Building elements catalogue

Introduction

This component catalogue includes a number of tested component constructions and the respective measuring values. The data has been measured partly in the laboratory, partly in buildings and test buildings erected specifically for this purpose.
The connecting components (structure and transitions) are more or less essential for the acoustic insulation coefficients measured in the buildings.

For this reason, the essential associated node configurations for the individual construction systems are presented. The boundary conditions that occur most frequently in practice have been assumed for the construction systems. In the overviews, different colours stand for different users. This leads to the options for the individual node solutions.
In addition, there also may be varying requirements for the individual components; for that purpose, the component catalogue includes different variations enabling them to comply with different boundary conditions.

The indicated details are intended to illustrate the principle of construction and to serve as a basis for further developed details (for the use in practice). The facade, floor and interior work details are only presented by means of diagrams.
The manufacturers' instructions for installation and/or state of the art have to be complied with in the case of various built-in parts like for example floors, false ceilings, etc.
It is recommended to enlist the services of a competent building physicist for the details of the development.

Basics

The strengths and the types of material of the individual layers are indicated for the component constructions; in the case of alternative materials, care must be taken that they have the same building-physics properties (impermeability, stiffness, flow impermeability, etc.).

Different structures with different acoustical insulation coefficients are presented for the individual types of components separating wall, external wall, flat separating wall, roof elements, separating ceilings, flat separating ceilings respectively. Thus it is easy to adapt them to a vast variety of boundary conditions, standards and regulations. A building physicist is able to infer the variants and/or their effects from these values.

Statics and strength of KLH boards

The strengths of the elements and components have been adapted to standard building constructions. A statical treatment of the building is, however, necessary for each individual case.

Installations

Installations inside a building are - insofar as electric installations (sockets or several switches) are concerned - shaped into the boards in most cases. It is recommended to remain at a distance of at least 10cm from the edge of the board and to form only in direction of the orientation of the covering layer.

In the case of heavier installations, a wall-fitted installation is required, that can be covered with gypsum plaster, tiles, etc. afterwards.

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Building physics

As a matter of principle, it is recommended to make a wall/ceiling construction open for vapour diffusion, i.e. the individual materials ought to be increasingly permeable from the inside to the outside. This guarantees that the wall absorbs moistness and can release it again to the interior, if necessary. Thus no condensate can develop within the wall structure, and an agreeable and sound climate in the rooms is created.

Another basic principle is the layer-by-layer structure of the wall. An KLH construction forms the load-bearing, stiffening and space-enclosing core that can, when it is carefully executed, also be regarded as a wind-proof layer. For this reason, it would also be possible to build up the wall without using any foils. It is important to pay attention to transitions to concrete parts that are, as experience has shown, often realised in a relatively inexact manner. This item also has be paid more attention from a point of view of building physics (condensates).

According to the requirements, a convection barrier or a vapour-proof barrier is installed on the outside of the boards (according to the insulating material and the structure of the facade). This layer has to be installed over the entire surface, joints have to be bonded together and connected to the connecting components like for example windows/doors and concrete/basement, etc.

The insulating layer is installed on it. If the insulating materials are sufficiently stiff, they can also be directly fixed on the walls without intermediate fixtures, and then the facade can be installed (mounting according to the type of facade).

Facade

In addition to timber facades, metal or plaster facades are possible as well. It is recommended to adapt the entire structure of the wall to the facade. The more impermeable the materials of the outer layer, the more important a ventilation layer and/or a more impermeable vapour-proof barrier.

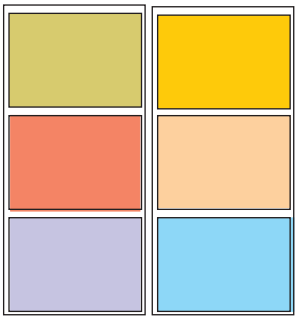
KLH solid wood boards have been used for numerous buildings in the form of terraced houses or multi-storied buildings. The acoustic insulation coefficients have been complied with in every case, but in most cases they have been exceeded by far.

Due to the simple, layer-by-layer structure of the wall and ceiling constructions, it is possible to avoid a large number of sources of error during the assembly.
A building consisting of KLH solid wood boards can be completely refurbished or redeveloped outside and inside without additional works being required. The surfaces on the inside can be renewed after a phase of usage (change of flat owner) without necessitating a lot of work. Alteration works can be carried out in a large variety of ways because the construction provides of reserves in most cases and/or can easily be reinforced. Facades can be adjusted to changed conditions, for example. In most cases, the load-bearing construction remains untouched by that to a large extent.

Basically KLH constructions can be used in combination with other types of construction as a matter of course. However, particular care must be taken when it comes to the statical and building physics matters in connection with transitions.

Building elements catalogue

Legend to the building elements catalogue



Different colours stand for different users in the individual units

Same colours stand for the same users in the individual units

KLH WB aw td 01

KLH …	Wooden construction element as a basis for the assembly
WB ….	Housing construction systems (higher requirements with regard to sound)
aw, tw ….	Designation of the separating components (see below)
01 ,etc.	System designation
03.1 ….	Variant of system design

KLH wtd 01

Component designation in the construction details
(possible tested variants of individual components)

KLH wtw 01

Designation of tested components

KLH …	Basis of the assembly
wtw, …	Designation of the separating component
01, xxt, etc.	Additional designation or number

aw	External wall
tw	Separating wall
wtw	Flat separating wall
td	Separating ceiling
wtd	Flat separating ceiling
Fd	Flat roof development

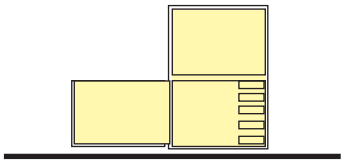
1s, 2s	1- and/or 2-leaf wall design
vs, xxt	specific designations
01,02…	Serial numbering of components with the same function

Building elements catalogue

Overview - types of buildings

Detached houses

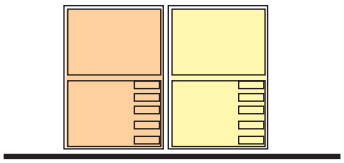
- no particular soundproofing requirements within the building



Detached houses

Semi-detached houses or terraced houses

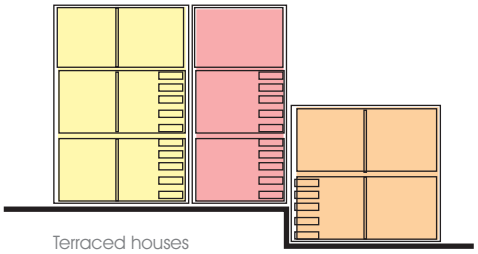
- no particular soundproofing requirements within the building
- exacting requirements for the separating wall between the two buildings



Semi detached houses

Types of multi-storey terraced houses

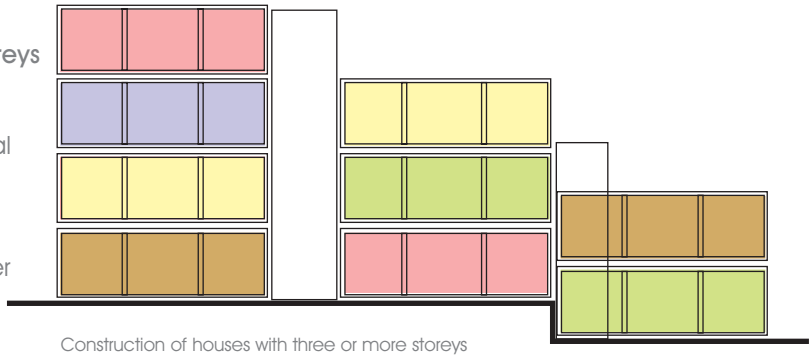
- no particular soundproofing requirements within the individual houses
- exacting requirements for the separating wall



Terraced houses

Construction of houses with 3 or more storeys

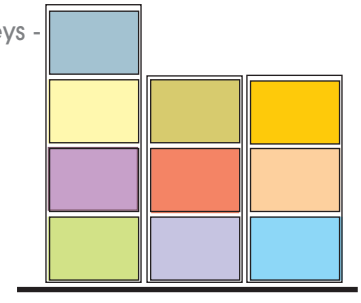
- exacting requirements for the separating components used between the individual flats (separating ceiling, separating wall)
- layouts rather long and wide
- separation of the tower blocks using staircases or direct connection to another tower block



Construction of houses with three or more storeys

Construction of houses with 3 or more storeys - hotel construction - office construction

- exacting requirements for the separating components used between the individual flats (separating ceiling, separating wall)
- rather narrow and long types of layout, intermediate types with 2 or more storeys also possible, coupling of units on the same level possible



Construction of houses with 3 or more storeys /hotel construction

Construction of houses with 3 or more storeys

These structures are partially proprietary structures - please make enquiries with regard to possible licence fees

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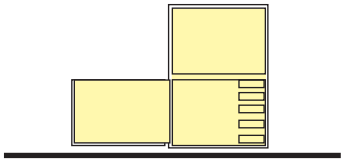
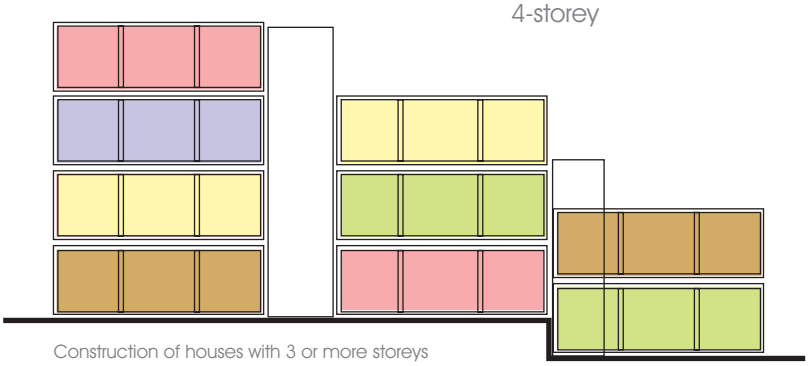
Terraced houses estate in Frohnleiten
2-storey with attic

