BCL ACOUSTIC TIMBER SYSTEMS

TECHNICAL INFORMATION HANDBOOK

BCL
TIMBER PROJECTS

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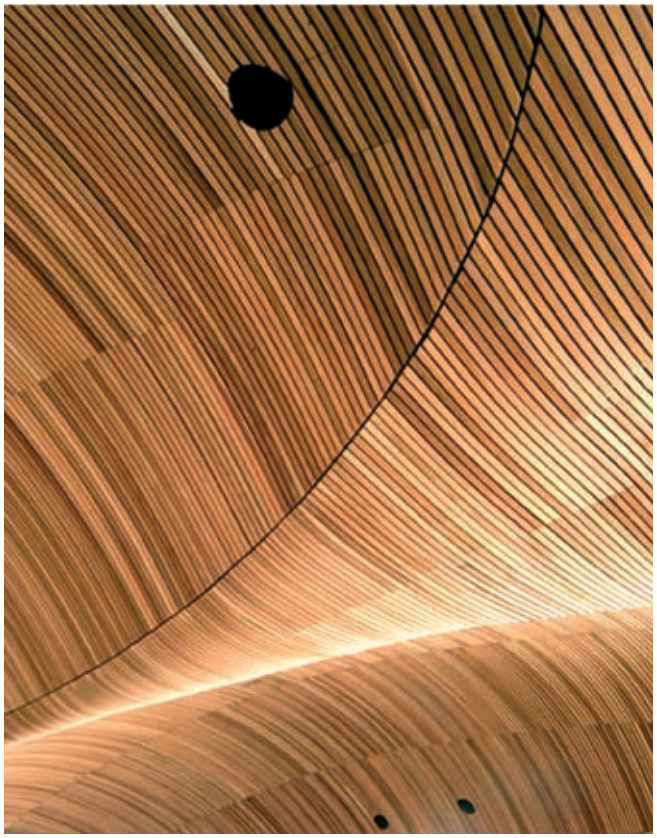
Overview

"Why timber …?"

The use of timber as a building material has been going on as long as building itself, but still no other material offers the same combination of natural beauty, versatility and environmental credentials.

Building with timber allows us to store the carbon extracted from the atmosphere efficiently, replacing the need for other heavy carbon producing materials such as brick, aluminium, plastic etc. This helps to lower the 'carbon impact' each building has on the environment and in turn reduce the amount of CO2 released into the atmosphere. At the end of a building's life the timber can then be recycled and used for other 'reclaimed wood' products.



Benefits

- **Versatile** – Wide range of colours, grains & finishes.
- **Beautiful** – Unrivalled warmth, character and texture.
- **Low imbedded energy** – Production requires minimal energy use.
- **Carbon off-setting** – Replaces plastic/HPL/Aluminium and other energy intensive materials.
- **Sustainable** – Average 25-50 year growth cycle, sourced from certified (FSC or PEFC) forests.

"Why Bamboo ... ?"

Sustainability...

Bamboo is one of the most sustainable building materials in the world. It has a 5 year growth cycle compared to the 25-50 years of traditional timbers. Also, bamboo forests store up to 3 times more carbon per sqm than timber forests and due to the plant's 'bush-like' structure, 25% of a single forest can be harvested without reducing the total number of plants!

This makes for an exceptionally sustainable material and a highly effective way of reducing a buildings carbon footprint. In fact, Bamboo is carbon positive even after accounting for transportation from China!

Value...

Combined with its sustainability is bamboo's aesthetics and price. It is extremely cost effective, typically priced at the bottom end of the timber market, alongside the lower grade cladding timbers. However bamboo has a very 'high grade' appearance with a straight fine grain and zero knot content, something you would expect of the very best timbers, such as 'prime grade' Oak.

In its panel form, kiln dried bamboo is highly impact resistant, perfect for schools and heavy use areas and comes in a range of beautiful natural colours.

- **High Quality** – Beautiful straight, fine grain & zero knot content.
- **Low Cost** – Similar cost to Siberian Larch.
- **Highly Sustainable** – 5 year growth cycle. Sourced from FSC certified forests.
- **Impact Resistant** – Hardwearing surface, ideal for low level walls.
- **Low imbedded energy** – Minimal manufacturing process - very low energy usage.

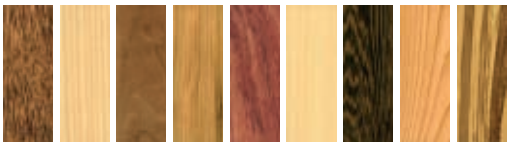
ACOUSTIC TIMBER SYSTEMS

"Why BCL...? "

BCL are the leading manufacturer of '***design-flexible***' timber panel systems in the UK and have been at the heart of some of the most forward thinking and technically demanding modern commercial projects in timber. Our construction experience, design knowledge and flexible approach allow us to help architects realise even their most challenging designs, practically and efficiently.

"Any species, any size, any colour.."

Unlike many 'off-the-shelf' panel products, every BCL system is fully 'design-flexible'. This means architects have the entire spectrum of UK commercial timbers to choose from and a wide selection of coatings and membranes, giving them literally hundreds of different colour and texture combinations to work with.



Core Benefits of a BCL system:

- Flexible Design – Choose from a vast selection of timber species, membranes and treatments giving you the freedom to create your designs without limits.

- 'Secret-Fixings' – Achieve smooth modern finishes across large areas with BCL's proprietary fixing systems. No visible screws or nails.

- Reduced Waste – Control total waste to between 1-2% (including on-site installation) compared to an average 15-20% waste associated with traditional site-fix.

- Rapid Installation – Reduce prelims and on-site costs substantially with BCL's rapid installation system. 1000sqm of timber can be installed in under half-the-time with BCL. (Typical saving 1000 man-hours)

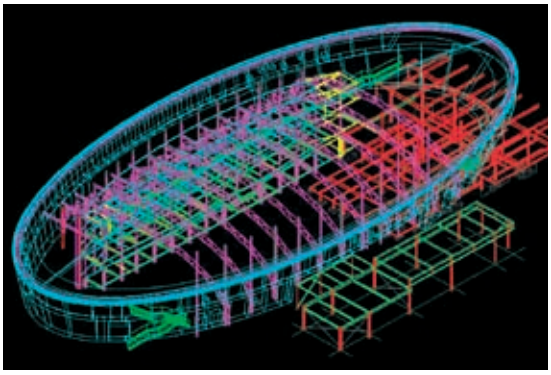
"The flexibility of a bespoke system, with the depth of a major supplier "

BCL have over 30 years worth of experience in the design, manufacture and installation of secret-fixing panel systems for large commercial projects. This means we are able to consult on technical detailing, species selection, value engineering – every area of the design & specification process, giving our customers the confidence that comes with working with a major supplier.

BCL's turn-key service…

Design

- BCL's professional in-house design team provide the depth required to undertake bespoke panel designs, provide detail design support for architects and supply full panel layout, detail and manufacturing drawings with every BCL system.



