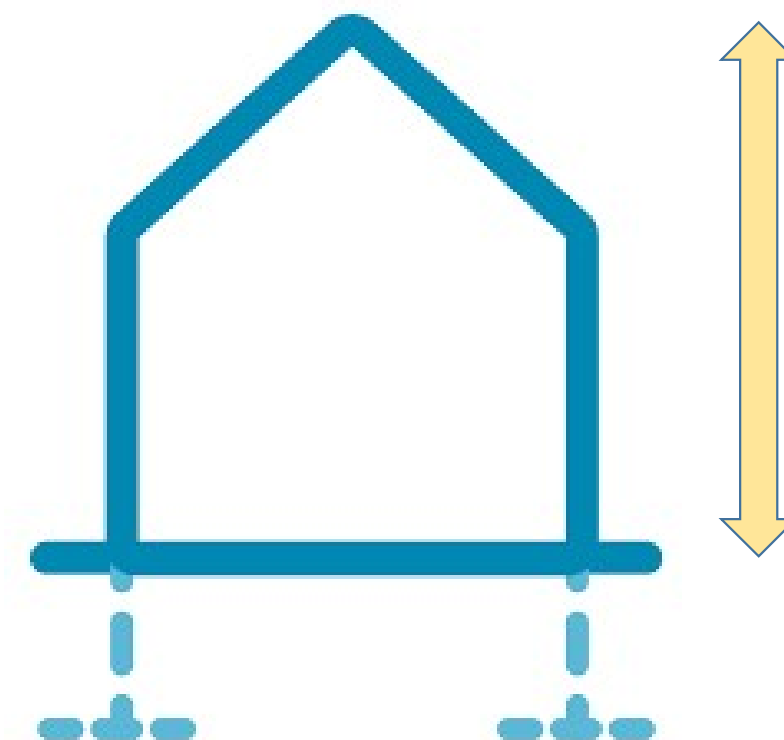


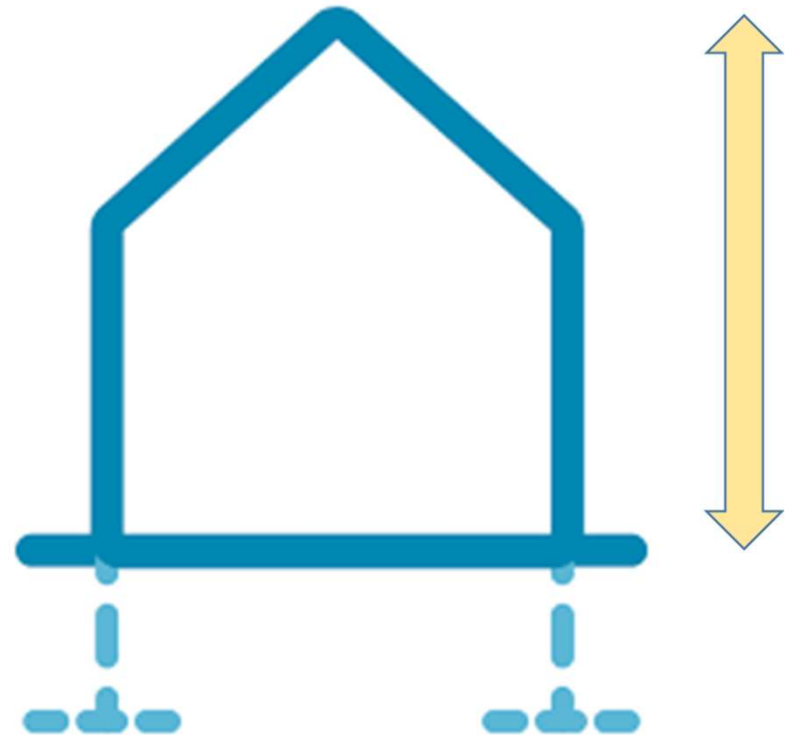
Superstructure : Fundamentals of Construction Technology

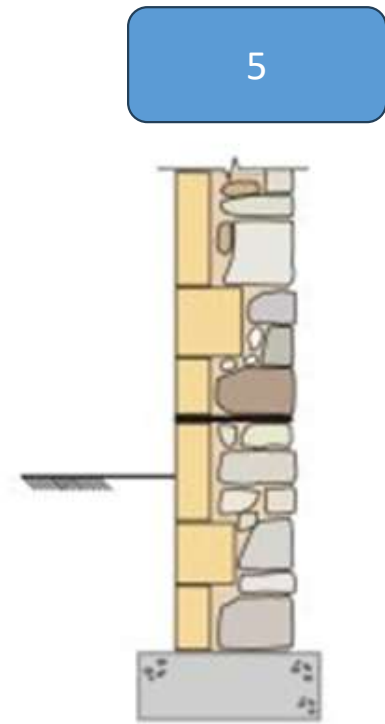
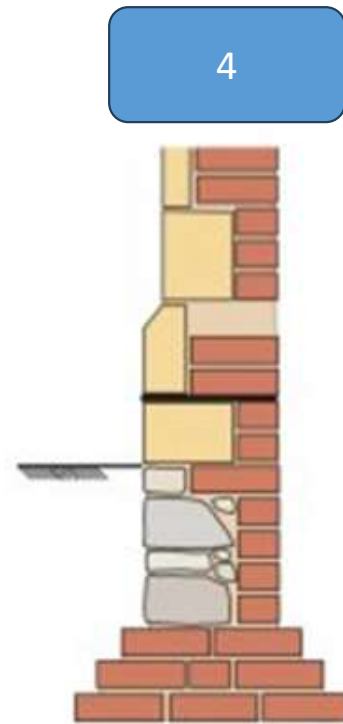
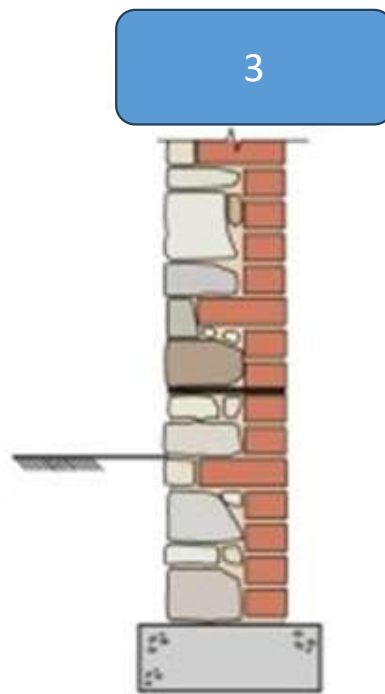
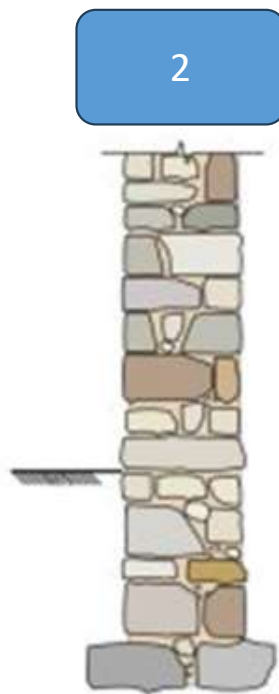
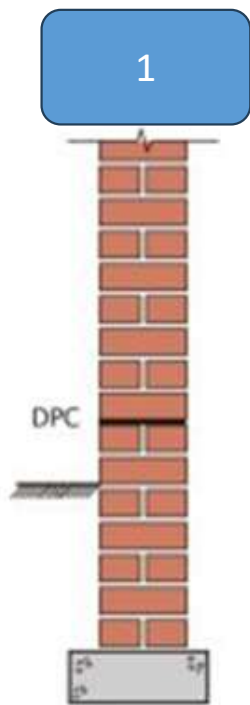


Recap

Partitions

Floors





EXERCISE

Draw a cross section for a typical brick and block external cavity Wall in Swansea. Include all elements that are necessary for the correct performance.



PARTITION WALLS



DEFINITION

- Wall or division with the purpose of dividing one room or space
- They are designed as non-load bearing walls
- If they are load bearing then they are called as 'internal wall'
- Light in weight and cheaper costs in construction
- Occupy less area
- Easily constructed
- Adaptability

REQUIREMENTS

- Thin cross-section to occupy minimum floor area
- Provide adequate privacy in rooms (sight and sound)
- Light, sound, uniform, homogeneous, durable materials
- Easy and economical in construction
- Sufficient resistance against fire, heat, dampness, etc.
- Rigid and strong enough to support sanitary fittings and heavy fixtures

TYPES OF PARTITION WALLS

- Brick partitions
- Clay brick partitions
- Concrete partitions
- Glass partitions
- Plaster slab partitions
- Metal lath partitions
- Timber partitions

TYPES OF PARTITION WALLS

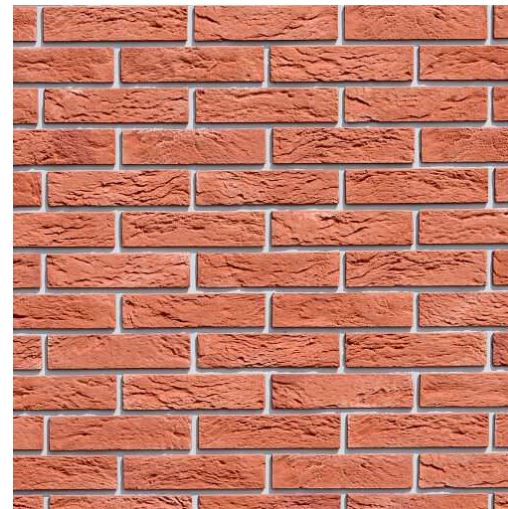
Plain brick partition wall

Common and cost effective

Bricks laid as stretchers in cement mortar

Recommended height: maximum 2m for construction in a day

Strong and fire resistant



TYPES OF PARTITION WALLS

Hollow clay brick partition wall

Reduced weight

Increased thermal and acoustic insulation

Similar construction to structural walls but they are non-load bearing



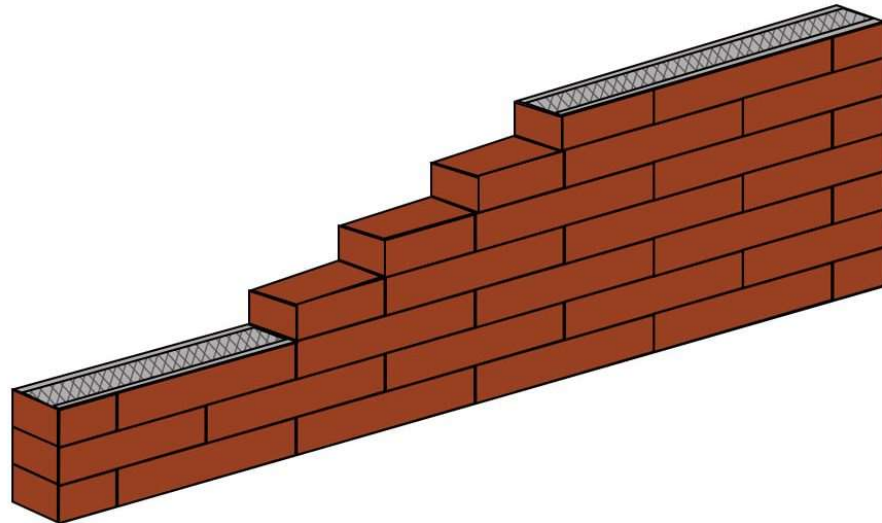
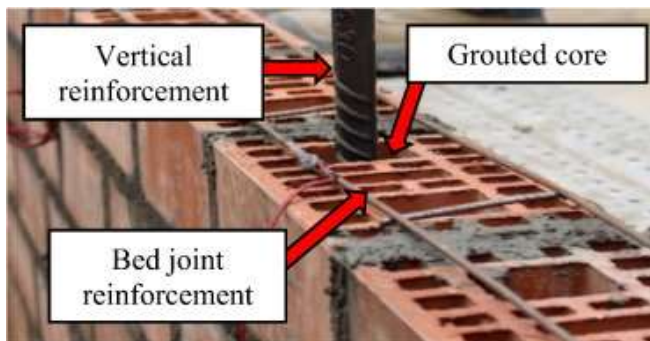
TYPES OF PARTITION WALLS