Construction of houses with 3 or more storeys in Judenburg
3-storey

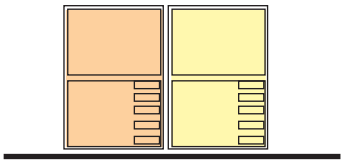
Construction of houses with 3 or more storeys in Judenburg
4-storey



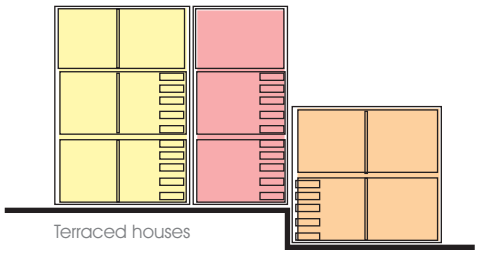
Detached houses



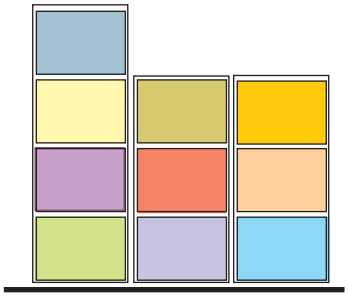
Construction of houses with 3 or more storeys



Semi-detached houses



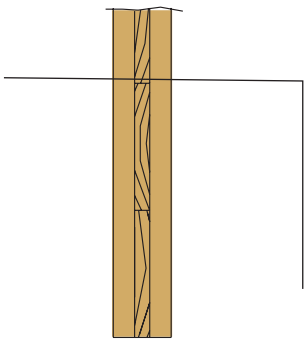
Terraced houses



Construction of houses with 3 or more storey /hotel construction

Construction of houses with 3 or more storeys

Building elements catalogue

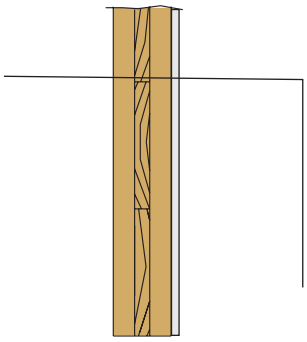


KLH 3 s 94 mm KLH solid wood panel

Thickness of component 94 to 128 mm
(according to the statical requirements)

KLH tw 01
KLH Separating wall

R_w = 32 dB
R'_w = 29 dB (incl. bypasses)
U = 1.1 W/m^{2}K



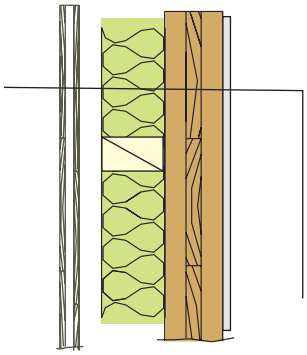
KLH 3 s 94 mm KLH solid wood panel
GKF 15mm inside lining

Thickness of component approx. 100 to 130 mm
(according to the statical requirements)

KLH tw 02
KLH Separating wall

R_w = 38 dB
U = 1.04 W/m^{2}K

with second gypsum plaster layer
R_w > 40 dB



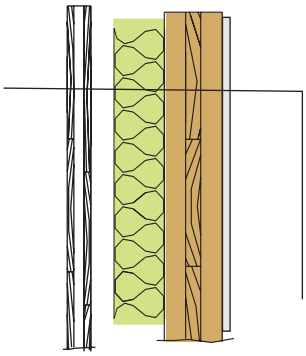
Facade - wood (board, planks)
Ventilation level
80 mm rock wool with intermediate lath
KLH 3 s 94 mm KLH solid wood panel
GKF 15 mm inside lining

Thickness of component 240 to 320 mm
(for insulating material strengths from 8 to 16 cm)

KLH aw 01
KLH External wall

R_w = > 38 dB
U = 0.32 to 0.20 W/m^{2}K

Building elements catalogue

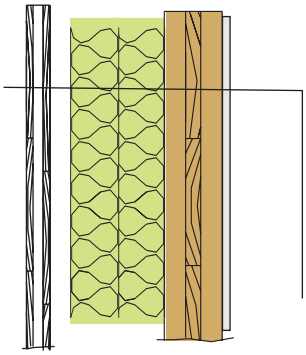


Facade - wood (board, planks- sealed)
Ventilation level - lath screwed together with KLH
2 x 80 mm rock wool throughout (>90 kg/m³)
KLH 3 s 94 mm KLH solid wood panel
GKF 15 mm inside lining

Thickness of component 240 mm

KLH aw 02
KLH External wall

R_w = 47 dB
U = 0.32 W/m2K

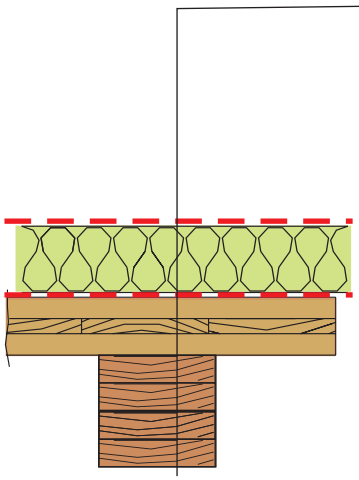


Facade - wood (board, planks- sealed)
Ventilation level - lath screwed together with KLH
2 x 80 mm rock wool throughout (Heralan FP)
KLH 3 s 94 mm KLH solid wood panel
GKF 15 mm inside lining

Thickness of component 320 mm

KLH aw 03
KLH External wall

R'_w = 51 dB (incl. bypasses)
U = 0.20 W/m²K



Roofing skin - PVC
80 mm Heraklith DDP (affixed mechanically to KLH)
Vapour-proof barrier (e.g. Vedagard)
KLH solid wood board (according to statical requirements)
BS wooden rib bonded with the KLH solid wood board

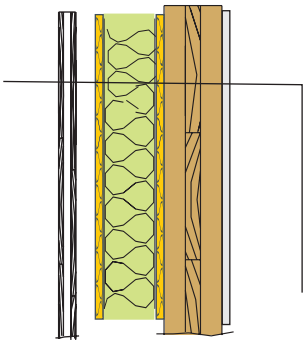
Note: Even higher values are to be expected
with a layer of gravel

KLH fd Folie
KLH Flat roof

R_w = 49 dB
U = 0.32 W/m²K

Thickness of component = approx. 330 to ...mm
(according to the statical requirements)

Building elements catalogue

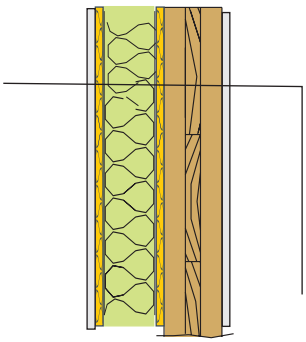


Facade - wood (board, planks- sealed)
Ventilation level or directly screwed together with KLH
75 mm Tektalan E12
KLH 3 s 94 mm KLH solid wood board
GKF 15 mm inside lining

Thickness of component 220 to 290 mm

KLH aw 04
KLH External wall

R_w = 57 dB at 120 mm
R_w = 50 dB at 75 mm
U = 0.28 and/or 0.44 W/m^{2}K

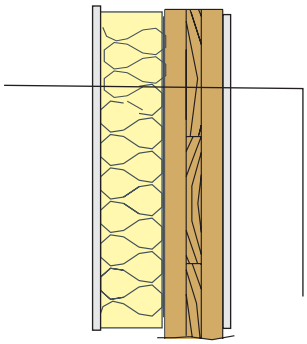


115 mm Plaster
75 to 100 mm Tektalan E12
KLH 3 s 94 mm KLH solid wood board
GKF 15 mm inside lining

Thickness of component 200 to 230 mm

KLH aw 05
KLH External wall

R'_w = 48 to 50 dB (incl. bypasses)
U = 0.36 to 0.45 W/m^{2}K



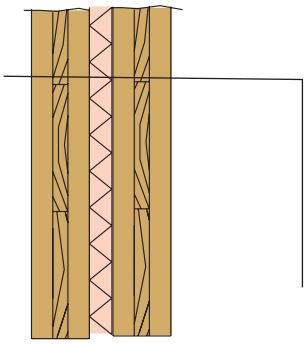
15 mm Plaster
120 mm Fixprix insulation
KLH 3 s 94 mm KLH solid wood board
GKF 15 mm inside lining

Thickness of component 240 mm

KLH aw 06
KLH External wall

R'_w = 50 dB
U = 0.32 W/m^{2}K

Building elements catalogue

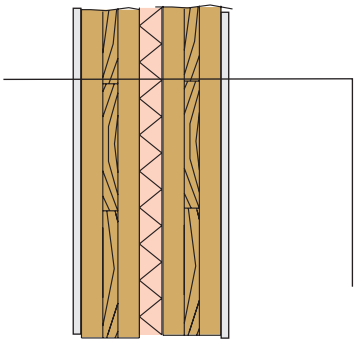


KLH 3 s 94 mm KLH solid wood panel
30 mm footstep sound insulation board TDPT 30/30
KLH 3 s 94 mm KLH solid wood panel

