FIELD DATA SHEET: 45° REED-THATCH & Ø10 CM SKIFTESVERK HALL

Parametric True-Scale CAD | 5.00 × 6.00 m (30 m²) | 4 × 1.50 m Thin Birch Bays | 45° Winter Reed Roof | Elevated Reed-Clay Floor

DOC: TDS-SKIFT-OPEN-v4
REV: 2026-11-26 | OUTER RIDGE: 4.81 M (<5.0 M)

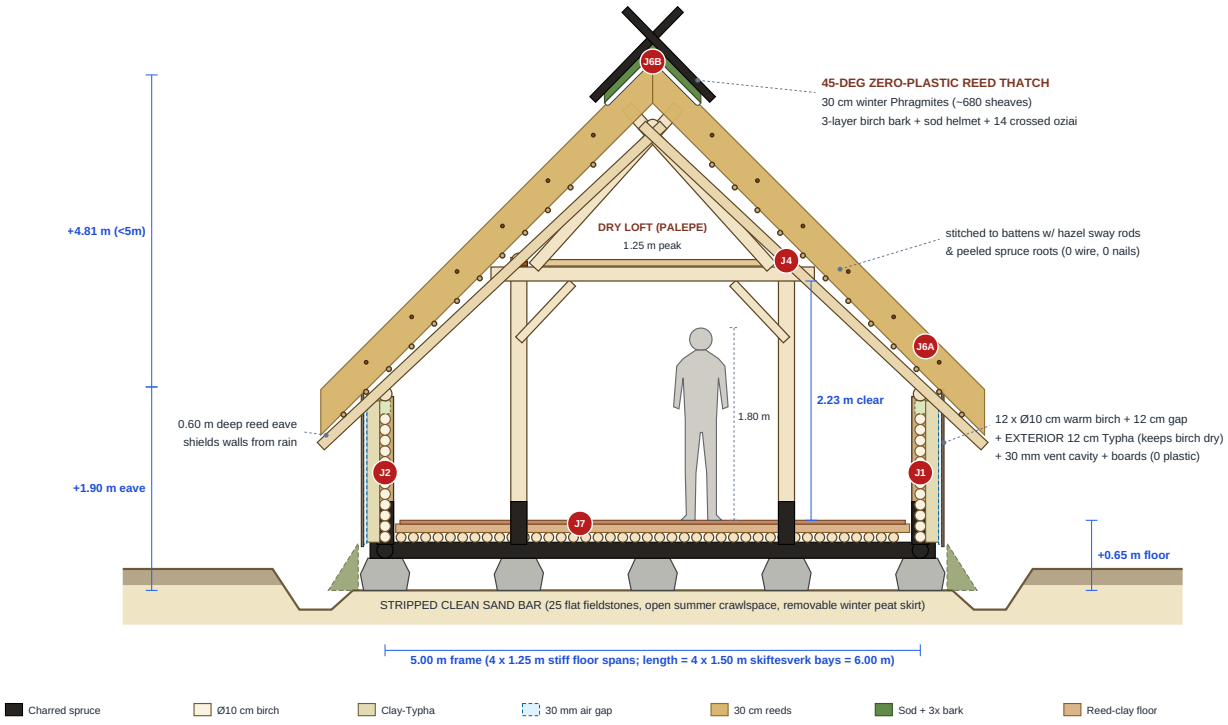


FIG 1. TRUE-SCALE CROSS-SECTION: 45-DEG REED HALL + REAL Ø10 CM SKIFTESVERK BIRCH WALLS & ELEVATED REED-CLAY FLOOR

SCALE 1:40 | ALL UNITS METRES

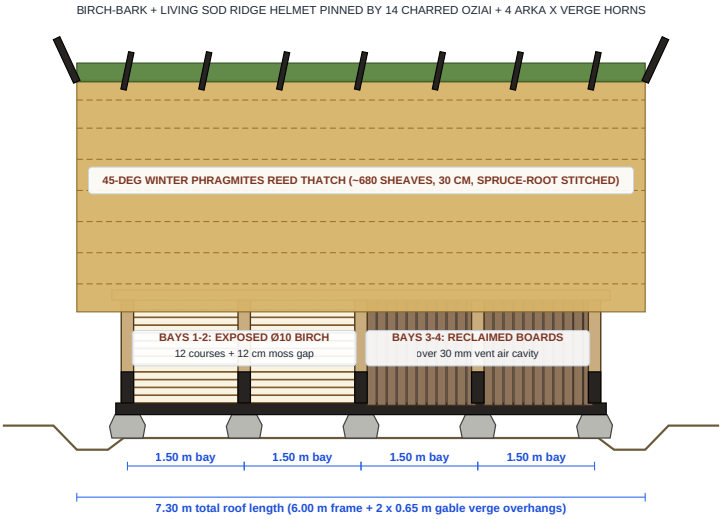


FIG 2. TRUE-SCALE SIDE ELEVATION (4 x 1.50 M SKIFTESVERK BAYS = 6.00 M): REAL Ø10 CM BIRCH STACKING VS. VENTILATED RECLAIMED SIDING

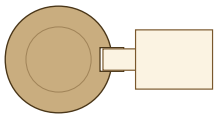
SCALE 1:45 | 12 COURSES PER BAY

JOINERY, STACKING, REED FLOOR & 45° REED ROOF DETAIL ATLAS

Plates J1 (Skiftesverk Post), J2 (272 mm Corrected Wall: Exterior Clay or Lime-Typha), J7 (Elevated Reed-Clay Floor), J4 (45° Bent Head), J6A (Reed Thatch), J6B (Viking Ridge)

TRUE METRIC SCALES: 1:5 / 1:10 / 1:15
ZERO NAILS | ZERO WIRE | ZERO WIND PAPER

