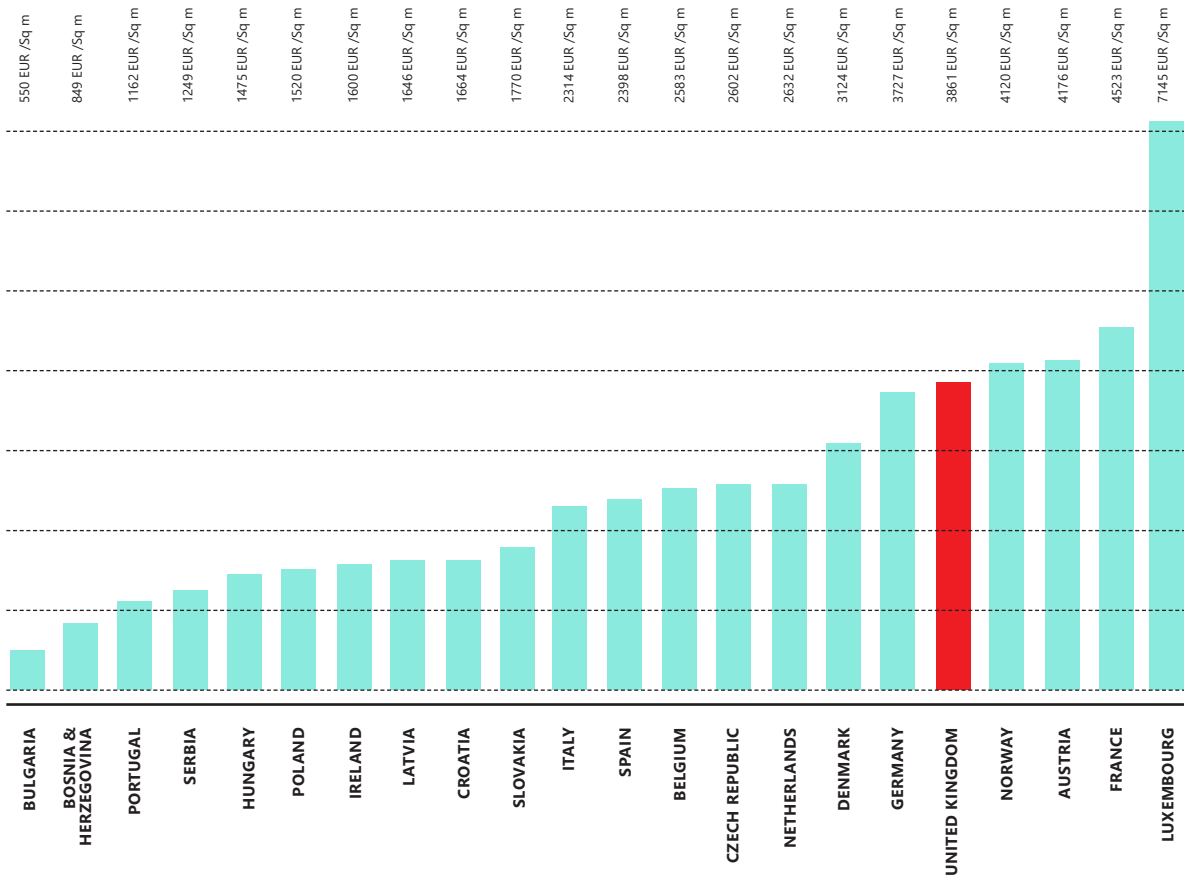


Average Size of Newly Built European Homes



Average Transaction Price of a New Dwellings (2019) - Deloitte Report

Bigger Better Cheaper

England has long been known for having some of the smallest homes in Europe along with the most expensive and poorly built.

It can be easy to think about housing in numbers, percentages, bricks and mortar. But we should not forget that housing is fundamentally about people. This research series starts a conversation about 21st century living and spatial requirements within the contemporary home as it increasingly becomes a place of work and educational attainment. Having enough space to store possessions and entertain guests should complement the home as a place of comfort and delight that supports the well-being of those that live in it.

Bigger

Comparing the size of newly built homes in England and Europe can be difficult as each country does not always provide the data every year, therefore, we have collected the latest data we can find from each country. According to ONS 2014–2015 English Housing Survey(1) the average English new build home is 87m² and finished in the bottom four of a list of 15 major EU countries where the average home is 101m², making UK homes 14% smaller on average and 36% smaller than the EU highest Denmark. It could be argued that the reason for this difference is because the UK population density is one of the highest in Europe which would be true if this translated into the fabric of our towns and cities. However, only one of our cities features in the top 15 dense cities in Europe according to University of Sheffield research (2).

Better

There is great concern about the quality of the UK's housing stock from home owners which can be seen in a YouGov survey from 2020 (3), polling more than 2,000 UK adults. Their research found the quality of homes within the UK is the fastest growing issue with almost two thirds (63%) of adults citing it as a serious concern, up 6% from 2018. This gets worse with people living in rented accommodation where 69% of people reported serious concerns with housing stock quality.

Cheaper

Deloitte (4) recorded that the price of new built dwellings in the United Kingdom increased by 2.3% in 2019 to 3861 EUR / sq m with only France, Luxembourg and Norway seeing higher costs per sq m. New built dwellings in London are the third most expensive in Europe, second only to Paris and Luxembourg City at 7699 EUR / sq m. This is also reflected in the rental market with London having the third highest average monthly rent at EUR/sq m. The indicator of housing development intensity on the residential markets shows the number of completed dwellings per 1,000 citizens. In 2019 the United Kingdom built 2.65 new homes for every 1,000 citizens in comparison to the other two most expensive countries where France built 6.70 new homes per 1,000 and Luxembourg at 11.65 per 1000. This in turn demonstrates the lack of housing supply potentially causing prices to increase. Furthermore, the UK has the 2nd lowest housing stock per 1000 in Europe.

Bigger

It is clear that our homes are some of the smallest in Europe and that this does not relate to population density. We have an opportunity to increase the size of our homes without impacting on our natural environment if settlement densities are increased to similar European standards. This chapter looks at the current UK guidance and legislation relating to spatial housing design and aims to assess if these meet modern day living requirements and aspirations.

Counterbalance has made spatial recommendations for each room type showing how this extra space can best be utilised to improve living conditions and quality of life. There are a series of example housing types which demonstrate how these rooms come together to form bigger homes.

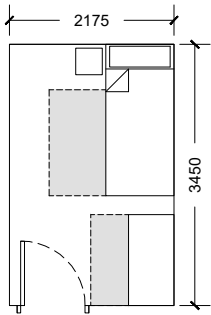
Current Bedroom Design Guidance

Current Bedroom Spatial Policy Examples

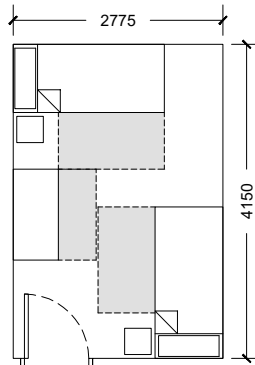
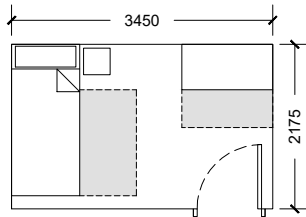
Single Bedrooms Layout Examples

Twin Bedrooms Layout Examples

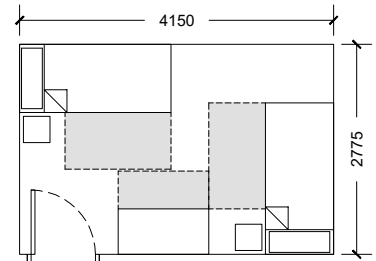
Approved Document - M4(1) & M4(2)



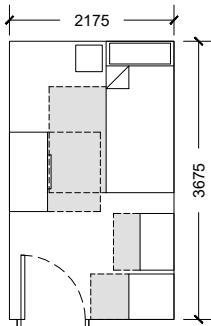
Area: 7.5m²



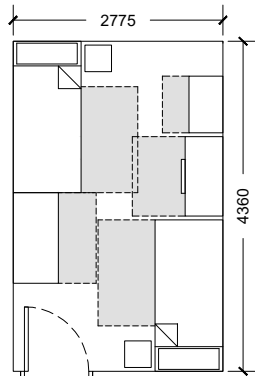
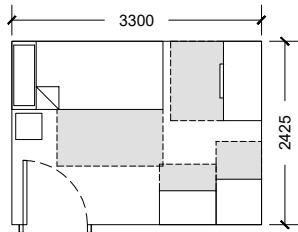
Area: 11.5m²



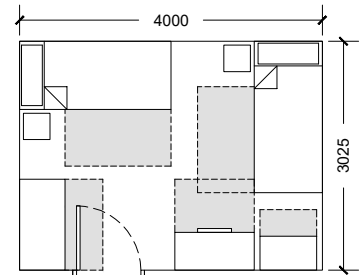
Superseded London Housing Design Guide - Interim Edition 2011 - Complies with M4(2)



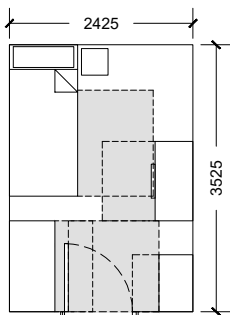
Area: 8m²



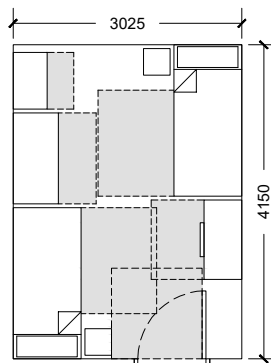
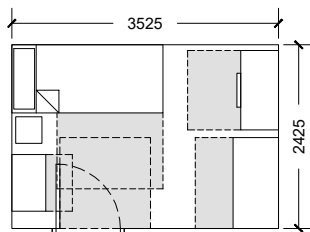
Area: 12m²



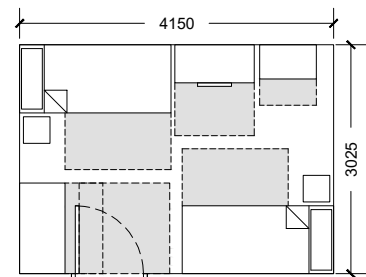
Approved Document - M4(3)



Area: 8.5m²



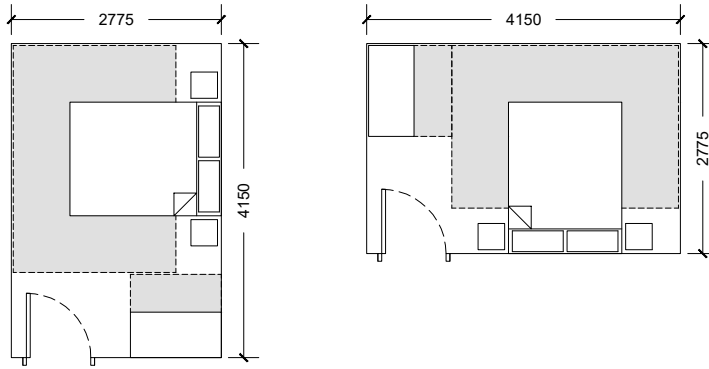
Area: 12.5m²



Bedroom Design Guidance

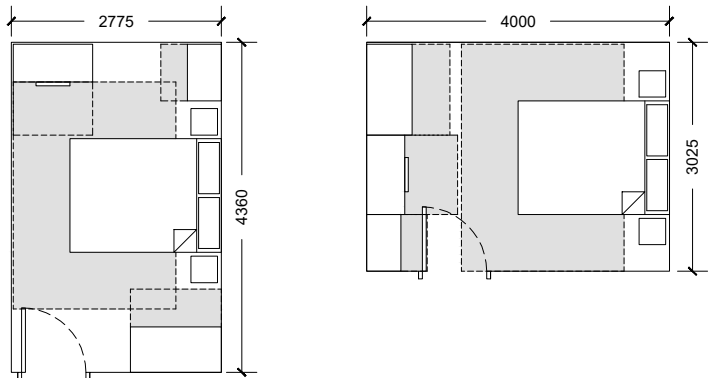
Double Bedrooms Layout Examples

Approved Document - M4(1) & M4(2)



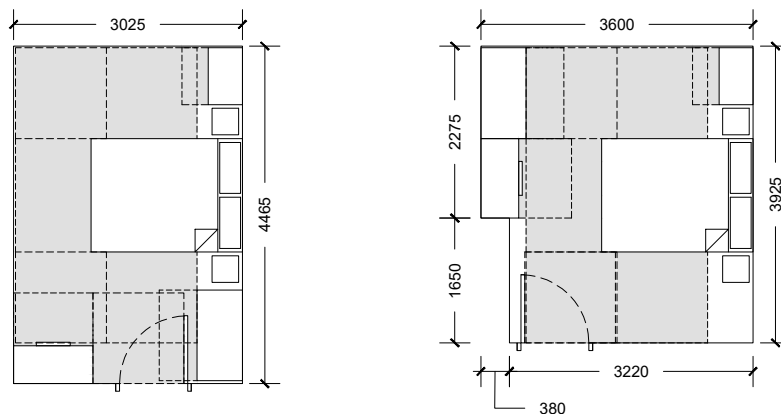
Area: 11.5m²

Superseded London Housing Design Guide - Interim Edition 2011 - Complies with M4(2)



Area: 12m²

Approved Document - M4(3)

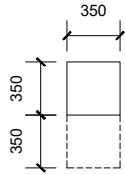


Area: 13.5m²

Counterbalance Bedroom Recommendations

Bedroom Storage

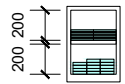
Typical Bedside Cabinet - 28 Items



14x Underwear



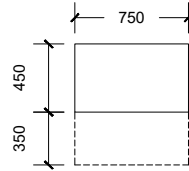
14x Socks



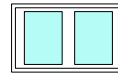
200
200

Typical Chest of Drawers for Clothing - 31 Items

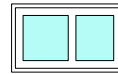
(Could be used for Toys, Books or other personal Items)



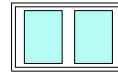
4x Jumpers



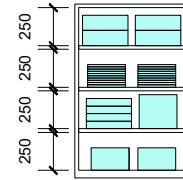
10x T-Shirts
10x Polo Shirts



4x Shorts
1x Sports Shoes

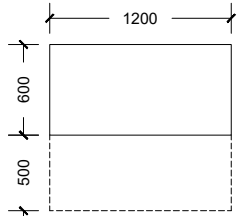


1x Casual Shoes
1x Formal Shoes

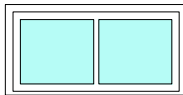


Typical Female Wardrobe - 60 Items

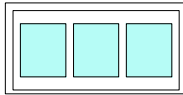
(minus items in storage boxes)



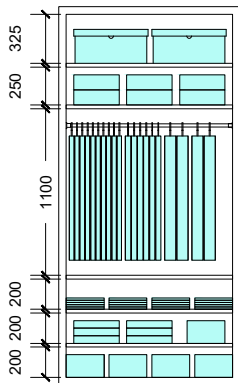
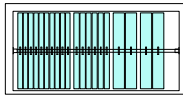
2x Storage Boxes
Hats, Belts, Bags,
Scarfs etc.



6x Jumpers
1x Storage box



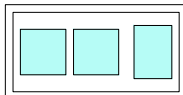
10x Blouses
6x Dresses
2x Jackets
2x Trousers



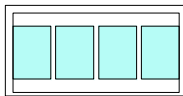
10x Tops
10x Skirts



6x Gymwear
1x Sports Shoes

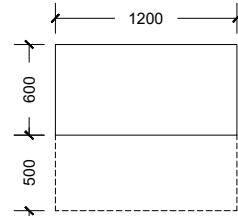


2x Casual Shoes
2x Formal Shoes

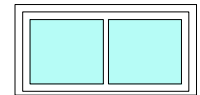


Typical Male Wardrobe - 60 Items

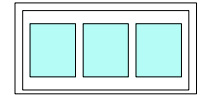
(minus items in storage boxes)



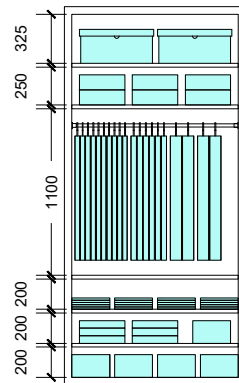
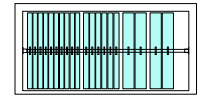
2x Storage Boxes
Hats, Belts, Bags,
Ties etc.



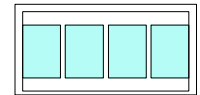
6x Jumpers
1x Storage box



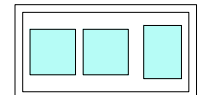
10x Shirts
6x Trousers
2x Jackets
2x Suits



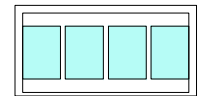
10x T-Shirts
10x Polo Shirts



6x Shorts
1x Sports Shoes



2x Casual Shoes
2x Formal Shoes



Counterbalance Bedroom Recommendations

Counterbalance Research

A common complaint about new build housing is the size of rooms, in particular bedrooms. The policy requirements only require a wardrobe and standard size bed within a non-accessible apartment. It is easy to understand the complaints as bedrooms become smaller which in turn leads to extra pressure for storage elsewhere within houses and apartments.

Furniture

At Counterbalance we have researched the various furniture types within a typical bedroom and has made several suggestions to improve bedroom layouts. These have been detailed in a series of Counterbalance bedroom proposals.

Wardrobes

Currently there is a requirement for only a single wardrobe in all bedrooms regardless of the number of people sleeping in the room. With a person in the UK owning on average 152 items (5) there is simply not enough space for two people's amount of clothing within an single wardrobe. Even if we take into account that on average people only wear 44% of these items regularly that still requires a full wardrobe for each person (See diagram to the left). Counterbalance recommends that 2 wardrobes are included in all double and twin bedrooms with these ideally being built-in and constructed as a standard fit-out in a house or apartment.

Bedside Cabinets

We agree with the need for bedside cabinets as they provide vital storage for underwear and other miscellaneous items.

Chest of Drawers

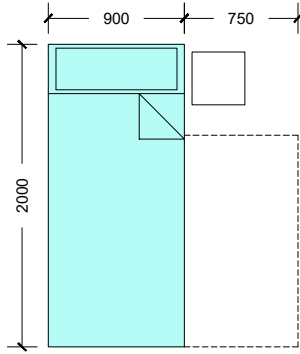
Following the superseding of the London Housing Design Guide there is no requirement for chest of drawers in M4(2) bedrooms. This space provides storage for both clothing and general items such as toys, books and other personal items. We believe there should be a requirement for an extra piece of furniture which can be used for general storage or clothing within bedrooms and therefore should be included in all bedrooms. Alternatively, a larger wardrobe would need to be provided.

