Kontio SmartLog™

FOR ARCHITECTS

NEW ARCHITECTURAL POSSIBILITIES
WITH MASSIVE WOOD

KONTIO

INDEX

Kontio SmartLog™
– new architectural possibilities & benefits

Kontio SmartLog is innovative solution for massive wooden buildings. It stands for:
- Architecture with free design and style for massive wooden buildings
- Healthy Living benefits of Kontio Arctic Pine™ massive wood
- Durability and ecological, long life-cycle
- Advanced engineering and prefabricated joints, details and technical solutions
- Low-energy building solutions

FREE DESIGN

SmartLog offers new possibilities for modern massive log architecture, because logs manufacture in a new technique do not settle as they dry, unlike regular massive logs. This feature allows more flexibility in designing and combining building materials, without losing the beneficial properties of massive wood. SmartLog also allows using plain details, since log settling does not have to be considered and moisture-related dimensional changes of wood are minimal.

New School Center in Pudasjärvi, Finland, 9800m², under construction with Kontio log technology.

HEALTHY LIVING BENEFITS

Kontio Arctic Pine™, growing in the North, is well-known for its health benefits for both; the residents as well as the building. We use the terms healthy house and Kontio Healthy Living™. In a healthy house, Arctic pine balances the moisture content of room air on the optimal level, which makes it easy to breathe in, but difficult e.g. for viruses and fungi to live in. Wood has mind calming effect and it is acoustically pleasant material. It has been studied that in a space built from wood a heart rate is stabilized and stress is reduced.

LOW CARBON AND ECOLOGICAL FOOTPRINT

Kontio houses are built from the same kind of wood material than the hundreds of years old log houses. Arctic pine has high share of heartwood that is extremely durable and weather resistant. This enables long lifespan for Kontio log buildings, which is the basis for ecological values. Carbon footprint is also very low due to carbon stored in growing trees and, after cutting and processing, in massive wooden structures. New forest is growing according to the standards of sustainable forestry and PEFC forest certification principles. At the factory raw material is used 100% with residues going to papermaking and energy production.

HIGH-QUALITY ENGINEERED DETAILS

The total quality of every house is the sum of our in-house engineering knowhow and technical solutions developed with 40 years R&D work. We utilise state-of-art manufacturing technology including robotics. Joints and details are innovative and dimen sionally accurate. European Technical Approval and quality system enable the CE marking for Kontio houses.

LOW-ENERGY SOLUTIONS

Kontio log houses originate from cold Northern conditions close to the Arctic Circle. Our energy solutions are designed to perform in extreme conditions. Kontio SmartLog™ structures with massive non-settling load-bearing logs combined with ecological insulation are optimal solution for modern low-energy buildings.

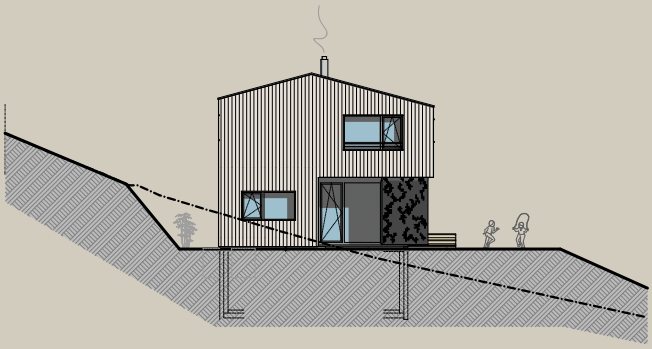
PEFC
PEFC/02-31-147

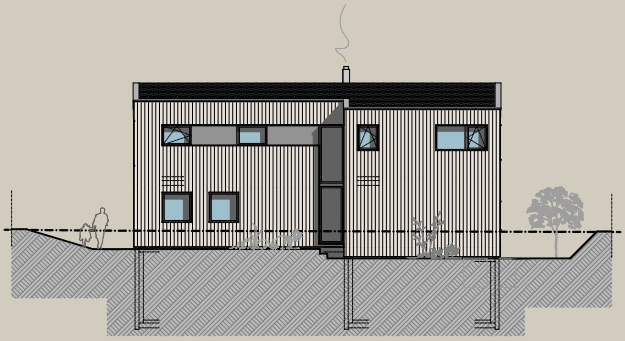
Kontio Arctic Pine comes from well and responsibly maintained Finnish forests, where more wood grows each year than is cut.

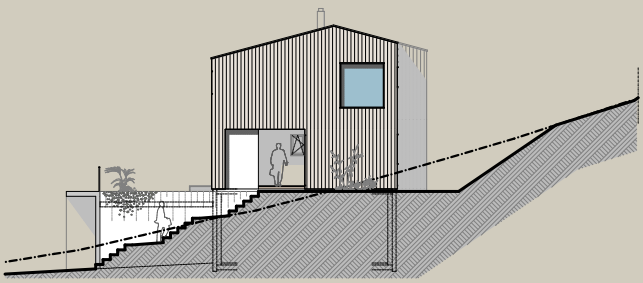
Contemporary Log Architecture

Kontio SmartLog offers novel possibilities with log construction. Here are some samples for your inspiration.

A SMARTLOG HOME IN PLANNING







KONTIO NORDICA VISIO

A MODERN WOODEN HOME IN SCANDINAVIA

Beauty is in the Details

SmartLog offers fresh possibilities also for the interiors.

SIMPLIFIED MOULDINGS

Due to non-settling properties of SmartLog, e.g. mouldings can be light and unnoticeable

SIMPLIFIED MOULDINGS

BEAUTIFULLY SIMPLE MATERIAL JOINTS

A COMPLETE, BEAUTIFUL NORDIC WHOLE IS CREATED WHEN MASSIVE LOG TREATED WITH LIGHT-COLOURED FINISH, IS COMBINED WITH OTHER NATURAL MATERIALS.

Free Design

SmartLog enables plain, carefully considered details and various, new possibilities for creating new contemporary architecture.

a Reduced details for openings. See pages 12–13.

b Exterior walls can be covered with almost any desired material. Here as an examples log panel and plastering.

c Different kinds of construction techniques can be combined. Here, for example, is log with beam structure.

d Logs can be positioned on different levels.

e Because SmartLog does not settle, unlike a regular log, different elements can be easily combined with it.

f Structure enables simplified corner joints.

If you have any questions please contact us so we can be of assistance.
Find you nearest Kontio Expert at www.kontio.com

Technical Facts

Kontio SmartLog is produced from three Pine lamellas that are glued crosswise to each other with high pressing power to form long laminated log elements. The crossways arrangement of the longitudinal and crosswise laminates reduces the shrinkage and the swelling of the log wall to an insignificant minimum. Also static strength and shape retention increase considerably, which makes free architectural design possible.

In order to rule out any damaging pest, fungus and (insect attacks), in compliance with the European Technical Approval ETA-05/0119, only technically dried wood with a wood moisture of 15 % (+/-3 %) is used by Kontio. Glued logs are cut with state-of-the-art CNC-technology to exact measure according to final drawings.

Logs are labelled at the factory, so that when logs arrive at construction site, customer is provided with log-map, which tells where each log belongs to. This procedure ensures fast and easy assembly.

SmartLogs are excellently suited for load-bearing, reinforced and non-load-bearing walls. They are used in the construction of single-family houses, multi-storey residential buildings, public buildings, in industrial and commercial construction, for reconstructions and extensions.

