDIX REFERENCE 1**

## 4. External Walls (Full Fill)

### 4.1 General

- Full filled cavities with fair faced masonry brickwork or reconstituted blockwork outer leaves are not permitted in areas of very severe exposure in accordance with Approved Document C and Premier standards.
- Where sites fall into zones of Very Severe exposure then alternative measures must be used, such as Render (subject to detailing and Premier approval), partial cavity fill or timber frame.
- Bespoke cladding systems can be used but care must be taken in their selection to ensure they are fit for purpose and suitable for the location, such as harbour front developments and they must be in accordance with Premier standards.
- Where there is concern over the increased incidence of wind-driven rain, consider increasing the map zone. Reference Premier Map (Chapter 7 – Figure 2) showing categories of exposure to wind driven rain, within the Premier Standards value by one category. This modification should only be considered where there is increased local exposure e.g. Hillside location, urban fringe etc. Request Local building control body to advice, alternatively the wind driven rain index can be more accurately calculated from the large scale maps and correction factors given in the British Standard. A working model of this procedure is available on request from BSI.
- A residual cavity of 75mm (min) in conjunction with partial fill insulation is required for building in areas of “Very Severe” exposure unless the full height of the wall has a rendered finish. In accordance with Premier Standards
- The use of aircrete blockwork in aggressive ground conditions is subject to the “Sulphate Classification” as defined by BRE Special Digest 1 Pt 4 or the Digest 3.5.2 and confirmation by the manufacturer of their suitability for use. If in doubt refer to structural engineer.

#### Thermal Bridging

- Install continuous perimeter insulation with a min R value of 0.75m<sup>2</sup>K/W. Floor insulation must tightly abut the blockwork wall.
- Seal all penetrations through the floor (air barrier) with a flexible sealant.
- 225 x 30mm thick threshold insulation (SD expanded polystyrene board (0.038 W/mK) to be inserted below all external door entry positions to outer face of cavity and filled behind and below with Gen 1 cavity fill – ensure DPC is inserted and laps with dpm and outer wall DPC at cill level to prevent bridging of the cavity.
- Ensure wall insulation is installed at least 150mm below the top of floor insulation.
- Ensure that partial fill insulation is secured firmly against the inner leaf of the cavity wall.
- Seal all penetrations through air barrier using a flexible sealant.
- Continuous dabbing of plasterboard adhesive is to be applied around all door and window openings and room perimeters at ceiling and floor level and vertical wall junctions and all electrical / TV points

#### Damp Proof courses

- Suitable polyethylene damp proof course on mortar bed at a minimum 150mm above finished ground level.
- 100mm DPC in outer leaf of external cavity wall, 100mm DPC in inner leaf of external wall, party walls and internal load bearing walls to be continuous with damp proof membrane. Ensure damp proof courses do not project into cavities. Joined damp proof courses to be lapped minimum 150mm. Damp proof course to be totally impermeate and to have superstructure brick and blockwork bedded on top surface.
- DPC course above finished ground level should have a ‘weathered/struck’ pointed joint.

## 4.2 External Masonry Walls (Typical U value of 0.21W/m2K)

### 4.2.1 Walls below Damp Proof Course

#### 2 Storey Houses

- 352mm cavity wall construction for a minimum of 3 courses below DPC level comprising 102mm FL quality outer leaf brickwork. 150mm cavity. 100mm 3.5N/mm<sup>2</sup> aircrete blockwork in accordance with manufacturers data or 7N/mm<sup>2</sup> solid aggregate blockwork (1350 –1600 Kg/m<sup>3</sup> density) as noted by the structural engineer and shown on the working drawings.
- Cavity to 225mm below lowest DPC filled with Gen 1 concrete.
- 350mm wide x 140mm aircrete trenchblocks min 3.5N/mm<sup>2</sup> to foundation level for strip foundations or as noted by the structural engineer and shown on the working drawings.
- Where adjoining floor levels differ (max 900mm) between dwellings at separating walls measures should be taken to prevent the ingress of water into the cavity wall construction and dwelling by the use of a proprietary tanking membrane and horizontal cavity trays where appropriate.
- Blockwork to conform to the “Special category of manufacturing control” requirements of the British Standard
- Where the ground, ground water or the masonry contains levels of sulphates likely to be harmful, the mortar should be made with sulphate resisting cement to the British Standard.

#### 3 Storey Houses

- Dorchester Living appointed Structural Engineer to check compressive strength requirements of blockwork walls below DPC level and where these are found to be in excess of 3.5N/mm<sup>2</sup> then 2 leaves of 100mm 7.3N/mm<sup>2</sup> solid aggregate blockwork (1350 –1600 Kg/m<sup>3</sup> density) shall be used in lieu of the aircrete specification. These walls shall be identified on the house types foundation drawings, similarly bespoke 3 storey houses shall be treated equally.

### 4.2.2 Walls above Damp Proof Course

#### 2 Storey Houses

352mm Facing masonry applicable to all storey heights comprising:

- i. 102mm brickwork (tooled flush joints) min 5N/mm<sup>2</sup> for 2 storey and 7N/mm<sup>2</sup> compressive strength for 3 storey.
- ii. 150mm cavity retro-filled with Blown Mineral Fibre (0.034W/mK – Knauf Supafil 34 or equivalent approved product). Injected cavity fill must have third party certification and be installed under an approved surveillance scheme and in accordance with manufacturers recommendations.
- iii. 100mm aircrete blockwork (density 600-800 kg/m<sup>3</sup>) 3.5N/mm<sup>2</sup> min and a thermal conductivity of 0.15 W/mK to the inner leaf. Where 7N/mm blocks are required for structural reason then the thermal conductivity is to be 0.19 W/mK.
- iv. 12.5mm Gypsum based plasterboard on dabs with joints taped and sealed with 3mm plaster skim applied.
- v. Continuous horizontal cavity tray to be provided at 225mm above uppermost ceiling if insulation is not continued to verge level.

#### 3 Storey Houses

352mm Facing masonry applicable to all storey heights comprising:

- i. 100mm brickwork (tooled flush joints) min 5N/mm<sup>2</sup> for 2 storey and 7N/mm<sup>2</sup> compressive strength for 3 storey.
- ii. 150mm cavity retro-filled with Blown Mineral Fibre (0.034W/mK – Knauf Supafil 34 or equivalent approved product). Injected cavity fill must have third party certification and be installed under an approved surveillance scheme and in accordance with manufacturers recommendations.
- iii. On 3 storey dwellings the compressive strength of the blocks may have to be increased particularly on ground floors, details of which should be clearly marked on the working drawings. 100mm aircrete blockwork (density 600-800 kg/m<sup>3</sup>) 7N/mm<sup>2</sup> and a thermal

conductivity of 0.19W/mK to inner leaf in line with structural engineers calculations (not all 3 storey to require 7N/mm<sup>2</sup> blockwork). Reference should be made to individual House type designs and structural calculations.

- iv. 12.5mm Gypsum based plasterboard on dabs with joints taped and sealed or 3mm plaster skim applied.
- v. Continuous horizontal cavity tray to be provided at 225mm above uppermost ceiling if insulation is not continued to verge level.

### 4.3 Accredited Details

- Linear thermal bridges should be calculated in accordance with the methodology as detailed with SAP 2009 and subsequent amendments. The use of default figures is no longer permitted and each dwelling has to be calculated using the correct psi values.
- Linear thermal bridges should be calculated using the constructions details applicable for the dwelling/development in question. For standard Dorchester Living developments the standard details and house types have been assessed and appropriate psi values produced.
- Linear Thermal Transmittances and Temperature Factors should be calculated following the guidance set out in BR497 (Conventions for calculating linear thermal transmittance and temperature factors, BRE 2007)
- Compliance can be demonstrated by adopting a quality assured accredited construction details approach in accordance with a scheme approved by the Secretary of State. In the event of such a scheme not being available then details calculated by a person with suitable expertise and experience can be used without incurring the 0.02W/mK or 25%, whichever is the greater penalty.
- Any deviations from the approved details and specification will require new linear bridge calculations to be produced.

### 4.4 Render & Reconstituted Stone Cladding

- For rendered elevations substitute brickwork facings for 100mm solid aggregate blockwork or aerated block of min density 1500Kg/m<sup>3</sup> and 7.0N/mm<sup>2</sup> compressive strength.
- Surface preparation and the local weather conditions under which render is applied is of vital importance if maintenance issues are to be avoided. Due cognizance and diligence should be demonstrated by the contractor with particular regard to the requirements of the Codes of Practices listed below.
- The top edges of rendering should be protected from the ingress of water by flashings, copings or eaves details. Rendering should stop above DPC level and be formed into a drip with a Galvanized or plastic edging bead. Rainwater run-off from sills and openings should be shed away from the render. Wind driven rain may penetrate rendered masonry through minor cracks around openings and other details – cavity trays with stop ends are required over all exposed openings. Weepholes do not need to be provided where masonry walls are fully rendered.
- Two Coat Cement Lime (sharp) Sand Render: Undercoat mix of 1:1:5 to 1:1:6 nominal 10mm thickness top coat mix of 1:1:5 to 1:1:6 nominal 6mm thickness. To achieve a good bond the masonry backing (not brick with full fill cavity insulation) should be moderately strong and porous to give some suction and mechanical key, use medium density blockwork as above (1:5 mix masonry cement; sand). Undercoats should be applied at least three days before the finishing coat and the finishing coat shall be kept damp for at least three days after application. Two coats Gliddens Textured Masonry Paint (durable high build sand textured).One coat Alkali resisting primer.
- Proprietary Render System (Weber Pral): Movement Joints should be formed by either expressing the movement joint by the use of 'greased' temporary battens to create the joint in the fresh rendering. The joint then filled with a suitable elastomeric sealant following rendering. Alternatively, the use of a proprietary sealed plastic profile movement beads is acceptable. (Weber ref BD-04-09 or similar)
  - Temporary timber battens or Plastic PVC-U beads can be used to form vertical stops. Where the render finishes horizontally this detail should be achieved with a PVC-U Bell Cast Profile Bead.

- The window head detail (where shown on the elevation drawings) should be formed with a render profile Bell Cast Bead adhered by a dabbed on bed of PRAL to produce the bell cast. The bead should sit 30mm approximately from the substrate extending past the line of the reveal. The render should sweep in from the side of the bead. (Weber ref BD-06-09 or BD-07-09)
- The thickness of render is to consider BS5262 which defines categories of exposure, which are calculated against the driving rain index. These fall into the three ranges of sheltered, moderate and severe.
- For sheltered and moderate exposures a minimum finished application of 15mm render coat at the lowest point is necessary to provide the correct level of weather protection. For severe exposure the render thickness should be increased to a minimum finished thickness of 20mm. The maximum finished thickness for Weber Pral materials should not exceed 25mm unless forming feature bands, splayed window heads, keystones or quoins
- For fully insulated cavity construction in a sheltered/moderate location the thickness of render should be applied as for the severe classification, i.e. 20 mm finished thickness.
- Mesh reinforcement should be cut into strips that will extend past the junction of dissimilar materials or point of weakness by 200 - 500 mm and pressed evenly into freshly applied render with a trowel or spatula, ensuring that it is not in direct contact with the substrate, and then overlaid with further render to encapsulate the mesh.
- The initial basecoat should be applied by a diesel machine render pump at a thickness relevant to the exposure rating. Any variances in suction of the substrate should be unified particularly between the mortar joint and the block. The base coat should be ruled level and flat and then allowed to pick up for a period of between 1 and 2 hours before application of the second pass.
- The second pass, should be applied again by render pump to produce the pre agreed finish. An initial pass to achieve 2/3 texture coverage is applied using a nozzle size of 10mm, then an additional dusting to produce complete coverage of the texture pass is done with the use of a 14mm nozzle.
- Regardless of texture it is important that the combined final thickness of the render at its lowest point relates to the exposure rating.
- Reconstituted stone: Masonry units should comply with the relevant British Standard. Provision for movement will require a combination of movement joints, mortar specification and bed joint reinforcement. The building façade design should take account of this and if necessary a check made with the structural engineer to ensure adequacy of provision to suit the building type.
- Where two piece stone cills are used incorporate two layers of bed joint reinforcement under the window – one layer directly under the cill and one layer 150mm below that.

#### 4.5 Wall Ties

- 275mm long (stainless steel) placed at staggered 750mm horizontal centres and at 450mm vertical centres and at every blockwork course within 225mm of all openings. Max wall height set by BBA certificate should not be exceeded for the appropriate wall tie used.
- Party walls to be spaced at 900mm centres horizontally and to be Type A ties in accordance with approved document E of the building regulations. Reference should also be made the appropriate Robust Detail.
- Type 4 ties are suitable for single or two storey domestic dwellings not greater than 10m in height
- Type 2 ties are suitable for domestic dwellings and small commercial buildings up to three storeys and not greater than 15m in height. For 4 storey apartments use Heavy Duty ties or refer to structural engineers recommendations.
- BS 5628: The use of Masonry Pt1 allows wall ties to either DD140 or BS 1243 to be used. Recommendations are given on embedment, length of tie, density (as above) and positioning. The strength and rigidity of above specified ties were compared with the requirements of DD140 Pt2 (refer to BBA Certificate) for a Type 4 tie and were found to be equal to or greater than them in all respects. Any deviation from the wall ties specified should be checked by Structural Engineer.

## 4.6 Mortar

- The selection of the appropriate mortar should follow the recommendations given in BS 5628: Part 3; and Premier Standards
- Unless recommended otherwise by the brick manufacturer, the mixes in the table below should be used for clay bricks.
- In the case of concrete or calcium silicate bricks, particular attention should be paid to manufacturer's recommendations.

Mortar mixes using ordinary Portland or sulphate-resisting cements where required

Location		Recommended cement: lime: sand mix	Recommended cement: sand mix with air-entraining plasticiser	Recommended masonry cement: sand mix	Mortar designation to BS EN 1996-1-1
<b>General wall area above DPC</b>	in areas of Severe or Very Severe exposure - high durability	1 : ½ : 4½	1 : 3½	1 : 3	(ii)
	other exposure categories - general use	1 : 1 : 5½	1 : 5½	1 : 4½	(iii)
<b>Below DPC level and in chimney stacks</b>	high durability	1 : ½ : 4½	1 : 3½	1 : 3	(ii)
<b>Cappings, copings and sills</b>	low permeability	1 : 0 to ¼ : 3	-	-	(i)

- Sulphate resisting cement should be used where recommended by the brick manufacturer
- Proprietary mortars and admixtures should only be used strictly in accordance with the manufacturer's recommendations, taking into account the type of masonry unit and its location.
- Under gauging of Limebond/sand mixes should be avoided and Premier guidelines followed
- Recessed or raked joints should be avoided in conjunction with full fill cavity insulation in areas of Moderate and Severe exposure.

## 4.7 Movement Joints

- Movement joints may be required where straight walling occurs in runs in excess of 12 metres in clay brickwork and 6 metres in blockwork, stonework and render (i.e. without returns and openings e.g. in straight terraces). Some reconstituted stone and concrete brick manufacturers state 9m spacing for expansion. Spacing of expansion joints should be reduced at corners. Manufacturer's to be consulted for guidance on their individual requirements. Guarantees must be gained from the supplier.
- Movement joints may be required where thermal movement may occur due to material properties or where differing strata occur in foundations. Check with Structural Engineer when apartments are combined or in other above cases. Movement joints are required where brickwork return is less than 750mm. For returns between 750 and 1000 check with Premier.
- Joints, 16mm in width or 10mm in recon stone or blockwork, to be located at the rear of rainwater pipes to minimize visual impact and to be formed with proprietary foamed polyurethane sealing

strip with 2 part polysulphide mastic. Check with Engineer for extent i.e. outer or both leaves of wall. Final flexible pointing in two-part polysulphide mastic to match facing material all to manufacturer's recommendations.