KLH wtw 2s 01
KLH Flat separating wall

R_w = 53 dB
U = 0.40 W/m^{2}K

Thickness of component approx. 220 mm

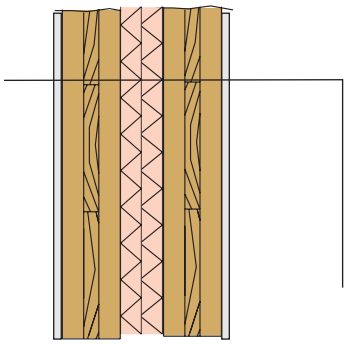


15 mm GKF inside lining
KLH 3 s 94 mm KLH solid wood panel
30 mm footstep sound insulation board TDPT 30/30
KLH 3 s 94 mm KLH solid wood panel
15 mm GKF inside lining

KLH wtw 2s 02
KLH Flat separating wall

R_w = 57 dB
U = 0.41 W/m^{2}K

Thickness of component approx. 250 mm



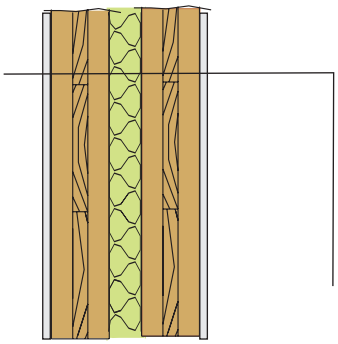
15 mm GKF inside lining
KLH 3 s 94 mm KLH solid wood panel
2 x 30 mm footstep sound insulation board TDPT 30/30
KLH 3 s 94 mm KLH solid wood panel
15 mm GKF inside lining

KLH wtw 2s 03
KLH Flat separating wall

R_w = 61 dB
U = 0.32 W/m^{2}K

Thickness of component approx. 280 mm

Building elements catalogue

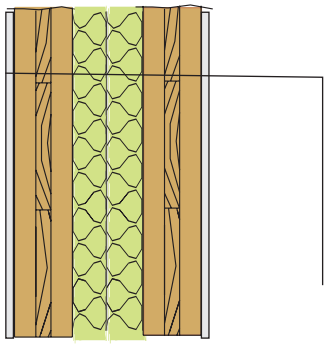


15 mm GKF inside lining
KLH 3 s 94 mm KLH solid wood panel
60 mm Heralan TW
KLH 3 s 94 mm KLH solid wood board
15 mm GKF inside lining

Thickness of component approx. 280 mm

KLH wtw 2s 04
KLH Flat separating wall

R_w = 58 dB
U = 0.40 W/m^{2}K

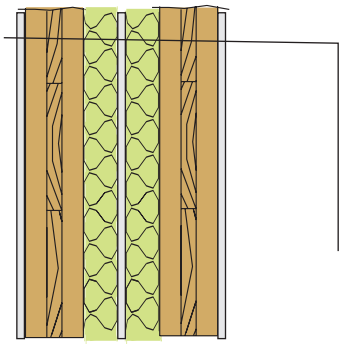


15 mm GKF inside lining
KLH 3 s 94 mm KLH solid wood panel
2 x 60 mm Heralan FP
KLH 3 s 94 mm KLH solid wood panel
15 mm GKF inside lining

Thickness of component approx. 340 mm

KLH wtw 2s 05
KLHFlat separating wall

R_w = 61 dB
U = 0.21 W/m^{2}K



15 mm GKF inside lining
KLH 3 s 94 mm KLH solid wood panel
60 mm Heralan TW
12.5 GK gypsum plaster
60 mm Heralan TW
KLH 3 s 94 mm KLH solid wood panel
15 mm GKF inside lining

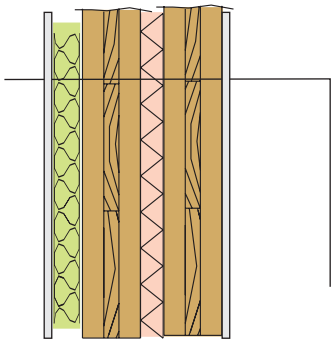
Thickness of component approx. 350 mm

KLH wtw 2s 06
KLH Flat separating wall

R_w = 64 dB
U = 0.21 W/m^{2}K

These structures are partially proprietary structures - please make enquiries with regard to possible licence fees

Building elements catalogue

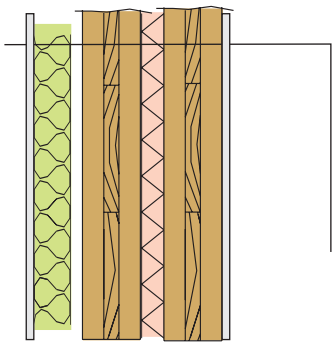


KLH wtw 2s 07
KLH Flat separating wall

15 mm GKF inside lining
45 mm distance for swinging hoop and insulation
KLH 3 s 94 mm KLH solid wood panel
30 mm Footstep sound insulation board TDPT 30/30
KLH 3 s 94 mm KLH solid wood panel
15 mm GKF inside lining

R_w = 60 dB
U = 0.28 W/m^{2}K

Thickness of component approx. 300 mm

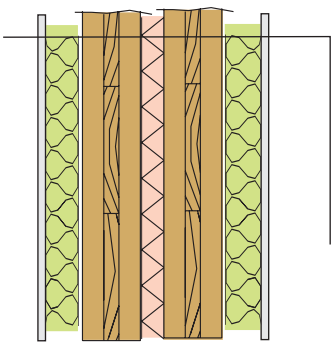


KLH wtw 2s 08
KLH Flat separating wall

15 mm GKF inside lining
70 mm distance for swinging hoop and 60 mm Heralan TW
KLH 3 s 94 mm KLH solid wood panel
30 mm footstep sound insulation board TDPT 30/30
KLH 3 s 94 mm KLH solid wood panel
15 mm GKF inside lining

R_w = 62 dB
U = 0.24 W/m^{2}K

Thickness of component approx. 320 mm



KLH wtw 2s 09
KLH Flat separating wall

15 mm GKF inside lining
70 mm distance for swinging hoop and 60 mm Heralan TW
KLH 3 s 94 mm KLH solid wood panel
30 mm TDPT 30/30
KLH 3 s 94 mm KLH solid wood panel
70 mm distance for swinging hoop and 60 mm Heralan TW
15 mm GKF inside lining

R_w = 64 dB
U = 0.18 W/m^{2}K

Thickness of component approx. 390 mm

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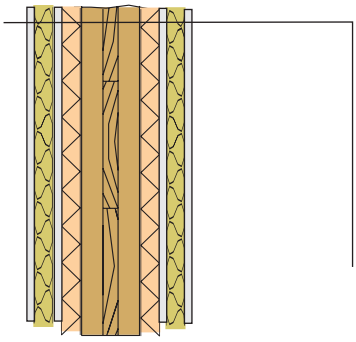
KLH wtw 1s xxt
KLH Flat separating wall

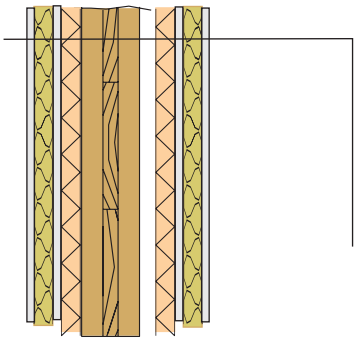


15 mm GKF inside lining
35 mm Heraklith BM (with GK boards bonded point by point into a stack)
12.5 mm GK
25/22 TPS footstep sound insulation board
KLH 3 s 94 mm KLH solid wood board
25/22 TPS footstep sound insulation board
12.5 mm GK
35 mm Heraklith BM (with GK boards bonded point by point into a stack)
15 mm GKF inside lining

$R_w = 63$ dB
Rw' = 60 dB (incl. bypasses)
$U = 0.26$ W/m^{2}K
Bypasses were measured with continuous ceilings

Thickness of component approx. 245 to 270 mm
(according to the statical requirements)

KLH wtw 1s xt
KLH Flat separating wall

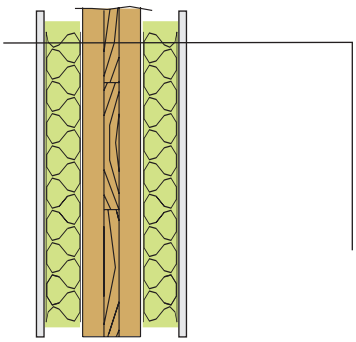


15 mm GKF inside lining
35 mm Heraklith BM (with GK boards bonded point by point into a stack)
12.5 mm GK
25/22 TPS footstep sound insulation board
KLH 3s 94 mm KLH solid wood board
60 mm WDF (25 mm air)
12.5 mm GK
35 mm Heraklith BM (with GK boards bonded point by point into a stack)
15 mm GKF inside lining

$R'_w = 70$ dB
$U = 0.24$ W/m^{2}K
Bypasses were measured with continuous ceilings