Airtightness	q50(m^3/m^2h)
Best result	0,2
Average	1,6

Kontio Log Houses, domestic 2014

U-values

	mm	W/ m^2K
Log wall with paneling		0,189
Log wall with plastering		0,174
Felt roof, mineral wool, insulation thicknes	200	0,18
	250	0,14
	300	0,12
	350	0,1
	400	0,09
	450	0,08
	500	0,07
Floor: Concrete + polystyrene insulation	200	0.11

Profin DK-window		W/ m^2K
3K selective argon		0,92

VTT report: No.VTT-O-146218-13

Sound proofing		R_W	$R_W + C$	$R_W + C_{TR}$
Log wall with additional outer insulation		47	50	46

Fire Resistance class, only log 160x275		R60
		EI 30

Fire resistance class R= load bearing capacity

Fire resistance class EI= fire separating function

(E = integrity, I = insulation)

Technical Details Overview

Tight window joint
due to wind barrier fabric

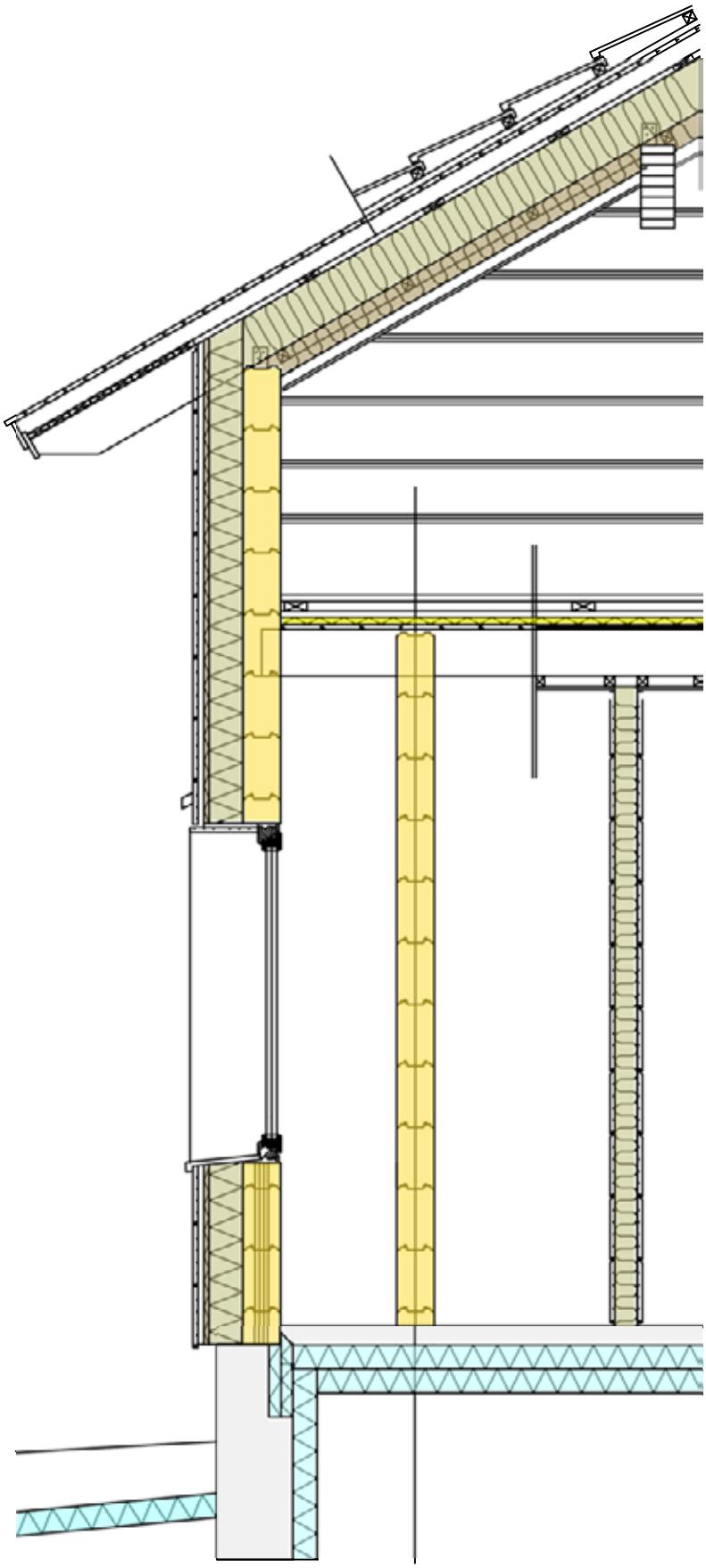
Modern simplified
visible details

Non-settling
Kontio SmartLog

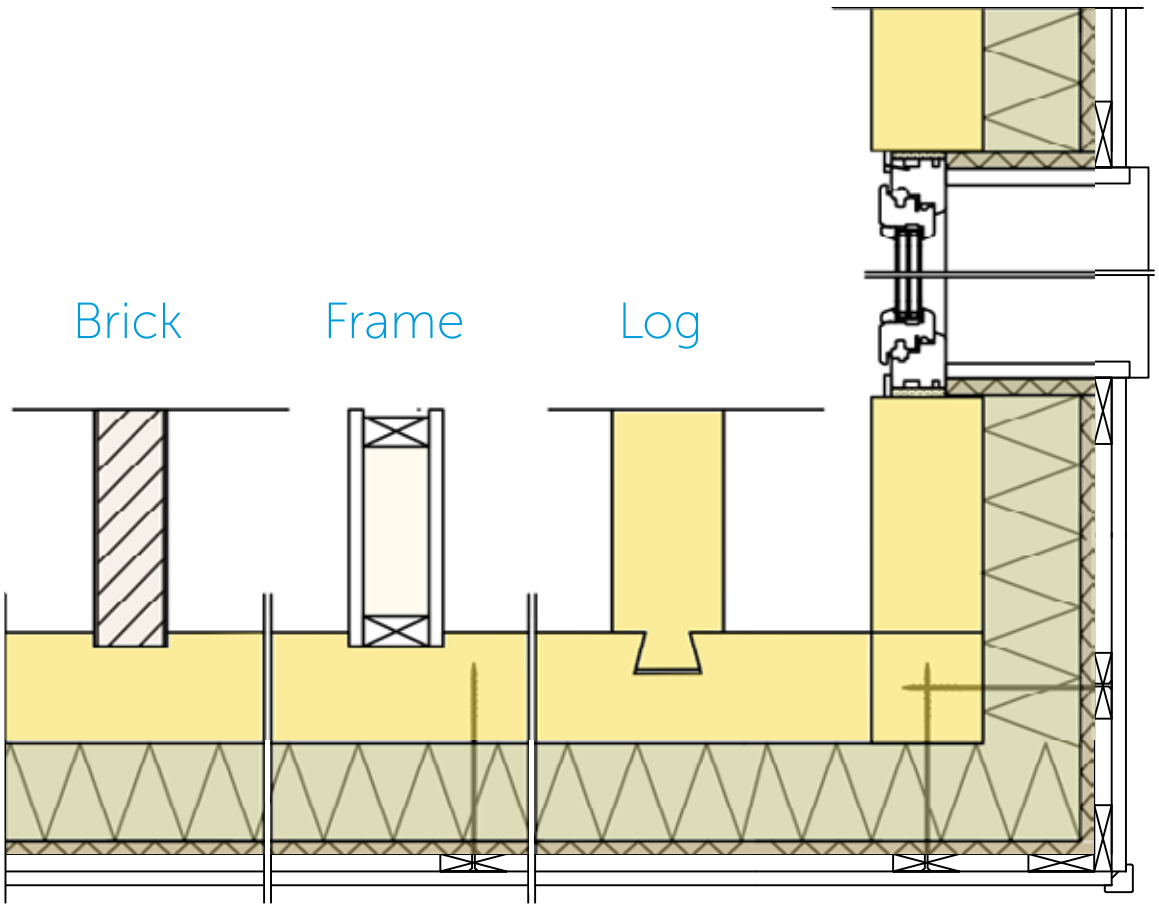
Insulation without frame
guarantees better thermal
insulation capacity.

Windbreak board

Log panel
can also be replaced by
other surface materials,
completely or partially,
such as plastering.

