



Manufacture of
authentic scandinavian
log houses

*Modern technology that revives the best traditions
of handcrafts, surpassing the aesthetic appeal of
handmade cabins and precipitating a
significant increase of trust in the
quality of log houses*

*“The structural finish is the same as 300 or 500 years ago.
This is the most natural environment for a person to live in.
Each tree has its own size. You will not find two identical
trees in any one project.*

Theoretically developed and immaculately executed in practice.

If you really want something, everything is possible.”

A handwritten signature in black ink, appearing to be 'E. Poga', written in a cursive style.

Ervins Poga,
Owner

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SKANDINAVISK TØMMERHUS

Log building is one of the oldest methods of construction and one which, without losing its special value and meaning, has continued until today. More and more city dwellers feel the need to live in an ecologically clean and comfortable environment in order to be in harmony with nature and with themselves. Through an ingenious combination of traditional log building and modern technologies, it is now possible to bring these dreams to fruition.

Our company commenced its operations in 2000, by creating log buildings manually for both the domestic and foreign markets. Through our struggles with human error, which affected quality, efficiency and costs, we returned ever more frequently to the questions of: Is it possible to produce a particularly complicated corner joint industrially? Will it remain authentic, retaining the forms and values that have been developed over centuries? And, how can we reach that common image of a traditional log building without it being handcrafted?

Log buildings should be produced from logs of various heights, retaining the authentic performance of the corner joint' – the aim sounds so idealistic. Despite this, at our first exhibition in 2003, our first log building produced using modern technology was unveiled, and we took our first steps in the Norwegian

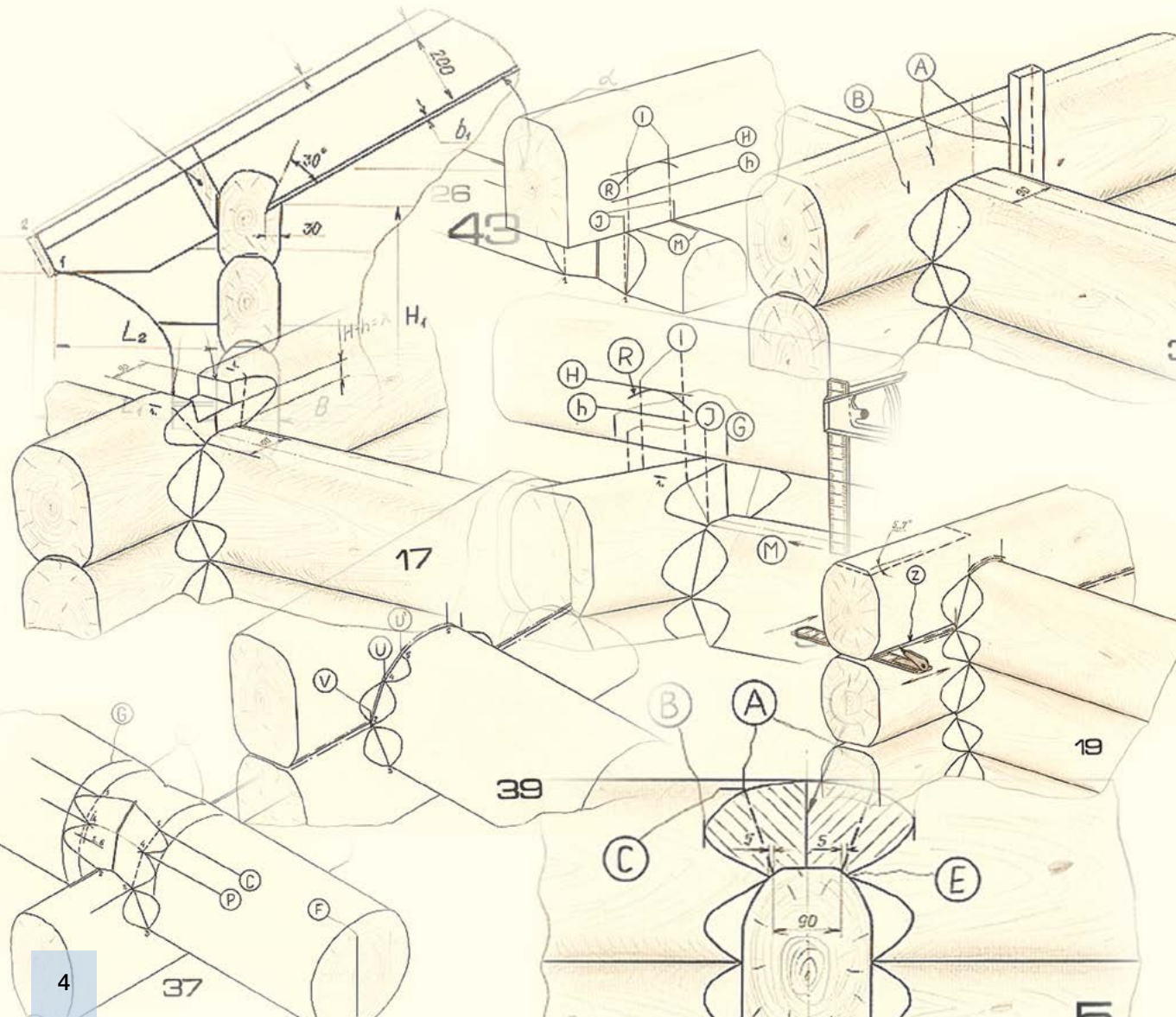


market, which, naturally, has ancient traditions, extensive knowledge and high expectations in this field. Of course, time was required for the new product to prove itself and to extinguish the incredulity among the market's many customers, competitors and specialists, who basically only acknowledged the authenticity of handcrafted buildings. Step by step, our product continued to win customers trust, establishing the belief that industrially manufactured log buildings are not only able to look like high-quality handcrafted products, but can also win out in terms of the accuracy of the joints, among other things.