Manufacture

- BCL's manufacturing is carried out in a modern factory environment under a comprehensive QA framework and has the capacity to take on very large systems production. As an ISO 9001:2008 approved company, every area of the construction process is monitored and consistently reviewed.

Installation

- BCL provide a full installation service for all of their timber panel systems, carried out by teams of certified fixers right across the UK. BCL also have the capacity to provide systems for projects in Europe, Asia & Gulf regions.

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Specifying a BCL panel system

Timber Species

In general, species selection for internal projects is focused on the aesthetics, cost and density or hardness of the timber. Durability is not a primary concern as in most scenarios the timber will be protected from the elements.

Below is a table of the major commercial species available in the UK, all of which can be used in a BCL panel system.

Species	Cost 1=low 10=high	Density	Durability	Movement	Source	Certified FSC/ PEFC
UK grown & popular commercial timbers						
Oak (prime)	5	v Hard (725 kg/m3)	v High	Medium	UK & EU	Yes
Oak (QF2)	4	v Hard (725 kg/m3)	v High	Medium	UK & EU	Yes
Western Red Cedar	3	Soft (390 kg /m3)	High	Small	Canada	Yes
Home Grown Cedar	3	Soft (350 kg /m3)	High	Small	UK	Yes
Siberian Larch	1	Hard (725 kg/m3)	High	Small	Russia	Yes
Home Grown Larch	1	Medium/hard (590 kg/m3)	High	Small	UK	Yes
Bamboo	1	v Hard (700 kg /m3)	Low	Small	China	Yes
Other European grown						
European Walnut	8	v Hard (670kg / m3)	Medium	Medium	EU	Yes
Ash - EU	6	Hard (675 kg/m3)	Low	Medium	EU & UK	Yes
Sycamore	6	Hard (625 kg/m3)	Low	Small	EU	Yes
Chestnut	5	Medium/Hard (575 kg/m3)	High	Large	EU	Call BCL
European Elm	5	Medium (550 kg/m3)	Low	Medium	EU	Call BCL
Cherry - EU	4	Hard (625 kg/m3)	Medium	Medium	EU	Yes
Beech (unsteamed)	4	Hard (725kg / m3)	Low	Large	EU	Yes
Beech (steamed)	4	Hard (725kg / m3)	Low	Large	EU	Yes
Lime	3	Medium (550 kg/m3)	Low	Small	EU	Call BCL
European Whitewood	1	Medium (510 kg/m3)	Low	Medium	Scandinavia	Call BCL
European Redwood	1	Medium (510 kg/m3)	Low	Medium	Scandinavia	Call BCL
US & Canadian grown						
American Black Walnut	6	v Hard (660kg / m3)	Medium	Small	US	Yes
American Cherry	6	Hard (625 kg/m3)	Medium	Medium	EU	Yes
Maple	5	Hard (650 kg / m3)	Low	Small	US	Yes
American Red Oak	4	Hard (680 kg/m3)	Medium	Small	US	Yes
American White Oak	4	(Hard 670 kg / m3)	Medium	Small	US	Yes
Kebony	4	Hard (625 kg/m3)	High	Small	US	Call BCL
Douglas Fir	3	Medium (530kg / m3)	Medium	Small	Canada	Yes
American Ash	3	Hard (675 kg/m3)	Low	Medium	US	Yes
Cape Cod	3	Medium	High	Small	Canada	Call BCL
Hemlock	3	Medium (500 kg/m3)	Low	Small	US & Canada	Call BCL
Yellow Poplar / Tulipwood	2	Soft (450 kg / m3)	Low	Small	US	Yes
Southern Yellow Pine	2	Hard (660 kg/ m3)	Medium/Low	Small	US	Call BCL
Canadian Yellow Pine	2	Soft (420 kg / m3)	Low	Small	Canada	Yes

Tropical hardwoods						
Teak	10	Hard (660 kg/m3)	High	Small	Asia	No
Mahogany - Brazilian	10	Medium / Hard (560 kg/m3)	High	Small	South America	Yes
Wenge	9	v Hard (880 kg / m3)	High	Small	Africa	Yes
Zebrano	9	v Hard (740 kg/m3)	Low	Medium	Africa	Call BCL
Japanese Oak	8	Hard (670 kg/m3)	High	Small	Japan	Call BCL
Mahogany - African	7	Medium (530kg / m3)	Medium/Low	Small	Africa	Call BCL
Afromosia	7	Hard (725kg / m3)	V High	Small	Africa	Call BCL
Bubinga	7	v Hard (800-950 kg/m3)	Medium/Low	Small	Africa	Call BCL
Coconut	6	v Hard (750 kg/m3)	Medium/High	Small	Africa	Call BCL
Padauk	6	Hard (725kg / m3)	V High	Small	Africa	Call BCL
Utile	5	Hard (660 kg/m3)	High	Medium	Africa	Yes
Iroko	5	Hard (660 kg/m3)	V High	Small	Africa	Yes
Cumaru	4	Hard	High	Small	South America	Yes
Red Louro	4	Hard	High	Small	South America	Yes
Dark Red Meranti	4	Hard (650 kg/m3)	Medium	Small	Malaysia	Call BCL
Koto	4	Hard (650 kg / m3)	Low	Medium	Africa	Call BCL
Sapele	4	Hard (640 kg/m3)	High	Small	Africa	Yes
Pitch Pine	4	Hard (670 kg/m3)	Medium	Small	South America	Call BCL
African Cedar	4	Medium (510 kg/m3)	High	Small	Africa	Call BCL
Red Grandis	3	Hard	High	Small	South America	Yes
Idigbo	3	Medium (560 kg/m3)	High	Small	Africa	Call BCL
Obeche	2	Soft (390 kg /m3)	Low	Small	Africa	Call BCL

Considerations...

UV Exposure

If the timber system is exposed to un-polarized UV light (eg. in an open atrium with roof lights) then some 'silvering' or bleaching of the wood tannins may occur, turning the timber a silver/grey over time. To protect against this, UV resistant lacquers should be used.

Density

If panels are at low level (ie corridors) or subject to impact (sports halls, etc), the density of the timber will play a crucial role in the robustness of your system against everyday knocks. In contrast to this, soft timbers are better sound absorbers and will in general perform better in an acoustic setting than harder species.

Sustainability & Certification

Due to environmental building ratings, such as the BREEAM scoring scheme, the location of timber sources is now often a primary concern. In some areas of Europe it is easy to source a wide selection of certified timbers, whereas in some tropical and sub-continent regions it is much harder.

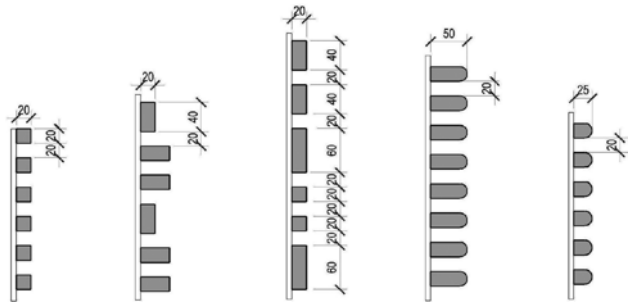
Movement

All timber is 'hydroscopic', meaning that it will absorb or lose moisture according to the environment in which it is placed. This can cause the timber to move as the wood fibres expand and contract. Some species of timber however, experience more movement in service than others and this should be paid consideration if specifying a timber system within an area of fluctuating temperature/moisture, eg. Swimming pool.