Windows Positions

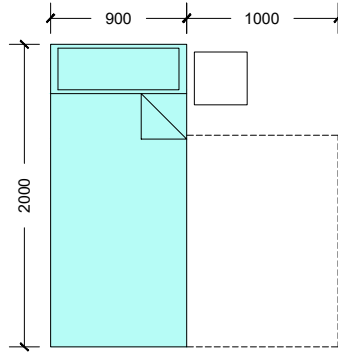
In addition, the smaller bedrooms have added restrictions on where windows can be placed within a bedroom that is compliant with the minimum dimensions required in the national and regional policy. These restrictions lead to small windows in predictable locations or windows above furniture which in turn can lead to health and safety hazards in children bedrooms. Counterbalance bedrooms free up the external wall from furniture to allow more flexible external facade design.

Bedroom Sizes

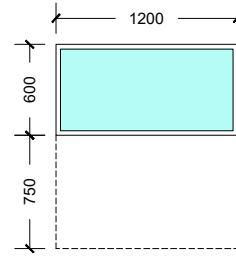
Single Bed (M4(2))



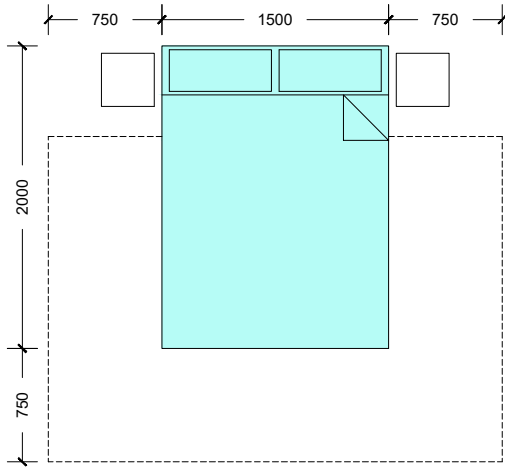
Single Bed (M4(3))



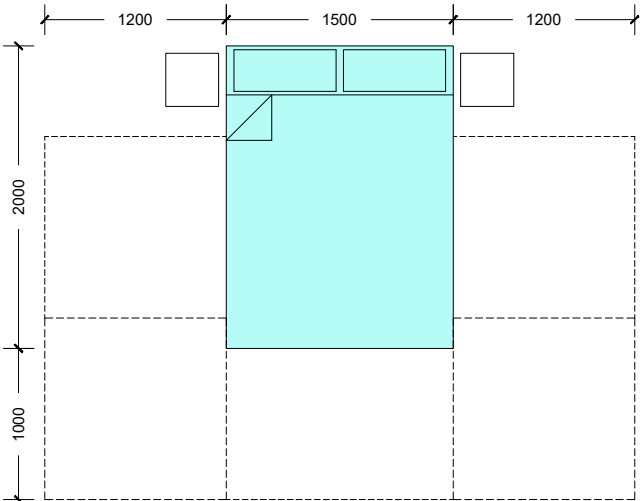
Baby Cot



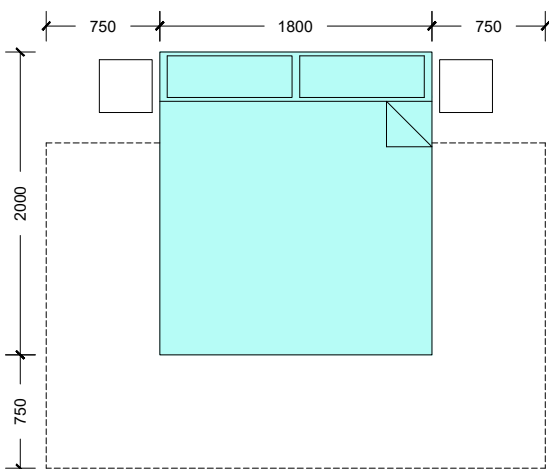
Double Bed - King Size (M4(2))



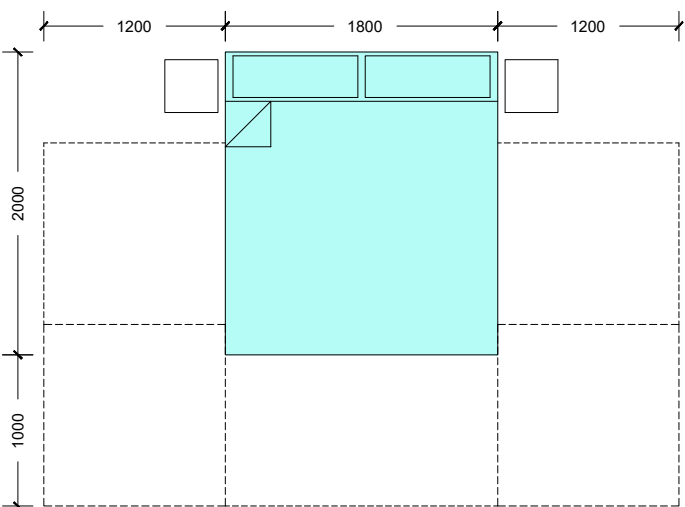
Double Bed - King Size (M4(3))



Double Bed - Super King Size (M4(2))



Double Bed - Super King Size (M4(3))



Counterbalance Bedroom Recommendations

Counterbalance Research

Bed Sizes

The current policy/guidance does not provide guidance for young infants who may sleep in the same bedroom as adults. We believe there should be additional space allocated for a cot to be placed in the master bedroom especially in 1 bedroom apartments.

Current policy only requires the master bedroom to have a King size bed (1500x2000mm) with all other containing a standard UK Double Bed is 1900x1350mm. At Counterbalance we believe that all double bedrooms should provide space for King size beds with the master bedrooms providing space for super king size (1800x2000mm). Sleep is extremely important to humans and can have a large impact on both the physical and mental health of an individual. Our Building Regulations should set a positive example in improving the health of the society they serve. Most adults sleep in a UK standard double bed which provide less width per person than we give a baby in a cot!

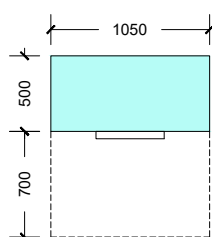
Desk - Home working

The requirement for desk space has been removed from non-wheelchair homes in our national or regional policy eliminating quiet space for children to complete homework and study for exams. In addition, with home working becoming common and the need for companies to be more flexible in the working arrangements it vital that this furniture space allocation is reinstated. Twin rooms should provide space for two desks in the event where children are sharing rooms, which will mean that twin bedrooms designed for children should be larger than a standard double bedroom for one or two adults.

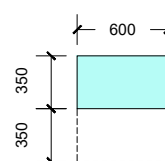
Children Storage - Toys

There are no current spatial arrangements for children storage for toys and learning equipment, both naive and unhelpful for a family home which needs to be addressed within our regulations and guidance. Although we believe further research in this area is required, the very least a storage unit per child should be provided.

Standard Desk



Kids Storage

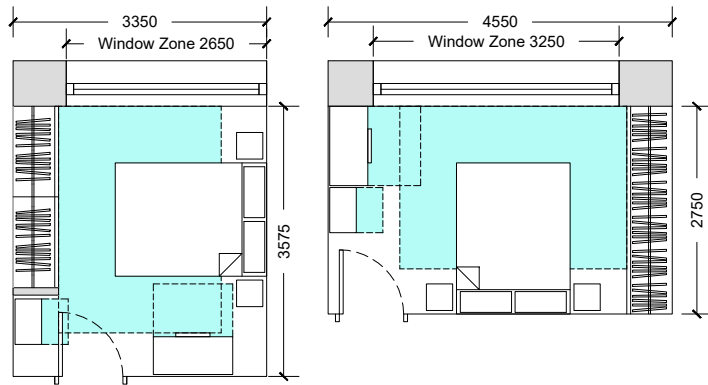


Counterbalance Bedroom Layouts

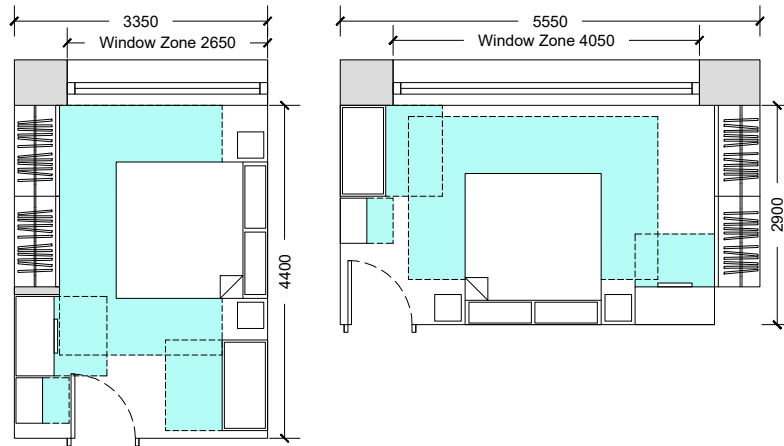
Single / Twin Bedroom Layout Examples



2nd Double Bedroom Layout Examples



Master Bedroom Layout Examples



Counterbalance Bedroom Recommendations

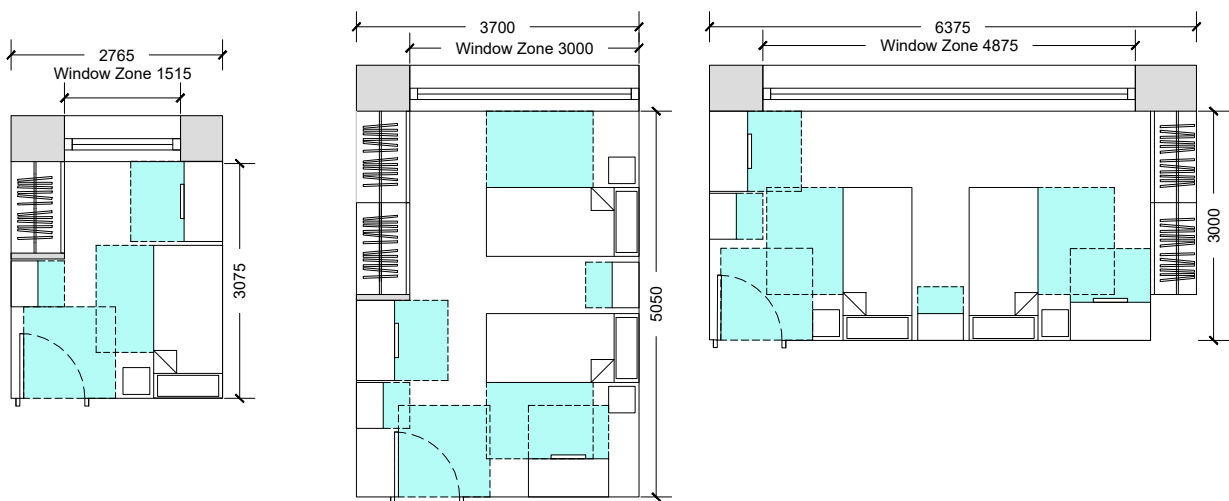
Counterbalance Conclusion

Layouts

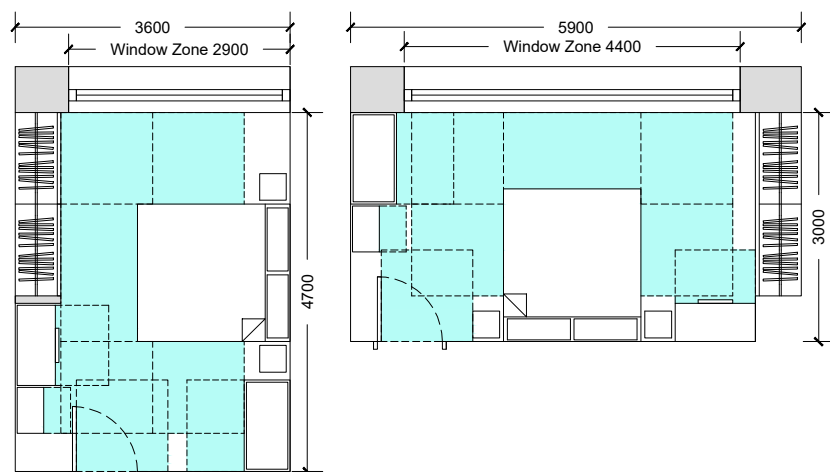
At Counterbalance we have produced a series of bedroom layout examples which take into account the furniture research above and although larger in area provide space and suitable amount of furniture for individuals and families alongside space for wheelchair users/visitors.

These bedrooms types come in two forms of M4(2) and M4(3) compliant layouts with a range of single, twin and double bedrooms.

Wheelchair Single / Twin Layout Examples



Wheelchair Double Bedroom Layout Examples



Counterbalance Bathroom Recommendations

Counterbalance Recommendations

Sanitary Provision

It is important to ensure you have the correct number and types of WC's, Showers and bathrooms within each dwelling under the AD Part M guidelines.

Where dwellings provide both an accessible bathroom with WC and a cloakroom within the same storey then the guidance requires the cloakroom to be designed to M4(1) standard. Similarly, additional en-suite bath/shower rooms would only comply with M4(1) bathroom special requirements. However, we would recommend that all en-suites comply with M4(2) requirements. See below a useful sanitary provisions for both M4(2) & M4(3) dwellings.

M4 (2) - Sanitary Provision Apartments

Bed spaces (persons)	Floors	Minimum Sanitary Provision	Counterbalance Recommendations
1	1	Bathroom with level access shower	
2	1	Bathroom with level access shower	
3	1	Bathroom with level access shower	
4	1	Bathroom with level access shower	Bathroom with level access shower and a separate WC/cloakroom or En-suite in master bedroom.
5 or more	1	Bathroom with level access shower (London Plan requires one additional WC or shower room)	

M4 (2) - Sanitary Provision Houses and Duplexes

Bed spaces (persons)	Floors	Minimum Sanitary Provision
1	2+	Entrance storey WC/Cloakroom or a bathroom + bathroom on same floor as the principal bedroom
2	2+	Entrance storey WC/Cloakroom or a bathroom + bathroom on same floor as the principal bedroom
3	2+	Entrance storey WC/Cloakroom or a bathroom + bathroom on same floor as the principal bedroom
4	2+	Entrance storey WC/Cloakroom or a bathroom + bathroom on same floor as the principal bedroom
5 or more	2+	Entrance storey WC/Cloakroom with potential level access shower or a bathroom + bathroom on same floor as the principal bedroom

Counterbalance Bathroom Recommendations

M4 (3) - Sanitary Provision Apartments

Bed spaces (persons)	Floors	Minimum Sanitary Provision
1	1	Bathroom with level access shower
2	1	Bathroom with level access shower
3	1	Bathroom with level access shower
4	1	Bathroom with level access shower and separate WC/cloakroom
5 or more	1	Bathroom with level access shower and separate WC/cloakroom (or second bathroom). Wheelchair accessible dwellings must also provide both a level access shower and a bath

M4 (3) - Sanitary Provision Houses and Duplexes

Bed spaces (persons)	Floors	Minimum Sanitary Provision
1	2+	Bathroom with level access shower on same level as principal bedroom + entrance storey WC/cloakroom (where bathroom not on the entrance storey)
2	2+	Bathroom with level access shower on same level as principal bedroom + entrance storey WC/cloakroom (where bathroom not on the entrance storey)
3	2+	Bathroom with level access shower on same level as principal bedroom + entrance storey WC/cloakroom (where bathroom not on the entrance storey)
4	2+	Bathroom with level access shower on same level as principal bedroom and entrance storey WC/cloakroom or second bathroom
5 or more	1	Bathroom with level access shower on same level as principal bedroom and entrance storey WC/cloakroom or second bathroom. Wheelchair accessible dwellings must also provide both a level access shower and a bath.

Additional WC

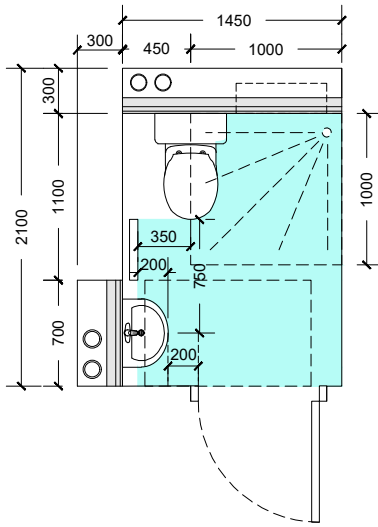
Where the dwelling provides both a bathroom and a WC/cloakroom on the same storey, the WC and basin in the WC/cloakroom (and their associated clear access zones) should as a minimum comply with the provisions of M4(3)) guidance.

En-suites

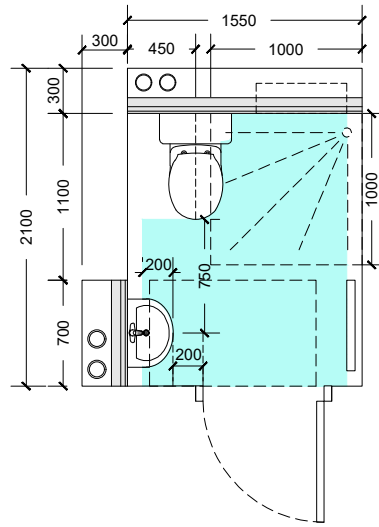
Where there is a fully accessible shower room on the same storey as the principal bedroom, a separate room providing the bath need only comply with the requirements for a n M4(2) bathroom.