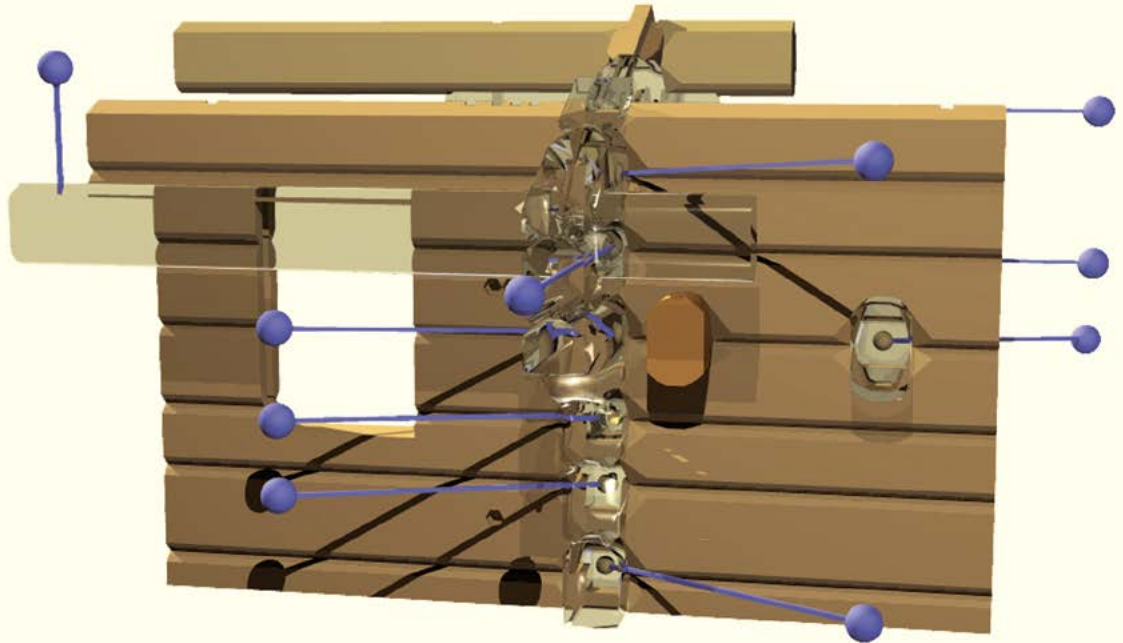
Our development since has been continuous – our manufacturing premises have expanded to 30.000 m², we have created more modern equipment and improved existing plant, innovations in the wood-drying process have been implemented, and our specialist design and machine control software has been improved and supplemented – with the ability to cut new joints, create new log profiles and thicknesses and mill wood differently, as well as the introduction of barcodes and automation. Our customers trust and interest in SKANDINAVISK TØMMERHUS log buildings has been increased by these innovations and we will continue to make such changes in the future!



CORNER JOINTS | CONSTRUCTIONS



Interactive animation, see:
www.ekonams.com

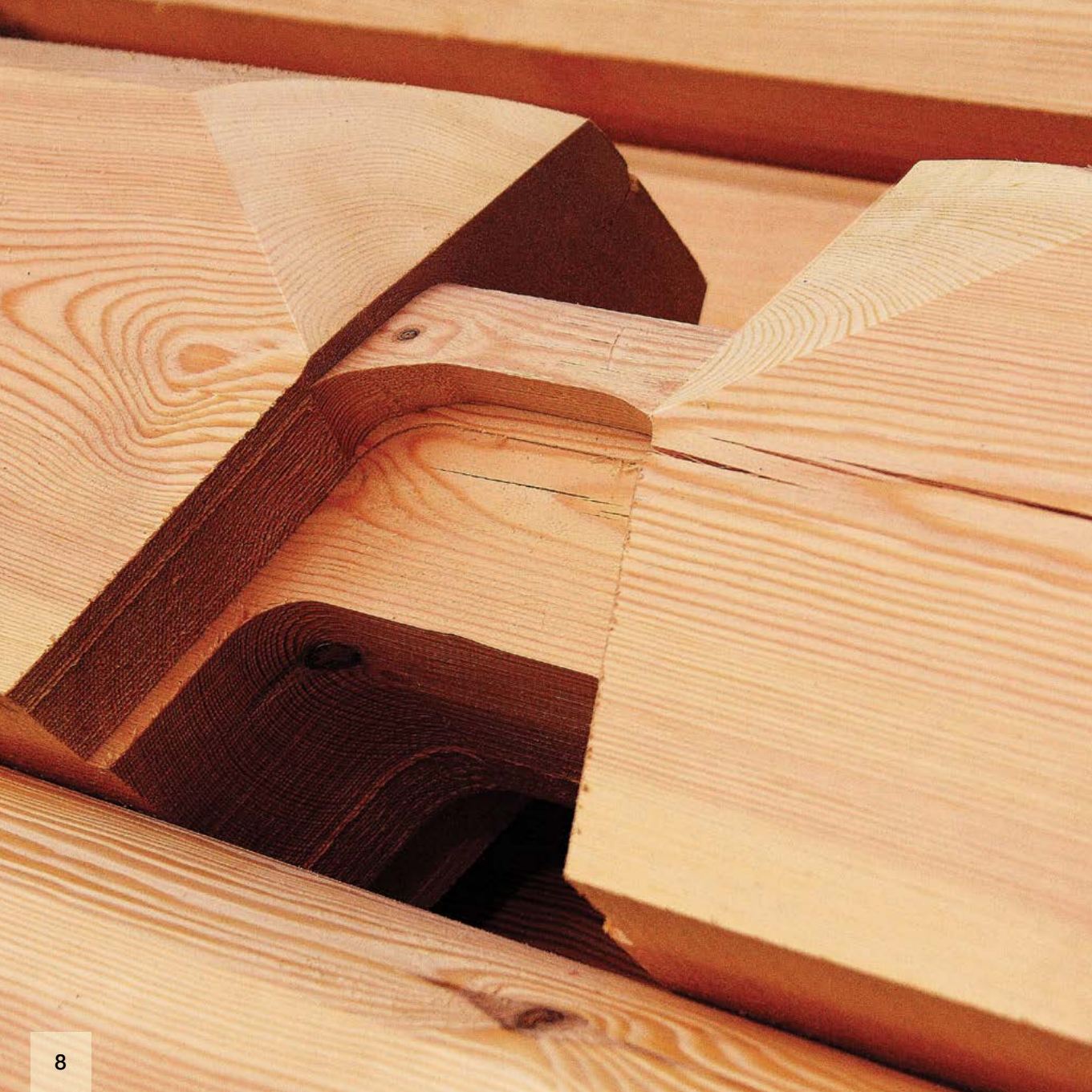




Corner



The traditional scandinavian connection of corners. Historically, its construction was improved by solving problems of settling and heat-stability, by reducing impact of log torsion and origination of gaps. Internationally, it is acknowledged as the most complicated one! Applying modern CAD-CAM processing, the theory was effectuated in praxis: structure and properties of connection are approximated to the ideal. Absolute conformity to traditions is preserved in combination with correct proportions of connections, cleanliness of forms and lines, guaranteed geometry of settling and over-measure, controlled effort, radical protection against wind, preciseness, a.o. qualities.