ACOUSTIC TIMBER SYSTEMS

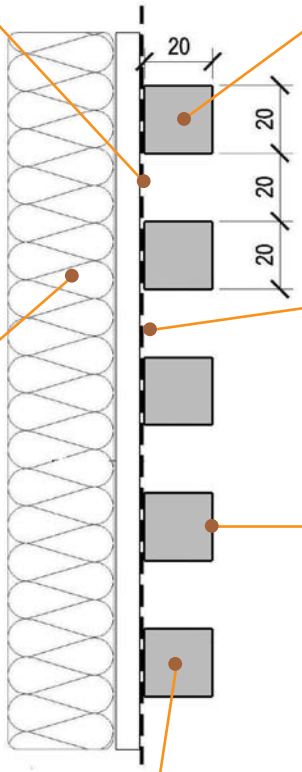
Panel Design / Build up

Insect mesh – Often recommended in complement to the acoustic fleece at low levels, particularly in schools or heavy use areas. The insect mesh provides a reinforced backing to prevent tearing of the fleece.



Profiles

Generally, timber slats within an acoustic panel will be 'planed-all-round' with square or rounded corners. However, any bespoke profile can be used without adding to the cost of the system..



Insulation

- Fibreglass – Good all round performance, low cost.
- Polyeurethane Foam – Good performance midlow frequency, medium/high cost.
- Melamine Foam – High performance especially mid-high frequencies, high cost.
- Rubber Foam – Used for room attenuation, v good low frequency absorption, high cost

Acoustic fleece – A fibre-glass based acoustic fleece, normally black, which provides an initial layer of absorption and covers internal fixings behind panel. Often fire treated to Euro class C.

Available Colours:

(custom colours available on request)

Finishes

Timber is often lacquered or finished with a protective coating, especially at low level, to allow easy 'wipe-down' maintenance, protecting the wood from everyday dirt buildup and reducing the risk of 'splintering'. Can be matched to any colour.

• Intumescent • Anti-graffiti • UV resistant

Fire Treatment

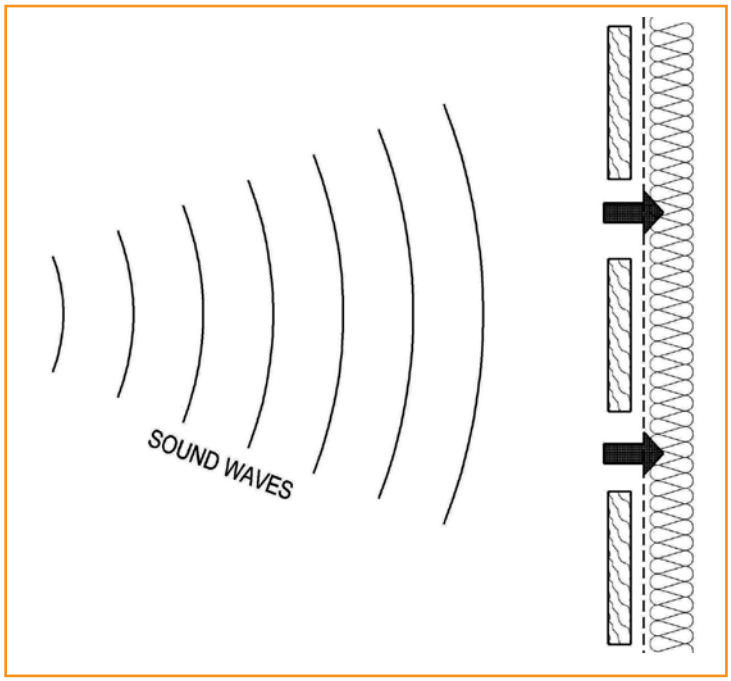
BCL timber panels can be treated using either impregnation or surface coating. In addition, the acoustic fabric facing to the acoustic pads can also be treated in a similar manner.

- EU Class B (Class 0)
- EU Class C (Class 1)

Acoustic Performance

Overview

This section explores the components which affect a panel's acoustic performance. The acoustic properties of a BCL panel are dependant on several factors that can be decided upon at specification stage..



'Open Area'

This is the most important factor in the performance of a panel, defined as the amount of 'space' between the timber slats, allowing sound waves to travel through and hit the absorptive insulation behind. Normally reported as a % of the total panel area The larger the open area, the more sound can be absorbed and hence, the higher the performance of the acoustic panel.

Insulation Thickness

This is the other primary determinant of an acoustic panel's overall performance. The thicker the insulation pad, the better the level of absorption across all frequency bands. Generally, to achieve classes B, C, & D, 25mm thick insulation is required. However for most Class A acoustic panels, 50mm is required.

Insulation Density

Insulation density is an important consideration when you require increased absorption across particular frequency ranges. Generally, the denser the acoustic pad, the better the level of acoustic absorption across the medium/ low frequency bands. Very high density insulation is often required for low frequency absorption and vibration dampening. Conversely, low density insulation is better for absorbing high frequency sound.

Insulation Material

Some types of insulation are better performing than others due to the type of material used in its construction. For instance, melamine foam offers particularly good absorption across the higher frequency bands, due to its very open cell structure. BCL are always on hand to consult on the different options available and what may be suitable for your project.

Timber Species

The density and hardness of a species can also have a minor effect on the performance of an acoustic timber panel. Softer woods such as Western Red Cedar are natural sound absorbers and will provide a slightly better overall acoustic performance than a particularly hard wood such as Oak or Walnut.

Ask BCL a question

Performance Classes

The table below briefly outlines the noise reduction coefficients (NRC) of each acoustic class and the minimum 'open area' usually required to achieve each.

Performance Class	NRC average weighted (calculated to EN ISO 11654:1997)	Minimum 'open area' required
class A	0.90 - 0.99	40%
class B	0.75 - 0.9	30%
class C	0.6 - 0.75	20%

Acoustic Functions

A key question when specifying an acoustic system is the role in which it will play within the building's environment. There are 3 main functions an acoustic panel can perform: Absorption, Reflection & Attenuation.

The table below briefly describes the three functions, the design approaches required for each and the typical areas of use.

Function	Description	Example of use	Panel Design
Absorption	The most common acoustic function. Panels are installed to reduce ambient sound within a space, normally in accordance with specified reverberation times.	Public areas, atriums, (often in complement to hard surface finishes).	Large open area. Thick insulation, medium density Softer timbers ideal but not critical.
Reflection	Panels are required to reflect sound to retain clarity and evenly distribute audio around a space. These panels will be required to be as hard as possible, to minimise absorption and maximise reflection.	School classrooms & lecture theatres, concert halls, parliament buildings.	Small or no open area, hard timbers, minimal or no insulation.
Attenuation	Panels are required to minimise sound transference from one room to another, with or without the need for absorption as well.	Adjoining classrooms, music studios, plant rooms.	Medium open area, thick insulation with high density backing.