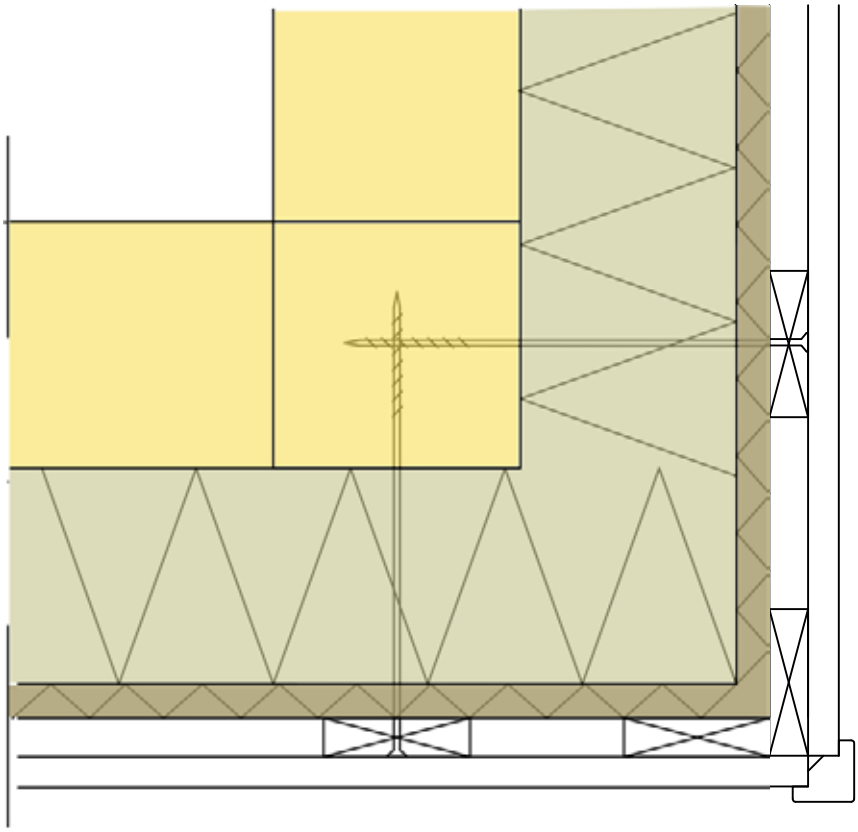


Interior wall options

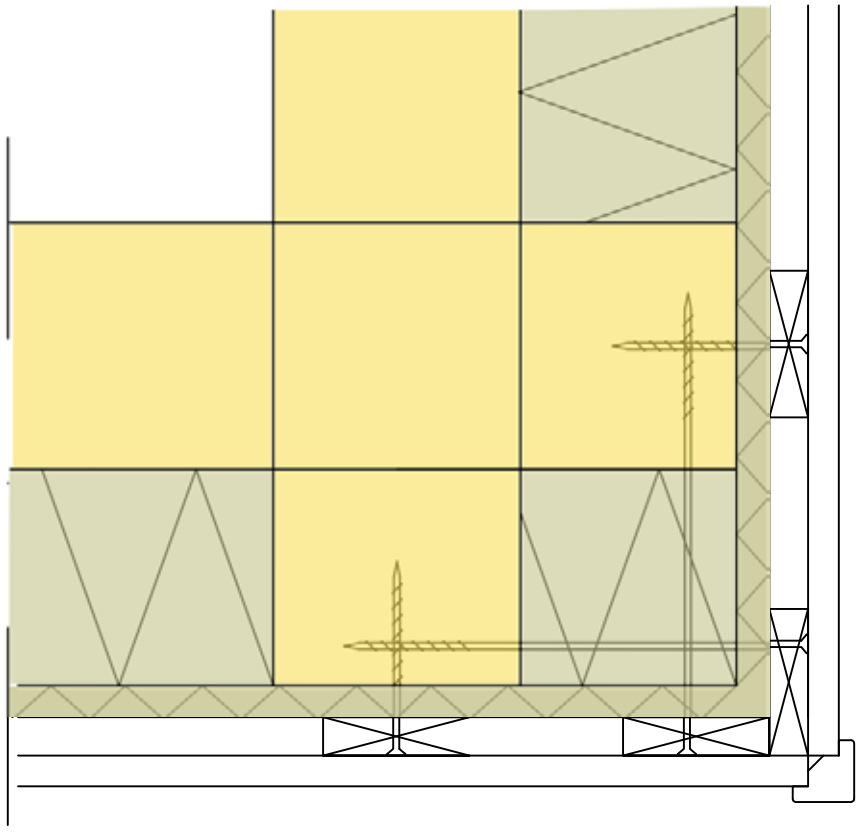


Corners
SmartLog

Tyrol Corner

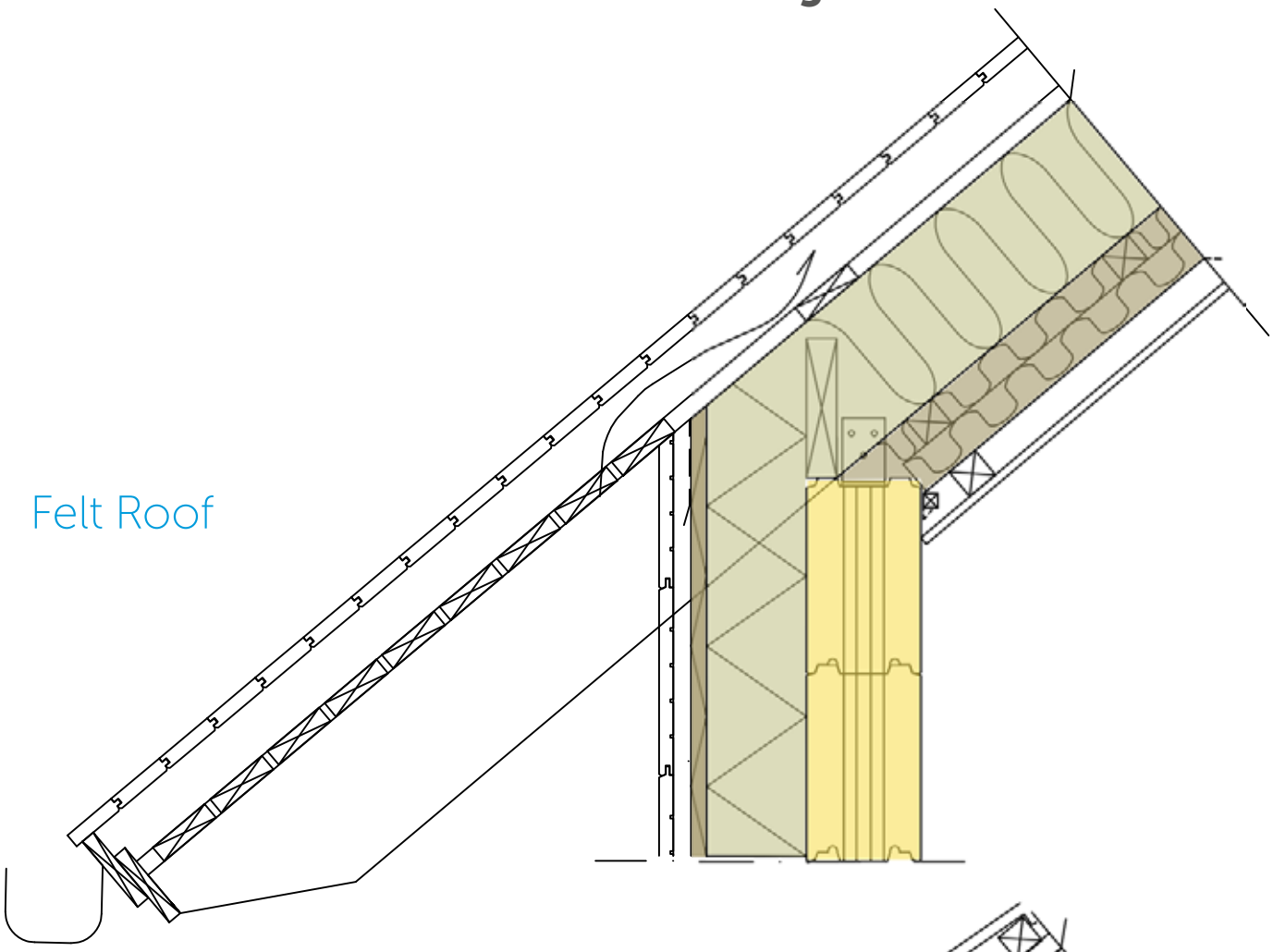


Normal Corner

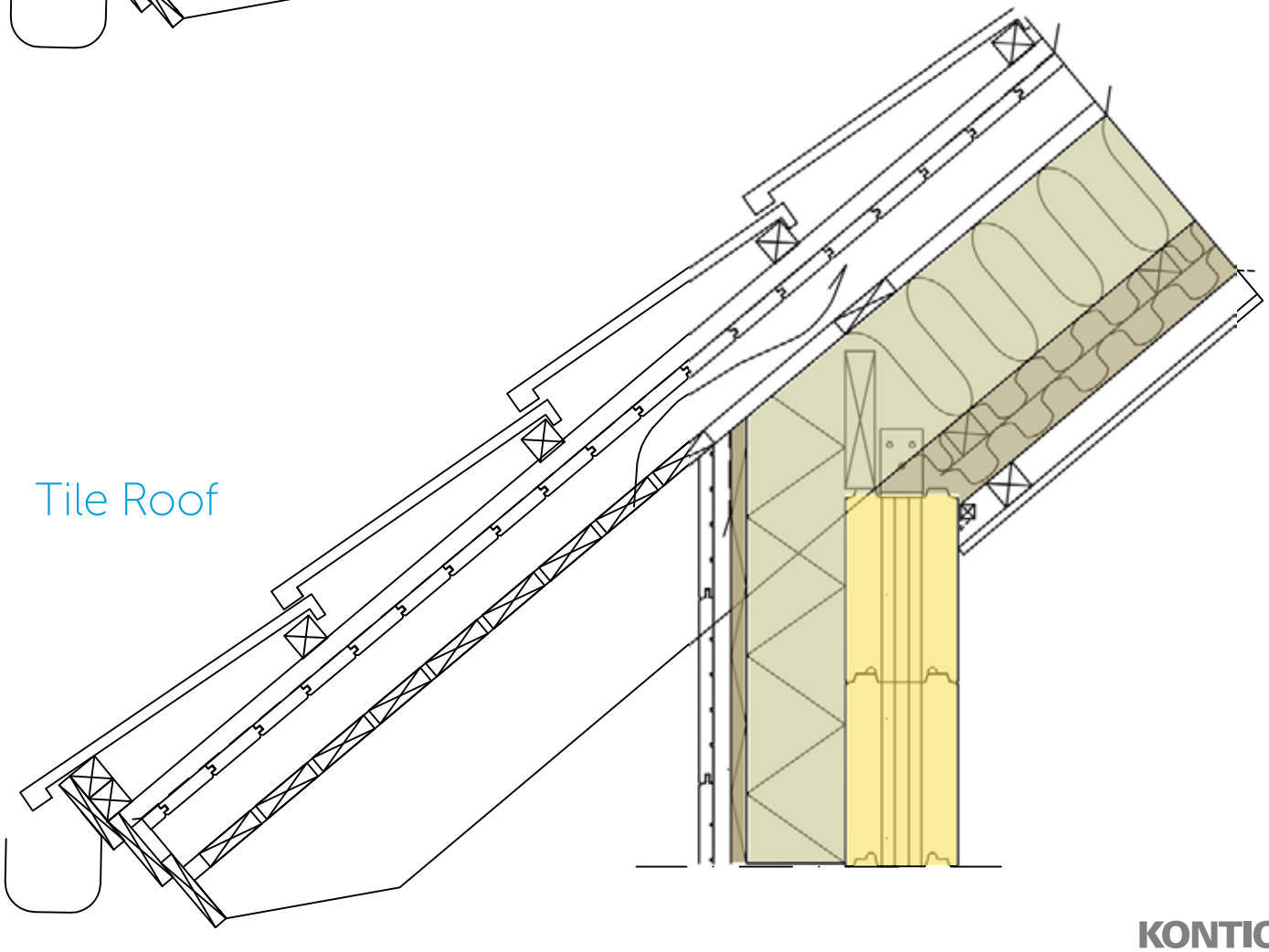


Eaves
SmartLog

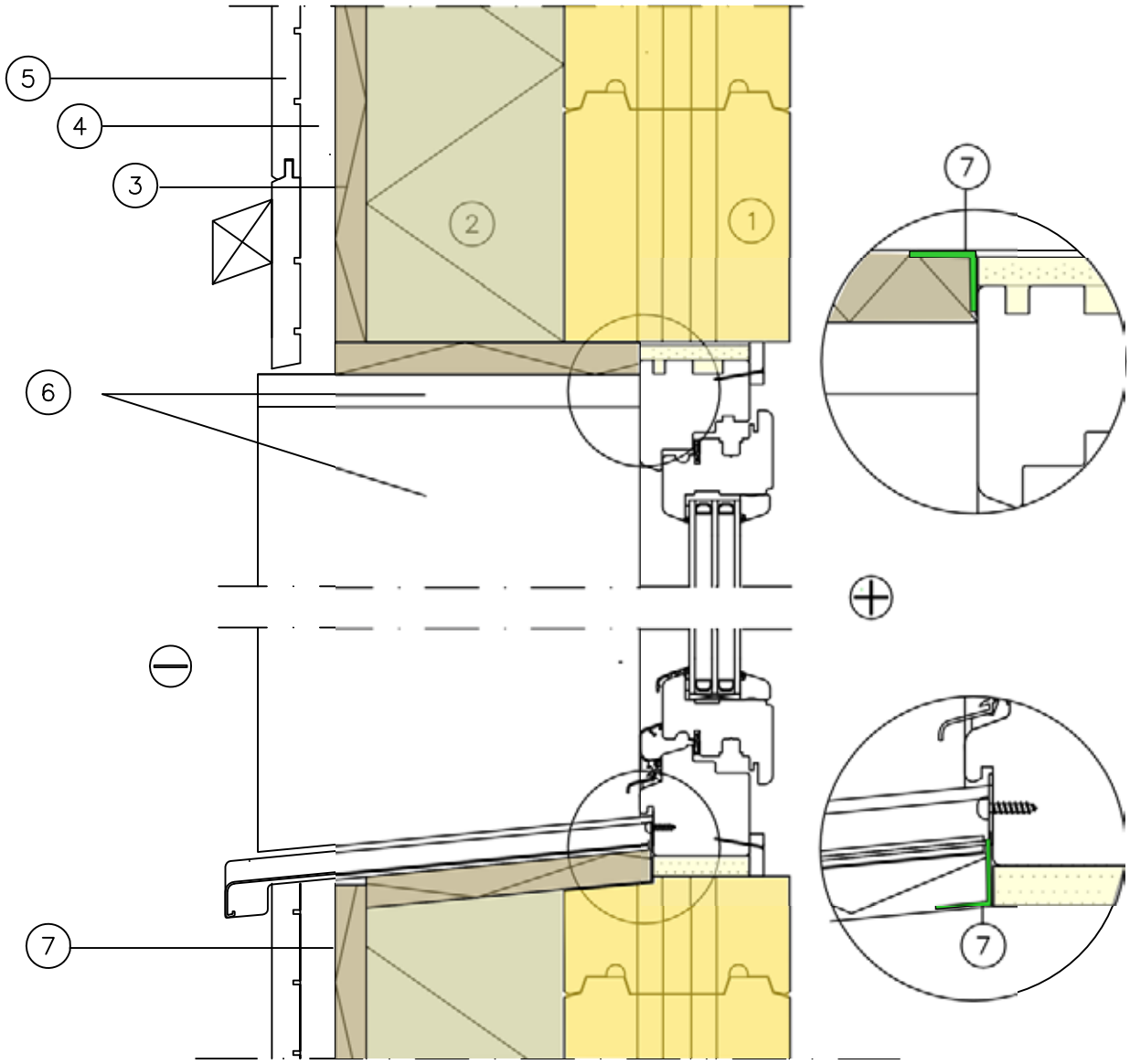