Foundation crown



The foundation crown is formed by 100-300 mm high logs with straight base. All connections are made in strictly regulated division of proportions in range from 100 mm to 190 mm. In contradiction to the typical corner, the angle-like “cheek” surfaces are cut only to the underneath log by letting bases to achieve the zero level. Besides, by improving the connection structure, additional cams are made to adverse sides for filling of internal voids. Both base of logs and preciseness of central plugs and respective sockets prevent logs from torsion while comb-type effort seals contacting lines of the connection additionally.



Dovetail



The dovetail is introduced into the end of a unilateral, not through-going corner connection for hiding of ends of cross wall and other logs in the walls. Preciseness in combination with the massive construction assists in prevention of lateral movement of cross logs from this asymmetric connection. In addition, seizing of sides of the dovetail fixes it and subjects to the tensioned effort. In order to strengthen problematic joints, the connection might be modified with a half of typical corner. Settling over-measure (10 mm) is cut in upper and/or underneath part of the log; and its edges press into the adverse side of the connection, namely, in the end of the wedge-shaped settling slope.



Reverse joint



This special connection is applied in cases when ceiling beams, profiled roof purlins have to be located in a specific height, a wall or other structure has to be started. Only by turning the detail to the other side in virtual reality and cutting other 120mm socket, connection with the next typical corner will be provided. It mainly refers to profile without groove joint. For all connections of subtypes, upper and underneath points of “cheeks” go into one point. As the structure settles, the symmetric and angle-conic formation of “saddles” facilitates self-closing of contacting lines of the corner; and, at the same time and together with the central plug, it does not let logs to twist.



Combined joint



Combinations include transition from a through-not-going, dovetail connection to a through-going corner connection or vice versa by changing the profile simultaneously. Such connections are quite rare and usually located in premises; therefore, the most complex hybrids do not have wind protection Groove and Tongue. In design, it incorporates in the common philosophy: every detail has to be inimitable or unique and to cross freely and differently with details of related walls. The program tests all divisions of proportions with no permission to wrong (too steep or too flat) connections. Cut with non-standard CNC equipment; summary preciseness $\pm 0,5\text{mm}$.



Purlins joint



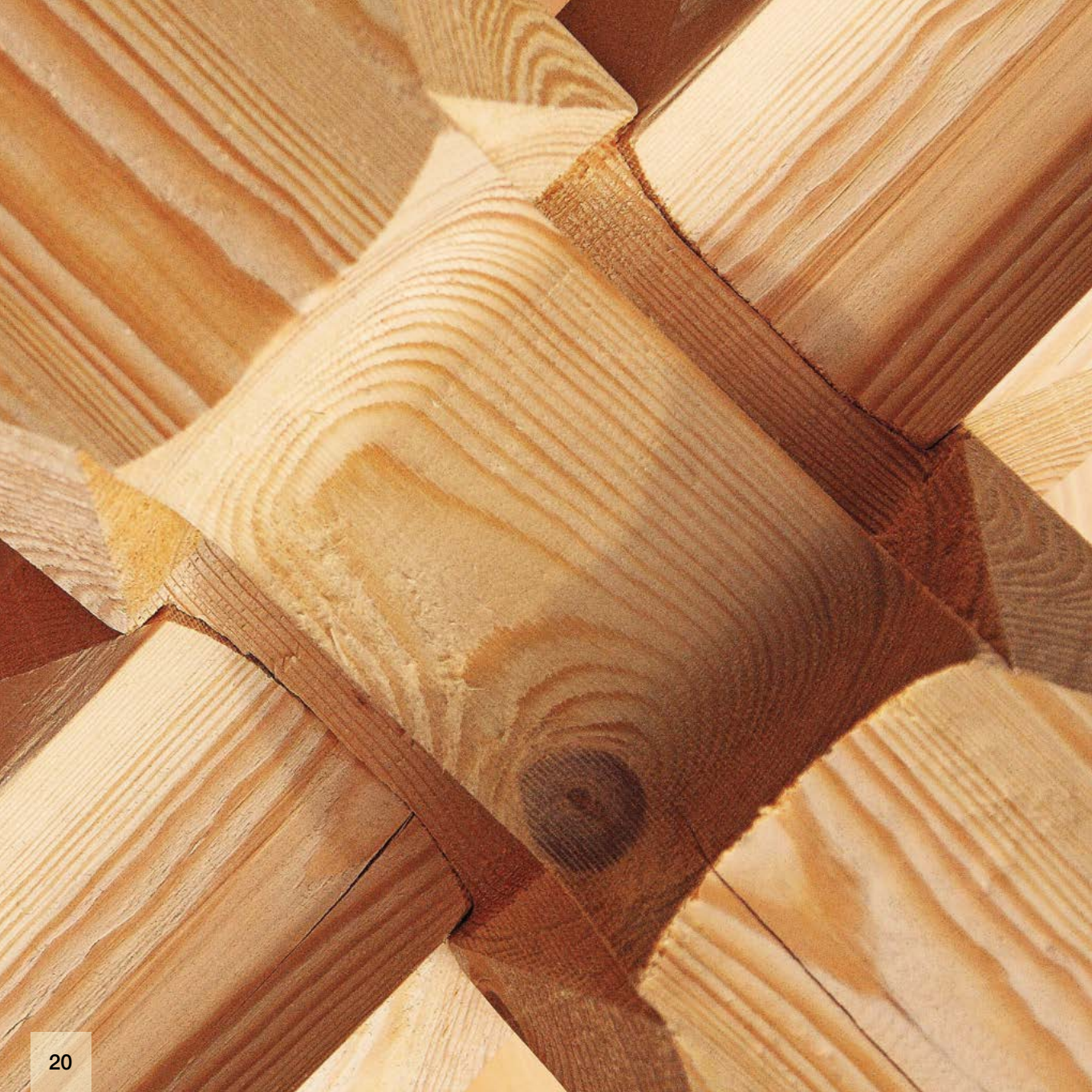
Purlins are turned in diameter 220-360 mm basing on their strengths or aesthetical considerations. Connections fully conform to structure and characteristics of a typical corner. Larger amount of division versions is allowed thus increasing manoeuvrability in designing of complicated crossing roofs and other complicated joints. These attractive elements will contrast lively and distinguish if diameters of nearby purlins differ for at least 40 mm. Diversity of sizes for purlins and profiled logs impart naturalism; in addition, impression of industrially manufactured product is erased by obtaining all its advantages and qualities.



