



# Patented Construction System

Save time and money with us

# Setting new standards

VST Production s.r.o. and our patented construction system is **the ideal solution** for developers looking to maximize their profits.

The VST Group has many years of experience in the composite formwork technology market and offers developers a bespoke solution for modern construction with innovative patented technologies and components that are tailored to the specific project.

We specialize in fast, efficient, environmentally friendly rough construction at a competitive price.

**As a result of our technology, 420 m<sup>2</sup> can be built in 10 days with the work of only 7 workers.**

**20 years**  
References

More than  
**35,000**  
apartments

and other accommodation or hotel spaces,  
mostly in the western part of the Europe.

**The most modern and largest** factory with almost **17,000 m<sup>2</sup>** for the production of building elements, such as walls and slabs, in Europe.

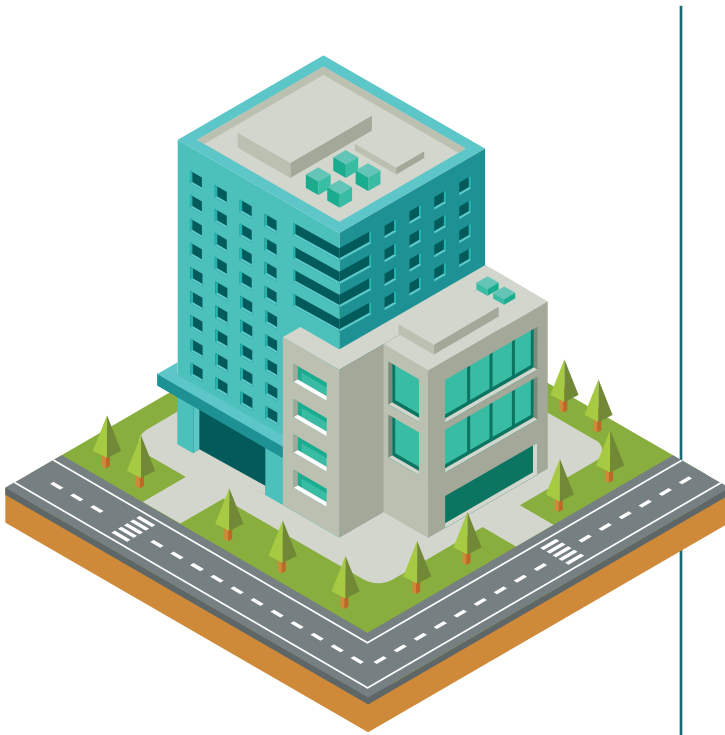
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## The system is suitable for:

- Residential complexes
- Commercial complexes
- Workers' hostels
- Dormitories
- Homes for the elderly
- Hotels
- Family houses

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# Why build with VST Technology?



**ESG**  
sustainability

01

**Time**  
50% savings

02

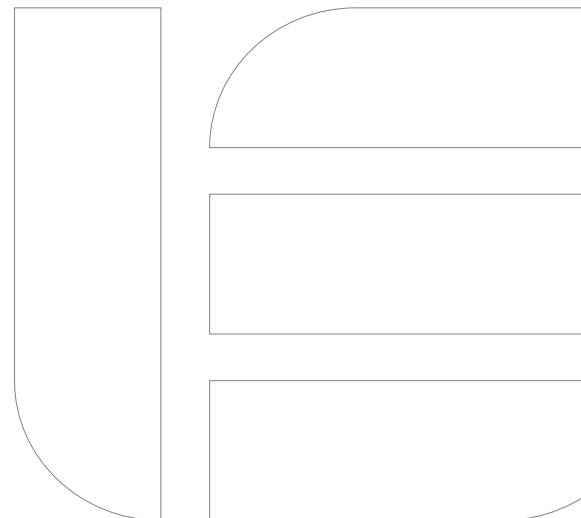
**Workforce**  
80% saving

03

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## Result:

- You pay less interest to the bank
- Faster cash-in from renting or selling apartments
- ESG - lower interest from a senior bank
- Higher project profitability
- Double the investor/institution's cash turnover



### EPD certification / ESG compliant

Evaluation of the environmental impacts associated with the production of construction product. Includes all phases of the product life cycle from raw material extraction and the manufacturing of the product to its disposal.