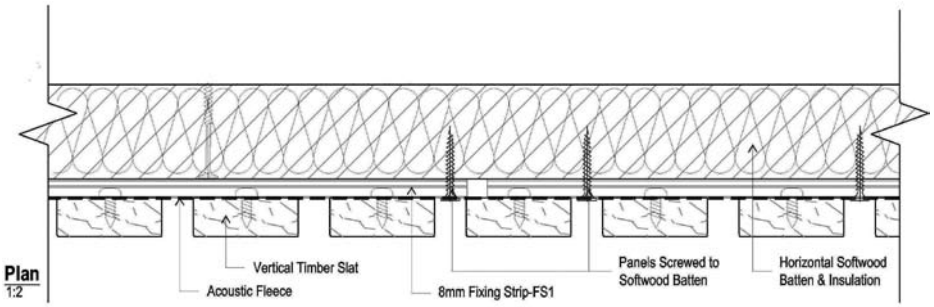
BCL Wall Systems

This section provides an overview of BCL's internal wall systems for both timber/steel stud and concrete block walls.

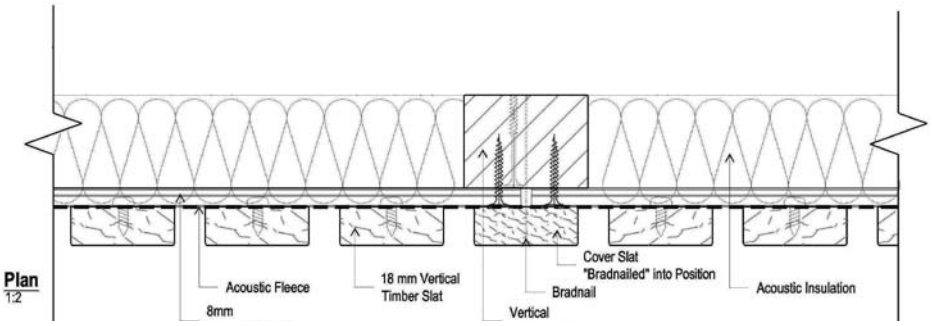
Fixings

Vertical Systems

'Direct fix' – Often used for vertical panel systems, the panels are fixed direct to timber studs or SW timber bearers, through slat gaps.

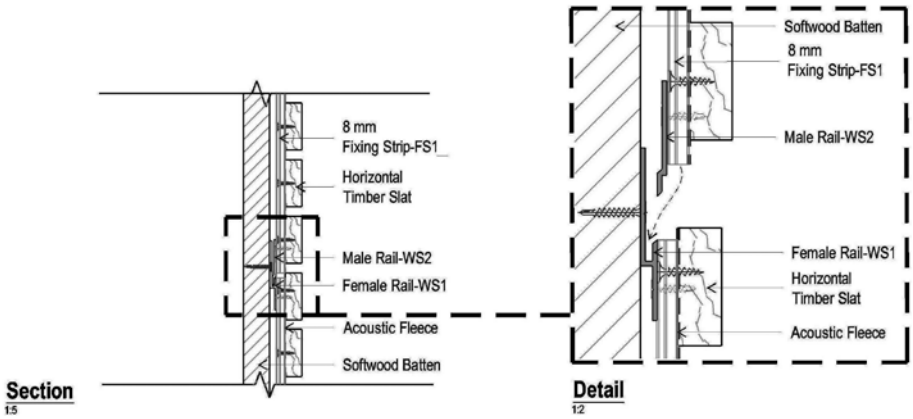


'Cover batten' – Primarily used for vertical panel systems, panels are screwed back to timber battens and junctions are hidden by a timber 'cover slat'.



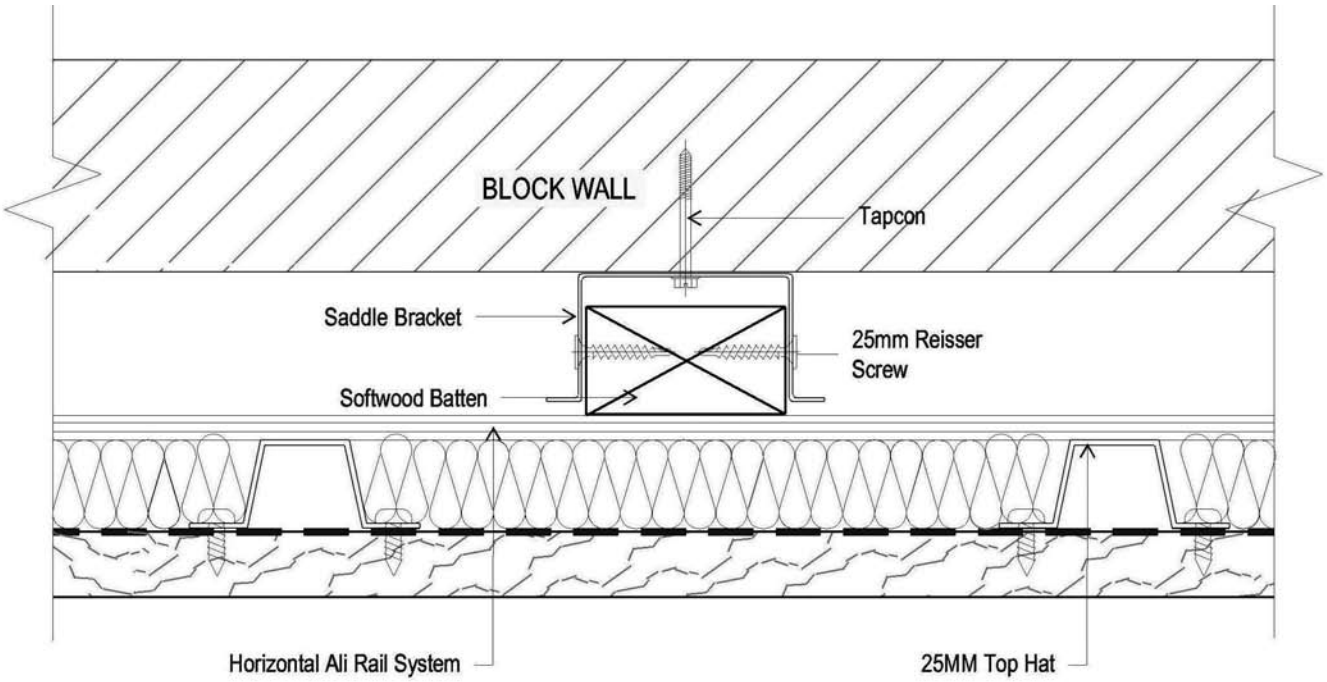
Horizontal Systems

'Wall rail system' – Panels are stacked upon each other via the male-female rail and screwed back to vertical metal studs or SW timber bearer.

