



SITECH:UA

A UNIVERSAL INDUSTRIAL
CONSTRUCTION SYSTEM

November 2023

SITECH:UA System

The **SITECH:UA** system is the basis for the industrialization of the **restoration of the housing stock and social infrastructure** in Ukraine.

The **SITECH:UA** system allows the launch of a **large-scale network** of industrial building construction companies in Ukraine.

The system is a **modern development** that uses the **newest technologies and materials** and meets the requirements of **European standards for “sustainable development”** in construction.

SITECH:UA is fundamentally different from the old Soviet series of panel houses and is devoid of their shortcomings.

SITECH:UA System

The **SITECH:UA** system is based on a column-beam frame construction scheme and unsupported/self-supporting exterior walls, which makes the structure flexible and versatile and **optimizes the consumption of materials** used for the buildings' construction and the **cost of construction**.

The service radius of each **SITECH:UA** house-building plant can reach **250 km**, provided that ready-mixed concrete and precast concrete products are transported at a maximum distance of **50 km**. For this purpose, the **SITECH:UA** system was developed for use by matrix/mobile house-building plants.

SITECH:UA System

The **SITECH:UA** system is flexible and allows building both 1-2-storey private houses and 2-7-storey apartment buildings.

It is also possible to build administrative buildings and infrastructure facilities, such as kindergartens, schools, healthcare facilities, etc.

Reusable block section designs for 2-4 and 5-7-storey block sections should be developed for the entire network of house-building plants operating in the **SITECH:UA** system, which allows forming of residential blocks of any configuration.

The sections should be designed in such a way that they meet the thermal resistance and seismic requirements in any region of Ukraine.

Section designs should be developed with a variability of ground floors.

SITECH:UA System Structures

SITECH:UA system structures with a frame construction scheme:

- **Foundations** – an unburied monolithic slab of cell section



SITECH:UA System Structures

Sand cushion preparation

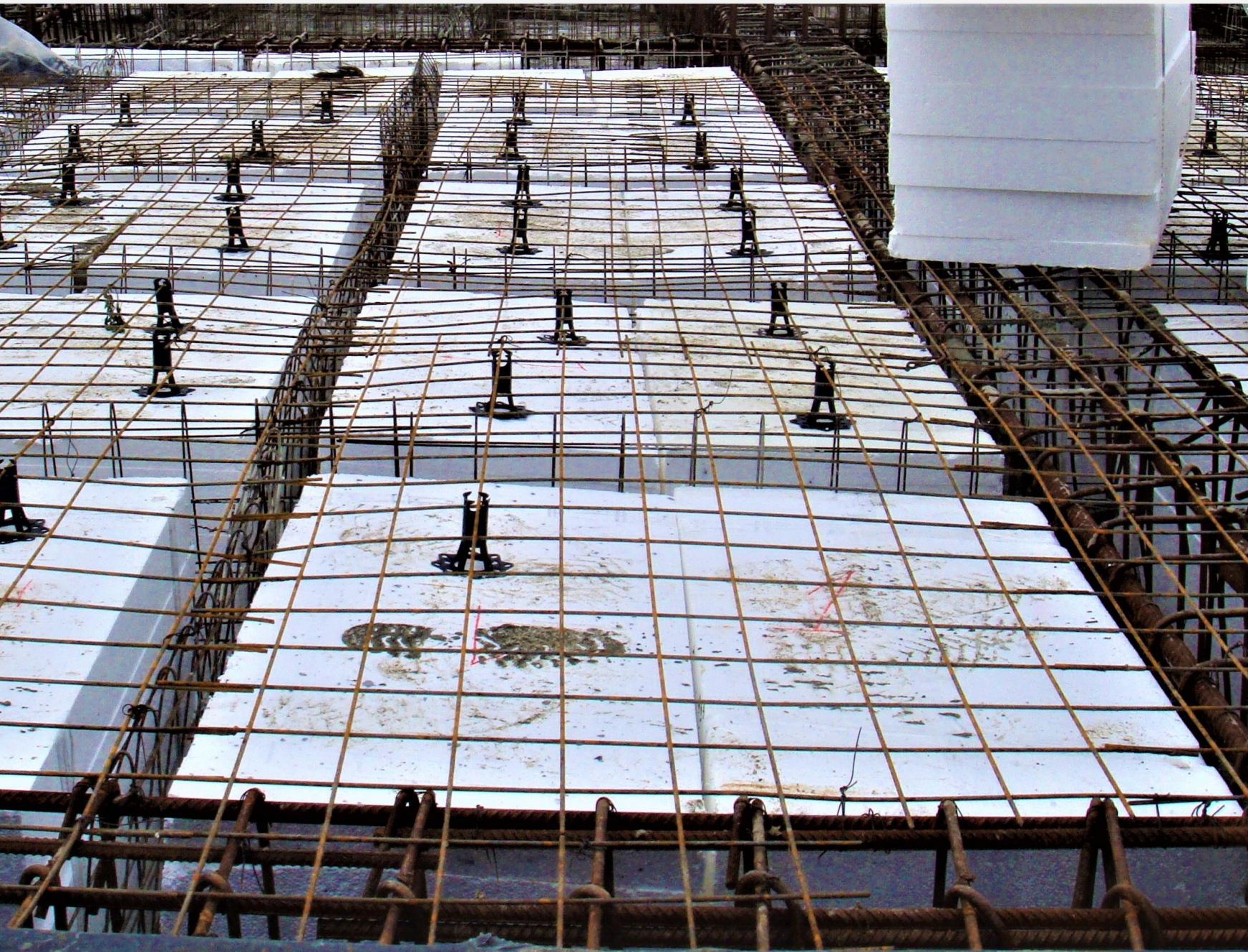


Reinforcement



SITECH:UA System Structures

Inlays



Pouring the concrete



SITECH:UA System Structures

Ready foundation



Surface treatment



SITECH:UA System Structures

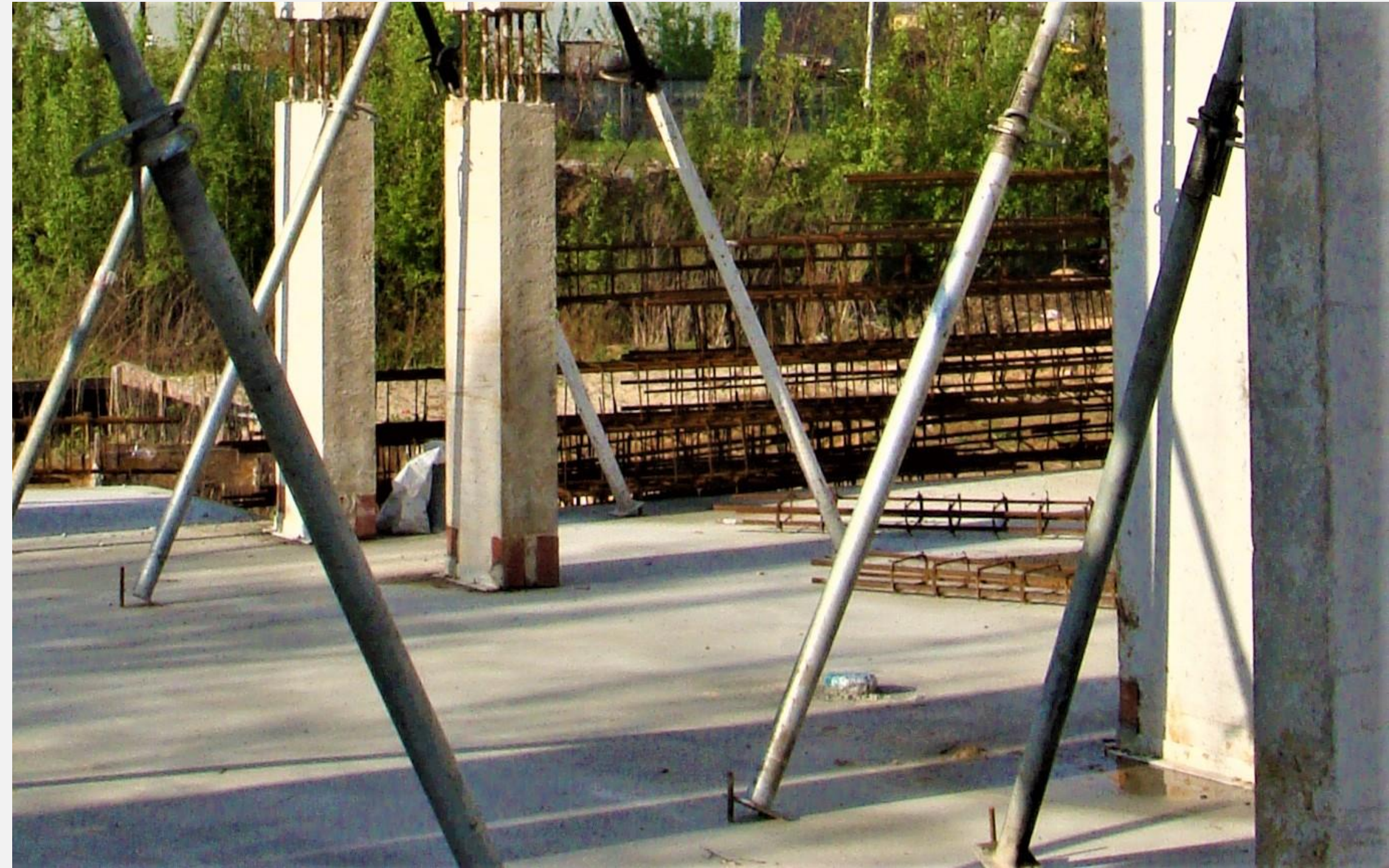
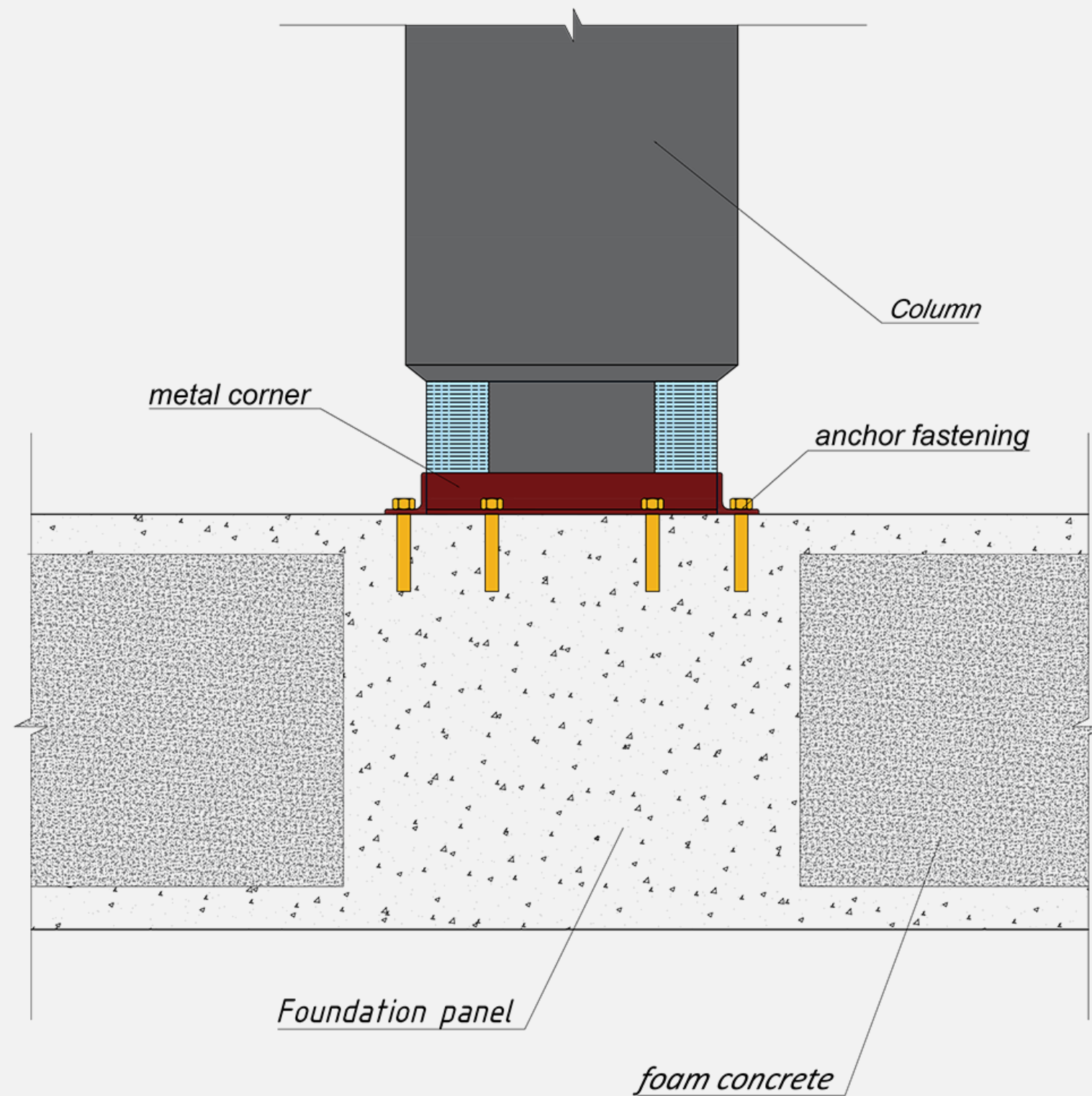
SITECH:UA system structures with a frame construction scheme:

- **The frame** is precast concrete multi-tier columns + precast concrete flat girders
- The structural stability of the framework is ensured by rigid frame nodes at the column-to-slab joints
- Cross-bars and columns are 200 mm thick
- Cross-bars are placed in the plane of the inter-apartment walls