Felt Roof



Tile Roof



Window ***option 1***

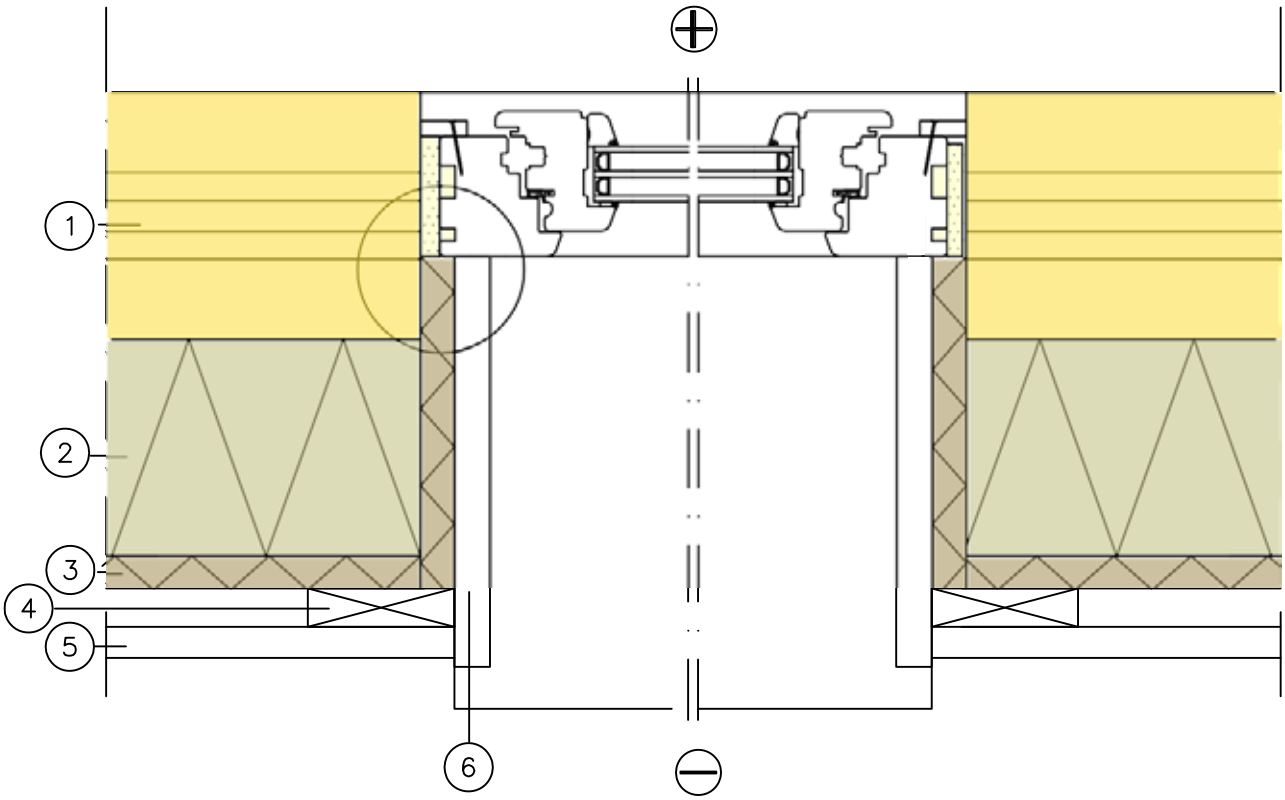


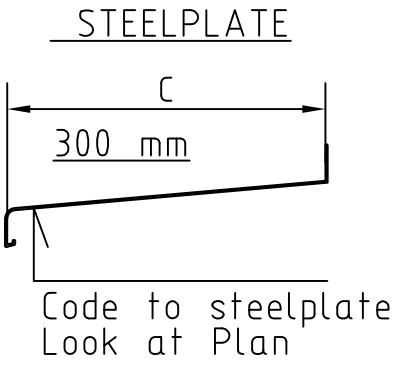
List of required items

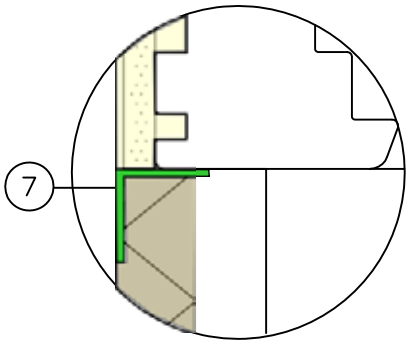
1	CLL 160x275
2	Homatherm 140 mm
3	Homatherm 22 mm
4	Rails 25x95
5	Log panel 22x275
6	Architrave 23x295, glued
