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New In This Issue

This is a list of key changes that have been included since the previous edition.

Updated product range	page 10-19
Control joints in ceilings	page 38
Revised GIB bracing systems	page 48
Information on machine stopping and sanding	page 75

Introduction

The planning, building and finishing of a home or commercial building has a large number of important considerations. This guide provides you with the essential information needed when designing with and/or installing, GIB® systems.

GIB® systems specifically designed for fire rating, noise control, bracing and wet areas are not fully documented in this guide. Please refer to the relevant sections in the specific technical publications.

GIB® SYSTEMS LITERATURE

Winstone offer an extensive range of tested systems to ensure compliance with the requirements of the New Zealand Building Code. Detailed and appraised information about these systems can be found in the following literature.



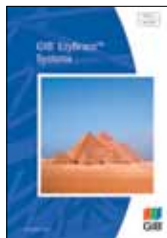
GIB Noise Control®
Systems



GIB Aqualine® Wet Area
Systems



GIB Fire Rated®
Systems



GIB EzyBrace®
Systems



GIB Ultraline®
PLUS Lining
Systems



GIB X-Block®
Radiation Shielding
Systems



Penetrations in
GIB Fire Rated®
Systems

These publications can be
downloaded from www.gib.co.nz
OR by phoning 0800 100 442
OR from most GIB® stockists

GIB® PRODUCTS AND OTHER PRODUCTS

GIB® systems incorporate different GIB® products, which are manufactured or supplied by Winstone and are distributed nationwide by authorised dealers.

Winstone has a range of GIB® branded jointing compounds, adhesives, fasteners and other drywall products. It is recommended that these GIB® branded products are used with GIB® plasterboard systems. They have been specifically developed or chosen by Winstone for their compatibility with GIB® plasterboard systems.

Instructions on how to handle, store, install, fix and maintain GIB® products are given on p24. These instructions must be followed if GIB® systems are to achieve their claimed performance levels.

SUBSTITUTION

Winstone accepts no liability if the systems are not installed in accordance with instructions contained in the GIB® technical literature. Substitution of specified or recommended components with alternative brands can compromise performance dramatically.

HEALTH AND SAFETY

Under normal conditions of use, GIB® plasterboard presents no known health hazard.

Construction sites can contain multiple hazards. It is important that appropriate health and safety requirements are strictly followed in such environments.

Careful lifting techniques must be employed to minimise the risk of back injury.

- Plasterboard lifting machines are recommended for ceiling sheets. These can generally be hired from a local hire centre. If a plasterboard lifter is not available, ensure that adequate labour is on hand to assist
- Knives used for scoring and snapping need to be sharp to operate effectively. Extreme care needs to be taken when using any cutting implements
- Dust masks complying with AS/NZS 1715 and 1716 must be worn for all sanding of stopping compounds. For more information visit www.dol.govt.nz.
- Do not dispose of waste materials or compounds into any drainage system. Most local authorities will accept gypsum waste materials in landfills. If in doubt, check with your local authority
- Contact GIB® Helpline 0800 100 442 for information on recycling options
- Ensure that scaffolding complies with relevant safety requirements
- All electrical equipment and leads must have a current and appropriate safety tag

COMPLIANCE

Under normal conditions of dry internal use GIB® plasterboard systems have a service life complying with the durability requirements of NZBC B2 Durability.

The systems and product testing referred to in this guide have been carried out and/or appraised by BRANZ and various other independent testing organisations.

LIMITATIONS

- Winstone strongly advise against installing GIB® plasterboard in any situation where external claddings are not in place or which is not totally protected from the elements. If plasterboard is installed under such conditions it greatly increases the risk of surface defects such as cracked or peaked joints and fastener pops
- GIB® plasterboard in use must not be exposed to water or be installed in situations where extended exposure to humidity above 90% RH can reasonably be expected. Such areas include group shower or steam rooms and moisture and chlorine rich environments such as indoor heated swimming pools
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details
- GIB® Bracing Systems must not be used in shower cubicles or above baths. See page 48
- GIB® plasterboard products must not be used in external situations
- To limit sag in GIB® plasterboard ceilings, long term uniformly distributed loads such as that of fixtures and fittings and/or overlaid insulation shall not exceed 3kg/m² unless independently supported
- Insulation thickness shall not exceed that of the wall framing. Note: this requirement is to prevent distortion of the surface of the installed gypsum linings and may have a potential negative impact on thermal performance of the insulation