### Speed

Thanks to the high degree of industrial prefabrication and the elimination of formwork, construction time can be reduced by up to 50% compared to other construction methods. It is possible to order windows, doors and furniture already at the moment of the project, as the final construction is precise to the millimetre. This is a further time-saver.

### Cost savings

Thanks to the relocation of the work steps to the VST factory, work no longer has to be carried out on site. In the walls is already installed preparation for electricity and according to the client's requirements, water, heating and cooling systems can be built in. This shortens the construction time and saves costs.

### Energy savings

VST technology is highly airtight, saving heating and cooling costs. In addition, the VST components have a thermal insulation effect.

### Flexibility and precision

The VST system can produce each component to the millimetre exactly to the customer's specifications. Special components such as rounded structures are also possible.

### Fire resistance

Thanks to the non-combustible surface of the cement-bonded particleboards and the concrete core, extensive fire protection is guaranteed for the VST components.

### Compatibility

The VST system is compatible with construction methods such as precast concrete or in combination with timber structural components.

### Safety and cleanliness

Moving many of the work steps into the safe environment of a VST factory increases safety on site and reduces waste on site to a minimum.

### Monolithic buildings

VST buildings are solid reinforced concrete structures that have a monolithic concrete core (that is, the concrete core runs continuously through the entire building).

# Production factory in Nitra

It is the most modern and largest factory - with an area of almost 17,000 m<sup>2</sup>  
- for the production of building elements such as walls and slabs in Europe.

The annual capacity of the facility is

**1 600 to 2 200 apartments.**



# Production process

**At the VST production factory in Nitra, we produce the patented VST composite formwork system for "off-site construction" according to individual customer project.**

**Thanks to the automated production line, the entire production process is maximally efficient, economical and completely precise.**

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Iron reinforcements, electrical wiring are already built into the walls in the factory, as are water and heat distribution systems. On site, the work is minimized to assembly, concreting of the elements and final work by professionals.

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The production of VST elements is carried out on two lines: semi-automatic and manual. In addition to these lines, the factory also includes a workshop for locksmith work and steel bending. All processes are software linked and work together to create the final VST elements.

**The innovative VST elements are made from 24 mm thick cement-bonded particleboards, which consist of 69% cement, 19% wood chips, 10% water and 2% hydrating additives.**

- Prefabricated VST elements are designed according to individual customer requirements.
- The highest precision is guaranteed throughout the industrial prefabrication process.
- Site work is limited to the assembly and concreting of the elements.
- After this process, the concrete core is permanently bonded to the cement-bonded particleboard. This means that the VST components form a composite shell that remains in the structure as so-called "permanent formwork".
- Due to the low weight of the VST components, one truck can load up to 190 m<sup>2</sup> of VST walls or 490 m<sup>2</sup> of VST boards.
- The VST factory in Nitra has a delivery distance of up to 2,000 km.

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The manufactured walls are delivered from the factory to the site by a just-in-time system in the volume required for the construction of a given floor. No construction yard is created. The walls are permanently joined and filled with concrete on site. This creates a reinforced concrete monolith that is walkable in two days.

In the case of a high-rise building, windows and finishing work can be fitted in the already completed floors while the higher floors are being built.

# Comparison of VST and its advantages

Our perimeter walls are 20 cm wide for conventional buildings. Compared to brick or ytong, this creates more living space and less demand on the size of the plot.

For a four-storey apartment building built with 300 mm brick, a saving of approximately 11 m<sup>2</sup> on 1 floor of 520 m<sup>2</sup>, which means 44 m<sup>2</sup> of extra living space in the apartment building if the VST system is used.