Thickness of component approx. 320 mm

KLH wtw 1s vs
KLH Flat separating wall

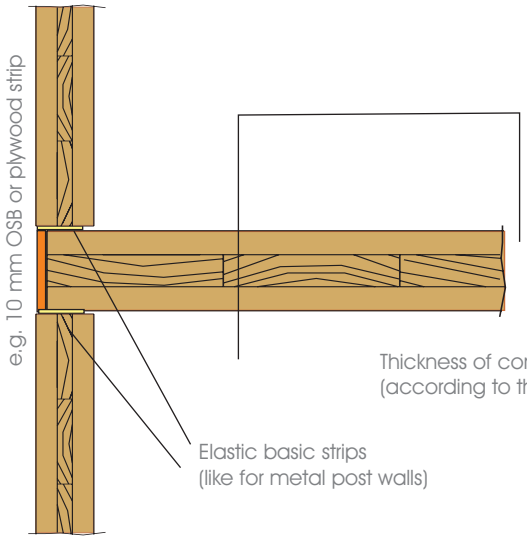


15 mm GKF inside lining
60 mm Heralan TW on metal post or lath separate
KLH 3 s 94 mm KLH solid wood board
60 mm Heralan TW on metal post or lath separate
15 mm GKF inside lining

$R_w = 58$ dB
$U = 0.24$ W/m^{2}K

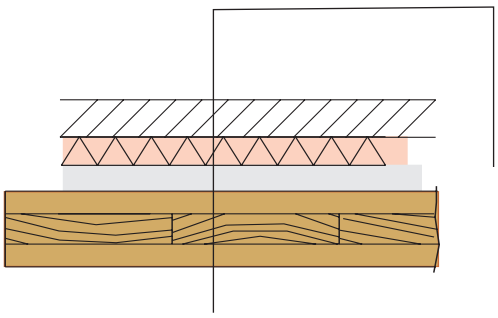
Thickness of component approx. 250 to 280 mm
(according to the statical requirements)

Building elements catalogue



KLH td 01
KLH Separating ceiling

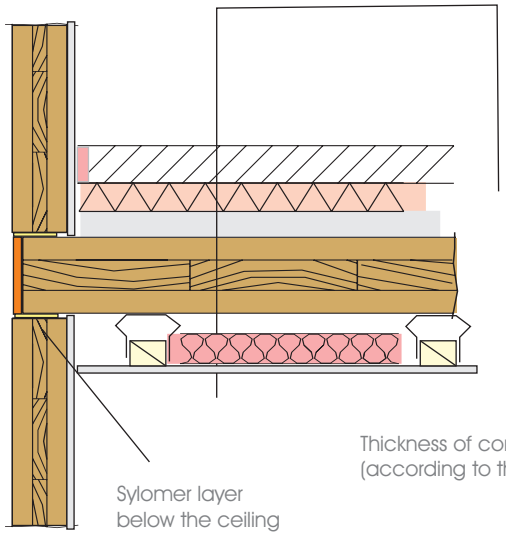
R'_w = 39 dB
$L'_{nT,w}$ = 80 dB
(incl. bypasses)
U = 1.1 W/m²K
Bypasses were measured with continuous ceilings



KLH td 02
KLH Separating ceiling

R_w > 60 dB
$L_{nT,w}$ < 54 dB
U = 0.50 W/m²K

Source: Pro Holz
"Mehrgeschossiger Holzbau in Österreich"

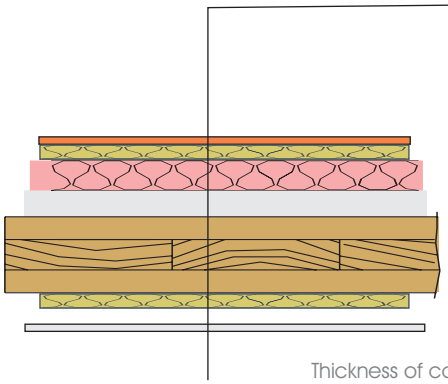


KLH wtd 01
KLH Flat separating ceiling

$L'_{nT,w}$ = 33 bis 45 dB
R'_w = 60 bis 79 dB
(inkl. Nebenwege)
U = ca. 0.27 W/m²K
The sound values are dependent on the bypasses and the size of the rooms

Source: Gemeinnützig Siedlungsgenossenschaft Frohnleiten

Building elements catalogue



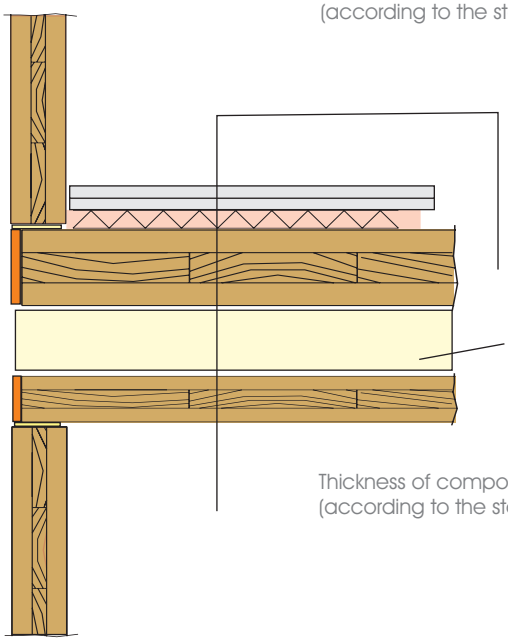
18 mm OSB N+F - board
25 mm Heraklith BM 25
60 mm Heralan DF 60
50 mm grit/bottoming
KLH solid wood board according to the statical requirements
25 mm Heraklith BM
50 mm spring point with 12.5 mm plasterboard

Thickness of component = 320 to 390 mm
(according to the statical requirements)

KLH wtd 02
KLH Flat separating ceiling

$L_{n\Gamma,w}$ < 48 dB
R_w > 58 dB
U = ca. 0.30 W/m²K

Source: ÖTZ - Heraklith



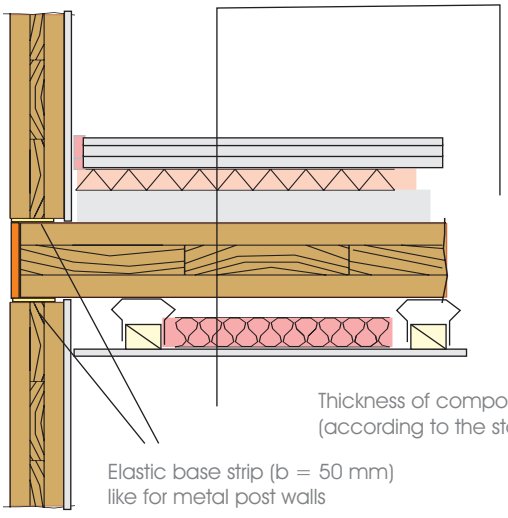
12.5+15 mm Fermacell dry screed
35 mm footstep sound insulation board
KLH solid wood ceiling (according to the statical requirements)
120 mm distance with special filling
KLH solid wood ceiling (according to the statical requirements)

The indicated sound insulation values are dependent on the connection and the filling between the wooden elements.
Please contact the order centre of KLH Massivholz GmbH for more detailed information.

Thickness of component = 370 to 390 mm
(according to the statical requirements)

KLH wtd 03
KLH Flat separating ceiling

$L'_{n\Gamma,w}$ = <48 dB
Rw' = >58 (incl. bypasses)
U = ca. 0.22 W/m²K



3 x 10 mm Knauf dry screed
35 mm footstep sound insulation board Heralan TPS 35/32
50 mm grit unbound
Protection against flowing for joints
KLH solid wood ceiling (according to the static requirements)
70 mm distance with 50 mm mineral fibres
12.5 mm GK board on swinging hoop

Thickness of component = 330 to 390 mm
(according to the statical requirements)

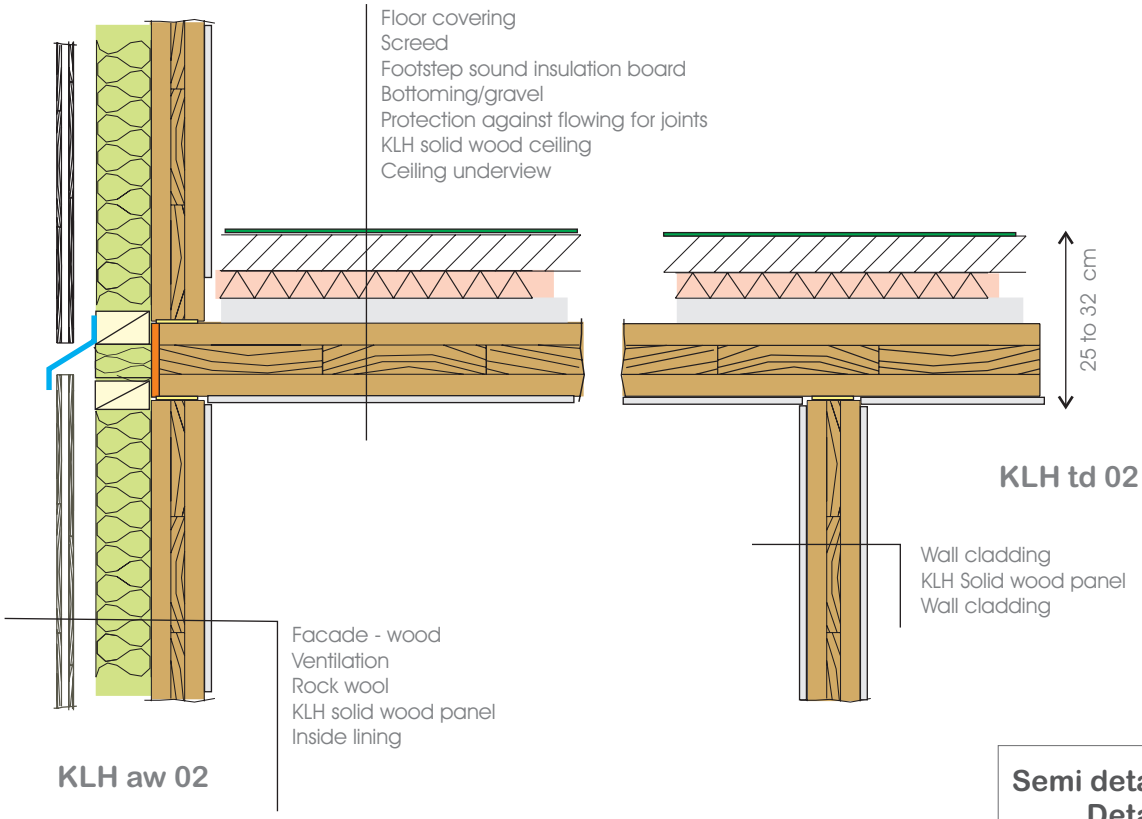
Elastic base strip (b = 50 mm)
like for metal post walls

