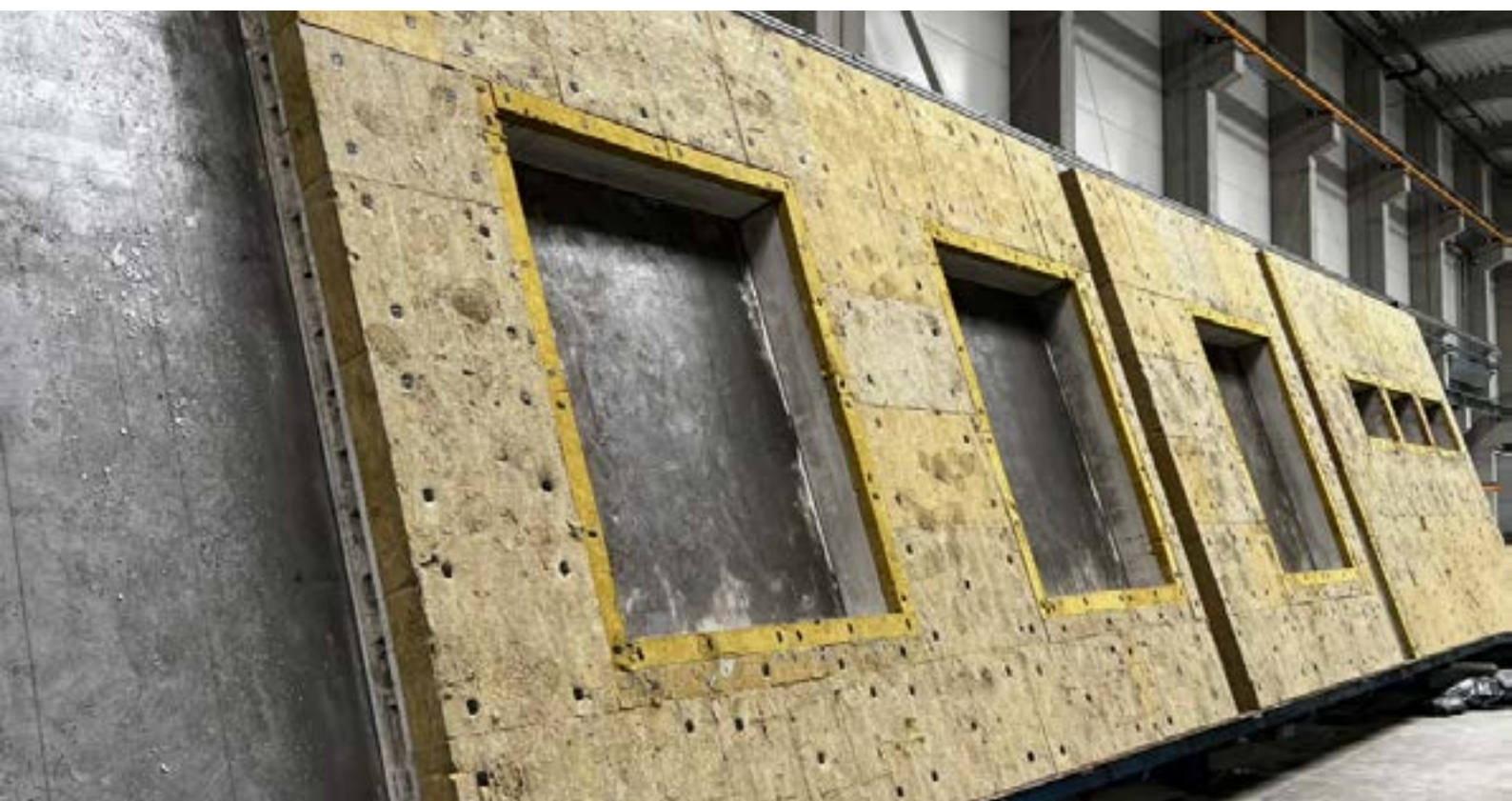


Technical catalogue

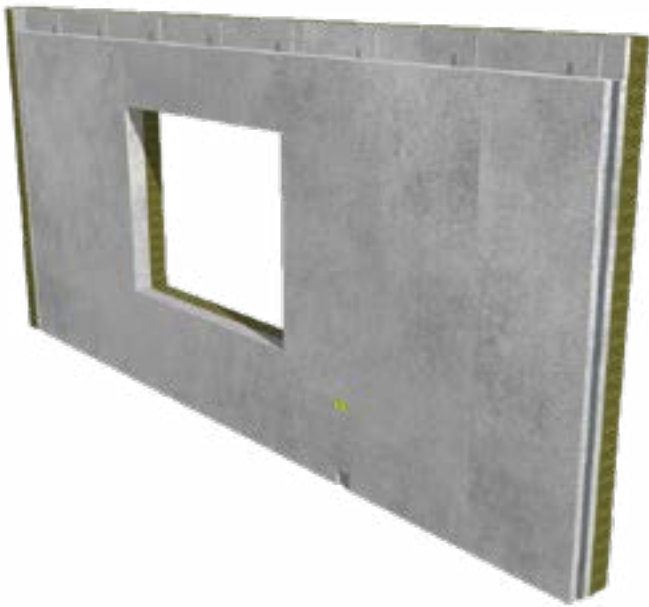
Designer's handbook – two-layer walls



SOLID WALLS WITH INSULATION

TWO-LAYER PRECAST UNITS

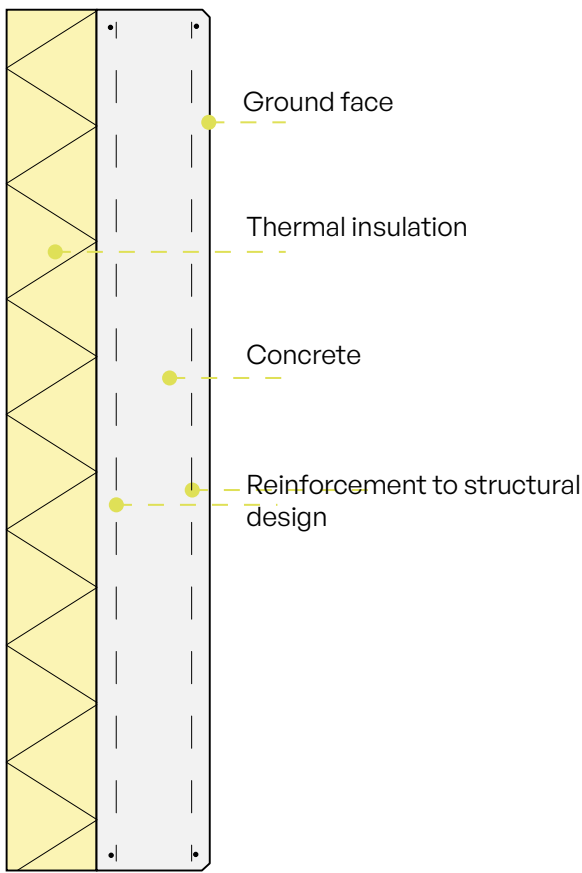
A half-sandwich wall consists of a load-bearing inner concrete leaf 150 mm thick and an insulation layer up to 300 mm thick. Expanded polystyrene (EPS) insulation is used as standard; it is resistant to rain and moisture. Versions with mineral wool and with high-performance insulation (PIR) are also available. On site the half-sandwich wall is completed with an outer layer of brick, board material or render. It is recommended that polystyrene insulation be topped with a layer of mineral wool before rendering, which improves the quality of the render coat. Half-sandwich walls are designed individually for each project, in various heights and lengths. They can be supplied with cast-in boxes and electrical conduits and with openings for doors and windows to the client's requirements.