- Thanks to the low weight of our walls:**
- You save transport costs.
  - You save on crane hire costs - the maximum weight of our wall is 1,050 kg and if necessary, the wall can be split into two halves weighing 525 kg.

GA	Key feature	Evaluation procedure	Level/class/description
5	<b>Air sound insulation</b>		
	Wall thickness 15 cm	EN ISO 10140-2	R <sub>w</sub> = 51 dB
	Wall thickness 17.5 cm	EN 12354-1 a	R <sub>w</sub> = 53 dB
	Wall thickness 20 cm	EN ISO 717-1	R <sub>w</sub> = 55 dB
	Wall thickness 21.5 cm		R <sub>w</sub> = 56 dB
	Wall thickness 23 cm		R <sub>w</sub> = 57 dB
	Wall thickness 25 cm		R <sub>w</sub> = 58 dB
	Wall thickness 30 cm		R <sub>w</sub> = 61 dB
<b>Notes</b>			
The approximate values of the spectrum match C and C <sub>tr</sub> are = -2 dB and C <sub>tr</sub> = -5 dB. The VST composite box system walls affect the transmission of the airfoils in the building. This should be considered, e.g. by calculation according to EN 12354-1. The sound insulation index of a wall with additional thermal insulation may be lower and must be assessed individually depending on the additional layers.			
<b>Sound absorption</b>		Characteristics not rated	

## Heat loss

VST walls are also suitable for passive buildings.

## Example:

Total perimeter wall width 440 mm

VST system 200 mm

Isover EPS 70F 240 mm  $\lambda=0.039 \text{ W/(m.K)}$

Heat transfer coefficient of the structure  $U = 0.14 \text{ W/m}^2\text{K}$

The optimal solution for excellent thermal comfort in the house.

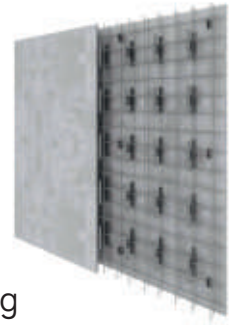
# Construction Components

**VST construction components meet the highest quality requirements, are significantly lighter than conventional concrete components and are characterized by their simple and fast assembly.**

The system is suitable for all load-bearing and non-load-bearing structures.

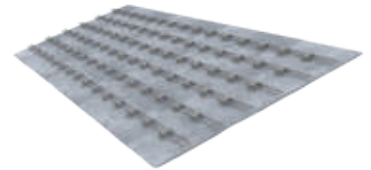
## Walls

The VST walls consist of two cement chipboards with a thickness of approximately 24 mm, which are connected to each other by special spacer profiles. If necessary, reinforcement, empty electrical pipes, as well as heating and sanitary pipes can be built into the walls of the VST. All openings and penetrations (e.g. for doors, windows, empty electrical conduits, etc.) are cut at the factory. The wall thickness is variable depending on the design requirements. On the construction site, the cavity between two cement chipboards is filled with concrete.



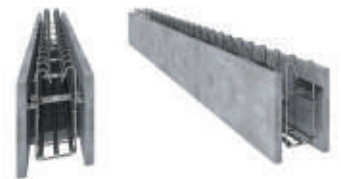
## Ceilings

The cement-bonded particleboard slabs are delivered to the site and laid, onto which special steel hat beams have been bolted at the VST factory. On site, only the formwork components are placed on top of the normal base slabs and concreted in place once the reinforcement has been installed. The height of the profiles is uniformly 50 mm and the overall thickness of the slab is 75 mm (irrespective of the thickness of the concrete layer). For VST ceilings, openings are already taken into account in the manufacturing process.



