

ANSWER KEY TO ACCOMPANY:

Introduction

- (p. 9) creates compatibility and makes repair and replacement easier, minimizes the need for new elements and components and also provides useful first reference point in decision-making
- (p. 9) metric (metres, millimetres) and imperial (feet, inches)
- (p. 10) a comprehensive description in drawings and words of the full extent and quality of the work necessary to complete the project satisfactorily
- (p. 10) the materials to be used, their sizes and the method for their assembly
- (p. 10) the estimated cost of all necessary work, including labour and materials
- (p. 11) **b.** 1:2, **d.** 1:10, **f.** 1:5

Chapter 1: Existing Walls

- (p. 14) loadbearing wall – divides spaces but is also responsible for supporting the construction above it
non-loadbearing wall – responsible only for the subdivision of space
- (p. 14) a wall, or beam, providing continuous support on all edges of the slab
- (p. 16) **b.** 10 mm
- A horizontal line of brickwork is known as a **course**. (p. 16)
- (p. 16) 'weathered' and 'keyed'
- (p. 16) **d.** pointing
- (p. 18) a beam resting on stable support points to allow the creation of an opening in a loadbearing wall
- (p. 19) the weight they can support before crumbling, cracking and collapsing
- (p. 20) around door and window openings because of the deterioration of frames and the compounds that seal gaps between them and the masonry
- (p. 22) fixing of an impervious waterproof membrane to the inner face of the existing wall or the building of a freestanding inner wall

Chapter 2: New Walls

- (p. 26) a non-loadbearing wall
- (p. 26) because they are heavy and an upper floor may be incapable of taking the additional concentrated loading, also because of the time delay caused by the time taken for wet sand-and-cement mortar to dry
- A partition with the decorative texture of its surface materials and joints left exposed is referred to as **fairfaced**. (p. 26)
- (p. 26) advantages – strong, useful as a means of reducing sound transference
disadvantages – particularly heavy and has long construction time
- (p. 26) by applying a 12mm sand-and-cement render to a lightweight 'stud' frame or a 3mm 'skim' coat of grey plaster
- (p. 27) plasterboard sheets that may be either finished with a 3mm skim of plaster or painted directly after some simple filling of joints
- (p. 27) a core of gypsum plaster between two sheets of paper
- (p. 27) the wet skim phase of stud partition
- (p. 28) **False**, specialist softwood framing is used
- (p. 30) to fix the plasterboard to the softwood framing when the surface is to be finished with a skim coat
- (p. 32 and p. 36) to ensure that the faces of both will be precisely aligned, making the elimination of visible evidence of the junction easier, also ensures there can be no local movement or distortion of an unsupported edge
- (p. 32) the joints between the panels and the external corners
joints: skimming – provide a bridge using 50mm-wide strip of 'scrim' tape
drywall – provide a bridge with a strip of self-adhesive, heavy duty paper
external corners: skimming – reinforce corner with a metal (usually aluminium) corner strip or bead
drywall – reinforce corner with a strip of heavy-duty paper to which are glued two 10mm-wide metal strips
- (p. 36) by using three vertical framing members that are nailed or screwed together to ensure that they do not move unilaterally
- (p. 37)
advantages – lightweight aluminium minimizes the amount of material used, quick method of building stud partitions, standard framing components slot together quickly and labour costs can thus be minimized
disadvantages – specialized evolution of the system makes variations from the standard more complex than with timber stud, does not offer flat surfaces to make butting it together as simple as for wooden structures, has no structural capacity beyond that of providing support for plasterboard cladding, shelving and cupboards
- (p. 38) to cover the junction of the floor and wall in traditional construction