End joint



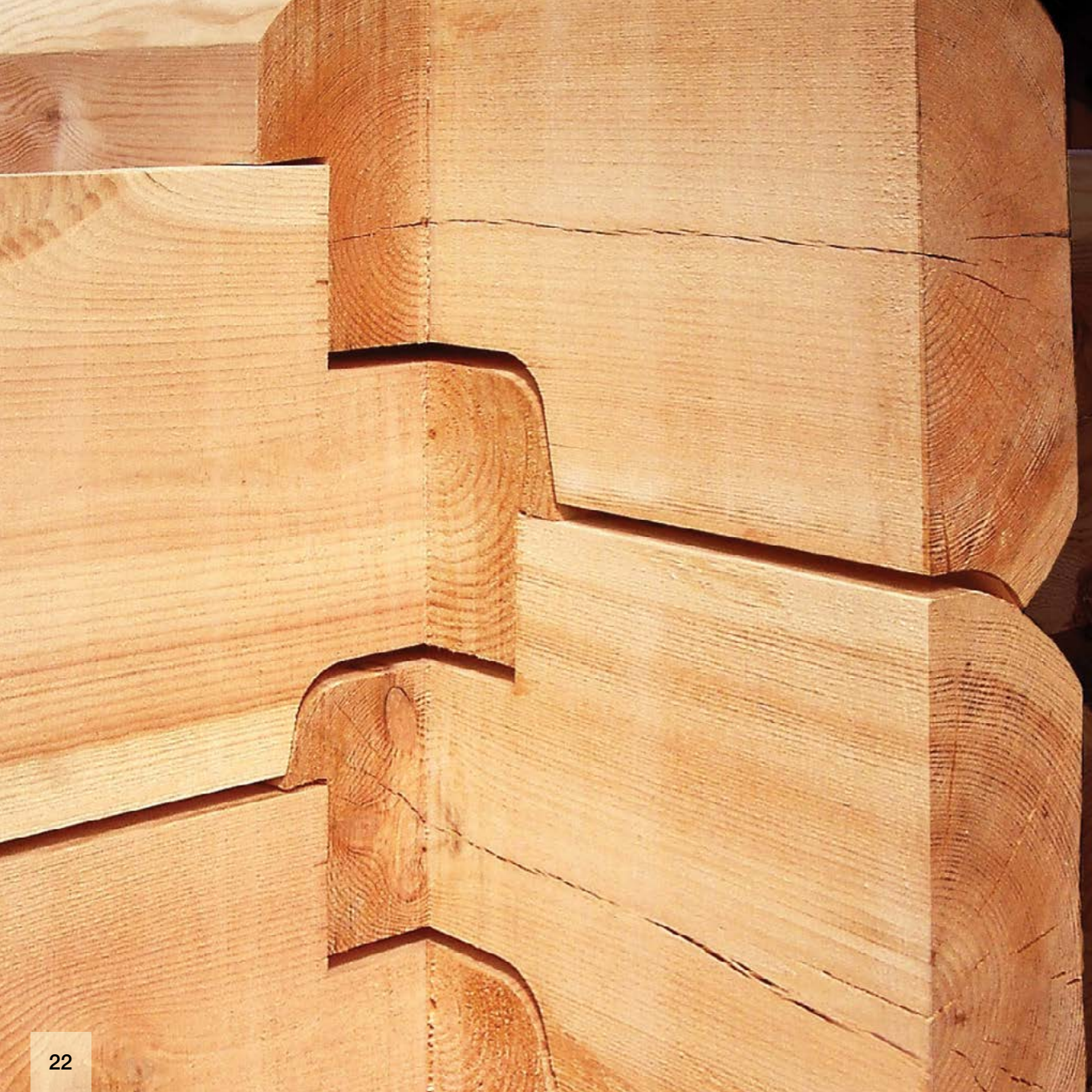
Joint connection knits together long (>8m), specific details. It is logically, and, if possible, in turns, hidden in the most appropriate crossing point of corners. Also the set of bracing is inserted internally: horizontal and vertical drills are connected in a unified depth. The steel wedge is braced, fixated, tensed to the desirable direction so contacting lines of the connection are slightly pressed. This and deformation from effort can be naturally recovered by performing multiple local humidifications: impressions will straighten up. It is a unique method for closing of gaps in places where they have formed by time in spite of preciseness and theory.



Tongue and Groove



The central plug is from both sides prolonged with small tongue or pin; and it has also a respectively cut groove in depth of 10 mm (height of “wind” pin for purlins is 20-30 mm). It covers the weakest place of corners, forms barrier against wind and snow, increases heat-strength, and reinforces the cross-section. Width of this match, groove joint, central plug, and socket is equal: exactly 120 mm. All together they do not permit torsion of details and exclude the possibility of incorrect installation. In addition, the connection is sealed by the already mentioned 1-2 mm effort, which comb-type impressions in the surface of “cheeks” form additional labyrinths and improves the adherence.



Settling



Unified span in connections and between details, limited angles of “cheeks” and other extremes, sorted bent-fibred logs, conic, proportionally increasing formation, and equal effort of contacting lines provide homogenous structure, identical conditions of settling ($1 \div 3\%$), minimal risk of complications, and smooth course of the process. The initial settling and drying is compensated with the effort of connection while the wedge-shaped (0-3 mm) slope is intentionally lifted for 2 mm in order to lay on “saddles” only at the end of this stage. As the wood continues pressing for many years, spans and over-measures invisibly shrink.