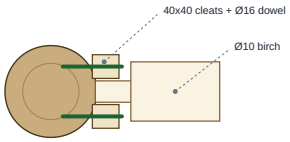
OPT A: CUT GROOVE (Ø18-20 cm)



40x40 mm groove | 36x36 tenon

Only if post Ø >= 18 cm

OPT B: DOWELED CLEATS (Ø15-16)

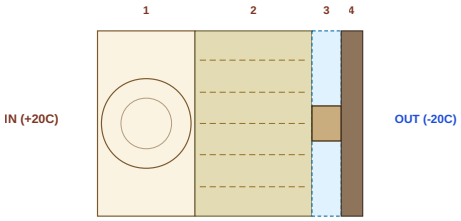


100% uncut post core + Ø16 dowels

3x faster for thin forest spruce

J1 · SKIFTESVERK JOINT (PLAN): CUT GROOVE VS. DOWELED CLEATS SCALE 1:5

EXTERIOR TYPHA: CLAY (U=0.32) OR SLAKED LIME (U=0.33..0.38)



1) 100 mm Ø10 birch INSIDE (+9.7..+18.4C, dry, natural retarder)

2) 120-150 mm Typha OUTSIDE: clay slip (0 EUR) OR slaked lime Ca(OH)2

(lime: pH 12.5 anti-rot, λ~0.070, apply >=+5C; NEVER pure lime alone)

3) 30 mm ventilated cavity (wire mesh) 4) 22 mm boards (0 plastic)

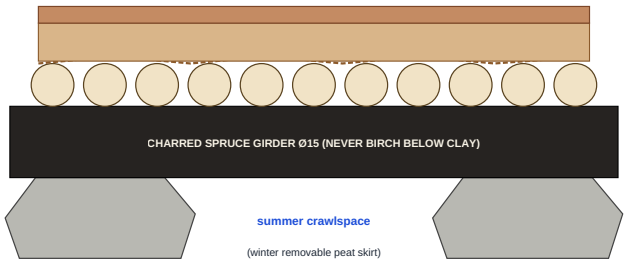
J2 · CORRECTED WALL (272 MM): WARM BIRCH + EXTERIOR CLAY OR LIME-TYPHA SCALE 1:5

J7 · ELEVATED WOVEN REED-CLAY FLOOR (0 PLASTIC)

1. Charred SPRUCE ONLY girders Ø15 on 1.25 m span (δ=0.80 mm).

2. Close-spaced Ø9 spruce poles + woven hazel stabilizer rods.

3. 8 cm Lehmwickel (70 reed sheaves in clay) + 3.5 cm 1:3 clay-ash.