7	Sealing tape

Architraves
SmartLog

Window *option 1*







List of required items

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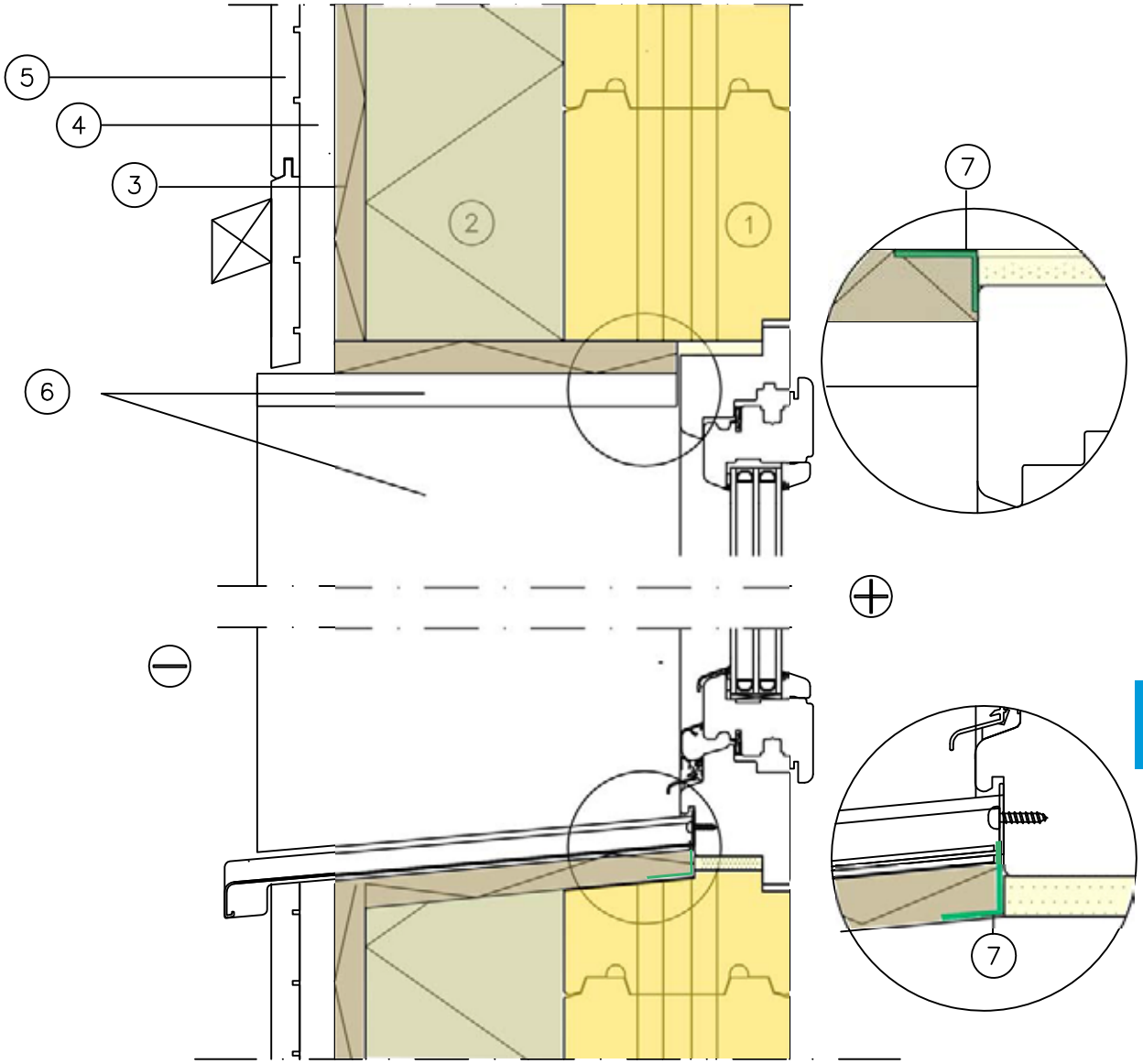
2	Homatherm 140 mm
3	Homatherm 22 mm
4	Rails 25x95
5	Logpanel 22x275
6	Architrave 23x295, glued
7	Sealing tape