#### 4.8 Attached Garages

- 100mm solid aggregate blockwork of density 1350–1600Kg/m<sup>3</sup> and 3.5N/mm<sup>2</sup> compressive strength in lieu of facing brickwork between house and a garage, where this is a cavity wall insulate as an external wall. Fire stopping to be installed in line with Premier standards
- **Integral Garage walls** - For single leaf solid walls - 100mm aircrete blockwork 600- 800Kg/m<sup>3</sup> density (0.15W/mK conductivity) and 3.5N/mm<sup>2</sup> compressive strength. 60mm thick urethane batts (0.022W/mK) between 60mm x 60mm timber studwork on the garage side faced with 12.5mm Gypsum based plasterboard on dabs with joints taped and sealed. Fire stopping to be installed in line with Premier standard. Alternatively laminated plasterboard could be used provided in lieu of the timber frame and board provided the overall performance is identical.

#### 4.9 Galvanised Steel Lintels

- Galvanized steel lintels designed, tested and manufactured fully in accordance with the British standard, with integral insulation to suit 150mm cavity width. Openings over 1.2m wide may require 'propping' until the brickwork over has matured. Minimum bearing of lintels to be 150mm each end. Bearing to be onto complete block. Lintels above internal doors to have minimum 100mm end bearing up to 1200mm clear span and 150mm bearing over 1200mm openings. All lintels to manufacturer's schedules and calculations. Expanded metal reinforcement over meter boxes. Recon stone or other feature head details are normally supported on the outer flange of the steel lintel.
- Lintels having base plates to have effective thermal conductivity not exceeding 30W/mK
- Lintels to be fully filled with insulation
- Thickness of Lintel flanges to be no more than 3.2mm

##### **Recommendations for the installation of concrete floors with steel lintels**

The following are guidelines to the safe installation of concrete floor units on steel lintels.

- i. Check that the correct lintel has been installed according to the manufacturer's schedule.
- ii. Avoid shock loading of lintels during the installation of concrete floor units and also any sideways loading while being lifted into position.
- iii. Avoid loading new floors with building materials.
- iv. Raise both levels of cavity walls together and allow masonry to cure sufficiently before applying heavy loads. Alternatively prop the lintel if large loads are to be applied to fresh masonry.
- v. Bed the lintel on full blocks and allow mortar to cure.
- vi. Check that the masonry over the lintel is properly installed and allow no more than 10mm-12mm between the masonry and lintel up stand. The gap should be filled with mortar.
- vii. Ensure that the composite part of any composite lintel is fully filled with well jointed masonry and allowed to cure.
- viii. Precast flooring units should be laid on a mortar bearing of the full wall width and should not be dragged over supports.

#### 4.10 Steel Beams

- Any steelwork (to Engineers calculations) to be built-in solid (supported on pad stones to Engineers design) and levelled with steel shims provided and treated with either:
- One coat high build zinc phosphate primer and one coat of bituminous paint - to beams supporting cavity walls or
- One coat red oxide or zinc chromatic primer - to beams in floor/roof voids etc or For externally exposed steel beams - One coat high build zinc phosphate primer at works and site applied



intumescent paint (Firetex M77 or equal approved) to give 1hr fire protection with topcoat (Firetex M71 or equal approved)

#### 4.11 Cavity Trays

- Proprietary preformed polypropylene stepped cavity tray components (may be specified with factory fitted code 4 lead flashings) all installed in accordance with manufactures instructions provided. Long Leads can be supplied if site location and exposure dictates (very severe exposure). Otherwise Flexible polyethylene (min 450mm wide rolls) horizontal cavity trays formed on site. These should be continuous so as not to form slip planes in joints. Weep holes to be used to the lowest tray (catchment tray), positioned in perpendicular joint of brickwork
- Stepped preformed cavity trays and flashings are always to be used at the abutment of G.R.P. pitched canopies in all cases. – refer to manufacturers design and schedule of components for each canopy type.
- Tray and abutment details to take account of tile type and appropriate flashing arrangements. Refer to manufacturers details
- Preformed internal and external trays to be used where stepped and horizontal trays meet.
- Cavity trays are to be provided at all interruptions which are likely to direct rainwater across the cavity such as:
  - Horizontal and stepped roof abutments separating internal and external environments.
  - Above lintels in external walls in exposure zones 4 and 3 and in zones 2 and 1 where the lintel is not corrosion resistant and intended to function as its own cavity tray.
  - Continuous horizontal cavity tray immediately above acoustic / fire barrier to all separating floor levels.
  - Continuously above lintels where openings are separated by short piers and above openings where the lintel supports a brick soldier course.
- Cavity trays are to rise at least 140mm from the outer to the inner leaf, to be self-supporting or fully supported (where built into the inner leaf do not exceed ¼ of bed joint)
- Continuous horizontal cavity tray to be provided if insulation is not continued to verge level.
- Watertight stop ends to be secured at the ends of all cavity trays or lintels which are intended to act as trays to prevent water discharging from the ends into the cavity.
- Insect proof weep holes to be installed at not more than 900mm centers to drain water from the cavity trays. Centers to be reduced to 450mm to fair faced masonry above openings and at least 2 per opening.

#### 4.12 Reference Material

##### **Building Regulations**

Approved Document A (Structure)

Approved Document C (Site preparations & resistance to contaminants and moisture)

##### **Premier Technical Manual**

Chapter 2 – Materials

2.3 – Other components

Chapter 7 – Superstructures

7.1 – External Masonry walls

7.3 – Timber frame

7.4 – Windows and Doors

7.5 - Chimneys

7.7 - Render

##### **Codes of Practice & BS EN Standards**

BS 8000 Pt3 – Workmanship masonry

BS 4027 – Sulphate resisting cement

BS 6515

BS 8215 – Design and installation of damp proof courses in masonry construction

BS 5628 – Design strengths of bricks, blocks and mortars. Blockwork to conform to the “Special category of manufacturing control” requirements of the British Standard  
BS EN 771-5 Reconstructed stone  
BS 8000 Pt3 – Workmanship masonry  
BS 8000 Pt10 – Workmanship plaster and render  
BS 5262 DTU 26.1 and DTU 20.1  
BRE Thermal Insulation: Avoiding the risks  
BS 5977 - Galvanised steel lintels  
BS 5950 Structural use of steelwork in buildings  
BS 5628: Part 3: use of masonry. Materials and components, design and workmanship  
BS.6398: Specification for bitumen damp-proof courses for masonry

**Manufacturers Information**

**BBA CERTIFICATE 01/3816 FOR CELCON STANDARD AND HIGH STRENGTH GRADE BLOCKS SEE APPENDIX REFERENCE 2**

**BIRTLEY LINTELS – ALL LINTELS ARE CE MARKED REFERENCE 3**

**BBA CERTIFICATE 11/4857 FOR SUPAFIL KNAUF INSULATION 34 SEE APPENDIX REFERENCE 4**

**BBA CERTIFICATE 05/4268 FOR WEBER PRAL MONOCOUCHE RENDERS SEE APPENDIX REFERENCE 5**

# 5. Roof

## 5.1 General

- Over recent years the number of valid claims dealt with by the warranty providers has dramatically increased. Common failures relate to mortar 68% and Roof Leaks/Flashing/Detailing 15%.
- Ensure the gap between the wall plate and the proprietary eaves ventilator (ventilated roof) is completely filled with insulation having a min R-value across the thickness of the insulation of 1.2m<sup>2</sup>K/W.
- Ensure continuity of the insulation throughout the junction and ensure that the full depth of insulation between and over the joists abuts the eaves insulation. Tuck compressible insulation down into the head of the cavity.
- Ensure wallplate bedded on continuous bed of mortar.
- Insulated access hatch to be proprietary (Glidevale or equal approved) injection moulded polypropylene having closed cell compressible seals and anti-wind uplift mechanism with rigid integral insulation to Table 2 of the ADL (30 minute fire resistance versions where specified) Air leakage through the access hatch including the frame when tested to BS EN 13141-1:2004 to be less than 1.0m<sup>3</sup>/hr@2pa.
- Ceiling lining to be continuous across the heads of partitions (fixed first) and seal all gaps between the ceiling and masonry wall with either plaster, adhesive or flexible sealant.
- Below the roof voids of a “room in the roof” seal all penetrations in the plasterboard with a proprietary or flexible sealant.
- Install a double full depth timber noggling between the floor beams or ties and seal between the noggling, ceiling and upper stud wall with a flexible sealant.
- Dead and imposed loads should be calculated in accordance with the British Standard. Structural timber should be specified according to strength classes of the British Standard in conjunction with Approved Document A of the Building Regulations. Wind loads appropriate to the site location should be calculated in accordance with the British Standard and the roof designed to resist wind uplift, **holding down straps should be utilised where the self-weight of the roof is not sufficient – Check with the local building control body.**
- For low pitches below tile manufacturer’s recommendations, a proprietary (Ondutile or equal) sarking system may be utilised provided the BBA Certification and manufacturers installation guidance is followed.

## 5.2 Tiles General

- Work shall be set out to the correct gauges and with suitable horizontal and perpendicular alignment to give a true, straight and regular appearance with horizontal tails straight in line
- The final gauge should always be between the minimum and maximum gauge for the manufacturers tile and should not be outside this range under any circumstances
- The initial eaves course tile shall be in the same plane as the remainder of the roof and overhang the fascia by approximately 50mm to ensure that the rainwater discharges into the centre of the gutter.
- Where slate or plain tile used, the verge should project 38mm to 50mm beyond the gable wall or barge board. Interlocking tile can project 30mm to 60mm.
- Unless a proprietary dry verge system or cloaked verge is used, tiles should be bedded into a minimum 100mm wide bed of mortar on an under cloak of cement based board, plain tile or slate which in turn should be bedded onto the gable wall with mortar or suitable bedding sealant. Plain tile should not be used as an under cloak below 30o pitch or on a bargeboard.
- Where tile clips are specified they should be twice nailed to battens and sized to ensure they are in direct contact with the top surface of the verge tile.
- In order to limit mortar claims the use of dry ridge and hip systems and a cloaking verge, compatible

with the tile choice is recommended. If this approach is not taken appropriate checks should be made on site to confirm compliance with the specification and manufacturers details.

- If mortar is specified for the use on ridges, hips and verges then guidance should be sought from the manufacturer and be in accordance with Premier Standards. The general principles when using mortar are:
- All roof tiles should be double mechanically fixed with self-sealing non-ferrous fixings into timber battens.
- Where ridge and hip tiles are bedded on mortar to rolled tiles, concealed or decorative dentil tiles should be fully bedded into all joints in excess of 25mm thick.
- Substantial bedding may also apply beneath rolled tiles at the verge and valley positions. In order to prevent shrinkage of large mortar joints concealed or decorative dentil tiles should be fully bedded into all joints in excess of 25mm thick.
- Tiles to be bedded on mortar should be wetted first in the contact surface. Surface water should then be allowed to drain before fixing.
- Roofing mortar should be 1:3 cement: sharp sand with plasticizer. The mix should be based on sharp sand with soft sand added to achieve workability. The proportion of sharp sand should not be less than 1/3 of the total sand content.
- Mortar bedding and jointing should be completed in one operation.
- Alternatives such as proprietary mortar mixes may be accepted by Premier if they are shown to have similar strength, durability and workability. We would recommend that should you wish to use such a mix that you first obtain Premier approval.

### **5.3 Duo Pitch Roofs (Typical U value of 0.11W/m<sup>2</sup>K)**

- Clay or concrete interlocking tiles to the British Standard. on pre-treated tiling battens on a vapour permeable underlay to the British Standard (vapour resistance not to exceed 0.25MN.s/g), on counter battens. Underlay to be laid strictly in accordance with the manufacturer's instructions or third party Accreditation Certification and to have a 10mm drupe between truss members to allow the free drainage of water into the guttering.
- Work on site should be in accordance with the Code of Practice stated below. The 2003 revision includes the following:
- Increased batten sizes apply to single lap tiling on 600mm rafter spacing to 25 x 50mm. The specification for double lap plain tiles remains at 25 x 38.
- Battens and counter battens should be the sizes specified in the design and in accordance with the Premier standards.
- Battens and counter battens should be as listed in BS5534 and should be fully stress graded and marked with the following information: Supplier, Species, Graded BS5534 and Size. Any battens or counter battens supplied without being fully marked should not be used.
- Battens should be preservative treated unless the timber is naturally durable. Reference should be made to Premier standards for guidance on timber types and classes requiring treatment. Cut ends of tile battens that are in contact with mortar should be treated with a liberal brush coating of preservative.
- Minimum 225mm wide Type 5U underlay to be dressed over rain water gutter at eaves levels and to be fully supported and underlap with main roof underlay.
- Trussed rafters should be designed in accordance with the British Standard. The truss manufacturer should be given the requisite information from the building designer as listed in Premier Standards. Sizing and Spacing (max 600mm) centers as shown on the truss drawings.
- Multiple and girder trusses should be permanently fastened together by either at manufacture or on site strictly in accordance with the truss designers specification.
- Trussed rafters are to be fixed to 100 x 75mm wallplates with ms galvanised truss clips using 3.75x30mm long square twisted sheradised nails in all holes provided.
- In some areas of the UK, treatment against House Longhorn Beetle is required, Timber may be naturally durable or treated, refer to Premier Standards.
- 100mm glass mineral fibre insulation roll (0.044W/K) laid between ceiling ties and 2 layers 150mm cross-laid over the top for houses, FOG's & apartments to give a U value of 0.11W/m<sup>2</sup>K.

- Immediately prior to covering the roof ensure sections of glass mineral wool are placed between rafters and dress into cavity at eaves level below ventilator tray position. Insulation must be continuous to avoid thermal bridging.
- Where the roof pitch is at 15deg or more proprietary eaves ventilators (over fascia type) shall be installed equivalent to a continuous 10mm slot running the length of the eaves. These shall be used in conjunction with proprietary ventilator trays equivalent to a 25mm continuous air gap.
- Ventilator trays must be long enough to allow for the 400mm in total insulation now specified within the roof structure and be robust enough not to be compressed by the insulation when placed.
- High level ventilation (dry vented ridge system mechanically fixed) equivalent to a continuous 5mm opening to be used in addition to eaves ventilation to all roof pitches.
- 15mm Gypsum based plasterboard ceilings (12.5mm fire resisting to 3 storey and apartments where above stairwells and corridors); screw fixed and jointed in accordance with manufacturer's instructions. 3mm skim.
- Perimeter and intermediate noggins are not required for edge support to 15mm boards.
- To common areas of apartments (stairwells / corridors) apply a class C absorber retaining the necessary void below the 15mm gypsum based plasterboard lining.

#### 5.4 Mono pitch & Cut Roofs

- **Traditional cut roofs:** shall be designed by an engineer in accordance with Premier Technical Requirement. Calculations should be based on the British Standard.
- **Valley:** Lay 125mm proprietary GRP valley on 250 x 19mm valley support boards cut and supported between and flush with the top of rafters. At ridge / valley intersections, a lead valley is required. Suitable for pitch variances up to 5 deg.
- **Pediment Gables:** Wind driven rain may penetrate the outer leaf brickwork, therefore a cavity construction should be adopted. Blockwork built off a wallplate is not satisfactory and a timber framed pediment should be formed with a 9mm OSB sheathing board fixed to rafters over which a breather membrane is fitted. Timber frame wall ties are to be used to tie the construction leaves together. A cavity tray with stop ends and weep holes to be inserted below.
- **Abutments:** Provide ventilation openings (proprietary top edge abutment systems) equivalent to a 5mm continuous gap at high level where to roof spaces which are not cross ventilated e.g. Mono-pitched roofs over habitable areas where they exceed 3m<sup>2</sup>.