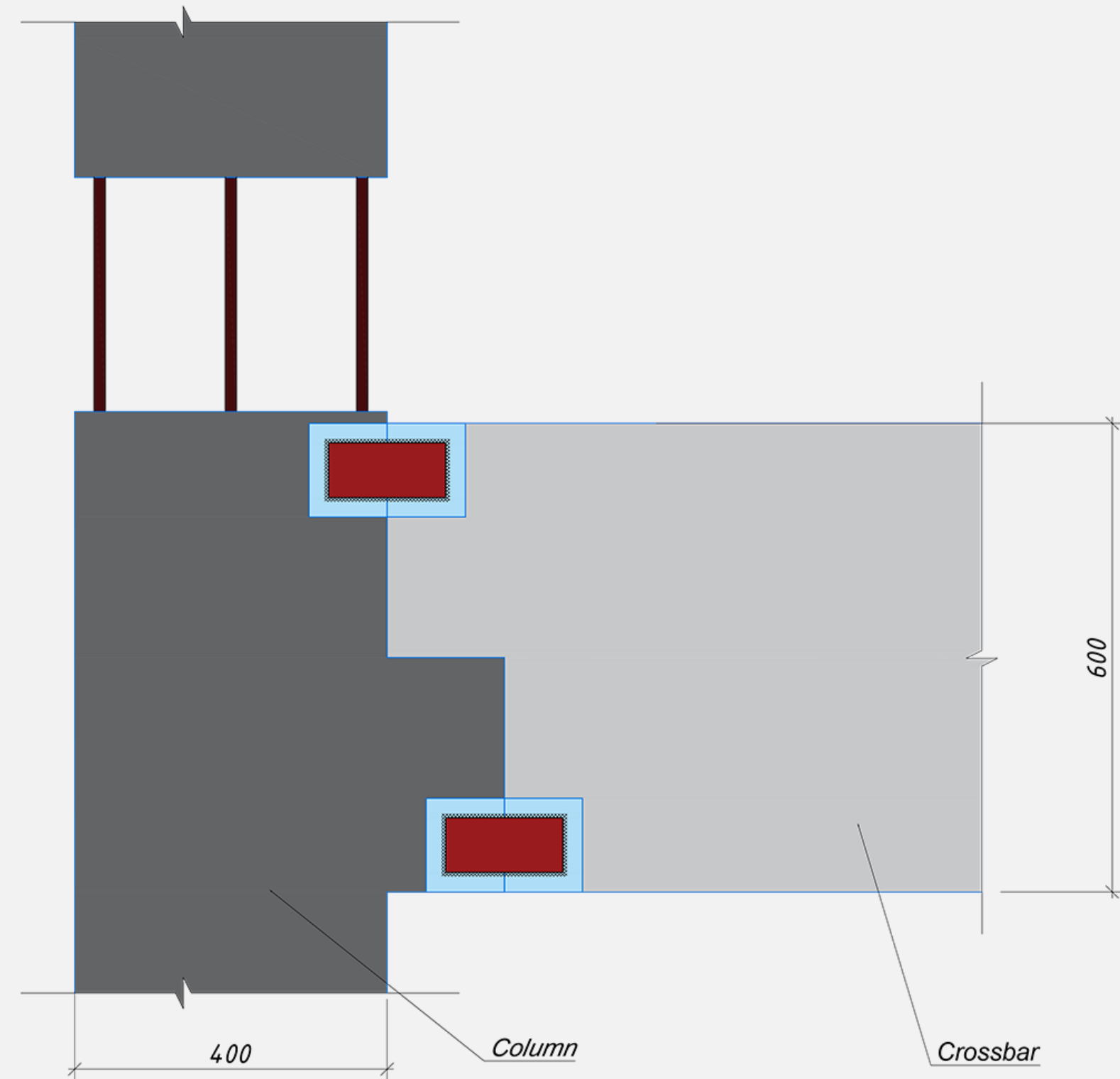
SITECH:UA System Structures

Detail of the joint between the column and the foundation



SITECH:UA System Structures

Detail of the crossbar-column joint



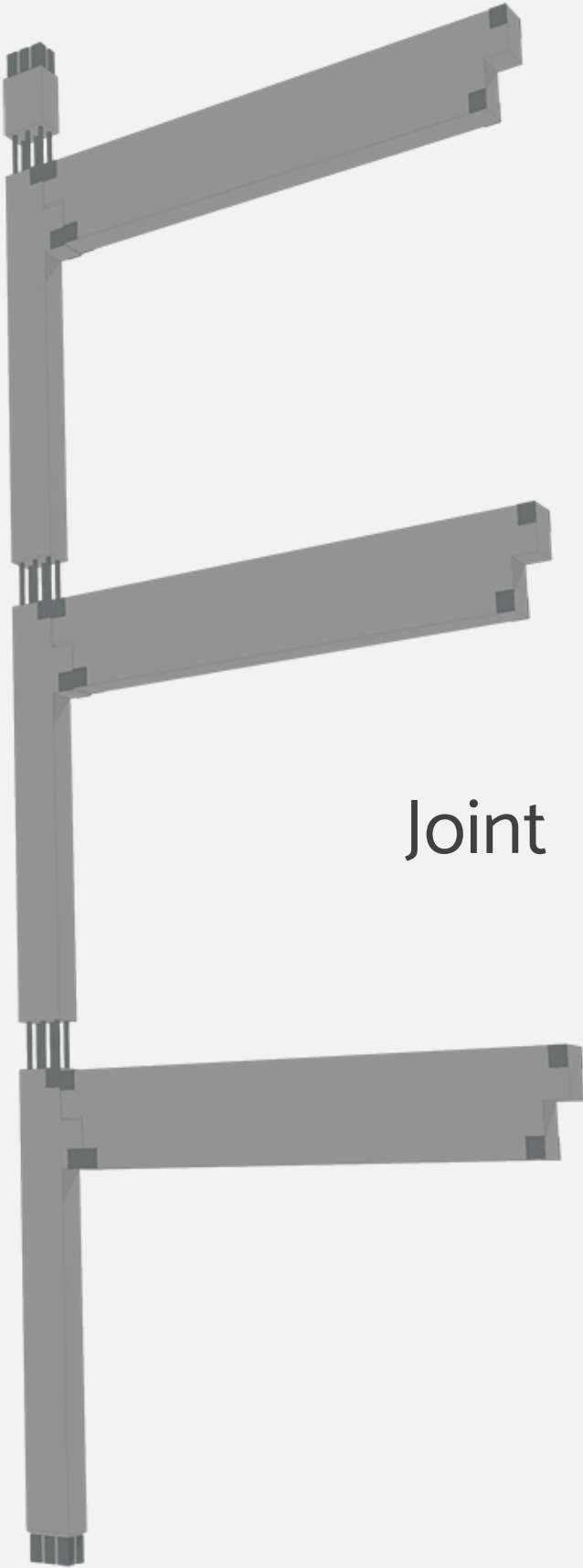
Detail of the height joint between the columns



SITECH:UA System Structures



Column



Joint



Cross-bar

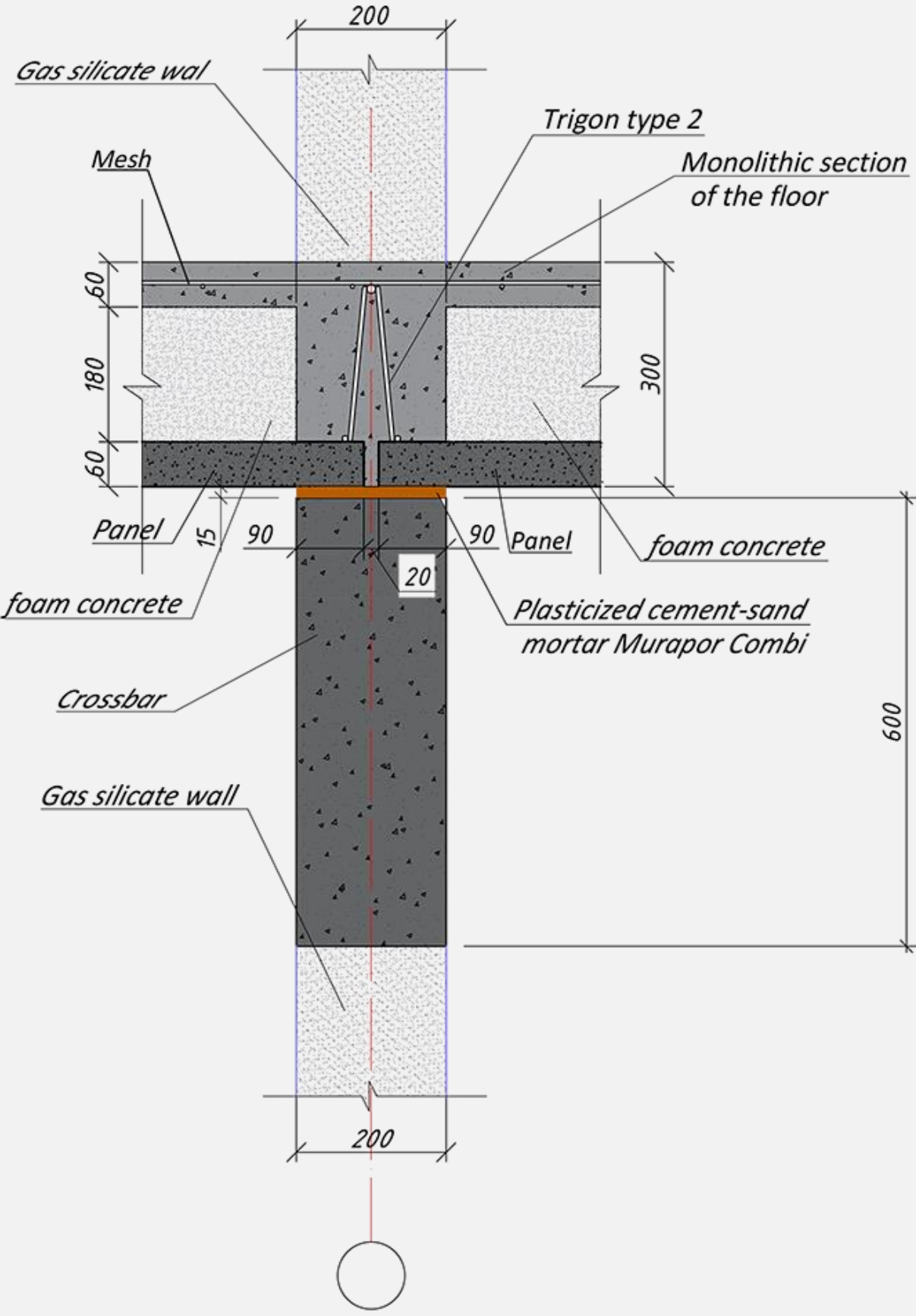
SITECH:UA System Structures

SITECH:UA system structures with a frame construction scheme:

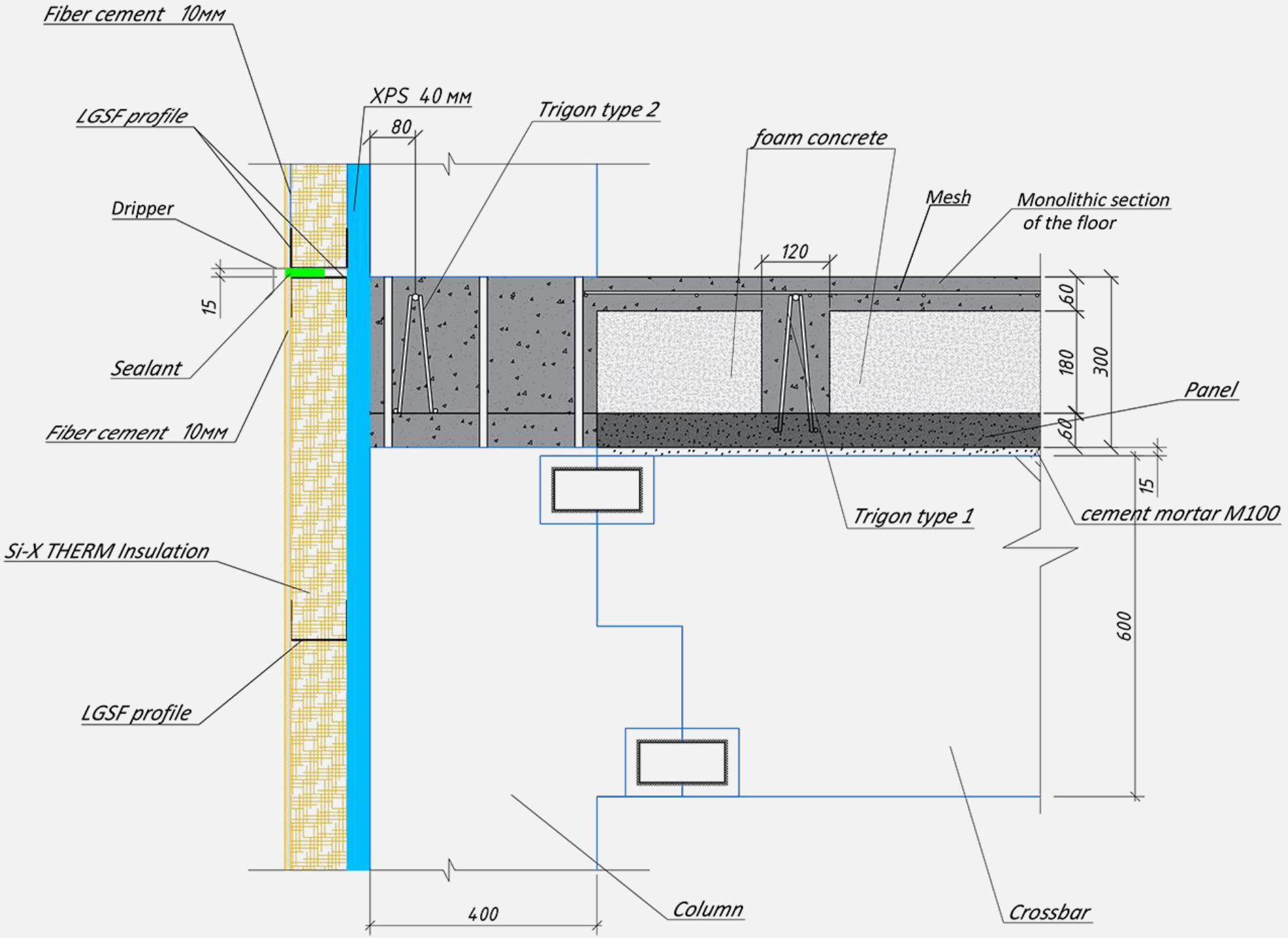
- **The ceilings** are combined prefabricated monolithic structures with a thickness of 30 cm using reinforced concrete formwork/filigree slabs (FILIGRAN) and cavity formers. Such floors require only 11 kg of reinforcing steel per 1 m². The floor design precludes the need for further screeding as the surface is ready for laying a clean floor.



SITECH:UA System Structures



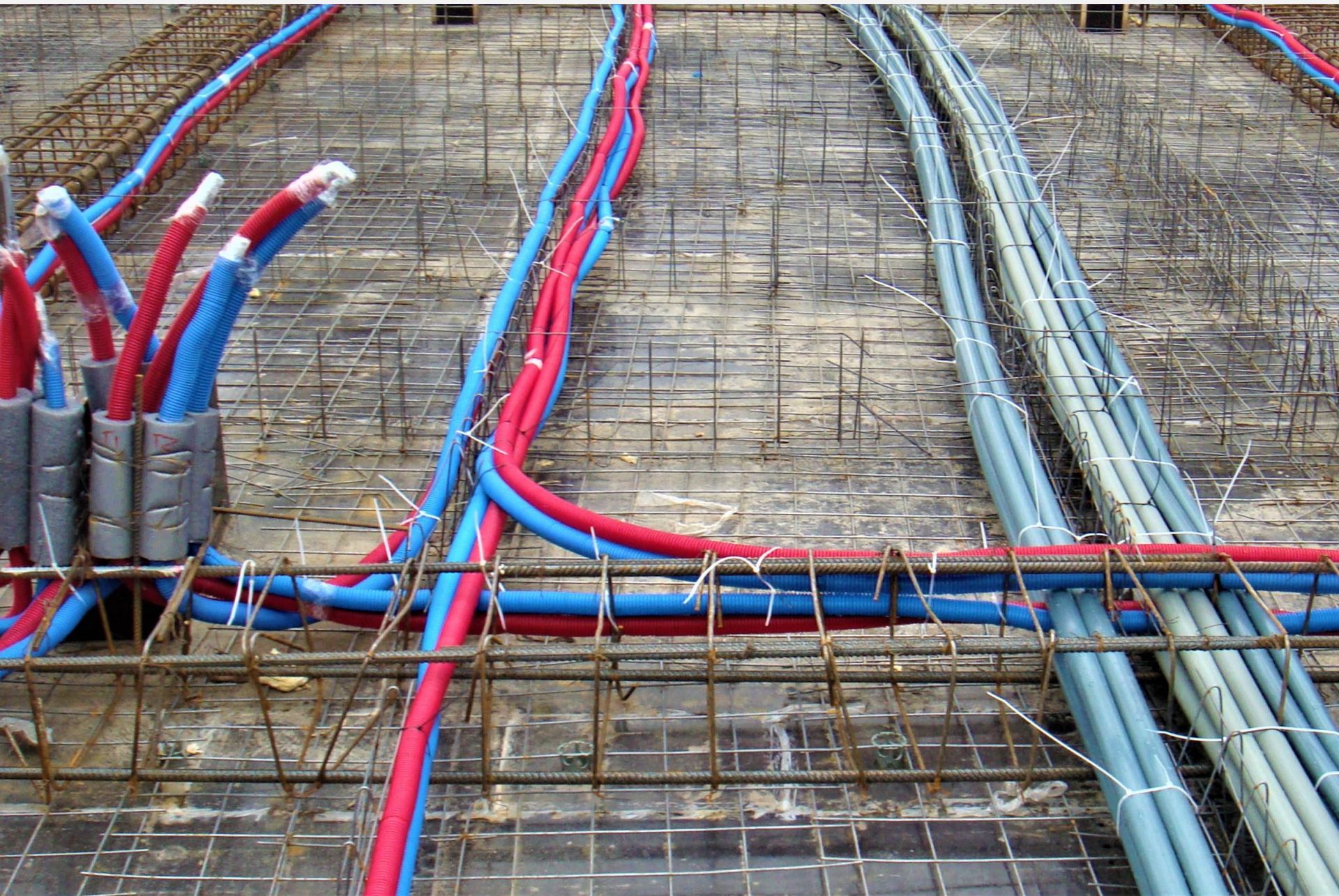
Detail of the joint of the floor with the crossbar