## Beams

The VST beam effortlessly takes the load from ceilings, arches or walls and transfers it in a structurally sound manner. It consists of three cement-bonded particle-board panels that are connected to each other by spacers or metal brackets. The dimensions of the VST beam are freely selectable and, even with a maximum length of 13 m, it is strong enough to support any building.



## Staircases

The VST staircase can be effortlessly assembled right at the start of the construction work. This not only saves unpleasant emergency solutions such as the use of ladders, but also increases safety on site. As with all VST components, the reinforcement is factory-installed and there is no need for additional work steps. VST staircases are suitable for both indoor and outdoor use and are designed entirely according to the customer's wishes. The advantage is that they can be combined with different acoustic solutions.







### Columns

With a maximum circumference of 2.8 m, the VST columns are up to any challenge. In addition, VST columns can be combined with manufactured punching heads. VST columns are quick and easy to assemble and, once concreted, are fully integrated into the building, not only visually.



### Roof dormers

Whether with single or double bends, the VST roof dormer is made to measure according to the customer's wishes and requirements and there is no need for lengthy and time-consuming formwork on site. The factory cut-out of the window also ensures that the glazing fits precisely and no labour-intensive adjustments are required.

### Formwork

The 24 mm thick cement-bonded particleboards, which serve as the base for all VST components, can be used as formwork (composite or decking) or as a stand-alone component, e.g. for raised beds or non-load-bearing components. Indoors, they are ready for painting after installation and require no additional sealing. The components are supplied as standard with a length of 100 cm and a width of 62.5 cm and weigh 35 kg/m<sup>2</sup>. Other sizes are available on request.

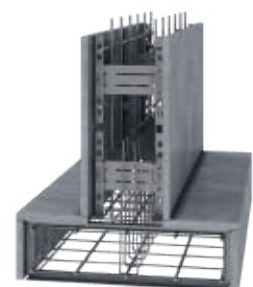


### Ventilation shafts

The VST ventilation shaft provides supply and/or extract air where this is not possible with windows, or serves as a connection to the outside air for intelligent ventilation of the living space. VST ventilation and light shafts can also be thermally separated, so there is no need for insulation, saving costs and time.

### Special features

Balconies, interior walls, attics, installation walls and many more can be realized using prefabricated VST components, among others. This makes it possible to create a complete shell construction in the VST system - the components of the VST composite formwork can be combined with each other, allowing for a consistent solution.