M4 (2) WC/Shower Room

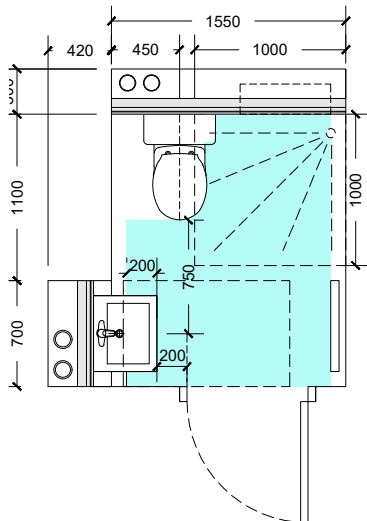
Type 01 - Service zones



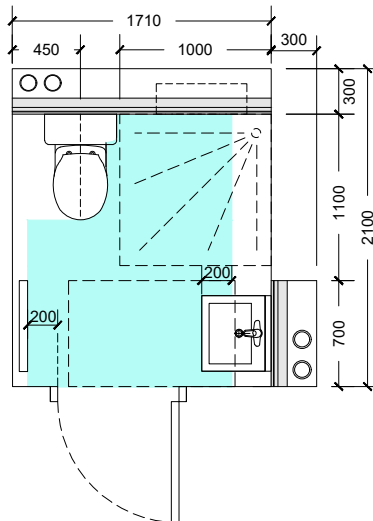
Type 02 - Larger towel heater



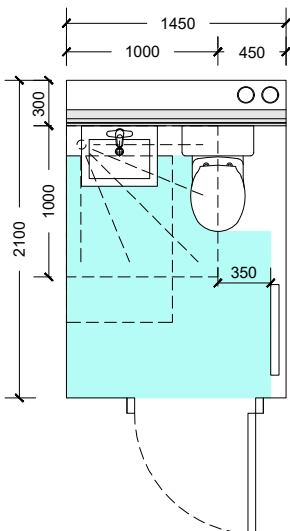
Type 03 - Larger hand basin



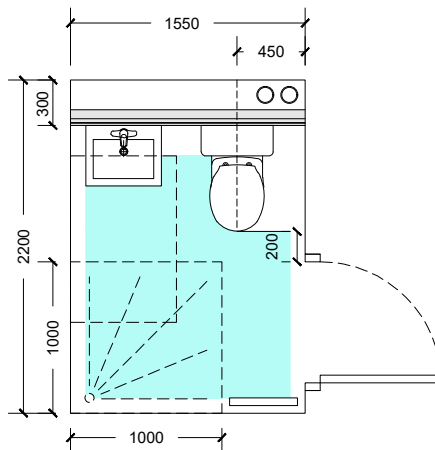
Type 04 - Increased shower zone



Type 05 - Single service zone



Type 06 - Alternative location of shower zone



Counterbalance Bathroom Recommendations

Counterbalance Recommendations

Category 2 - Accessible and Adaptable Dwellings - M4(2) - WC/Shower Room and Bathrooms

The overall size and layouts suggested in AD Part M are of a good standard. However, experience has shown that these layouts do not take into account the exact sanitary item sizes, service zones and construction tolerances. The Counterbalance layouts proposed in this section comply with AD Part M and allow for further flexibility in bathroom design, including the following improvements:

WC/ Shower Room

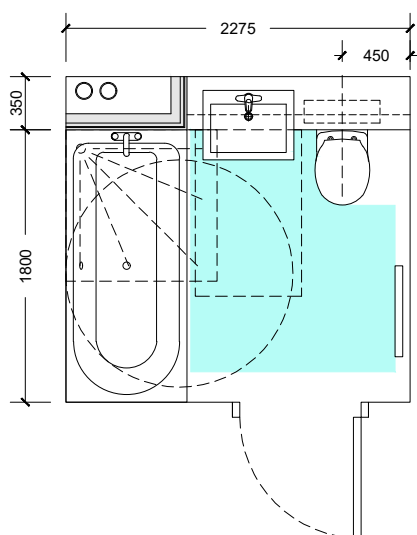
1. Hidden Service zone added which allows for storage cupboards to be installed without effecting access zones.
2. Extended width to accommodate a larger towel heater. (Needed for large towels if room is used as a shower)
3. A larger hand basin can be included. (No one likes to wash their hands in those small basins)
4. Re-arrangement of shower position allows for a shower to be installed without needing to remove or change location of WC or hand basin. (AD Part M layouts are not adaptable without complete refurbishment)

Bathroom

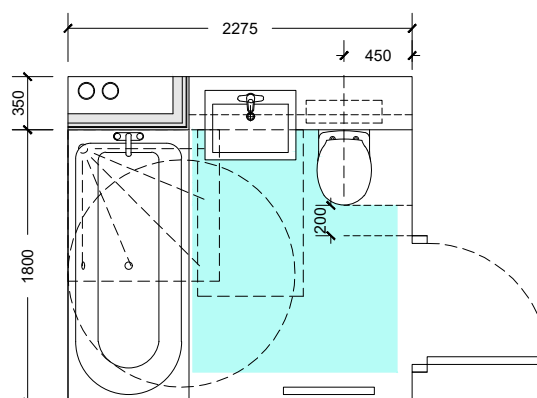
5. Hidden Service zone added which allows for storage cupboards to be installed without effecting access zones.
6. A larger hand basin can be installed without effecting access zone. (Allows for large range of basins to be used)
7. Increased size of bathroom takes account of construction tolerances to ensure access zones are met.
8. These bathrooms allow for a 800x1800mm bath (Taller end-users will appreciate this improvement)

M4 (2) Bathrooms

Type 01 - Door Head-on

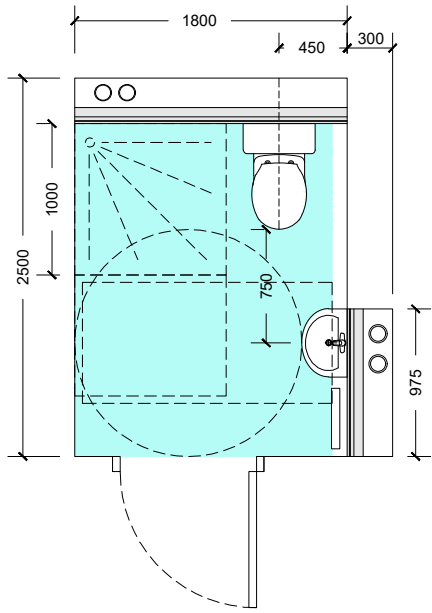


Type 02 - Door Side-on



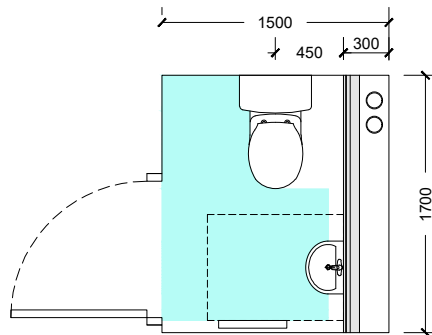
M4 (3) WC/Shower Room

Type 01 - WC / Adaptable Shower Room

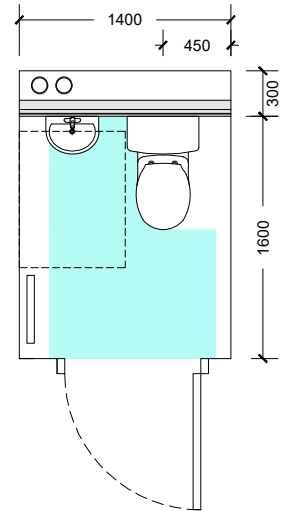


2nd WC/Cloakroom per floor

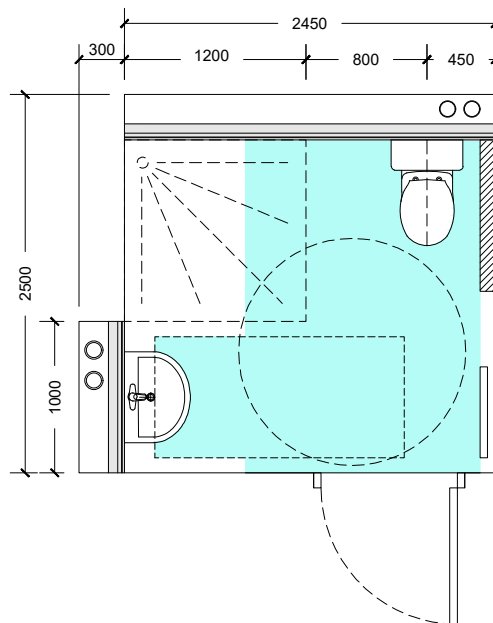
Type 01



Type 02



Type 01 - Level access shower Room



Counterbalance Bathroom Recommendations

Counterbalance Recommendations

Category 3 - Wheelchair User Dwellings - M4(3) - WC/Shower Room and Bathrooms

WC/ Shower Room / 2nd W/C per Floor

1. Hidden Service zone added which allows for storage cupboards to be installed without effecting access zones.
2. Increased room width to allow for a larger size of hand basin. (No one likes to wash their hands in those small basins)

Bathroom

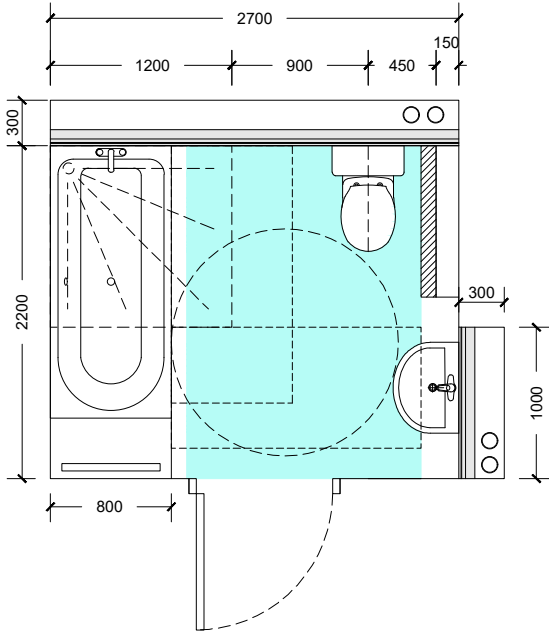
3. Hidden Service zone added which allows for storage cupboards to be installed without effecting access zones.
4. Larger hand basin can be installed without effecting access zone. (Allows for large range of basins to be used)
5. Increased size of bathroom takes account of construction tolerances to ensure access zones are met.
6. These bathrooms allow for a 800x1800mm bath (Taller end-users will appreciate this improvement)

Notes:

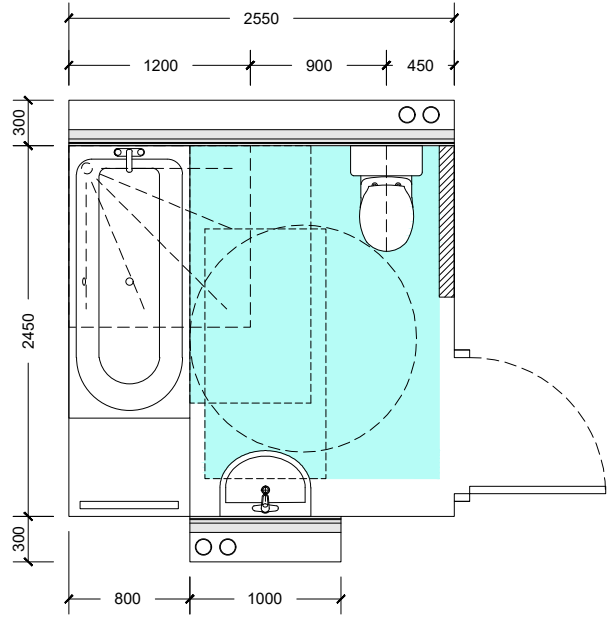
- Ensure all doors are outward opening and have a minimum of 850mm clear opening for all M4(3) bathrooms; door nibs are at least 300mm on both sides of the door.
- M4(3) bathrooms can lead to 3 sets of soil vent pipes (SVP) due to the large sizes of the rooms, it is advised to design all bathrooms as accessible pre-planning allowing for additional SVP's. (It is easier to remove the SVP later in the project once the fit out of the bathrooms has been confirmed with the client or housing association).

M4 (3) Bathroom / Bath & Shower Room

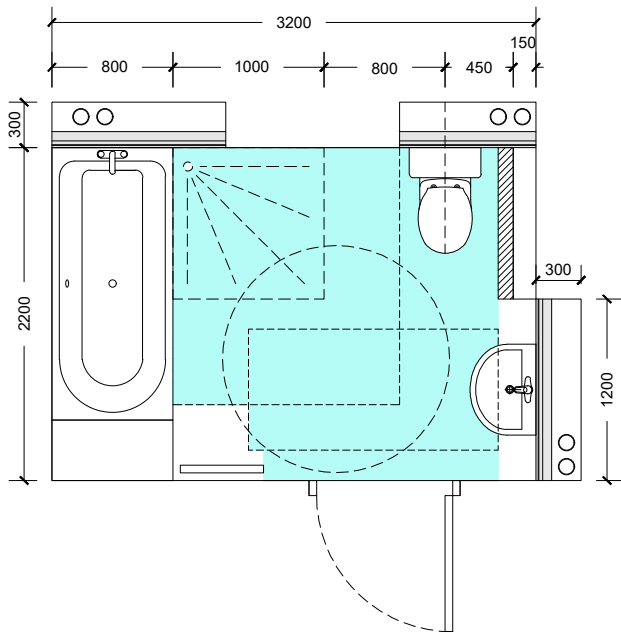
Type 01 - Bathroom - Head-on Door



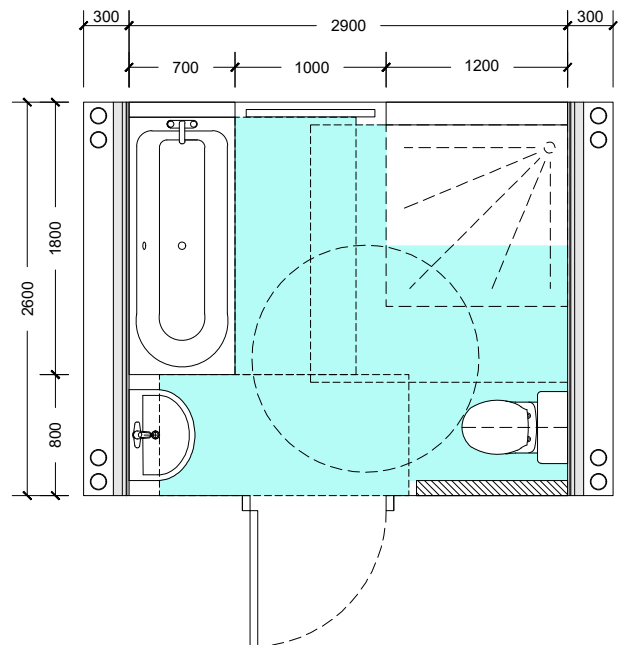
Type 02 - Bathroom - Side-on Door



Type 01 - Shower & Bathroom



Type 02 - Shower & Bathroom



Counterbalance Bathroom Recommendations

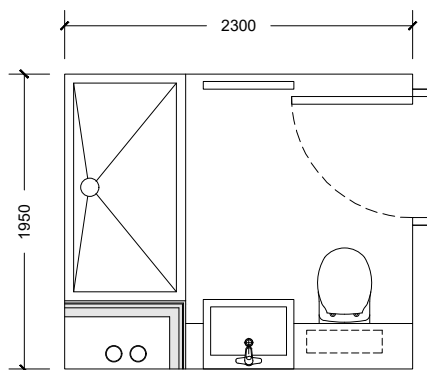
Bedroom En-suites

For AD Part M M4(2) dwellings the guidance suggests as follows: "Every dwelling has a bathroom that contains a WC, a basin and a bath, that is located on the same floor as the double bedroom, described as the principal bedroom in paragraph 2.25b." This then allows for en-suite bathrooms to be smaller and comply with M4(1) WC and basin requirements only.

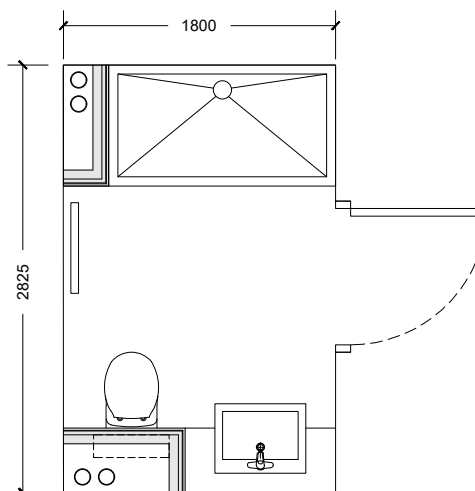
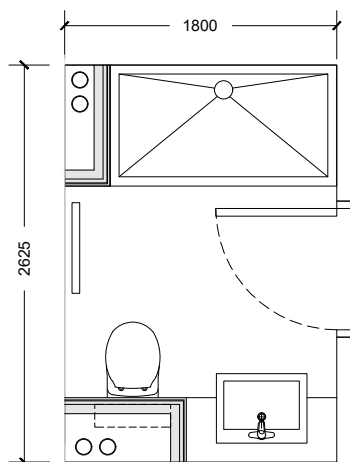
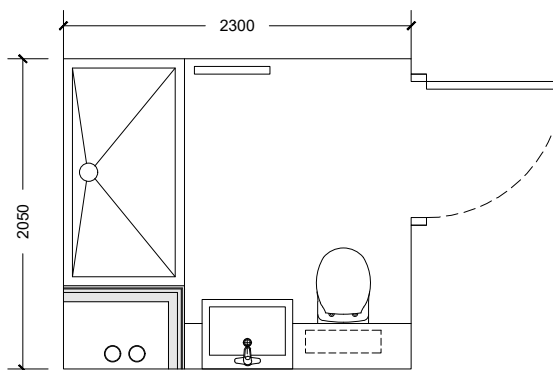
For AD Part M4(3) dwellings the guidance is as follows: "Where there is a fully accessible shower room on the same storey as the principal bedroom, a separate room providing the bath need only comply with the requirements set out in paragraph 2.29 for a category 2 bathroom."

This should not be used, however, as a way for en-suites to be too small to be accessible without walking side wards into the room. We have, therefore, designed a series of en-suite layouts which provide a comfortable size for every day use. They also provide larger door nibs which, although not required under the AD Part M guidance, enable wheelchair users to access all rooms within a home.

M4(2) En-suite



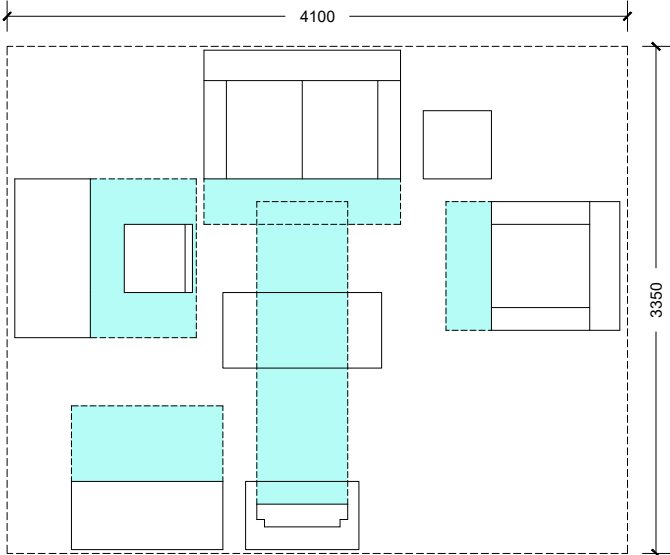
M4(3) En-suite



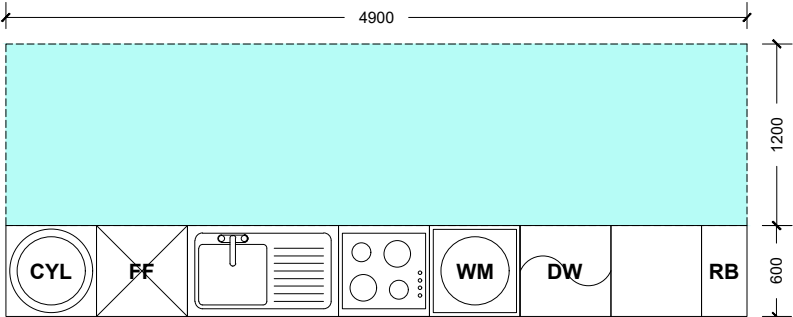
Counterbalance Living, Kitchen & Dining Recommendations

1 Bedroom Apartment - M4(2)

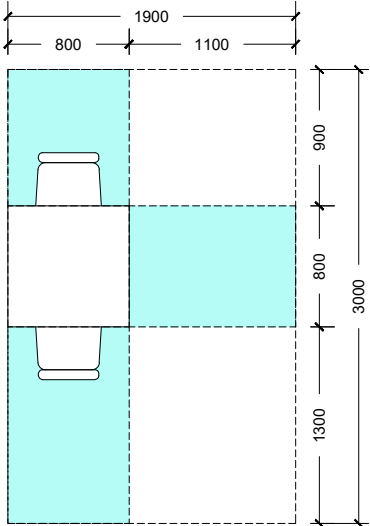
Living Room



Kitchen



Dining Room



Counterbalance Living, Kitchen & Dining Recommendations

Counterbalance Recommendations

The following pages contain sample furniture layouts for living, kitchen and dining rooms for 1, 2 & 3 bedroom homes. There are many different layout options for these rooms, therefore, we have only provided a handful to help demonstrate the requirements and suggestions.