Detail of the floor-column-crossbar-wall joint

SITECH:UA System Structures

Engineering networks in the ceiling before concreting



Mounting of permanent formwork slabs



SITECH:UA System Structures

Concrete laying

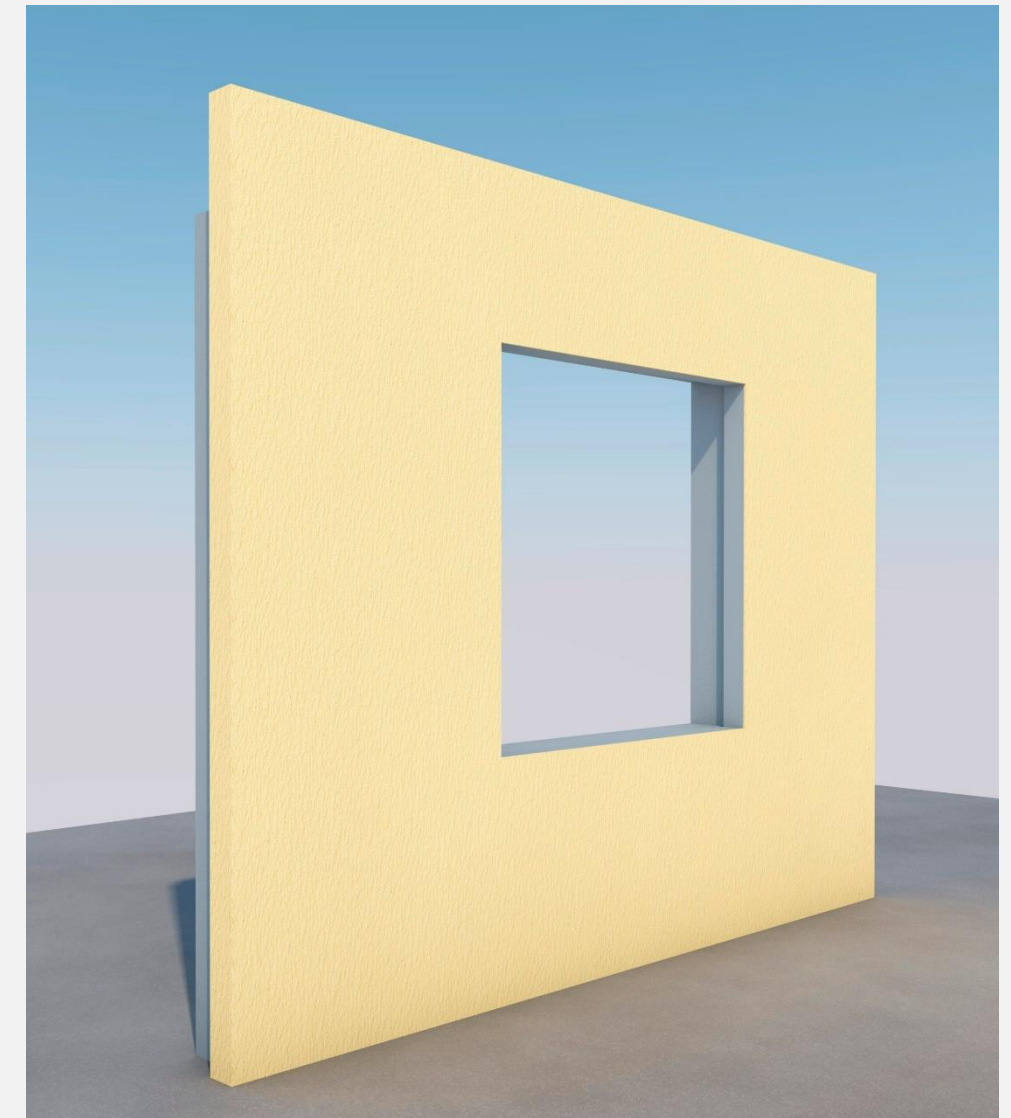
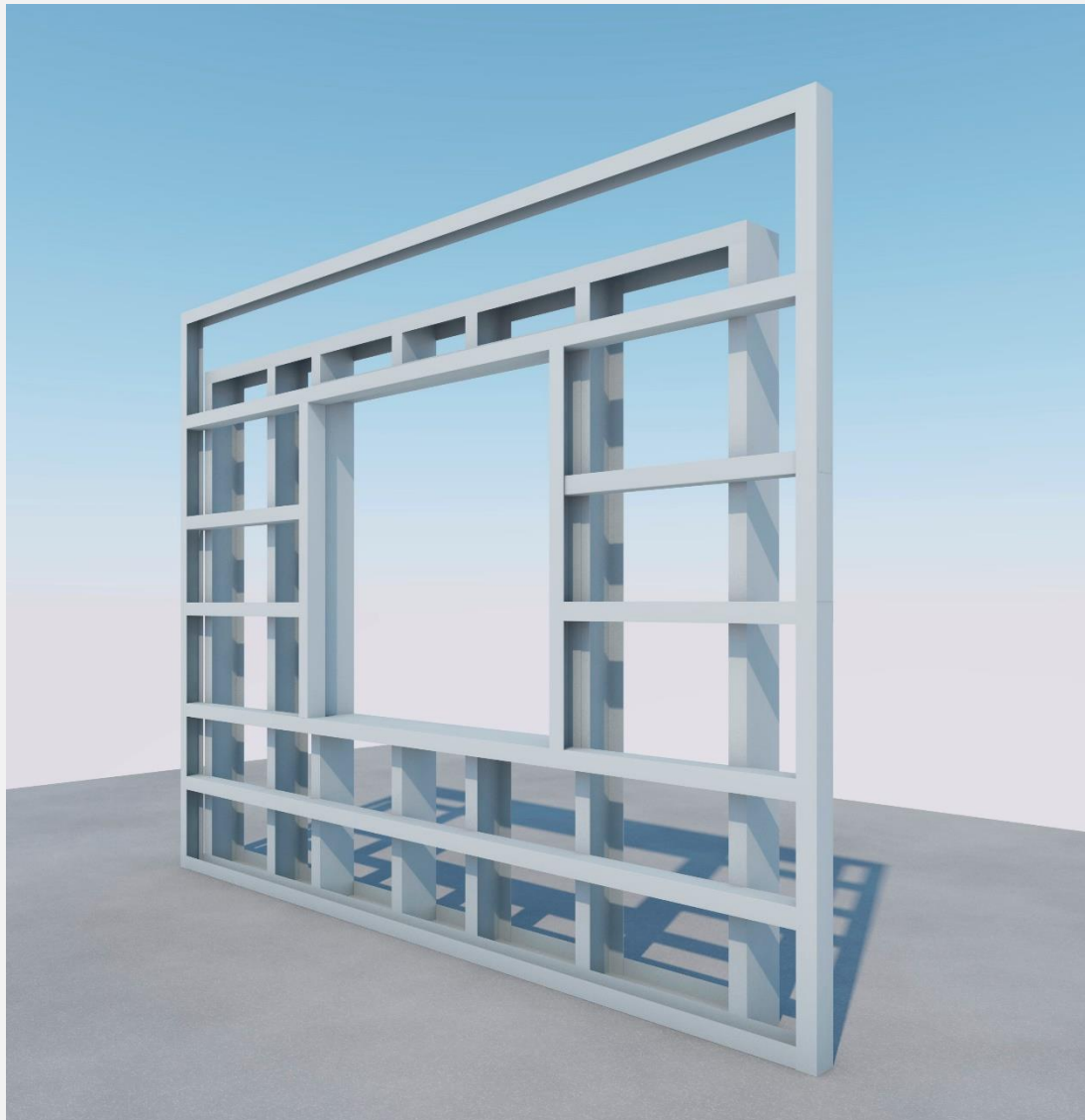