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- 16 (p. 38) because it comes in sections which may be moulded to reproduce simpler, traditional forms, also has a consistency of section and performance and often comes ready primed for the paint finish
- 17 (p. 38) after floor and wall finishes (other than paint and wallpaper) have been installed
- 18 (p. 38) eliminates the need to make good the local damage caused by nails and screws
- 19 (p. 42) to mask the potentially unsightly junction of wall and ceiling
in modern construction offers a distinct change of plane at which to make changes in paint colour
- 20 (p. 46) include two layers of plasterboard and a skim-coat finish, use specialist plasterboard (identified by a blue paper) that can improve sound reduction, build two independent stud frames to break acoustic bridge, introduce unobtrusive background sound to mask overheard sounds, plan the interior space carefully i.e. grouping and isolating areas that need quiet, creating buffer zones
- 21 (p. 47) including a skim-coat, the use of two sheets of plasterboard on the face of a partition, using specialist plasterboard (faced with pink-coloured paper) with improved fire rating
- 22 (p. 48) by giving them a protective coating of concrete, or by treating them with a suitable paint, or by encasing them in plasterboard cladding with a plaster skim coat
- 23 (p. 49)
first fix – the installation of basic service elements for electricity and plumbing before finishes are applied
second fix – final connection of services which takes place after wall finishes (with possible exception of paint) have been applied
- 24 (p. 49)
partition walls – within the hollow core of the partition, passed through holes bored in the centre of timber studs or cut out of metal studs at manufacture
masonry – grooves or 'chases' are cut mechanically or by hand into the face of the wall
concrete – chases may be cut or when new walls, floors and ceilings are being poured normal practice to incorporate within them a metal or plastic 'conduit', pipes for circulating water are laid directly in the concrete

Chapter 3: Alternative Partitions

- 1 (p. 52) because curved walls are more difficult to build and therefore more difficult to do well

- 2 (p. 52) True
- 3 (p. 52) in short, straight lengths spanning between the vertical framing
- 4 (p. 52) metal lath sheeting and plasterboard
- 5 (p. 52) to provide stability to support additional loadings or to withstand impact
- 6 (p. 60) a pre-fabricated metal sleeve, welded to a baseplate that is drilled to facilitate a screw fixing to the subfloor
- 7 (p. 60) cover strips, shadow-gap solutions
- 8 (p. 64) metal split brackets
offers greater precision and projects less from the supporting structure
- 9 (p. 66) must be toughened or laminated to give it the necessary strength to resist inevitable impacts, poor fire resistance and poor sound-reductive properties
- 10 (p. 68) allows a slight degree of flexibility that reduces chances of the glass cracking when any movement occurs
- 11 (p. 73) vertical or horizontal fins, or both, fixed at right angles to provide a continuous connecting member between glazed panels
provides a rigid skeleton that increases the effective structural depth of the wall plane and its resistance to lateral forces

Chapter 4: Doors

- 1 (p. 76) refers to vertical framing on each side of the door
role is to make a robust junction between the wall and the door opening and to support the leaf
- 2 The word 'head' refers to the **horizontal** framing on the upper edge of a door. (p. 76)
- 3 (p. 76) c. architrave
- 4 (p. 78) creation of a separation between frame and wall that eliminates the possibility of cracks or minor misalignments, also enhances perception of the wall as the dominant visual element
- 5 (p. 82) a limited amount of borrowed light to corridors as well as visually extending the door element from floor to ceiling
- 6 (p. 83) **False**, known as a 'glazed screen'
- 7 (p. 85) the minimum periods for which door leaves and their frames should be able to withstand fire and contain flames and smoke within the area of an outbreak of fire
- 8 (p. 85) intumescent strips

ANSWER KEY TO ACCOMPANY:

Chapter 5: Floors

- 1 (p. 88) poured concrete, easy to level and creates a durable surface
- 2 (p. 88) provides an impervious layer that prevents moisture penetrating the fabric of the building
- 3 (p. 89) damp proof course
an impervious membrane built horizontally into one course of brickwork or blockwork of the external and internal walls to prevent moisture rising vertically through them
- 4 (p. 91) the beams that support the components (such as timber floorboards and plasterboard sheets) that make up the planes of floors and ceilings
- 5 (p. 95) **False**, the greater the depth the greater the distance it can span
- 6 (p. 96) c. rolled-steel joist
- 7 (p. 98) where the weight of all the floor area it supports is directed on to a small area
- 8 (pp. 98-99) a beam, usually concrete, built or cast into the brickwork or blockwork of the perimeter wall distributes the load of a beam or joist over a greater length of wall
- 9 (p. 99) an agreement with the owner of an adjoining property concerning any structural work which encroaches on shared or 'party' walls
a written, drawn and photographic record of the condition of the neighbouring properties so that responsibility for any damage will be clear
- 10 (p. 100)
timber joists – for a new floor, simplest and easiest way of building a floor
laminated beams – allow greater depth of beam with structural stability, manufactured from a renewable source, good quality finish that does not require additional treatment
steel beams – as structural beams, comparatively easy to assemble on site and provide stable and dimensionally accurate base for subsequent work, useful if curved mezzanine is proposed
concrete beams – pre-fabricated and don't have to dry on site, possible to cast fixings for other elements and finishes into them, are fire resistant
- 11 (p. 101) a steel column used for support when there are no suitable walls or it is expedient to reduce spans
- 12 (p. 105) opening should sit logically within the proposed grid of the floor structure, parallel to joists and within the confines of structural bays
- 13 The joist supporting the end of the cut joists is called a **trimmer**. (p. 105)