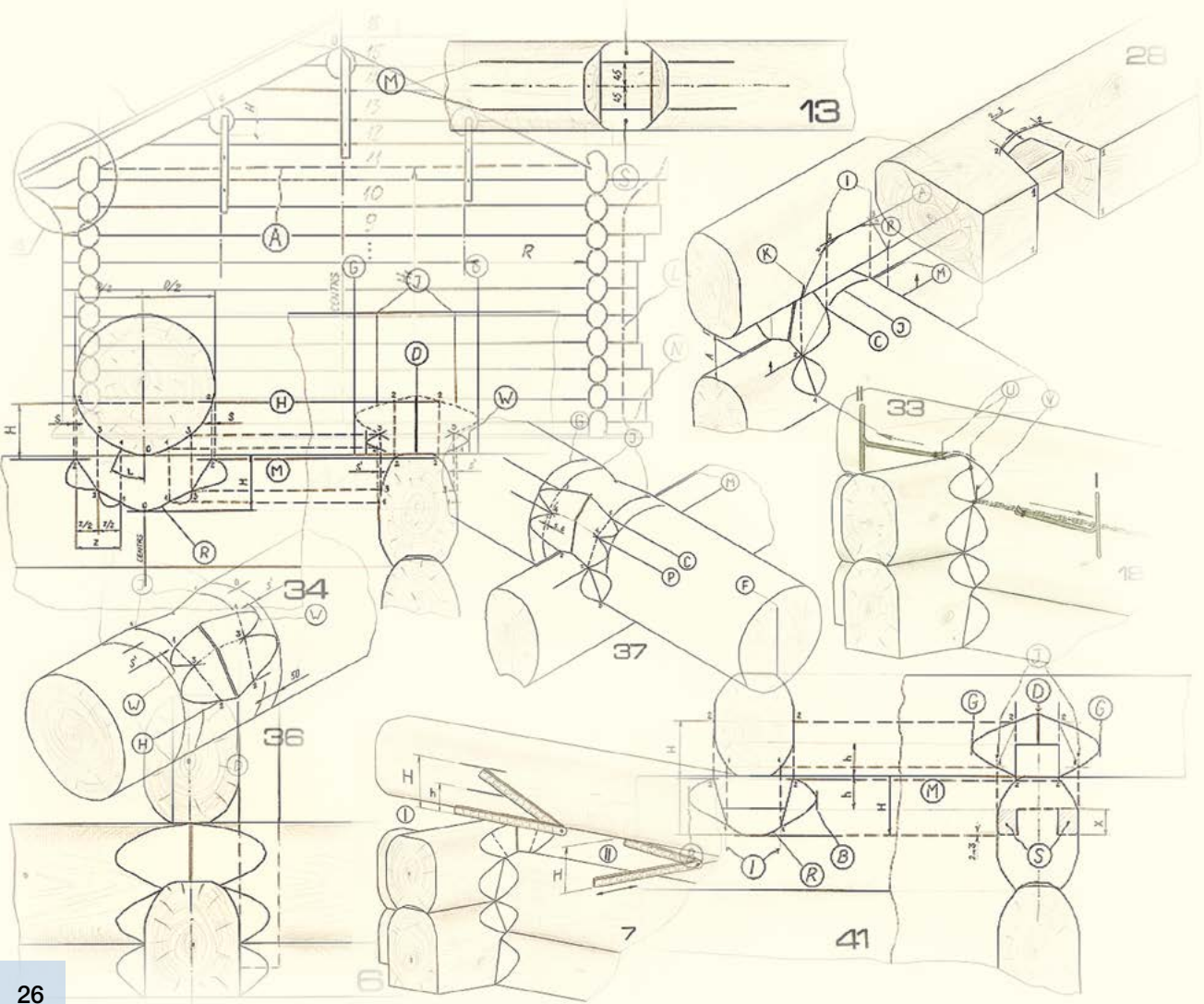


Transition of profiles

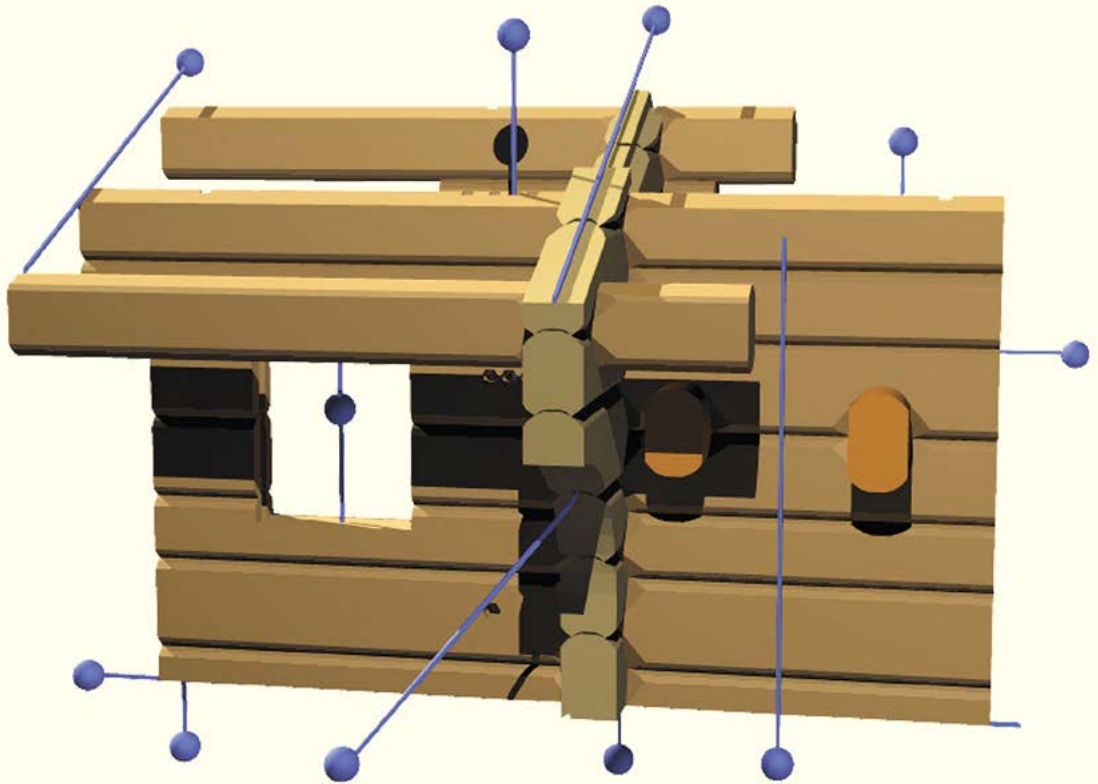


Having respect to traditions, harmonic, aesthetic constructions, and cleanliness of structures, despite technological complications, there is provided transition from non-grooved to grooved profile in scope of one detail. It is needed for transition to terraces, beams, balconies, decorative aisles, log ends, and other structures, where implicitly only non-grooved profile shall be used. In case of possibility, longer details are knit together by butt joint without taking additional risk with defects of groove lines when applying hand work. Such details can be mutually connected with all profiles by using any type of connection.