Surface treatment



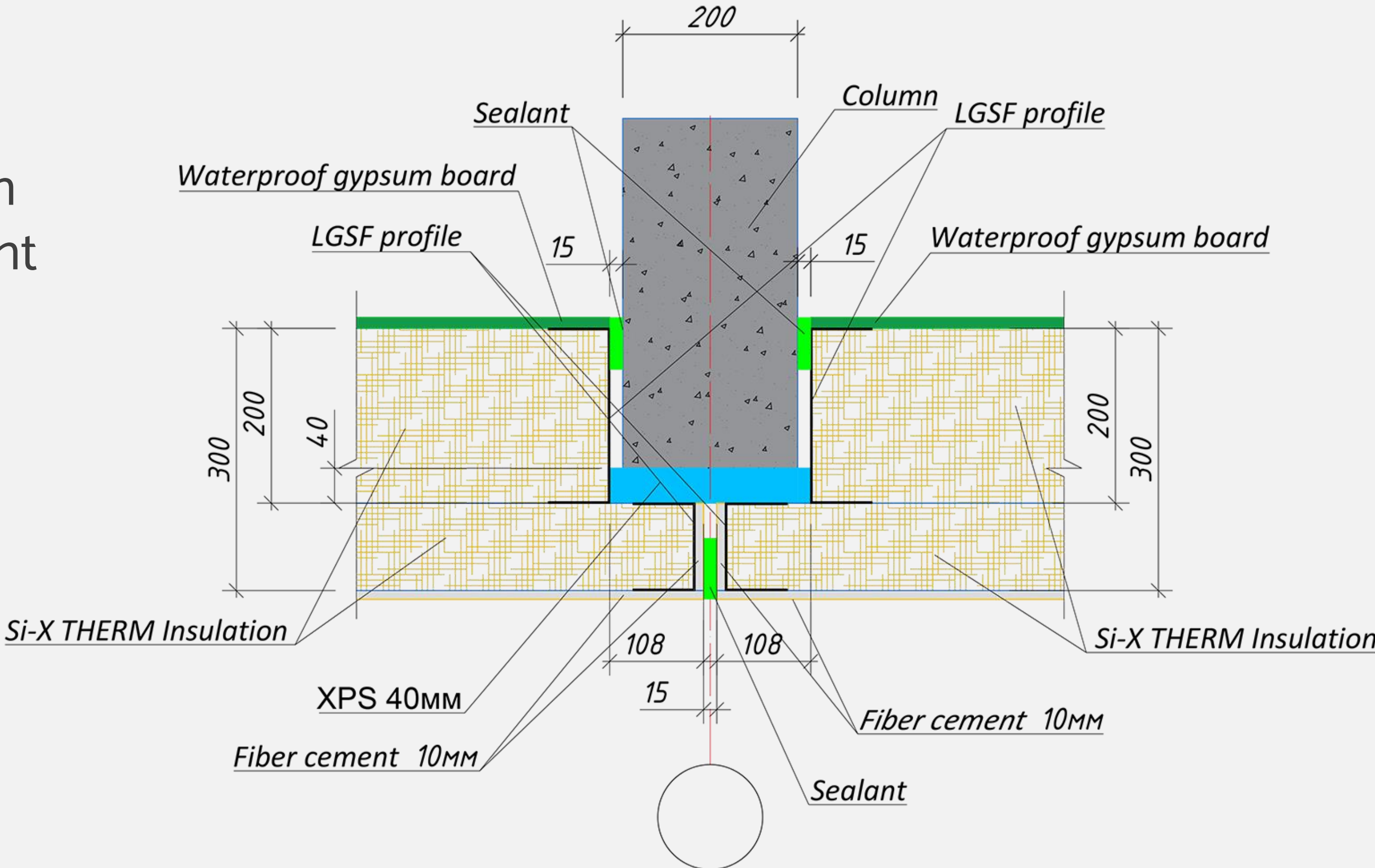
SITECH:UA System Structures

- **External walls** are hinged panels with a frame made of a Light Gauge Steel Frame (LGSF). **The insulation is Si-X THERM** thermal insulation boards. The exterior cladding is made of fiber cement boards. The interior lining is moisture-resistant drywall.



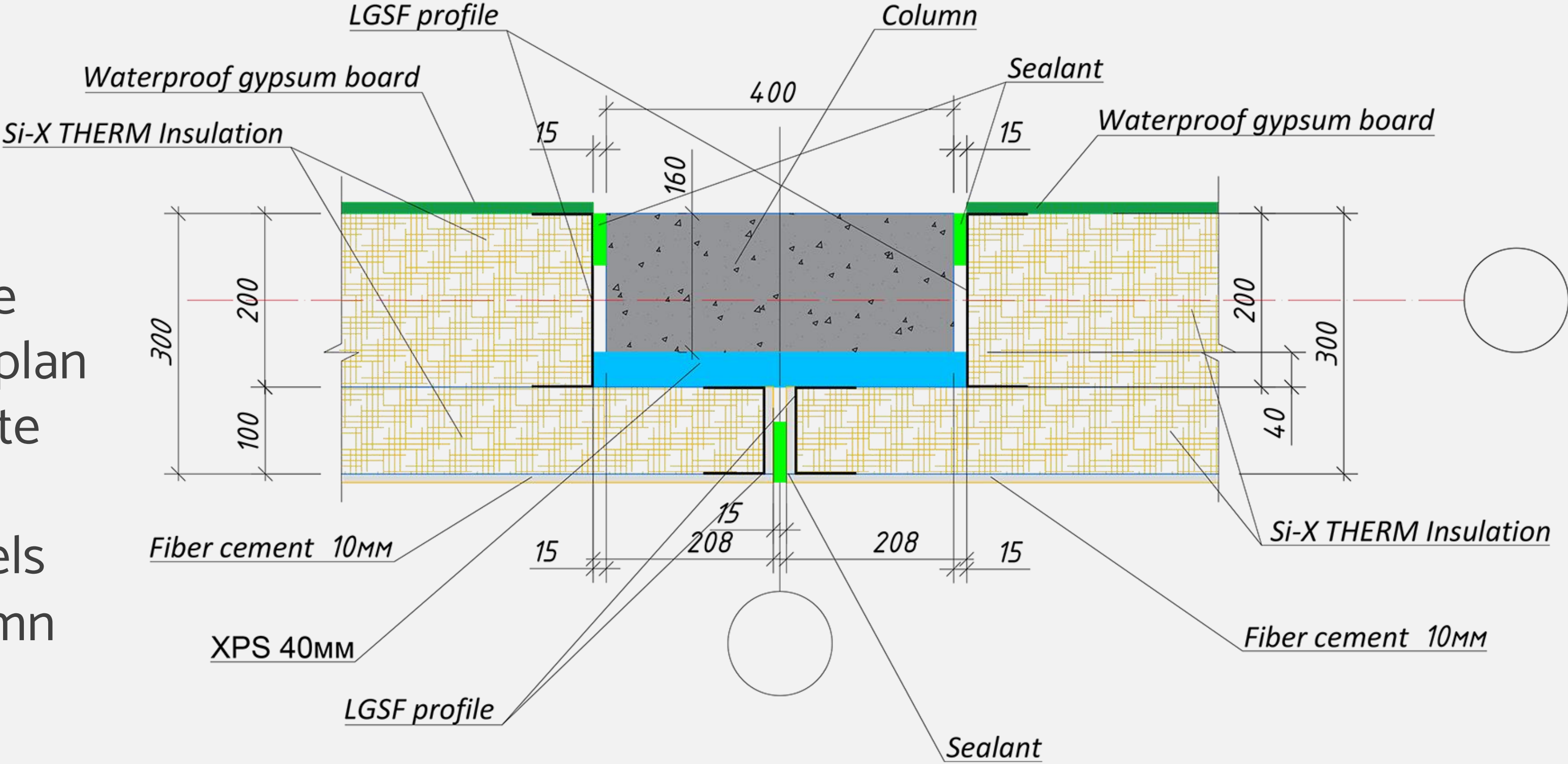
SITECH:UA System Structures

Detail of the joint in the plan (inter-apartment wall) of wall panels with a column