#### 5.5 Room in the Roof (Typical U value 0.20W/m<sup>2</sup>K)

- **Roof construction to be "Small void above insulation & a Type LR underlay as defined by the British Standard"**. Only roof tiles designated as an "air open" roof covering (in accordance with Annex L of BS 5534) to be used in conjunction with this construction or Type F1 impermeable underlay with enhanced ventilation to suit roof covering.
- Battens as above on a vapour permeable underlay to the British Standard (vapour resistance not to exceed 0.25MN.s/g), to be laid strictly in accordance with the manufacturer's instructions or third party Accreditation Certification and to have a 10mm drape between truss members to allow the free drainage of water into the guttering.
- 50mm deep counter battens in order to maintain minimum small void (25mm) between membrane and insulation. Place 140mm Ursa Hometec Insulation 35 (0.035W/mK) between rafters and 37.5 Kingspan K17 board (0.211W/mK). Ensure the rafter is of sufficient depth to maintain the 25mm air gap and consideration given to the effect of possible insulation slump that would restrict such an opening. Attic truss rafter depth may need to be underscored with sw battens to achieve the necessary depth and ply bracing added as required by the roof design. Apply 2 number layers of 12.5mm plasterboard with staggered joints taped and sealed or 3mm plaster skim applied (regional option).
- Alternatively 140mm Isover frame batt 32 (0.032W/mK) or equivalent between rafters and 38 mm ThermaLine PIR (0.240W/mK) or equivalent to the underside of the rafter.
- No eaves ventilation is required for type LR underlay (no trays), however to minimise

condensation risk (particularly in the drying out period) the standard specification for ridge ventilation is to apply. Ventilation to be in accordance with Premier recommendations and to comprise 10mm continuous vent at eaves and 5mm continuous vent at ridge. Ventilation when Type F1 underlay is utilised to consist of 25mm continuous ventilation at eaves level and 5mm continuous vented dry ridge.

- Air permeable underlays may also be considered but must be approved by Premier and installed in accordance with manufacturer's instructions.
- To vertical stud walls separating a roof void from habitable areas tightly fit 100mm of self-supporting glass mineral wool insulation (0.032W/mK) between studs. Face with 12.5mm vapour check fire resisting plasterboard. Any service penetrations to be well sealed.
- Alternatively take the insulation down the rafter to wall plate/eaves level to avoid some of the potential linear thermal bridge junctions.
- Insulation to horizontal ceilings as above. Any service penetrations to be well sealed.

## 5.6 Flat Roofs and Balconies

All flat roofs and balconies to have a minimum fall of 1:80. Where slopes intersect it is the intersection that should be at a minimum fall of 1:80. To that end a minimum fall of 1:60 is recommended for adjacent, abutting roof slopes. All falls to be either away from (preferable) the elevation or parallel to the elevation. Falls should not be back towards the elevation.

The preference for the creation of falls is by the use of tapered insulation.

The flat roof must be a **WARM ROOF** construction.

The U Value of the roof structure at any point in its thickness must be at least equal to the requirement in the Building Regulations.

All roofs and balconies must be positively drained and an overflow should be provided to areas only served by one rainwater outlet. The overflow should have the same capacity as the rainwater outlet, be located close to the outlet and at max 50mm above the waterproof membrane.

The waterproof membrane must extend up any surrounding walls and penetrations in the membrane a minimum of 150mm and 75mm at external openings with flashings extending down 75mm.

The waterproof membrane must have third party accreditation (eg BBA Certification).

All balconies must be provided with edge protection in accordance with the Building Regulations.

Any support structures for any edge protection must be adequately weatherproofed and sealed against the penetration of rainwater into the roof structure.

## 5.7 Reference Material

### Building Regulations

Approved Document A (Structure)

Approved Document B (Fire Safety)

Approved Document C (Site Preparation & Resistance to Contaminants & Moisture)

### Premier Technical manual V10

Chapter 7.8 – Roof structure

7.9 – Roof Coverings – Slate and Tiles

7.10 – Roof Coverings – Continuous Membrane Roofs

### Codes of Practice & BS EN Standards

BS 6399: Roof loading

BS 5268 Pt2 Structural timber design

BS 5268 Pt3: Roof truss design

BS 6229: flat roofs with continuously supported coverings

BS 6399 Pt2: Wind loading

BS EN 1991- 1-4 Impact of wind on land based structures

BS 402: Clay tiles

EN 490 /491 Concrete tiles

BS 5534: Code of practice for slating and tiling

BS 747: Underlay BS 5250 Code of basic data for the design of buildings: The control of condensation in dwellings

BRE Thermal Insulation: Avoiding the risks

**Manufacturers Data**

GRP products installation guides

Multiple or girder truss site fixing specification

British Gypsum Technical information document 1330-PA-001

**BBA CERTIFICATE 99/3648 FOR DALTEX ROOF LINING SYSTEM SEE APPENDIX REFERENCE 6**

# 6. External Components

## 6.1 General

- External Components refers to those products that are applied to the main structure of the building such as Dormers, GRP chimneys, canopies and porches
- Priority products to be agreed with the Premier prior to installation

## 6.2 BRE Thermal Insulation: Avoiding the risks GRP Products

- Pre-formed Glass Reinforced Polyester (GRP) outer structural roof with true reproduction lead finish and colour. All patterns dressed in lead with rolled joints and flashing up stands as indicated on the approved working drawings. The GRP is manufactured by spray or hand lay-up technique with specially formulated fire retardant resins to provide a performance in accordance with the Approved Document B (Appendix A6) to give a resistance to external fire exposure of not less than designation AC (small canopies and roofs are exempt from this requirement). The pigmented gel coat is to be evenly applied and the final laminate is to have a minimum density for 3,600-6,000 grams per square metre with minimum glass content of 36%. All cut edges that are exposed after erection are to be treated with flow coat resin pigmented to match roof colour. The GRP fascia and soffit is manufactured to represent the construction of the main house and is to be bonded to the roof and structural frame. The structural frame to be softwood - stress graded to M50 and will be VAC - VAC treated with organic solvent based chemicals to manufacturer's instructions. The bay roof complete is to be as the approved working drawings. Eaves ventilation to be provided equal to a 10mm continuous air gap to all insulated flat roofs and equally to pitched roofs where the plan area exceeds 3m<sup>2</sup>. Integral insulation should achieve a U value in accordance with Table 2 of Approved Document L1a 2006. Protect at rear by a breather membrane or similar capable of resisting water penetration.
- Bay roofs - The structural frame is to be designed to impose any load (including for maintenance and snow loading) on the designated load bearing points (corners) of bay windows and is not to be evenly distributed along with the window head.
- Canopies with exposed soffits do not require ventilation or insulation but are required to have the GRP soffit to extend the full width of the unit. "Apex" and "Lean to" Canopies over entrances are to be prefabricated in either GRP as above or from recycled sources such as Recplast (recycled polystyrene).
- Dormer roofs and other bay roofs are to be prefabricated GRP and timber components to the above specifications, ready for tiling. Dormers to be inclusive of lead apron flashing. They are to have integral sprayed foam insulation and lead look dormer cheeks. Integral insulation should achieve a U value in accordance with Table 2 of Approved Document L1a 2006. Architect to specify either lead look front gable finish or "tile hung ready". To be lifted into place and installed in accordance with the manufacturer's instructions.

## 6.3 Reference Material

### Building Regulations

Approved Document A (Structure)

Approved Document B (Fire Safety)

Approved Document C (Site Preparation & Resistance to Contaminants & Moisture)

### Premier Technical Manual

Chapter 7 – 7.6 -Balconies

Manufacturers Data

**BBA CERTIFICATE 06/4360 FOR STORMKING PREFABRICATED DORMERS SEE APPENDIX REFERENCE 7**

**BBA CERTIFICATE 99/3585 FOR FREEFOAM PLASTICS LIMITED ROOF TRIM SYSTEMS SEE APPENDIX REFERENCE 8**



**Codes of Practice & BS EN Standards**

BS 6399: Roof loading

BS 5268 Pt2 Structural timber design

BS 5268 Pt3: Roof truss design

BS 6399 Pt2: Wind loading

BS 402: Clay tiles

EN 490 /491 Concrete tiles

BS 5534: Code of practice for slating and tiling

BS 747: Underlay

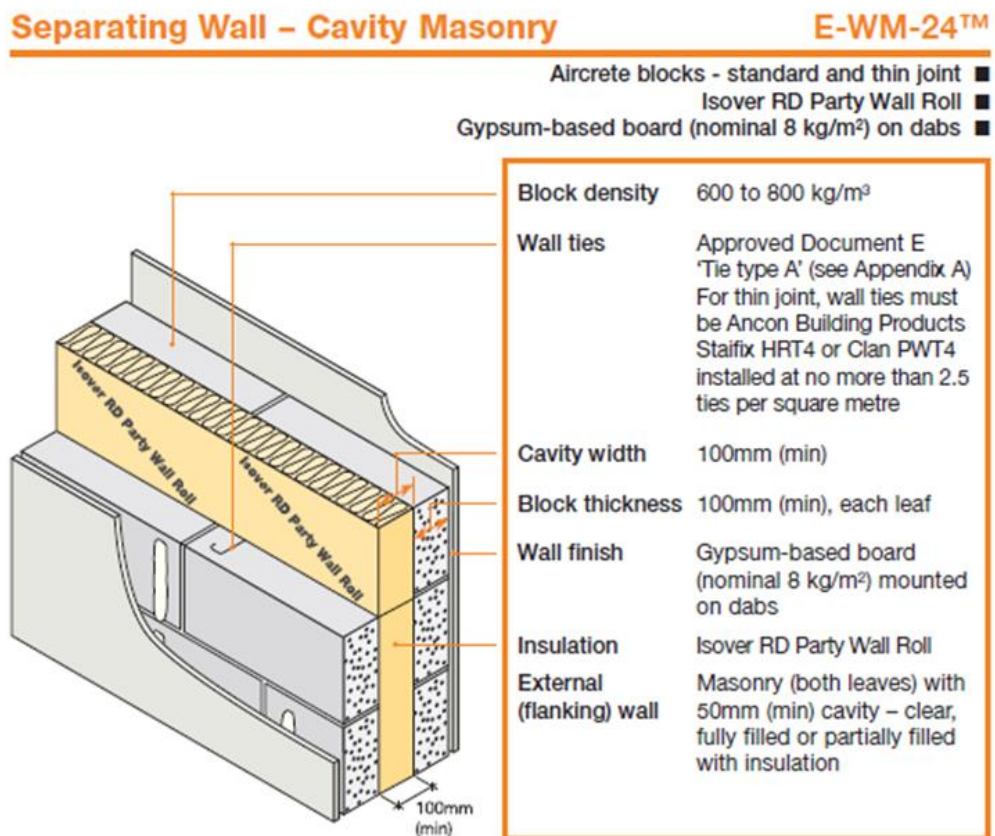
BS 5250 Code of basic data for the design of buildings: The control of condensation in dwellings

# 7. Internal Walls

## 7.1 General

- Separating Walls to be fully filled with effective edge sealing in accordance with Robust Details.
- Ensure all gaps are sealed around partition perimeters and junctions – apply flexible sealant as necessary.
- Air movement at rear of dry lining is to be limited by sealing of gaps between masonry walls and openings. Continuous dabbing of plasterboard adhesive is to be applied around all door and window openings and room perimeters at ceiling and floor level and vertical wall junctions and all electrical / TV points
- Seal all penetrations where service pipes pass through any walls, partitions and duct casings with expanding foam or other suitable flexible sealant.
- Soil pipes passing through ALL rooms to be lagged with minimum 25mm sound deadening insulation quilt (unfaced with a minimum density of 10kg/m<sup>3</sup>), fixed to prevent settlement or slippage. 2 layers 12.5mm plasterboard screw fixed to metal or timber framing.
- Long external walls may need to be provided with intermediate buttressing walls or partitions (refer to details) designed for the purpose, where in doubt check with structural engineer.

## 7.2 Separating Wall (Robust Details)



- The site is to be registered with Robust Details Ltd; and strictly in accordance with the registered design; in this case E-WM-24. Sound testing will not be required upon completion of the dwelling.
- The above detail is the chosen Robust Detail to satisfy Part E of the building regulations for Dorchester Living sites. The detail has been extracted from the Robust Detail Handbook and all requirements from the handbook must be adhered to. For further information please see [www.robustdetails.com](http://www.robustdetails.com)

- Credit can be awarded for the use of E-WM-24 under the Code for Sustainable Homes criteria in accordance with the Robust Details handbook. This however should be checked prior to claiming the credits due to possible changes in the performance ratings published by RD from time to time.
- Keep cavity, insulation rolls and wall ties free from mortar droppings and debris
- Fully fill all blockwork joints with mortar
- Make sure there is no connection between the two leaves except for wall ties, insulation and foundation
- To comply with Approved Document E Celcon Standard Aircrete blocks with a gross dry density of 600kg/m<sup>2</sup> and a mean compressive strength of 3.6N/mm<sup>2</sup> should be used as a minimum in all separating walls. Blocks of a higher density are acceptable. Blocks of a higher density may be specified by the Structural Engineer in properties over two storeys high – refer to working drawings for details.
- Ensure that only solid blocks (i.e. no hollow or cellular) are used in the construction of separating and flanking walls
- Ensure all 150mm Isover RD Party Wall Rolls are tightly butted together and half cuts are made with a clean sharp knife and are installed in accordance with the manufacturer's instructions

### 7.3 Loadbearing Walls

- 12.5mm Gypsum based plasterboard on dabs with a 3mm plaster skim applied. Single or twin leaf 100mm aggregate blockwork of density 1350 – 1600Kg/m<sup>3</sup> and 3.5N/mm<sup>2</sup> compressive strength (7.0N/mm<sup>2</sup> to apartments). Aircrete or dense block can be used in lieu of aggregate dependent on geographical area structural calculations. To be mechanically tied at every course at junctions with external and separating walls.
- For apartments 210mm loadbearing walls should not be built by laying blocks face down (215mm) since this is not structurally acceptable. They should be tied together in accordance with clause 9.7.
- Internal walls of this specification meet requirements of the Building Regulations E2 (a) – see ADE 5.19 internal wall type C.
- For apartments internal loadbearing walls to incorporate pressurised concrete lintels to manufacturer's calculations and schedules.
- Steel lintels can be used in lieu of concrete where they have been designed to be of heavy duty type and designed of a cavity type construction to avoid additional fire protection. Care must be taken when specifying that all lintels of this type are heavy duty to avoid incorrect lintels being installed. All lintels to be as per manufacturers specification and schedules but must take account of the above recommendation which may involve some lintels being over designed to avoid complications on site.
- Timber Internal loadbearing walls tend to be used more widely in conjunction with timber frame construction and therefore reference should be made to manufacturer's details and specifications.

### 7.4 Metal Stud Partitions (2.4 m Ceiling heights)

- 70mm Stud Gypframe 70s 50 @ 600mm Centres @ nominal thickness of 100mm in accordance with manufacturer's instructions (BG System 70).
- Lining - 12.5mm Gyproc wall board either side.
- Standard Edge Channels have now been replaced with the folded edge channels for floor and ceilings. These must be supplied and erected in accordance with manufacturers details.
- Must achieve minimum airborne sound insulation laboratory values (40 Rw dB) where required to comply with Part E of the Building Regulations with 25mm Isover APR 1200 in the stud cavity or equivalent approved material – see manufacturers Performance substantiation report. Must achieve a 30 minutes fire rating for use in 3 storey stairway enclosure.
- Wet Areas – 12.5mm Tile Backer (Tiled Areas) / 12.5mm Moisture Resistant other walls, 25mm Isover APR Insulation in the cavity.
- Partitions built off in-situ slabs should have a DPC between, however a DPC is not required to metal stud partitioning built off fully suspended floors with a voided undercroft.

## 7.5 Metal stud partitions (2.7 & 3.0m ceiling heights)

- 70mm Stud Gyframe 70s 50 @ 600mm Centres @ nominal thickness of 100mm in accordance with manufacturer's instructions. 15mm SoundBlock Plasterboard No Insulation – Heavy duty rated.  
**Or**
- Gyframe as above with 12.5mm wallboard both sides with 25mm Isover APR 1200 acoustic roll in the stud cavity.
- Provided there is at least 150mm of insulation above the ceiling to the roof space and a 15mm plasterboard (perimeter and edge batten support) giving the required period of resistance with this form of construction this will be sufficient to protect the stairway (escape route).
- Standard Edge Channels have now been replaced with the folded edge channels for floor and ceilings. These must be supplied and erected in accordance with manufacturers details.
- Must achieve minimum airborne sound insulation laboratory values (40 Rw dB) where required to comply with Part E of the Building Regulations with 25mm Isover APR 1200 in the stud cavity or equivalent approved material – see manufacturers Performance substantiation report. Must achieve a 30 minutes fire rating for use in 3 storey stairway enclosure.
- Wet Areas – 15mm Moisture Resistant SoundBlock, studs at 400mm c/c with 25mm Isover APR Insulation in the cavity. Heavy duty rated. 12.5 mm Glasroc tilebacker to bathroom side.
- Partitions built off in-situ slabs should have a DPC beneath, however a DPC is not required to metal stud partitioning built off fully suspended floors with a voided undercroft.