RADIANT CEILING HEATING

Electric Radiant Ceiling Heating (ERCH) systems may give rise to abnormal localised or overall temperature conditions in ceiling spaces which could affect the timber framing and GIB® plasterboard linings. Excessive thermal or hygrometric movement induced by these systems may result in some or combinations of the following defects; deterioration of the gypsum in the GIB® plasterboard core (possibly affecting structural and fire resistant rating performance), fastener 'popping', joint peaking or joint cracking. Prior to construction, we suggest you contact your designer to fully consider these factors in order to optimise surface finish quality. Winstone will not accept liability for surface finish quality problems where ERCH systems are installed in conjunction with any GIB® lining system.

COMPLAINT PROCEDURE

Should a GIB® product problem arise during the installation or finishing process, immediately contact the GIB® Helpline on 0800 100 442. Do not continue to use material which is not performing according to specifications and expectations. Keep samples of products and batch numbers/ manufacturing dates where possible.

SUSTAINABILITY AND THE ENVIRONMENT

Winstone is committed to protecting the environment. Environmental matters are integrated into all business activities:

- All operations of Winstone will strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We will treat the environment equally with all other operations and allocate appropriate management time and resources to address and continuously improve our activities.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

The Environmental Choice label acknowledges the product as meeting or exceeding the voluntary environmental declaration standard set by the NZ Eco-labelling Trust. The standard is a comprehensive life-cycle assessment which is scientifically and internationally recognised.

The Environmental Choice label covers all GIB® Plasterboard 13mm and greater in thickness.

Achieving the desired finish

No sheet lining material or substrate has a surface that is perfectly flat and totally free of minor imperfections. Customer satisfaction will best be achieved by firstly setting expectations followed by identifying the right level of finish and finally installation by skilled tradespeople in accordance with the contents of this guide. Often 'reasonable expectation' and 'attainability' are not the same. Designers and builders must understand and explain to their customer the quality that can reasonably be expected from the chosen materials in each specific situation. A reasonable expectation is that the surface, particularly with flush-stopped linings, appears flat for most of the time. It is important to acknowledge that both the fixing and particularly the stopping processes for plasterboard are manual processes. Hence it is quite normal for the finished joint of flush-stopped materials to be slightly raised above the surface of the sheets being joined. By careful attention to the design and installation of the substrate, the linings, the applied finish and the lighting conditions which impact on the linings, visual imperfections can be minimised. The specified 'Level of Finish' for each internal area must be carefully chosen and agreed to best disguise these imperfections and to meet the owner's expectations.

Specification of all aspects of functionality and performance of the walls and/or ceilings of a building must reflect the needs and expectations of the customer. Architectural specifications for GIB® materials and systems may be found in 'MasterSpec®' (www.masterspec.co.nz) or download from the GIB® website www.gib.co.nz

QUALITY EXPECTATIONS

Building owners, designers, builders and tradespeople must be aware of the finish quality that is achievable considering the following points:

- Construction times and site conditions
- The quality of workmanship at all stages of installation, stopping and decoration
- The framing quality - timber or steel (see Substrates section pages 8, 25)
- Timber framing, whether it is air dried or kiln dried machine graded
- Defects show more readily on ceilings than on walls (larger unbroken areas)
- Lining materials - grade and characteristics
- Sheet installation techniques, such as horizontal or vertical sheet alignment, or the method of fixing - nail, screw and/or adhesive
- The number of end joints used - as a general rule, cut or end joints should be avoided where a higher quality finish is required. If unavoidable they should be backblocked

- The type of decoration to be applied to the surface - is it glossy, smooth or textured, paint or wallpaper? (See Surface Finishes page 8 for more detail)
- The type of lighting that will be illuminating the surface - will it be glancing? (See Lighting Design page 8 for more detail)

