

Technical catalogue

Designer's handbook – sandwich walls



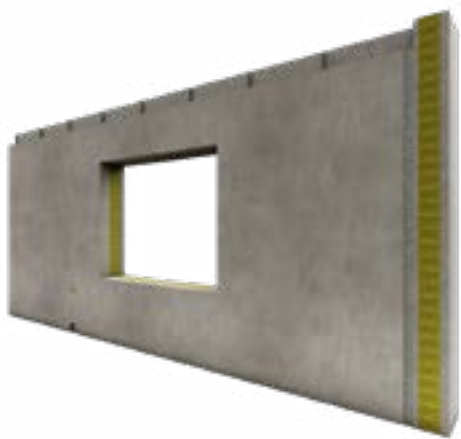
SANDWICH WALLS

TRIPLE-LEAF PRECAST UNITS

A layered wall is a well-insulated external concrete wall that can be produced with a range of finished surface textures to match the appearance of the building. It consists of a load-bearing inner leaf, an insulation layer and an outer leaf that is durable and maintenance-free.

The insulation can be up to 300 mm thick, which makes very low thermal transmittance (U) values achievable. A residential building constructed with layered walls is airtight, durable and provides good sound insulation.

A sandwich wall can also be designed to carry earth pressure. On request the wall can be supplied with cast-in electrical conduits and boxes and with windows already fitted.



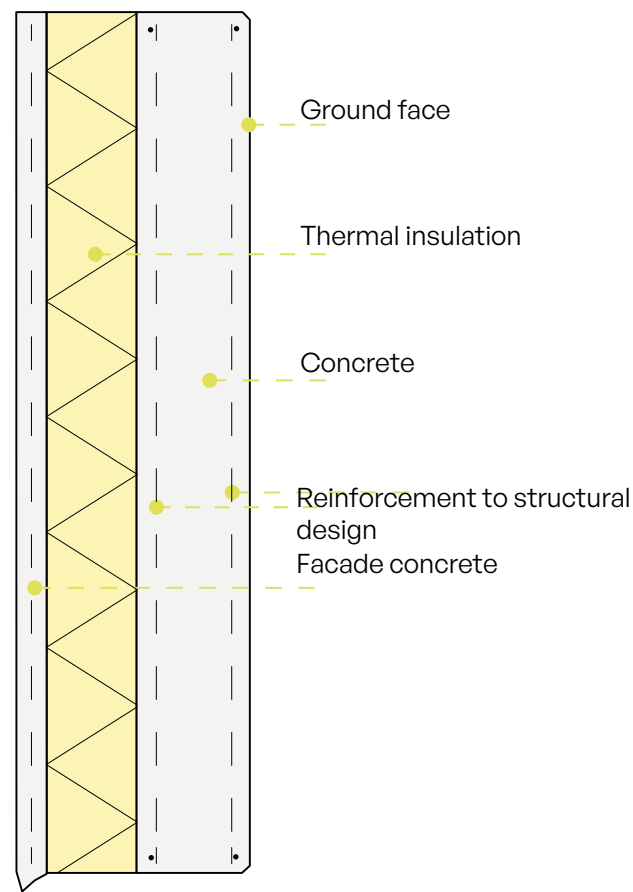
Technical data:

Maximum element dimensions	3,85 x 9,00 m
Element thickness in cm	Load-bearing leaf min. 15 cm, insulation to the client's specification, outer leaf 7 cm
Concrete class	LC20/22 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

Other provisions:

- All edges are chamfered 1 cm
- Special dimensions only to order
- Corbel 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
- For an optimal design, joints, formwork patterns and coloured concrete may be used; window, door and other recesses can be made to requirement.

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.

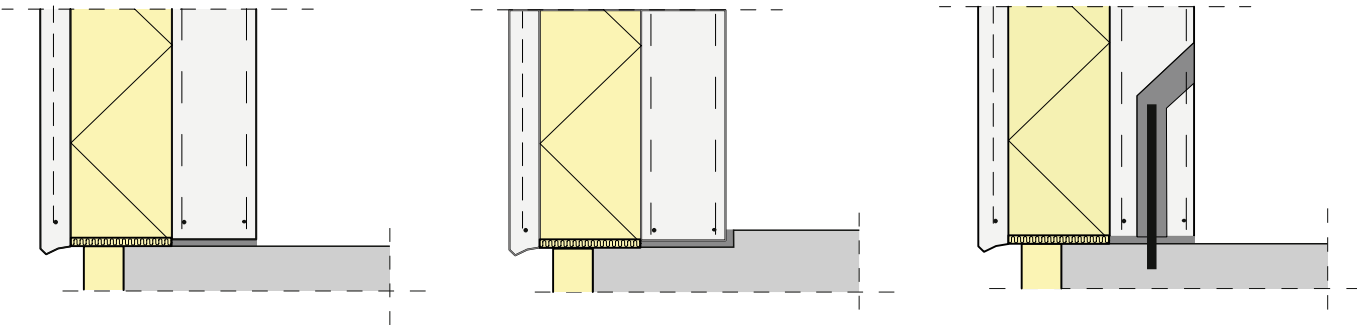
Various installation methods are covered – from standard bearing on grout, through solutions with a step, to dowelled systems that increase the load-bearing capacity and stiffness of the structure.