## 7.6 Reference Material

### **Building Regulations**

Approved Document A (Structure)

Approved Document E (Resistance to the Passage of Sound)

Approved Document L1A (Conservation of Fuel and Power)

Approved Document Q (Security)

### **Premier Technical manual**

Chapter 8 .1 – Internal walls

### **Manufacturers Data**

Brick, block and mortar manufacturer's suitability for use guidance

Plasterboard manufactures installation guides to linings and partitions.

British Gypsum NBS specification K10 1330-PA-001

### **Codes of Practice & BS EN Standards**

BS 8000 Pt8: Workmanship plasterboard partitions and dry linings

# 8. Intermediate Floors

## 8.1 General

- The introduction of I Beams and the use of concrete planks for apartments is now common place throughout the industry. As such all designs to be produced by the manufacturers and installed to manufacturer's details and recommendations.
- Acoustic & fire integrity must be considered at all times and not compromised by design and installation.
- For separating floors reference should be made to Robust Details and the specific installation check sheets.
- Registration and compliance with Robust Details will remove the requirement to acoustically test units in accordance with Approved Document E.
- Apply 8mm soundcoat render parging coat approx. 150mm wide to loadbearing wall faces at junction with soffit of pc planks.
- Reference should be made to the Gas Safe Technical Bulletin 217 for installation of gas pipes within floor voids, Alternatively they can be laid in a screed (refer to clause 6) and where they rise vertically in apartments they should be housed within ventilated ducts (ventilated at each storey height) or a riser (where this is ventilated to the outside) in accordance with Gas Safe requirements. Where they rise vertically behind plasterboard on a masonry wall they should be surrounded in continuous gypsum based adhesive bead.
- Space and water heating pipework and electrical cables may be run in the ceiling void to a separating floor provided they are adequately clipped to the floor unit soffit.
- Service pipes may be incorporated into the floor voids of intermediate floors by feeding through the perforated knockout holes or by passing through site-drilled holes strictly in accordance with the manufacturers permitted zones. The flanges must NOT be drilled, notched, or otherwise altered on site.
- Where boilers are positioned centrally within the property and not on external walls such as apartments the flue must be accessible for visual inspection along its route. Full guidance on this can be found on the Gas Safe Technical Bulletin (TB008 Edition 2) "Room-sealed fanned draught chimney/flue systems concealed within voids. General notes are as follows:
  - It is not intended that additional provision for inspection should be provided for short flue sections passing directly through an external wall
  - Open flues are not covered by this bulletin and separate guidance should be sought.
  - It is necessary for means of access to be provided at strategic locations so that the flue system can be visually inspected along its route. The means of access should allow for visual inspection to be achieved for the entire length of the flue system, including any separately routed air supply pipe, particularly where there are deviations or joints and supports. It is not envisaged that means of access is provided at every joint, deviation or support but that it can be visually inspected in some way.
  - The access provided needs to be sufficiently sized to allow a visual inspection. It is not intended to allow physical access to the flue system for example to carry out maintenance.
  - Location of the means of access should be decided upon through liaison with the Gas Safe registered business installing the flue system. This may be on a property by property or site by site basis until such time that a generic detail is produced.

## 8.2 Timber "I" Joists

- 22mm moisture resistant flooring grade protected P5 chipboard panels (Egger) to be laid and fixed strictly in accordance with manufacturer's instructions (see under "manufacturers data") and supported at all boarded room perimeters.
- 242mm engineered I beams to be laid (at max 600mm centers) and fixed strictly in accordance with manufacturer's instructions and in accordance with the house type floor designs produced by a suitably qualified person.

- Manufactured timber end blocks (extending beyond masonry face) to be factory fitted where I beams are built into external walls and mortar joint around to be struck or recessed to receive suitable flexible sealant. Alternatively, proprietary end-cap shoes may be utilised to limit air leakage in these situations provided they have the approval of the building control body.
- 15mm Gypsum based plasterboard ceilings (12.5mm fire resisting to 3 storey and apartments where above stairwells and corridors); screw fixed and jointed in accordance with manufacturer's instructions. 3mm skim.
- Where the first joist is parallel to the external or party walls, position it with a minimum 25mm gap from the face of wall to the face of joist. (If the 25mm gap is not used this will be noted on the layout. Up to a 75mm maximum gap is allowed as per Premier Standards)
- All floors for dwellings to be designed for a dead loading of 0.50kN/m<sup>2</sup>, a partition loading of 0.25kN/m<sup>2</sup> and an imposed load of 1.50kN/m<sup>2</sup>. If additional construction loads are present on the floor, e.g. Soundbar or under floor heating, these loads are to be assessed separately and added to the above values.
- Concentrated loads shall be applied to trimmers which support the stair strings, approximately at stringer positions, calculated in accordance with the UKTFA guidelines using the stair arrangement.
- All floor joists shall comply with the deflection limits in BS5268 Part 2 2002 and Premier Standards i.e. a maximum deflection of 0.003 x span, with a maximum value of 12mm. **Dorchester maximum deflection value = 7mm**. All trimmers are to be restricted to **7mm** deflection as per joist specification above. Primary trimmers should be at least the same width as the adjacent floor joists which are located on centres.
- Other trimmer joists, e.g. those at service voids, are to be treated as joists for consideration of deflection limits, regardless of joist depth. No blocking or strutting shall be incorporated in the floor as referred to in the Premier Standards.
- No 'composite' action to be used when designing floors.
- Dormer roof loadings are assumed to be supported by rafters unless noted otherwise on the Architect's drawings.
- The current limit on TJI/FJI floors is a 180 litre tank (or 200kg) without applying additional loads. Variation from this must be communicated to the joist supplier.
  - Typical cylinder weights are:
  - 180 litres = 200kg
  - 210 litres = 250kg
  - 250 litres = 300kg
  - 300 litres = 360kg
- Minimum joist width to be 38mm. Default joist spacing to be 600mm. 300mm spacing should only be used after consultation with Dorchester Living where joist depth needs to be kept at 242mm deep.
- Joists spaced at 480mm should avoid being mixed with other joist spacing's where the joists are parallel, unless the impact on deck cuts is minimal.
- Joists are to be built into the inner leaf of all external and party walls. Each joist to be fitted with Finnseal of appropriate size for the joist or other suitable approved end seal to prevent air leakage. These are to be fitted in accordance with manufacturer's instructions.
- Part E of the Building Regulations requires that floors within a single dwelling can demonstrate the ability to provide airborne sound insulation of 40dB. 40db airborne sound insulation can be achieved if approved 'I' joists have a minimum depth of 220mm, 22mm chipboard deck, and 15mm plasterboard ceiling.

### 8.3 Metalwork & Lateral Restraint

- I beams at right angles to separating walls shall wherever possible be built in, strictly in accordance with robust details requirements, however where they are supported in hangers they are to be galvanised steel return flange type masonry hangers 225mm deep as specified on the house type floor designs and be fixed strictly in accordance with the manufacturer's instructions.
- The installation and specification of the hangers should be in accordance with the Dorchester Living Site HSE Manual and be either Simpson Strong-tie Safety Fast Hangers or Cullen RA or RAD hangers. Checks to be made to ensure the reference codes for these hangers to be noted on the Joist designs.
- Unless the hangers are of the lateral restraint type and have building control approval for use as such, then galvanised steel restraint straps shall be fitted to I beams (at no more than 2m centres to one side only to separating walls) strictly in accordance with manufacturer's instructions.
- Restraint straps are additionally to be fixed in all cases to I beams where they run parallel to external walls (at no more than 2m centres and to one side only to separating walls). On 3 storey house type's restraint straps shall be fitted to I beams both at right angles to and where they run parallel to external walls at each floor level. Refer to construction details. Proprietary two-piece alternatives may be utilised to traditional straps if approved by the building control body.
- Masonry Restraint straps: Use thin gauge straps by Simpson Strong Tie and or Cullen, installed as follows:
  - Joists parallel to external or party wall (strap to extend over 3 no joists with either 38x125mm timber noggins laid flat or full depth FJI noggins fixed with z-clips – detail M2b) Straps at 2.0m max centres
  - Joists perpendicular to external or party walls greater than 2 storeys high (straps fitted to bottom flange to avoid perimeter noggins – detail M4) Straps at 2.0m max centres on all floors
  - NB Parallel straps are not required where attic trusses form the 2nd floor
  - FMS/FMSC straps by Simpson Strong Tie may also be used, fitted to every joist.
  - Z clips to only be used for partition noggins

### 8.4 Intermediate Floors over Integral Garages

- Insert two layers glass mineral fibre insulation quilt to the full depth (240mm -250mm compressed) laid between all I beams. All spaces between wall and I beams running parallel to wall to be packed with glass mineral fibre quilt. Single half brick exposed walls adjacent to these ceilings shall have a polyethylene dpm inserted between the plasterboard perimeter and wall face.
- One layer of 15mm plasterboard with taped and sealed joints and intumescent seal to the perimeter to the underside of the ceiling.
- Over drive-through (exposed soffit) provide 6mm layer of masterboard with taped and filled joints. Additional noggins will be required to support the board. Seal perimeters of soffits with flexible sealant. Finish to be, paint, fine build or T&G cladding as specified.

### 8.5 Reference Material

#### Building Regulations

ADA: For Class 2a structures (apartments up to 4 storeys) compliance with disproportionate collapse to be achieved by “effective anchorage” in the following manor: - where a precast concrete plank floor spans onto or is parallel to a wall and has a bearing of at least 90mm there is no requirement for strapping provided the plank is fully and effectively built into the wall during construction with a wet mortar bed above and below taking due account of any pre-camber in the units. The plank adjacent the wall should be a “full width” plank and extend at least 800mm from the internal face of the inner leaf of the wall.

## **Premier Technical Manual V10**

Chapter 8.10 – Internal Floors

### **Manufacturers Data**

**BBA CERTIFICATE 08/4585 FOR EGGER BOARDS SEE APPENDIX REFERENCE 9**

**POSI JOISTS - EUROPEAN TECHNICAL APPROVAL ETA-070161 SEE APPENDIX REFERENCE 10**

Decking storage, handling, fixing and taping instructions

Steico Joist hanger fixing and support details

Decking Details – Method Statement.

### **Internal Reference Material**

Site HSE Manual for safe loading of floors and agreed hanger specifications.

### **Codes of Practice & BS EN Standards**

BS 8103 Structural design of low rise buildings: Pt4 Code of Practice for suspended concrete floors for housing

BS EN ISO 11654: Sound absorbers for use in buildings

BS 8110 Pt 1: Design and manufacture of pc units and concrete mix proportions to satisfy Table 3.4 with the use of additives to BS 5075

BS 8000 Pt5: Workmanship carpentry, joinery and general fixings

Gas Safe Technical Bulletin (TB008 Edition 2) "Room-sealed fanned draught chimney/flue systems concealed within voids"



# 9. Fire Protection

## 9.1 General

- Fire protection is not solely defined by the fabric performance but also means of detection, alarms, means of escape and fire rescue.
- Reference in this section may overlap into other parts of the specification such as internal doors, but will also be covered here for clarity.

## 9.2 Integrity of Elements

- **30 Minutes Fire Resistance:** Required between rooms and hallways and to top storey ceilings in apartments.
- Between house and attached garage.
- **60 Minutes Fire Resistance:** Required to structural frames, beams, columns and elements of the structure (separating walls and floors). Refer to construction details.

## 9.3 One & Two Storey Houses

- Except for kitchens all habitable rooms on the first floor (served by one stair) should be provided with an escape window.
- A room whose only escape route is via another room is termed an inner room and unless it is a bathroom, kitchen or dressing room (example; bungalow bedroom opening onto an inner hallway) should be provided with an escape window also.
- The window should have an unobstructed open able area that is at least 0.33m<sup>2</sup> and at least 450 x 750mm in size.

## 9.4 Three & Four Storey Houses

- Refer to Section 13 Doors & Windows for specifics reference to Fire Doors.
- Provide FD 30 fire doors at every storey level opening onto a fire protected escape route (landings / hallway). Ensure 30 minutes fire rated construction is maintained in the floor zone above partitions separating rooms from the escape route, fire doors may be omitted from bathrooms but must be fitted to storage areas.
- In addition to a fire door, a storage area under a stairway used as a means of escape should be underscored with 2 layers of 12.5mm plasterboard (staggered joints).
- Provided there is at least 150mm of insulation above the ceiling to the roof space and a 15mm fire resisting plasterboard (perimeter and edge batten support) giving the required period of resistance with this form of construction this will be sufficient to protect the stairway (escape route).
- Min half-hour fire resisting loft hatches will be required to habitable rooms and stairwells if a cavity barrier is not provided within the roof space to create a protected stair. Where a cavity barrier has been provided half-hour loft hatches are not required in habitable rooms unless an entrance hall is provided (apartments) and fire could escape into this area via the loft space and restrict access.
- Dwellings with more than one floor over 4.5m above ground level (typically 4 storey units) must comply with the paragraph 2.7 and diagram 1 of Approved document B volume 1 as detailed below:  
An alternative escape route should be provided from each storey or level situated 7.5m or more above ground level. Where the access to the alternative escape route is via:
  - i. the protected stairway to an upper floor; or
  - ii. a landing within the protected stairway enclosure to an alternative escape route on the same storey; then

- iii. the protected stairway at or about 7.5m above ground level should be separated from the lower storeys or levels by fire resisting construction, see diagram 3 ADB; or
- iv. The dwelling should be fitted throughout with a sprinkler system designed and installed in accordance with BS 9251:2005

## 9.5 Integral Garages

- The wall between the garage and house may be terminated at ceiling level, provided 12.5mm fire resisting plasterboard is used and overlain with at least 150mm insulation.
- FD 30 fire doors to be fitted between house and attached garage. 100mm step down to garage floor level not required where there is a slope of the garage floor to the outside.
- Note: Any door & frame between house and garage must meet the requirements in A.D. Q (security) refer to Section 11 for details.

## 9.6 Cavity Barriers

- Should be provided in the following locations (refer to construction details and ADB volume 2 paragraph 9.2):
- At the junction of external and separating walls vertically, between adjoining houses and both between apartments and common areas.
- At the junction of external walls and separating floors horizontally. This also applies to FOG units.
- At the head of all cavity walls (at eaves and verge levels) and within boxed eaves and canopies that are continuous across separating walls.

## 9.7 Reference Material

### Building Regulations

Approved Document B (Fire Safety)

Approved Document J (Combustion Appliances & Fuel Storage)

Approved Document Q (Security)

**Fire Safety Information:** Building regulations do not impose any requirements on the management of a building. The eventual owners and occupiers however should be provided with basic advice on the proper use and maintenance of systems such as emergency egress windows, fire doors and smoke alarms. Householders should also be made aware that unauthorised material alterations may leave them liable to prosecution. Regulation 38 Fire Strategy Plan and Information to be supplied for multi occupancy buildings.

The Regulatory Reform (Fire Safety) Order 2005. This places an obligation on the building owner of blocks of flats to make and implement arrangements for planning, organising, controlling, monitoring and review of the preventative and protective measures required by the Order.

### Premier Standards

No specific part relates solely to fire protection but references are referred to within various parts of the document.