Living Room

We recommend that all living spaces contain as a minimum the following furniture:

- Desk & Chair
- Storage Unit (size depends on home bed-spaces as stated in AD Part M Vol 1)
- TV / Sideboard
- Coffee Table
- Sofas containing space for the number of bed spaces

For M4(2) homes provide at least 750mm access zones between all furniture and clear access to the windows in the room. This should be increased to 1000mm for M4(3) homes.

Kitchen

We recommend that for M4(2) homes the superseded kitchen requirement in the London Housing Design Guide should be followed. The kitchens layouts could be changed to a U or L shape layout as long as a 1200mm access zone is provided. For M4(3) homes, Building Regulations Approved Document Part M - Access to and use of buildings Volume 1 Dwellings guidance should be followed, however consideration for tolerances should be taken into account.

We recommend that washing machines are housed in M&E Cupboards within the hallways, however, the additional space should be maintained in the kitchen.

Dining

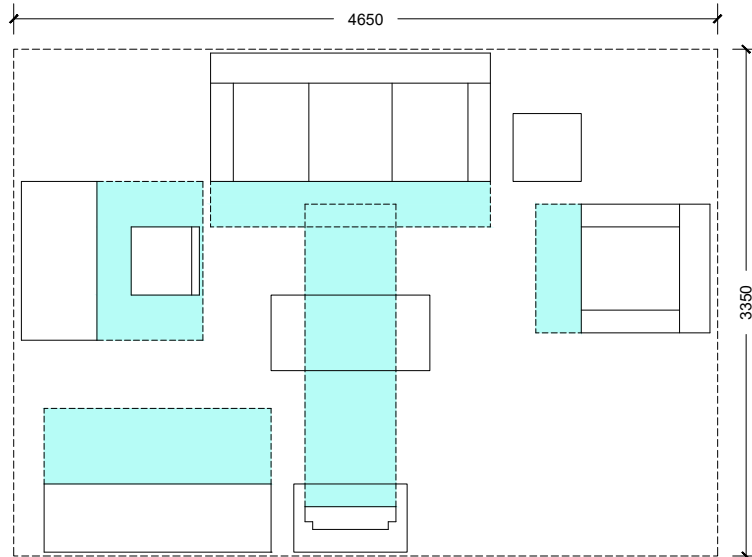
We recommend that for M4(2) and M4(3) homes the superseded table and access space requirement in the London Housing Design Guide should be followed.

Combined Rooms

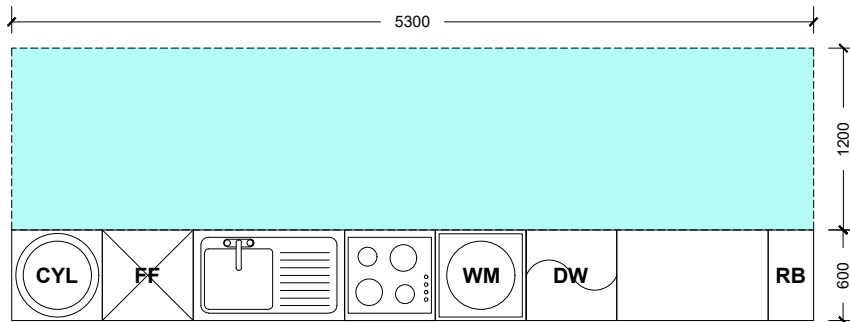
These rooms can be combined, for M4(2) homes we would recommend following the superseded area requirements as a minimum in the London Housing Design Guide. For M4(3) homes area requirements in Building Regulations Approved Document Part M - Access to and use of buildings Volume 1 Dwellings guidance should be followed.

2 Bedroom Apartment - M4(2)

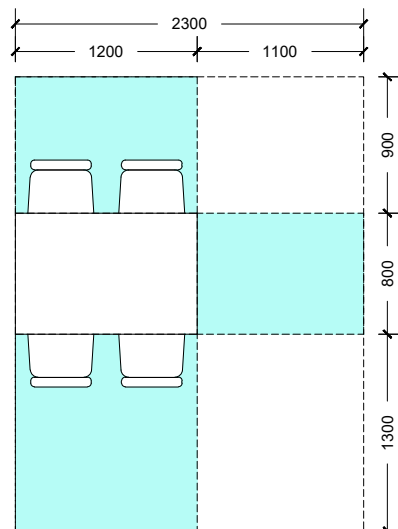
Living Room



Kitchen



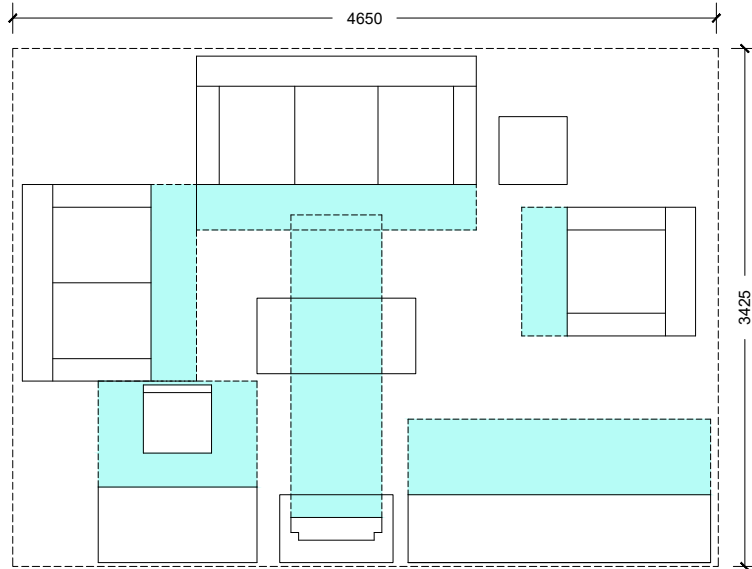
Dining Room



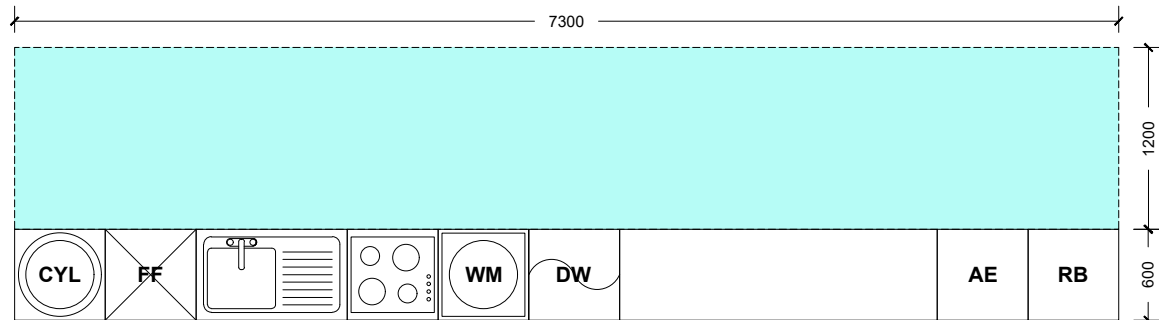
Counterbalance Living, Kitchen & Dining Recommendations

3 Bedroom Apartment - M4(2)

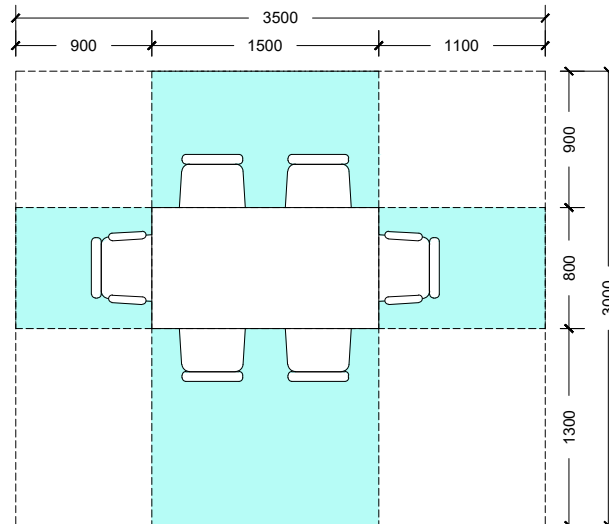
Living Room



Kitchen

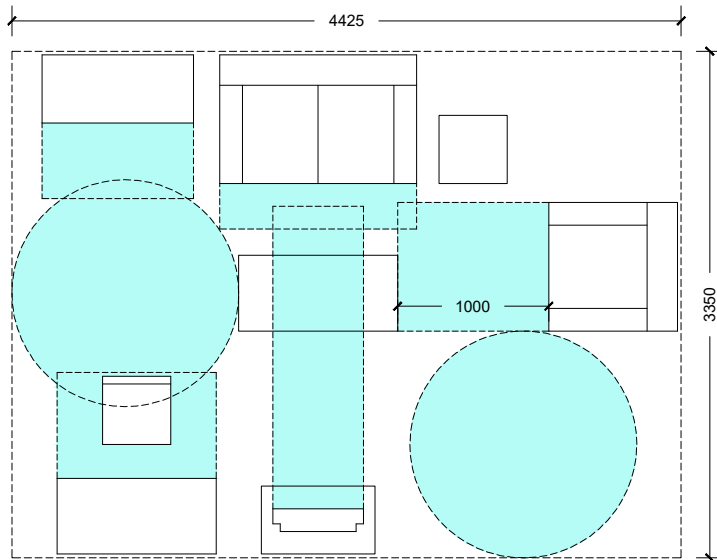


Dining Room

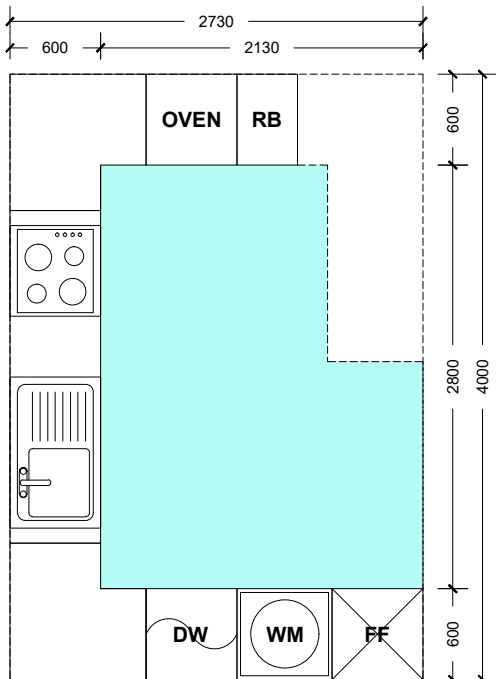


1 Bedroom Apartment - M4(3)

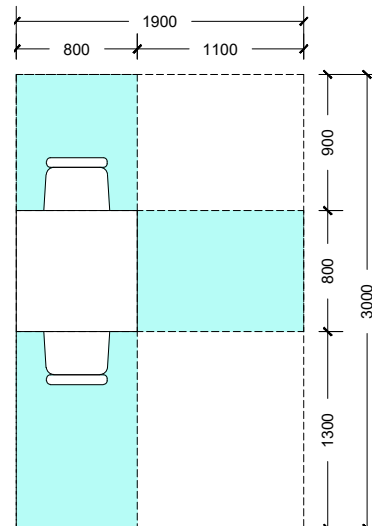
Living Room



Kitchen



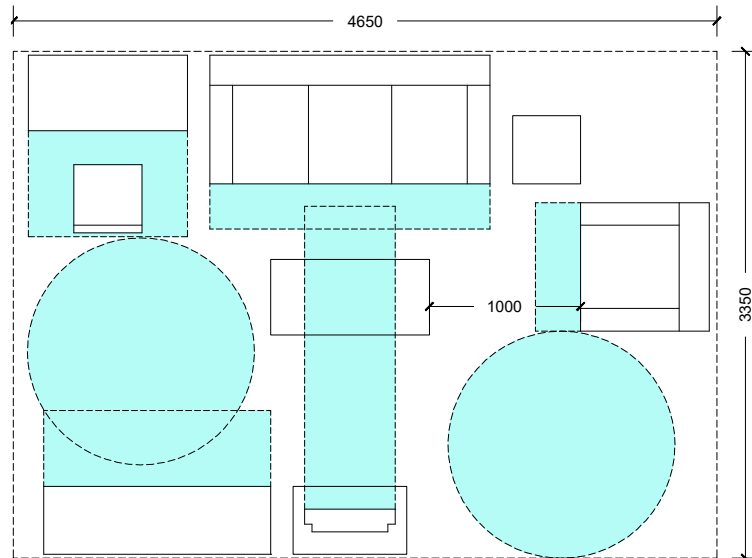
Dining Room



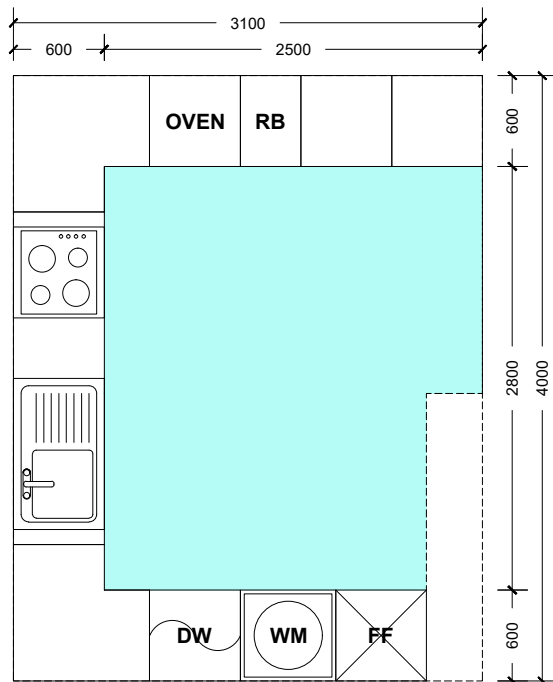
Counterbalance Living, Kitchen & Dining Recommendations

2 Bedroom Apartment - M4(3)

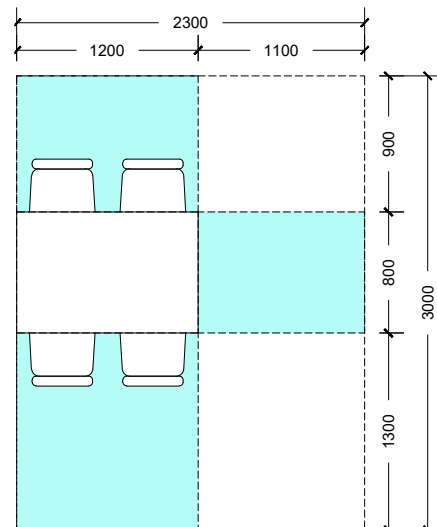
Living Room



Kitchen

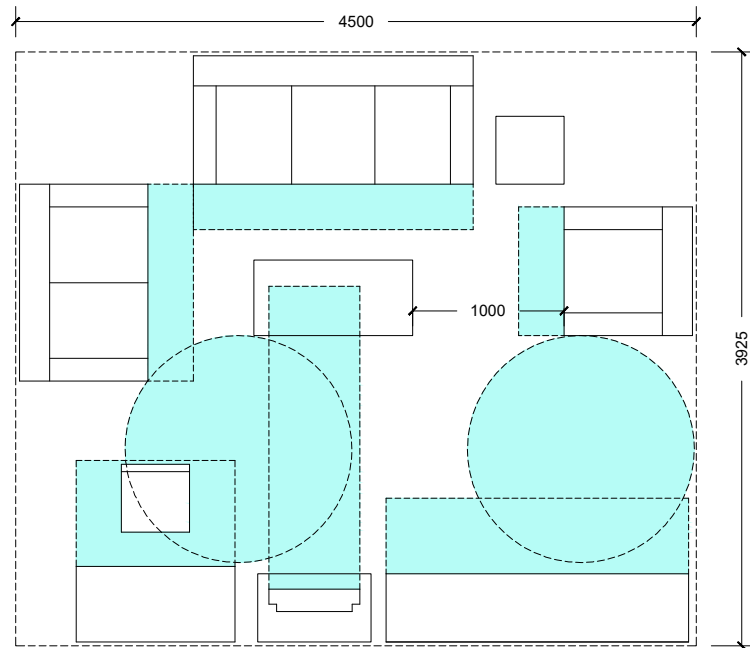


Dining Room

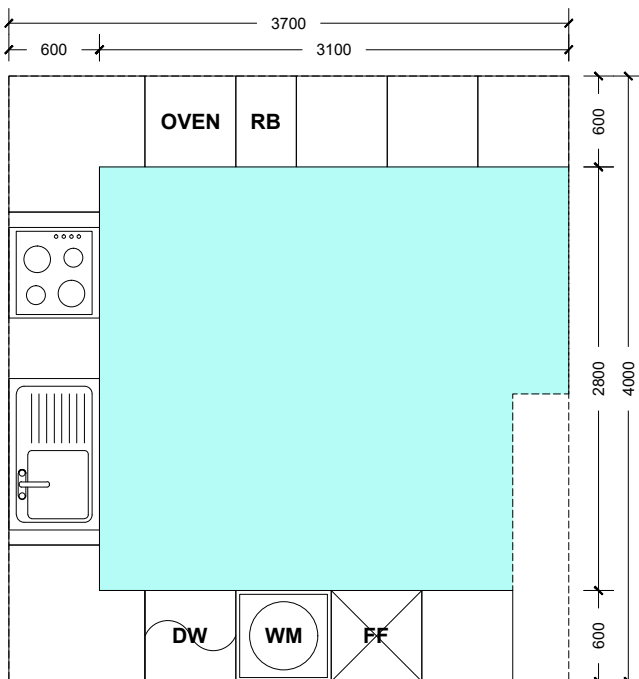


3 Bedroom Apartment - M4(3)

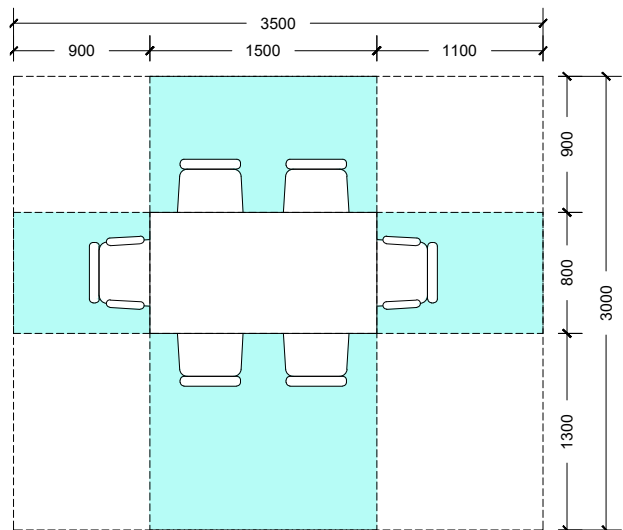
Living Room



Kitchen



Dining Room



Counterbalance Living, Kitchen & Dining Recommendations

Counterbalance Storage & Circulation Recommendations

	Storage / M&E Cupboard	
1 bedroom		2500
2 bedrooms		3350
3 bedrooms		4175
4 bedrooms		5000
5 bedrooms		5850
6 bedrooms		6675

Counterbalance Bathroom Recommendations

Counterbalance Recommendations

Counterbalance recommends that the storage mentioned in the National Described Space Standard should be on top of a standard M&E cupboard and should be provided in hallways where possible. We accept that this can be difficult when hallways are short (especially in 1 bedroom homes) and can lead to undesirable plans, therefore, it should be provided in other rooms as additional space on top of the area/advice given for the relevant room.

