



Prefabricated X-LAM timber structures

Model specification

Model Special Specification

X-LAM Works

Technical section for the award of public works – modular text to be coordinated with the design, price list, PSC (safety and coordination plan) and contract rules

IN-DEPTH WORKING EDITION – 27 October 2026

Basis: 14 attached PDF documents, from the G. Marconi school, the Polo Dinamico in Bologna and the Tassoni school.

WARNING: single-project data are given as case studies, not as generally applicable sizing. The model requirements shall be completed on the basis of the design and checked against the applicable regulatory framework.

English translation of the Italian original, provided for information. Italian legal references are quoted in their original form; in case of doubt the Italian text prevails.



Also available online at www.xlam.com/en/clt-model-specification.html

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Instructions for use and scope of application

This specification governs the supply and installation of load-bearing or non-load-bearing walls made of CLT/X-LAM panels, together with the related connections and interfaces with the building envelope. The administrative part of the CSA (special tender specification), where provided, remains separate. The fields in square brackets shall be completed in the design. The data of the projects examined are examples and do not constitute constraints of this specification.

Project data sheet to be completed

Item	Design requirement
Works, contracting authority, CUP/CIG where relevant	[TO BE DEFINED IN THE DESIGN]
Intended use and nominal service life	[TO BE DEFINED IN THE DESIGN]
Technical standards and use class	[TO BE DEFINED IN THE DESIGN]
Structural model, actions and seismic design	[TO BE DEFINED IN THE DESIGN]
X-LAM product: manufacturer/qualification route	[TO BE DEFINED IN THE DESIGN]
Thickness, number of layers, classes and orientation	[TO BE DEFINED IN THE DESIGN]
Build-ups and material properties	[TO BE DEFINED IN THE DESIGN]
U-value, condensation, R_w and fire resistance performance	[TO BE DEFINED IN THE DESIGN]
Structural details, screw and steelwork schedules	[TO BE DEFINED IN THE DESIGN]
Test and inspection plan, tolerances	[TO BE DEFINED IN THE DESIGN]
Accounting criteria and prices	[TO BE DEFINED IN THE DESIGN]
Applicable CAM (Italian minimum environmental criteria for construction) and verification documents	[TO BE DEFINED IN THE DESIGN]

Chapter I – Contractual technical requirements

Art. 01 – Scope of the works

The contract includes detailed construction design by the contractor within the contractual limits [specify], prefabrication, packaging, transport, unloading, storage, lifting, installation, fixings, temporary protection, joint treatment, envelope completion works where provided, tests and final documents. Only the works expressly excluded in the other articles and in the price list are excluded.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, structural report SR1B, pp. 2–9; Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 02 – Hierarchy of design documents and handling of inconsistencies

Before producing the panels, the contractor shall verify the consistency between the structural calculation report, structural drawings, schedules, architectural drawings, wall schedules, detail specifications, price list and safety documents. Discrepancies or omissions shall be submitted to the DL (works supervisor) and to the designer; unilateral corrections to the structural system are not permitted.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, structural report SR1B, pp. 2–9; Marconi, architectural report AR1B, pp. 8–12; Marconi, foundations S07B, single sheet; Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet

Art. 03 – General characteristics of CLT

The panels are cross-laminated timber structural elements, manufactured in accordance with the reference technical documentation [specify], with mechanical properties, durability, adhesives, geometry, layer orientation, fire behaviour and service conditions corresponding to the design. Values, lengths and tolerances are those stated in the validated design documents.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate); Bologna, Polo Dinamico ST-D 03, single sheet

Art. 04 – Qualification and acceptance of materials

Before procurement, the contractor shall provide the qualification/assessment route actually applicable to the product, identification of the manufacturer, the required declarations and performance documents, product data sheets, batch traceability, any tests, the required environmental certifications and transport documents. The DL may suspend the installation of unidentifiable or non-compliant material.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate); Bologna, Polo Dinamico ST-D 03, single sheet; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 05 – Production design and panel lists

Before cutting, the contractor shall submit lists stating panel code, quantity, thicknesses, number and orientation of layers, dimensions, openings, millings, gridline references, holes and lifting points. The documents shall identify revisions and shall correspond to the structural and architectural drawings.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet

Art. 06 – Classes, adhesives and exposure conditions

Specify [product/strength class], use [environment], permitted species or characteristics, adhesives declared by the manufacturer, design service class and expected exposure conditions. Material intended for an incompatible environment, and reference products with undocumented performance, shall not be accepted.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate); Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 07 – Sizing and verifications

The thickness and layer configuration are those of the design: no data taken from case studies constitutes a general minimum thickness. The design shall verify in-plane and out-of-plane forces, shear, bending, deformations, stability, overturning, openings, diaphragm action and connections in the relevant load combinations.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, structural report SR1B, pp. 2–9; Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate); Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet; Bologna, Polo Dinamico ST-D 03, single sheet

Art. 08 – Build-ups and ETICS on CLT

Where an external thermal insulation system is provided, the contractor shall supply a complete system compatible with the CLT substrate: insulation with declared characteristics, fixing pattern and number of fixings as per design, adhesive where permitted by the system, reinforcement mesh, base coat, finish, profiles,

reinforcements, joints, base course and reveals. Merely reproducing the Marconi E1/E2 build-up is not sufficient for a new work.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, wall schedule A09A, single sheet; Marconi, architectural report AR1B, pp. 8–12

Art. 09 – Internal lining walls, claddings and building services

Lining walls shall be installed with certified framing and systems as per design and shall ensure the required thermal/acoustic/fire performance. Service cavities shall limit drilling of the structure, maintain the necessary accessibility for inspection and allow airtightness to be restored.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, wall schedule A09A, single sheet; Marconi, architectural report AR1B, pp. 8–12

Art. 10 – Thermal and hygrometric performance

The build-up shall ensure thermal transmittance, control of thermal bridges, condensation risk, airtightness and functional continuity of the layers in accordance with the calculations and details [references]. It is prohibited to arrange membranes in a manner incompatible with the hygrometric design or to enclose wet timber surfaces.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, wall schedule A09A, single sheet; Marconi, details booklet A11B, pp. 2–9; Marconi, architectural report AR1B, pp. 8–12

Art. 11 – Acoustic performance

Systems and joints suitable for the required performance [specify] shall be constructed. Any R_w values given in the wall schedule refer to the specific wall and are not automatically applicable to other systems. Penetrations shall be sealed and the continuity of decoupling layers shall be ensured without compromising structural resistance.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, wall schedule A09A, single sheet; Marconi, structural details S11A, single sheet

Art. 12 – Fire safety

The contractor shall provide the documents certifying the required performance for the complete wall system and for joints, cavities, penetrations and connections. Board and lining protections shall be consistent with the approved design and with any fire safety application.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, wall schedule A09A, single sheet; Marconi, architectural report AR1B, pp. 8–12

Art. 13 – Protection against moisture and separation from the ground

The bearing of the wall on underlying structures shall include the prescribed barriers and separating elements; membrane upstands, base courses and junctions with floors/thresholds shall maintain continuity against water and rising damp. The Marconi detail with plinth and ventilated curb is a model to be sized and adapted, not a detail to be applied automatically.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, details booklet A11B, pp. 2–9; Marconi, foundations S07B, single sheet; Marconi, architectural report AR1B, pp. 8–12

Art. 14 – Hold-downs and tension anchors

The contractor shall supply anchoring systems identified by the specification [type and reference], with plates, nails/screws, rods, washers, anchors and protections as defined in the calculations. Substrate conditions, edge distances and reinforcement positions shall be verified; substitutions without technical authorisation are prohibited.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, foundations S07B, single sheet; Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate)

Art. 15 – Shear and sliding anchors

Shear devices and connectors shall be installed in the number, orientation and position shown in the validated details. The inspection shall verify actual installation, depth, combination with tension elements and absence of interference with openings and joints. The Marconi B1–B4 families remain examples.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, foundations S07B, single sheet

Art. 16 – Wall-to-wall joints

Butt, corner and T-joints shall ensure force transfer and continuity of the envelope requirements. Only the screws, spacings and inclinations shown in the validated construction details shall be used. A specific schedule shall be prepared for each joint category.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, structural details S11A, single sheet

Art. 17 – Wall-to-floor and floor-to-floor connections

The connection shall ensure continuity of the diaphragm and of in-plane and out-of-plane actions; in the zones indicated in the design, compatible acoustic decoupling layers shall be incorporated. Actual execution shall be verified before covering.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, structural details S11A, single sheet