### Manufacturers Data

Certifier test data for engineered I beam floor constructions

Manufacturers test certificates for fire resistance of doors and linings

### Internal Reference Material

Section 13 Door & Windows for specific reference to Fire Rated Doors

### Codes of Practice & BS EN Standards

BSS 476 Pt22: Fire tests on building materials and structures. Methods for determination of the fire resistance of non-loadbearing elements of construction

BS EN 1154: Building hardware - controlled door closing devices - requirements and test methods

BS 7352: Specification for strength and durability performance of metal hinges for side hanging applications and dimensional requirements for template drilled hinges

BS 5588 Pt1: Fire precautions in the design, construction and use of buildings. Code of practice for residential buildings

BS 8214: Code of practice for fire door assemblies with non-metallic leaves

# 10. Mechanical & Electrical

## 10.1 General

- Electric gate installation must not proceed without guidance from the HSE safety Manual. See below.
- Electric Gates must also comply with A.D K 2013 (K5 and K6)
- Socket outlets which might reasonably be used for external appliances should be protected by a residual current device (RCD).
- In accordance with the revised British Standard new harmonised (EU) cable core colours for all new fixed wiring are to be adopted. Guidance and examples of these should be included in the Home Owners Guide.
- Mechanical extract ventilators in external walls and ceilings to be supplied with sealing gaskets.
- Intumescent gaskets may be utilised as an alternative to a flexible sealant to light fittings penetrating the (plasterboard) air barrier.
- Must be designed and installed in accordance with the **Domestic Building Services Compliance Guide 2010 Edition & Domestic Ventilation Compliance Guide 2010 Edition**

## 10.2 Meter Box Connection

- Where the site is “self-connect” i.e. the electrical contractor makes the connection from the consumer unit to the meter, this is normally to switch fuse in the meter cupboard, in which case there should not be a restriction on the “tails” between the meter box and cu positions. Where the electricity utility provider makes the connection, they will normally insist on a maximum distance of approx. 2m between the two unless a separate switch fuse is provided which they will not normally allow to be positioned in the meter box. The designer should therefore be aware of the implications and avoid situations where the meter box and cu are remote.
- Provide armour protected separate 13amp radial circuit protected with residual circuit breaker (RCD) at the distribution board (CU) with 16amp miniature circuit breaker (MCB) to detached garages
- Consumer units to have lockable covers to help prevent circuits being energised accidentally. Reference should be made to the Dorchester Living Site HSE Manual

## 10.3 Electrical Points, Lighting & Extract Vents

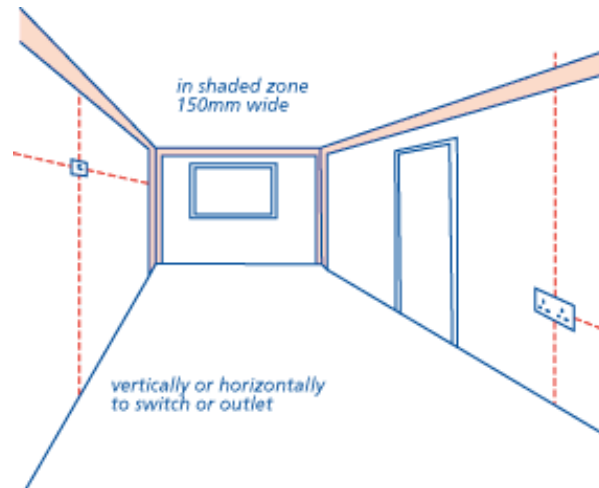
- The resistance of ducted systems should be matched against the selected fan performance curve (available from the manufacturer) to achieve the installed performance for the room. Where a duct rises vertically a condensation trap shall be fitted. Ensure flexible ducting is installed without peaks or troughs.
- System 3 approach to be used via decentralised continuous mechanical extract fans Greenwood CV2GIP type.
- CV2GIP has the ability to easily adjust the fans to comply with the Guaranteed Installed Performance as required for Part F.
- Air leakage rates are set at a default of  $7\text{m}^3/(\text{h.m}^2)\text{@}50\text{Pa}$ . This will allow for a varied approach on air leakage testing to be agreed with Building Control. The average approach will lead to air leakage rates of below 5 being achieved. Continuous ventilation via the system 3 approach gives flexibility in this area where concerns have been raised about poor air quality.
- Ventilation rates for a system 3 approach (continuous extract) will be on the following basis:
- **Rigid ducts, rectangular or circular, should be used wherever possible.** Where necessary, flexible ducts may be used, but their lengths should be kept to a minimum, connecting to rigid ductwork at the earliest opportunity.
- **For flexible duct connected to axial fans the length is limited to 1.5 metres;** for centrifugal fans the length limit is 6 metres (for extract rates 6 to 30 Vs), and 3 metres (for extract rates 31 to 60

Vs).

- **Whole dwelling ventilation rate:** to be in accordance with Table 5.1b of Approved Document F. This is calculated on number of bedrooms but the minimum ventilation rate should be not less than 0.3 litres/second per m<sup>2</sup>. Manufacturer to confirm ventilation strategy.
- **Minimum high rate:** Minimum high rate of ventilation for continuous extract systems is to be in accordance with Table 5.1a of Approved Document F. Summary of rates are noted below:
- **Kitchen extract vent** – high rate to be not less than 13 litres/second. Ducting to be rigid over wall units or flexible in floor voids (or within dropped ceiling to apartments - only permitted in ceiling void if fitted with appropriate fire damper) but the design and length should not impede these performance levels – if in doubt check with fan manufacturer.
- Cooker Hoods under the System 3 approach are not required as part of the ventilation strategy. However a re-circulating cooker hood could be utilised for aesthetic reasons and also to help remove fats etc generated while cooking.
- **Bathroom and Utility** – High rate to be not less than 8 litres/second in a wall or within dropped ceiling. 1 gang switch plate with 3 module aperture to feed light switch / double pole fan switch / 3amp fuse for fan.
- **Sanitary Accommodation** - High rate to be not less than 6 litres/second and operated in conjunction with the light switch.
- **Minimum Low rate** – Should be that given in Table 5.1b as described above.
- **Maximum Whole dwelling Extract Rate** – Should be at least greater than the sum of the whole dwelling extract rate and the sum of the minimum high rate for individual fans given in tables 5.1a and 5.1b of Approved Document F. Manufacturer to confirm ventilation strategy.
  - **Boost Facilities** – It is recommended that the following is applied for boost facilities to the continuous extract fans
  - **Kitchens** – Boost via separate switch either in the gang plate or dedicated switch.
  - **WC & Bathroom/En-suite (no window)** – Boost via the light switch with built in humidistat & timer
  - **WC & Bathroom/En-Suite (with window)** – Boost via built in humidistat & timer plus manual boost switch (not light switch)
  - **Commissioning** – To be installed and commissioned in accordance with the requirements of **Domestic Building Services Compliance Guide 2010 Edition & Domestic Ventilation Compliance Guide 2010 Edition**
  - **Purge Ventilation** – Purge ventilation to be in accordance with Approved Document F Appendix B which requires hinged or pivot windows that open 30° or more to have an opening part of at least 1/20<sup>th</sup> of the floor area of the room. For windows that open less than 30° reference should be made to the appendix.
  - Ensure there is at least a 300mm separation between an extract fan terminal and flue termination of a gas boiler and 500mm between an extract fan and a background (window trickle) ventilator.
  - Background Ventilators (trickle vents), in accordance with the system 3 approach, having a minimum equivalent area of 2500mm<sup>2</sup> should be fitted in each room, except wet rooms from which air is extracted.
  - To assist those people whose reach is limited and to use the dwelling more easily, light switches, socket outlets and other equipment (not consumer unit) should be located in habitable rooms at appropriate heights between 450 and 1200mm from finished floor level in accordance with Diagram 29 of Approved Document M Volume 1, 2015 of the Building Regulations.
  - 100% low energy lighting to be used throughout the dwelling and in accordance with the specification noted below, Energy Efficient Lighting.
  - Downlighters – to be IP60 (65 above baths and showers) rated limiting air leakage. They must have been designed and tested such that they will not cause overheating when overlain with insulation e.g. low voltage systems with dimmable transformers which can also be changed through the bezel. They should have a 30 minute fire rating in ceilings below roof spaces and 60 minutes in separating floors. They should have been satisfactorily assessed in accordance with the procedure described in Appendix F of ADE Robust Details. A copy of the test report shall be handed to the site manager. They should be spaced at no more than one light per

- 2m<sup>2</sup> of ceiling area measured in each room and at centre
- Numbers not less than 750mm unless tested otherwise.
- Socket outlets to be provided not less than Premier requirements)
- Gang switches to be provided within kitchens for all appliances.

## 10.4 Electrical Cables



LOCATION OF CABLES WITHOUT SPECIAL PROTECTION

- Where cables are concealed within a wall, they should be located at a minimum depth of 50mm from the surface opposite to where the electrical point is positioned – refer to partition manufacturer's installation guidelines and ensure this is strictly adhered to.
- Cables without special protection, such as an earthed metal conduit, must be positioned as indicated in Premier Standards. This applies to all walls.
- The presence of insulation around a cable has the effect of reducing the current carrying capacity:
- Circuits run within thermal insulation must be protected with cartridge fuses or mini circuit breakers (MCBs), rewirable fuses are not suitable.
- Cables fully enclosed by insulation may need to be increased in size above the standard recommended by as much as 20% if they pass at right angles through an insulating layer and as much as 50% if they are enclosed along the length for more than 500mm.
- For cables enclosed by insulation but in contact with a thermally conductive surface on one side, the larger of the standard recommended sizes will generally need to be used.
- PVC-U Cables should NOT come in contact with polystyrene and where located on walls faced with laminated polystyrene backed plasterboard should be suitably protected.
- TV distribution cable to be CT 100 digital satellite / terrestrial.

## 10.5 Smoke & Heat Detection

- Smoke alarms to be mains operated with a battery backup and connected to the lighting circuit. To be of the Ionization type where positioned in living rooms and of the Optical type when located in circulation areas. They should be ceiling mounted, within 7.5m of doors to habitable rooms and 300mm min from light fittings and bulkheads. Minimum of one smoke alarm per storey and interlinked.
- Where the kitchen area is not separated from the circulation space by a door, there should be a compatible, interlinked heat detector located in the kitchen in addition to smoke alarm(s).

## 10.6 Energy Efficient Lighting

- 100% low energy lights required throughout the dwelling.

- Energy efficient lighting is to be provided in accordance with Approved Document L1A and the Domestic Building Services Compliance guide.
- Light fittings can be either dedicated fittings or standard fittings with low energy lamps. Dorchester Living have chosen to use standard fittings with low energy lamps in accordance with the following requirements. Low energy fittings should have lamps with a luminous efficacy greater than 40 lamp lumens per circuit-watt and a total output greater than 400 lamp lumens. Light fittings whose supplied power is less than 5 circuit-watts are excluded from the overall count of the number of light fittings.
- Standard fittings supplied with low energy lamps with integrated control gear (e.g. bayonet or Edison screw based compact fluorescent lamps). Light fittings with GLS tungsten filament lamps or tungsten halogen lamps would not meet the standard.
- Kitchens having pelmet fluorescent lighting will comply.
- Recessed downlights can be either GU10 type LED type fittings or alternative low energy compact fluorescent type. LED lamps produce little or no heat and should be considered where insulation may cover the fittings. Confirmation should be gained from the manufacturer and contractor and installed in accordance with manufacturers details
- External lighting if provided must also comply with the following if attached to the building:
  - Either a)
    - Lamp capacity not greater than 100 lamp-watts per light fitting; and
    - All lamps automatically controlled so as to switch off after the area lit by the fitting becomes unoccupied; and
    - All lamps automatically controlled so as to switch off when daylight is sufficient.
  - Or b)
    - Lamp efficacy greater than 45 lumens per circuit watt; and
    - All lamps automatically controlled so as to switch off when daylight is sufficient; and
    - Light fittings controllable manually by the occupants

## 10.7 Electrical Provision in & Around Bathrooms

- Section 601 of the BS wiring regulations relates to locations containing a bath or shower which are classified into the following zones:
- **ZONE 0** Represents the interior of the bathtub or shower tray
- **ZONE 1** Wraps around and on top of zone 0 and is limited to a height of 2.25m
- **ZONE 2** Reaches 0.6m outside of zone 1 and sits above zones 0 & 1 at a minimum height of 2.25m. **Insulation should not cover the fitting** as the fitting could overheat, reducing lamp life and creating a fire risk (those installed in ceiling voids to compartment floors should be 1hr fire rated and meet with RSD's Appendix F requirements). **Extract Fans** IPX4 rated (protection against splashing)
- **ZONE 3** The outer layer is therefore the rest of the bathroom extending to the same height -
- Shaver Sockets / Batten Holders
- Section 601 defines where 240volt electrical items can and cannot be placed in these rooms in accordance with the zoning. This means fan / lighting positions and wiring accessories unless they are SELV (Safety Extra Low Voltage)

### **Pull Chord/Rocker Switches in wet rooms**

Are permissible outside this zones

- Rocker switches preferred and to be located outside the wet rooms.

### **Fan Isolating Switch**

Should be outside zone 3 e.g. located 2.25m above this zone or outside the room where the assessment/inspection body permits

- In addition section 601 stipulates that electrical cables in partitions adjacent to zones 0 & 1 need to be a minimum 50mm away from the wall face.

## 10.8 Structured Cabling

- Where provision is made for 1st and 2nd fix of cabling backbone star wired back to an in- house control box and in substitution of standard TV and BT outlets as indicated on the house
- /apartment services drawings, these may be “active” or blanked off allowing optional customer upgrade as indicated.
- Data cable to be CAT5e
- TV and Video co-axial cables must be Sky approved (CT100 or H019F)
- **Audio cable** must be good quality stranded copper speaker cable (shielded where necessary)
- **Video Distribution System** - should be capable of accepting the optimum number of external inputs such as Satellite, TV, Cable, Door Entry System and CCTV, combining these with a number of internal inputs such as VCR and DVD and allowing for the distribution to any room, the video server should be located in the control panel and installed in a suitable location in the property. The clients video equipment (VCR, DVD and Satellite Digibox may connect into the system via a point in the lounge)
- **Data Distribution** – the system should allow for a 10/100 Ethernet LAN, which will allow data sharing, printer sharing and multiple user internet access, the Data distribution panel and hub is to be sited in the control panel. Live data outlet points to be installed as shown on the drawings.
- **Voice Distribution system** – shall be capable of supporting up to 4 incoming telecom lines that can be routed to any telecom point within the property. The voice distribution panel is to be located within the main control panel. Live data outlet points to be installed as shown on the drawings.
- **Communal TV and aerial** - See separate specifications for Integrated reception systems (IRS) covering satellite, terrestrial, analogue and digital) and radio (both FM and DAB) to every apartment covered by the system.

## 10.9 Reference Material

### Building Regulations

Approved Document F (Ventilation)

Approved Document L1A (Conservation of Fuel & Power {New Dwellings})

Approved Document P (Electrical Safety)

### Other Guidance

HSE Bulletins on Electric Gates

- <http://www.hse.gov.uk/safetybulletins/electricgates.htm>
- <http://www.hse.gov.uk/safetybulletins/electricgates2.htm>

### Premier Technical Manual V10

9.3 Electrical installations

### Manufacturers Data

Manufacturer’s details

Partition manufacturer – safe installation of electrical cables

Codes of Practice & BS EN Standards

BS 7671 “Requirements for electrical installations”

Min performance of extract fans to BS EN 13141-4 clause 4

Min performance of range hoods to BS EN 13141-3 clause 4

BS 4293: Specification for residual current-operated circuit-breakers

BS EN 60929 Ballast Performance

BS EN 60928 Electrical safety of the fitting

BS EN 61000-4 Electromagnetic Compatibility

BS EN 61000-3-2 Harmonics / 61547 Immunity / 55015 Emission

BS 5446 pts1 & 2: Fire detection and fire alarm devices for dwellings – Specification for smoke alarms



# 11. Plumbing & Heating

## 11.1 General

- Individual Gas engineers or gas installation businesses are required to be Gas Safe Registered. Systems cannot be installed or commissioned by those without the appropriate certification.
- Extended Gas Flues should be avoided wherever possible. Where it is felt this is unavoidable central Design and Technical should be contacted.
- Proprietary products are being released on a daily basis. Care should be taken when specifying such products to ensure they comply with the relevant legislation.
- Renewable items such as Solar Thermal and Air Source Heat Pumps (ASHP) will not be covered in the section but will be referenced under Section 14 Renewable technologies
- Flue Gas Heat Recovery (FGHR) and Waste Water Heat Recovery (WWHR) will be referenced in this section.
- Heating & Hot Water systems must be designed and installed in accordance with the “Domestic Building Services Compliance Guide 2010 Edition”
- Fit “top hat” S & vp collar – 110mm Visqueen or equal approved material. Sealed with Visqueen double sided jointing tape at ceiling level below a roof void.
- All plumbing & Heating to be purchased in line with the group’s procurement policy unless a specific product is not available from the prescribed manufacturers. In this instance central Design and Procurement should be informed.