The diagram to the left demonstrates the amount of storage that is required with an ideal depth of 600mm cupboards. Deep and shallow storage cupboards should be avoided to ensure the storage is functional and useful for the end user.

Better

The general public has a low expectation when it comes to the quality of new build homes in the United Kingdom. This view is supported by snagging companies where on average 160 snags per property our found. (6) The HomeOwners Alliance reported that almost 9 in 10 of new build homeowners want a snagging retention system to withhold funds to house builders until they rectify faults, showing the seriousness of the problem and the extent homeowners want the government to go to improve the quality of homes in the UK. (7)

Counterbalance has made recommendations in the following chapter to help improve the quality of homes in the UK.

Snagging Retention System

Moving into a new home is a stressful time, made even worse by discovering hundreds of snags, faults and defects in your brand new home. No other industry would treat their customers in this manner. Imagine getting a brand new car with scratches and dents all over it, its unimaginable. Quite often it can be difficult to get house builders to even acknowledge the snags let alone fix them and when they do it is common for snag lists to take up to a year to fix.

Quite often homeowners feel like they are due compensation for the inconvenience and stress caused by the process but find it difficult with the current legal system to successfully claim any money. Once the homeowner moves into their new home the developer-client relationship disappears with the complaints process, at times feeling like you're talking to a brick wall.

It is why Counterbalance believes the government should bring in a "Snagging Retention System" which would offer all buyers of new homes the right to retain a minimum 2.5% of their purchase price for six months to give time for snags and defects to be made good. We believe this will incentivise builders to firstly get all snags and defects completed before the owner moves in and secondly if any snags or defects are found they will be promptly made good. If the developer does not fix them within an agreed period, the homeowner can use the money to fix the issues themselves. An independent government body would need to be set-up to administer claims but would give the buyer a mechanism to claim compensation.

Example: (ONS - UK House Price Index: February 2021)

Average House Price (England) - £266,532 (2.5%) = £6,663.30

Average House Price (London) - £496,000 (2.5%) = £12,400.00

Floor to Ceiling Heights

Notes:

The following information has been produced to help understand the relevant policy requirements of floor to ceiling heights in residential dwellings within England, as well as the implications of typical construction build-ups to ensure an adequate floor to floor height can be used for pre-planning uses when finishes and construction method are typically unknown.

Further to this, Counterbalance believes that best practice should be used wherever possible and architects should go beyond policy to help improve the quality of homes being designed. A series of recommendations are put forward with this in mind.

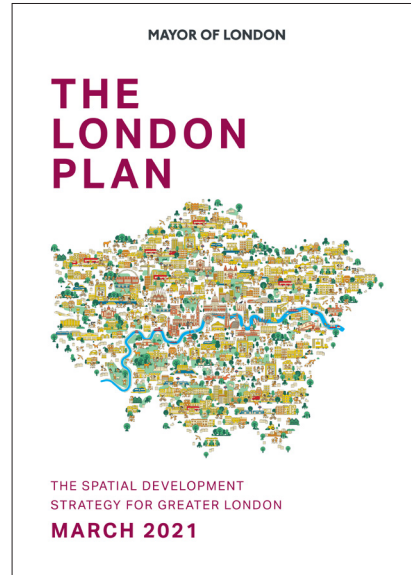
Every project is different and could have different requirements, and therefore we highly recommend confirming build-ups with the relevant consultants as soon as possible to ensure the desired floor to ceiling heights are met. Any inaccuracy in the information is not the responsibility of Counterbalance or contributors of the guidance. The guidance provided has materialised from previous project experience and best practice guidance at the time of issue.

Future Research:

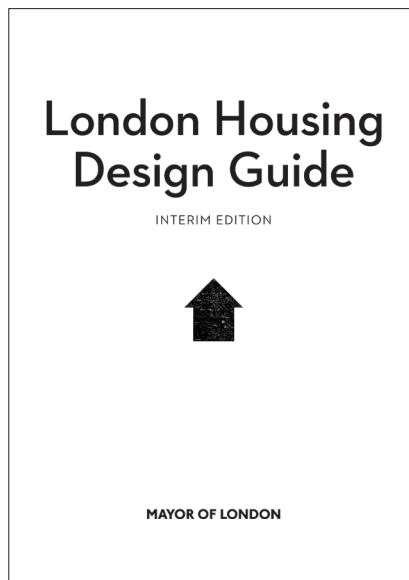
In the future Counterbalance would like to extend this research to contain more construction types, comparing cost and efficiencies in floor to floor heights. If you have any interesting projects, research or would like to contribute please get in touch.



Technical housing standards – nationally described space standard, March 2015



The London Plan, March 2021



London Housing Design Guide, August 2010

Floor to Ceiling Heights

Current Floor to Ceiling Height Policy

England currently does not have any mandatory minimum floor to ceiling heights.

Technical housing standards – nationally described space standard (2015) states:

“The minimum floor to ceiling height is 2.3m for at least 75% of the Gross Internal Area”

However, this policy was not incorporated into the building regulations. Instead it may be imposed by Local Planning Authorities as a planning condition.

The London Plan 2021 by the Greater London Authority (GLA) states:

“A minimum ceiling height of 2.5m for at least 75 per cent of the gross internal area is required.”

Again, this policy is not mandatory for London Boroughs to use but can rather be imposed by Local Planning Authorities as a planning condition.

Best Practice Policy

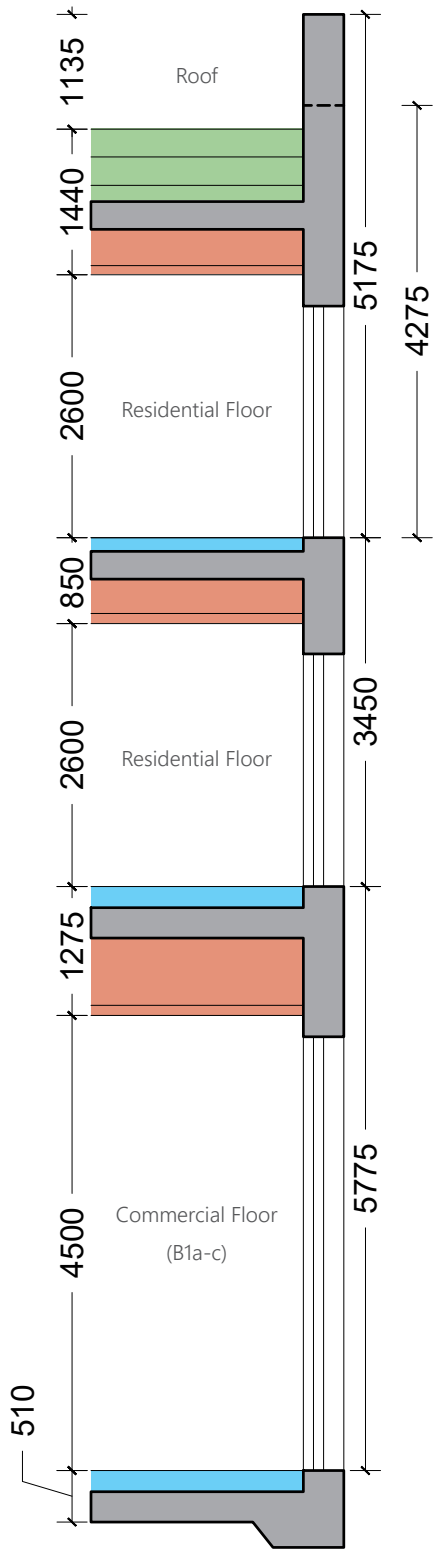
London Housing Design Guide – August 2010 (Policy Superseded)

“The minimum floor to ceiling height in habitable rooms is 2.5m between finished floor level and finished ceiling level. A minimum floor to ceiling height of 2.6m in habitable rooms is considered desirable and taller ceiling heights are encouraged in ground floor dwellings.”

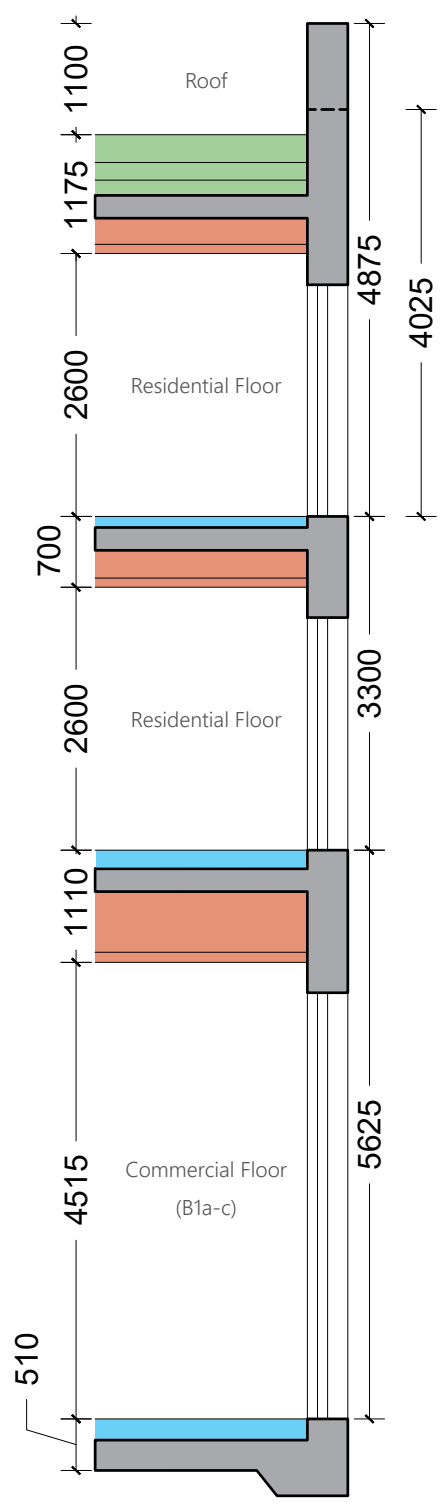
Counterbalance Conclusion

Generous floor to ceiling heights allow for a sense of place and design quality which improves daylight penetration, ventilation and cooling, reducing the urban heat island effect. Counterbalance believes that 2.6m floor to ceiling heights for all habitable rooms provides a fair balance between the additional construction costs and the health advantages of increasing floor to ceiling heights. All other rooms including bathrooms, utility and storage spaces should achieve 2.4m.

To ensure housing is of adequate quality within London and England this policy should be incorporated within building regulations. The next page sets out recommended floor to floor dimensions to be used at early stages of a project to achieve 2.6m floor to ceiling heights.



Recommended Heights



Minimum Heights

Typical Floor to Floor Dimensions

Residential Floor to Ceiling Heights

The diagram to the left demonstrates the required floor to floor heights needed to allow for floor to ceiling heights of 2600mm in habitable rooms and 2400mm in all other rooms.

Our recommended heights allow for various construction methods and provide greater flexibility in the future when build-ups are unknown with the added benefit of enjoying generous floor to ceiling heights.

The minimum heights should only be used when various conditions are agreed with your client and design team as they have implications on cost, structural design and construction methods.

Commercial - Floor to Ceiling Heights

There are no standards/policy for commercial units as they are very dependent on the end user / use class, however, the following is a good starting point at feasibility stage, but heights should be confirmed by the client or sales agents.

Ground Floor

B1a Office / Low Cost Workspace

- 3300mm (Minimum) 3600mm (Recommended)

B1c – Small-medium scale light industrial

- 4500mm (Minimum) 5500mm (Recommended)

1st Floor

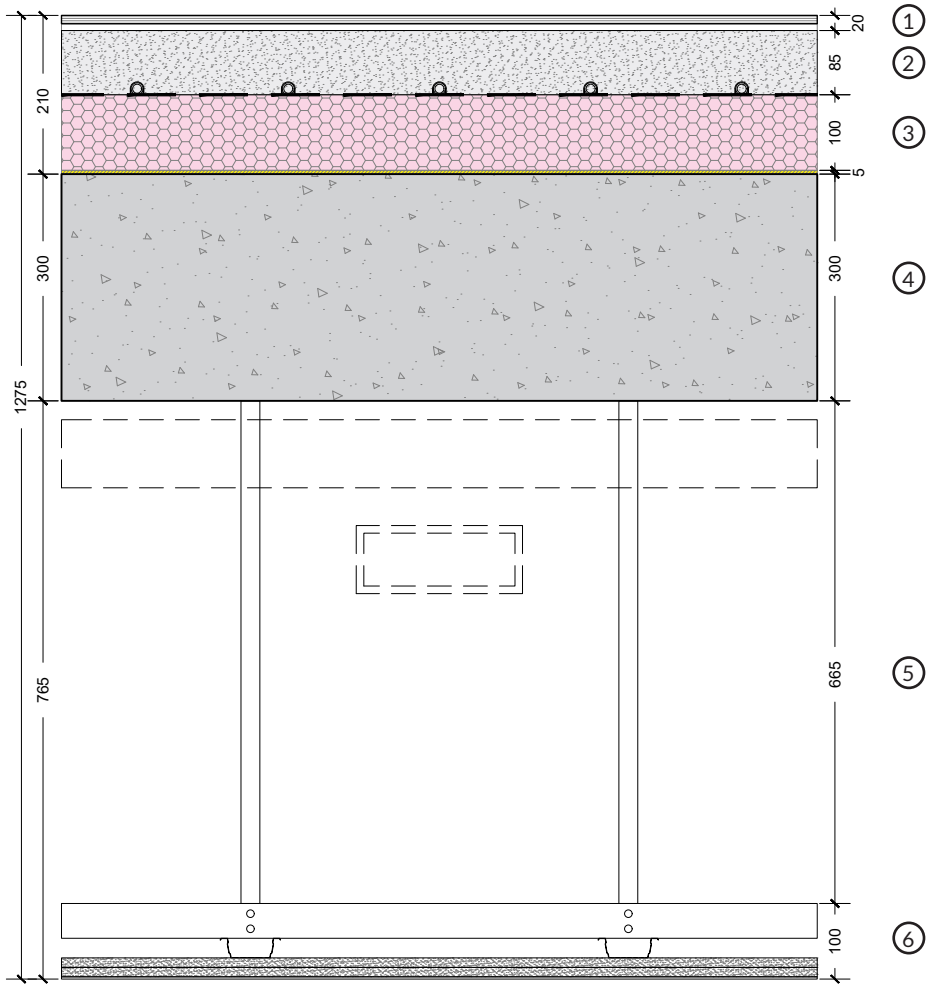
B1a Office / Low Cost Workspace

- 2750mm (Minimum) 3000mm (Recommended)

Brick Dimensions

Floor to Floor dimensions have been rounded up to brick coursing, floors can be reduced if an alternative material is being used. If the external material is unknown maintain brick dimensions until known.

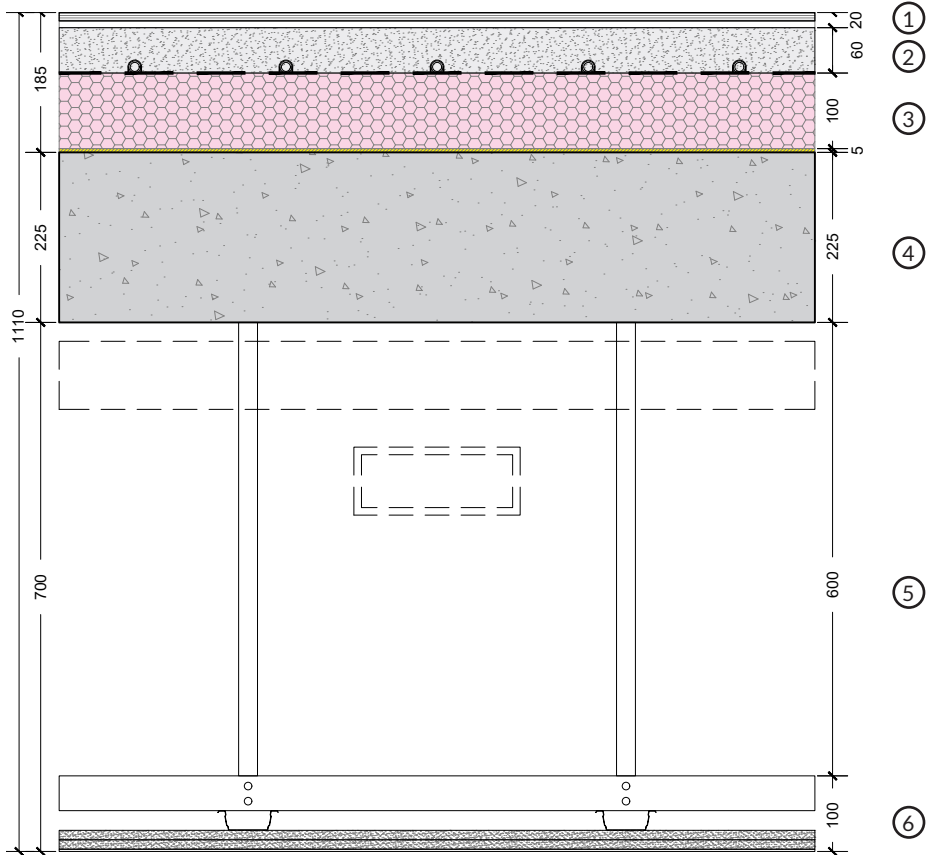
(215 x 102.5 x 65mm UK Standard Brick Size)



- ①
- ②
- ③
- ④
- ⑤
- ⑥

Recommended Floor Build-up

(This build-up allows for a sand/cement screed and thicker RC slab to be used. It accommodates for larger commercial MEP equipment such as ventilation ducts to be hidden within a ceiling without effecting the floor to ceiling heights.)