Reinforced brick partition wall

Reinforcement of wire mesh strips or iron bars

Placed at every third or fourth course

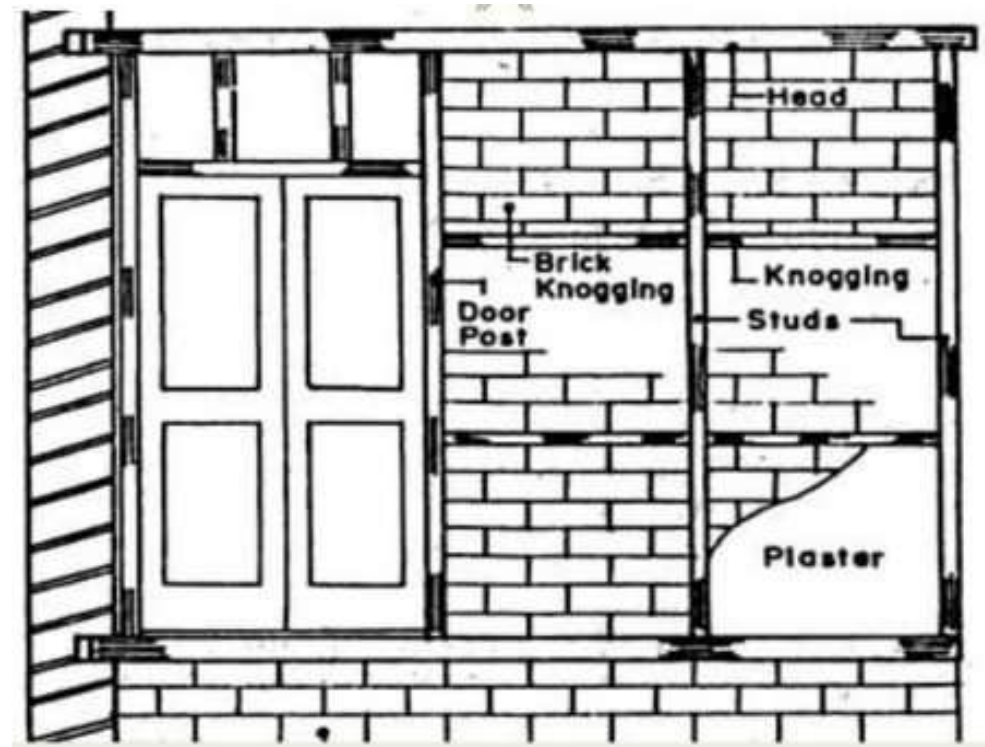
Used to strengthen the partition when it has to support additional loads



TYPES OF PARTITION WALLS

Brick noggin partition wall

Brickwork built within a framework of wooden members
Studs (vertical posts) spaced at 60-150cm
Nogging pieces (horizontal) housed into the studs at 60-90cm vertically



TYPES OF PARTITION WALLS

Glass partition wall

- Light in weight, vermin proof, damp proof and soundproof
- Glass sheets are fixed to a wooden framework
- Glass fixed with beadings or by putty



TYPES OF PARTITION WALLS

Safety glass

Safety in glazing. Documents applicable:

- BS 6262:2005. Glazing for Buildings
- Building Regulations. Approved Document N

Types:

- Tempered glass (or toughened glass)
- Laminated glass
- Wire mesh glass
- Engraved glass

TYPES OF PARTITION WALLS

Safety glass

Tempered glass (or toughened glass)

- Shower doors
- Architectural doors
- Component of bulletproof glass



Tempered

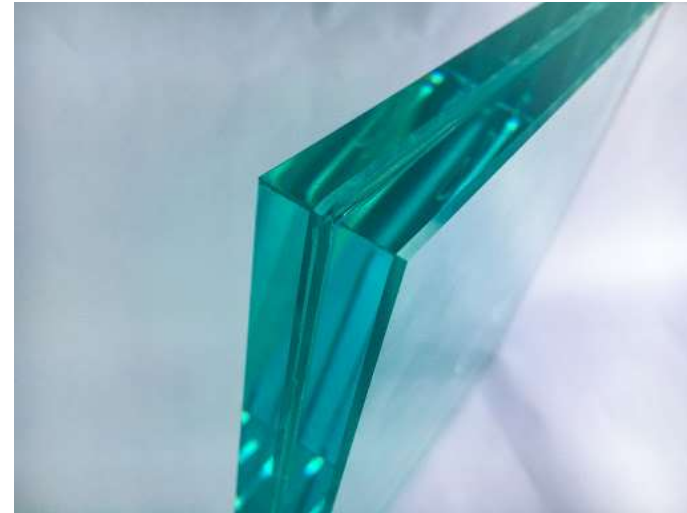
Float

TYPES OF PARTITION WALLS

Safety glass

Laminated glass

- Used when possibility of human impact
- Skylight glazing
- Automobile windshields
- PVB interlayer gives more acoustic insulation and blocks most of UV radiation



Interlayer of poplyvinyl butyral (PVB)

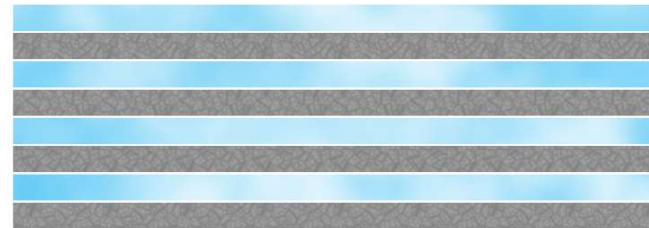


TYPES OF PARTITION WALLS

Safety glass

Bulletproof glass

- Type of laminated glass
- Combination of different types of glass (hard and soft)
- The more layers, the more resistance
- Used in windows that require such security (jewellery stores, embassies, banks, etc.)

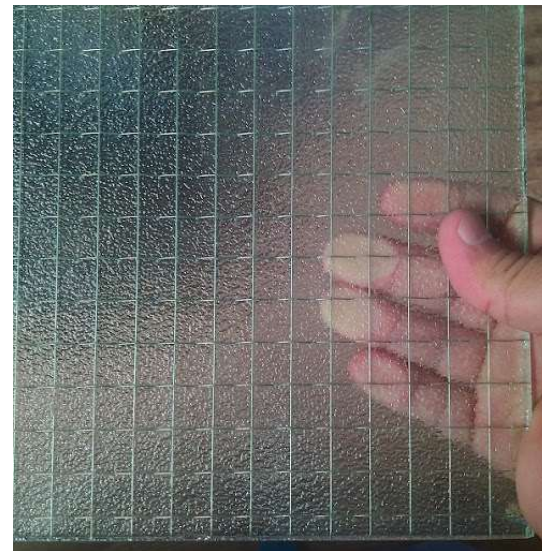


TYPES OF PARTITION WALLS

Safety glass

Wire mesh glass

- Fire-resistant capacity
- Fire protection partitions
- Not as strong as other types of glass
- Breaking in sharp pieces that can cause injuries
- Not commonly used



TYPES OF PARTITION WALLS

Safety glass

Engraved glass

- Engraved networks of micro-cracks produced with laser
- Energy is dissipated much better



TYPES OF PARTITION WALLS

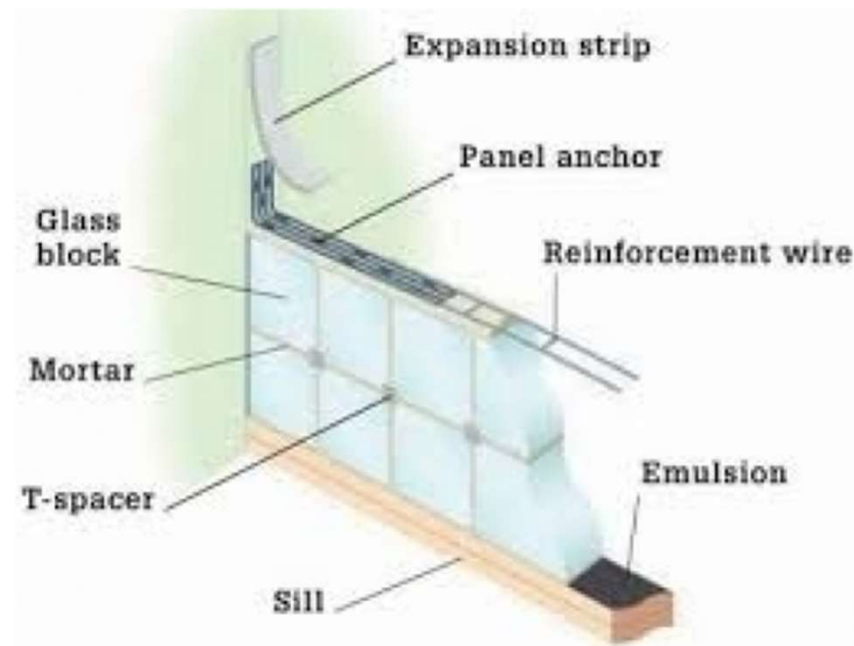
Hollow Glass partition wall

- Using hollow glass blocks
- Standards size 14x14cm or 19x19cm, thickness 10cm
- Blocks laid in cement-lime mortar and fine sand (1:1:4)
- All joints filled conveniently
- Reinforcement placed at every course



TYPES OF PARTITION WALLS

Hollow Glass partition wall



TYPES OF PARTITION WALLS

Plaster slab partition wall

- Slabs made of burnt gypsum or plaster of paris, mixed with sawdust or other fibrous material
- Size of 1 to 2m long, 30cm high and 50 to 100mm thick
- Provided with grooves to create rigid joints
- Adhesive plaster as a binder
- BS EN 12859:2011

TYPES OF PARTITION WALLS

Plaster slab partition wall



TYPES OF PARTITION WALLS

Plaster slab partition wall



TYPES OF PARTITION WALLS

Plaster block partition wall



TYPES OF PARTITION WALLS

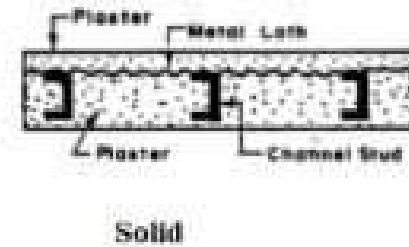
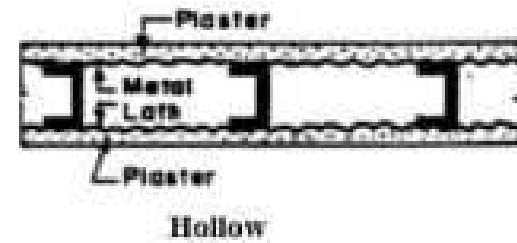
Metal lath partition walls

- Constructed placing 2cm or 2.5cm studs and fixing metal lath to it on one side
- Plaster is applied to both faces of the metal
- When a hollow partition is needed, metal lath is fixed to the channels on both sides and then plaster is applied



TYPES OF PARTITION WALLS

Metal lath partition walls



<https://www.metsec.com/products/dry-lining/partitioning-systems/>

Partitioning Systems

Metsec manufacture a full range of dry lining metal profiles.

- C Stud
- Heavy Duty C stud
- Acoustic Stud
- I stud including Shaftwall and Independent wall lining
- Wall Liner
- Tracks – Standard, Deep and Extra Deep
- Metal Furring ceilings including SMF5, SMF6a, SMF7 and angle
- Floating Floor systems
- Resilient (Acoustic separating) Bar
- Angles and Channels



Thanks to extensive research and development with advanced manufacturing techniques Metsec offer partitioning systems that conform to the latest British and European standards.



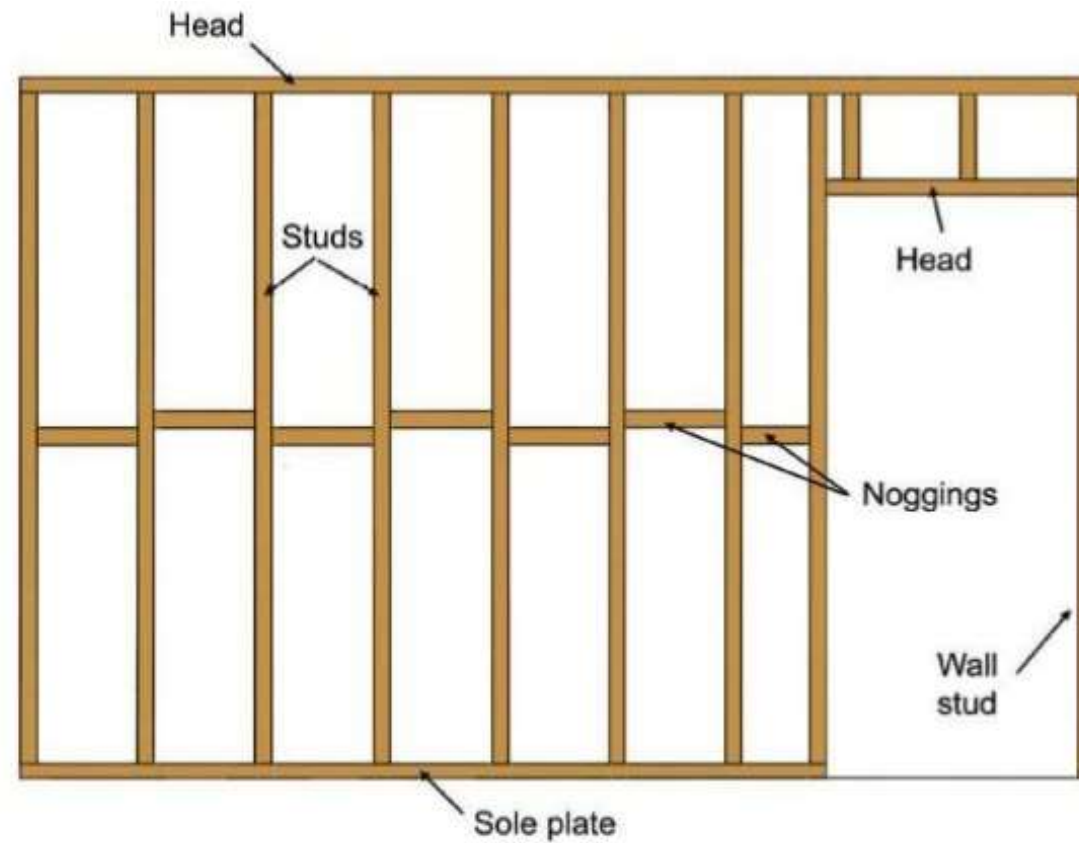
TYPES OF PARTITION WALLS

Timber partition walls

- Stud framework as vertical loadbearing skeleton
- Studs placed at 600mm or 400mm centres
- Top and bottom rails are the same size as studs
- Sizes 38x89mm and 38x140mm (BS EN 336 Structural Timber)
- Use of noggins:
 - Support for plasterboard edges
 - Reduce buckling of studs
 - Provide fixing points for fittings and fixtures