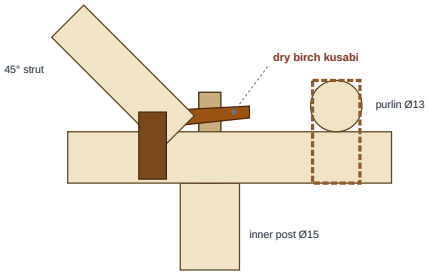
J7 · ELEVATED WOVEN REED-CLAY FLOOR (WINTER REEDS + CLAY) SCALE 1:10

J4 · 45° BENT HEAD (TIE TENSION H = 1.50 kN SLS)

1. Saw 5x8x23 cm tenon + chop 20x45 mm kusabi wedge slot.

2. Drop tie beam -> drive dry birch kusabi wedge tight.

3. Seat 45° strut in 4 cm pocket -> hazel neso lashing.



J4 · MASTER 4-WAY BENT HEAD AT 45° (ZERO NAILS, ZERO BOLTS) SCALE 1:10

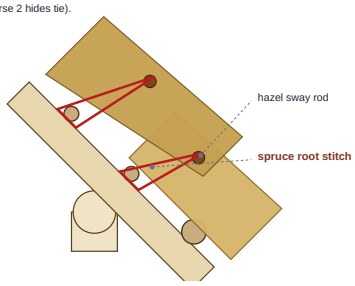
J6A · 45° ZERO-WIRE REED THATCHING (~680 SHEAVES)

1. Lash Ø4-5 cm battens every 30 cm across 24 spaced rafters.

2. Lay 30 cm winter water reeds butt-down; dress w/ paddle.

3. Clamp w/ hazel sway rods & soaked split spruce roots.

4. Stitch w/ carved 45 cm birch needle (Course 2 hides tie).



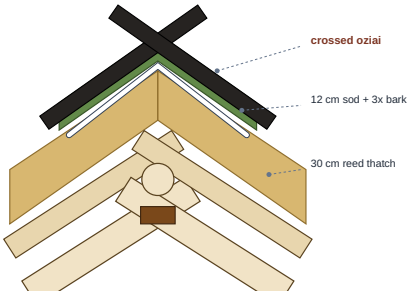
J6A · 45° REED THATCH: SWAY RODS + SPRUCE-ROOT STITCHING (0 WIRE) SCALE 1:10

J6B · VIKING-BALTIC ZERO-PLASTIC RIDGE CAP

1. Interlace top reed courses tightly across Ø13 ridge pole.

2. Saddle 3 layers of wide white birch bark (50 cm, June peel).

3. Cap w/ 12 cm living grassland sods + 14 crossed charred oziai.



J6B · WATERPROOF RIDGE: BIRCH BARK + SOD HELMET + CROSSED OZIAI SCALE 1:15

OPEN FIELD MATERIALS BILL & 1-PERSON MANUAL TOOL LIST

Reference sizing for a 5.00 × 6.00 m (30 m²) timber hall · Single-builder manual hand-tool kit (no prices, no power tools required)