Technical data:

Maximum element dimensions	3,85 x 9,00 m
Element thickness in cm	10, 12, 15, 18, 20, 24
Concrete class	LC12/13 D1.4 or higher C20/25 or higher
Surface	Smooth surface on the formwork face (DF), the other face mechanically ground (GF) – orange-peel effect.
Available insulation materials	EPS, XPS, PIR, mineral wool;
Thermal transmittance U:	≥ 0,2 [W/m2 x K]
fire resistance	R60-R240 , EI30-EI60
sound reduction index Rw	≤50 dB

Technical drawing



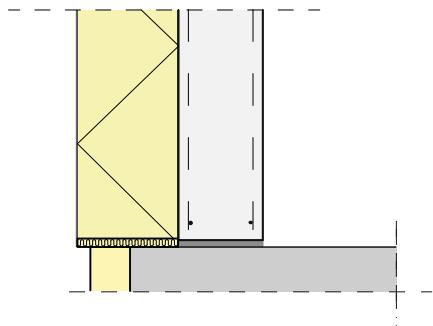
Below are examples of technical solutions for typical connections used in precast concrete systems. The details cover both the ways of seating precast walls on the foundation slab and the options for connecting walls to one another in three dimensions.

Various installation methods are covered – from standard bearing on grout, through solutions with a step, to dowelled systems that increase the load-bearing capacity and stiffness of the structure.

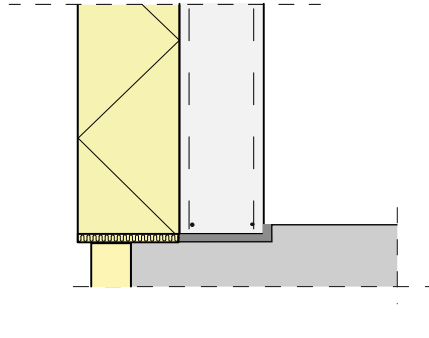
The set of wall connections includes the most common corner configurations and T-junctions – including variants with additional fixing components that improve tightness and ease installation.