TYPES OF PARTITION WALLS

Timber partition walls



TYPES OF PARTITION WALLS

Timber partition walls

- Sheeting can be covered by:
 - plasterboard
 - OSB, plywood or fibreboard
- Nailed to the internal substructure
- Joints are filled and taped, applied second coat and sanded to smooth finish



TYPES OF PARTITION WALLS

Plasterboard

Also known as drywall

Inner layer of gypsum sandwiched between two outer layers of lining paper

- Different additives in gypsum
- Different weight and strength of lining paper

Characteristics:

- fire resistance
- Acoustic insulation
- Not good for continuous wet environments (special product for moisture and water resistance in kitchens and bathrooms)

TYPES OF PARTITION WALLS

Plasterboard

Width size generally 1200mm
(to cover distance between studs)

Two faces:

- Ivory
- Brown (plaster never applied on this face)

Screw fixing

Two options:

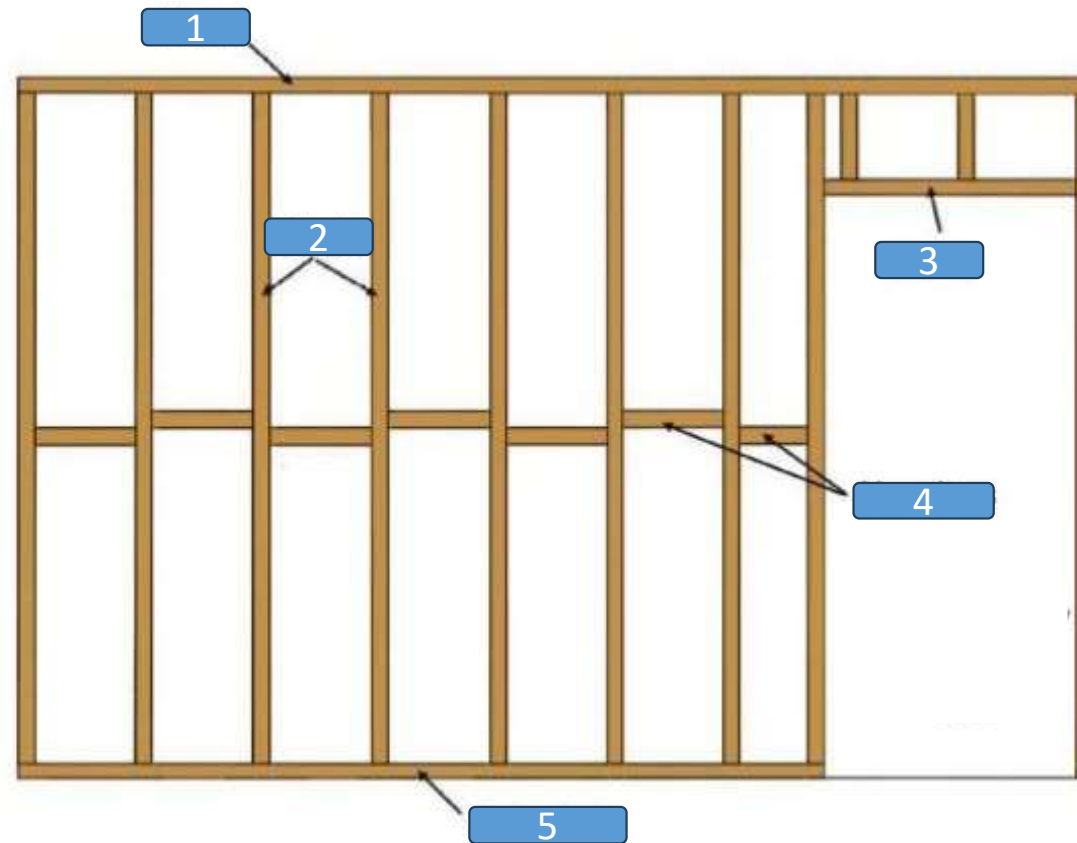
Tapered edge (jointing or skimming)

Square edge (textured finishes)



TYPES OF PARTITION WALLS

Class Exercise:



GROUND FLOORS

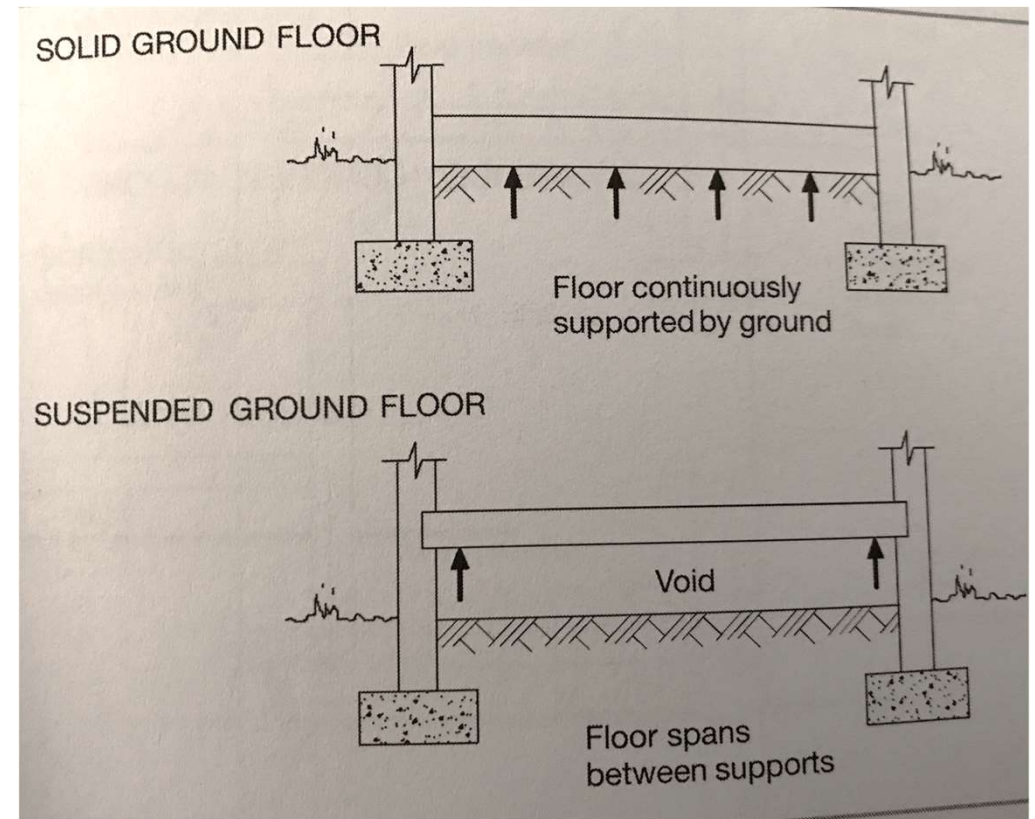
Aims

- **Function of ground floors and selection criteria**
- **Ground-supported floor options**
- **Suspended Floor options**
- **Timber upper floors**

Types of Ground Floor

Solid Floor are formed such that the underside of the floor is in continuous contact with and is supported by the Ground.

Suspended floors are formed such that the structural elements of the floor span between supports, not relying on the ground for support of the floor structures. This may result in the creation of a void beneath the floor and the ground.



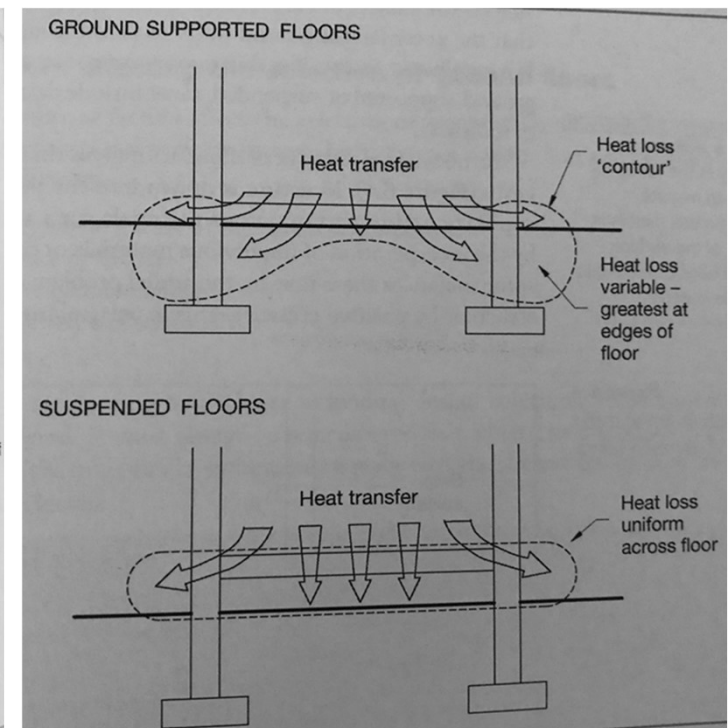
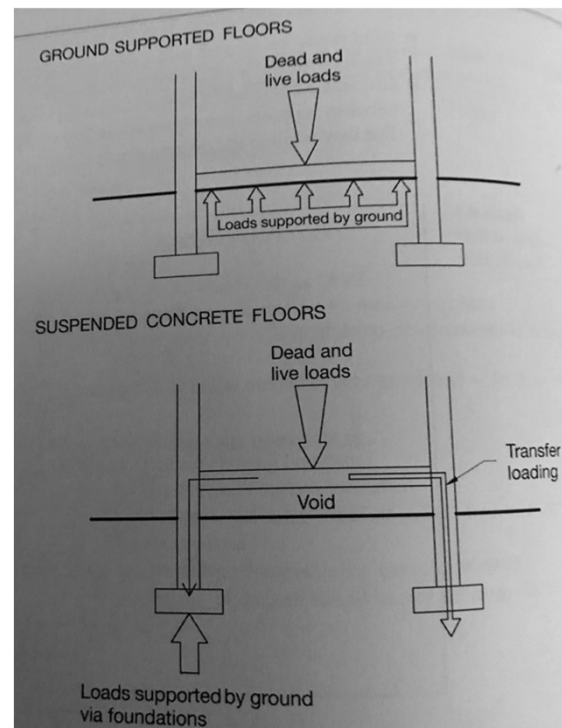
Functional requirements of Ground Floors

Structural Stability

Thermal Insulation

Exclusion of ground water and contaminants

Durability

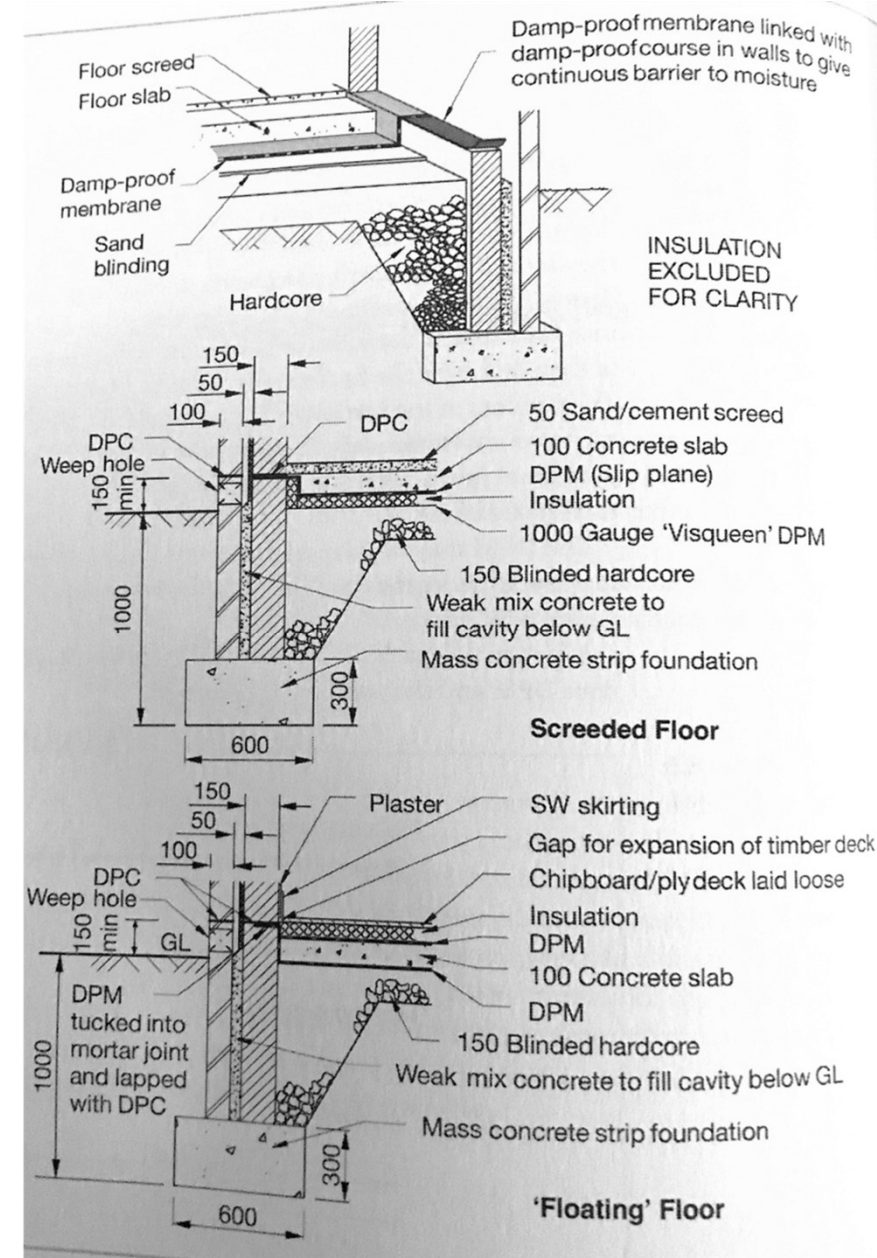


book: Construction technology. 1, House construction
Riley, Mike., Cotgrave, Alison., Third edition., Basingstoke, Hampshire ;, Palgrave Macmillan, 2013., Total Pages vii, 382 pages, 8 pages of unnumbered plates :