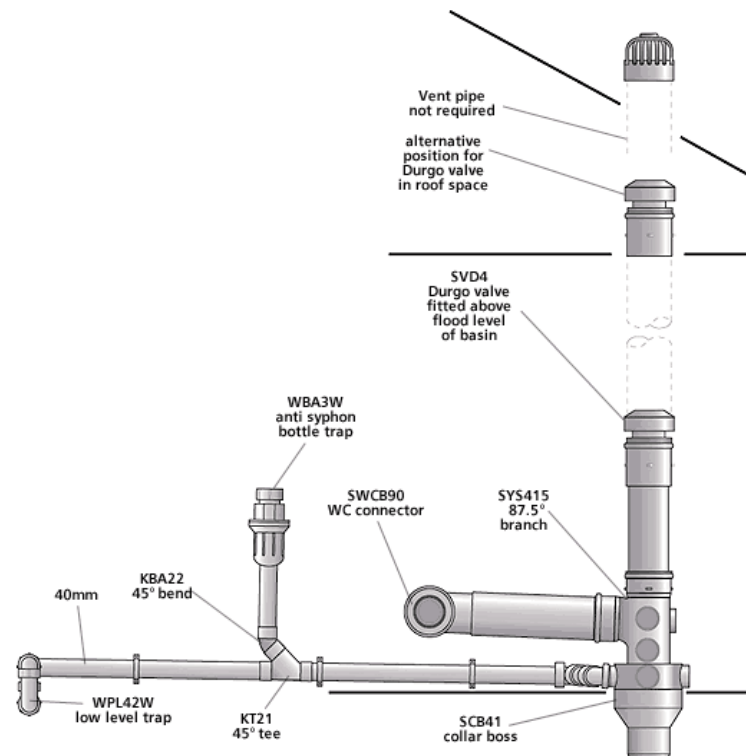
## 11.2 Rainwater Goods

- Rainwater gutters and down pipes to be manufactured in heavy grade PVC-U to the British Standard in black unless stated otherwise. Gutter to be 112mm half round section (125mm to apartments) with 68mm circular drops. Eaves details without full depth fascia boards require level gutters and down pipes should therefore be spaced accordingly to avoid overcapacity – check manufacturer’s roof areas data.
- Alternative deep flow options are available and could be considered viable if down pipes and associated below ground drainage can be removed. This must however be shown by calculation to accommodate the required flows.
- In certain areas of the country it may be prudent to consider additional fixing requirement to deal with the potential of heavy snowfall. At present this is not a requirement but deepening on site location it may be felt that this is a cost effective solution in lieu of any future claims.

## 11.3 Flashings

- Where a roof abuts a vertical surface, cover flashings, stepped flashings, soakers and back or parapet gutters should be provided. They should link with cavity trays where there is an enclosed space below.
- Code 4 milled lead sheet to BS 1178 in lengths not exceeding 1.5m. Step and cover flashing dressed over tiles by at least 150mm and turned up brickwork at least 150mm to all abutments. To avoid damage to (unattached) cavity trays the joint for lead flashings should be raked out to a depth of 25mm as work proceeds (all in accordance with recommendations made by the Lead Development Association). Lead work to be cleaned and coated with patination oil.
- Unless factory fitted lead flashings are installed, the “free edge” of the lead cover should be adequately clipped at max 500mm centres which are to be mechanically fixed to the tiling batten.
- For weathering of plain tiles use either a (GRP) secret gutter or soakers and cover flashing in accordance with tile manufacturers fitting instructions.

## 11.4 Plumbing



- All fittings to have traps in ABS plastic conforming to the British Standard. Provide waste for washing machine and dishwashers where applicable. All waste pipes shall be laid to fall. All plumbing shall be installed in accordance with approved manufacturer's instructions.
- Where waste discharge pipes take the waste water from two or more fittings and thence become "combined waste pipes" the combined waste pipe is to be fitted with an air admittance valve to ensure traps are not syphoned out of one fitting by the draining of another fitting on that waste pipe.

Appliances	Dia	Min trap seal	Max length of pipe	Pipe gradient	Max bends	Max drop
Washbasin	32	75	1.7	2.2	0	0
Washbasin	40	75	3.0	1.8 to 4.4	2	0
Bath or shower	40	50	No limit	1.8 to 9.0	No limit	1.5
Kitchen sink	40	75	No limit	1.8 to 9.0	No limit	1.5
Washing machine	40	75	3.0	1.8 to 4.4	No limit	1.5
WC	110	50	No limit	1.8 min	No limit	1.5

- Soil and ventilating stack and fittings to the British Standard with ring seal or solvent joints to terminate via tile or ridge tile ventilator. (The dry part of the stack may reduce from 100mm to 75mm diameter above the highest branch). Ground floor WC to be taken direct to drain or to dedicated stub stack serving ground floor only, unless otherwise instructed - never connect to stack receiving discharge from above. WC's to be specified with integral overflow kits.
- Air admittance valves - Valves should be installed within the building in a ventilated duct or roof space where there is no risk of freezing and must be accessible for inspection and testing. Each valve is supplied boxed with a polystyrene insulation cover that should remain in position after installation, as this will protect the valve against freezing, particularly when installed in a roof space.

- To ventilate the underground drainage system and to minimise the effects of back pressure should a blockage occur, the branch or main drain serving a stack or stacks fitted with durgo valves may require conventional venting at a point upstream of the stack connection. For up to and including four dwellings, 1, 2, or 3 storeys in height, additional drain venting is not required. Where a drain serves more than four such dwellings equipped with the valve, the drain should be vented according to the following rules:
  - 5 to 10 such dwelling – conventional ventilation to be provided at the head of the system.
  - 11 to 20 such dwellings – conventional ventilation to be provided at the mid-point and at the head of the system.
  - All domestic supply and space heating pipework is to be “thermoplastic” with demountable or slim-line fittings to the British Standard, except in exposed locations above floor level and visible in airing cupboards containing the hot water cylinder where it is to be copper to the British Standard, of British manufacture with compression or brass push fit fittings.

### 11.5 Hot Water Supply

- Baths to incorporate a thermostatic blending valve (ideal Standard Bath Thermostatic Valve – S7436AA) or similar approved to ensure the temperature of the water delivered to the bath does not exceed 48oC.
- Valve to be fitted below the bath behind the bath panel.

### 11.6 Water Consumption

- Estimated water consumption to be set at 110 litres/person/day.
- Water consumption calculations should be provided to building control on request per plot. However, as an alternative, the fittings approach may be used. To comply with the fittings approach the flow rates of water fittings provided cannot be exceeded as per the values in the table below. If exceeded, consumption must be calculated to demonstrate compliance.

Water Fitting	Maximum Consumption
WC	4/2.6 litres dual flush
Shower	8 l/min
Bath	170 litres
Basin taps	5 l/min
Sink Taps	6 l/min
Dishwasher	1.25 l/place setting
Washing Machine	8.17 l/kilogram

### 11.7 Space & Domestic Hot Water Heating

- **Gas and electric Central heating systems** - shall be designed, installed and commissioned by competent persons in accordance with Approved Document L1a of the building regulations, second tier document “Domestic Heating compliance guide”. Boilers should be specified to have a SEDBUK rating of A with a minimum SEDBUK efficiency of 89.0% or better (SAP 2009 figures). NOx to be class 5 and have emission of less than 40mg/kWh. External design temperature to be based on –3 degrees (internal room temperatures and air changes as per house type heating designs) as required by Premier Standards. Additionally, the following provisions should be noted:
  - **Un-vented hot water systems** - Discharge pipes from un-vented cylinders may be connected to a suitably located SVP via a Premier approved 40mm diameter “self-sealing waste valve” provided the tundish and valve are visible to inspection, otherwise discharge pipes must be fitted in accordance with the building regulation G.3 and the D.2 discharge pipe work-sizing chart, terminating below a fixed grating, of a trapped gully. Any variation from this specification should be discussed with the building control officer before installation. Indirect approved stainless steel or copper hot water storage cylinder and expansion vessel manufactured to British Standards.

A 3kw immersion heater is to be included.

- **Gravity fed, open vented systems** – to be installed where there is insufficient mains pressure to support an un-vented system. Cold water storage cisterns should have the capacity specified in the design and be supported in the roof space in accordance with Premier Standards. A cold mains water supply to be taken to all sinks.
- **Condensing Boilers (houses with 2 or more bathrooms)** – Wall mounted for open vented and sealed system applications. They should be located in accordance with the manufacturer's installation manual requirements. Condensate boilers require an appropriate waste pipe connection from the condensate drain.
- **Combi Condensing Boilers (houses and apartments with single bathroom)** – for sealed systems, complete with pump and expansion vessel and safety discharge valve.
- **Combi Condensing Boilers (houses and apartments with 2 bathrooms) – Electric shower** to be specified to the en-suite in this situation to comply with the required flow rates laid down by Premier.
- **One box systems (2 bathroom apartments)** – comprising boiler to the above specification and integral stainless steel mains pressure hot water store and pump and programmer all combined in one unit. Discharge pipes must be fitted in accordance with the building regulation G.3 and the D.2 discharge pipe work-sizing chart, terminating below a fixed grating, of a trapped gully. Any variation from this specification should be discussed with the building control officer before installation.
- **Controls** – In accordance with the **Domestic Building Services Compliance Guide 2010 Edition**, dwellings up to 150m<sup>2</sup> should be divided into at least 2 space heating zones with independent temperature control, one of which is assigned to the living Area. Dwellings over 150m<sup>2</sup> should be provided with at least 2 space heating zones each having separate timing and temperature controls. Zone control by provision of thermostatic radiator valves to each room except that containing the thermostat. 2 on 2 off 7 day programmer for space and water heating. Boiler control interlocks should operate when no heat is called for. **Delayed Start Programmable thermostat** – may be specified as required by the SAP calculation (check heating designs).
- **Weather compensation** – should be supplied as standard but is subject to system and product design.
- **Commissioning** - In accordance with Approved Document L1a of the Building Regulations and second tier document "**Domestic Building Services Compliance Guide 2010 Edition**".

## 11.8 Cylinders & Cupboards

- **Indirect open vented copper hot water cylinder or indirect sealed system** - capacity dependant on demand requirements (see design drawings) shall be positioned 50mm clear of the floor on bearers. See individual heating drawings for cylinder capacity. 0.5 square metres of shelving to be provided and at least 500mm clear space above. Immersion heating switch to be located in cupboard. 225 x 150mm grille at high level above door (should not vent onto landings in 3 storey houses).
- **Combined units:** The compartment must be ventilated in accordance with manufacturer's instructions. Any vents to be intumescent air transfer grills in a door. The compartment shall be a fixed rigid structure large enough to allow it and the boiler to be inspected and serviced. A minimum width between door jambs of 560mm must be provided. Internal surfaces should be non-combustible or lined with non-combustible material. Examples of non-combustible materials having a fire resistance of not less than ½ hour are plaster skimmed plasterboard and fireproof boarding. The floor need not be lined. Doors or shelves made from combustible material, e.g. Wood must be at least 75mm from the front or top of the boiler. The flue pipe must be protected by the ducting supplied by Potterton or by another no less suitable non-combustible enclosure.
- Householders should be discouraged from storing clothes etc. on the boiler itself. A removable shelf at least 75mm above the boiler is acceptable.

## 11.9 Gas Installation

- All gas work must be carried out by a registered gas installer (Gas Safe Registered engineer), with a valid gas certificate under the codes of practice (A.C.O.P.S) or nationally accredited certificate scheme (A.C.S.) for individual gas operatives and the relevant British Standard (see below).
- All work must be gas soundness tested in accordance with GAS Safe regulations at first and second fix stages.
- CO alarms must be provided to all Dorchester Living properties where gas appliances are present which includes boilers, hobs and fires. This may result in multiple alarms being placed throughout the property.
- CO alarms are to be of the Honeywell H450EN battery operated models. Alarms must be installed in accordance with the manufacturer's instructions provided with each alarm but are typically located on the wall at a height greater than the height of any door or window but at least 150mm from the ceiling. The CO alarm should be at a distance of between 1m and 3m from the potential source (in this case the gas appliance). Each alarm must be left operational once installed.
- In all cases the Gas Safe Registered engineer must confirm the number and location of the alarms to be installed and insert the appropriate fixing supplied.
- Extended Gas Flues – In accordance with the Dorchester Living guidance the use of extended gas flues is not permitted within properties and alternatives must be explored where these are proposed. The preference will be for wall mounted gas boilers unless alternative space and domestic water heating system options are proposed such as electric or district heating systems. All Dorchester Living standard house types do not show extended gas flues and this must remain.
- Where the use of extended flues is considered unavoidable, the Dorchester Living Build Manager must be contacted to see if alternatives are available. In the event that no alternative is available and extended flues have been designed then a full risk assessment must be produced which clearly outlines the process undertaken and alternatives considered when formulating the final decision and what protective and inspection regimes you have put in place. All information must be provided and approved in accordance with the Dorchester Living guidance
- Extended flues must be accessible for visual inspection along their route. Full guidance on this can be found in Approved Document J and the Gas Safe Technical Bulletin TB008 Edition 2.1
- "Room-sealed fanned draught chimney/flue systems concealed within voids". In any event the Gas Safe Registered Engineer must be consulted on the design and agree the location of any panels where required. General notes are as follows:
  - It is not intended that additional provision for inspection should be provided for short flue sections passing directly through an external wall
  - Open flues are not covered by this bulletin and separate guidance should be sought.
  - It is necessary for means of access to be provided at strategic locations so that the flue system can be visually inspected along its route. The means of access should allow for visual inspection to be achieved for the entire length of the flue system, including any separately routed air supply pipe, particularly where there are deviations or joints and supports. It is not envisaged that means of access is provided at every joint, deviation or support but that it can be visually inspected in some way. Please refer to Part J and Gas Safe TB008 Edition 2.1 for exact guidance.
  - The access provided needs to be min 300mm x 300mm (clear aperture) to allow for visual inspection of the entire length of the flue. It is not intended to allow physical access to the flue system for example to carry out maintenance.
  - Location of the means of access and inspection should be decided upon through liaison with the Gas Safe registered business installing the flue system. This may be on a property by property or site by site basis until such time that a generic detail is produced.
  - Inspection Hatches must be appropriately fire and acoustically rated for their location which may vary dependant on property type and where or how installed.