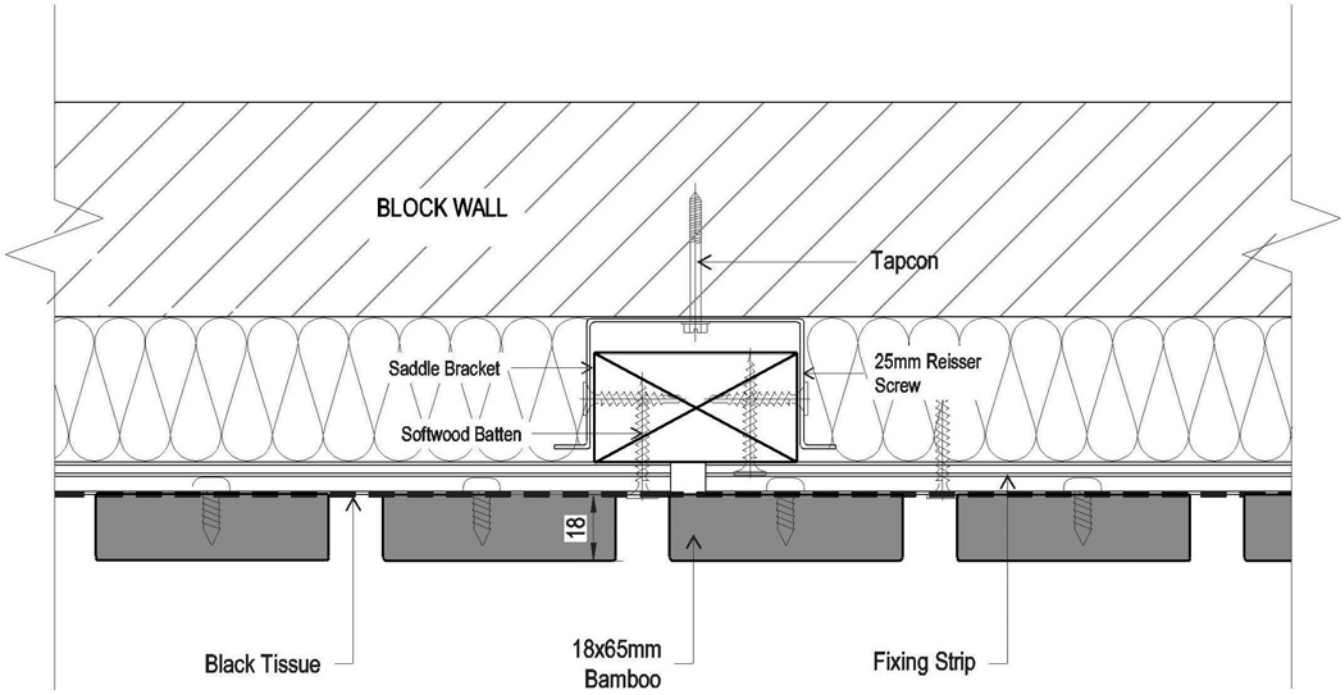


Drawing Details

Block wall – Horizontal – Wall Rail system

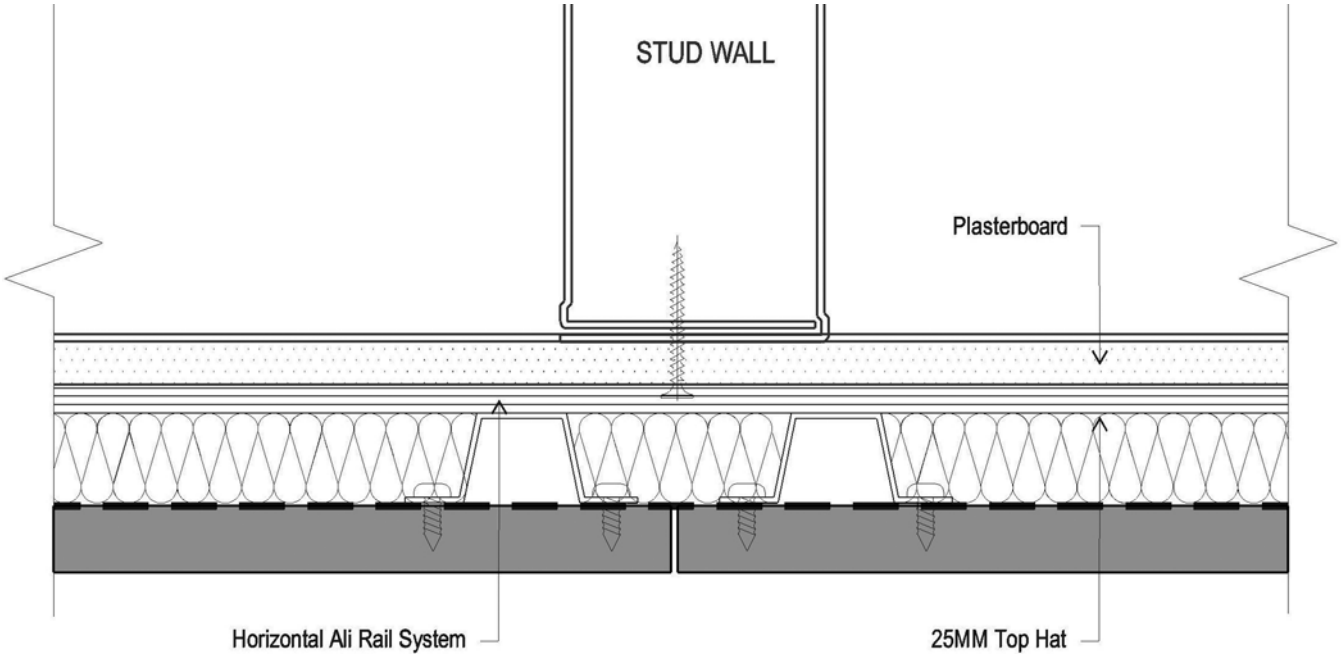


Block wall – Vertical – Direct fix

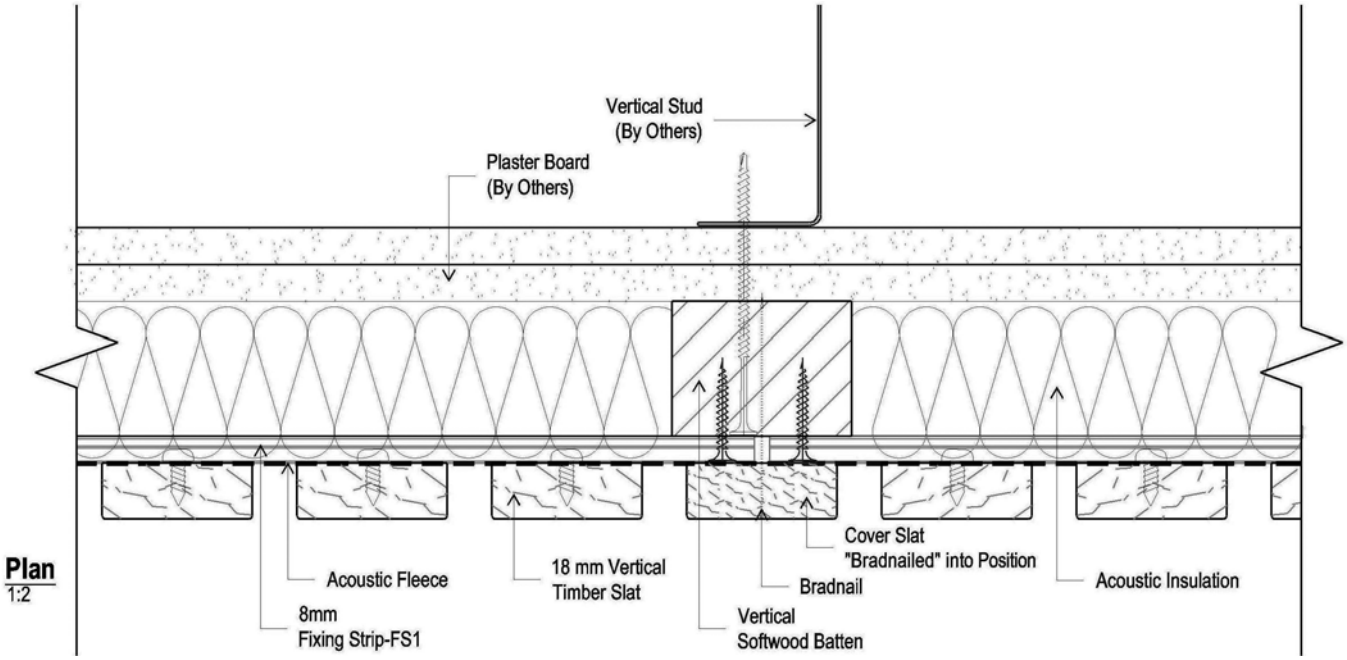


Drawing Details

Stud wall – Horizontal – Wall-rail system



Stud wall – Vertical – Direct fix



Typical Draft specifications

Below is a typical K11 (or K13) specification for a BCL internal wall system. Architects can decide the timber species, sizes and treatments as well as the amount of acoustic absorption. However, BCL are always on hand to consult on every stage of the specification process.

K11 ACOUSTIC WALL LININGS

To be read with Preliminaries / General Conditions.

Substrate : Timber / Dry-wall Stud
Primary support system :Direct fix to internal studs (by others)
(note: support system depends on substrate and depth of void / insulation required)

K11/110 TIMBER PANELS

Species : Siberian Larch.

Class : Best cladding grade available (timber supplier to confirm)

Profile : Square Edge

Finished Face Dimension : 44mm (Ex 50mm). Tolerance = +/- 1mm.

Spacing / Gap : 10mm

Finished Thickness : 19 mm. (Ex 25mm) Tolerance = +/- 1mm.

Moisture content at time of fixing : 13 - 19 %

Fixings : Stainless steel screws secret fix through aluminium support profiles into back of timber slats.
(as clause 140)

Slat support profiles : Polyester powder coated extrusions as clause 140.

Method of fixing : The timber slats are to be pre-fabricated into panels to suit the layouts shown on the architects drawings. The panel support profiles are fixed to slats with concealed fixings, fixed through pre-punched slots to allow timber movement without distortion.

Fire treatment : Class 0 SSF as clause 150.

Surface treatment : As clause 155.

Membrane : As clause 130.

Insulation : As clause 135.

Timber panels : Manufactured off-site by BCL Timber Projects. (www.bcltimberprojects.co.uk) or equal approved.