Art. 18 – Beam-to-wall connections

Hangers, screws and reinforcements shall comply with the drawings and the structural report, taking into account the direction of loads and the orientation of the panels. Commercial equivalence is admissible only where performance, geometry, durability and structural verification are documented and approved.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, structural details S10A, single sheet; Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate)

Art. 19 – Plates, screws, nails and bolts

Each connector shall be identified by strength, geometry, treatment and field of application. Where the design gives brand designations, these identify the required technical performance and functional equivalence shall be verified. Actual spacings, holes, inclinations and depths shall be checked.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate); Marconi, foundations S07B, single sheet; Marconi, structural details S10A, single sheet; Marconi, structural details S11A, single sheet

Art. 20 – Windows and doors, reveals, sills and edge finishes

Continuous membranes shall be laid under sills with upstands according to the approved detail, with external drainage and junctions with the thermal insulation system and the window/door frame. The Marconi A11B detail is an example with a 30 cm upstand and sill; dimensions to be defined in the design.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, details booklet A11B, pp. 2–9; Marconi, wall schedule A09A, single sheet

Art. 21 – Roofs, parapet and ancillary fixings

Vapour control layers, insulation, roof covering, flashings, parapet and fixings shall be constructed in sequences compatible with the X-LAM substrate and with the verification of wind, thermal movements, water and condensation; drainage and protection of panel ends shall be ensured.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, architectural report AR1B, pp. 8–12; Marconi, structural details S11A, single sheet

Art. 22 – Openings and penetrations

Cuts, holes, chases or millings not shown in the validated drawings are prohibited, unless previously verified and authorised. Penetrations shall maintain structural capacity, fire protection, acoustic performance and air/water tightness.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, foundations S07B, single sheet; Marconi, structural report SR1B, pp. 2–9

Art. 23 – Transport, storage and protection

The panels shall be packaged and transported so as to avoid deformation, impacts, soaking and standing water. On site they shall be stored on suitable, protected supports, with provision for ventilation and procedures for wet material. Any damage shall be recorded and remedied before installation.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 24 – Erection and temporary works

The contractor shall prepare the lifting sequence, propping, temporary bracing, weather restrictions and geometric control plan. Temporary protections shall be removed only when the permanent structural system is complete and verified.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53; Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet

Art. 25 – Tolerances and non-conformities

The design or the approved production documents define dimensional tolerances, flatness, out-of-plumb, hole deviations and joint positioning. Defects exceeding the tolerance require a non-conformity report and approval of the repair or replacement.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 26 – Acceptance and in-progress inspections

The DL shall verify the correspondence of the panel code, documents, surface condition, correct installation of devices, joints, membranes and works before they are concealed. The contractor shall complete inspection sheets with signature, date, location, photographs and any request for joint verification in the presence of both parties.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate); Marconi, foundations S07B, single sheet; Marconi, structural details S10A, single sheet; Marconi, structural details S11A, single sheet; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 27 – Test plan, inspections and hold points

Before the start of the works, the list of mandatory and discretionary tests and the hold points shall be agreed: foundation substrate, first fixings, structural joints, anchor tests where provided, membrane closure, thermal insulation system, completion of erection and pre-acceptance testing. Procedures and sampling are **[TO BE DEFINED]**.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53; Marconi, foundations S07B, single sheet

Art. 28 – Completion documents

The contractor shall deliver as-built drawings, panel and component lists, declarations and qualification documents, inspection reports, photographs of joints, resolved non-conformities, use and maintenance manuals, inspection plans and the documents required for final acceptance testing.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53; Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate)

Art. 29 – Environmental protection and CAM edilizia

The minimum environmental criteria actually relevant to the procedure shall be applied, according to the rules applicable to the design and to its validation date. The tender documents shall identify the specific criteria, verification documents, responsibilities and production stage. It shall not be assumed that PEFC certification alone documents every CAM requirement.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Bologna, Polo Dinamico ST-D 03, single sheet; Bologna, Polo Dinamico ST-D 04, single sheet; Bologna, Polo Dinamico ST-D 05, single sheet