Window ***option 2***



List of required items

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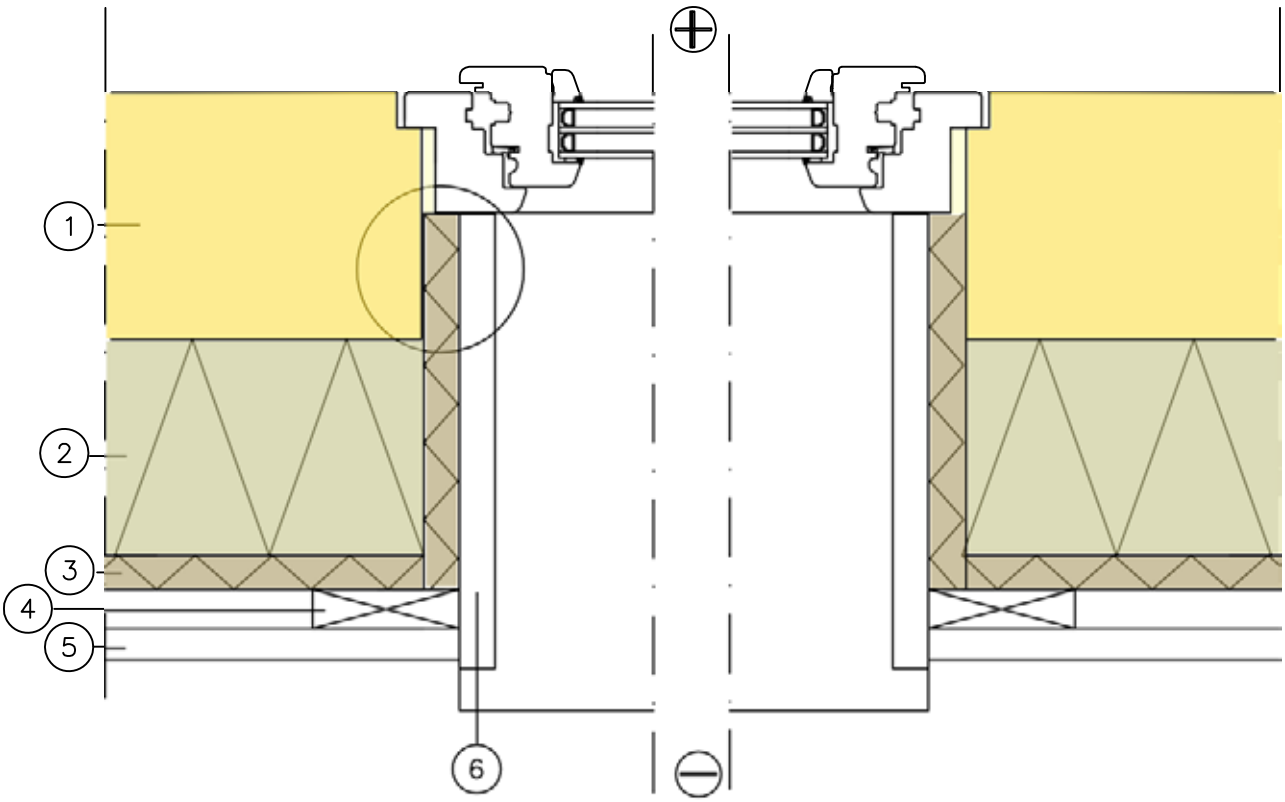
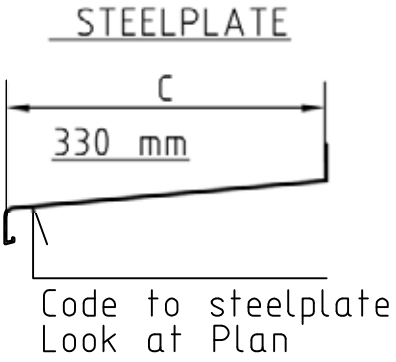
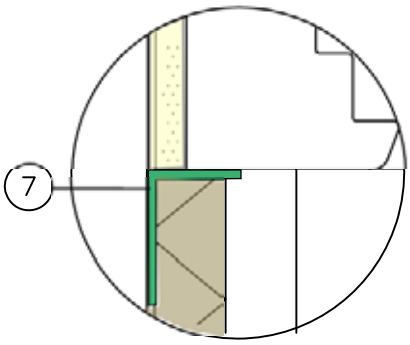
Architraves
SmartLog

Window *option 2*







List of required items

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2	Homatherm 140 mm
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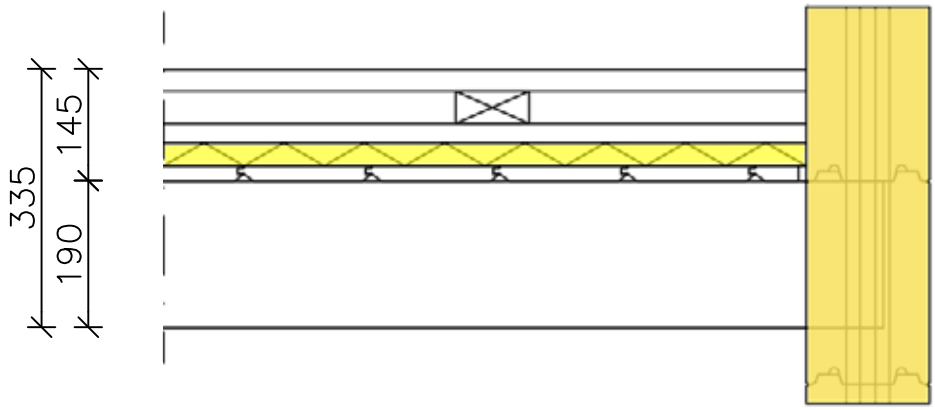
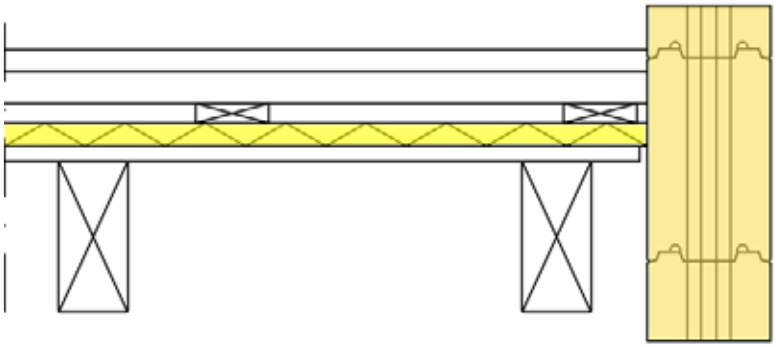
5	Logpanel 22x275
6	Architrave 23x295, glued
7	Sealing tape