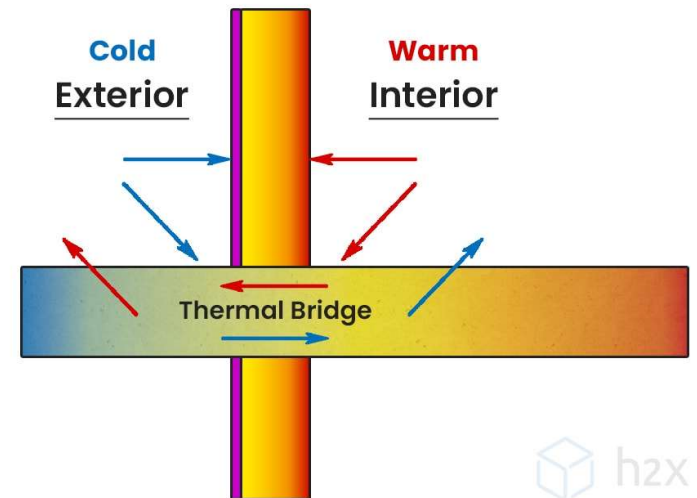
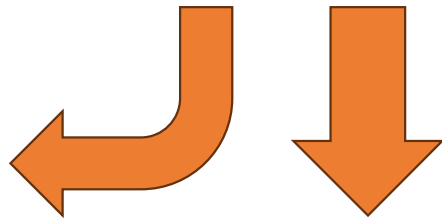
Solid Floor Construction

Term used to describe ground supported floors where all design options adopt the same approach to construction of layered elements. The Main Load-supporting element is the floor slab which would normally take the form of a layer of mass concrete cast in-situ to the desired level. Where ground bearing capacity is low, additional reinforcement bars and mesh can be added to the slab to increase the loadbearing capacity of the slab.

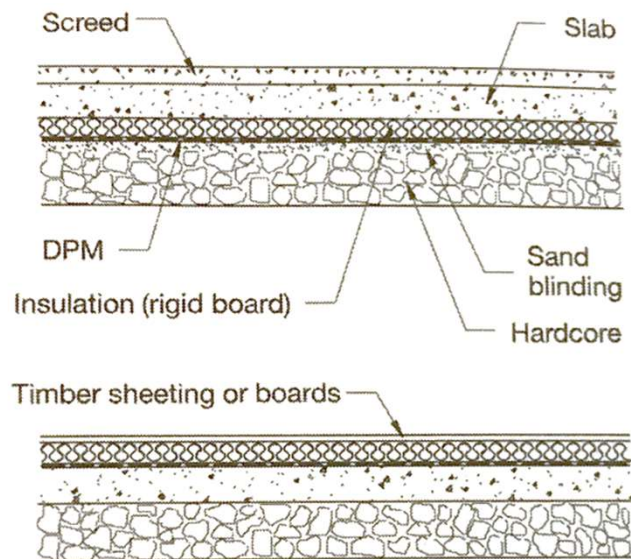
BOOK Construction technology. 1, House construction
Riley, Mike., Cotgrave, Alison., Third edition., Basingstoke, Hampshire ; Palgrave Macmillan, 2013., Total Pages vii, 382 pages, 8 pages of unnumbered plates :



HEAT TRANSFER

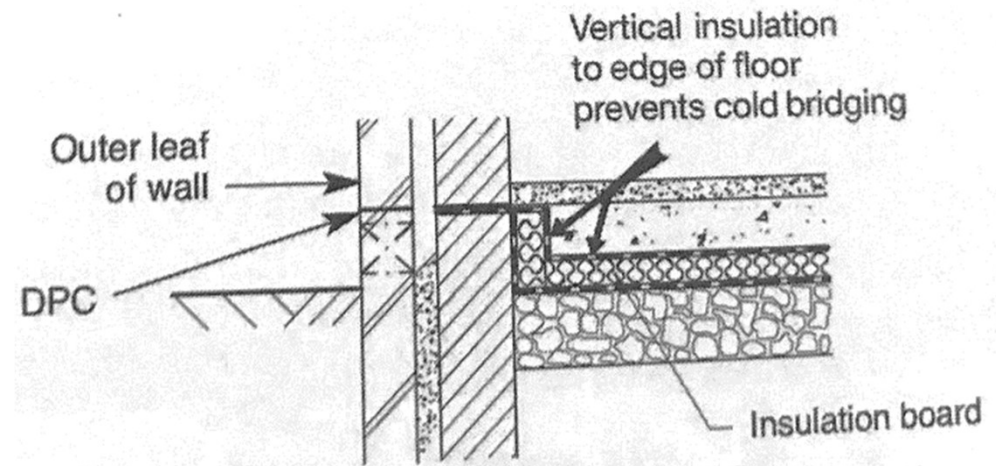


Thermal Insulation



Screeded Floor

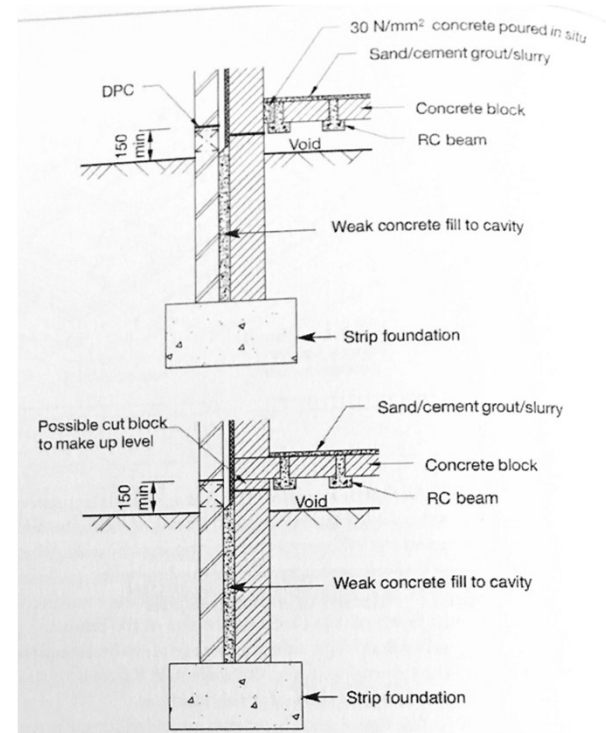
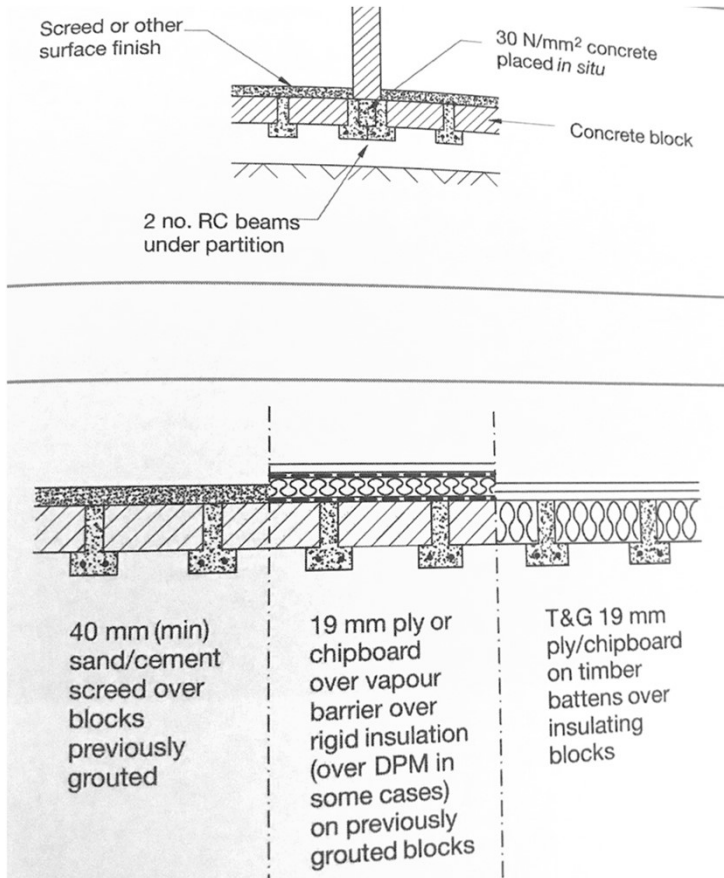
'Floating' Floor



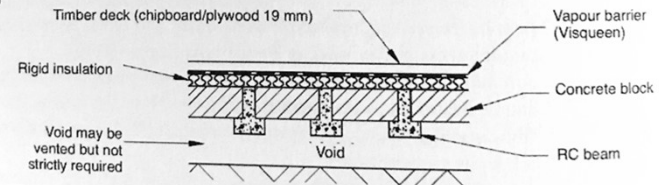
BEAM & BLOCK FLOORS



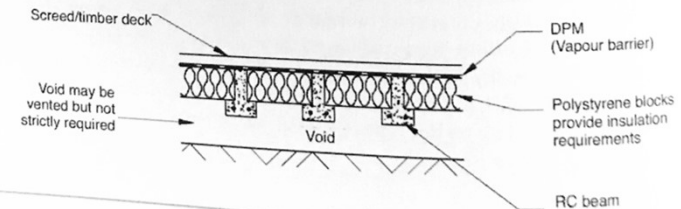
Typical details Beam and Block Suspended Floor



OPTION 1

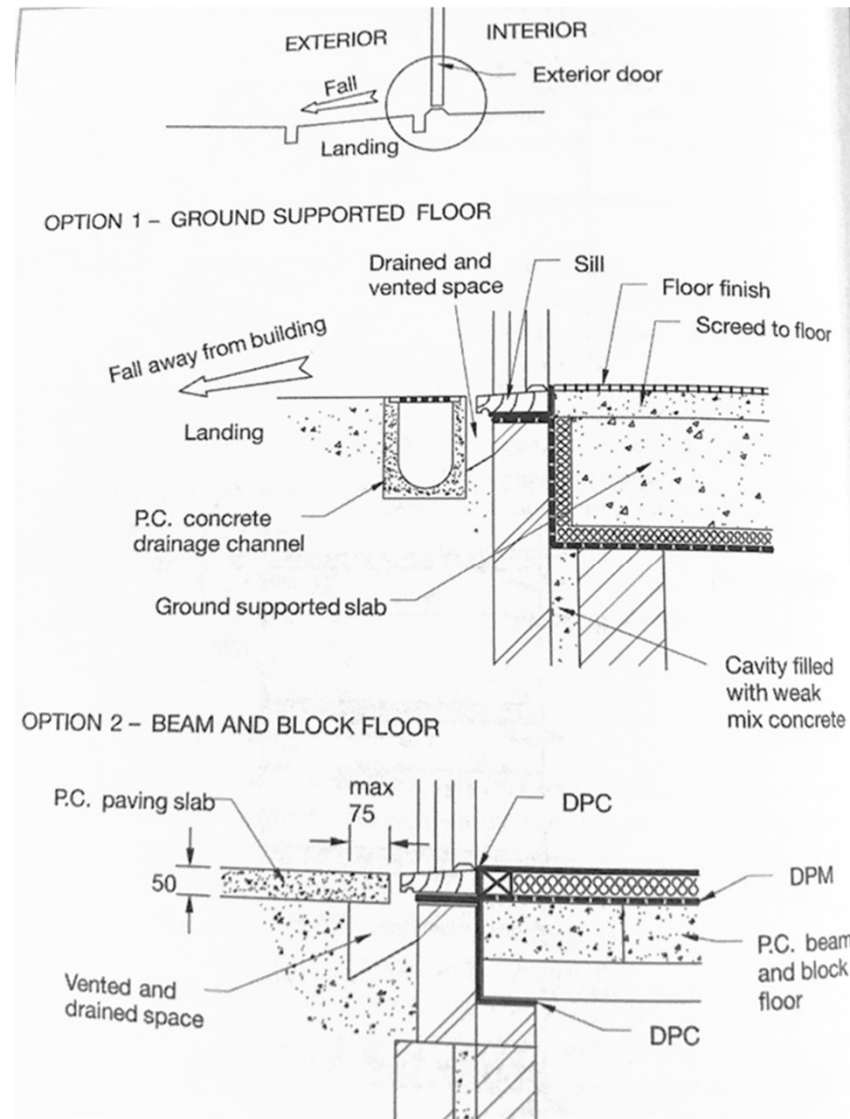


OPTION 2



Options for Level Access Threshold details.

