Project Overview & Logistics

Project Details

Typology: Load-bearing timber frame and roof construction

Location: Valchiusella (TO), Italy

Execution: Maisdabòsch (in collaboration with Merlino Zeldenthuis)

Role: Executive engineering, hand-hewing with broadaxe, traditional joinery, roofing

Materials: Local chestnut (primary frame), larch (roof decking) and wood fiber insulation

General Context & Project Philosophy

Construction of a roof structure integrated into the rural landscape of Valchiusella, aimed at utilizing short-supply-chain local resources.

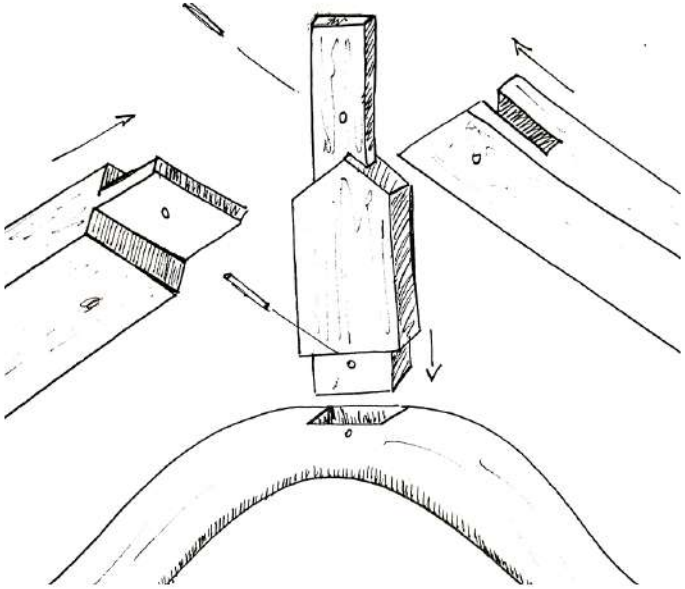
The primary frame is crafted from local chestnut, a wood species with high mechanical strength and natural protective tannins. The roof covering consists of larch boards, insulated with wood fiber panels and clay tiles.

Construction Solution

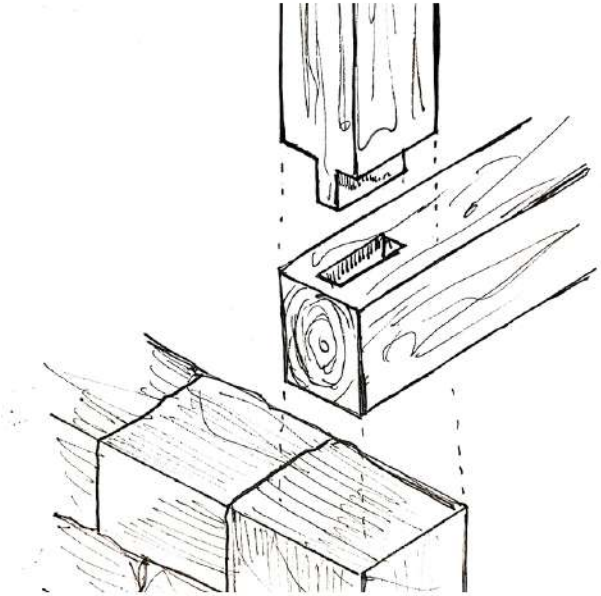
The chestnut logs were hand-hewn with a broadaxe and processed on site, pre-assembling the joints on the ground to ensure exact geometry control. Handling and lifting of the timber framing were managed using manual systems and winches, minimizing site impact before the final installation of the larch roof decking.

Photo 1 | On-site timber frame installation

Joint Engineering & Details



Drawing 1 | Axonometric view of truss 1



Drawing 2 | Axonometric view of ground connection

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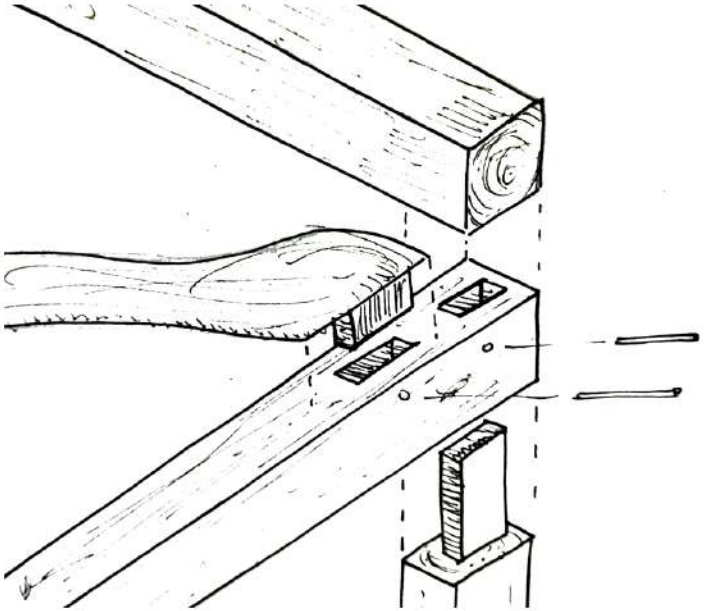
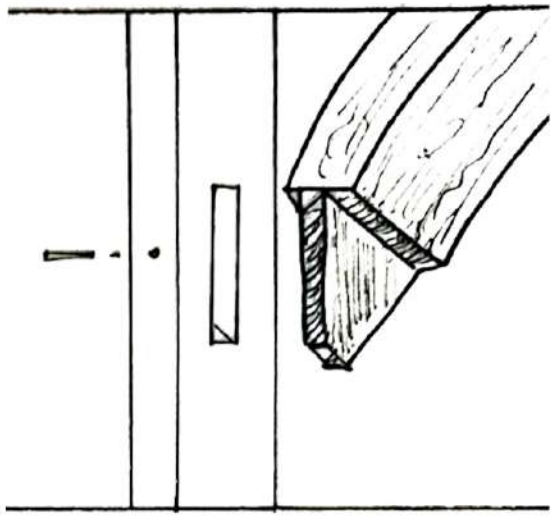
Joint Engineering & Construction Phases



Drawing 3 | Axonometric view of joint construction detail



Drawing 4 | View and detail of curved strut

Joint Engineering

Traditional Timber-to-Timber Joints

The connection between the chestnut framing and struts was engineered using mortise and tenon joints, ensuring optimal load transfer without visible steel plates.

Construction Details & Durability

- **Joint precision:** Interfaces are hand-crafted to follow the natural curvature of the timber, guaranteeing perfect surface contact.

- **Joint protection:** Cold-applied natural plant oil protects end-grain surfaces, ensuring water repellency and moisture protection while preserving breathability.

The 4 Construction Phases

1- Broadaxe Hewing

Selection of local chestnut logs and manual broadaxe hewing on site, shaping the raw timber along its natural fiber.

2- Ground Pre-Assembly

Layout, cutting, and hand-crafting of mortise and tenon joints, pre-assembling on the ground to verify joint fitment.

3- Structure Erection

Lifting and positioning primary beams and struts using manual winches, anchoring the frame to the stone masonry.

4- Roofing & Finishing

Installation of exposed larch roof decking, completing upper insulation layers and the outer roof envelope.

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