Art. 30 – Measurement and accounting

For CLT walls, the price list shall specify whether measurement is per m² of net/gross area, per m³ of timber or lump sum, and the treatment of openings, special pieces, waste and included accessories. It shall be stated whether hold-downs, connectors, membranes, ETICS and lining walls are included or paid separately. Double accounting shall be avoided.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, panel list S08A, single sheet; Marconi, panel list S09A, single sheet; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 31 – Variations and substitutions

Any change of product, layers, thicknesses, connectors, spacings, openings or build-up requires comparative documentation and the authorisations provided for in the contract, including any verifications by the structural designer, the fire safety professional and the DL.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate); Marconi, structural details S10A, single sheet; Marconi, structural details S11A, single sheet; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Art. 32 – Handover, maintenance and technical warranties

The contractor shall deliver instructions for keeping the panels dry and for inspecting accessible anchors, joints, seals, roofs and base courses; it shall provide procedures in the event of water ingress, fire, impact or changes of use, stating the limits of interventions permitted without a designer.

Mandatory project-specific specifications: [performance/drawing reference/requirements and acceptance test, to be completed where relevant].

Document references examined: Marconi, details booklet A11B, pp. 2–9; Marconi, architectural report AR1B, pp. 8–12; Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

Chapter II – Work specification sheets

Sheet ST-01 – Overview of the structural system

Technical context drawn from the sources: The cross-laminated solid timber panel system can perform load-bearing and bracing functions, with behaviour depending on layer orientation, openings and, above all, the design of the connections. The Marconi school is a single-storey building with load-bearing walls and X-LAM floors supported on glulam beams; the Polo Dinamico in Bologna instead shows a distribution of walls across several structural units.

Suggested operational requirement: Load-bearing walls, infill walls and panels with a bracing-only function shall not be automatically treated as equivalent: plans and calculation reports define their roles.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: SR1B,BO03,BO04,BO05.

Sheet ST-02 – Structural material and panel composition

Technical context drawn from the sources: In the Marconi case, the materials report specifies 120 mm cross-laminated glued board panels in three layers 40+40+40, C24 timber according to UNI EN 338, as well as GL24h glued laminated timber. Lists S08A and S09A show panels identified by M. codes and located along the design gridlines. The Polo Dinamico specifies 16 cm X-LAM panels: this is an example of a different design solution, not a minimum requirement.

Suggested operational requirement: Specify geometry, composition, material class, declared product performance, orientations, CNC machining, openings, tolerances, joints and the performance required by the calculations, without always prescribing 12 or 16 cm.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: SR2A,S08A,S09A,BO03.

Sheet ST-03 – Identification, traceability and control of materials

Technical context drawn from the sources: SR2A refers to qualification under the NTC 2018 (Italian technical standards for construction) and to appropriate marking or equivalent documentation. The Bologna drawings contain documentary requirements regarding CE marking, ETA/EOTA and PEFC: these wordings, dating back to the design, shall be checked against current regulations and linked to the actual qualification route of the product.

Suggested operational requirement: For each panel, verify manufacturer, batch, intended use, technical assessment document where relevant, declaration of performance and correspondence with the erection list. It shall not be taken for granted that every CLT panel is always covered by a harmonised standard.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: SR2A,BO03,BO04,BO05.

Sheet ST-04 – External wall build-up

Technical context drawn from the sources: The Marconi wall schedule provides, for some E1/E2 walls, a 12 cm X-LAM wall with an external thermal insulation system of dual-density rock wool boards, 14 cm thick, stated λ 0.035 W/(m·K), reaction-to-fire class A1 for the insulation, mechanical fixings, adhesive/base coat and silicone finish. Special reveal details with 4 cm high-density insulation are provided. Variants with 10 cm and 5 cm thickness exist for specific areas, to be read on the wall schedule.

Suggested operational requirement: Define the insulation system as a verified system (compatibility, anchors suitable for timber substrates, wind resistance, details at reveals, base course, joints, water). Avoid requiring a brand named in the historical design.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: A09A,AR1B.

Sheet ST-05 – Internal lining walls and finishes

Technical context drawn from the sources: Wall schedule A09A and report AR1B document lining walls on metal framing with mineral insulation panels, dry-lining boards and impact-resistant paints. In the school, non-load-bearing self-supporting internal walls with double boards on each side and insulation infill are described. Finishes are related to the school's intended uses.