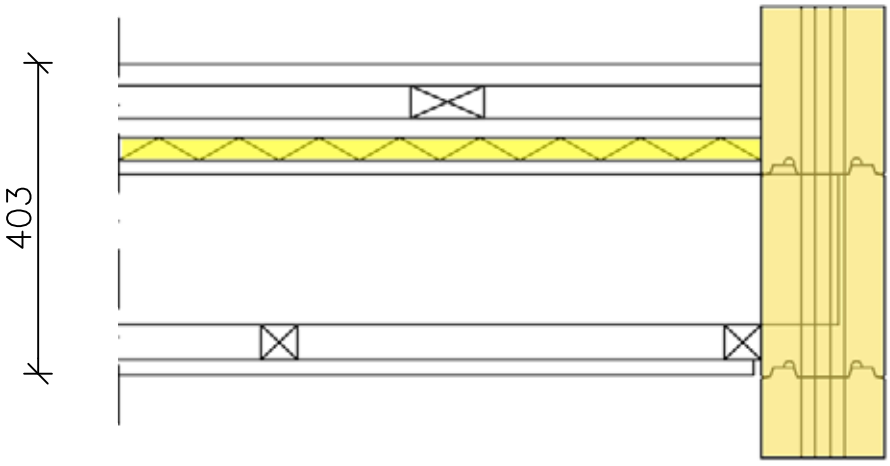
Attic, visible beams



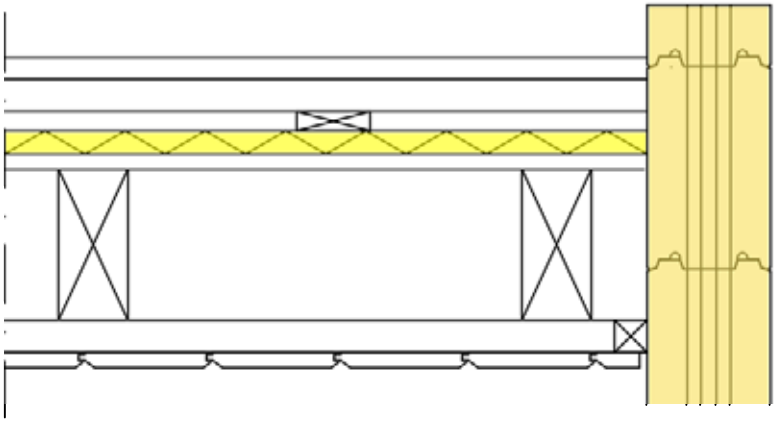
FLOOR BOARD 28*87 RAILS 42*95 k600 RAILS 25*95 k600 INSULATION ISOVER FLO 30 PANEL 19*170 BEAM DL 88*190 k600



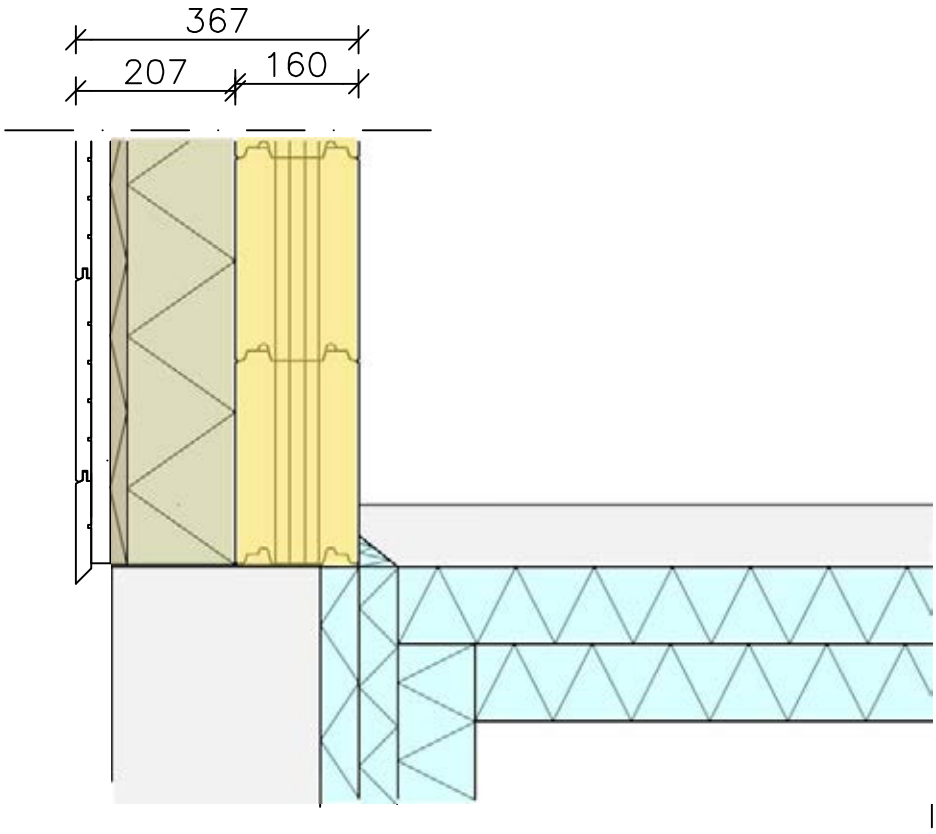
Attic, non-visible beams



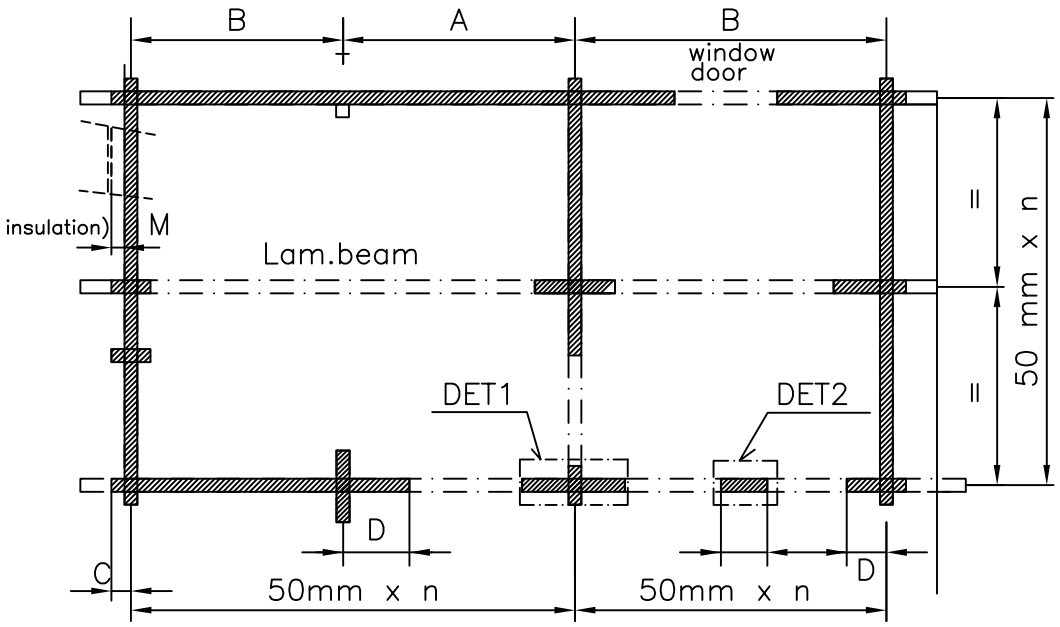
FLOOR BOARD 28*87 RAILS 42*95 k600 RAILS 25*95 k600 INSULATION ISOVER FLO 30 OSB 1200X2400X18 BEAM DL 88*190 k600 RAILS 42*45 k600 PANEL 19*170



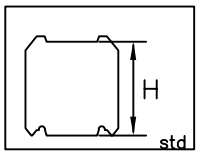
Floor
SmartLog



Critical measures (Max and Min Measures)

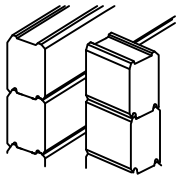


Effective height

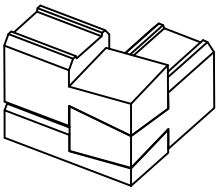


std = standard

Normal corner



Tyrol corner



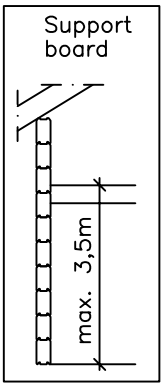
	A (max) (mm)	A + B (max) (mm)	C (mm)	$D^{x)}$ (mm)	H_{std} (mm)	Additional frame M (min) (mm)	Additional frame Frame (mm)	City corner C (mm)	City corner CL xx) (mm)	City corner CE (mm)	City corner DC (mm)	Thinner log for interior wall
CLL 160*275T	6000xxx)	9000xxx)	220	350	263	140	-	-	-	-	-	-

xxx) When large openings on the wall, the max. measure shall be determined separately for each case.