Approved Document Part M



SUSPENDED TIMBER FLOORS



Introduction

Cheap and easy to construct

It can adapt to the site perfectly

Ground preparation is much reduced

It is the solution for level floors, but also can do for ground floors

Legislation applicable:

- Building Regulations, Document A
- Eurocode 5 span tables for solid timber members in floors, ceilings and roofs for dwellings. 4th edition (2014) (Parts 1 to 7)
- BS EN 1995-1-1:2004+A2:2014:2019 UK National Annex to Eurocode 5. Design of Timber Structures
- PD 6693-1:2019 Recommendations for the design of timber structures to Eurocode 5: Design of timber structures. General - common rules and rules for building
- BS 8103-3:2009 Structural design of low-rise buildings. Code of practice for timber floors and roofs for housing

Level floors

Built-in joists

Building in joists is acceptable provided that:

- Not a party wall (would affect acoustic insulation)
- Joists accurately cut to length (supported by the full width of the blockwork)
- Masonry accurately cut to allow an even mortar joint (of between 10mm and 15mm) all the way around the sides and tops of the joist.
- Mortar joint is to be struck or recessed to allow a bead of silicon mastic between the blockwork and the joist
- Blockwork is built level
- Silicon mastic bead installed after both the joists and the masonry are reasonably dry

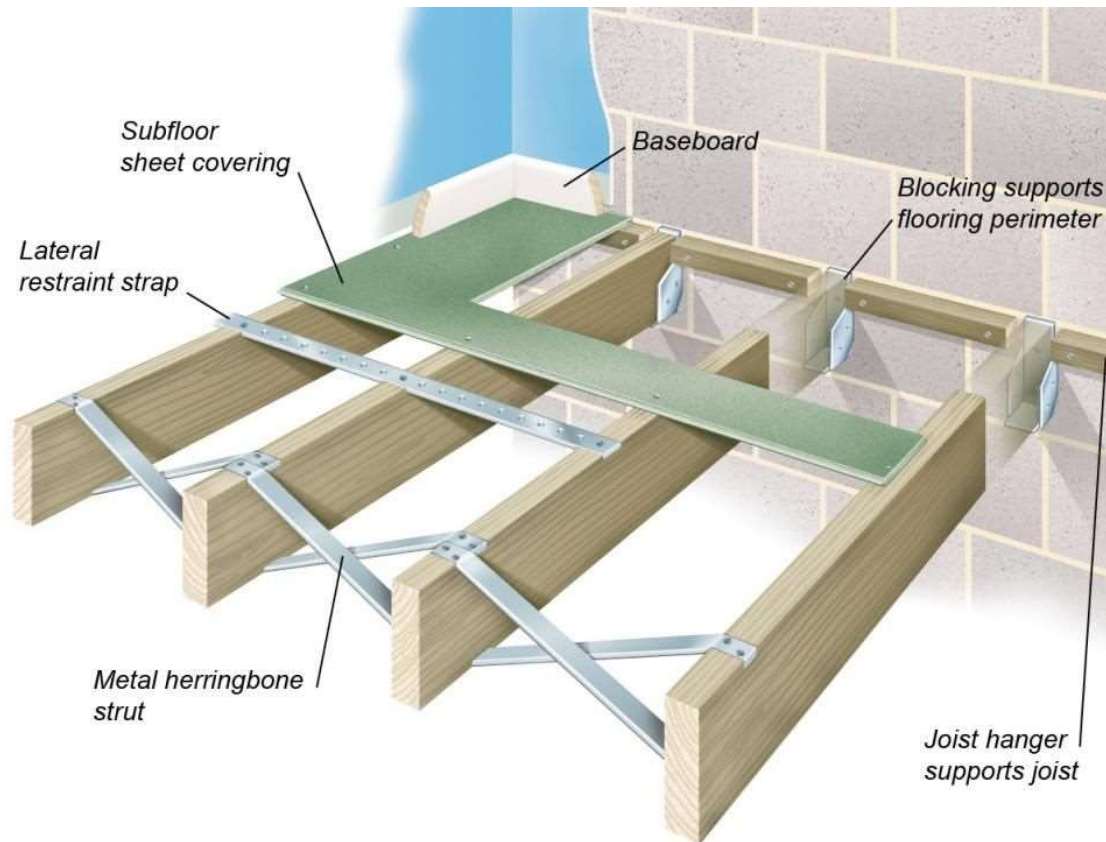
Level floors

Built-in joists



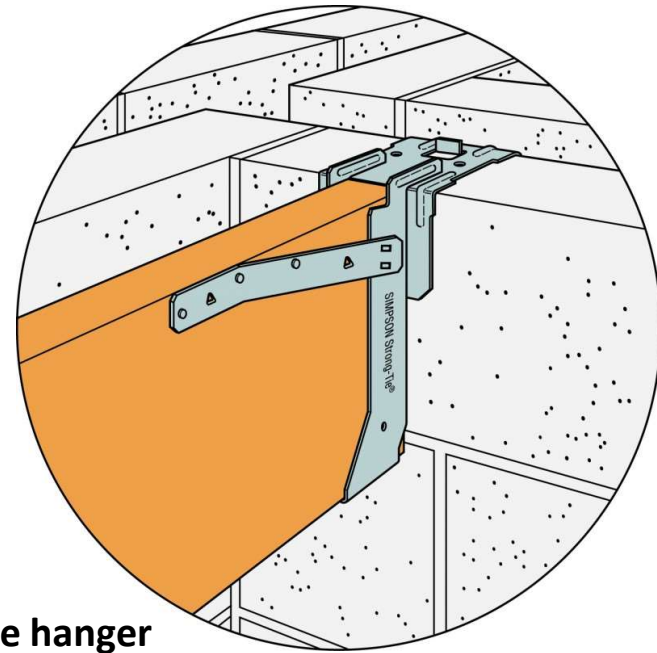
Level floors

With joist hangers



Level floors

With joist hangers



Typical joist hangers

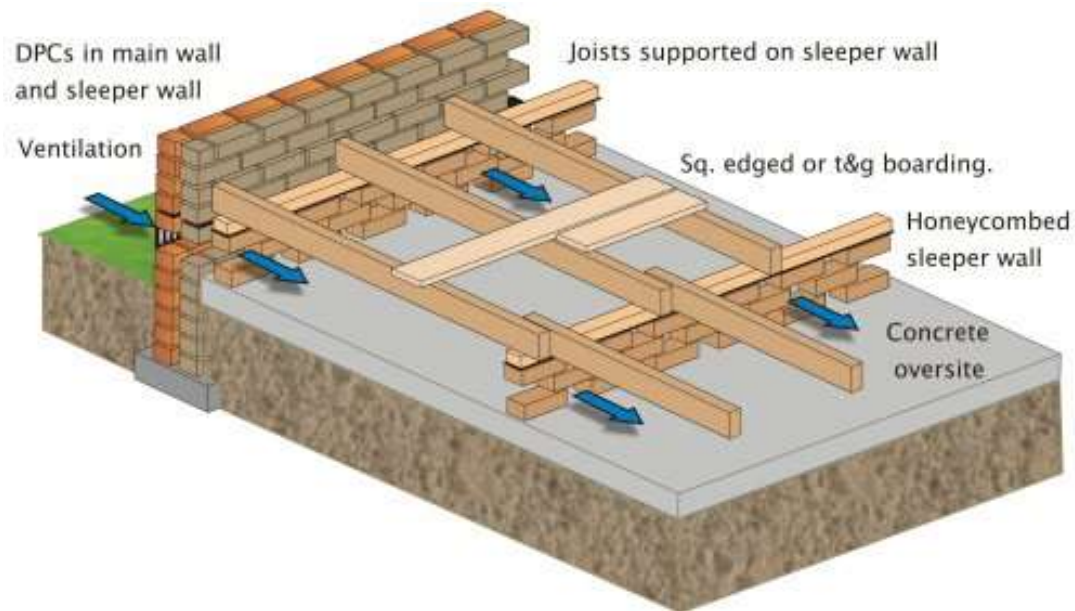


Restraint type hanger

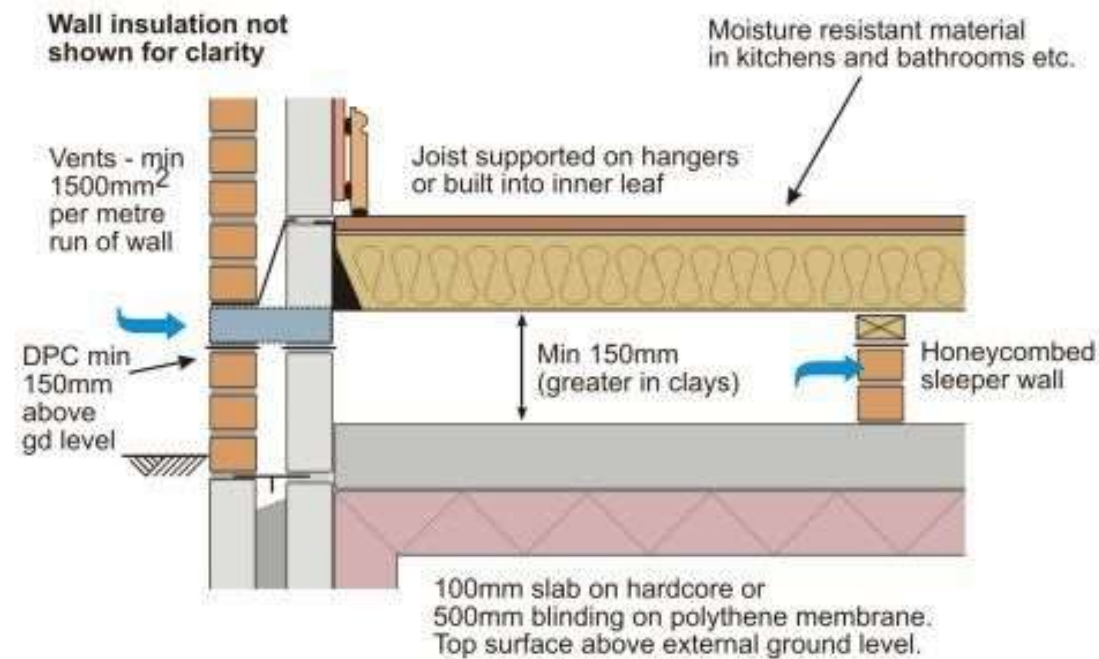


Ground floors

Also known as hollow floors or floating timber floors
It can be uneven ground, little ground preparation needed
Use of sleeper walls over strip foundations or slab.
Need of ventilation



Ground floors

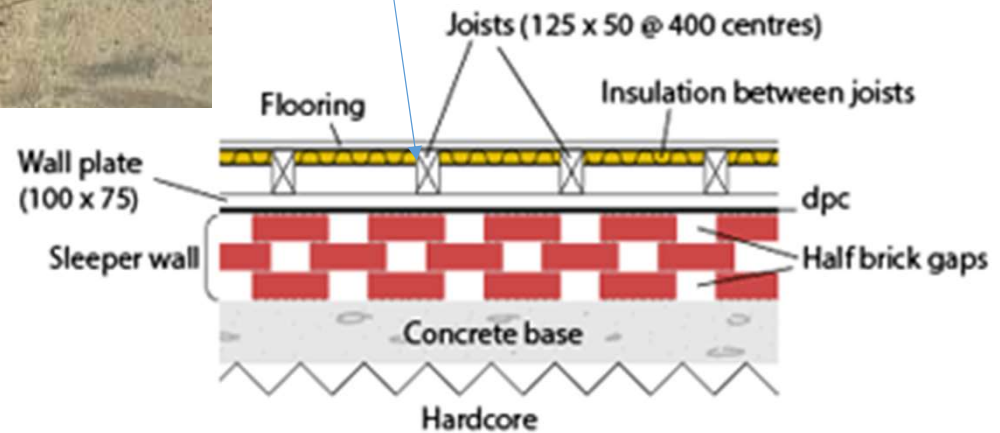


Ground floors

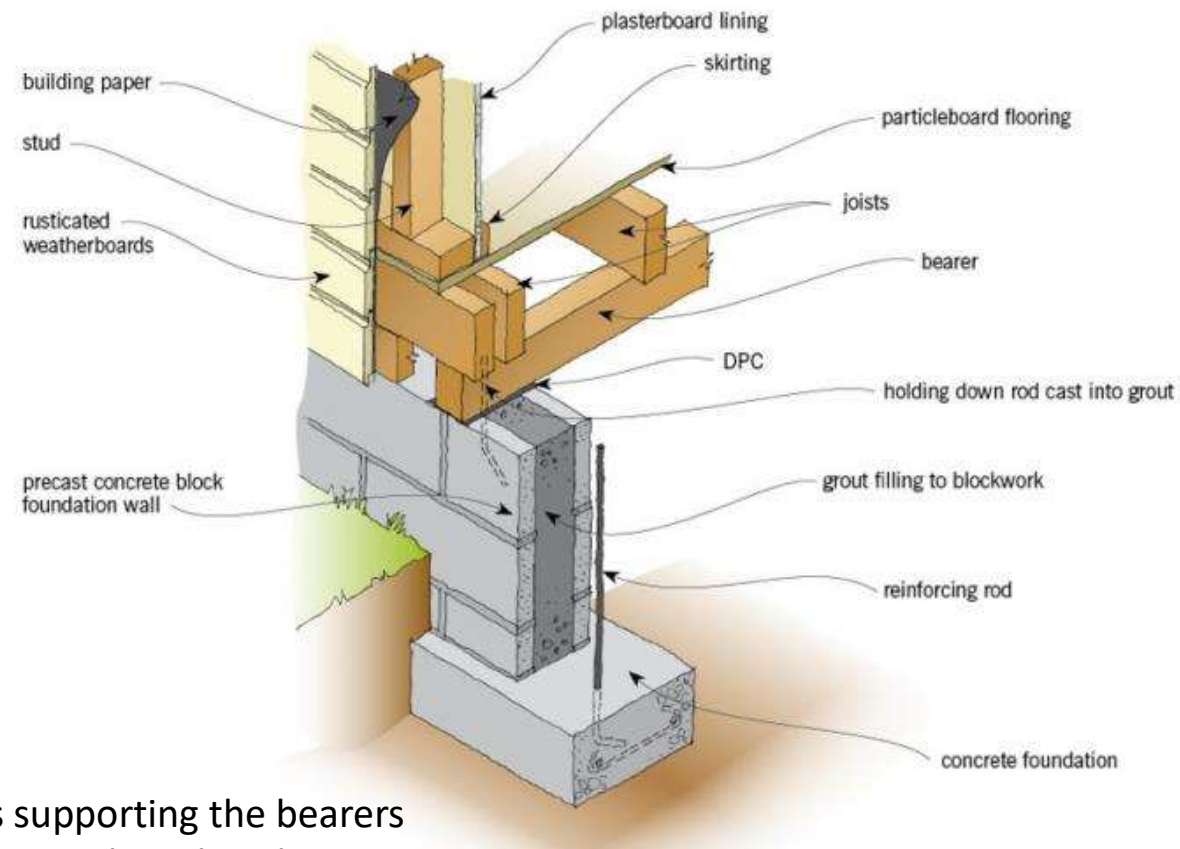


Problem:

Insulation is not continuous.
How can we solve it?