## Technology comparison

# Comparison of residential building construction costs per 1 m<sup>2</sup> of walls

### Wall - classic RC - THK 150 - 250mm

Main construction production		
VERTICAL CONSTRUCTION		
1	Concrete for superstructure walls, steel (without reinforcement) Class C 25/30	€ 23.94
2	Formwork for walls and partitions, double-sided construction - parts	€ 21.90
3	DOKA Daily rental of Framax steel frame formwork Xlife for formwork of single walls with formwork height panel height of 1,350 mm - 1 m <sup>2</sup> x 28 days	€ 31.92
4	Formwork for walls and partitions double-sided removal - parts	€ 5.94
5	Wall and partition reinforcement 10505 - preliminary dimension 120 kg/m <sup>3</sup>	€ 45.01
<b>VERTICAL CONSTRUCTION</b>		<b>€ 128.71</b>
SURFACE FINISHES		
6	Rough filling of grooves in walls with any mortar, any width of groove	
7	Expansion of reinforced concrete walls (flatness, after shawl bars, after caverns and poorly compacted concrete, after extruded and bulged concrete...)	
8	Preparation of the substrate, BAUMIT pre-coating, under the internal plaster walls, mixing by machine, application by hand, THK 2 mm	
9	Substrate preparation, BAUMIT pre-coat, under plastering of interior walls, to increase the adhesion of the coating	
10	BAUMIT interior wall plaster, gypsum, mixing and application by machine MSS 20, THK 1 cm	
11	Surcharge for built-in plasterers in wall surfaces, columns and pillars (measured in m <sup>2</sup> of surface area)	
12		
<b>SURFACE FINISHES</b>		<b>€ 20.73</b>
OTHER CONSTRUCTION AND WORKS		
13	Scaffolding light working auxiliary, with scaffolding floor height above 1.90 to 2.50 m	
14	Cutting grooves in any brickwork for any mortar up to a depth of 30 mm and a width of up to 70 mm	
15	Vertical transportation of rubble and spoil beyond the first floor above or below the base floor	
16	Removal of rubble to a landfill site within 1 km	
17	Removal of rubble and spoil to landfill for each additional 1 km, 10 km	
18	In-site transport of rubble and spoil up to 10 m	
19	Storage fee - concrete, bricks, tiles	
20	Storage fee - concrete, bricks, tiles, other - statutory charge	
<b>OTHER CONSTRUCTION AND WORKS</b>		<b>€ 11.27</b>
TRANSFER OF MATERIALS		
21	Mass transfer for buildings, vertical construction, monolithic concrete height up to 6 m	
TRANSFER OF MATERIALS		€ 10.46
<b>Main construction production</b>		<b>€ 171.17</b>
Associated construction production		
PAINTINGS		
22	Penetration of single layer fine-grained substrates of height up to 3.80 m	
23	Painting from Primalex liquid paint mixtures, monochrome double in rooms up to 3.80 m high	
<b>PAINTINGS</b>		<b>€ 2.75</b>
ELECTRO INSTALLATION		
23	Installation of flexible protectors and boxes	€ 2.78
<b>ELECTRO INSTALLATION</b>		<b>€ 2.78</b>
Associated construction production		<b>€ 5.53</b>
<b>TOTAL Main + Associated construction production</b>		<b>€ 176.70</b>

#### TOTAL 23 ITEMS

Example: 1,000 m<sup>2</sup> of RC walls x 176.70 €/m<sup>2</sup> = € 176,700

### Wall - VST System - THK 150 - 250mm



Main construction production		
VERTICAL CONSTRUCTION		
1	Concrete for superstructure walls, steel (without reinforcement) Class C 25/30	€ 23.94
2	Permanent formwork of VST SYSTEM walls	€ 65
3		0
4		0
5	Wall and partition reinforcement 10505 - preliminary dimension 150 kg/m <sup>3</sup>	€ 45.01
<b>VERTICAL CONSTRUCTION</b>		<b>€ 133.95</b>
SURFACE FINISHES		
6		0
7	Filling corners and joints or joints between structures and overlying structures with tape and sealant, with the supply of materials	€ 1.96
8		0
9		0
10		0
11	Surcharge for built-in plasterers in the area of walls, columns and pillars (measured in m <sup>2</sup> of area)	€ 0.91
12	OPTIONAL - screwing of slabs	€ 12.01
<b>SURFACE FINISHES</b>		<b>€ 14.88</b>
OTHER CONSTRUCTION AND WORKS		
13	Scaffolding light working auxiliary, with scaffolding floor height above 1.90 to 2.50 m	
14		
15		
16		
17		
18		
19		
20		
<b>OTHER CONSTRUCTION AND WORKS</b>		<b>€ 8.96</b>
TRANSFER OF MATERIALS		
21	Mass transfer for buildings, vertical construction, monolithic concrete height up to 6 m	
TRANSFER OF MATERIALS		€ 7.96
<b>Main construction production</b>		<b>€ 165.75</b>
Associated construction production		
PAINTINGS		
22	Penetration of single layer fine-grained substrates of height up to 3.80 m	
23	Painting from Primalex liquid paint mixtures, monochrome double in rooms up to 3.80 m high	
<b>PAINTINGS</b>		<b>€ 2.75</b>
ELECTRO INSTALLATION		
23	Installation of flexible protectors and boxes	€ 2.78
<b>ELECTRO INSTALLATION</b>		<b>€ 2.78</b>
Associated construction production		<b>€ 5.53</b>
<b>TOTAL Main + Associated construction production</b>		<b>€ 171.28</b>

#### TOTAL 11 ITEMS (saving of 12 items / 12 work tasks)

Example: 1,000 m<sup>2</sup> of walls VST SYSTEM x 171.28 €/m<sup>2</sup> = € 171,280

# Selected references

The result speaks for itself. More than 35,000 residential units and commercial buildings with a total floor area of 900,000 m<sup>2</sup> have already been built using the VST construction system.