KLH wtd 04
KLH Flat separating ceiling

$L'_{n\Gamma,w}$ = 47 dB
R'_w = 60 dB
(incl. bypasses)
U = ca. 0.30 W/m²K

Building elements catalogue

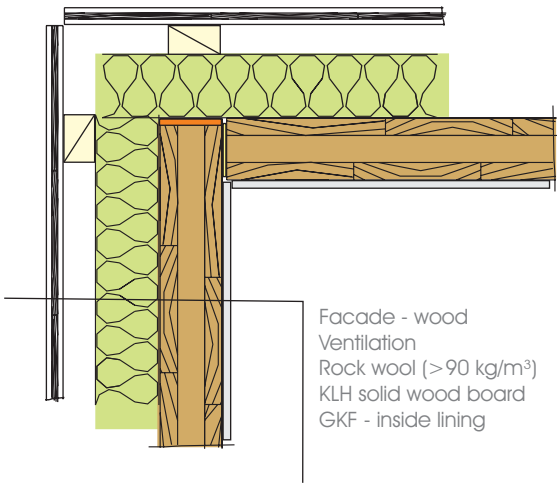
KLH WB aw td 01
External wall - Separating ceiling

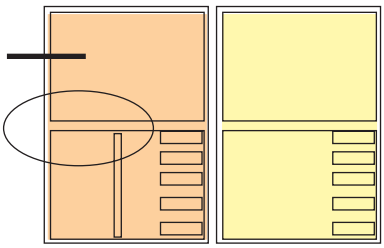


Semi detached house
Detached house

Ceiling
$R'_w < 50$ dB
$L'_{nT,w} > 45$ dB

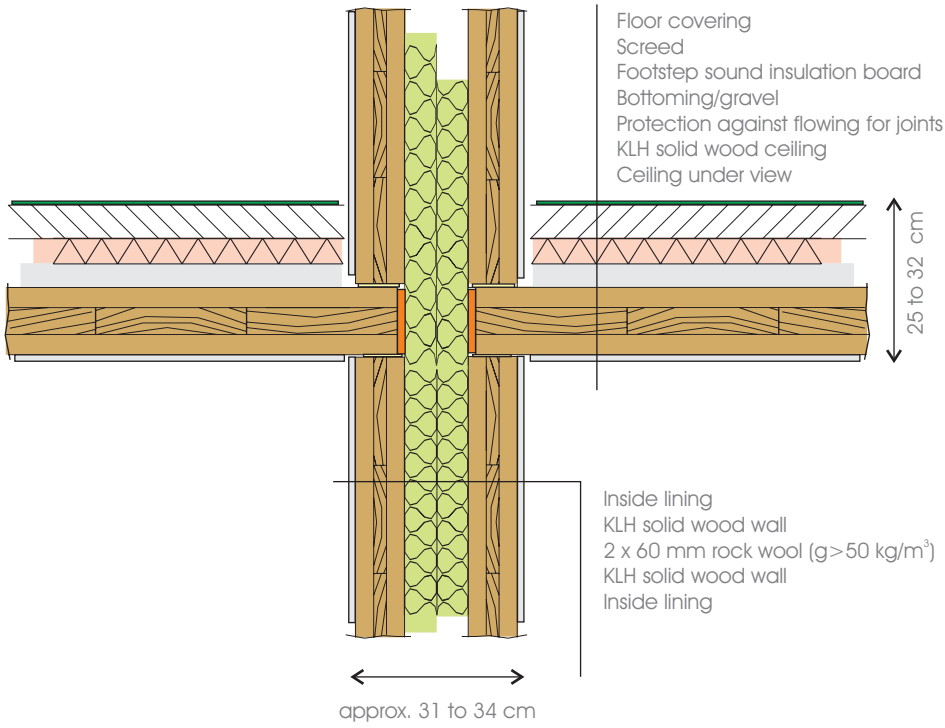
External wall
$R'_w > 47$ dB





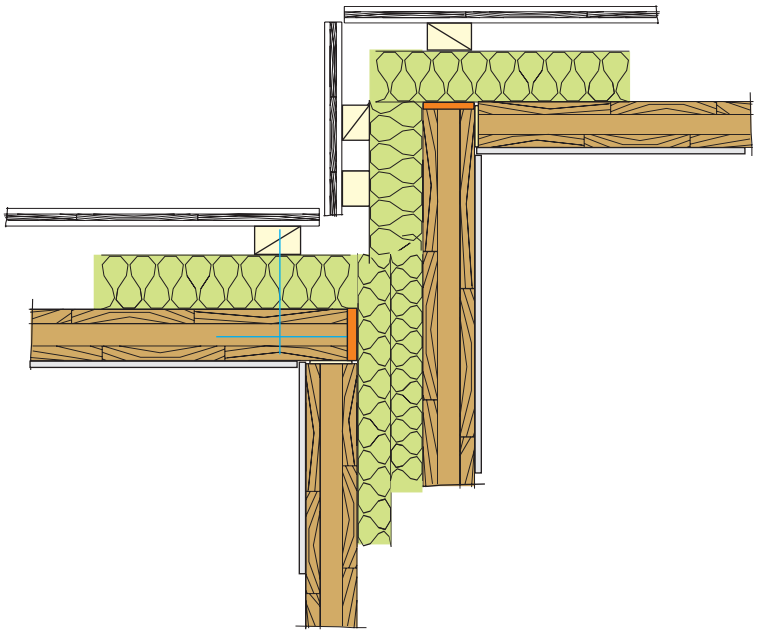
Building elements catalogue

KLH WB td wtw 01
Separating ceiling - Flat separating wall



KLH td 02

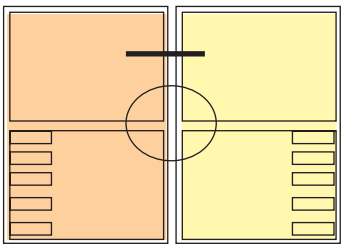
KLH wtw 2s 05
KLH wtw 2s 06



Semi-detached house
Detached house
Terraced house

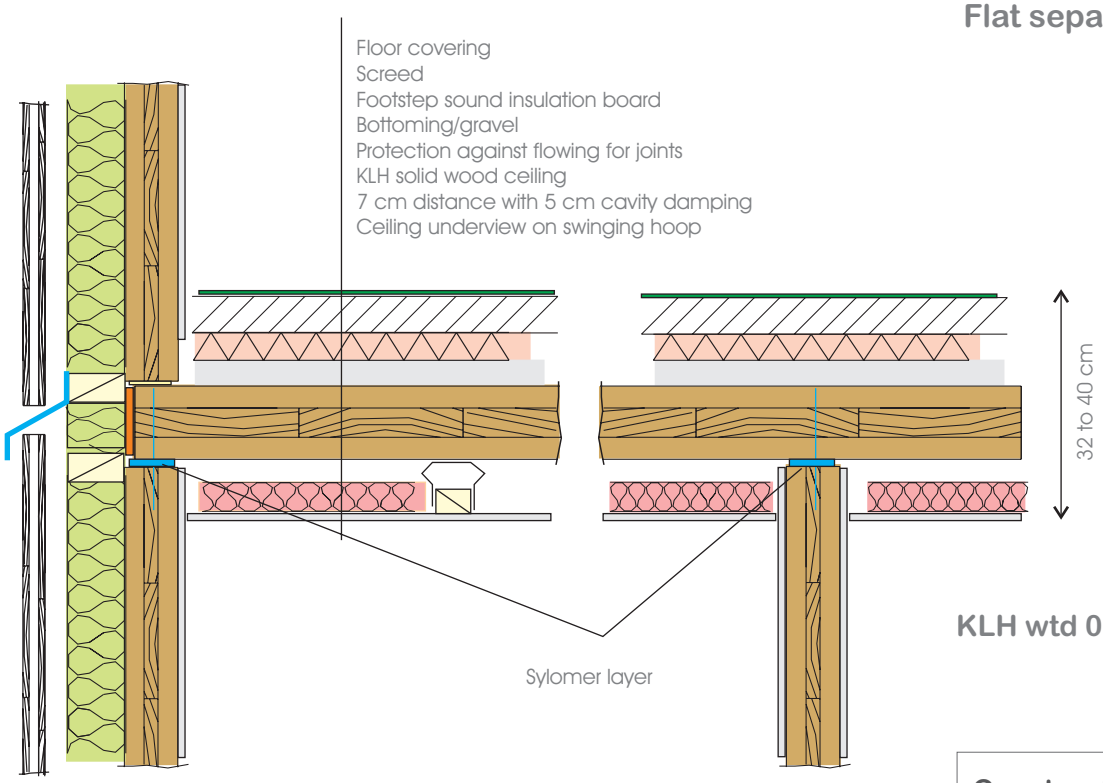
Ceiling
$R'_w < 50$ dB
$L'_{nT,w} > 45$ dB