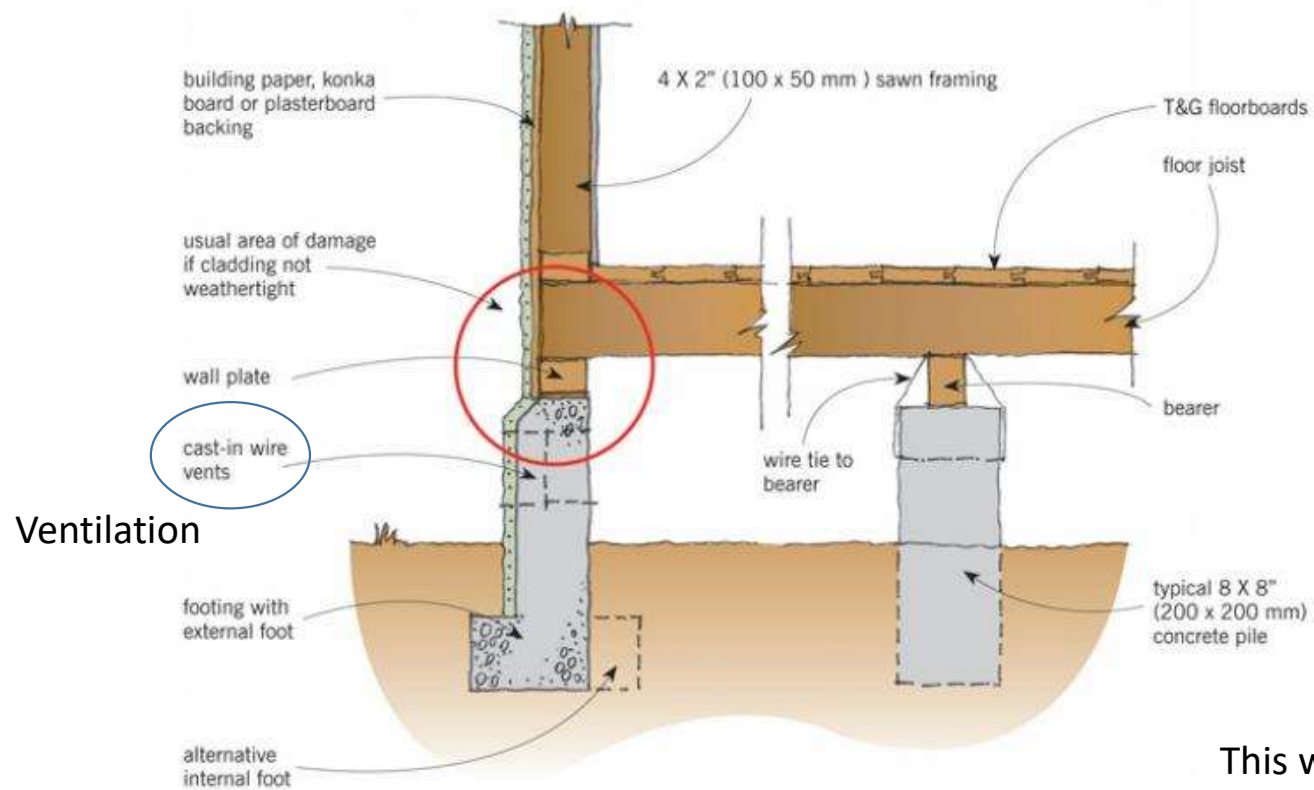


Ground floors. Use of bearers



This wall is supporting the bearers
Ventilation is in the other direction

Ground floors. Use of bearers



This wall is supporting the bearers
Ventilation is in the other direction

Permissible clear spans

BS 8103-3

Timber class C16

No partitions

Table 7 Permissible clear spans of joists supporting floors with no partitions. Timber of strength class C16

C16		No partitions								
Size of joist ^{A)} mm x mm	Dead load kN/m ²									
	Not more than 0.25			More than 0.25 but not more than 0.50			More than 0.50 but not more than 1.25			
	Spacing of joists mm									
	400	450	600	400	450	600	400	450	600	
	Maximum clear span of joist m									
BS EN 336 sizes with sawn thickness to tolerance class 1 and processed depth to tolerance class 2	38 x 72	1.130	1.011	0.767	1.061	0.954	0.731	0.920	0.834	0.652
	38 x 97	1.828	1.692	1.303	1.717	1.556	1.214	1.423	1.301	1.037
	38 x 120	2.482	2.385	1.925	2.368	2.215	1.755	1.947	1.791	1.448
	38 x 145	2.983	2.868	2.510	2.853	2.707	2.331	2.453	2.290	1.872
	38 x 170	3.442	3.306	2.873	3.281	3.098	2.690	2.808	2.649	2.267
	38 x 195	3.939	3.752	3.263	3.724	3.518	3.056	3.189	3.010	2.609
	38 x 220	4.434	4.193	3.648	4.161	3.932	3.418	3.567	3.367	2.920
	47 x 72	1.324	1.233	0.942	1.272	1.154	0.891	1.091	0.993	0.783
	47 x 97	2.024	1.914	1.583	1.920	1.818	1.460	1.665	1.527	1.228
	47 x 120	2.663	2.561	2.302	2.548	2.450	2.087	2.255	2.081	1.696
	47 x 145	3.200	3.078	2.786	3.062	2.945	2.609	2.723	2.570	2.174
	47 x 170	3.691	3.551	3.188	3.533	3.398	2.987	3.116	2.942	2.552
	47 x 195	4.221	4.063	3.619	4.042	3.889	3.391	3.538	3.341	2.900
	47 x 220	4.723	4.572	4.044	4.549	4.354	3.791	3.954	3.735	3.244
	63 x 97	2.319	2.197	1.919	2.191	2.079	1.822	1.934	1.839	1.533
	63 x 120	2.931	2.821	2.566	2.807	2.700	2.454	2.527	2.429	2.088
	63 x 145	3.518	3.388	3.084	3.370	3.244	2.950	3.037	2.920	2.577
	63 x 170	4.055	3.905	3.558	3.886	3.741	3.404	3.504	3.370	2.950
	63 x 195	4.633	4.465	4.070	4.442	4.278	3.896	4.009	3.850	3.350
	63 x 220	5.061	4.923	4.580	4.905	4.770	4.365	4.512	4.301	3.745
	75 x 120	3.100	2.985	2.718	2.970	2.859	2.601	2.677	2.575	2.327
	75 x 145	3.719	3.582	3.265	3.564	3.432	3.125	3.216	3.094	2.807
	75 x 170	4.283	4.128	3.765	4.107	3.957	3.605	3.709	3.569	3.212
	75 x 195	4.830	4.700	4.306	4.683	4.523	4.125	4.242	4.084	3.646
	75 x 220	5.268	5.128	4.793	5.109	4.971	4.641	4.740	4.595	4.074
CLS/ALS sizes	38 x 89	1.617	1.463	1.121	1.499	1.356	1.052	1.259	1.149	0.910
	38 x 140	2.843	2.733	2.398	2.719	2.587	2.167	2.330	2.149	1.752
	38 x 184	3.721	3.557	3.092	3.530	3.334	2.895	3.022	2.852	2.471
	38 x 235	4.710	4.460	3.890	4.430	4.180	3.640	3.800	3.590	3.110

Minimum design bearing length

If wane at end-bearing [see Figure 8 b)] is permitted to the strength class limit, i.e. one-third of thickness for strength class C16, the minimum design bearing length is 38 mm.

If wane is not permitted, the minimum design bearing length is 20 mm.

See also 6.5.2.

^{A)} Check the availability of section sizes.

Permissible
clear spans

BS 8103-3

Timber class
C24

No partitions

Table 8 Permissible clear spans of joists supporting floors with no partitions. Timber of strength class C24

C24		No partitions								
Size of joist ^{A)} mm x mm	Dead load kN/m ²									
	Not more than 0.25			More than 0.25 but not more than 0.50			More than 0.50 but not more than 1.25			
	Spacing of joists mm									
	400	450	600	400	450	600	400	450	600	
	Maximum clear span of joist m									
BS EN 336 sizes with sawn thickness to tolerance class 1 and processed depth to tolerance class 2	38 x 72	1.262	1.189	1.023	1.215	1.146	0.989	1.108	1.048	0.874
	38 x 97	1.936	1.829	1.586	1.838	1.739	1.514	1.635	1.551	1.358
	38 x 120	2.582	2.482	2.200	2.469	2.369	2.076	2.180	2.073	1.826
	38 x 145	3.103	2.984	2.709	2.969	2.854	2.588	2.667	2.561	2.305
	38 x 170	3.580	3.444	3.128	3.426	3.294	2.989	3.079	2.958	2.678
	38 x 195	4.096	3.941	3.581	3.921	3.771	3.423	3.526	3.388	3.068
	38 x 220	4.609	4.436	4.034	4.413	4.246	3.856	3.971	3.816	3.458
	47 x 72	1.404	1.324	1.144	1.347	1.273	1.103	1.223	1.159	1.010
	47 x 97	2.141	2.025	1.763	2.026	1.920	1.678	1.795	1.705	1.499
	47 x 120	2.770	2.664	2.421	2.651	2.549	2.290	2.382	2.268	2.006
	47 x 145	3.327	3.201	2.910	3.185	3.064	2.783	2.865	2.754	2.496
	47 x 170	3.836	3.693	3.359	3.674	3.535	3.212	3.307	3.179	2.883
	47 x 195	4.387	4.224	3.845	4.202	4.045	3.678	3.786	3.640	3.302
	47 x 220	4.860	4.725	4.328	4.707	4.552	4.141	4.262	4.099	3.720
	63 x 97	2.432	2.321	2.030	2.308	2.192	1.925	2.032	1.934	1.709
	63 x 120	3.046	2.933	2.669	2.918	2.808	2.553	2.628	2.527	2.273
	63 x 145	3.665	3.521	3.207	3.503	3.372	3.069	3.158	3.038	2.759
	63 x 170	4.211	4.058	3.699	4.037	3.888	3.541	3.643	3.505	3.185
	63 x 195	4.770	4.637	4.231	4.614	4.445	4.052	4.168	4.011	3.646
	63 x 220	5.204	5.064	4.731	5.046	4.908	4.560	4.678	4.514	4.106
	75 x 120	3.220	3.102	2.827	3.086	2.972	2.705	2.784	2.678	2.678
	75 x 145	3.862	3.721	3.394	3.703	3.567	3.250	3.344	3.218	3.218
	75 x 170	4.446	4.286	3.913	4.265	4.110	3.748	3.855	3.711	3.711
	75 x 195	4.966	4.833	4.474	4.816	4.686	4.287	4.408	4.245	4.245
	75 x 220	5.415	5.272	4.932	5.253	5.113	4.778	4.878	4.743	4.743
CLS/ALS sizes	38 x 89	1.713	1.617	1.399	1.633	1.544	1.341	1.464	1.388	1.201
	38 x 140	2.957	2.844	2.581	2.829	2.719	2.466	2.541	2.440	2.170
	38 x 184	3.869	3.723	3.382	3.703	3.561	3.232	3.329	3.199	2.897
	38 x 235	4.850	4.710	4.310	4.700	4.540	4.120	4.240	4.080	3.700

Minimum design bearing length

If wane at end-bearing [see Figure 8 b)] is permitted to the strength class limit, i.e. one-third of thickness for strength class C24, the minimum design bearing length is 45 mm.

If wane is not permitted, the minimum design bearing length is 24 mm.

See also 6.5.2.

^{A)} Check the availability of section sizes.