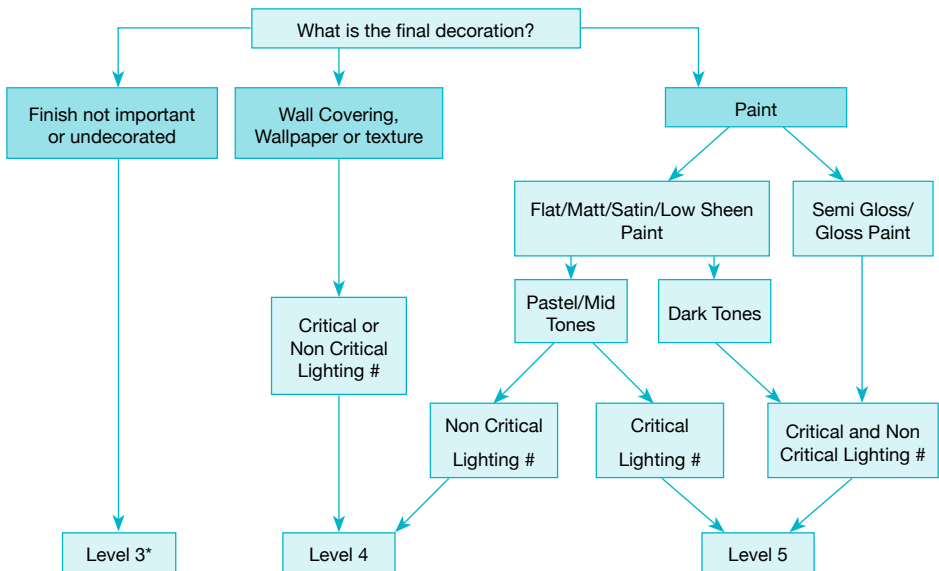
Note: It often pays to establish a sample or reference area for a project that may be used to judge the acceptability of the quality of finish under prescribed conditions of inspection.

LEVELS OF FINISH

'Levels of Finish' is a tool contained in AS/NZS 2589 2007 for specifying the required quality of finish when installing and flush stopping plasterboard prior to application of a range of decorative finishes under various lighting conditions.

Three Levels of Finish for plasterboard are defined in the Australian & NZ Standard AS/NZS 2589; 2007. Level 4 and 5 Finishes are commonly specified and encountered in both residential and commercial construction.

LEVELS OF FINISH SELECTION CHART



Critical Lighting - when the light source is nearly parallel to the surface

Non Critical Lighting - when the light striking the surface is diffuse and/or at right angles, see p9

* May not be suitable for subsequent decoration to high levels of quality in the future. Refer to Level 4 or 5 for upgrading requirements

Level 3

Level 3 shall be used in areas that do not require decoration such as above ceiling level or inside service shafts and the like.

All joints and interior angles shall have tape embedded in joint compound and one separate coat of joint compound applied over all joints and fastener heads. All joint compounds shall be finished smooth. (Generally this is achieved by scraping off nibs and ridges and the like, with the edge of a trowel.)

Level 4

Level 4 shall be the default level of finish for gypsum linings unless specified otherwise.

Flat or low sheen paints shall be used for this level.

All joints and interior angles shall have tape embedded in jointing compound and a minimum of two separate coats of jointing compound applied over all joints, angles, fastener heads and accessories. All jointing compound shall be finished evenly and be free of tool marks and ridges in preparation for decoration.

Note:

- Under critical lighting conditions surface imperfections may still be apparent in a level 4 finish.

Level 5

Level 5 is for use where gloss or semi-gloss paints are specified or where critical lighting conditions occur on satin, flat or low sheen paints. Level 5 is characterised by a parity of texture and porosity. The surface texture shall be random in fashion and monolithic, concealing joints and fixing points.

All joints and interior angles shall have tape embedded in joint compound plus a minimum of two separate coats of joint compound applied over all joints, angles, fastener heads and accessories. All joint compound shall be finished smooth and be free of tool marks and ridges.

A paint or plaster material shall then be sprayed, rolled or trowelled over the defined area in accordance with the manufacturers recommendations.