Flat separating wall
$R'_w > 58$ dB



Building elements catalogue

KLH WB aw wtd 02
External wall - Flat separating ceiling



KLH aw 02

KLH wtd 01

Construction of houses with 3 or more storeys

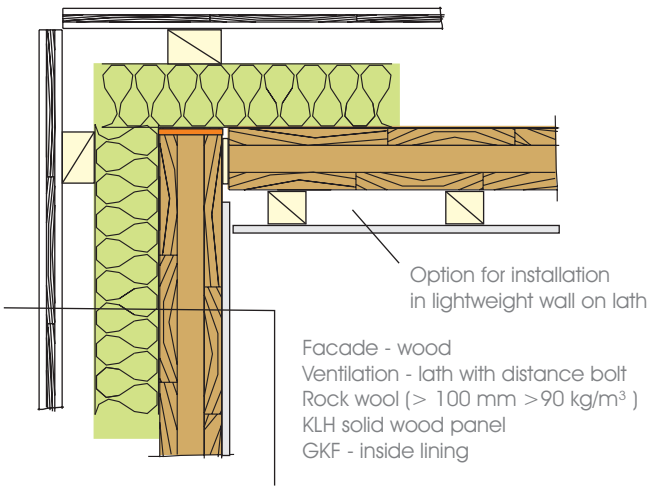
Flat separating ceiling

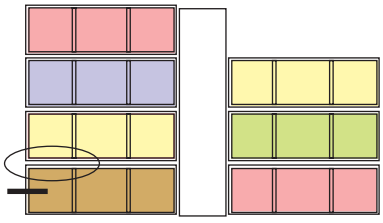
$R'_w > 58$ dB

$L'_{nT,w} < 45$ dB

External wall

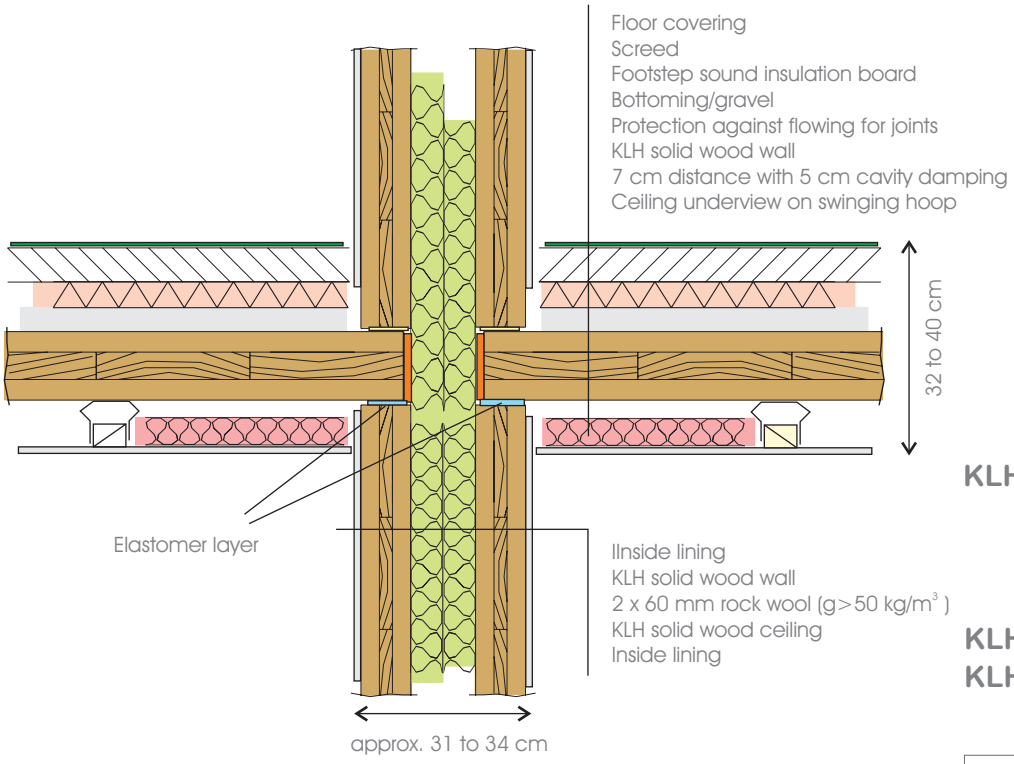
$R'_w > 47$ dB





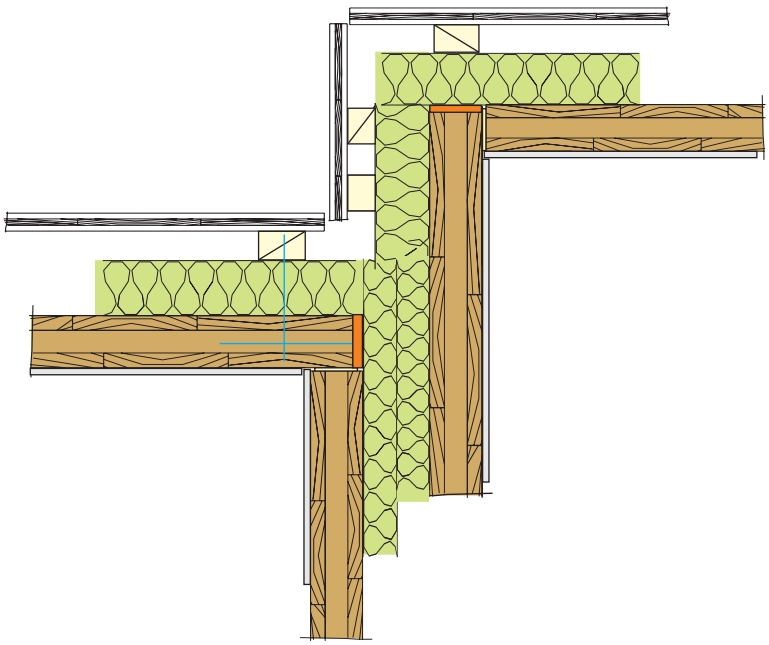
Building elements catalogue

KLH WB wtd wtw 02
Flat separating ceiling - Flat separating wall



KLH wtd 01

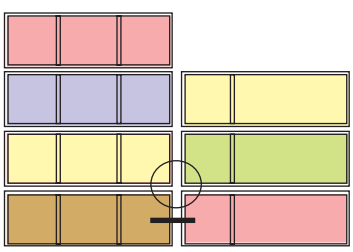
KLH wtw 2s 05
KLH wtw 2s 06



Construction of houses with 3 or more storeys

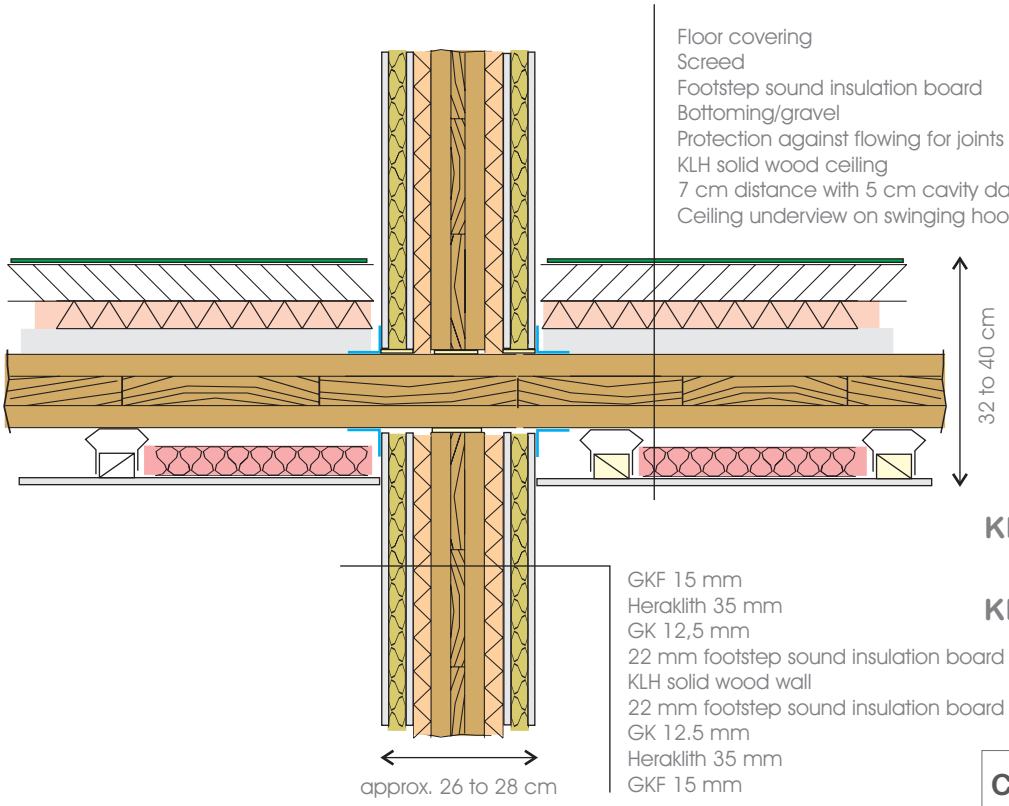
Flat separating ceinlng
$R'_w > 58$ dB
$L'_{nT,w} < 45$ dB