Suggested operational requirement: Finishes shall meet acoustic, fire, impact, building services, moisture and maintenance requirements; the structural panel shall not be drilled arbitrarily for installations.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: AR1B,A09A.

Sheet ST-06 – Hygrothermal performance and airtightness

Technical context drawn from the sources: The X-LAM panel and the thermal insulation system form a layered system: performance shall be verified on the build-up and at the junctions. Interruption of waterproofing and airtightness at joints, anchors, windows and doors and service penetrations is a critical point.

Suggested operational requirement: Design the continuity of the airtight layer, hygrothermal verification according to site conditions, vapour management and control of thermal bridges; do not state U or Sd values not contained in the sources.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: A09A,A11B,AR1B.

Sheet ST-07 – Wall acoustics

Technical context drawn from the sources: The wall schedule shows at least one wall with a minimum sound reduction index Rw of 62 dB, contextualised within the project wall schedule: this does not equate to a guaranteed performance of every X-LAM wall. Junctions, lining walls and penetrations may reduce in-situ performance.

Suggested operational requirement: Distinguish between the laboratory performance of the system and the in-situ passive acoustic requirements, including joints, decoupling layers and building services.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: A09A,S11A.

Sheet ST-08 – Fire resistance and reaction to fire

Technical context drawn from the sources: In the Marconi wall schedule, the rock wool thermal insulation is stated as Euroclass A1; the reaction-to-fire performance of the insulation does not by itself demonstrate the fire resistance of the composite wall. Lining walls and protections may be essential components of the required performance.

Suggested operational requirement: Require a fire safety design, classification of the wall or an admissible verification method, continuity of protections and sealing of penetrations; assess charring and connections.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: A09A,AR1B.

Sheet ST-09 – Base connection, plinth and moisture

Technical context drawn from the sources: AR1B describes a 30×18 cm plinth topped by a ventilated curb to keep the timber away from moisture. A11B shows, in the base connection details, a waterproofing membrane with an upstand on the X-LAM panel of minimum height 30 cm. The solution is project-specific and shall be verified for thermal bridges and service conditions.

Suggested operational requirement: Provide a capillary break, drainage, separation from the ground, continuity with thresholds and thermal insulation systems, mechanical protection of membranes and accessibility for inspection.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: AR1B,A11B,S07B.

Sheet ST-10 – Timber-to-foundation connections: tension and shear

Technical context drawn from the sources: S07B shows separate tension and shear anchors; for the tension detail, an HD1-type hold-down 130×340 mm is specified, with 24 LBA Ø4×60 nails, M16 8.8 rod, 17 mm hole and 400 mm anchorage; distance from the wall end 15 cm. For shear anchors, families B1–B4 are described with numbers of nails and rods related to the panel length. These are design examples only.

Suggested operational requirement: Size the anchor and substrate according to actions, distances, actual depths, concrete cracking, seismic design, installation conditions and the anchor's technical data sheets; survey the actual position of the reinforcement bars.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: S07B,SR2A.

Sheet ST-11 – Wall-to-wall connections

Technical context drawn from the sources: S11A shows details for butt, corner and T-joints. For one drawn solution, pairs of VGZ 9×160 screws at 150 mm spacing are shown; other connections use 9×240 with specific spacings. The drawings distinguish plan and elevation to highlight the axes and orientation of the elements.

Suggested operational requirement: Design shear, tension and rotation transfer and deformation compatibility; specify screws by type, direction, spacing, edge distances, pre-drilling where provided, and execution inspection.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: S11A.

Sheet ST-12 – Wall-to-floor and floor-to-floor connections

Technical context drawn from the sources: S11A contains connections between X-LAM floor and X-LAM panel with VGZ 9×280 screws at 250 mm spacing for the solutions shown, floor-to-floor joints with VGZ Ø9×160 screws at 200 mm spacing and floor-to-beam connections with Ø9×240 at 300 mm spacing. An acoustic decoupling layer is shown at some junctions.

Suggested operational requirement: Verify diaphragm behaviour, forces along the edge and stress concentrations, sliding, uplift and installation of the decoupling layer without altering the structural behaviour.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: S11A,S10A.