- ①
- ②
- ③
- ④
- ⑤
- ⑥

Minimum Floor Build-up

(By using a liquid based screed you can reduce the zone above the RC Slab. Working with your Structural engineer it may be possible to reduce the floor slab. Reducing the MEP zone for the commercial unit will depend on layout and cross overs, we would recommend not reducing beyond 600mm unless your MEP engineers advises otherwise)

Commercial to Residential Floor Build-up

Commercial to Residential Floor Build-ups

01 - Floor Finish Zone (20mm)

Timber or Tiles: Maximum 16mm Board/Tile with 4mm Adhesive.

Solid wood flooring is not recommended for installations over UFH. Always check with manufacturer to ensure the selected Solid or Engineered Wood Flooring is approved for use over UFH. Check to see if a decoupling membrane is required as this will add 3mm within the floor finish zone.

Carpet: Typically, 10mm Underlay / 10mm Carpet

Combined TOG value of the carpet and underlay should not exceed 2.5 tog.

Underlay Layer - When installing certain flooring as floating installation, a suitable polythene slip membrane beneath is essential. Check with manufacturer of flooring.

03 - Insulation / Acoustic Layer

100mm Insulation (Cellecta XFloor 300 or Similar)

5mm Acoustic Layer (Yelofon HD5 or Similar)

Acoustic Performance - Airborne - 54dB D + C nT,w tr /
Impact - 54dB LnT,w (Building Regulations + 5dB)

05 - Service Void

600mm Zone for - Air Conditioning, Ventilation, Electrical, Water, SVP & RWP with 45 degrees bends

Larger zone required for commercial units

02 - Screed/UFH (60mm to 85mm Zone)

Unbonded Sand & Cement Screed - Minimum: 85mm

- 75mm (65mm K-Screed – potentially more expensive)
- 10mm structural slab building tolerances

Unbonded Self-smoothing Screeds – Minimum: 60mm

(Self-smoothing screed more expensive than sand & cement screeds – confirm with client)

- 20mm Zone for Pipes
- 30mm coverage over pipes
- 10mm structural slab building tolerances

DMP – 500 Gauge Polythene Layer

It is recommended to include a moisture suppressant layer within the subfloor. This layer must be incorporated beneath the heat source and fully supported from beneath.

04 - Concrete

Range from 225mm to 300mm

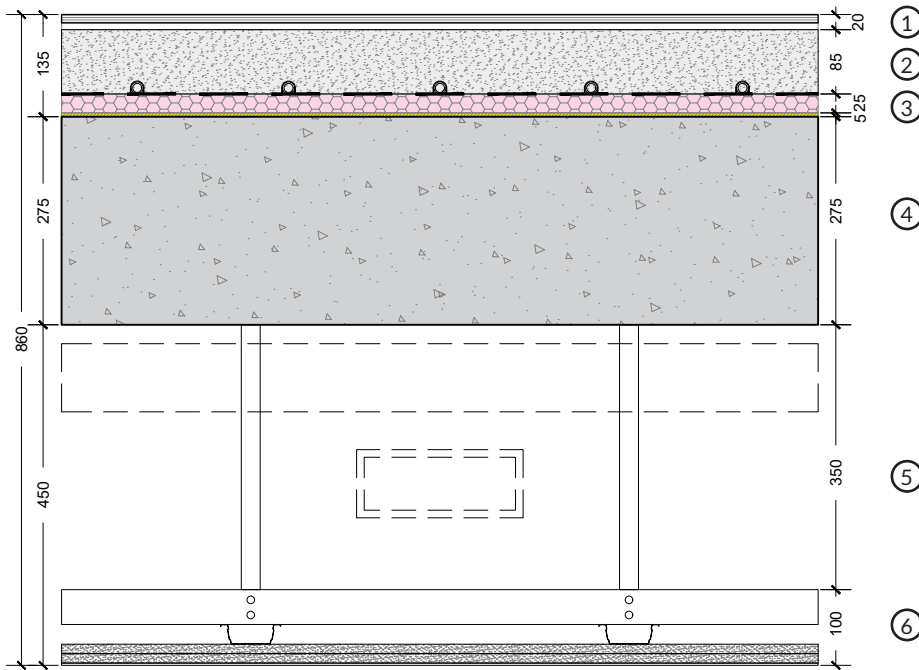
(Confirm with Structural Engineer)

06 - Plasterboard

Standard British Gypsum CasoLine MF System consists:

(Approximate 100mm)

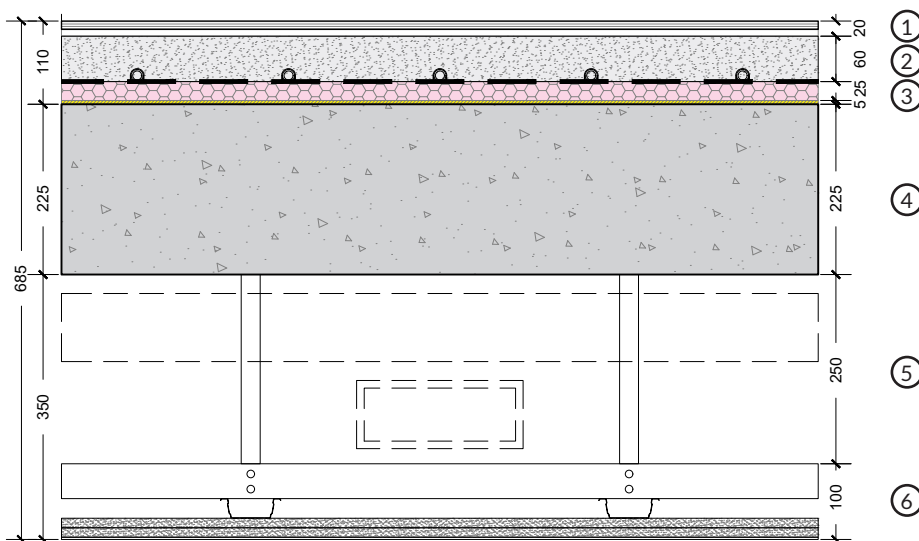
- 46mm Gypframe MF7 Primary Support Channel
- 26mm Gypframe MF5 Ceiling Section
- 2x12.5mm Plasterboard
- 3mm Plaster Skim



- ①
- ②
- ③
- ④
- ⑤
- ⑥

Recommended Floor Build-up

(This build-up allows for a sand/cement screed and thicker RC slab to be used. It accommodates for MEP equipment such as MVHR and Soil Vent Pipes to be hidden within the ceiling without effecting the floor to ceiling heights.)



- ①
- ②
- ③
- ④
- ⑤
- ⑥

Minimum Floor Build-up

(By using a liquid based screed you can reduce the zone above the RC Slab. Working with your Structural engineer it may be possible to reduce the floor slab. Reducing the MEP zone for residential units will depend on stacking layouts and eliminating the cross over of MEP pipes and ducts)

Residential Floor Build-up

Typical Residential Floor Build-up

01 - Floor Finish Zone (20mm)

Timber or Tiles: Maximum 16mm Board/Tile with 4mm Adhesive.

Solid wood flooring is not recommended for installations over UFH. Always check with manufacturer to ensure the selected Solid or Engineered Wood Flooring is approved for use over UFH. Check to see if a decoupling membrane is required as this will add 3mm within the floor finish zone.

Carpet: Typically, 10mm Underlay / 10mm Carpet

Combined TOG value of the carpet and underlay should not exceed 2.5 tog.

Underlay Layer - When installing certain flooring as floating installation, a suitable polythene slip membrane beneath is essential. Check with manufacturer of flooring.

03 - Insulation / Acoustic Layer

25mm Insulation (Cellecta XFloor 250 or Similar)

5mm Acoustic Layer (Yelofon HD5 or Similar)

Acoustic Performance - Airborne - 54dB D + C nT,w tr /
Impact - 54dB LnT,w (Building Regulations + 5dB)

05 - Service Void

- 350mm required for Attenuator/Fan Coil Units
- 325mm - MVHR, Electrical, Water, SVP & RWP if 45 degrees bend required.
- Stacked services can reduce zone to 250mm

02 - Screed/UFH (60mm to 85mm Zone)

Unbonded Sand & Cement Screed - Minimum: 85mm

- 75mm (65mm K-Screed – potentially more expensive)
- 10mm structural slab building tolerances

Unbonded Self-smoothing Screeds – Minimum: 60mm

(Self-smoothing screed more expensive than sand & cement screeds – confirm with client)

- 20mm Zone for Pipes
- 30mm coverage over pipes
- 10mm structural slab building tolerances

DMP – 500 Gauge Polythene Layer

It is recommended to include a moisture suppressant layer within the subfloor. This layer must be incorporated beneath the heat source and fully supported from beneath.

04 - Concrete

Range from 225mm to 275mm

(Confirm with Structural Engineer)

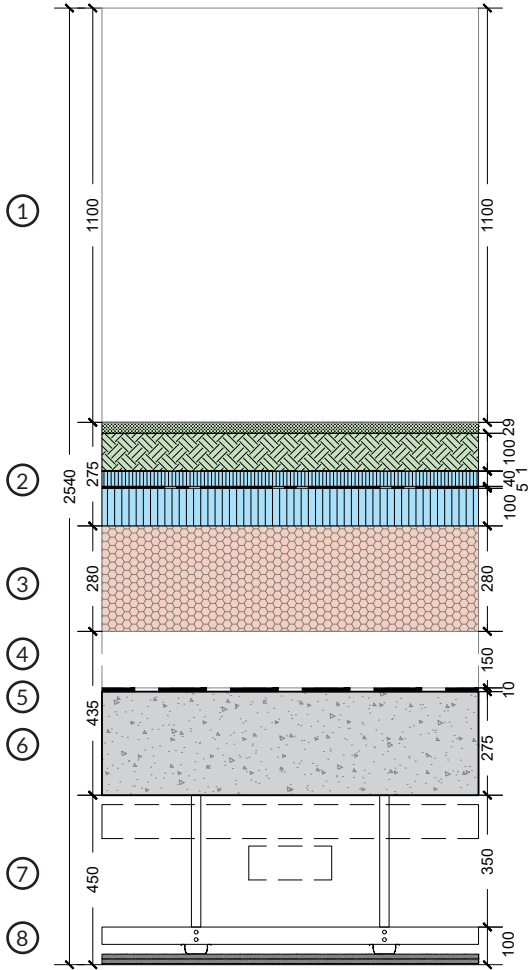
06 - Plasterboard

Standard British Gypsum CasoLine MF System consists:

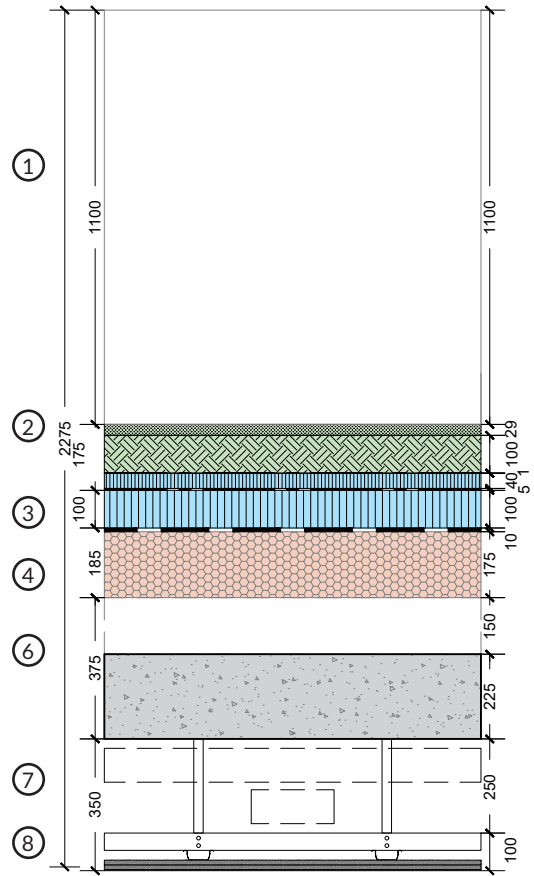
(Approximate 100mm)

- 46mm Gypframe MF7 Primary Support Channel
- 26mm Gypframe MF5 Ceiling Section
- 2x12.5mm Plasterboard
- 3mm Plaster Skim

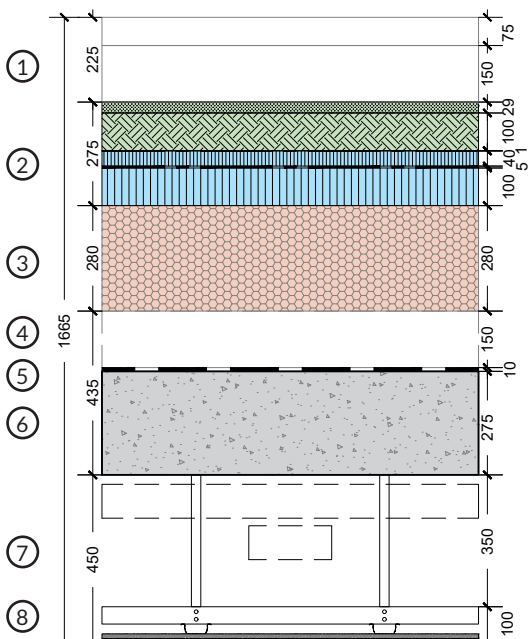
Recommended Parapet Build-up



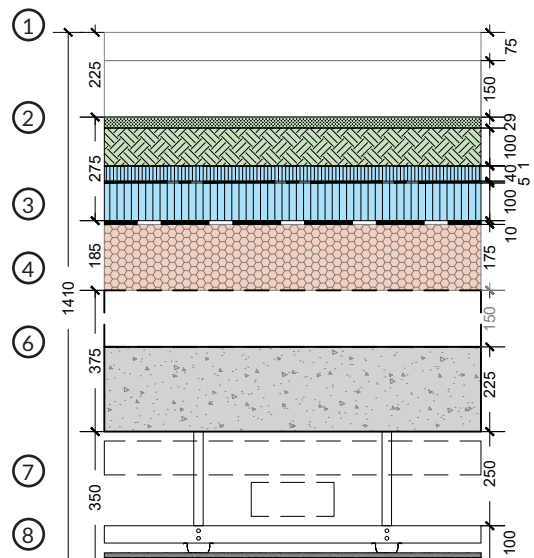
Minimum Parapet Build-up



Recommended Low Parapet Build-up



Minimum Low Parapet Build-up



Roof Build-up

Typical Roof Build-up (Green / Blue Roofs) 0.13 W/m²K

01 – Waterproofing Zone

150mm Waterproofing Zone generally required for parapets plus 75mm coping / 1100mm parapet required to avoid any fall restraints systems.

03 – Insulation – Inverted Roof (280mm)

280mm Bauder JFRI 200 Inverted Insulation or similar (U-Value - 0.13W/m²)

03 – Insulation – Warm Roof (185mm)

- 3mm KSA DUO Underlay & 6mm K5K Capping Sheet
- 175mm Bauder PIR FA-TE Insulation or Similar (U-Value - 0.13W/m²)

05 – Waterproofing Zone (Inverted Roof - 10mm)

10mm Bauder Hot Melt Structural Waterproofing System

06 - RC Concrete Frame

Range from 225mm to 275mm
(Confirm with Structural Engineer)

07 - Service Void

- 325mm - MVHR, Electrical, Water, SVP & RWP if 45 degrees bend required.
- Stacked services can reduce zone to 250mm
- 350mm required for Attenuator/Fan Coil Units

02 – Green Roof System – 175mm –

Typical Green roof build-up / confirm with Landscape Designer / Local Authority Planning requirements

- 25mm Wildflower Blanket
- 100mm Biodiverse Substrate
- 1mm Filter Fleece
- 40mm DSE 40 Drainage Layer
- 5mm FSM 600 Protection Layer & PE Foil Separation Layer

04 – Fall in Roof

150mm Zone for 1:40 falls in RC Slab for 4 meters increase zone if length of fall is larger.

- Fall in Screed (Min 50mm – 4-meter length)
- Fall in RC Slab (6-meter length – Structural Engineer to advise if possible)
- Fall in Insulation (Include falls zone within insulation zone)

08 - Plasterboard

Standard British Gypsum CasoLine MF System consists: (Approximate 100mm)

- 46mm Gypframe MF7 Primary Support Channel
- 26mm Gypframe MF5 Ceiling Section
- 2x12.5mm Plasterboard
- 3mm Plaster Skim

External Wall Build-up

Notes:

The following information has been produced to help designers understand policy driven requirements as well as the technology driven aspect of construction build-ups. Every project is different and has different requirements, we therefore highly recommend confirming build-ups with the relevant consultants as soon as possible to ensure fire, acoustic and thermal requirements are met. Any inaccuracy in the information is not the responsibility of Counterbalance or contributors of this guidance. The guidance provided has materialised from previous project experience, using common construction methods for housing projects.

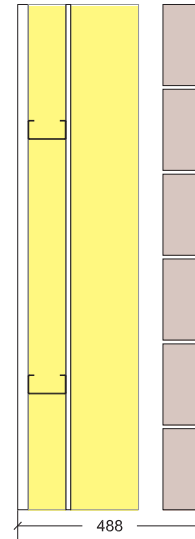
Future Research:

Counterbalance would like to extend this research in the future to contain more construction types as well as provide comparison between various methods of construction and efficiency of external wall build-ups. If you have any interesting projects or research to contribute please get in touch.



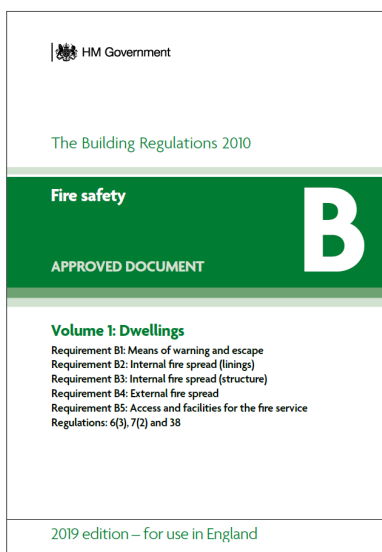
Recommended Width

600mm should be used as a starting point until an external material and construction method has been chosen. It gives the flexibility of using brick or a cladding system with either block or SFS as inner leaf.

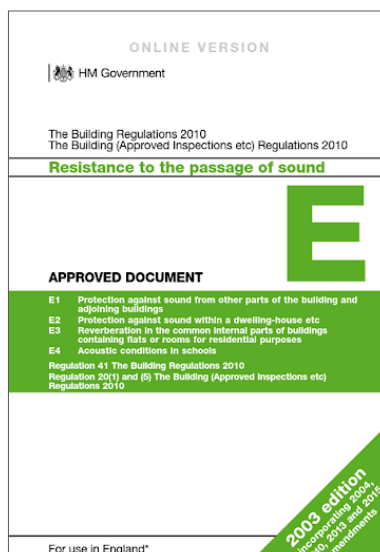


Minimum Width

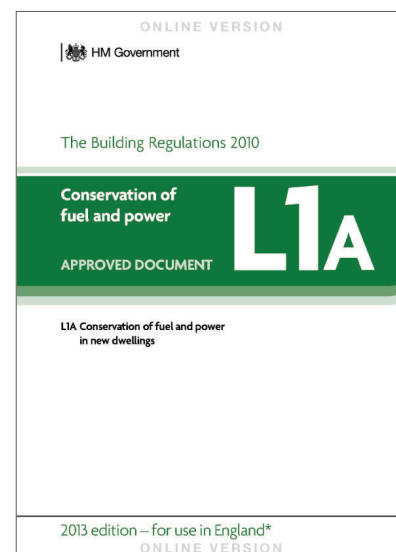
If you are after minimum width then 488mm is the smallest build-up whilst achieving a 0.13 W/m²k u-value. This will fix the design into having a brick finish and an SFS inner leaf.