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

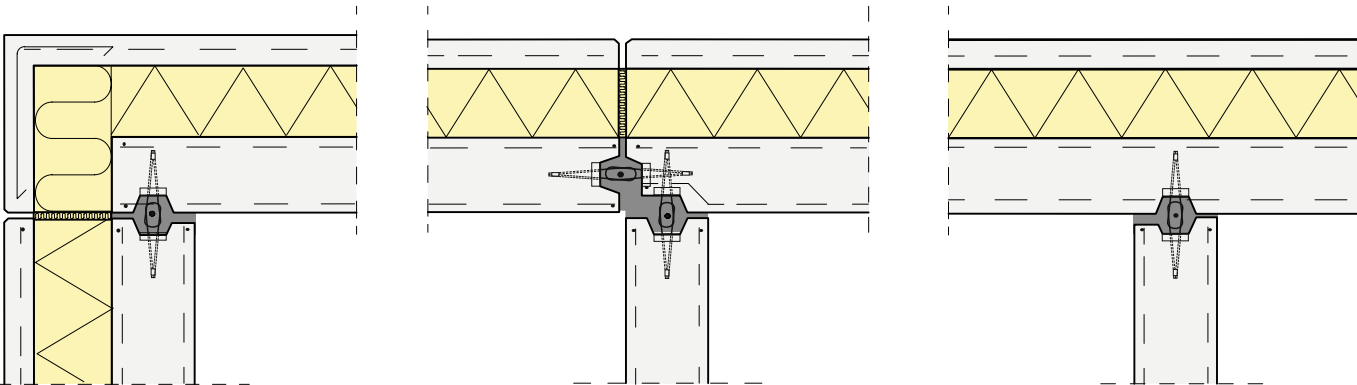
with grout and a step on the slab dowelled