Sheet ST-13 – Glulam beam to X-LAM wall connection

Technical context drawn from the sources: S10A shows AluMIDI 120 hangers or equivalent (with an example of 3 STA Ø12×120 dowels and 22 LBA Ø4×60 nails), orthogonal and parallel connections, local reinforcements and HBS 8×240 screws. Connection types and reinforcement layouts change with the size and orientation of the beam.

Suggested operational requirement: Hardware shall be taken from the detailed structural design: verify strength, deformability, corrosion, installation and grain orientation, and avoid equivalences based on geometry alone.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: S10A,SR2A.

Sheet ST-14 – Steel components and protection

Technical context drawn from the sources: SR2A cites S355 steel for plates, 8.8 bolts and rods, hold-down components, perforated straps, plates and hangers; it attaches catalogue data sheets for screws and connections. Catalogue characteristics do not replace calculations for the specific combination of actions.

Suggested operational requirement: Define the design corrosivity class, coatings, material compatibility, exposure, inspectable cavities, identification documents and tightening checks where prescribed.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: SR2A,S07B,S10A,S11A.

Sheet ST-15 – Erection and prefabrication

tolerances

Technical context drawn from the sources: Lists S08A/S09A identify each panel by M. designations and give positions, overall dimensions, levels and openings. Correct correlation between list, piece numbering, loading plan and erection limits geometric errors and unauthorised on-site modifications.

Suggested operational requirement: Require verified shop drawings, transport plans, numbering, lifting points, finished dimensions, explicit tolerances, and inspection before the connections are fixed.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: S08A,S09A,S07B.

Sheet ST-16 – Logistics, storage, lifting and safety

Technical context drawn from the sources: Prefabricated panels require protection from rainwater and standing water, ventilated packaging, supports raised off the ground and conditions compatible with the lifting device; they shall be stabilised during erection and before the diaphragms are closed.

Suggested operational requirement: Erection plan, wind checks, temporary propping and loading sequence; coordination with the safety plan and the role of the responsible parties.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: S08A,S09A,TAS.

Sheet ST-17 – Windows, doors and sills

Technical context drawn from the sources: A11B, p. 2, shows the ground-level window/door frame detail: 3 cm stone sill, 9 cm under-sill screed, waterproof membrane with an upstand on the X-LAM of at least 30 cm, and the stated surface slope. The detail shall be read together with the floor level and the façade system.

Suggested operational requirement: Continuity of water/air/vapour control and drainage is a priority; provide a frame fixing detail independent of the finish alone, tests/inspections and the junction with the thermal insulation system.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: A11B,A09A.

Sheet ST-18 – Roof and parapet

Technical context drawn from the sources: AR1B shows a flat X-LAM roof with vapour retarder, 8+8 cm rock wool and aluminium metal roof covering, 2% covering slope with adjustable supports and anti-condensation felt. S11A shows a parapet anchorage in a 12 cm X-LAM panel.

Suggested operational requirement: Verify condensation, ventilation, wind-loaded fixings, thermal movement of the covering, rainwater outlets, joints and protection of panel edges.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: AR1B,S11A,A11B.

Sheet ST-19 – Service penetrations and openings

Technical context drawn from the sources: The foundation drawing S07B shows holes for service penetrations. For above-ground panels, holes and provisions shall be coordinated before cutting, preserving resisting strips and connections.

Suggested operational requirement: Every new opening or structural chase requires verification/authorisation; provide documented upstands, sleeves and fire and acoustic seals.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: S07B,SR1B.

Sheet ST-20 – Testing, inspections and maintenance

Technical context drawn from the sources: The Tassoni CSA contains documentary rules and inspections for prefabricated/timber structures; it also contains outdated references, which shall not be reproduced verbatim. Acceptance tests, anchor inspections and completion documentation shall be consistent with current standards and the current inspection plan.

Suggested operational requirement: Establish hold points, photographic records of junctions before closure, moisture verification reports, connections, traceability, as-built documents, and an inspection plan following water ingress or modifications.

Contract data to be specified: [product type] [performance] [quantity and unit of measurement] [detail drawing] [verification/check] .

References: TAS,SR2A,S07B,S11A.