Panel fabrication lengths as per layout drawings. Tolerances : panel = +/- 2mm. slat = +/- 1mm.

Panel support system : As clause 145.

Panel abutments : 2 - 4 mm gap.

Sustainability : All timber to be procured through accredited FSC, PEFC, CSA or other approved sources, or any combination unless otherwise stated.

Other requirements :

K11/130 MEMBRANE

Membrane : Black 'Lantor' acoustic textile glass fibre tissue

K11/135 INSULATION

Insulation : 25mm mineral wool insulation, 48Kg/m3 density. Insulation panels encased with aluminium foil, with a black tissue fascia.

Thickness required to achieve an NRC of 0.7. To be fixed in accordance with manufacturers recommendations.

K11/140 SLAT SUPPORT PROFILES

Slat support profiles : 50x25x2 mm PPC aluminium top hat BCL ref TH1

K11/145 PANEL SUPPORT SYSTEM

Panel support system : Aluminium rail system BCL ref WR1/WR2.

Then fixed directly through internal sheathing board to internal timber studwork.

K11/150 FIRE TREATMENT

Fire treatment : DriCon Class 0 (EU class B), internal protection..

K11/155 SURFACE TREATMENT

Surface treatment :Clear 3 coat factory coating, Sikkens or similar

Project Examples

Walsall College of Arts & Technology

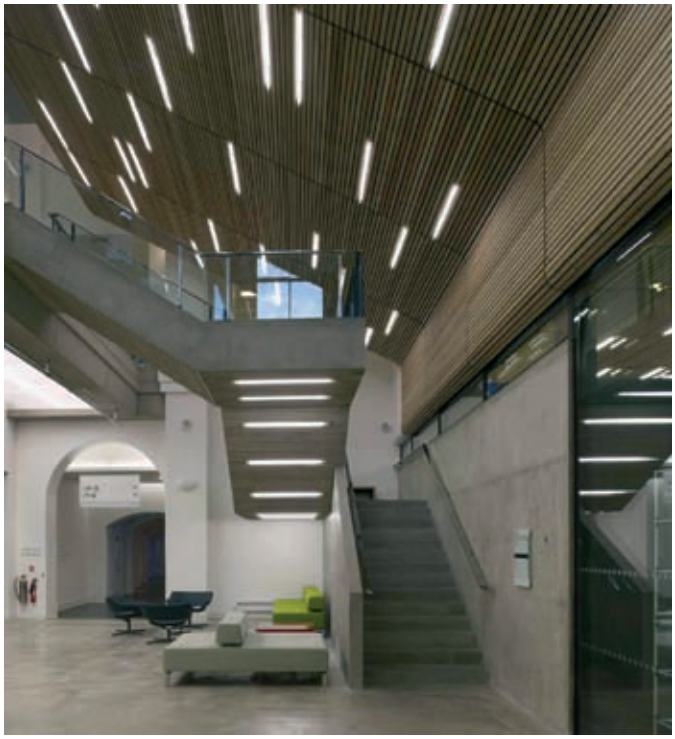
Architect	Dyer
Contractor	Shepherd
Acoustic Function	Absorption
Panel Class	C
Timber Species	Western Red Cedar
Additional Features	Class 0 SSF, PEFC certified. 100% secret-fixings.
Project Size	900 m^2
Installation Time	6 Weeks
Completion Date	April 2009

Walsall College is an ambitious £38M project to deliver a number of specialised music, business and IT academies within one centralised college campus. Designed by Dyer Associates, the central feature within the main atrium is a striking timber lined flexible learning pod. The acoustic panel system for this pod was in complement to plaster finishes that dominated the atrium space and was used to provide acoustic absorption necessary in meeting standard BB93 reverberation requirements.