Note:

- Level 5 is difficult to achieve and always requires co-operation of the framer, plasterboard installer, plasterer and painter in establishing suitable work practices that deliver the agreed paint finish for the given project
- Some minor imperfections may still be visible in a level 5 finish, however these will be minimised under the additional measures applied under level 5
- The surface of the defined area may require sanding to be suitable for decoration
- Further information on the factors affecting levels of finish may be found in the following publications:
 - **Plasterboard Expectations** - Federation of Wall and Ceiling Industries of Australia and New Zealand (downloadable from www.gib.co.nz)
 - **Illumination and Decoration of Flat Surfaces** - CSIRO 6th Edition (available for purchase from Techbooks 09 542 0132 www.techbooks.co.nz)
 - **AS/NZS 2589:2007** (available for purchase from STANDARDS NEW ZEALAND 0800 782 632)

Levels of Finish Guidelines

For light timber framed construction as covered by NZS 3604:1999. Levels of Finish specifications for construction falling outside this scope shall be established by specific negotiation.

Note: It is important to recognise that the level of finish approach was developed to optimise installed plasterboard surfaces IN PREPARATION for decoration and NOT as a basis for establishing acceptance or rejection criteria for the final decorated surface.

	LEVEL 3	LEVEL 4	LEVEL 5	
Framing requirements Maximum deviation from a 1800mm long straight edge along or across adjacent framing members	90% of measured points must be less than 4mm 10% may be less than 5mm		90% of measured points must be less than 3mm 10% may be less than 4mm	PRELINE
Moisture content of timber framing at the time of lining	18% or less NZS 3602 recommends lower moisture content (8-18%) if heat pumps, air conditioning or central heating is to be installed			
Installation requirements Wall joints	Sheets must be set out to minimise joints. Generally this requires horizontal fixing			FIXER
Joints round openings	Vertical joints must not coincide with the edge of windows or doors. If a joint needs to be made in this area it must be made above the opening, no closer than 200mm to the edge of the opening			
Control joints	At 9.0m centres in either direction Winstone recommends that this can be extended to 12 metres for ceilings provided with perimeter relief. See detail on page 38			
Sheet end butt joints in ceilings	Must be made centrally between ceiling battens and back-blocked. Butt joints must be staggered by 600mm min			
Tapered edge joints in ceilings	Back-blocking not required but procedure for Level 4 is recommended	Must be back-blocked in any area containing 3 or more edge joints. (6 joints if steel ceiling battens are used.) Not required in ceiling suspension systems, See page 47	All joints to be back-blocked	
Finishing requirements	All joints must have paper joint tape embedded in joint compound plus one additional coat of joint compound applied over all joints, angles, accessories and fastener heads	All joints must have paper joint tape embedded in joint compound plus two additional coats of joint compound applied over all joints, angles, accessories and fastener heads		STOPPER
	All joints must be finished smooth	All joints must be finished smooth with no tool marks or ridges acceptable		
			Skim coat all surfaces to remove differential surface textures and porosity	

This chart is intended as a guide only to critical elements relating to levels of finish.

Full details of the requirements can be found in AS/NZS 2589:2007.

SUBSTRATES

The final quality of finish for a plasterboard wall or ceiling is heavily influenced by the quality of the substrate to which the plasterboard is fixed.

Common substrate problems are:

- Bent or twisted studs, nogs or battens
- Protruding nogs/dwangs
- Steel angle braces not set flush with the framing
- Skew nails not driven home
- Inconsistent machining of the timber frame particularly at the stud-lintel connection
- Poorly assembled timber or steel framing
- Nail plates or hold down ties not set flush with the surface of the framing
- Excessively thick or unevenly placed insulation protruding beyond the outer face of the frame
- Pipes or wiring not correctly set back into the cavity
- Screws in steel framing not countersunk flush
- Uneven blockwork surfaces

It is recommended that a 1.8-2m long straight edge be used to check the framing, to ensure that the requirements of the relevant level of finish are being met.