## 11.10 Reference Material

### Building Regulations

Approved Document G (Sanitation, Hot Water & Water Efficiency)

Approved Document H (Drainage & Waste Disposal)

Approved Document J (Combustion Appliances & Fuel Storage Systems)

Approved Document L1A (Conservation of Fuel & Power {New Dwellings})



### **Other Regulations**

Gas Safety (Installations and Use) Regulations 1998  
Gas Safe Technical Bulletins in particular TB008 Edition 2

### **Premier Technical manual – V10**

Chapter 9.4 – Heating and mechanical services  
Internal services where plastic pipework is in or behind wall surfaces and would otherwise not be located by a metal detector or similar equipment, a metallic tape should be applied to the pipework. Combination boilers should be limited to homes with one bathroom.  
Minimum storage capacities of cylinders required dependant on number of baths / showers.  
Minimum design flow rates required for hot water services.  
Access shall be provided to all roof voids containing water services (not water pipes)

### **Manufacturers Data**

**BBA CERTIFICATE 89/2206 FOR POLYPIPE UNDERGROUND DRAINAGE SYSTEM SEE APPENDIX REFERENCE 11**  
Compliance with the requirements of TB008 and other associated Gas Safe Bulletins

### **Codes of Practice & BS EN Standards**

BS 4514: Specification for PVC-U soil and ventilating pipes, fittings and accessories  
BS 4576: PVC-U rainwater goods and accessories. Half-round gutters and pipes of circular cross-section  
BS 5955 Pt 8: Specification for the installation of thermoplastic pipes and associated fittings  
BS 5449 Pt1 & EN 442: Central heating for domestic premises  
BS 7206: Specification for un-vented hot water storage units and packages  
BS1566: Copper indirect cylinders for domestic purposes. Open vented copper cylinders. Requirements and test methods  
BS 8000 Pt13: Workmanship above ground drainage and sanitary appliances  
BS 8000 Pt15: Workmanship hot and cold water services  
BS 6891: Specification for installation of low pressure gas pipework of up to 28mm in domestic premises  
EN 1329 – 1 – 110mm & 160mm PVC-U soil pipe fittings & PVC – mu fittings  
BS 5627 – Pan Connections  
EN 1451 – 1 – Polypropylene push fit waste pipe & fittings (BS 5254)  
EN 1455 – 1 ABS solvent weld waste pipe fittings (BS 5255)  
EN 1566 PVC – MU waste pipes (BS 5255)  
BS 3943 – Waste traps

# 12. Doors & Windows

## 12.1 General

- External door and windows styles to be limited to those within the Standard Detail packs unless dictated by planning.
- Standard opening sizes should be in accordance with the Standard Details
- Secured by design is not included as standard but where required under planning or HCA requirements reference should be made to Secured By Design New Homes 2010 section 0.2 Physical Security ([http://www.securedbydesign.com/pdfs/SBD\\_New\\_Homes\\_2010.pdf](http://www.securedbydesign.com/pdfs/SBD_New_Homes_2010.pdf))

## 12.2 Entry Doors

- **Steel Entry Doors** - constructed using hot dipped galvanized 24 gauge steel faces (factory primed for onsite painting) with an insulated core of rigid polyurethane (thermal transmittance value of complete door to be not greater than 1.5 w/m<sup>2</sup>K).
- Door Styles to be selected from the Dorchester Living Product Range.
- Timber stiles, head and bottom rails.
- Factory fitted double glazed units to be fitted and sealed into the door (clear glazed). Glazing to be laminated glass except on door styles D02 and D41.
- The doors to be pre-hung at works (unless handling weights become an issue) into traditional timber frames and fitted with a proprietary weather seal threshold system (aluminium with gold effect finish) suitable for mobility access requirements to principle entrance and non-mobility version to secondary entrance.
- Main Entrance door to be fitted with a multi-point locking system with a key/thumb-turn cylinder. Additional ironmongery to consist of Double sided sleeved letter plate, eye viewer and door chain.
- Rear Entrance doors to be fitted with mortice sashlocks to BS3621, face fixed levers and keyed security bolts.
- Internal Apartment Entrance Doors to be 1/2hr fire rated (FDE01 style) and be fitted with Euro profile mortice sashlock to BS3621, face fixed Euro profile levers, Key/thumb-turn cylinder, overhead closer, eye viewer and door chain.
- **GRP Doors** - constructed using 2 GRP skins (approx 2mm) with an insulated core of rigid polyurethane (thermal transmittance value of complete door to be not greater than 1.6 w/m<sup>2</sup>K).
- Door Styles to be selected from the Dorchester Living Product Range.
- Timber stiles and head rail with a PVC bottom rail.
- Factory fitted double glazed units to be fitted and sealed into the door (clear glazed). Glazing to be laminated glass except on door styles D02 and D41.
- The doors to be pre-hung at works (unless handling weights become an issue) into traditional timber frames and fitted with a proprietary weather seal threshold system (aluminium with chrome effect finish) suitable for mobility access requirements to principle entrance and non-mobility version to secondary entrance.
- Main Entrance door to be fitted with a multi-point locking system with a key/thumb-turn cylinder. Additional ironmongery to consist of a double sided sleeved letter plate, eye viewer and door chain.
- Rear Entrance doors to be fitted with mortice sashlocks to BS3621, face fixed levers and keyed security bolts.
- Internal Apartment Entrance Doors to be 1/2hr fire rated (FDE01 style) and be fitted with Euro profile mortice sashlock to BS3621, face fixed Euro profile levers, Key/thumb-turn cylinder, overhead closer, eye viewer and door chain.

### Secured by Design

- When secured by design requirements are sought doors should have the following changes made to the specifications for both steel and GRP doors:
  - Composite stiles, top and bottom rails



- Key/thumb-turn anti-tamper cylinder (front doors)
- Security cowl to letter plates
- Key/key anti-tamper cylinder (rear doors)

## 12.3 PVC U windows

### 12.3.1 Frames

- High impact modified white PVC-U frames. 59 – 62mm multi-chamber outer construction with aluminium or galvanised steel reinforcement to transoms and mullions and galvanised reinforcement to outer frames where appropriate to provide added strength (bay window corners for example to transfer roof load). Outer frame fully welded, transoms and mullions mechanically jointed or welded to provide a strong and durable, watertight construction. Frames manufactured with concealed drainage. Weather seals to openings tested to severe weather rating.
- Cills are factory fitted and sized to suit set back of frame and sub-cill detail – refer to Construction details and cross-reference with Architects “External features schedule” for each site. The window manufacturer should ensure they have this information to hand together with a copy of the latest site layout plan indicating the handing of plots together with a signed off copy of the PVC-U suppliers “Checklist” of regional requirements.
- Cill profile acceptors to receive 25mm MDF internal boards.
- Each and every frame should have the appropriate BS or BBA certification reference clearly visible

### 12.3.2 Glazing

- Factory glazed 24mm glass units. Obscure glazing to all rooms containing sanitary fittings. Toughened glass to locations required to meet with Building Regulations ADM
- Houses/Apartments specification: The thermal transmittance value to be not worse than 1.4 w/m<sup>2</sup>K ‘B’ rated for a typical sized window and a BFRC rating no worse than 0.43. Manufacturer to confirm compliance with the ‘U’ value and rating. All figures to be supplied by the manufacturer (g glass, g window, solar trans etc) for SAP calculation purposes.
- Roof lights: The thermal transmittance value to be not worse than 1.4 w/m<sup>2</sup>K for a typical sized window to match the remainder of the dwelling.
- Each and every glazed unit should have the appropriate BS Kitemark (on the glazing bar) permanently marked.

### 12.3.3 Background Ventilation

- The amount of background ventilation will be dependent on the ventilation strategy proposed for the particular development which may be dictated by planning/physical constraints.
- Air Leakage rates, both design and actual, also have an influence on the amount of background ventilation required for any one solution. These must be carefully considered when formulating the ventilation strategy.
- For our standard range a System 3, decentralised continuous extract solution will be employed to limit potential design changes that may have to be made dependent on air leakage rates.
- Background Ventilators, in accordance with the system 3 approach, having a minimum equivalent area of 2500mm<sup>2</sup> should be fitted in each room, except wet rooms from which air is extracted.
- It is noted that background ventilation can be omitted for dwellings leakier than 5m<sup>3</sup>(h.m<sup>2</sup>) @ 50Pa. This approach is not recommended due to variation in air leakage test results.
- Equivalent area performance should comply with BS EN13141-1:2004 (clause4) and be clearly marked on the product.
- Background ventilators should be located to avoid draughts e.g. typically 1.7m above floor level
- Purge ventilation should be calculated in accordance with Appendix B of the approved document. Please note the change in requirement depending on the opening ability of the window.
- Where room requiring purge ventilation is not on an external wall reference should be made to

paragraphs 5.14 to 5.16 and Appendix B of Approved Document F which requires hinged or pivot windows that open 30° or more to have an opening part of at least 1/20<sup>th</sup> of the floor area of the room. For windows that open less than 30° reference should be made to the appendix.

- In noisy areas it may be necessary to use either sound attenuating background ventilators or mechanical ventilation solutions depending on the noise level and any planning conditions. Manufacturers are required to provide options to these situations as requested.
- Automatic opening vents may be required in common areas.
- Manufacturers are required to produce the appropriate background ventilation table for compliance with the Building Regulations in accordance with the ventilation strategy
- Details of background ventilation to be added to all working drawings.

#### 12.3.4 Ironmongery and Security

- Opening lights to be hung on stainless steel friction hinges concealed in frame rebates giving easy clean facility (min 95mm between frame and casement). They are to have multi-point espagnolette locking head system with mushroom head bolts for high security.
- Die-cast handles with cylinder locking (except to escape windows) are to be factory fitted as standard.
- Windows shall conform to Premier security requirements and where requested be produced to the “Enhanced Security” requirements of the British Standard.

#### 12.3.5 Fitting

- PVC-U building in profile / cavity closer system (25 mm ‘IN – CHECK’) used to form opening in masonry cavity walls during construction. Made from extruded profiles formed into a template with welded corners at the cill or threshold and an optional overhead ventilator at the head and complete with EDPM window stop gasket to suit minimum setback. All supplied fully assembled, ready to be built in on site.
- Cavity closers to be insulated to aid thermal bridging factors.
- Windows are to be supplied with the requisite fixing cleats and head fixing ties. A reveal stop is required (fitted to the closer) for frames in a check reveal or those located in rendered elevations. Internal plaster stops are not required. The sub-frame is to be manufactured to suit the exact brickwork opening; the window to be fitted is to be exactly sized to give the manufacturers required clearance. The sub-frame is to be built in as work proceeds in accordance with the BBA Certificate procedure and will eliminate the need to fit a conventional vertical and horizontal DPC to the opening.

#### 12.4 Internal Doors

- **Standard Doors:** to be 35mm thick hot pressed light duty hollow core doors to suit size and height noted on the working drawings. Doors to be typically 4 panel but reference should be made to the sales specification.
- Door kits to be used throughout to ensure consistency of installation and will consist of 25mm thick linings of width to match the wall thickness within which the opening is situated.
- To ensure good transfer of air though the dwelling, there should be an undercut of minimum area 7600mm<sup>2</sup> in all internal doors above the floor finish. This is equivalent to an undercut of 10mm for a 760mm wide door. This should be achieved by making an undercut of 10mm above the floor finish if the floor finish is fitted or by 20mm undercut above the floor if the finish has not been fitted.
- **Fire Doors:** Provide FD 30 fire doors, 44mm thick, at every storey level opening onto a fire protected escape route (landings / hallway). Ensure 30 minutes fire rated construction is maintained in the floor zone above partitions separating rooms from the escape route, fire doors may be omitted from bathrooms but must be fitted to storage areas.
- Fire ratings for fire door assemblies are given in minutes and prefixed by the letters “FD”.
- Door leaf must have a full test report to the British Standard and have BWF Certifier

Accreditation. The complete fire door assembly, including its frame, intumescent seals, hinges, glazing and ironmongery must perform to the British Standard. Current certification for Dorchester Living door kits is "BWF CERTIFIRE CAF 109 D0224339"

- Reference should be made to Approved Document B1 appendix B for appropriate fire door testing requirements and relevant BS/EN standards.
- The door assembly must carry a permanent and tamper evident label.
- The manufacturer's specific and comprehensive installation instructions must be followed.
- 1½ pair 100 x 76 x 3mm stainless steel ball bearing hinges to the British Standard to be fitted per door leaf.
- Approved concealed door closer (single chain) to be fitted into mid rail of door between a house and integral garage and apartment entrances (double chain). Common escape (stairwell and smoke lobby doors) are to be fitted with 60Kg brass overhead door closers, all meeting the British Standards. Smoke seals may be required between a house and integral garage if the test results do not comply with BS EN 12101 -6:2005. Self-closing devices are NOT required to internal doors (within a dwelling) opening onto an escape route.
- MDF linings require intumescent seals on 3 edges.
- To ensure good transfer of air throughout the dwelling there should be an undercut of a minimum area 7,600mm<sup>2</sup> in all internal doors above the floor finish (equivalent to a 10mm undercut to a 760mm door). Notwithstanding the above the maximum allowable threshold gap below a fire door should not be exceeded (8mm unless otherwise stipulated by the fire certificate).

## 12.5 Reference Material

### Building Regulations

Approved Document K (protection from falling)

Approved Document B Fire safety (escape windows)

Approved Document F (Ventilation)

Approved Document N (Glazing, in relation to impact, opening and cleaning)

### Premier Technical Manual V10

Chapter 1 – Tolerances-1.5 Doors and Windows

Chapter 7 – 7.4 windows and doors

### Manufacturers Data

Unique Window Systems - BBA CERTIFICATE 05/4231 SEE APPENDIX REFERENCE 12

IAN FIRTH - KITEMARKING LICENSE KM 647663 SEE APPENDIX REFERENCE 13

### Codes of Practice & BS EN Standards

BS 7412 / 7413 - Manufacturing compliance

BS EN 1279:2002 - Specification for hermetically sealed flat double glazed units and BS 6262 1982

BS 7950: Enhanced security (when specifically requested)

BS 6375: Air permeability 600 Pa. Water tightness 300 Pa. Wind resistance 200Pa.

BS EN 1670: Class 4: Corrosion resistance.

BS 5925 – Ventilation principles and designing for natural ventilation

# 13 Screen Walls and Fencing

## 13.1 General

- This section deals with Screen Walls and Fences which include the incorporation of gates whether electric or manual
- The design of screen design of screen walls and fences will be subject to site specific design principles but must be considered against H&S

## 13.2 Free Standing Walls

- Free standing walls must take account of ground conditions and exposure zones for any given development.
- Foundations to designed by a suitably qualified & approved person and will be subject to site conditions and constraints.
- Free standing walls are typically 1800mm above ground level but must be designed to take account of varying exposure zones to avoid the potential for collapse and possible crush injury. Walls above ground level must therefore be checked and approved by a suitably qualified & approved person and will be subject to site conditions and constraints.
- Allowance must be made for expansion joints within free standing walls based on material used. Locations to be marked on external works or similar approved plans. Expansion joints to be taken through the coping.
- Where fence panel are located between screen walls the fixing and potential wind loading must be taken into account to avoid unnecessary collapse and designed by a suitably qualified & approved person.

## 13.3 Fences

- Fences will be provided as shown on the external works layout or similar approved plans and will be typically 1800mm high close board fences to rear boundaries.
- For plot divisions this will be typically 1800mm high panel fences. All fences to be preservative treated.

## 13.4 Low Level Walls

- Low wall typically of 600mm in height must have foundations designed by a suitably qualified & approved person and will be subject to site conditions and constraints.
- Type and design of low level walls to be in accordance with the external works layout or similar approved plans.
- Expansion joints to be inserted into low level walls based on the materials used. Locations to be marked on external works or similar approved layouts
- Where low level walls incorporate railings or similar structures above they must be suitable in design so as to prevent injury (railings with spikes should be avoided) and be appropriately fixed. Fixing details to be in accordance with structural engineers calculations.