Flat separating wall
$R'_w > 58$ dB



Building elements catalogue

KLH WB wtd wtw 03
Flat separating ceiling - Flat separating wall



KLH wtd 01

KLH wtw 1s xxt

Construction of houses with 3 or more storeys

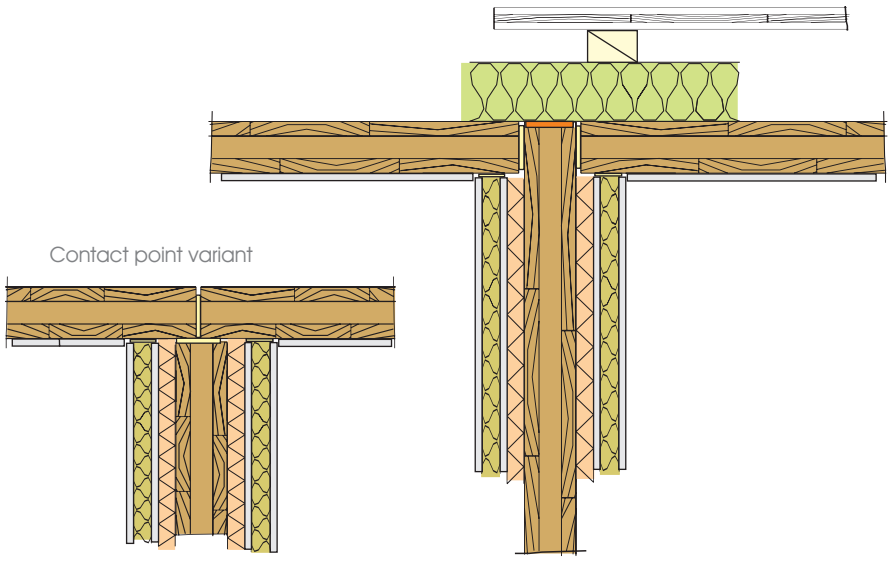
Flat separating ceiling

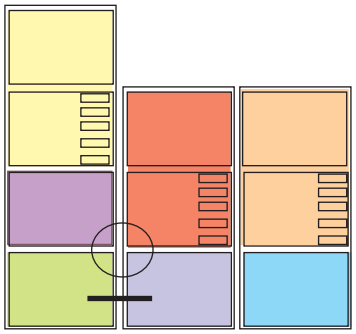
$R'_w > 58$ dB

$L'_{nT,w} < 45$ dB

Flat separating wall

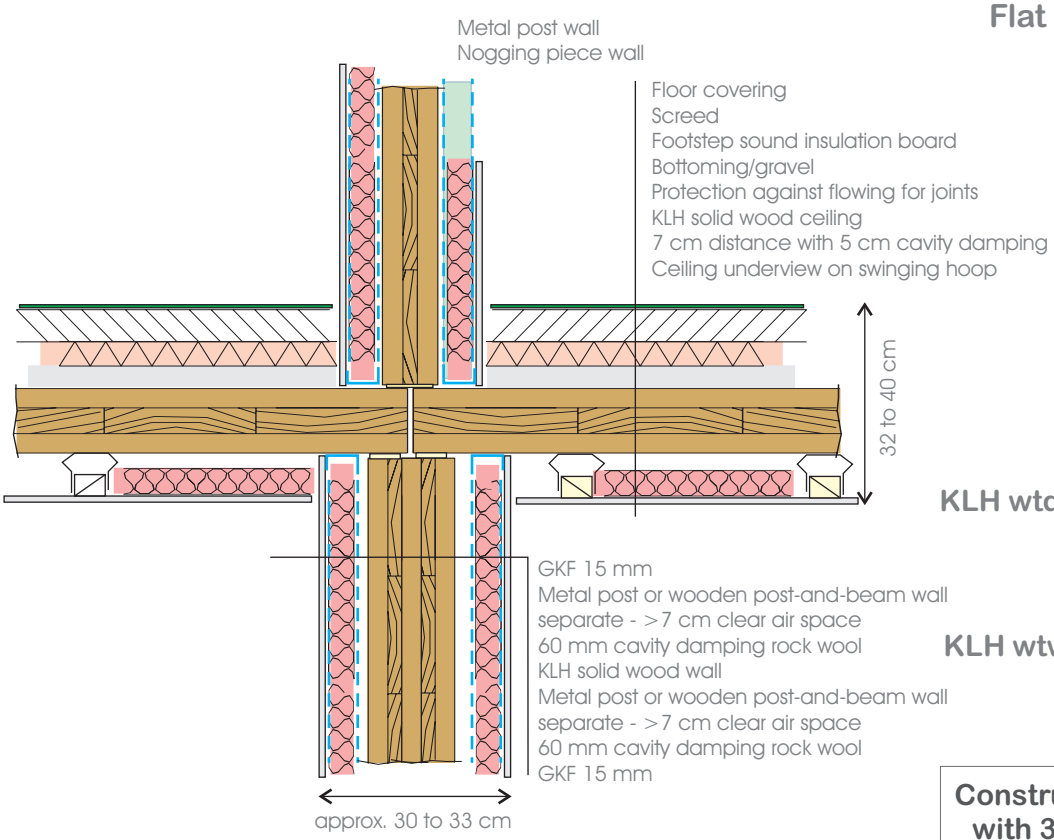
$R'_w > 60$ dB





Building elements catalogue

KLH WB wtd wtw 03.1
Flat separating ceiling - Flat separating wall



Construction of houses with 3 or more storeys

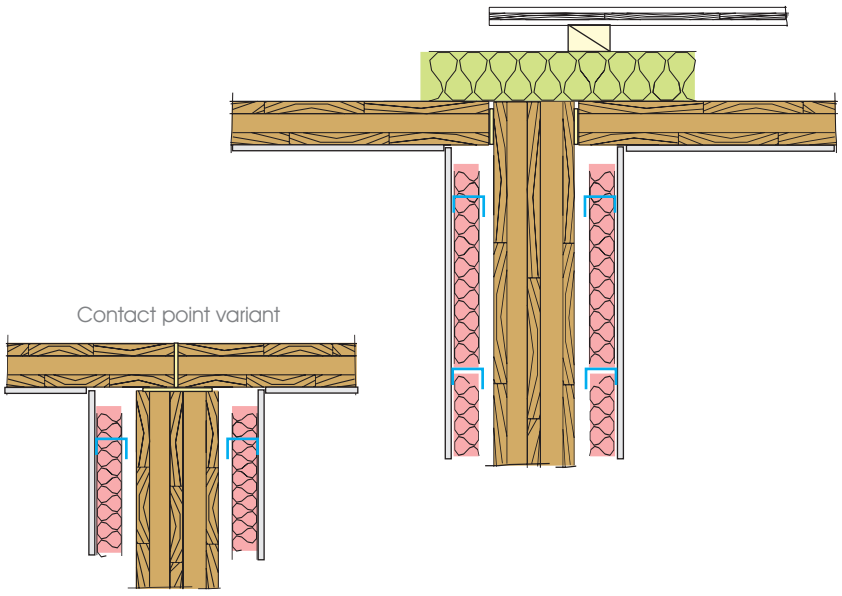
Flat seaparting ceiling

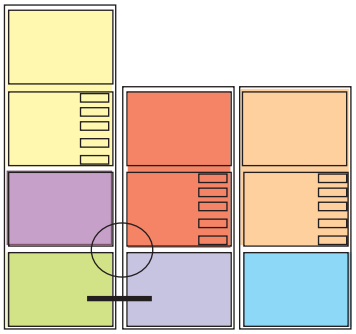
$R'_w > 58$ dB

$L'_{nT,w} < 45$ dB

Flat separating wall

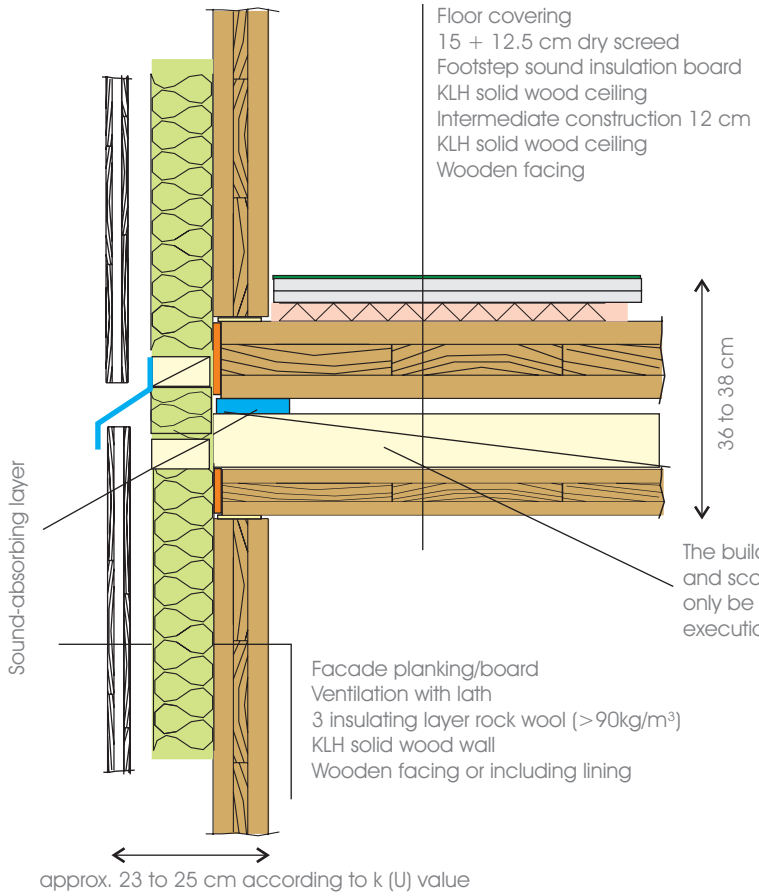
$R_w > 58$ dB





Building elements catalogue

KLH WB aw wtd 04
External wall - Flat separating ceiling



The build-up of the clear and the type and scope of the elastic mounting will only be disclosed after the licence for execution has been awarded