Approved Document Part B



Approved Document Part E



Approved Document Part L

External Wall Build-up

Guidance Notes

The purpose of this chapter is to ensure realistic wall build-ups are used at the beginning of a project when the external finish or construction method is unknown to avoid any future losses in net area. It should be noted that every project should be reviewed on a project by project basis to meet specific requirements. This guidance only addresses the overall wall thickness' and each element of the wall build-up will have its own requirements and specifications which are not covered in this chapter.

Counterbalance recommends the use of **600mm** width for external walls to allow for flexibility in the design when the external wall build-up is unknown. This width allows for all the build-ups to follow in this chapter, safe guarding the design from material changes in the future. These build-ups do not allow for any steps in facade but do allow for flexibility in the window/door position. We recommend, however, for the latter to be positioned in line with the insulation to reduce cold-bridging. The example widths to the left demonstrate a worse case and recommended scenario on using the same external finish material and why it is important to design larger external walls at the early stages of a project to avoid loss of net area.

Thermal Requirements

We would advise that all new buildings should operate at net zero carbon. Currently, Passivhaus design principles are the best method of achieving this goal. For the purpose of comparison the u-value of $0.13 \text{ W/m}^2\text{k}$ has been chosen as it is possible to achieve Passivhaus certification at this level subject to the overall design. This also safeguards against any changes in thermal requirements following any revisions in Approved Document Part L. For lower u-values these build-ups would need to be reviewed with the relevant manufacturers and suppliers. It is advised to confirm external wall u-values with your sustainability consultant as early as possible.

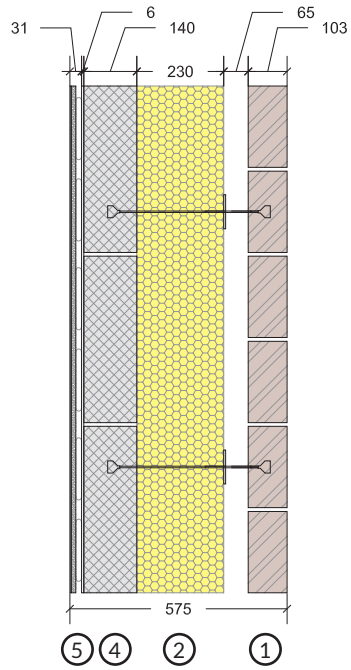
Acoustic Requirements

The acoustic performance of the external wall will be project specific. Ensure a review of requirements are carried out with the relevant acoustic consultant. Refer to Approved Document Part E/Robust Details for Acoustic requirements.

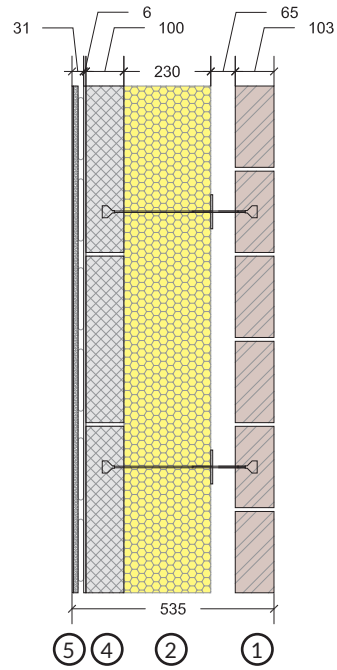
Fire Performance Requirements

Under the new Approved Document Part B all elements within the external wall build-up must only use non-combustible materials that achieve European Classification A2-s1, d0 or Class A1 when the building height is over 18m. Exemptions are possible under regulation 7 paragraph (3) Refer to Approved Document Part B2 paragraph 12.9-12.14. These should be read in conjunction with Part B2 Section 13 for fire resistance requirements in relation to distance from boundaries. It is advised to discuss and reach agreements with your client and Building Control before specifying any combustible materials to ensure compliance.

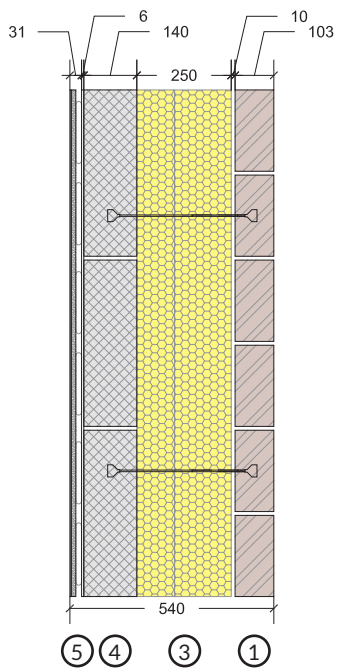
Partially Fill Cavity - 140mm Blockwork



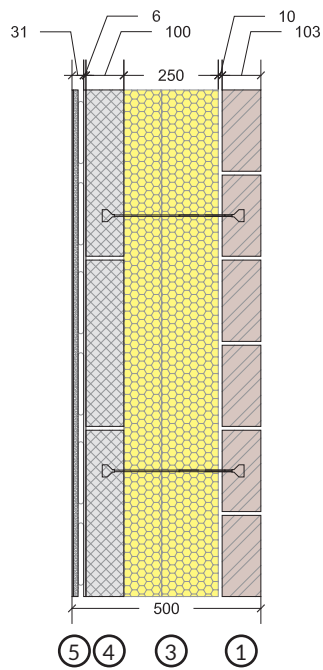
Partially Fill Cavity - 100mm Blockwork



Fully Fill Cavity - 140mm Blockwork



Fully Fill Cavity - 100mm Blockwork



External Wall Build-up

Brick - Masonry Inner Leaf - 0.13 W/m²K

01 – Facing Brickwork (103mm)

Mortar pointing and brick bond type are project specific, edit where appropriate. If brickwork continues below ground, the selected brick needs to be frost resistant to F2, S2 classification.

Wall ties are shown using Ancon Teplo-BF2 composite wall ties with low thermal conductivity (0.7W/mK). SE to advise amount of wall ties required.

Wall cavities require minimum 50mm clear cavity (includes wall ties and wall tie channels). Providing a 65mm clear cavity allows for 15mm tolerance in the brick construction. See NHBC 9.1.2. and BS 5606:1990 for details.

02 – Mineral Wool Insulation (230mm)

Mineral Wool Insulation - Partially filled in cavity

- PIR insulation can only be used in buildings under 18m
- Assume non-combustible until agreed with client.

03 – Mineral Wool Insulation (250mm)

Mineral Wool Insulation - Fully filled in cavity

- PIR insulation can only be used in buildings under 18m
- Assume non-combustible until agreed with client.

04 – Blockwork (100-140mm)

100mm wide inner leaf blockwork is suitable for use on standard 3000-3300mm floor to floor heights. For larger heights confirm with structural engineer the thickness, strength and restraint required.

- Medium dense inner leaf blockwork is assumed.
- If inner leaf is load bearing wall, structural engineer to specify strength.
- Confirm density specification to ensure the relevant acoustic and thermal properties are met.

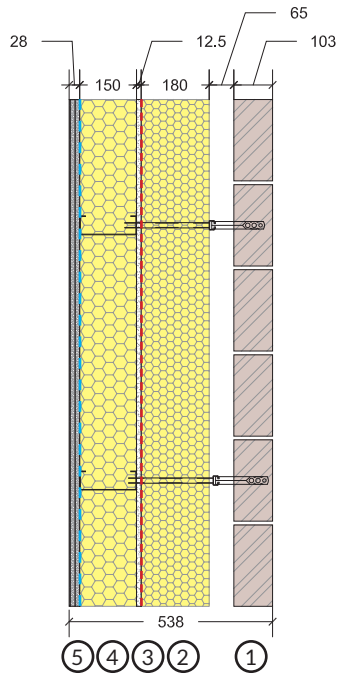
05 – Plasterboard / Vapour Control Layer (VLC)

Standard British Gypsum Plasterboard on Dabs consists:

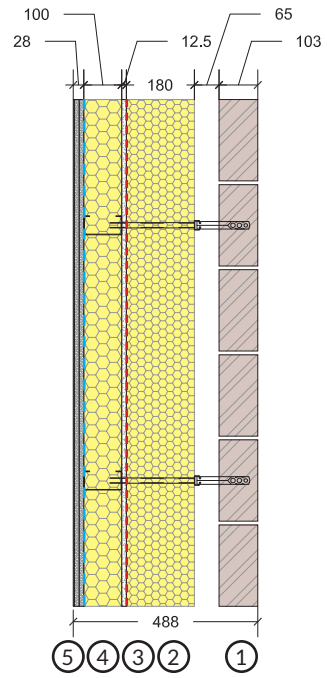
- 6mm Parge Coat - Gyproc Soundcoat Plus
- 15mm Gyproc DriWall Adhesive
- 12.5mm Plasterboard
- 3.5mm Plaster Skim

(Moisture resistant plasterboard to be used in bathrooms, utility cupboards and kitchens)

Partially Fill Cavity - 150mm SFS



Partially Fill Cavity - 100mm SFS



External Wall Build-up

Brick - SFS Inner Leaf - 0.13 W/m²K

01 – Facing Brickwork (103mm)

Mortar pointing and brick bond type are project specific, edit where appropriate. If brickwork continues below ground, the selected brick needs to be frost resistant to F2, S2 classification.

Wall ties are shown using Ancon Teplo-BF2 composite wall ties with low thermal conductivity (0.7W/mK). SE to advise amount of wall ties required.

Wall cavities require minimum 50mm clear cavity (includes wall ties and wall tie channels). Providing a 65mm clear cavity allows for 15mm tolerance in the brick construction. See NHBC 9.1.2. and BS 5606:1990 for details.

02 – Mineral Wool Insulation (180mm)

Mineral Wool Insulation - Partially filled in cavity

- PIR insulation can only be used in buildings under 18m
- Assume non-combustible until agreed with client.

03 – Breather Membrane

Breather membrane provides a water-tightness line.

04 – Structural Steel Framing System with Sheaving board (100 or 150mm plus board)

Confirm Structural Steel Framing System thickness with SE and manufacturers. Residential applications are typically either 100mm or 150mm.

12.5mm Fibre-reinforced calcium silicate boards, min Euroclass A2.

05 – Plasterboard / Vapour Control Layer (VCL)

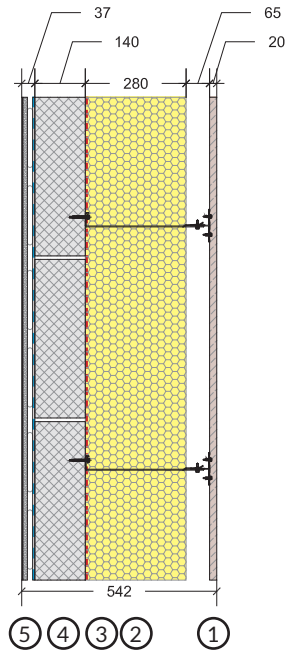
The vapour control layer provides an airtightness line. To ensure airtightness is not compromised all installations (e.g. wall-mounted TVs, shelves), conduits, and wall sockets/ switches should not be positioned on the external walls where the VCL is located. Alternatively, an additional service zone should be created between the plasterboard and VCL to prevent any penetrations.

Standard British Gypsum Plasterboard build-up containing:

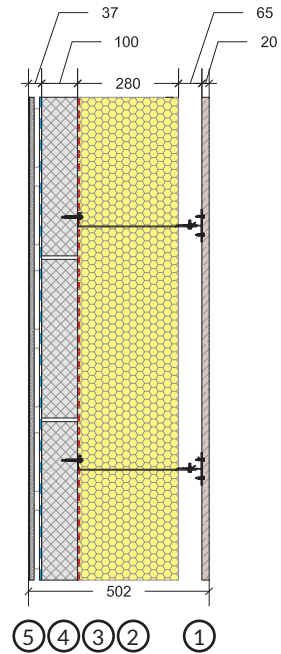
- 2x12.5mm Plasterboard (confirm thickness / type with acoustic consultant)
- 3.5mm Plaster Skim

(Moisture resistant plasterboard to be used in bathrooms, utility cupboards and kitchens)

Partially Fill Cavity - 140mm Blockwork



Partially Fill Cavity - 100mm Blockwork



External Wall Build-up

Cladding - Blockwork Inner Leaf - 0.13 W/m²K

01 – Rainscreen Cladding (20mm / 65mm Cavity)

U-value and cladding support system will be affected by the cladding material, weight and design. Seek advice from manufacturers or facade consultant to ensure correct thickness.

Check specification of cladding to ensure no combustible material is used in line with the new Approved Document Part B.

Ensure sufficient cavity space is provided and fire stopping/ fire barriers are provided.

02 – Mineral Wool Insulation (280mm)

Mineral Wool Insulation - Partially filled in cavity

- PIR insulation can only be used in buildings under 18m
- Assume non-combustible until agreed with client.

03 – Breather Membrane

Breather membrane provides a water-tightness line.
(Confirm with cladding manufacturer if required)

04 – Blockwork (100-140mm)

100mm wide inner leaf blockwork is suitable for use on standard 3000-3300mm floor to floor heights. For larger heights confirm with structural engineer the thickness, strength and restraint required.

- Medium dense inner leaf blockwork is assumed.
- If inner leaf is load bearing wall, structural engineer to specify strength.
- Confirm density specification to ensure the relevant acoustic and thermal properties are met.

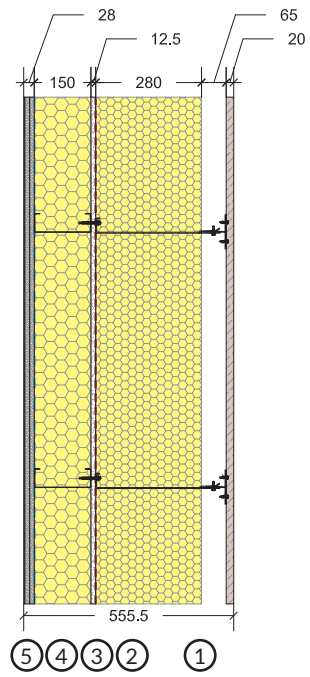
05 – Plasterboard / Vapour Control Layer (VLC)

Standard British Gypsum Plasterboard on Dabs consists:

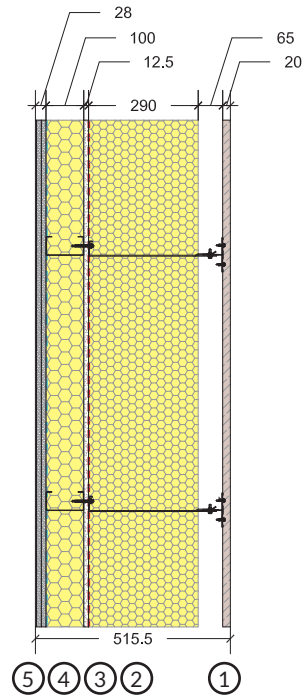
- 6mm Parge Coat - Gyproc Soundcoat Plus
- 15mm Gyproc DriWall Adhesive
- 12.5mm Plasterboard
- 3.5mm Plaster Skim

(Moisture resistant plasterboard to be used in bathrooms, utility cupboards and kitchens)

Partially Fill Cavity - 150mm SFS



Partially Fill Cavity - 100mm SFS



External Wall Build-up

Cladding - SFS Inner Leaf - 0.13 W/m²K

01 – Rainscreen Cladding (20mm / 65mm Cavity)

U-value and cladding support system will be affected by the cladding material, weight and design. Seek advice from manufacturers or facade consultant to ensure correct thickness.

Check specification of cladding to ensure no combustible material is used in line with the new Approved Document Part B.

Ensure sufficient cavity space is provided and fire stopping/ fire barriers are provided.

02 – Mineral Wool Insulation (290mm)

Mineral Wool Insulation - Partially filled in cavity

- PIR insulation can only be used in buildings under 18m
- Assume non-combustible until agreed with client.

03 – Breather Membrane

Breather membrane provides a water-tightness line.

04 – Structural Steel Framing System with Sheaving board (100 or 150mm plus board)

Confirm Structural Steel Framing System thickness with SE and manufacturers. Residential applications are typically either 100mm or 150mm.

12.5mm Fibre-reinforced calcium silicate boards, min. Euroclass A2.

05 – Plasterboard / Vapour Control Layer (VCL)

The vapour control layer provides an airtightness line. To ensure airtightness is not compromised all installations (e.g. wall-mounted TVs, shelves), conduits, and wall sockets/ switches should not be positioned on the external walls where the VCL is located. Alternatively, additional service zone should be created between the plasterboard and VCL to prevent any penetrations.