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



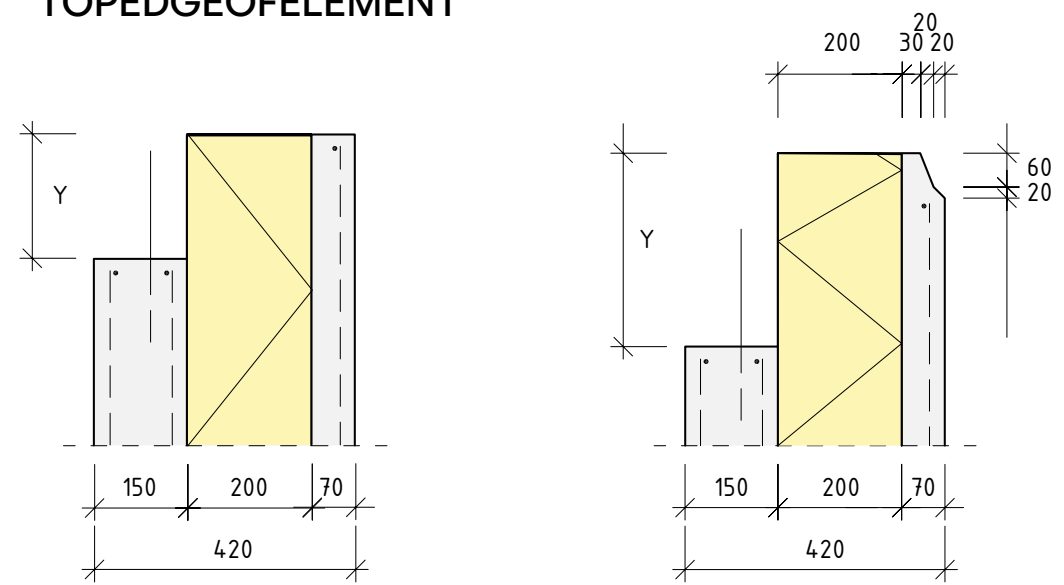
Washed surface



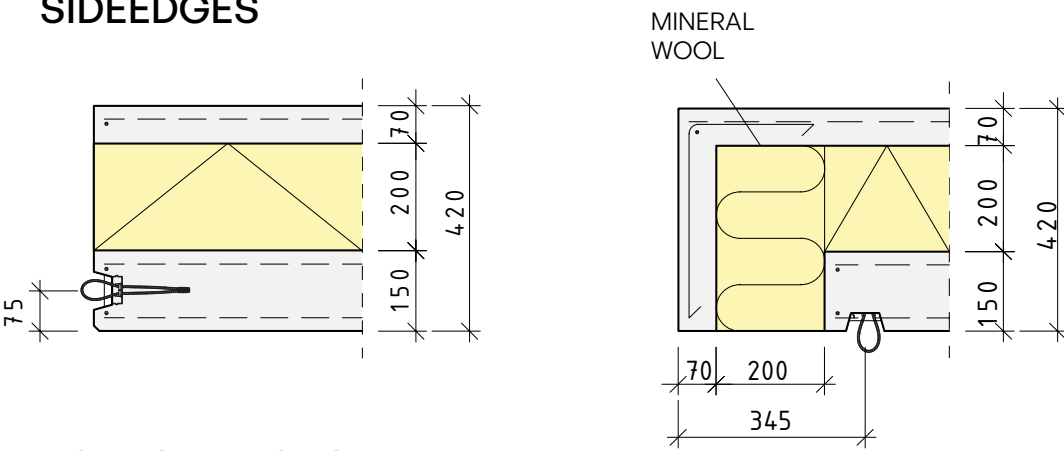
SANDWICH WALLS

TRIPLE-LEAF PRECAST UNITS DESIGN
DETAILS

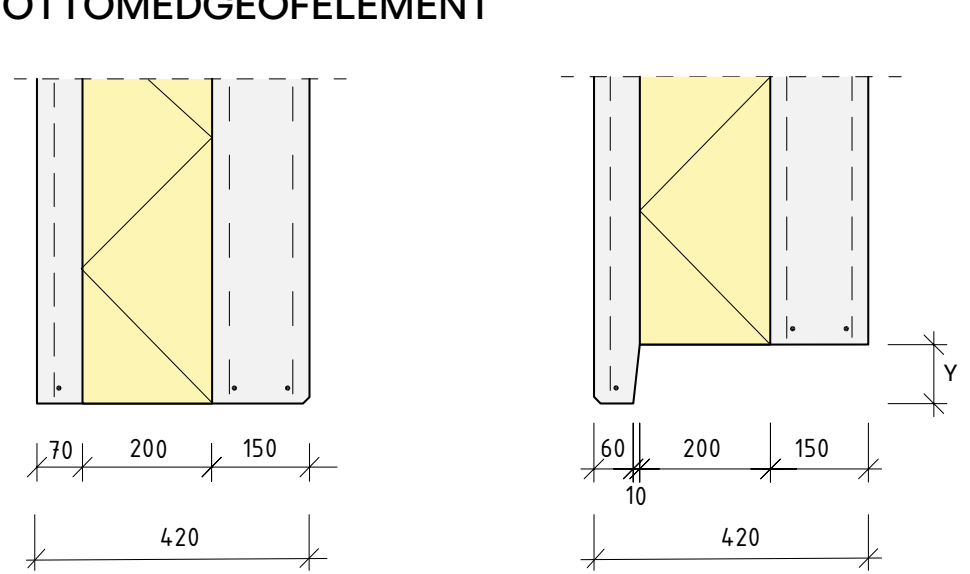
TOPEDGE OF ELEMENT



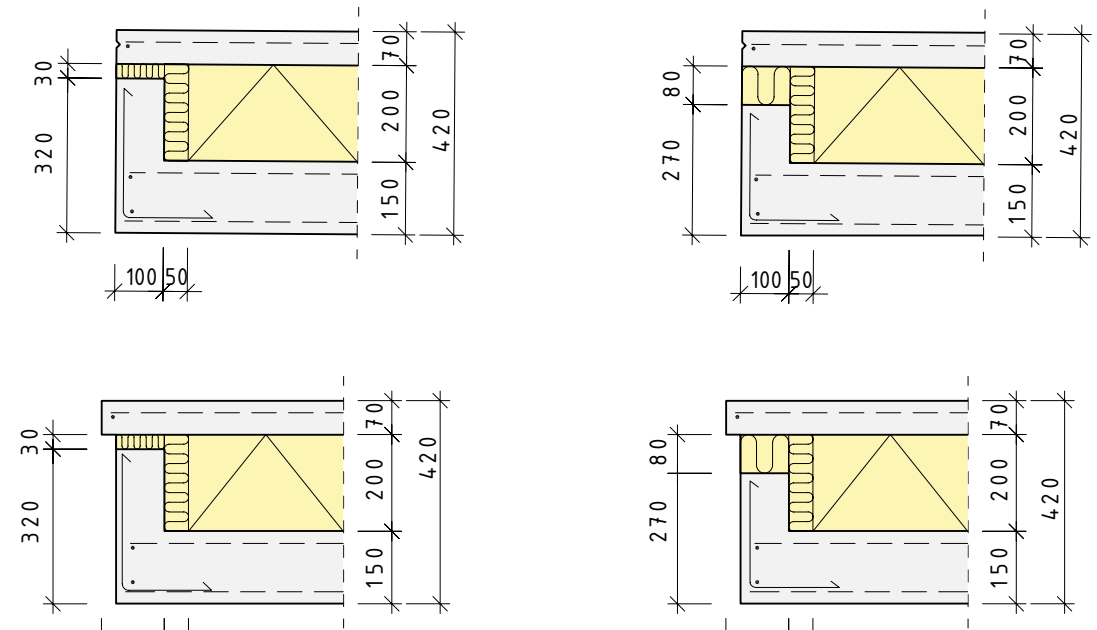
SIDE EDGES



BOTTOM EDGE OF ELEMENT



EDGES AT DOORS AND WINDOWS



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 $\lambda = 0,035 W/m^2K$			Graphite polystyrene $\lambda = 0,032 W/m^2K$			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	$D=2,0$ $\lambda = 1,1 W/m^2K$	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



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