ACOUSTIC TIMBER SYSTEMS

Sackler Centre – V&A Museum, London

Architect	Softroom
Contractor	Allenbuild
Acoustic Function	Absorption, reflection & attenuation.
Panel Class	Absorptive: C
Timber Species	Siberian Larch
Additional Features	Class 0 SSF, FSC certified, integrated lighting. 100% secret-fixings.
Project Size	900 m^2
Installation Time	6 Weeks
Completion Date	May 2009



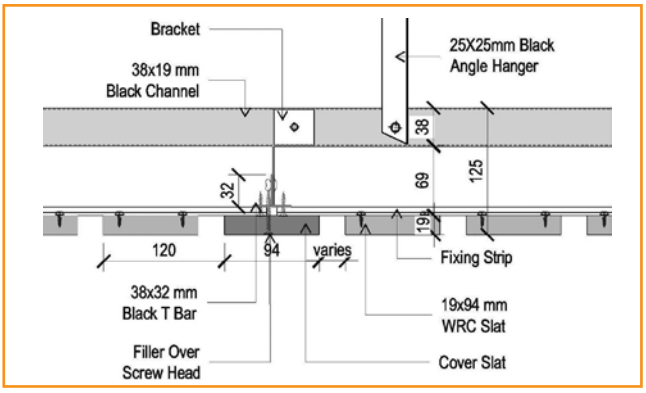
The construction of the new Sackler Centre provides state-of-the-art workshops and education areas for visitors of the V&A Museum. The centre houses teaching areas, artist studios, a restaurant and a lecture theatre. This resulted in the need for 3 different types of acoustic panel to cope with absorption, reflection and room-to-room attenuation. The wall/ceiling system also ran at low levels in some areas, which were subject to human contact, so Siberian Larch was chosen as a suitable impact resistant option.

BCL Ceiling Systems

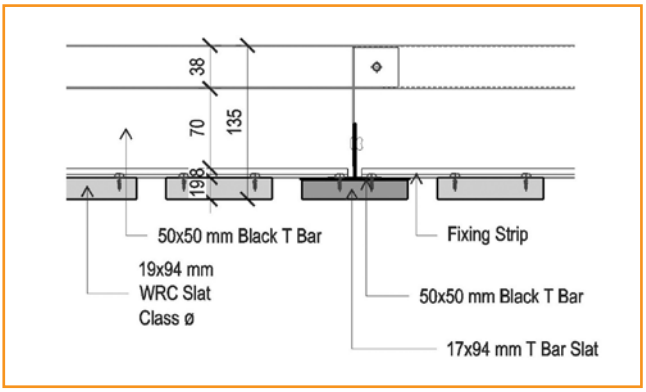
This section provides an overview of BCL's available ceiling systems.

Support / Fixings

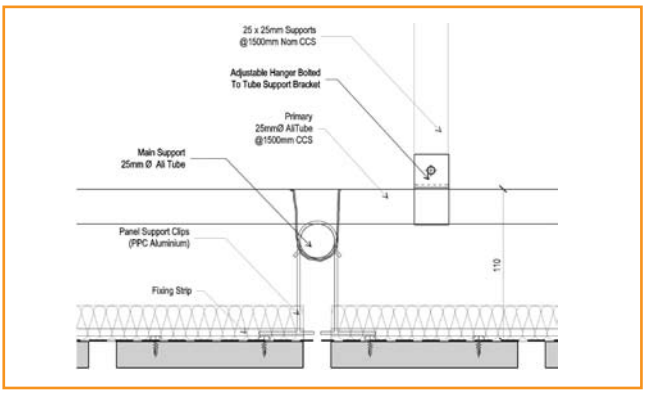
'Direct fix' – Panels are fixed direct to support structure/ grid. Often associated with flat soffit systems, this fixing provides increased security and is not demountable, access panels must be designed for services if required.



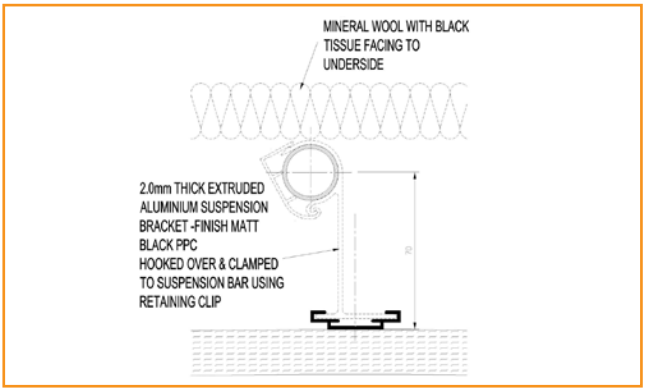
'Lay-in grid' – BCL ceiling panels are supported by an aluminium 'T-bar' grid. The grid is fixed direct to the roof structure and main steels above. The panels 'lay-in' to the grid and allow the system to be fully demountable. Normally requires the ceiling geometry to be flat.



'Tubular grid system' – Panels are 'hung' off a primary and secondary aluminium sub-grid via fixed or demountable clips. This flexible system is capable of creating complex geometrical surfaces and is used in BCL's curved ceiling systems.

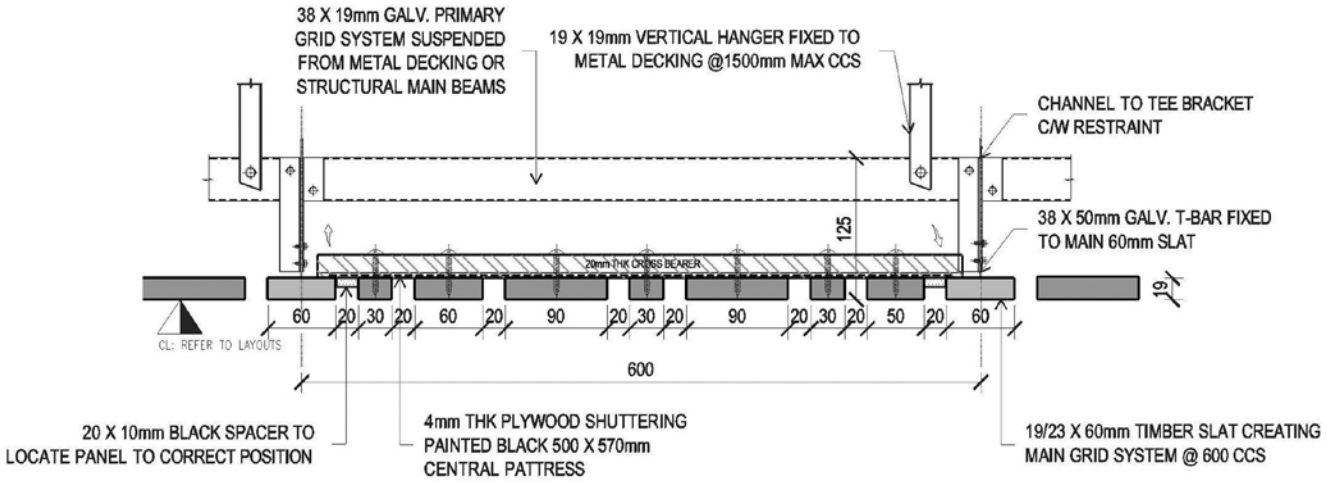


'Bomb-clips' – Based on the 'hanger system', however panels are hung using extra secure clips that prevent the panels becoming dislodged in the event of a blast, thus protecting the structural integrity of the ceiling system. Used often in high profile public areas, stations etc.