Standard British Gypsum Plasterboard build-up containing:

- 2x12.5mm Plasterboard (confirm thickness / type with acoustic consultant)
- 3.5mm Plaster Skim

(Moisture resistant plasterboard to be used in bathrooms, utility cupboards and kitchens)

Internal Wall Build-up

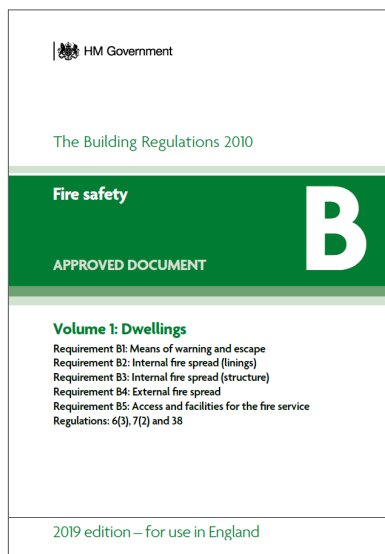
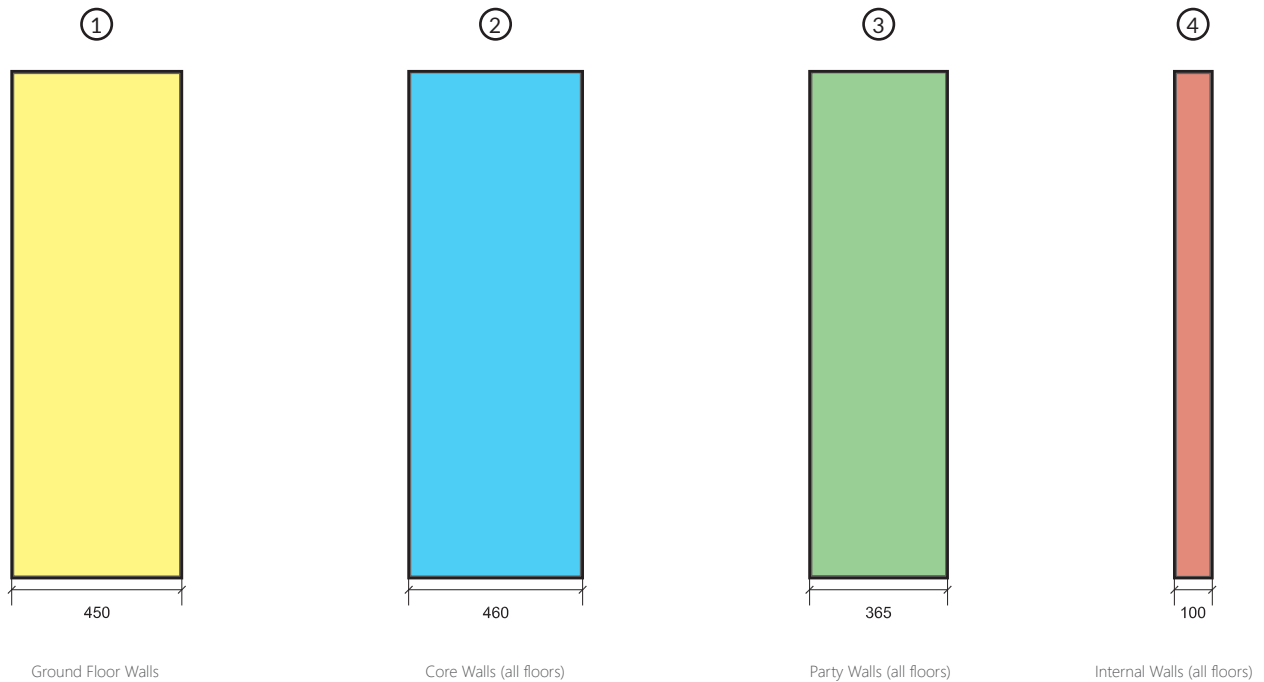
Notes:

The following information has been produced to help designers understand the policy driven requirements as well as the technology driven aspect of construction build-ups. Every project is different and has different requirements, we highly recommend confirming build-ups with the relevant consultants as soon as possible to ensure fire, acoustic and thermal requirements are met. Any inaccuracy in the information is not the responsibility of Counterbalance or contributors of the guidance. The guidance provided has materialised from previous project experience / guidance using a common construction method for housing projects.

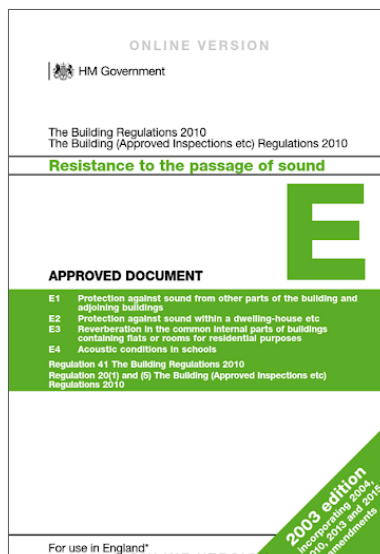
Future Research:

Counterbalance would like to extend this research in the future to contain more construction types and compare which methods have more efficient internal wall build-up. If you have any interesting projects or research to contribute please get in touch.

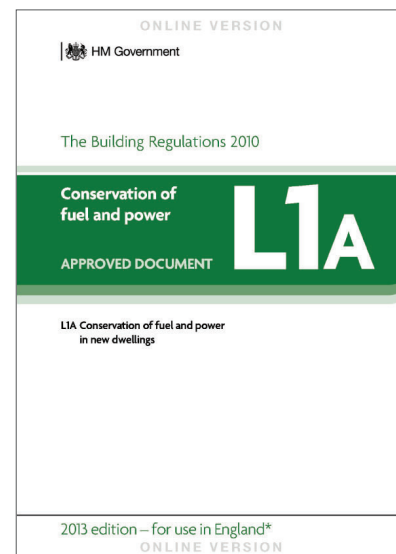
Typical Internal Wall Types



Approved Document Part B



Approved Document Part E



Approved Document Part L

Internal Wall Build-up

Guidance Notes

The purpose of this chapter is to ensure realistic internal wall build-ups are used at the beginning of a project when the construction method is unknown to avoid any future loses in net area. It should be noted that every project should be reviewed on a project by project basis to meet specific requirements. This guidance only addresses the overall wall thickness and each element of the wall build-up will have its own requirements and specifications which are not covered in this chapter.

Counterbalance would recommend the use of following wall build-up throughout the building to allow for flexible in the design when the internal wall build-up is unknown. These widths allows for all the build-ups to follow in this chapter, safe guarding the design from material changes in the future.

Thermal Requirements

The ground floor wall build-up has assumed thermal insulation is required within the walls to ensure a thermal break happened between refuse/cycle stores and residential common corridor/dwellings. Party wall build-ups have assumed that thermal insulation is required between units. This is only required if common corridors are not heated - refer to the project MEP engineer to confirm if insulation is required and target u-values. For guidance refer to Approved Document Part L.

Acoustic Requirements

The acoustic performance of the internal walls will be project specific. Ensure a review of requirements are carried out with the relevant acoustic consultant. Refer to Approved Document Part E/Robust Details for Acoustic requirements.

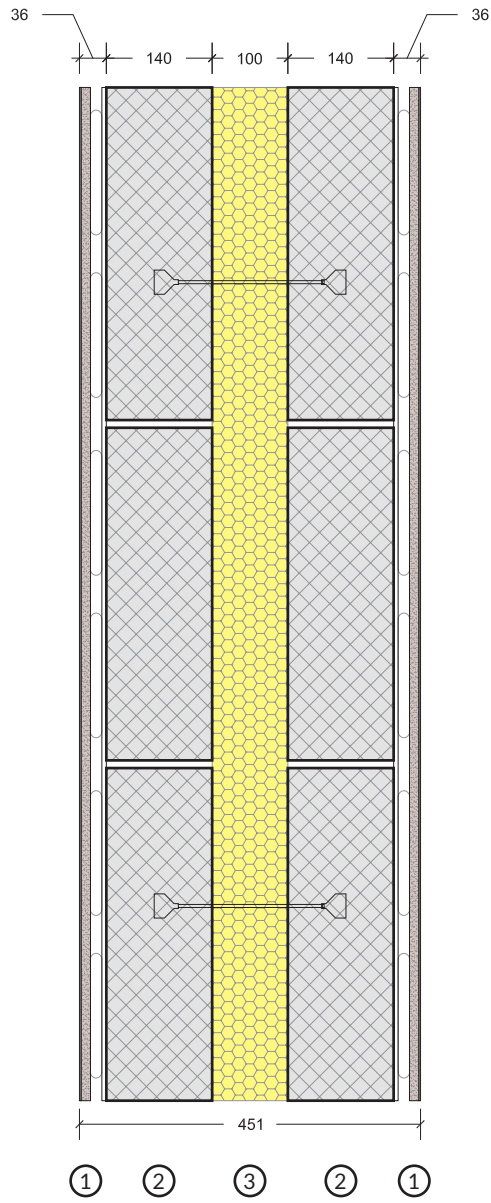
Fire Performance Requirements

The following fire resistances can be achieved through the relevant specification of individual elements with the wall build-up, refer to the manufacturers guidance for archiving each rating:

- Ground Floor Walls - 60-120mins
- Core Walls - 120mins
- Party Walls - 60-120mins
- Internal Walls - 30mins

Refer to Approved Document Part B for guidance and consult with the project fire consultant for advice.

140mm Full Fill Blockwork Wall



Internal Wall Build-up

Internal Walls - Ground Floor Walls

01 – Plasterboard & Skim (32mm)

- 2mm Plaster Skim (both sides)
- 15mm British Gypsum Gyproc Soundbloc on dabs (both sides)

Ensure moisture resistant plasterboard or VCL is used where appropriate.

02 – Blockwork (100-140mm)

140mm wide inner leaf blockwork is suitable for use on standard 5000mm floor to floor heights. For larger heights confirm with structural engineer the thickness, strength and restraint required.

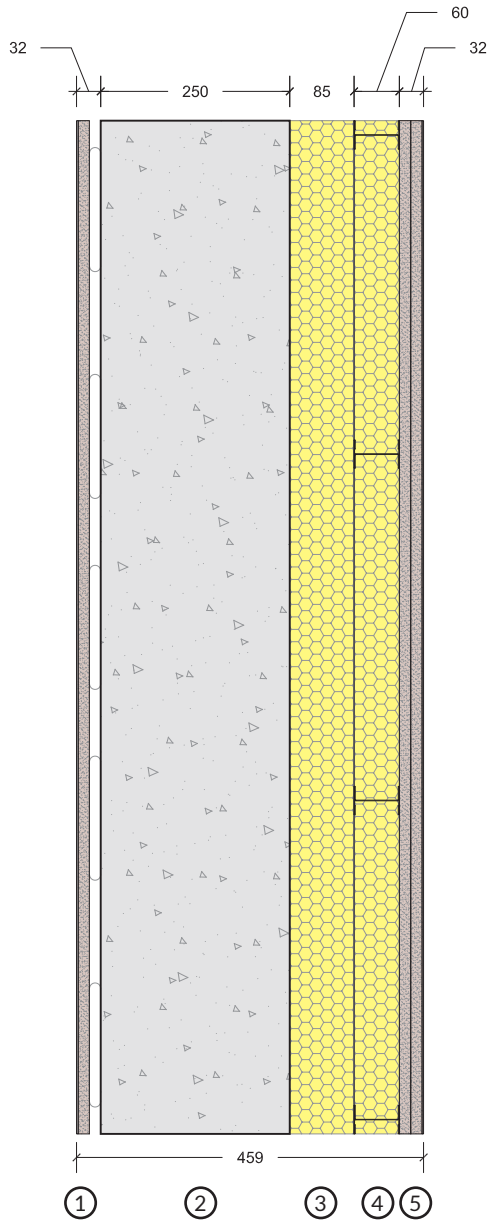
- Medium dense inner leaf blockwork is assumed.
- If inner leaf is load bearing wall, structural engineer to specify strength.
- Confirm density specification to ensure the relevant acoustic and thermal properties are met.

Wall ties are shown using Ancon Teplo-BF2 composite wall ties with low thermal conductivity (0.7W/mK). SE to advise amount of wall ties required.

03 – Mineral Wool Insulation (100mm)

- 100mm Full Fill Cavity Mineral Wool Insulation

250mm RC Frame - Core Wall



Internal Wall Build-up

Internal Walls - Core Walls

01 – Plasterboard & Skim (32mm)

- 2mm Plaster Skim
- 15mm British Gypsum Gyproc Soundbloc on dabs

Ensure moisture resistant plasterboard or VCL is used where appropriate.

02 – Reinforce Concrete Frame (250mm)

Refer to structural engineers information for thickness of frame. 250mm used as typical/past project experience starting point.

03 – Mineral Wool Insulation (85mm)

This insulation is required when the stair/core is unheated.

- Isover APR 1200 Mineral Wool (density 12kg/m³ min)

04 – Metal Frame Stud with Insulation

- Single Gypframe Studs 60mm Deep with 60mm Mineral Wool Quilt (density 10kg/m³ min)

(For the purpose of wall thickness, sealants, mastics and fire stripes have not been shown - refer to manufactures guidance.)

It is advised to work with your relevant contractor/client to find optimum build-up that is cost effective while maintaining a high level of performance.

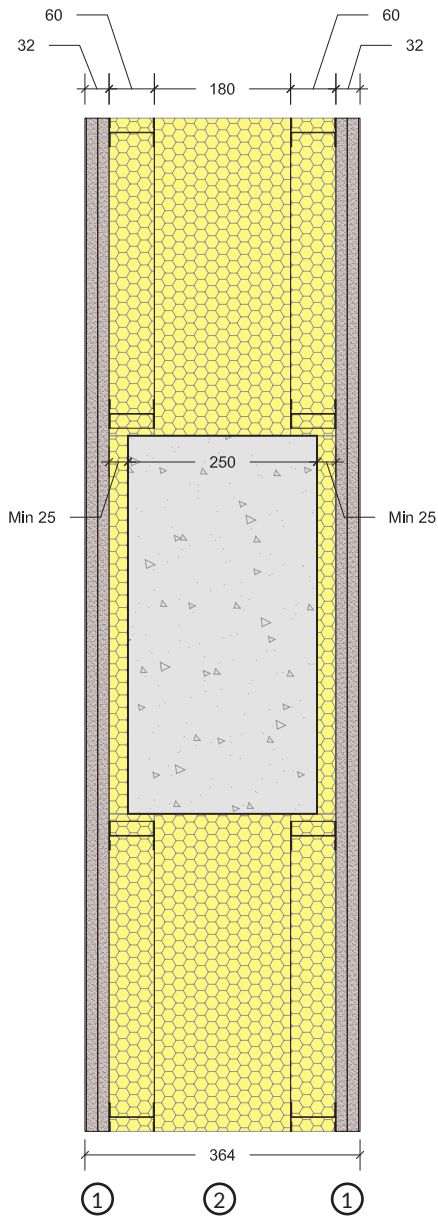
Refer to manufacturer, fire and acoustic consultant for relevant junction, stud spacing, pattressing and service details.

05 – Plasterboard & Skim

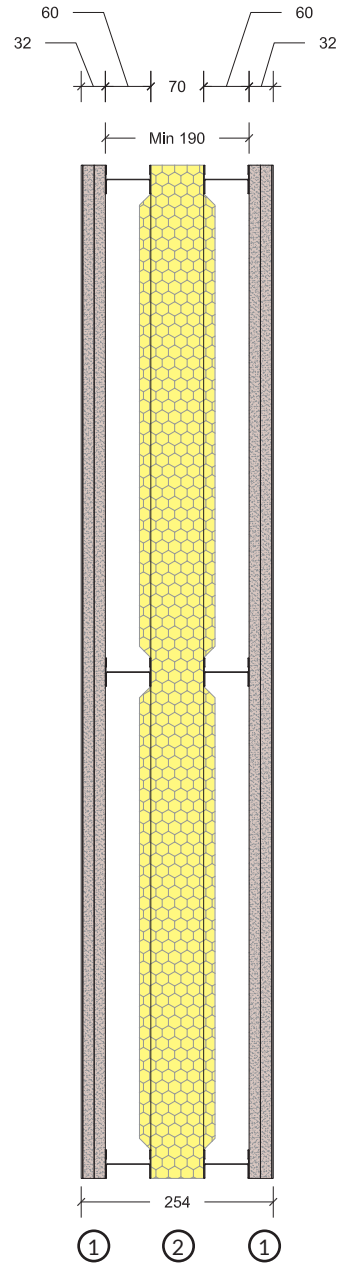
- 2mm Plaster Skim (both sides)
- 2x15mm British Gypsum Gyproc Soundbloc

Ensure moisture resistant plasterboard or VCL is used where appropriate.

Early Stage Party Wall



Minimum Party Wall



Internal Wall Build-up

Internal Walls - Party Walls

01 – Plasterboard & Skim

- 2mm Plaster Skim (both sides)
- 2x15mm British Gypsum Gyproc Soundbloc (both sides)

Refer to manufacturer, fire and acoustic consultant for relevant junction, stud spacing, pattering and service details.

Ensure moisture resistant plasterboard or VCL is used where appropriate.

02 – Metal Frame Stud with Insulation

It is advised to use the with RC columns version until the structural, fire, acoustic and thermal strategy is confirmed with the relevant consultant. Without RC columns version can only be used under strict circumstances.

With RC Columns

- Twin Gypframe Studs 60mm Deep with 100mm Mineral Wool Quilt (density 10kg/m³ min)
- 180mm Mineral Wool Quilt (density 10kg/m³ min)

(For the purpose of wall thickness, sealants, mastics and fire stripes have not been shown - refer to manufactures guidance.)

Minimum Party Wall Build-up

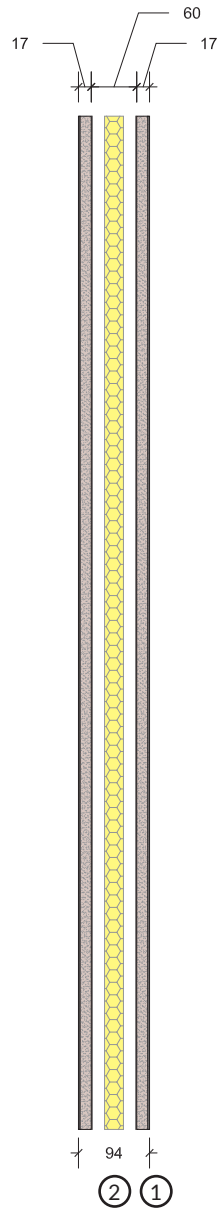
- Twin Gypframe Studs 60mm Deep with 100mm Mineral Wool Quilt (density 10kg/m³ min)

(This option requires common corridors and core to be heated - confirm approach with relevant consultants before taking this approach)

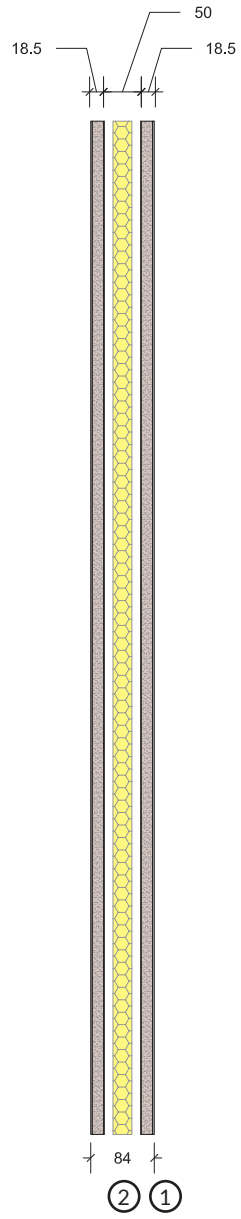
Walls between apartments and common corridors can vary greatly depending on the structure, thermal, fire and acoustic requirements it is therefore recommended that the relevant consultants are appointed to inform the design.

It is advised to work with your relevant contractor/client to find optimum build-up that is cost effective while maintaining a high level of performance.

60mm Metal Frame Stud



50mm Metal Frame Stud



Internal Wall Build-up

Internal Walls - Apartment Walls

01 – Plasterboard & Skim

- 2mm Plaster Skim (both sides)
- 15mm British Gypsum Gyproc Soundbloc (both sides)

Refer to manufacturer, fire and acoustic consultant for relevant junction, stud spacing, pattering and service details.

Ensure moisture resistant plasterboard or VCL is used where appropriate.

02 – Metal Frame Stud with Insulation

Slab to Slab recommended maximum heights: 3100mm (600mm Centres)

- 48 I 50mm British Gypsum Gypframe Steel Stud with 25mm Isover APR1200 quilt

Slab to Slab recommended maximum heights: 3800mm (600mm Centres)

- 60 I 50mm British Gypsum Gypframe Steel Stud with 25mm Isover APR1200 quilt

Increasing stud centres or adding layers of plasterboard can increase recommended maximum heights, refer to manufacturers guidance.

It is advised to work with your relevant contractor/client to find optimum build-up that is cost effective while maintaining a high level of performance.