## 13.5 Designing Electric Gates

When designing, constructing, installing and/or commissioning electrically powered gates, or where managing sites where electrically powered gates exist, Dorchester Living must ensure so far as is reasonably practicable that:

- They have undertaken a suitable and sufficient risk assessment to identify any hazards and associated risks to persons using the gates. This should include but is not limited to consideration of

the following;

- i. The identification of any trapping and/or crushing zones where employees or persons not in your employment (such as contractors or members of the public) may become trapped and injured;
  - ii. The identification of ways in which safe operating systems (such as key-pad or key-fob systems) may be defeated or by-passed and place employees, non-employees (such as contractors), or members of the public at risk. This is particularly relevant where children, members of the public, or persons not familiar with the safe use of any installation have access to electrically powered gates and may not recognise a risk to their safety;
  - iii. The identification of ways in which persons may be harmed by the gates should they be activated automatically, or by another person (for example, by a sensor under the road surface activating a gate when a car drives over it, or by a remote button or key fob pressed by a third person);
  - iv. Risk assessments should be undertaken as early as possible. Undertaking a risk assessment at the design phase will allow an opportunity to design out risks at an early stage;
  - v. Any design changes should be subject to a revised risk assessment to ensure the changes have not introduced new hazards or risks;
  - vi. Where more than one organisation is involved in the design, construction and installation of the gates their input into the risk assessment process should be sought. This will aid the risk assessment process, drawing on and sharing expertise and knowledge of best practice from different professions (such as metalwork fabricators and electricians with experience of installing electrically powered gates);
  - vii. When the installation is complete, a final risk assessment should be undertaken
- They have eliminated and/or controlled any risks identified from the risk assessment(s). Wherever possible risks should be eliminated, but where they need to be controlled technology such as fixed guards, pressure sensitive strips, safety sensor flooring, light barriers or infra-red detectors may help control and/or reduce the risk, but consideration needs to be given to how a person may still be harmed if one of these systems fail;
  - Where two or more employers and/or self-employed persons (such as contractors) are involved in work surrounding the gates there must be effective co-operation and co-ordination between work activities. Ensuring there is effective communication between different organisations will help ensure that hazards and associated risks from the various build phases are continuously identified and controlled;
  - Dorchester Living should satisfy themselves that the contractor is sufficiently competent to carry out the work that is asked of them. Their work should be periodically monitored and reviewed;
  - Any component parts (such as motors and motor arms) supplied by separate manufacturers should be installed in accordance with the manufacturers guidance, and used in accordance with their instructions for use;
  - Where the gates are defined as a machine under the Supply of Machinery (Safety) Regulations 2008 a conformity assessment must be undertaken by a responsible person prior to their use, and a technical file compiled. Any information or instructions required on how to operate the gates should be made available to the person(s) or organisation that the gates are produced for. An EC declaration of conformity should be produced, and the gates CE marked; one way of achieving this is to follow EN12635 from the outset of the project.
  - Persons adopting the responsibility for the management and maintenance of the gates should be provided with the appropriate safety documentation, instructions for use, and training in how to operate and maintain the gates safely. Persons using the gates regularly should be given appropriate information, instruction and training on how to operate them safely;
  - Regular reviews or assessments are undertaken to ensure that the gates are maintained in a safe condition.

## **13.6 Designing Manual Gates**

When designing, constructing, installing and/or commissioning manual gates, or where managing sites where gates exist, Dorchester Living must ensure so far as is reasonably practicable that:

- They have undertaken a suitable and sufficient risk assessment to identify any hazards and associated risks to persons using the gates. This should include but is not limited to consideration of the following;
  - i. The identification of any trapping and/or crushing zones where employees or persons not in your employment (such as contractors or members of the public) may become trapped and injured;
  - ii. The identification of ways in which persons may be harmed by the gates should they be opened or closed inadvertently, for instance by the wind, or by another person);
  - iii. Risk assessments should be undertaken as early as possible. Undertaking a risk assessment at the design phase will allow an opportunity to design out risks at an early stage;
  - iv. Any design changes should be subject to a revised risk assessment to ensure the changes have not introduced new hazards or risks;
  - v. Where more than one organisation is involved in the design, construction and installation of the gates their input into the risk assessment process should be sought. This will aid the risk assessment process, drawing on and sharing expertise and knowledge of best practice from different professions (such as metalwork fabricators);
  - vi. When the installation is complete, a final risk assessment should be undertaken
- They have eliminated and/or controlled any risks identified from the risk assessment(s) Wherever possible risks should be eliminated, but where they need to be controlled such consideration should be given to space from post/pillar and hinge type to be installed to prevent entrapment;
- Where two or more employers and/or self-employed persons (such as contractors) are involved in work surrounding the gates there must be effective co-operation and co-ordination between work activities. Ensuring there is effective communication between different organisations will help ensure that hazards and associated risks from the various build phases are continuously identified and controlled;
- Dorchester Living should satisfy themselves that the contractor is sufficiently competent to carry out the work that is asked of them. Their work should be periodically monitored and reviewed.

## 13.7 Reference Material

### **Building Regulations**

Not covered for free standing walls

### **Premier Technical manual V10**

Chapter 1 – Tolerances – 1.8 – External Works

Chapter 11 – External Works – 11.1 – Paving & driveway

### **Manufacturers Data**

Site storage and assembly instructions

BS 5628: Code of practice for the use of masonry

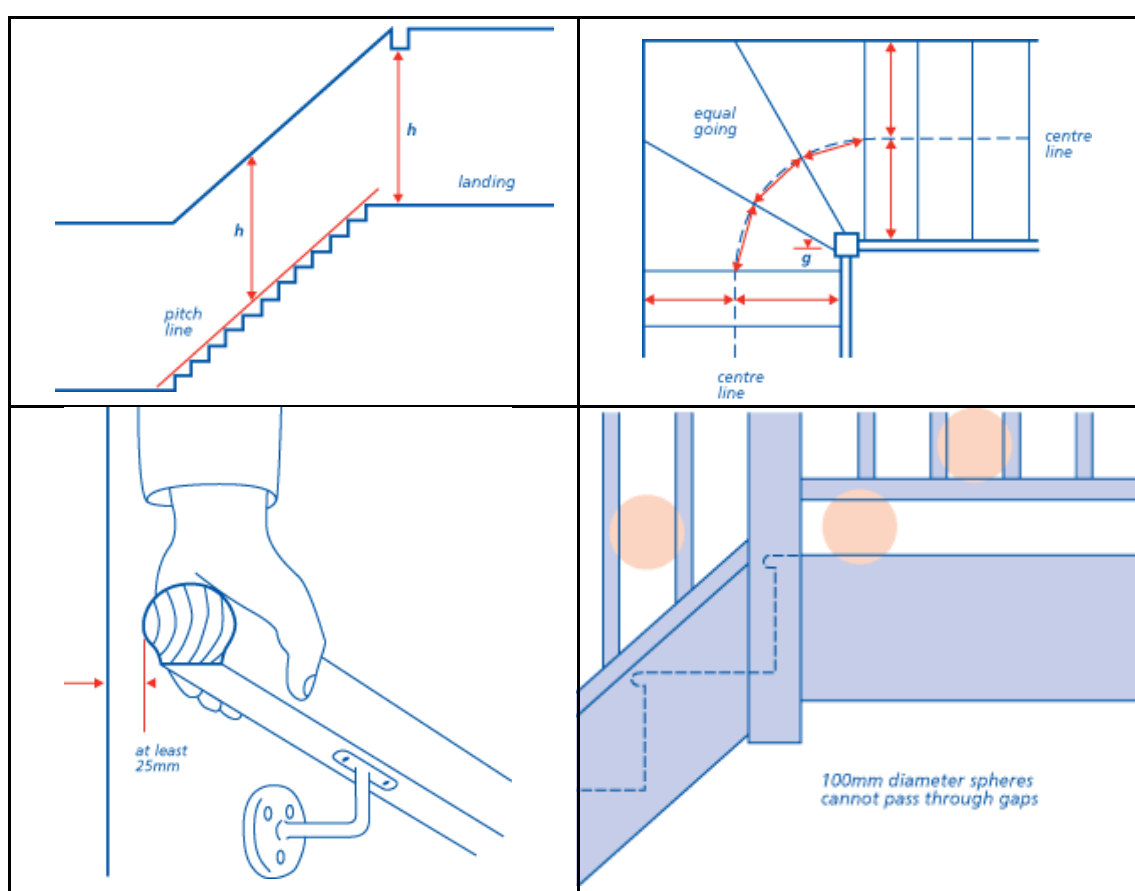
BRE: Good Building Guide 14 – Building Brick or blockwork free standing walls

# 14 Additional Items

## 14.1 General

- This section deals with items that do not fall easily into other categories but play an important part in the construction of the dwellings.
- For limiting Thermal Bridging and Air Leakage Seal with a flexible sealant between stair strings and plasterboard.
- Due to changes in VOC legislation premature yellowing has occurred using solvent based paints. Along with reduced air leakage rates and further changes to the legislation proposed it is recommended to change to a water based acrylic paint all in accordance with manufacturers details.

## 14.2 Staircases Houses



- Staircase construction should comply with the British Standard. The pitch and rise should be consistent to each flight (max rise 220mm min going 220mm) and a pitch of not more than 42 degrees. A headroom of 2m (h) is required measured at the pitch line. There is no requirement for the width of stair and reference should be made to the house type staircase details for dimensions and storey heights.
- Landings should be provided at the top and bottom of every flight and the width and length should be at least as great as the width of the flight. A door may swing across a landing providing it leaves a minimum of 400mm clear space across the full width of the flight.
- For tapered treads, the going measured at the centreline should not be less than the straight flight and be at least 50mm (g) at the narrow end.
- Stairs should have at handrail on at least one side and should afford safe passage. Double

newels at winder locations are not permitted. Handrails should be between 900 and 1000mm high and balusters spaced so as not to allow a 100mm sphere to pass through at any point.

### 14.3 Decoration (internal)

#### Surface Preparation

- Architraves, Skirtings, Window Boards and Door Linings will be pre-primed MDF.
- MDF surfaces should be de-nibed using either a fine grade Scotch Brite Pad (grey) or a fine grade abrasive paper. Do not polish or break the surface of the base coating.
- All minor defects in the Walls, Ceilings and MDF surfaces are to be filled with fine surface filler. Do NOT use decorator caulk.
- Bare Smooth Planed Timber (PSE). Remove all excess resin from live knots and other resinous areas with a hot air paint stripper, wipe immediately with methylated spirit and apply two coats of "knotting".
- Localised damage or deterioration due to exposure of factory based coatings for longer than four months, must be treated with a primer suitable for the chosen paint system.
- All surfaces must be clean, dry and free from any other substance that will interfere with the application of the finishes.
- Prior to painting the moisture content of the surfaces to be decorated should not exceed 18%.

#### Walls & Ceilings

- Walls and Ceiling surfaces require stabilising, either with a coat of thinned paint or with a sealer recommended by the manufacturer and are then to receive two full coats of Crown Trade Covermatt Emulsion (or other in accordance with the current group agreement at the time) to prepared sound and clean surfaces. Allow a minimum of four hours drying time between coats under normal drying conditions.

#### MDF and PSE timber

- MDF surfaces are to receive one full coat of Crown New Build Acrylic Primer Undercoat Water-Based and two full coats of Crown New Build Acrylic Gloss Water-Based (or other in accordance with the current group agreement at the time). Allow adequate drying time under normal conditions between applications (acrylic primer requires 2 – 3 hours drying time). Repair any surface blemishes between coats in accordance with the Surface Preparation Specification above.
- PSE timber following preparation is to receive one coat of Crown New Build Acrylic Primer Undercoat Water-Based followed by two full coats of Crown New Build Acrylic Gloss Water-Based (or other in accordance with the current group agreement at the time). Allow a minimum of four hours drying time under normal drying conditions between applications. Repair any surface blemishes between coats in accordance with the Surface Preparation Specification above.
- External Softwood Door Frames (Factory Primed). Apply one coat of Crown New Build Acrylic Primer Undercoat Water-Based followed by two full coats of Crown New Build Acrylic Gloss Water-Based (or other in accordance with the current group agreement at the time). Allow a minimum of four hours drying time under normal drying conditions between applications.
- **Do not apply** when temperatures are likely to fall below 8°C or when the relative humidity is above 80% during application or the drying period
- Acrylic paints must be applied with a good quality synthetic brush. Pure bristles brushes will absorb moisture which can cause excessive brush marks.

### 14.4 Tiling

#### Wall Tiling

- All tiles are to be fixed using a proprietary waterproof adhesive and mould resistant waterproof grout. Wall tiles in shower enclosures are to be bedded on a solid bed and NOT A KEYED BED. All excess grout to be cleaned off and a tool finish applied to all joints. Tiling to be taken over the



lip of shower trays when they have them. If electrical fittings and radiators are removed during the course of the works, they are to be re fixed immediately after completing grouting. Wall tiling heights are as indicated on the house type drawings and to be carried behind all fixtures and fittings except kitchen and bathroom units.

- Alternative fixing may be suggested by the manufacturer. In this instance guarantees must be obtained from contractor and supplier.

#### **Floor Tiles on Screeds**

- Screeds should be completely cured to allow for any shrinkage before tiling. Solid bed fixing is vital using a notched trowel and if necessary 'back buttering of tiles' to ensure no voids are left behind the tiles. It is recommended that a bed of adhesive between 3 and 6mm be applied to the screed. Once the adhesive has dried, normally after 24hrs, grouting may take place. Either ready mixed or cement based grout can be used.
- Alternative fixing may be suggested by the manufacturer. In this instance guarantees must be obtained from contractor and supplier.

#### **Floor Tiles on Timber**

- Check floorboards are securely fixed as before described. Plywood of a minimum thickness of 15mm should then be laid over and secured at 300mm centres with additional fixings at the edges. It is recommended that the area to be tiled is then primed and left to dry. The same solid bed fixing method should then be carried out as above. If a normal cement based adhesive is to be used, it is recommended that an admix be added to increase bonding. Alternatively a flexible grout could be used. Grouting can normally take place 24 hrs after fixing.
- Alternative fixing may be suggested by the manufacturer. In this instance guarantees must be obtained from contractor and supplier.

### **14.5 Lifts & Mobility Requirements**

- Where a lift is provided it should be suitable for an unaccompanied wheelchair user. Measures should also be adopted which give a disabled person sufficient time to enter the lift to reduce the risk of contact with closing doors:
- Minimum load capacity of 400kg.
- Has a clear landing at least 1500mm wide and at least 1500mm long in front of the entrance.
- Has a door or doors which provide a clear opening of at least 800mm.
- Has a car of sufficient space by test evidence or experience in use to be suitable for an unaccompanied wheelchair user.
- Has car and landing controls which are not less than 900mm nor not more than 1200mm above the landing and the car floor and a distance of at least 400mm from the front wall.
- Is accompanied by suitable tactile indication on the landing and adjacent to the lift buttons within the car to confirm the floor selected.
- Incorporates a signalling system which gives visual notification that the lift is answering a landing call and a "dwell" time of 5 seconds before its doors begin to close after they are fully open. The system may be overridden by a door re-activating device which relies on appropriate electronic methods but not a door edge pressure system; provided that the minimum time for a lift door to remain fully open is 3 seconds.
- When the lift serves more than 3 storeys, incorporates visual and audible indication of floor reached.

## 14.6 Reference Material

### **Building Regulations**

Approved Document M (Access to and use of Buildings)

### **Premier Technical Manual V10**

Chapter 1 –Tolerances, 1.5, Doors and Windows, 1.6 - Skirting's, 1.7 – Finishes and Fitted Furniture

Chapter 8 – Superstructures, (internal), 8.3 – Stairs

Chapter 10 – Finishes 10.1 – plasterwork, 10.2 – Second/3<sup>rd</sup> fix finishes

### **Manufacturers Data**

Site storage and assembly instructions

### **Codes of Practice & BS EN Standards**

BS 585: Wood stairs. Specification for performance requirements for domestic stairs constructed of wood-based materials

BS 8000 Pt11: Workmanship floor and wall tiling

# List of References

1. **COMBINED THERMAL SOLUTIONS LTD (LITECAST) TDECK EPS PANEL SYSTEM - BBA CERTIFICATE 06/4369.**
2. **CELCON STANDARD AND HIGH STRENGTH GRADE BLOCKS - BBA CERTIFICATE 01/3816**
3. **4N/mm<sup>2</sup> XELLAR YTONG FOUNDATION BLOCK - European Standard EN771-4 & Premier email dated 19/01/2018**
4. **BIRTLEY LINTELS – ALL LINTELS ARE CE MARKED.**
5. **SUPAFIL KNAUF INSULATION - BBA CERTIFICATE 11/4857**
6. **WEBER PRAL MONOCOUCHE RENDERS - BBA CERTIFICATE 05/4268**
7. **DALTEX ROOF LINING SYSTEM - BBA CERTIFICATE 99/3648**
8. **STORMKING PREFABRICTAED DORMERS - BBA CERTIFICATE 06/4360**
9. **FREEFOAM PLASTICS LIMITED ROOF TRIM SYSTEMS - BBA CERTIFICATE 99/3585**
10. **EGGER BOARDS - BBA CERTIFICATE 08/4585**
11. **POSI JOISTS - EUROPEAN TECHNICAL APPROVAL ETA-070161**
12. **POLYPIPE UNDERGROUND DRAINAGE SYSTEM - BBA CERTIFICATE 89/2206**
13. **UNIQUE WINDOW SYSTEMS - BBA CERTIFICATE 05/4231**
14. **IAN FIRTH - KITEMARKING LICENSE KM 647663**