Additional elements | Capabilities

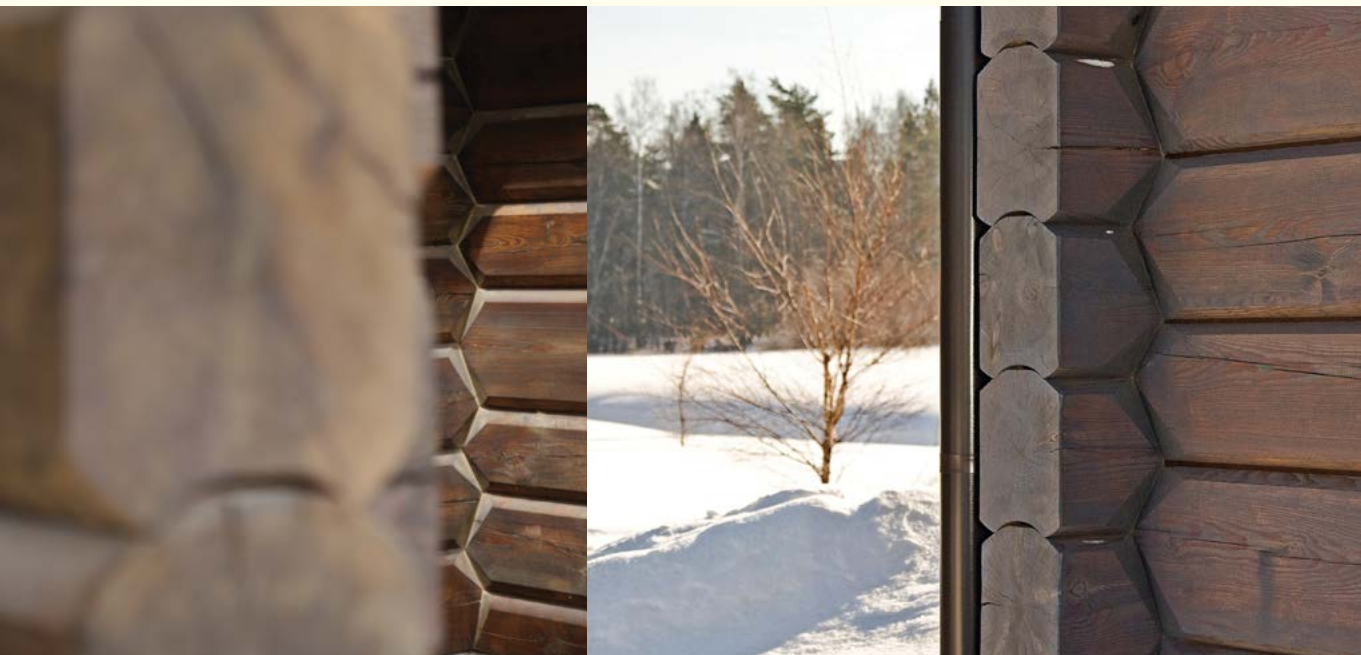


Interactive animation, see:
www.ekonams.com





Dimensions



The height of profiled logs (200-340 mm, step 10 mm) offers many possibilities for unique and as much as possible contrasting combinations not only in crowns but even in scope of them. Providing accurate control of dimensions and connections, a lively and aesthetically unobtrusive product was obtained as well as elasticity for reaching of required heights and optimal tie of structures was ensured. Grooved logs have even numbers and non-grooved – odd numbers of heights. In fact, to the height of logs 12 or 24 mm shall be added if their mutual overlapping is considered. Wall thickness: 200 mm; in the nearest future: 150 and 250 mm!



Profiles



By copying historic methods of shaping, – profiled as two-sided logs with sharp profile edges for transition to side surfaces. By understanding the processes of settling, – coordinated profiles of log upper part and joint groove. By using only logs of large height, – harmonic, proportional compatibility with thickness was reached. The deeply sitting (12 mm), universal profile, appropriated also for angle (5°) sloping of overhangs by protecting them against precipitation. Two types of profiles are offered: one is sharper, with different lines, and the other is more rounded and regular. 3 main types of profiles: grooved, non-grooved, saw squared, and, of course, also turned purlins.



Beams



In scope of a unified, natural style, the structural element of the building is highlighted. Calculations of strength, demands for heat or sound insulation as well as aesthetic considerations define the height of beams (non-grooved profile, 230-310 mm), regulate heights of beam upper and underneath parts and grooving. The result of the complicated designing work is not compromise only between beams of different directions, but also between grooves for ceiling in beams and cross walls. Corner connections provide logical, rigid tie with walls by reducing problems of beam settling and torsion. In addition, lying or groove for ceiling has been simplified considerably: it is elegant and without slats.



Planes



For support of rafters, ceiling, and other roof structures, - surfaces (unlimited in angles) or differently broken planes are milled in previously defined length, almost in every depth and distance from the centre. Simple, with cam, broken, divided into two heights and ridge planes, from one or both sides grooved surfaces both left and right ones. It is important that just in the process of designing, the optimal layout of complicated (perpendicular, of one height) roof support planes are solved. The ribbed milling provides very clear lines and facilitates contact of surfaces. Planes for purlins are prepared with bandsaw.