Chapter III – Forms to be completed

Panel acceptance register

Panel code	Batch / manufacturer	Documents	Condition/moisture	DL outcome
[]	[]	[]	[]	[]
[]	[]	[]	[]	[]
[]	[]	[]	[]	[]
[]	[]	[]	[]	[]

Panel code	Batch / manufacturer	Documents	Condition/moisture	DL outcome

Joint inspection register

Detail/drawing	Hardware	Spacings/distances	Photo/report	Outcome

Tests and verifications matrix

Stage	Check	Method/frequency	Responsible party	Outcome

Measurement table

Work item	Unit	Inclusions	Exclusions	Price list

Chapter IV – Sample price list items, to be completed

- Supply and installation of X-LAM structural wall panels: including any CNC cuts, lifting and fixings expressly provided for [specify unit and waste] .
- Supply and installation of hold-downs and anchors with plates/rods: including substrate preparation, tests/inspections where provided [specify per piece or lump sum] .
- Supply and installation of seals and air/vapour tightness tapes at joints, with surface preparation and continuity at junctions [linear m] .
- Supply and installation of an external thermal insulation system suitable for X-LAM, complete with fixings, reinforced base coat, system accessories and finish [m²] .
- Supply and installation of an internal lining wall on framing, insulation, boards, joint treatment and finish [m²] .
- Supply and installation of base connection protection, membranes/upstands and profiles, with continuity check [m or lump sum] .

Chapter V – Regulatory framework and notes for the contracting authority

NTC 2018 (D.M. – Ministerial Decree – 17 January 2018), Circular No. 7 of 21 January 2019; D.Lgs. 36/2023 (Italian Public Contracts Code) as amended; CAM edilizia, D.M. 24 November 2025 (in force from 1 February 2026, with application and transitional rules to be verified); Regulation (EU) 2024/3110 on construction products, progressive application. The attached sources partly come from 2014 and 2020 projects: the references in those documents are not automatically updated.

Official sources: https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.codiceRedazionale=25A06516&atto.dataPubblicazioneGazzetta=2025-12-03 ; <https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:02024R3110-20241218>

Annex – Traceability index

Code	Original attached document
AR1B	Marconi, architectural report AR1B, pp. 8–12
A09A	Marconi, wall schedule A09A, single sheet
A11B	Marconi, details booklet A11B, pp. 2–9
SR1B	Marconi, structural report SR1B, pp. 2–9
SR2A	Marconi, materials report SR2A, pp. 2–4 (subsequent commercial annexes kept separate)
S07B	Marconi, foundations S07B, single sheet

Code	Original attached document
S08A	Marconi, panel list S08A, single sheet
S09A	Marconi, panel list S09A, single sheet
S10A	Marconi, structural details S10A, single sheet
S11A	Marconi, structural details S11A, single sheet
B003	Bologna, Polo Dinamico ST-D 03, single sheet
B004	Bologna, Polo Dinamico ST-D 04, single sheet
B005	Bologna, Polo Dinamico ST-D 05, single sheet
TAS	Castelfranco Emilia, Tassoni school, CSA 2014, Arts. 43–49, pp. 41–53

XLAM.com services

Prefabricated X-LAM (CLT) timber structures, from the first estimate to installation. We work with private clients, contractors, designers and public clients in three ways.

Construction

The X-LAM structure supplied and installed, as a shell or turnkey.

- Shop drawings and panel lists
- CNC-cut production
- Transport, protected storage and installation
- Documentation for acceptance and maintenance

Consulting

The right technical decisions before they turn into site costs.

- Feasibility and comparison of solutions
- Joints, base connection, envelope, fire and acoustics
- Specifications, price lists, inspection plans
- Support to works supervision and acceptance

Partnership

Long-term cooperation with contractors, designers and producers.

- Supply-and-install subcontracting
- Joint bids for Italian public tenders
- Supply and network agreements
- Entry into the Italian market for foreign producers

Who we work with

Private clients

New house, extension or added storey with a clear cost before you start.

Designers

Preliminary sizing, joints, product specifications, editable specification.

Contractors

Supply and installation as subcontractor, joint tenders, bid support.

Public clients

Model specification in Word, technical information, preliminary market consultations.

How we work



Request



Free assessment



Quote



Design and
production



Installation and
handover

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Contact person

Phone

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Your request * (type of project, location, timing)

Profile

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Service of interest

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Construction

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Consulting

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Partnership

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