A, A+B Measures concern also the frames of tyroll corner wall frames. Then the notch is replaced by support wall or pillar.
Use of support board is alloved when floor–to–floor heigh is max. 3,5 m or when separate braces are used.

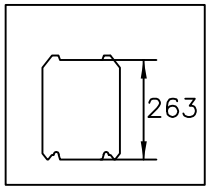
Not possiple to use thinner logs with CLL

Maximum length of CLL is 10300 mm

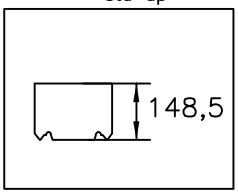


Measures of Half Logs

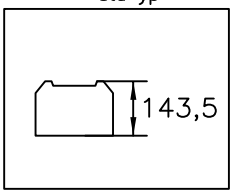
Effective height of logs (H_{std})



Bottom side half of the log ($H_{std\ ap}$)



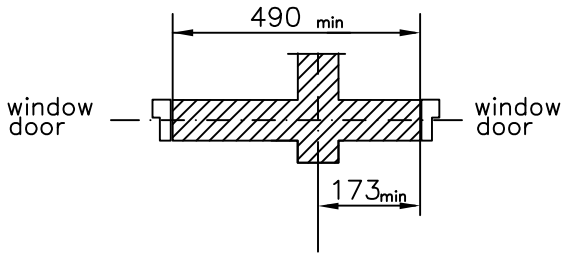
Top side half of the log ($H_{std\ yp}$)



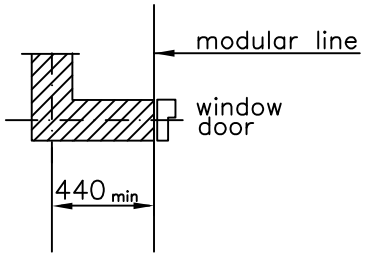
std = standard

(Minimum measure of horizontally sawn logs and half logs is 1000 mm)
Minimum measure of unprocessed log is 290mm.
no tongued jambs in openings

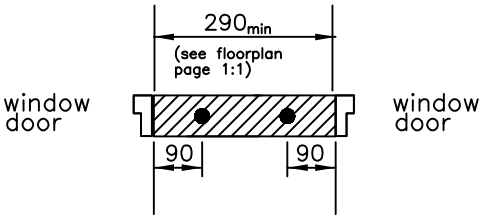
DET1 WITH LOG CORNER



DET3 TYROL CORNER

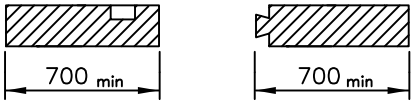


DET2 WITHOUT LOG CORNER

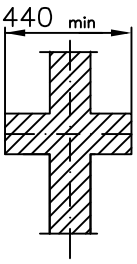


DET4 LOG WITH DOVERTAIL JOINT OR TIGHTENING HOLE IN THE LOG END

NOTE: LOGS WITH HEIGHT 275mm

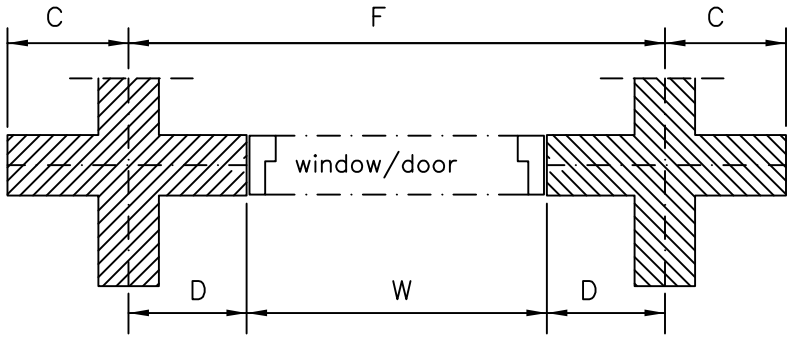


DET1 WITH LOG CORNER, IF SYMMETRIC



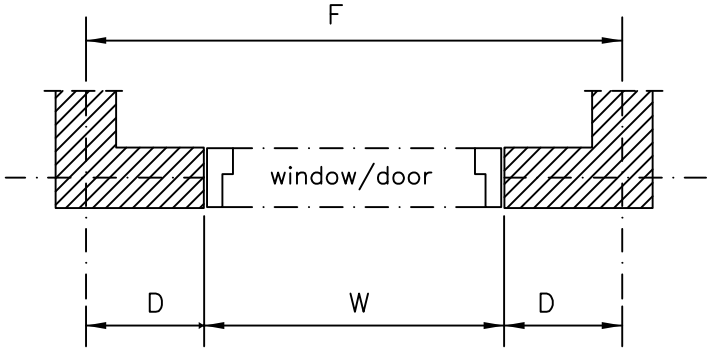
Opening Measures When Normal Log Corner Measures (C) Are Used

W (mm)	700	800	900	1000	1100	1300	1500	1700
	F (mm)							
CL L 160*275	1200	1300	1400	1500	1600	1800	2000	2200

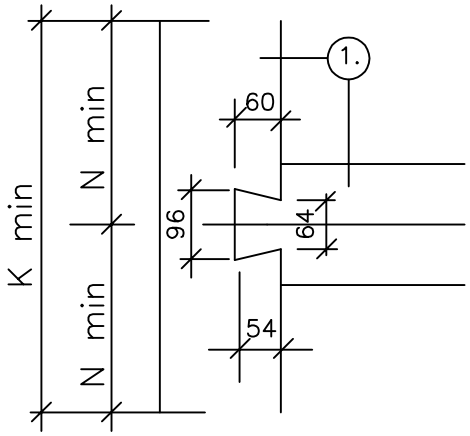


Modular Measures of Tyrol Corner Opening

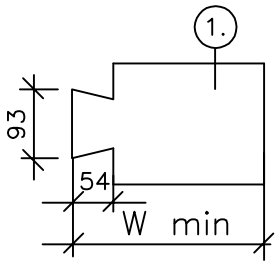
W (mm)	700	800	900	1000	1100	1300	1500	1700
	F (mm)							
CLL 160*275	1600	1700	1800	1900	2000	2200	2400	2600



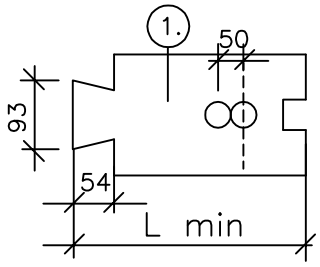
Interior Wall



1. LOG WALL



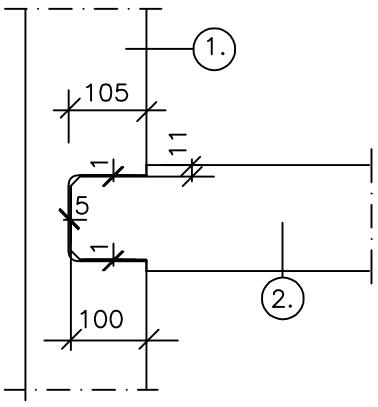
IF LOG IS SHORTER THAN MINIMUM SPECIAL CUTTING MADE AT FACTORY, HOLES FOR TONGUED JAMB AS ILLUSTRATED.

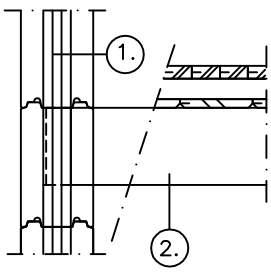


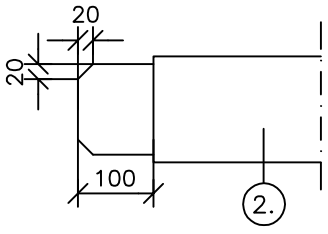
	N_{min} mm	K_{min} mm	W_{min} mm	L_n m
CLL 160*275	200	400	700	70

Attic Beam

1. LOG WALL
2. ATTIC BEAM







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