Gables



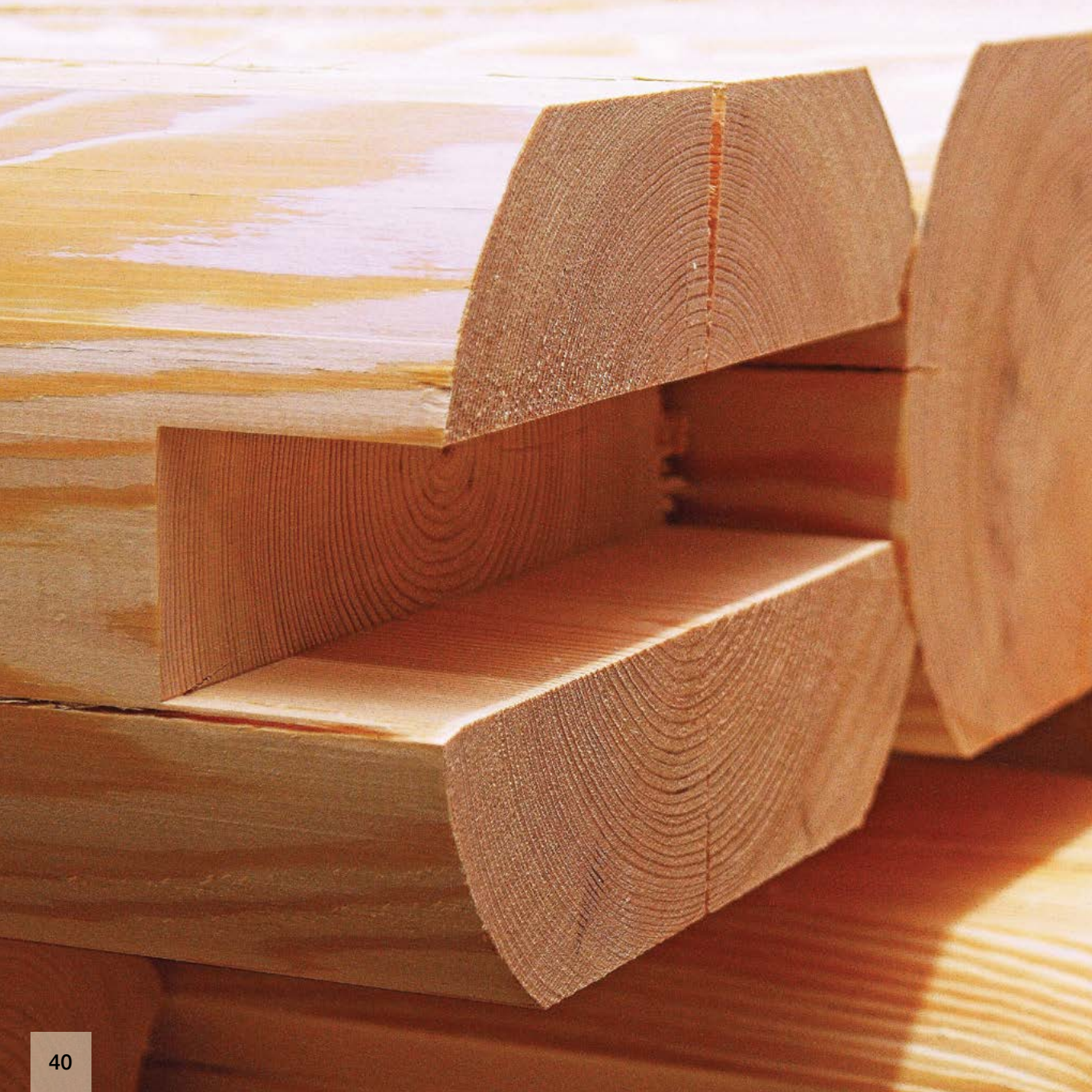
Side edges of ceiling and boarding are hidden in roof triangles by cutting with precise coordinate equipment. Grooving of any amount, side and orientation as well as partial, through-not-going (at side walls) grooving with freely changeable angle. For exterior: in depth of 35 mm; for interior: in depth of 60 mm; namely, before or behind the edge of the groove joint. An absolutely straight groove continues in all details; and perpendicularity of its edges guarantees precise installation. The boarding is concretely pressed and fixed if pressing lathes are wedged into the groove. The middle cam works as a heat barrier and convenient transition between sides. Milling width – 60 mm; it is appropriated also for simple cutting of frontons.



Apertures



Upper and underneath parts of all apertures have to be prepared; for lintels of decorative arches transition of profiles is made. It is significant to calculate correct over-measures of settling and to approach the external edge of upper and underneath detail only in exceptional cases. It may be effectuated only if all complications and conflicts are averted during the process of designing. Heights of apertures are usually equal; and only by combining heights of walls and base logs, by changing amount of crowns, an optimal, often the only solution appropriated for all walls can be found. Everything is connected; also beams and purlins define several, sometimes all, crowns under them.



Grooves



Industrially cut trough-going grooves (width 60 mm) for installation of windows, doors, columns, ceiling etc. Regulated depth, clear performance, precise surfaces. Through-not-going grooves are hand work; therefore, defects of cuts are possible. Limitations set by the program define that by designing of ceiling grooves in the beams, offsets from inconvenient places of profile are followed, namely, 10 mm before (upper part) and after (underneath part) the side surface edge. Grooving for laths of boarding and cross-wall places is possible to cut as well. The sliding set is formed by a board with groove, in which the timber is glued and screwed. Deformation of walls is suppressed considerably!



Drills



Vertical ($\varnothing 60$ mm, through-going or hidden) drills: for wall pins, settling bolts, electrical and other channels defined by the customer. Horizontal ($\varnothing 70$ mm, until centre, one-sided, double-sided) drills: for multi-place sockets and dividing boxes. Drills of different meaning are coloured differently in drawings. Increase of pins (massive octagon with tendency to cut into sides of the drill hole) amount and systematization of their application has improved stability of walls significantly. Accurate performance of drills eases the installation, pinning in every 4 crowns becomes safe; and even hammering of one-piece pin becomes theoretically possible.



Arches



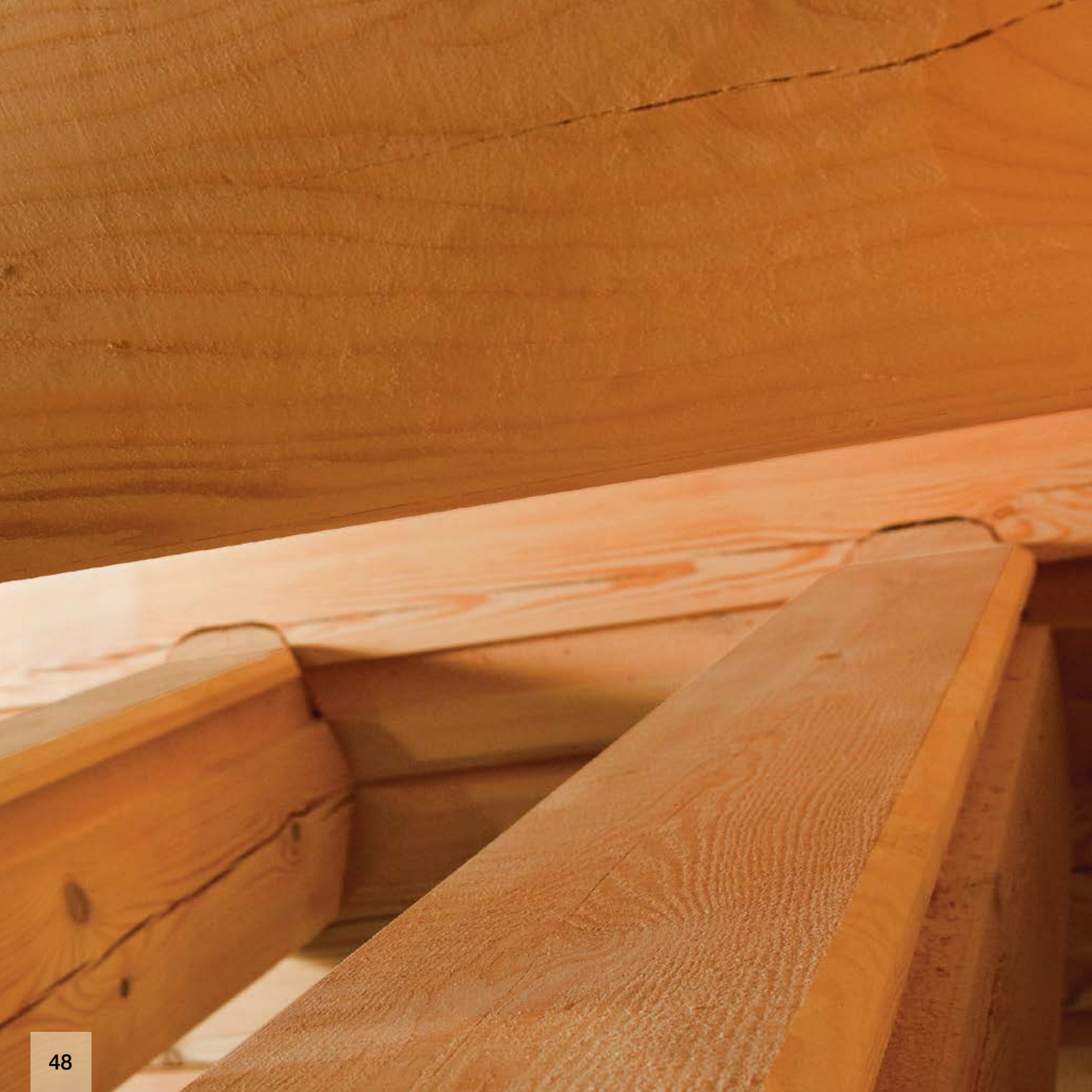
Having respect to wishes of our clients and traditions, decorative arches, upper and underneath polls of overhangs, rounds of aisles or other cuts of ends are scribed with patterns of different range and form and, temporary, sawn off and grinded applying hand work. There is individual approach to every decorative arch and poll by including details of sufficient length in the project. In the nearest future, these complicated, regular, and free forms will be connected with height and position of every separate detail in the project and cut by using programmed large-sized CNC machines.