OPEN EDITION: TDS-SKIFT-OPEN-v4
ZERO PLASTIC | ZERO NAILS | ZERO WIRE

1. REFERENCE MATERIALS & TIMBER CUT LIST (5.00 × 6.00 M | 4 × 1.50 M BAYS | 45° REED ROOF)

Component	Species & Real Ø	Reference Qty & Length	Harvest Window	Critical Field Rule
Skiftesverk Wall Infill	Debarked hardwood / birch **Ø10–12 cm**	~220–240 pcs × 1.50 m (~460 tenons 36×36 mm)	Winter (Jan–Feb) lowest sap	Peel bark SAME DAY (Class-5 birch rots under bark); stack dry; leave 10–12 cm top settling gap.
Girders & Outer Sills	Conifer / spruce ONLY **Ø15–16 cm**	10 girders × 2.75 m + 4 sills × 3.20 m (scarfed)	Winter / windfall	Deep-char 3–4 mm; NEVER place birch below damp clay floor; 25 level flat fieldstones.
Posts, Ties, Purlins, Ridge	Spruce / pine **Ø13–18 cm**	10 outer + 10 inner posts, 5 ties, 10 plate/purlin/ridge	Winter / dry standing	Ø15–16 cm outer posts use doweled 40×40 mm cleats (J1 Opt B); char bottom 40 cm.
45° Rafters, Struts, Braces	Spruce / pine **Ø9–12 cm**	24 rafters (4.4 m), 10 struts, 14 braces, 14 *ožiai*, 4 horns	Winter thinning / tops	60 cm c/c spacing; deep-char ridge *ožiai* & gable verge horns.
Subfloor Poles (J7)	Conifer ONLY **Ø8–10 cm**	~200 poles × 1.55 m (over 1.50 m bay spans)	Winter / dry standing	Peeled spruce ONLY beneath clay-reed *Lehmwickel* pad; weave hazel stabilizer rods.
Battens, Sway Rods, Ties	Hazel / willow **Ø1.5–5 cm**	56 battens (3.7 m), 52 sway rods, ~40 floor rods, ~150 lashings	Winter & early spring	Twist green hazel shoots over embers for tough *neso* lashings; zero nails or wire.
Winter Water Reeds	Standing dead *Phragmites australis*	**~750 tight sheaves** (~680 roof + ~70 floor, Ø25 cm)	Deep freeze (Jan–Feb) cut over ice	Cut ONLY dead winter stalks; stack upright in conical stooks to shed rain before thatching.
Exterior Wall Insulation	Non-flowering *Typha* leaves/stalks + clay OR slaked lime	**~4.0–4.5 m³** bundles + clay slip OR ~11–15 bags (25 kg) air lime CL90	Aug–Sep (*Typha*) ≥+5 °C if using lime	Pack on **EXTERIOR** of warm birch; ZERO seed fluff. Lime $Ca(OH)_2$ adds pH 12.5 anti-rot shield; never pure lime without plant fiber.
Bark, Roots, Sods & Boards	Birch bark / spruce roots / sods / reclaimed boards	12 m² bark, 250–300 m roots, ~70 sods, ~42 m² boards	Late May–Jun sap run (bark & roots)	3-layer bark + 30 sods = ridge (J6B); split roots stitch thatch (J6A); 30 mm vented cavity + boards.

2. COMPLETE SINGLE-PERSON MANUAL HAND-TOOL KIT (NO ELECTRICITY, NO PRICES)

Group	Essential Manual Tools	Exact Role in a Solo Build
Layout & Levelling	5 m tape, spirit level (or site-made wooden A-frame level), mason line, plumb bob, scribe compass	Squaring the 5.00 × 6.00 m grid, bedding 25 fieldstones (±3 mm), scribing round-log joints.
Debarking & Splitting	Drawknife / bark spud, froe (*skeltuvas*, can be forged from an old leaf spring), wooden mallet, 4 fire-hardened splitting wedges	Same-day birch debarking (~240 poles), splitting wall cleats/shingles, shaping 70 dry birch *kusabi* wedges.
Timber Joinery	1.2 kg felling/limbing axe, 400 g carpenter hatchet, bow saw (green + dry blades), 20–25 mm mortise chisel, sloyd knife, sharpening stone + bastard file	Bucking, paring ~460 sliding tenons, chopping J4 through-mortises and wedge slots, daily 3-min honing.
Harvest & Earthwork	Hand scythe / sickle, spade, heavy wooden clay tamper (*meška*), flat thatching paddle, carved 45 cm wooden stitching needle	Harvesting ~750 winter reed sheaves, stripping topsoil to mineral sand, tamping clay-reed floor, stitching thatch.
Solo Lifting & Lime PPE	Strong ropes, ratchet straps, site-made wooden hauling sled (*travois*), 2 forked pike-poles; rubber gloves + eye goggles (if using slaked lime)	Hauling winter timber over snow, solo-raising 5 timber bents safely, protecting skin/eyes from caustic $Ca(OH)_2$.