Permissible clear spans

BS 8103-3

Timber class C16

Lightweight Partitions

Table 9 Permissible clear spans of joists for floors supporting non load-bearing lightweight partitions^{A)},
Timber of strength class C16

C16		Lightweight partitions								
Size of joist ^{B)} mm x mm		Dead load kN/m ²								
		Not more than 0.25			More than 0.25 but not more than 0.50			More than 0.50 but not more than 1.25		
		Spacing of joists mm								
		400	450	600	400	450	600	400	450	600
		Maximum clear span of joist m								
BS EN 336 sizes with sawn thickness to tolerance class 1 and processed depth to tolerance class 2	38 x 72	1.017	0.910	0.690	0.955	0.859	0.658	0.828	0.751	0.586
	38 x 97	1.646	1.523	1.173	1.545	1.401	1.093	1.281	1.171	0.933
	38 x 120	2.234	2.147	1.732	2.131	1.993	1.579	1.753	1.612	1.303
	38 x 145	2.685	2.581	2.259	2.568	2.437	2.098	2.207	2.061	1.684
	38 x 170	3.098	2.976	2.586	2.953	2.788	2.421	2.527	2.384	2.040
	38 x 195	3.545	3.377	2.937	3.352	3.166	2.750	2.871	2.709	2.348
	38 x 220	3.990	3.773	3.284	3.745	3.539	3.076	3.210	3.030	2.628
	47 x 72	1.191	1.110	0.848	1.145	1.038	0.802	0.982	0.894	0.705
	47 x 97	1.822	1.723	1.424	1.728	1.636	1.314	1.498	1.375	1.105
	47 x 120	2.397	2.305	2.071	2.293	2.205	1.878	2.030	1.872	1.526
	47 x 145	2.880	2.770	2.507	2.756	2.650	2.348	2.451	2.313	1.957
	47 x 170	3.322	3.196	2.869	3.180	3.059	2.688	2.805	2.648	2.297
	47 x 195	3.799	3.657	3.257	3.638	3.500	3.052	3.184	3.007	2.610
	47 x 220	4.250	4.115	3.640	4.094	3.918	3.412	3.559	3.362	2.920
	63 x 97	2.087	1.978	1.727	1.972	1.871	1.640	1.740	1.655	1.380
	63 x 120	2.638	2.539	2.309	2.526	2.430	2.209	2.274	2.186	1.879
	63 x 145	3.166	3.049	2.775	3.033	2.919	2.655	2.733	2.628	2.319
	63 x 170	3.649	3.515	3.202	3.497	3.367	3.064	3.153	3.033	2.655
	63 x 195	4.170	4.018	3.663	3.998	3.850	3.506	3.608	3.465	3.015
	63 x 220	4.555	4.431	4.122	4.415	4.293	3.928	4.061	3.871	3.370
	75 x 120	2.790	2.687	2.446	2.673	2.573	2.341	2.409	2.317	2.094
	75 x 145	3.347	3.224	2.939	3.208	3.089	2.813	2.894	2.785	2.526
	75 x 170	3.855	3.715	3.389	3.697	3.561	3.245	3.338	3.212	2.891
	75 x 195	4.347	4.230	3.875	4.214	4.070	3.712	3.818	3.675	3.281
	75 x 220	4.741	4.615	4.314	4.598	4.474	4.177	4.266	4.136	3.667
CLS/ALS sizes	38 x 89	1.455	1.317	1.009	1.349	1.220	0.947	1.133	1.034	0.819
	38 x 140	2.559	2.460	2.158	2.447	2.329	1.951	2.097	1.934	1.577
	38 x 184	3.349	3.201	2.783	3.177	3.000	2.606	2.720	2.567	2.224
	38 x 235	4.236	4.009	3.490	3.979	3.760	3.270	3.412	3.221	2.794

Minimum design bearing length

If wane at end-bearing [see Figure 8 b)] is permitted to the strength class limit, i.e. one-third of thickness for strength class C16, the minimum design bearing length is 34 mm.

If wane is not permitted, the minimum design bearing length is 18 mm.

See also 6.5.2.

^{A)} See 6.5.1 when a partition is parallel to the joists.

^{B)} Check the availability of section sizes.

Permissible clear spans

BS 8103-3

Timber class C24

Lightweight partitions

Table 10 Permissible clear spans of joists for floors supporting non load-bearing lightweight partitions^{A)}.
Timber of strength class C24

C24		Lightweight partitions								
Size of joist ^{B)} mm x mm		Dead load kN/m ²								
		Not more than 0.25			More than 0.25 but not more than 0.50			More than 0.50 but not more than 1.25		
		Spacing of joists mm								
		400	450	600	400	450	600	400	450	600
		Maximum clear span of joist m								
BS EN 336 sizes with sawn thickness to tolerance class 1 and processed depth to tolerance class 2	38 x 72	1.136	1.070	0.921	1.093	1.031	0.890	0.997	0.943	0.786
	38 x 97	1.742	1.646	1.427	1.654	1.565	1.362	1.472	1.396	1.222
	38 x 120	2.324	2.234	1.980	2.222	2.132	1.868	1.962	1.865	1.644
	38 x 145	2.793	2.686	2.438	2.672	2.568	2.330	2.400	2.305	2.074
	38 x 170	3.222	3.099	2.815	3.083	2.965	2.690	2.771	2.662	2.410
	38 x 195	3.686	3.547	3.223	3.529	3.394	3.081	3.173	3.049	2.761
	38 x 220	4.148	3.993	3.630	3.972	3.821	3.471	3.574	3.435	3.112
	47 x 72	1.263	1.191	1.029	1.213	1.145	0.993	1.101	1.043	0.909
	47 x 97	1.926	1.823	1.587	1.824	1.728	1.510	1.615	1.535	1.349
	47 x 120	2.493	2.398	2.179	2.386	2.294	2.061	2.144	2.042	1.806
	47 x 145	2.994	2.881	2.619	2.866	2.757	2.504	2.579	2.478	2.246
	47 x 170	3.453	3.323	3.023	3.306	3.181	2.891	2.977	2.861	2.594
	47 x 195	3.948	3.801	3.460	3.782	3.640	3.310	3.407	3.276	2.972
	47 x 220	4.374	4.253	3.895	4.237	4.097	3.727	3.836	3.689	3.348
	63 x 97	2.189	2.089	1.827	2.077	1.972	1.732	1.829	1.741	1.538
	63 x 120	2.742	2.639	2.402	2.626	2.527	2.298	2.366	2.275	2.046
	63 x 145	3.290	3.168	2.886	3.152	3.035	2.762	2.842	2.734	2.483
	63 x 170	3.790	3.652	3.329	3.634	3.499	3.187	3.279	3.155	2.866
	63 x 195	4.293	4.174	3.808	4.153	4.001	3.646	3.751	3.610	3.282
	63 x 220	4.684	4.558	4.258	4.541	4.417	4.104	4.211	4.063	3.696
	75 x 120	2.898	2.792	2.544	2.778	2.675	2.435	2.505	2.410	2.190
	75 x 145	3.475	3.349	3.055	3.333	3.210	2.925	3.009	2.896	2.633
	75 x 170	4.001	3.858	3.522	3.839	3.699	3.374	3.470	3.340	3.039
	75 x 195	4.469	4.350	4.027	4.334	4.217	3.858	3.968	3.820	3.478
	75 x 220	4.874	4.745	4.438	4.728	4.601	4.300	4.390	4.268	3.915
CLS/ALS sizes	38 x 89	1.542	1.456	1.259	1.470	1.390	1.207	1.318	1.249	1.081
	38 x 140	2.662	2.560	2.323	2.546	2.448	2.220	2.287	2.196	1.953
	38 x 184	3.482	3.350	3.044	3.333	3.205	2.909	2.996	2.879	2.607
	38 x 235	4.361	4.238	3.874	4.222	4.077	3.704	3.814	3.666	3.322

Minimum design bearing length

If wane at end-bearing [see Figure 8 b)] is permitted to the strength class limit, i.e. one-third of thickness for strength class C24, the minimum design bearing length is 41 mm.

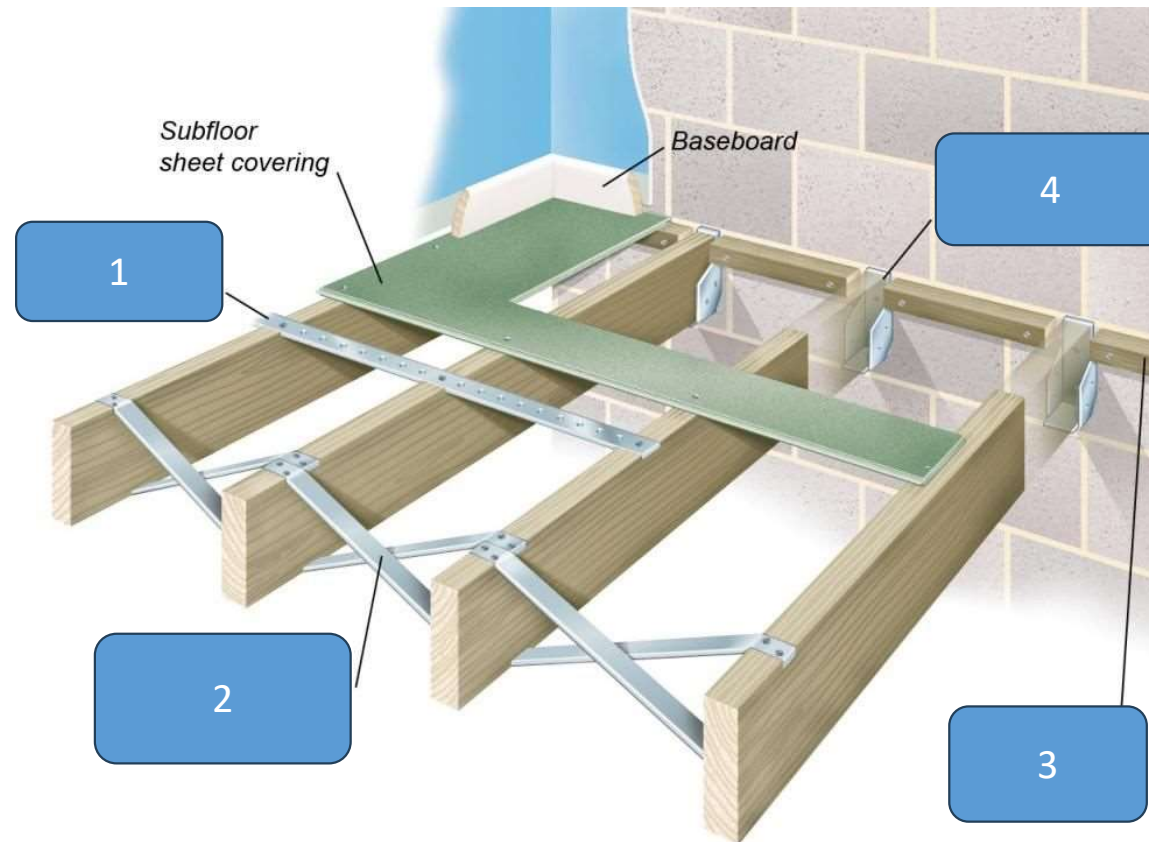
If wane is not permitted, the minimum design bearing length is 21 mm.

See 6.5.2.

^{A)} See 6.5.1 when a partition is parallel to the joists.

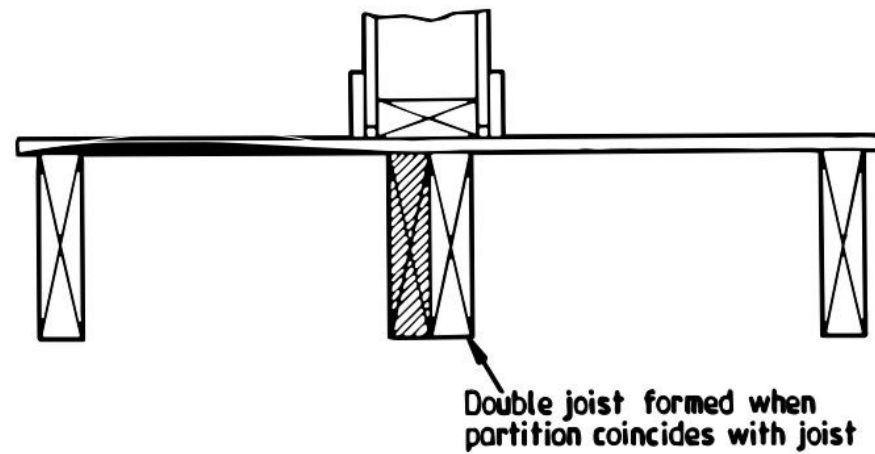
^{B)} Check the availability of section sizes.