Connections of precast units to the foundation slab

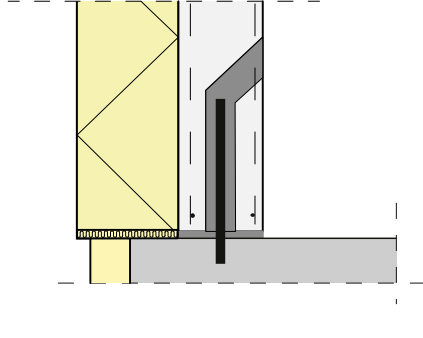
on grout



with grout and a step on the slab

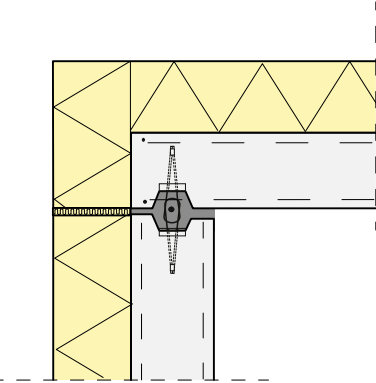


dowelled

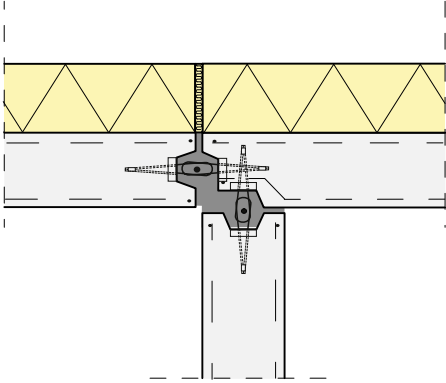


Connections of precast wall units

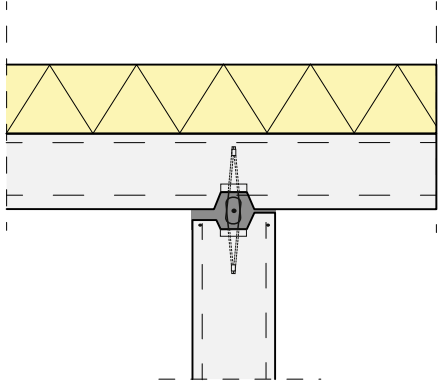
corner



type T – junction of three walls



type T – with a batten



Element surfaces

Floated surface



Ground surface



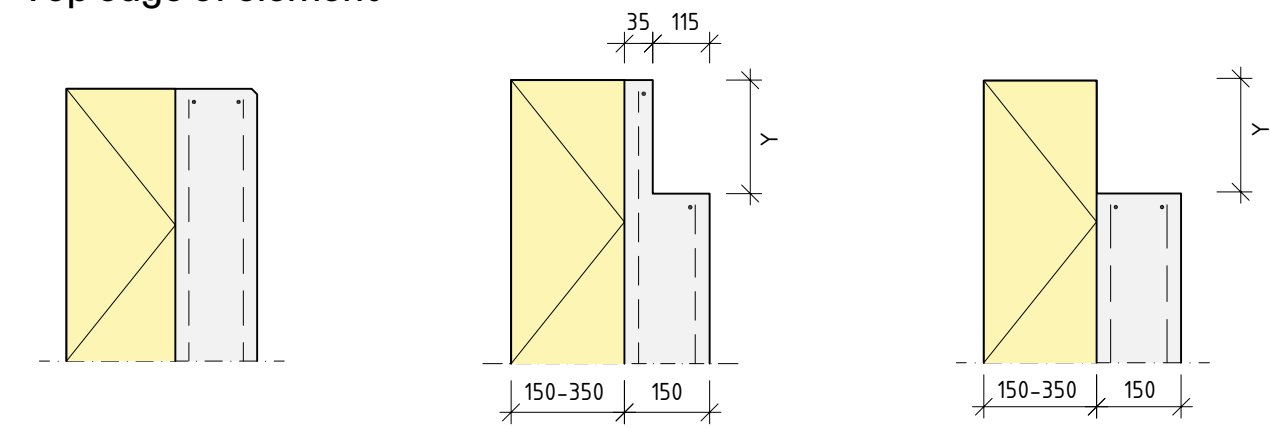
Formwork face surface



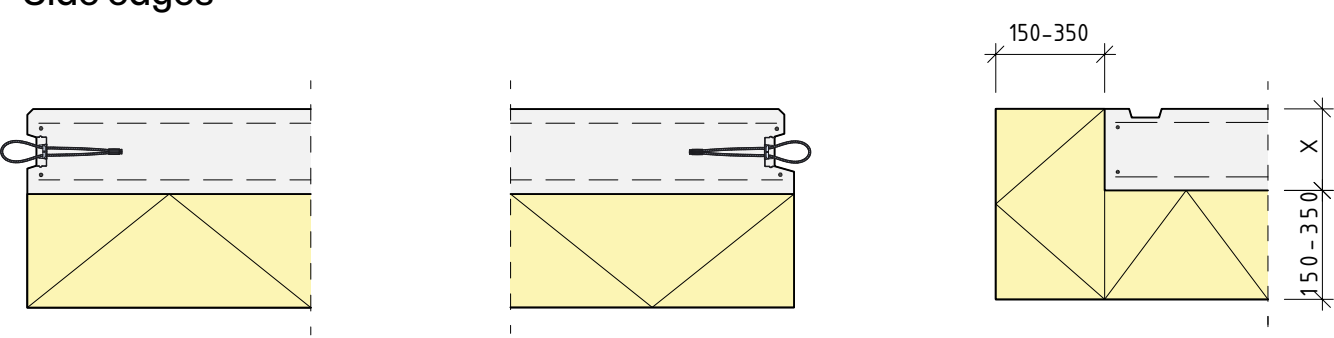
SOLID WALLS WITH INSULATION

TWO-LAYER PRECAST UNITS

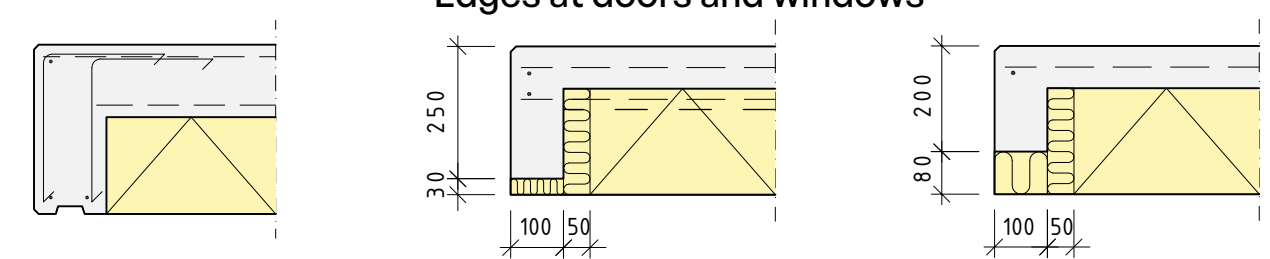
Top edge of element



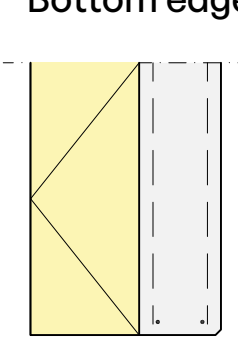
Side edges



Edges at doors and windows



Bottom edge of element



Thermal insulation of layered walls

The table gives the minimum thermal transmittance values U [W/m^2K] for layered walls required to meet thermal protection requirements. The summary covers various concrete classes, their bulk density and thermal conductivity λ , as well as the type and thickness of the thermal insulation used. The U values given cover typical material configurations, in line with standard requirements and with the design assumptions adopted for thermal bridges and the homogeneity of the element.

Concrete class	Density class [kg/m ³]	Type and thickness of insulation [cm]											
		Polystyrene / mineral wool $\lambda = 0,035 W/m^2K$			Polystyrene / mineral wool $\lambda = 0,032 W/m^2K$			PIR $\lambda = 0,023 W/m^2K$			Resol foam $\lambda = 0,022 W/m^2K$		