- 14 (p. 106) a layer between structural floor and the final finishing materials
because the essential structural components of floor construction do not offer an acceptable finish
- 15 (p. 106) by mechanical vibration of the newly poured concrete
- 16 (pp. 108-109)
stone and clay tiles – require little maintenance and withstand wear from foot traffic
plastic and rubber tiles – rubber and linoleum use renewable, sustainable sources, tiles come in variety of sizes and require no grouting
timber – perceived to be clean and natural, offers a range of grain pattern and tones
carpets – offer widest range of colours, patterns and textures, can be produced from natural and artificial plastic-based yarns, disguises joints, varying degrees of durability
- 17 (p. 109) veneer – refers to real timber
laminate – refers to plastic or paper replications
- 18 (p. 110) on the structural floor with a finer mix of the screed poured over them
a shallow metal conduit
- 19 (p. 110) least structurally stressed area in the joist

Chapter 6: Ceilings

- 1 (p. 114) essentially same as for stud partitions – plasterboard sheets (skimmed or drywall) are nailed or screwed to the underside of floor joists
- 2 (p. 114) with three coats of plaster
- 3 (p. 115) when the requirements for service circulation is greater than can be accommodated in the depth of floor joists or surface-mounted conduits
- 4 (p. 115) lengths of softwood fixed directly to the floor joists above to support light joists
- 5 (p. 116) smooth composite timber board such as plywood and MDF
- 6 (p. 118) easy and quick way of providing a fairly uninterrupted void for substantial service elements

Chapter 7: Furniture, Fixtures and Fittings

- 1 (p. 124) joinery – construction of bespoke elements that require precision and high level of finish
carpentry – deals with less refined and more structural work, first fix of timberwork
- 2 (p. 125) the base structure of a piece of furniture on to which final finishing materials are fixed

ANSWER KEY TO ACCOMPANY:

- 3 (pp. 128-129) cross joint – locks both pieces at right angles and is very rigid when glued
lapped joint – allows the thickness of framing to remain constant at junction points by the use of grooves
dowel joint – dowels (short cylindrical lengths of wood) are inserted and glued into the abutting faces of timbers forming an integral connection between the two components
- 4 (p. 131) c. routing
- 5 (p. 133) **False**, veneers are usually no more than 1mm thick

Chapter 8: Stairs

- 1 (pp. 144-145) straight flight – single flight of stairs between two floors
dog-leg – doubles back on itself at an intermediate landing
angled – flight of stairs that has been turned through an angle
spiral – circular plan with fan-shaped steps
- 2 (p. 145)
string – the sloping structural component that supports treads, usually two – one on each side of the flight
flight – a single continuous run of stair
rise – the overall height of a flight
going – the length of a flight measured on the horizontal
tread – the horizontal surface on which a user steps
riser – the vertical surface between treads
nosing – the projection of the front edge of the tread to increase its length
landing – the horizontal area on the length of a flight that may allow users to change direction
stairwell – the volume within which a stair is contained
- 3 (pp. 146-147) steel strips, steel angles, setting in strings, lamination
- 4 (p. 150) a thin timber post which supports a handrail
- 5 (p. 152) the pivotal action of the tread when stood on transfers significant asymmetrical loadings to the wall