Level floors



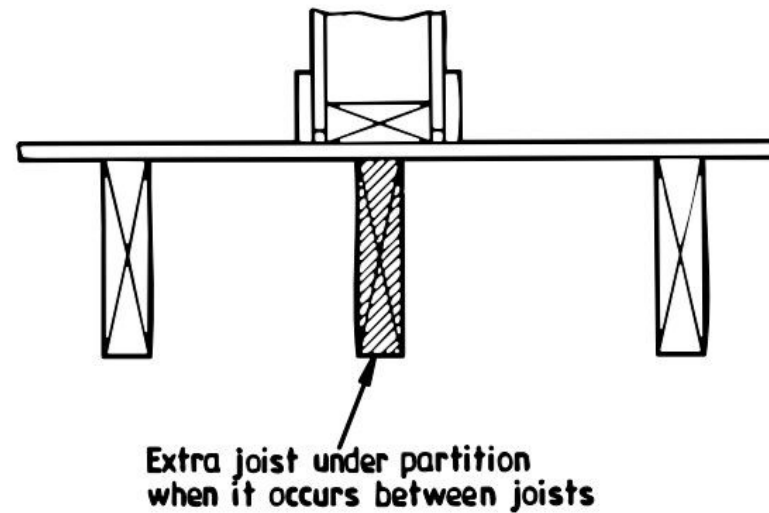
Partitions - Support

When a non-bearing partition is parallel to the joist span, there are different solutions:



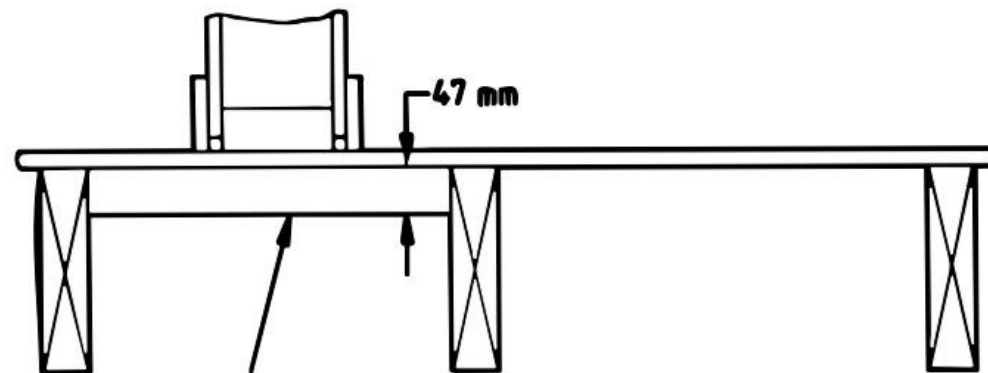
Partitions

When a non-bearing partition is parallel to the joist span, there are different solutions:



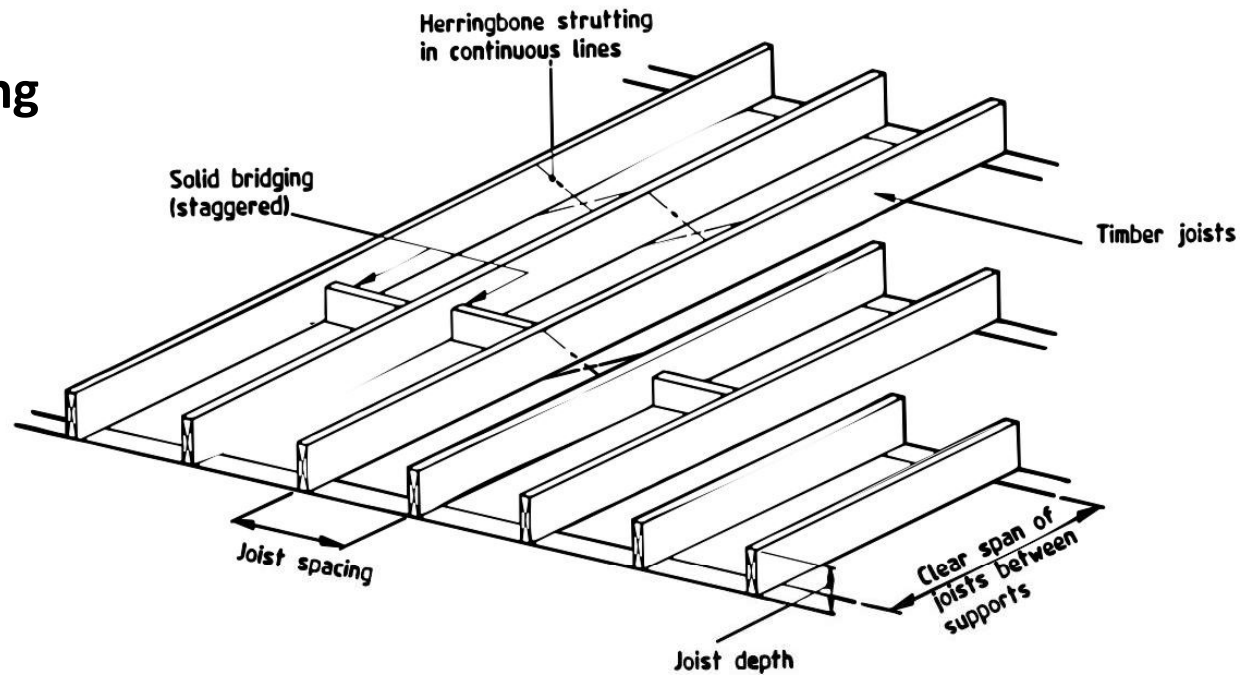
Partitions

When a non-bearing partition is parallel to the joist span, there are different solutions:



Noggings supporting partitions should be at least a basic size of 38 mm x 47 mm at centres not exceeding 600 mm unless justified by specialist calculation

Strutting



Solid bridging

Solid timber with a basic thickness of 38 mm min.

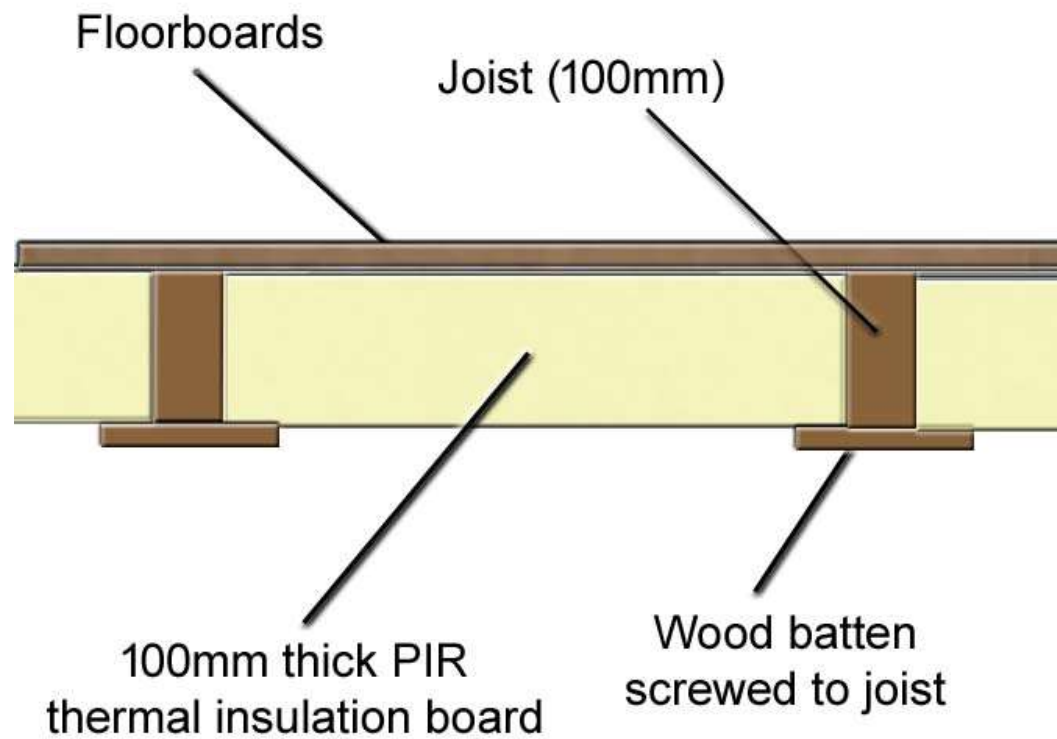
Herringbone strutting

Formed from solid timber sections

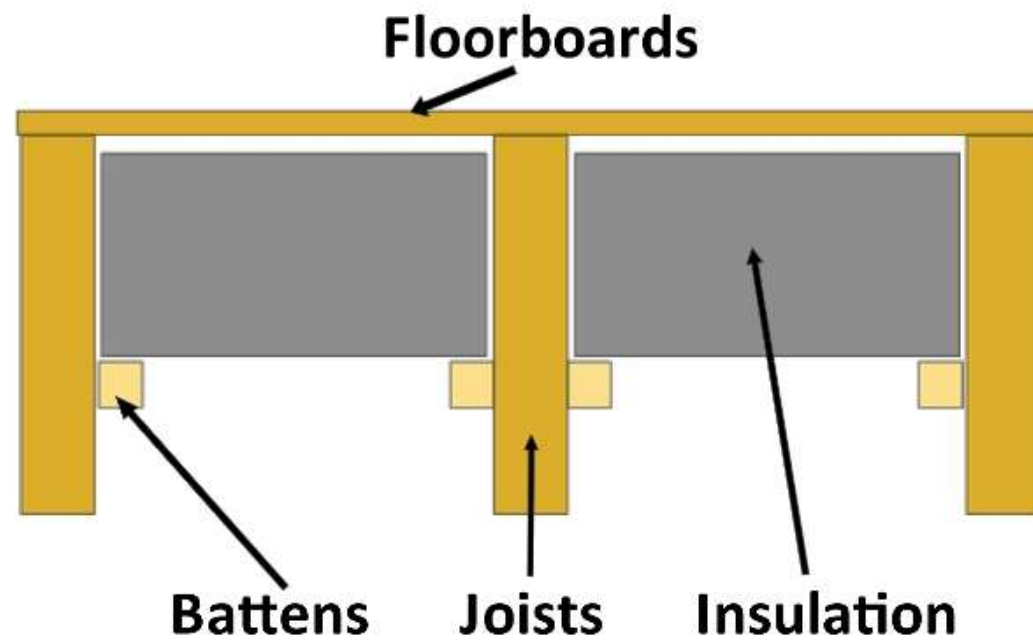
Joist clear span m	Number of rows of bridging/strutting required	Position of bridging/strutting
Up to 2.5	None	–
Over 2.5 and up to 4.5	One	At joist mid-span
Over 4.5	Two	At joist one-third span positions

Insulation support

What is the Insulation for?



Insulation support



Timber flooring

Subfloor should always be dry, flat and level

Leave expansion gap in all perimeter (at least 15mm)

Advisable to fit a DPM over cementitious sub-floors

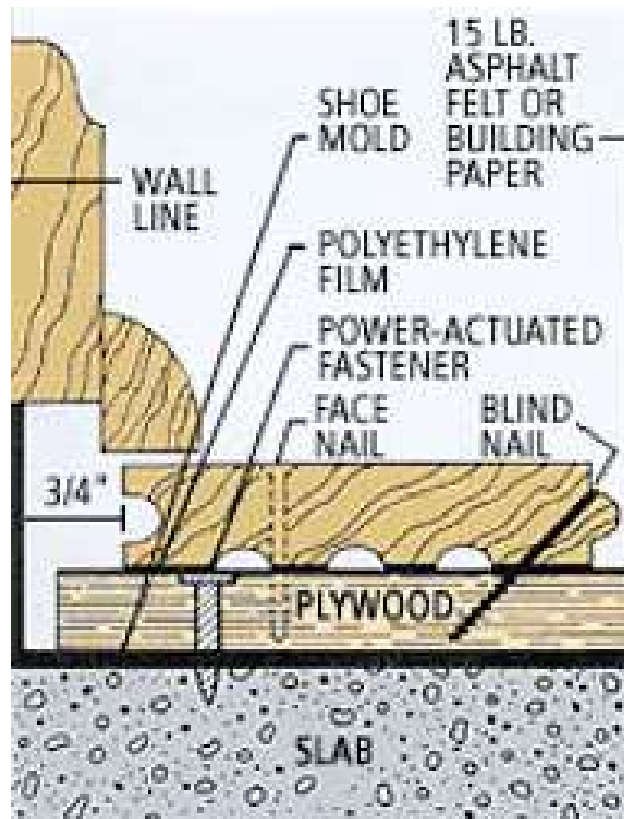
Use of foam underlay (without DPM) on top of wooden sub-floors

Fitting can be gluing or secret nailing

- Gluing
 - Solid subfloor (concrete or timber board)
 - Use of flexible flooring adhesive
 - Spread adhesive with a notched trowel (around 1m²) and put, place the flooring planks and push them together
- Secret nailing
 - Ideal with wooden subfloor
 - Flooring planks should be perpendicular to the subfloor
 - Place a nail gun over the edge of the plank where the tongue is found and push the nail at a 45 degree angle



Timber flooring



Timber flooring

Solid blocks



Timber flooring

Tongue and groove



Fitting very similar to a jigsaw puzzle

Planks can be installed glued down or floating

For a more secure fitting, they can be either:

- glued together
- held together with nails or screws

Easy solution to install

Repair can be difficult when glued or nailed

Timber flooring

Click



The protruding piece 'clicks' and locks into place

Easier to install

Eliminates nails and glue

Easy to replace

Requires a solid subfloor underneath as it can only be fitted as floating

Comparative Study: Ground Floors

Option	Advantages	Disadvantages	When to use
Solid Concrete	• Cheap • Familiar Technology • Easy detailing to insulate and resist moisture • Good loadbearing performance	• Wet operation slows construction • Several operations involved • Expensive when dealing with deep voids	• Most common form of ground floor • Used on relatively level sites with traditional foundation design
Suspended Timber	• Resilient floor form • Can cope with sloping sites and deep floor voids	• Potential problems of decay if subject to moisture • Expensive • Limited loadbearing capacity	• Rarely used in modern house building • Sometimes adopted for high-quality projects
Beam and Block	• Cheap • Fast • Good loadbearing capacity • Copes with sloping sites and deep voids	• More expensive than solid floor construction on level sites with small voids	• Becoming very common in house building • Particularly appropriate for sloping sites with poor ground conditions and sites involving deep sub-floor voids

Summary :

Recap
Partitions
Floors