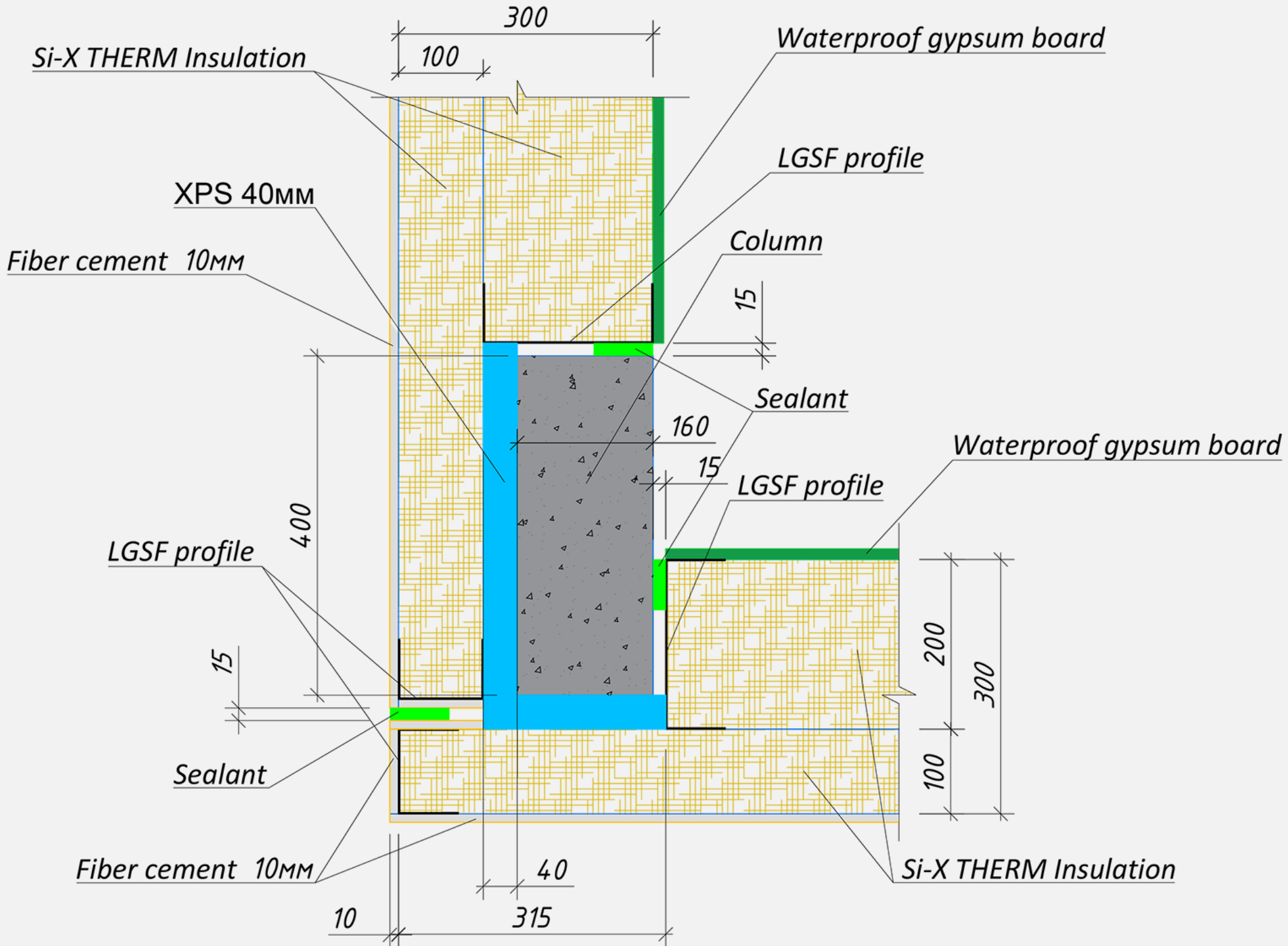
SITECH:UA System Structures

Detail of the joint in the plan (intermediate column) of wall panels with a column