Chapter 9: Materials

- 1 (p. 160) softwood – comes from fast-growing, usually coniferous trees with widely spaced annual rings
hardwood – comes from slow-growing, usually deciduous, trees with closely packed rings
- 2 (p. 160) sawn timber where the trunk is sawn along its length and converted into various sized planks and PAR (planed all round) timber which is planed smooth on all its sides
- 3 (p. 161) waste material from sawing wood (i.e. sawdust and thin shavings) bonded with specialist glues
plywood and MDF
- 4 (p. 161) manufactured from short lengths of timber glued together
- 5 (p. 162) advantages – workability (can be cut and machined with great accuracy as has no grain), stability, good base for paint finishes, can be used to produce simple moulded elements
disadvantages – density of board means it is necessary to pre-drill screw holes, nailing is difficult and can cause material to split, edges can crumble under impact, machining and construction process releases formaldehyde which can damage eyes and lungs
- 6 (p. 163) sheets come in different sizes and can be cut with a handsaw, one side can be finished with a skim coat of plaster, specialist boards available with increased performance, when sheets are securely fixed are robust enough to deal with significant impacts, can also support substantial loadings
- 7 (p. 164) consists of thin veneers of timber glued together, with the grain of each layer running at right angles to those next to it
relatively easy to cut, although the extant timber grains in each veneer mean that the cut edge of poorer quality boards may fray
- 8 Two types of steel used in the construction of interiors are **mild steel** and **stainless steel**. (p. 165)
- 9 (p. 165) light and durable, malleability makes it easy to machine, can be rolled to produce thin laminates or formed using a cold-pressing process, may be recycled more expensive than steel so use is limited
- 10 (pp. 166-167)
toughened glass – glass made by heating and rapidly cooling glass after primary manufacture, is four times stronger and better able to deal with impact, loading and thermal stress
laminated glass – comprises of sheets of glass bonded with layers of clear plastic to which the glass adheres when broken, provides significant safety factor, can withstand physical attack, can also improve sound insulation
multiple glazing – refers to hermetically sealed units where panes of glass are bonded to create a single panel, used for thermal insulation, can also improve sound insulation

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- wired glass – produced by embedding wire within the thickness of glass during manufacture, effective for fire resistance and security
 glass blocks – transparent or translucent components bonded with mortar joints to create a wall or part of a wall, have good thermal and acoustic properties
- 11 (p. 167) sandblasting – surface of clear glass is pitted by sand particles hitting it at high pressure, areas of surface may be masked off to allow varying degrees of intensity of pitting or to create tonal patterns
 acid etching – surface of glass is eroded by hydrofluoric acid to produce degrees of translucency
 - 12 (p. 167) two methods – derived from acrylic, can be either extruded or continuous-cast
 easy to bend and therefore better than glass for curved screens, marks can be removed by polishing or surface heating, particularly useful for display and exhibition cabinets as has a low reflectivity, resistance to impact means more secure than cheaper forms of glass, can be easily shaped and components can be joined by heat or solvents forming an almost invisible weld
 - 13 (p. 168) gluing, nailing and screwing

Chapter 10: Structural Principles

- 1 (p. 172) **False**, elements under compression fracture and disintegrate
- 2 The tendency of a beam to bend under loading means that the material on the upper edge will be **compressed** and the material on the lower edge will be **tensioned**.
 (p. 173)
- 3 (p. 173)
 timber – functions well in both compression and tension
 steel – excellent in tension, comparatively poor in compression
 concrete – strong in compression, very weak in tension
- 4 (p. 174) midpoint
 because the effect of the load will be greatest and there will be less support against bending from lateral restraints
- 5 The loadbearing capacity of a beam depends on the beam's **depth**, while stability depends on its **width**.
 (p. 174)
- 6 (p. 176) a projecting element, usually a floor or a canopy, that has structural support on only one side
- 7 (p. 176) simple cantilever – modest projecting element from a wall or line of columns sometimes with additional connection to a supporting structure by use of an angled strut

- counterbalanced structure – a conventionally supported structure which is projected beyond one of its support points
- 8 (p. 177) downstand – projects below the floor it supports so is visually significant element in the rooms below, can be disguised by a suspended ceiling
 upstand – projects above the floor it supports, can be accommodated within a wall in the rooms into which it projects or alternatively by a change of level
 - 9 (p. 178) with the addition of extra vertical and horizontal members
 - 10 (pp. 180-181)
 loadbearing masonry (brick, block or stone) – width should not exceed 1/12 of height
 reinforced concrete – width should not exceed 1/15 of height
 steel columns – width should not exceed 1/30 height
 timber columns or posts – width should not exceed 1/20 of height (NB varies with grade of timber used)
 beams – depth should be at least 1/15 of the span
 floor slabs supported on two sides – slab depth should be 1/25 of the span
 floor slabs supported on four sides – slab depth should be 1/30 of the span