SURFACE FINISHES

The type of decoration applied to the wall or ceiling surface also has an impact on the perceived quality once the plasterboard is fixed and stopped. Key points to be taken into account are:

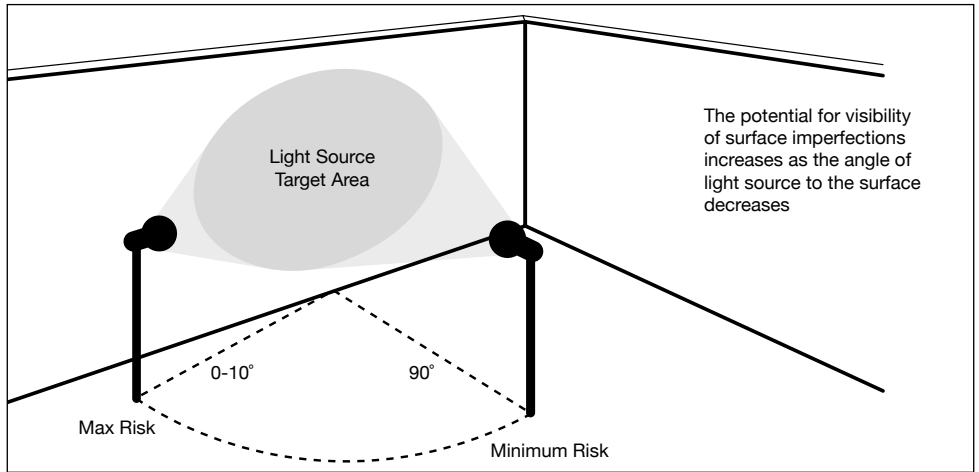
- Heavy textured or patterned finishes tend to hide imperfections
- Modern interior design using smooth-painted surfaces will tend to highlight imperfections
- Matt finishes disguise defects in the surface while semi-gloss and gloss finishes highlight them. Also gloss paints tend to highlight paint application variations (e.g. roller or brush marks where a good wet edge has not been maintained when painting)
- Variations in surfaces, such as negative details, designed projections, defined, expressed or false joints recesses or changes in plane can break up the surface and take the focus away from imperfections
- The method of paint application. Applying paint with a longer pile roller will disguise imperfections better than paint applied with a short pile roller or brush. A number of paint effects such as sponging will also disguise imperfections
- Lighter colours when compared to darker colours are;
 - less likely to show imperfections
 - more effective at diffusing the light and reducing shadow effects, particularly in smaller rooms

LIGHTING DESIGN

Although the following comments and recommendations are primarily related to design and specification, builders and the trade should also find the information useful.

Glancing light shines obliquely across the surface of a wall or ceiling. Because of the angle of the light, illumination of one side of the smallest imperfection creates a shadow on the other side. This can highlight imperfections that would not normally be visible under more diffused lighting conditions.

CRITICAL OR GLANCING LIGHT



Lighting sources can include windows, skylights and artificial wall or ceiling washer lights. Critical lighting should be avoided where possible. If it cannot be avoided it needs to be accepted that some imperfections may be visible under extreme lighting conditions. A degree of agreement, co-operation, acceptance and tolerance is required between parties

The following lighting choices will minimise the impact of glancing light and the visibility of surface imperfections:

- Locate fluorescent lights about 450mm below the ceiling, as this will give a more even distribution of light
- Use more rather than fewer lights - but don't over-light the space
- Space light sources evenly around the room to give a more even, diffused light
- Install multiple lights or rows of lights where possible because they negate the shadow created by the imperfection that occurs with a single row or light source
- Recess light fittings into a ceiling
- Allow a generous angle of incidence to the surface for feature lighting such as spotlights, to minimise the level of defects showing
- Do not locate a single or isolated unshaded light source close to a wall or ceiling in a space which has generally low levels of light
- Do not use uplights, wall-washers and spotlights in areas with a smooth wall finish because light is emitted at a glancing angle to the surface
- Design 'soft' rather than 'harsh' lighting conditions

Large windows, particularly those that run from floor to ceiling, admit large amounts of light at a glancing angle to both walls and ceilings. It is common also for windows to highlight defects in walls because of the angle and position of the sun at a particular point in time. Generally the sun remains in the critical position for only a short period each day.

- Consider the orientation of boards to minimize the tendency for natural or artificial light to fall at a critical angle across jointed areas

The following window design features will minimise the visibility of defects:

- Do not take windows right up to the ceiling level
- Avoid placing narrow windows immediately adjacent to the end of a wall (making the window wider and placing it away from the room corner should reduce the critical lighting effect)
- Provide sunshades over the window or recess the window to stop the sunlight reaching the wall