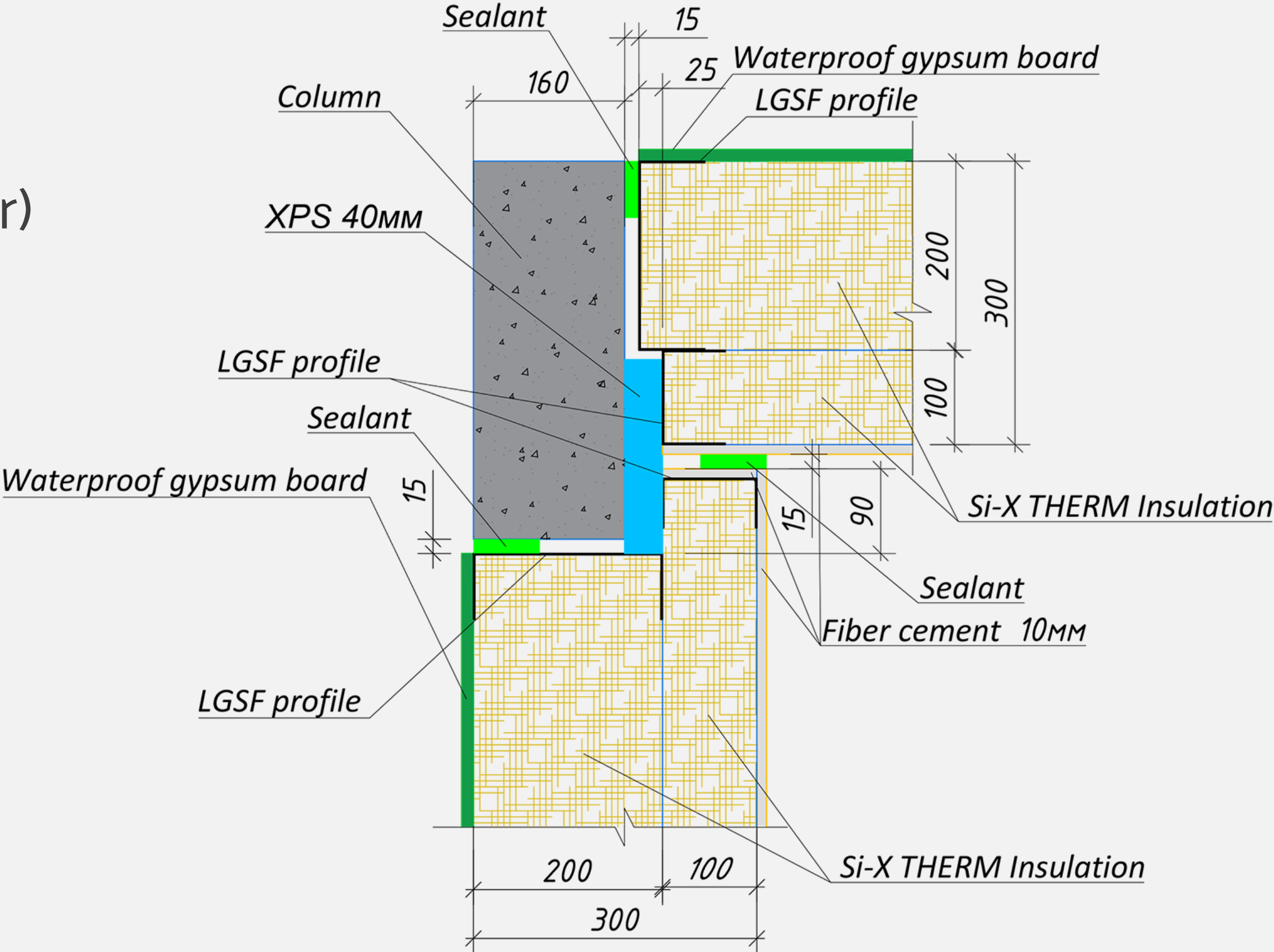
SITECH:UA System Structures

Detail of the joint in the plan (outer corner) of wall panels with a column



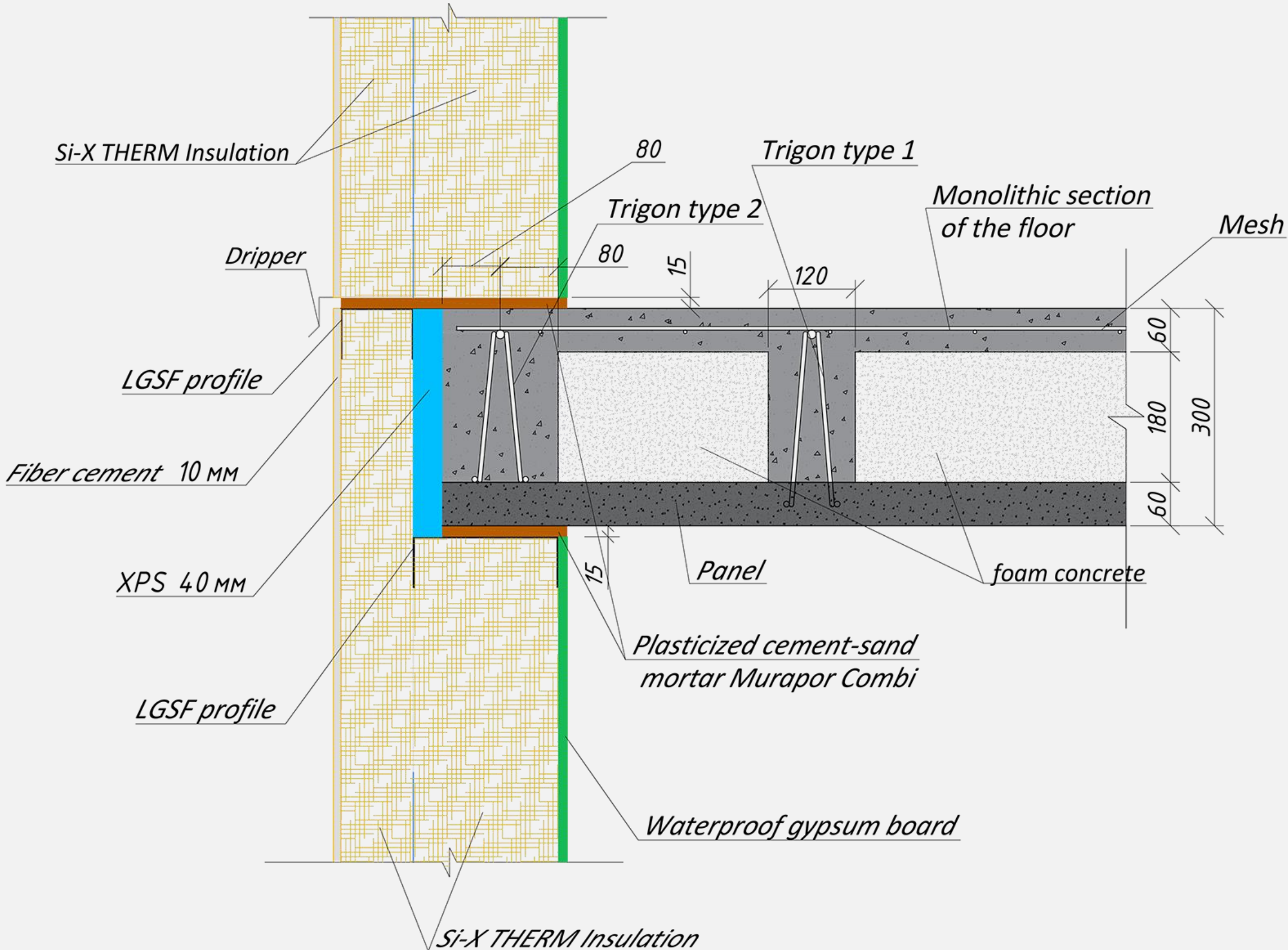
SITECH:UA System Structures

Detail of the joint in the plan (inner corner) of wall panels with a column



SITECH:UA System Structures

Joints of wall panels with the ceiling

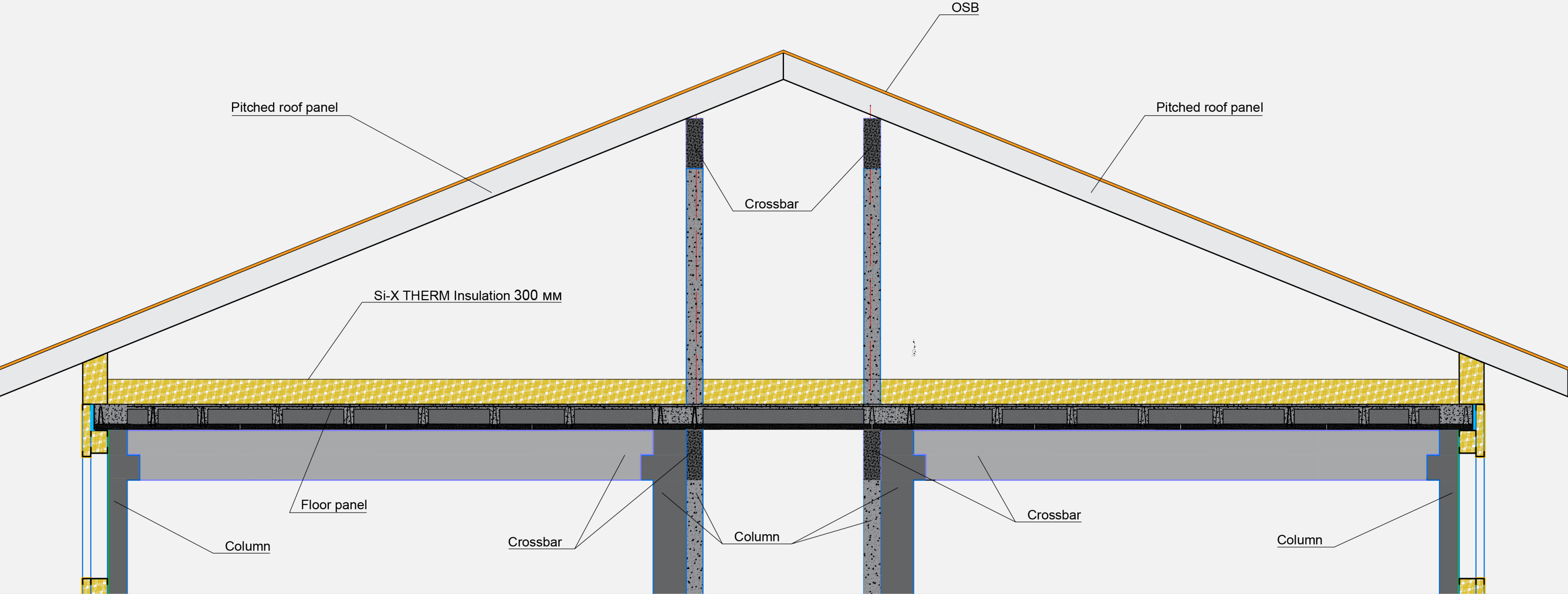


SITECH:UA System Structures

- **The internal walls and partitions** are made of gas silicate with a density of 600 kg/m³ and a thickness of 200 and 100 mm, respectively.
- **The roofs** are pitched from prefabricated panels, a ventilated attic with insulation on the attic floor with **Si-X THERM insulation**.
- **Pitched roof panels** are made of LGSF, top cladding is made of OSB 3, and hydro barrier.

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Cross-section of the roof structure



SITECH:UA System Structures



Pitched
roof
panels

SITECH:UA Ecological Aspects

1. **Substituting traditional basalt insulation for Si-X THERM boards significantly reduces the carbon footprint.** A house-building plant with a capacity of 100 thousand square meters of apartments per year will consume about 20 thousand m³ of insulating materials per year. The substitution of 20 thousand cubic meters of traditional basalt insulation with **Si-X THERM** boards reduces the carbon footprint of the insulating material production by 16,569,090 kg eCO₂.



Si-X THERM



SITECH:UA Ecological Aspects

2. The **SITECH:UA** system does not use any materials that are not subject to recycling and are considered “hazardous waste” according to the European classification. **SITECH:UA buildings can be almost completely recycled** after the end of their life cycle.
3. **SITECH:UA** buildings have significantly reduced specific consumption of concrete/cement and reinforcing steel as compared to “classical” industrial buildings. **Reduced consumption of energy-intensive cement and steel**, as well as the significantly lower weight of buildings (transportation, installation, etc.) will also significantly **reduce the carbon footprint** at all stages of production and building construction.
4. **Higher thermal resistance** (up to $R=6 \text{ m}^2 \times \text{°K/W}$) of external walls will also significantly **reduce energy consumption for heating/conditioning** and will also significantly **reduce the carbon footprint** of buildings during the operation phase.
5. The **SITECH:UA** system buildings are completely free of emissions of harmful materials (formaldehyde, etc.). This creates a **healthy microclimate** in living blocks. Also, the “free-breathing” exterior walls and the alkaline nature of the **Si-X THERM** board binder prevent mould/fungus growth during the house’s operation.

SITECH:UA System

The **SITECH:UA** system is a joint development by Egon Doeberl Holding (Austria) and Ukrainian specialists.