Drip edge



Cut in angle along the external perimeter of the foundation crown, the drip nose prevents precipitation and other type of humidity from crossing the form of log by making it to drop thus protecting from decay and rot. Despite the heartwood in profiled timber composes 75-85%, which is considered as significant advantage, we offer using of Siberian larch in this crown because it consists only from heartwood and it is naturally impregnated. Timber is artificially dried until transportation humidity (in depth of 50 mm – 18%, in the upper layer – about 12%) with purpose to balance drying of inside, swelling of exterior, and levelling of humidity in its cross-section.

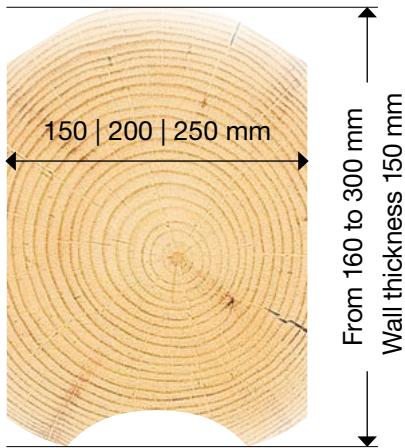


Surfaces etc.



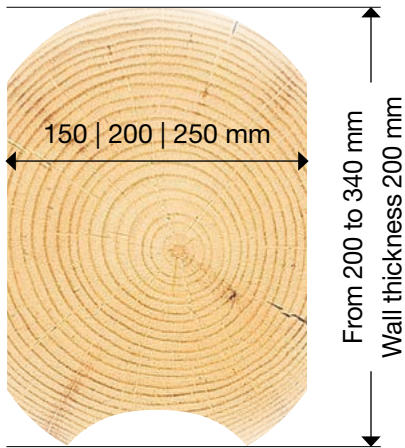
In precise coordinates, horizontal surfaces set in drawings are cross sawed. Mainly it is upper parts of ceiling beams and wall-plates; however, also any other non-standard surfaces. For example, for foundation crown of a pile building, two surfaces under angle are sawed. But, by applying hand work, we make the special wishes of our clients to come true: we are forming roof supporting structures, corner connections under angle, we are deepening base logs of terraces and pile buildings, and we are profiling columns... and it is possible to change dimensions of “cheeks”, to imitate shrinkage of logs (to the sharpest profile) visually, to age surfaces, etc.

Original



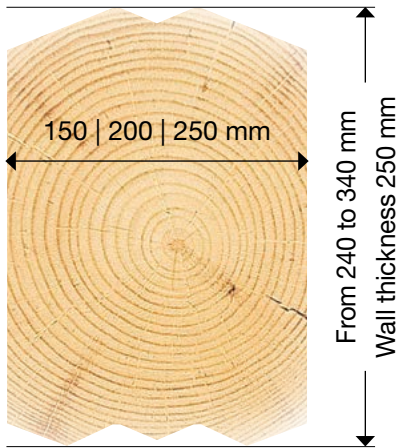
Classical, sophisticated log profile with sharp edges, extended side width, and typical shapes created during the process of hewing. The natural character of the profile is shown by its asymmetrical differences - straight lines on the top part and curved lines on the bottom part of the log. Bottom of the log is flattened on purpose to make it look visually wider. This authentic profile gives any log house a character, by proving how rigid are the walls and how tight are the corner notches.

Regular



A simple and modest profile, made close to a shape of a round log, creating a gentle overall image of the building and boosting the warm and cozy atmosphere of a log house. The profile is featured with symmetrically rounded corners, so that the joint with the side would not be as visible. It will be a better fit in a rural environment or among similar buildings. In this way an impression of lighter, freer construction is created by imitating natural roundness, by simple shapes & eased perception.

Ascetical



The frame and scope of this urban profile is the V-shaped groove, which is a traditional part of hewing. The groove fearlessly exhibits the triangle as the main shape of the design, as well as it features only straight, sharp edges and sharp corners. The profile has a low settling interval, very wide sides, and minimal separation [also triangle] between the logs. The improved groove barriers increase heat and wind resistance, as well as prevent sides of the beams from cracking.



We offer high-quality frames for log buildings made from pine and larch, competitive prices and the quick turnaround of orders.

Using a specialised CAD programme we will create an accurate 3D technical model of the log building from your drawings or sketches, facilitating the coordination process for your project.

Our highly efficient, automatically controlled CNC machine does the rest, and the finished log building is soon ready for transportation.

Frame assembly is carried out by our partners.

We invite large and small companies to cooperate with us!

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