3. SEASON-LOCKED BUILDING PROCESS (FOLLOW THE MATERIALS, NOT AN ARBITRARY CALENDAR)

Season Window	Solo Effort	Field Operations & Material Sequence	Biological / Weather Gate
WINTER FREEZE *Jan–Feb*	30–34 half-days	Cut ~750 dead winter *Phragmites* sheaves over frozen ditches/ice; fell thin birch & collect deadwood spruce; **debark birch same day**; haul heavy poles over snow on wooden sled; carve ~460 sliding tenons & dry 70 birch *kusabi* wedges indoors.	**FREEZE GATE:** Lowest wood sap, dry dead reeds, low-friction snow haul.
EARLY THAW *March*	14–16 half-days	Ribbon-test subsoil clay (≥5 cm) or plan slaked-lime fallback; debark spruce frame logs above +2 °C; deep-char (3–4 mm) all girders, sills, post bottoms (40 cm), 14 ridge *ožiai* & verge horns; verify local permit-free height/area rules.	**FIRE & CODE GATE:** Confirm local statutory cap before setting piers.
SPRING FRAME *Apr–May*	32–36 half-days	Strip organic topsoil to clean mineral sand (save sods grass-down); dig 25 cm perimeter drip swales; level 25 flat fieldstones; lay charred chassis & loose subfloor poles; solo-raise 5 bents with pike-poles & straps; set 24 rafters; slot birch infill under frame to dry.	**DRYING SHED:** Standing frame protects birch wall poles from rain while seasoning.
SAP WINDOW *Late May–Jun*	20–22 half-days	Peel 12 m² wide white birch bark sheets & pull 250–300 m shallow spruce roots (split & soak). Lash 56 hazel battens; lay 45° zero-wire reed thatch stitched with spruce roots (J6A); cap ridge with 3-layer bark + 30 sods + 14 charred *ožiai* (J6B).	**SAP GATE (2–3 WKS):** Birch bark peels cleanly ONLY during spring sap flow.
HOT DRY WIND *July*	16–18 half-days	Fix Ø9 conifer subfloor poles + woven hazel rods; pack 8 cm clay-dipped reed *Lehmwickel* + 3.5 cm 1:3 sandy clay-ash wear crust (J7); tamp & burnish leather-hard with wet cobble. Leave crawlspace wide open to wind.	**CURE GATE:** Floor must dry from top & underside before damp autumn air.
DRY WALL CLOSE *Aug–Sep*	14–16 half-days	Verify birch MC **<18%** & measure settling drop; harvest non-flowering *Typha*; coat in thin clay slip **OR slaked lime $Ca(OH)_2$ milk** and pack 120–150 mm on the **EXTERIOR** of the birch; mount 30 mm vented cavity (rodent mesh) + rainscreen boards; hang pivot door.	**LIME GATE (≥+5 °C):** Slaked lime needs 4+ frost-free weeks to carbonate into $CaCO_3$.
WINTERIZE *Oct–Nov*	2 half-days	Stack removable peat sods + boughs around crawlspace perimeter for winter floor warmth (re-open every April for dry summer airflow).	Weather-tight for −20 °C winter.

4. VERIFIED STRUCTURAL & HYGROTHERMAL MATH SUMMARY

Physics Check	Verified Value (5.00 × 6.00 m Ref.)	Principle & Practical Consequence
45° Roof Snow & Dead Load	Snow (Zone II, μ_1=0.40): **0.64 kN/m²** Reed + rafters: **0.96 kN/m²** -> **1.60 kN/m²**	45° pitch sheds rain and halves snow load; Ø9.5 cm rafter σ=3.2 MPa (<11 MPa), δ=1.73 mm (L/1023); 30 cm reed U≈0.18 W/(m²·K).
Bent Thrust, Floor & Euler Post	Tie H = **1.50 kN** SLS (**2.05 kN** ULS) Girder Ø15 (1.25 m): δ = **0.80 mm** (L/1563) Inner post Ø15 Euler: P_{cr} = **371 kN**	Dry birch *kusabi* wedges lock tie tension; 1.25 m pier grid keeps clay floor rock-rigid (<L/500); inner posts carry >30× Euler buckling margin.
Birch Tangential Shrinkage	**4.0–5.0%** air-dry (12–15% MC) 1.20 m side bay = **60 mm** | gable = **105 mm**	Leave **100–120 mm** moss-stuffed settling gap above top birch log; fix cover trim ONLY to top plate so wall slides freely.
Wall Fourier & Glaser Check (J2)	Clay-*Typha* 120 mm: **U=0.32** (birch +9.7 °C) Lime-*Typha* 120/150 mm: **U=0.38 / 0.33** Pure lime alone (no fiber): **U=0.93 (FAILS)**	Insulation MUST sit **OUTSIDE** Class-5 birch (6.7–10:1 vapor-open = DRY). Slaked lime $Ca(OH)_2$ works as an alkaline anti-rot binder with plant fiber, never alone.