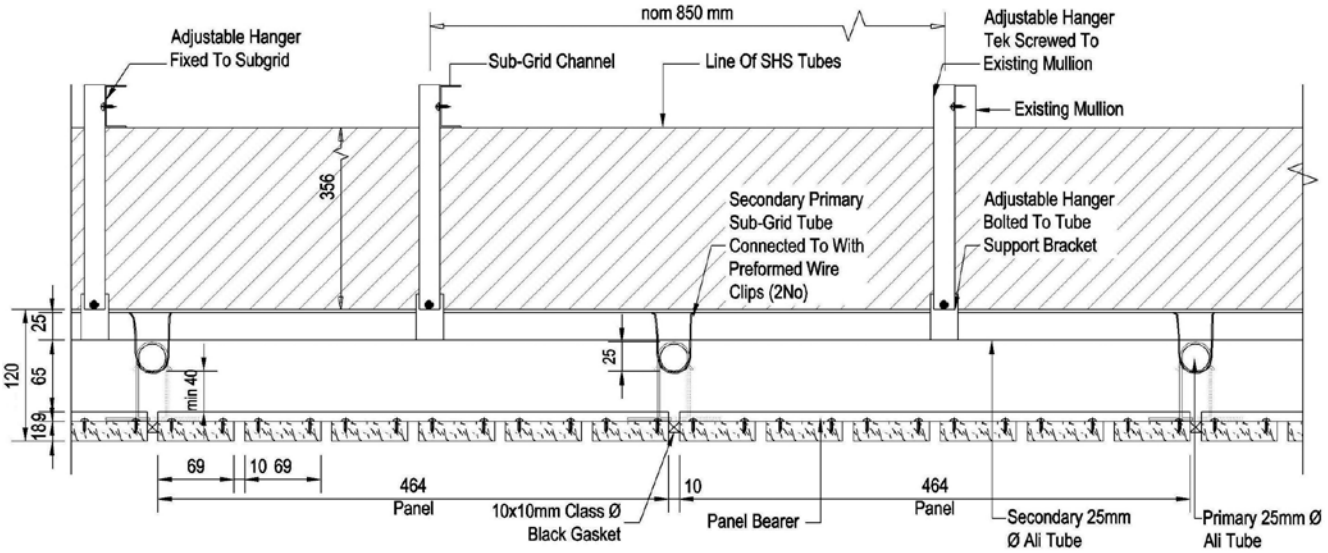


Drawing Details

Demountable Systems



Fixed Systems



Typical Draft specifications

Below is a typical K40 specification for a BCL ceiling system. Architects can decide the timber species, sizes and treatments as well as the amount of acoustic absorption. However, BCL are always on hand to consult on every stage of the specification process.

K40 Demountable Suspended Ceilings

To be read with Preliminaries / General Conditions.

K40/110 TIMBER CEILINGS

Species : Western Red cedar

Class : No 1. Clear & Better

Profile : Square Edge

Finished Face Dimension : 69mm Tolerance = +/- 1mm.

Spacing / Gap : 20mm.

Finished Thickness : 19mm Tolerance = +/- 1mm.

Moisture content at time of fixing : 13 - 19 %

Fixings : Stainless steel screws secret fix through aluminium support profiles into back of timber slats. (as clause 140)

Slat support profiles : Polyester powder coated extrusions as clause 140.

Method of fixing : The timber slats are to be pre-fabricated into panels to suit the layouts shown on the architects drawings. The panel support profiles are fixed to slats with concealed fixings, fixed through pre-punched slots to allow timber movement without distortion.

Edge Treatment : Not required

Fire treatment : Class 0 SSF as clause 150

Surface treatment : Not required

Insulation : As clause 135

Membrane : As clause 131

Timber ceiling panels : Manufactured off-site by BCL Timber Projects. (www.bcltimberprojects.co.uk) or equal approved. Panel fabrication lengths as per layout drawings. Tolerances : panel = +/- 2mm. slat = +/- 1mm.

Panel support system : As clause 145.

Panel abutments : 2 - 4 mm gap.

Sustainability : All timber to be procured through accredited FSC, PEFC, CSA or other approved sources, or any combination unless otherwise stated.

K40/130 EDGE TREATMENT

Edge Treatment : Not required.

K40/131 MEMBRANE

Membrane : Black 'Lantor' acoustic textile glass fibre tissue

K40/135 INSULATION

Insulation : 45Kg/m3 Rockwool insulation w/ flame retardent PVCThickness required to achieve an NRC of 0.7
To be fixed in accordance with manufacturers recommendations.

K40/145 PANEL SUPPORT SYSTEM

Panel support system : Welded Aluminium frame, fixed to vertical hangers.

K40/150 FIRE TREATMENT

Fire treatment : DriCon Class 0 (EU class B) internal protection. Or equal approved.

K40/155 SURFACE TREATMENT

Surface Treatment : Not required.

Project Example

Highcross Mall – Leicester

Architect	Chapman Taylor / Benoy
Contractor	Sir Robert Mc Alpine
Acoustic Function	Absorption
Panel Class	C
Timber Species	Western Red Cedar
Additional Features	Class 0 SSF, PEFC certified. 100% secret-fixings.
Project Size	1000 m^2
Installation Time	6 Weeks
Completion Date	December 2007

One of the main features of the Highcross mall in Leicester is this highly complex ceiling with two inwardly curving skylight areas which act as the join between the newly built and existing shopping malls. It is curved in cross section and there is a slope between the buildings, creating highly complex geometry.

BCL's in house design team formulated a panel layout that allowed the timber ceiling to be delivered quickly and efficiently. The use of prefabricated panels allowed for a tight installation schedule of six weeks.

Project Example

National Assembly for Wales – Cardiff

Architect	Richard Rogers Partnership
Contractor	Taylor Woodrow
Acoustic Function	Absorption, reflection.
Panel Class	C
Timber Species	Western Red Cedar
Additional Features	Class 0 SSF, PEFC certified. 100% secret-fixings. Pre-curved panels.
Project Size	2000 m^2
Installation Time	Ceiling – 16 Weeks Funnel – 12 Weeks
Completion Date	June 2005

The national Assembly for Wales is one of the most recognisable modern buildings in the UK. It was built to the highest environmental standards and incorporates a sprawling timber canopy that undulates and curves across the entire building area. This canopy also had to have acoustic absorptive properties due to the heavy use of glass and slate flooring inside the building. Despite the complex nature of the project, BCL's dedicated design process formulated a panel layout that allowed the entire ceiling to be delivered using only 36 different panel designs! This provided huge cost savings for Taylor Woodrow and streamlined the construction process to allow for an efficient and controlled delivery.

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