		18	20	22	18	20	22	12	16	18	12	16	18
LC16/18	D=1,6 $\lambda = 0,9 W/m^2K$	0,182	0,165	0,151	0,168	0,152	0,139	0,18	0,137	0,122	0,173	0,131	0,117
LC20/22	D=2,0 $\lambda = 1,1 W/m^2K$	0,183	0,166	0,152	0,169	0,153	0,139	0,181	0,138	0,123	0,173	0,132	0,118
C20/25	D=2,4 $\lambda = 2,0 W/m^2K$	0,185	0,168	0,153	0,17	0,154	0,14	0,183	0,139	0,124	0,175	0,133	0,119

Other provisions:

- All edges are chamfered 1 cm
- Special dimensions only to order
- Corbels only on the ground face
- Solid concrete wall panels are also used internally (load-bearing, stiffening) as facade, fire-resistant and sound-insulating panels. The panels are joined and fixed to supports or similar elements with special connectors. The visible face of the panel is not interrupted by the fixing; the other face is smooth
- Two-layer walls consist of a load-bearing leaf, thermal insulation and a facade leaf
- The type and thickness of insulation are selected to suit the thermal and acoustic requirements
- The leaves are connected as a system with stainless connectors (e.g. stainless steel anchors, composite connectors)
- The elements are provided with installation openings, lifting anchors and any spacer points
- Where fire requirements apply, the thickness of the load-bearing leaf is matched to the fire resistance class in accordance with PN-EN 1992-1-2
- Additional service boxes, ducts or a layer for fixing cladding can be provided
- The inner face can be left as fair-faced concrete or prepared for skim coating



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