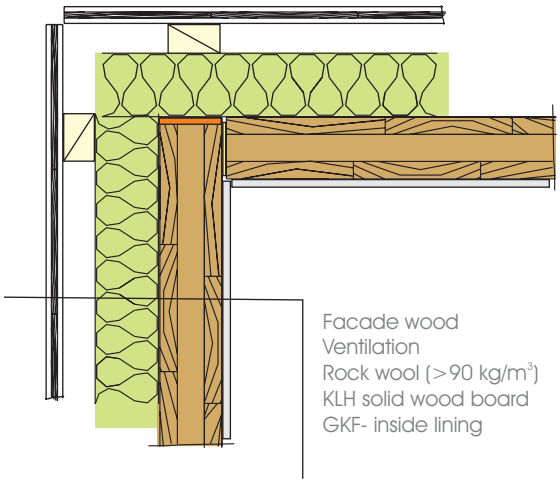
KLH wtd 03

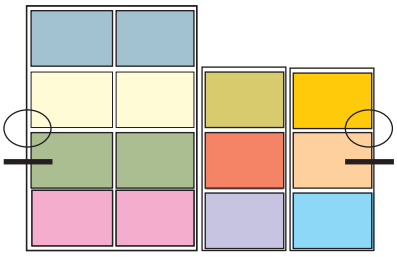
KLH aw 02
KLH aw 03
KLH aw 04
KLH aw 05
KLH aw 06

Construction of houses with 3 or more storeys

Externall wall
R'_w > 47 dB

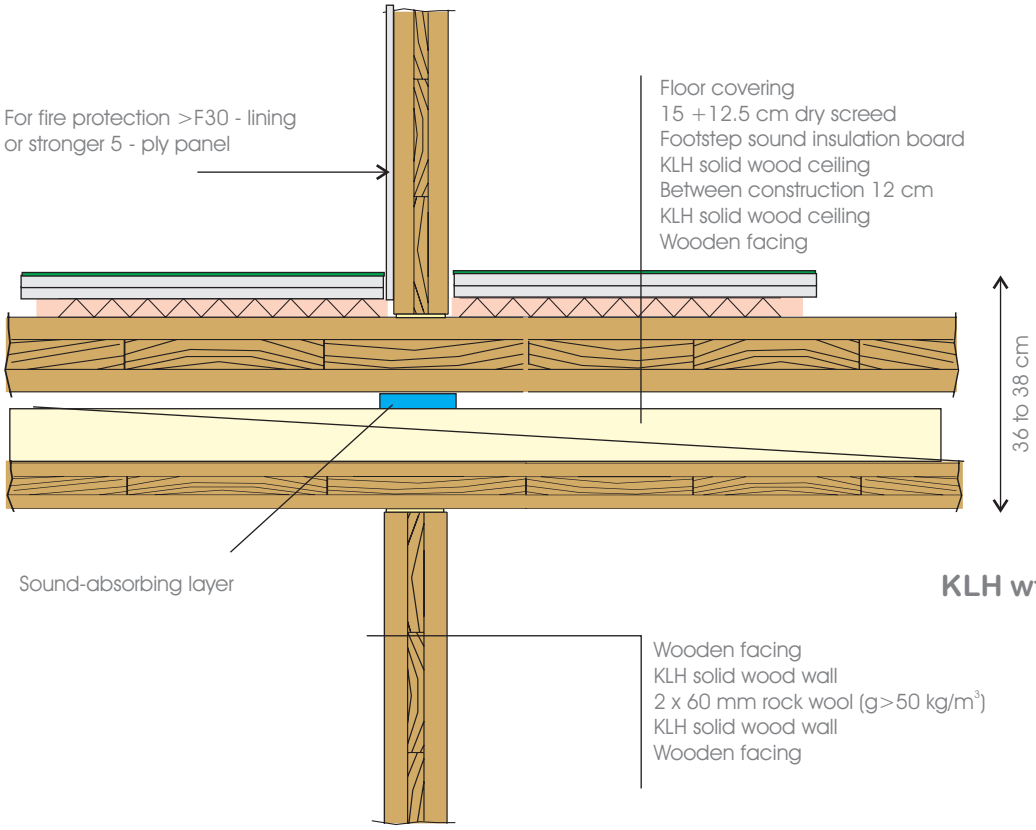
Flat separating ceiling
R'_w > 58 dB
$L'_{nT,w}$ < 45 dB

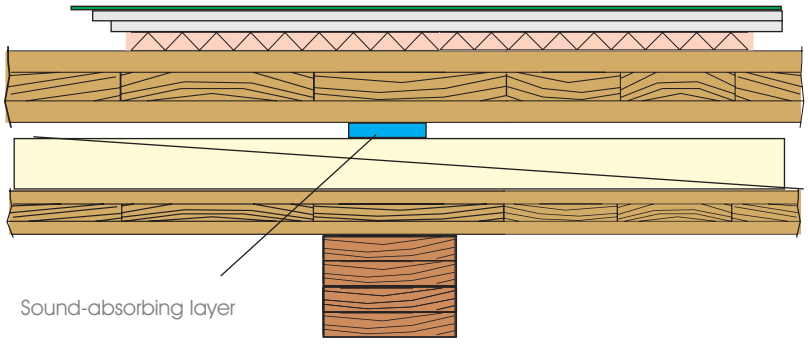




Building elements catalogue

KLH WB wtd tw 04
Flat separating ceiling - Separating wall



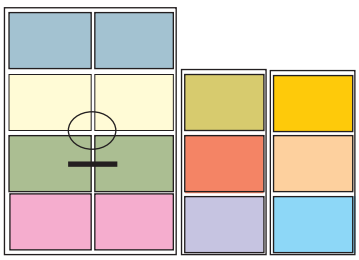


Construction of houses with 3 or more storeys

Flat separating ceiling

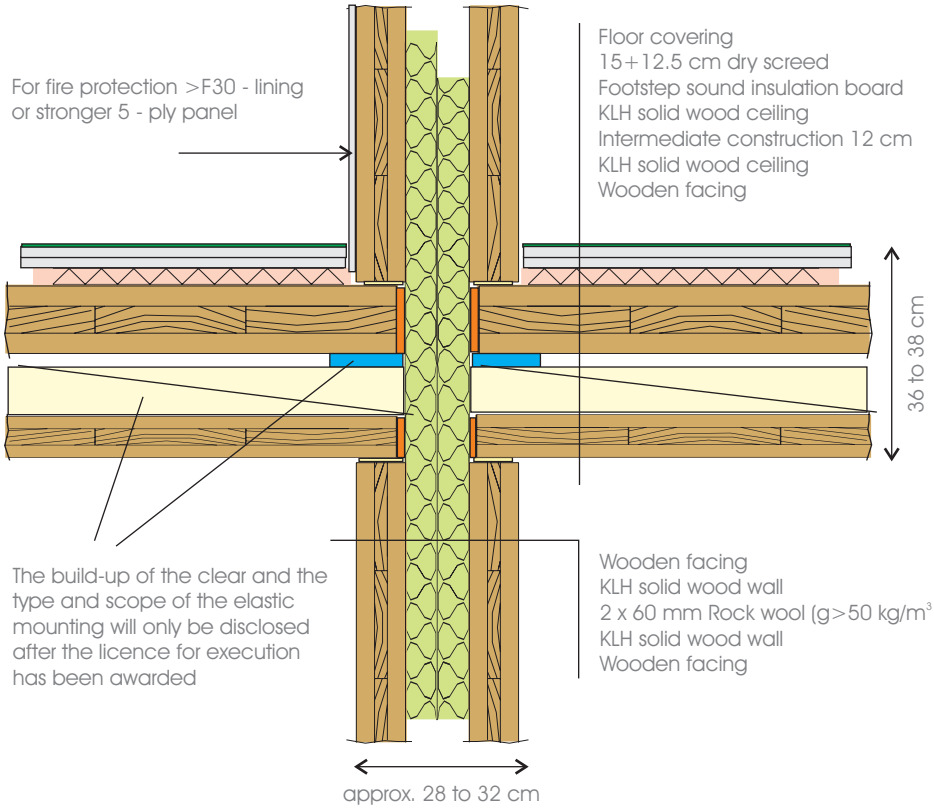
$R'_w > 55$ dB

$L'_{nT,w} < 45$ dB



Building elements catalogue

KLH WB wtd wtw 04
Flat separating ceiling - Flat separating wall



KLH wtd 03

KLH wtw 2s 05
KLH wtw 2s 06

Construction of houses with 3 or more storeys

Flat separating ceiling
$R'_w > 58$ dB
$L'_{nT,w} < 45$ dB

Flat separating wall
$R'_w > 58$ dB