The construction project at Universumstraße 31 in Vienna, which included 46 apartments built with VST technology, won the Austrian State Prize for Architecture and Sustainability in 2012.

One of VST's customers in Sweden is the construction group Skanska, which has already completed more than 30 projects with VST components. This includes the largest hotel project in Scandinavia, the 558-room Clarion Sign in Stockholm. The VST Group supplied a total of 19,500 m<sup>2</sup> of walls and 23,200 m<sup>2</sup> of ceilings for this project.



**Studentbostäder Albano**

📍 Albano 📅 2022 🏗️ Development project



**Kvarteret Scilla Täby Park**

📍 Scilla Täby 📅 2022 🏗️ Development project



**Stomme på Lillgårdskolan i Tungelsta**

📍 Albano 📅 2022 🏗️ Development project



**Kv Giffeln**

📍 Scilla Täby 📅 2022 🏗️ Development project

## References

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**Kungsvyn, Kungsängen**

📍 Kungsängen 📅 2019 🏗️ Development project



**Sicklingen studentbostäder, Gubbängen**

📍 Gubbängen 📅 2019 🏗️ Development project



**Rudanskolan, Haninge**

📍 Haninge 📅 2019 🏗️ Development project



**Godsvagnen, Hammarby Sjöstad**

📍 Stockholm 📅 2019 🏗️ Development project



**Kv Syllen, Årstadal**

📍 Årstadal 📅 2017 🏗️ Development project



**Lamellhuset, Hammarby Sjöstad**

📍 Stockholm 📅 2016 🏗️ Development project

## References

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**Kv Brevlådan, Svedmyra**

📍 Stockholm 📅 2016 🏗️ Development project



**Båghuset, Hammarby Sjöstad**

📍 Stockholm 📅 2015 🏗️ Development project



**Timglashusen, Hammarby Sjöstad**

📍 Hammarby Sjöstad 📅 2015 🏗️ Development project



**Lillgården (předškolní zařízení a domov důchodců)**

📍 Haninge 📅 2015 🏗️ Development project



**Kv Leendet, Kungsholmen**

📍 Stockholm 📅 2014 🏗️ Development project



**Kv Golvläggaren, Årstadal**

📍 Stockholm 📅 2014 🏗️ Development project

## References

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**Corner House, Sveavägen**

📍 Stockholm 📅 2014 🏗️ Development project



**Kv Jublet, Kungsholmen**

📍 Kungsholmen 📅 2012 🏗️ Development project



**Kv Välbehaget, Kungsholmen**

📍 Kungsholmen 📅 2010 🏗️ Development project



**Sven Harrys Konstmuseum**

📍 Stockholm 📅 2010 🏗️ Development project



**Clarion Hotel Sign, Norra Bantorget**

📍 Stockholm 📅 2007 🏗️ Development project



**Kristoff Plaza hotel**

📍 Slovakia 📅 2002 🏗️ Development project

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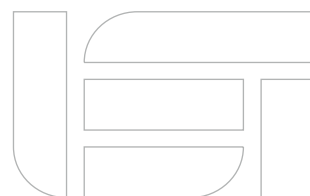
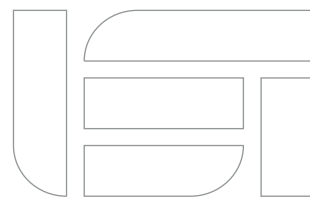


**Michal Straka**

Sales Director

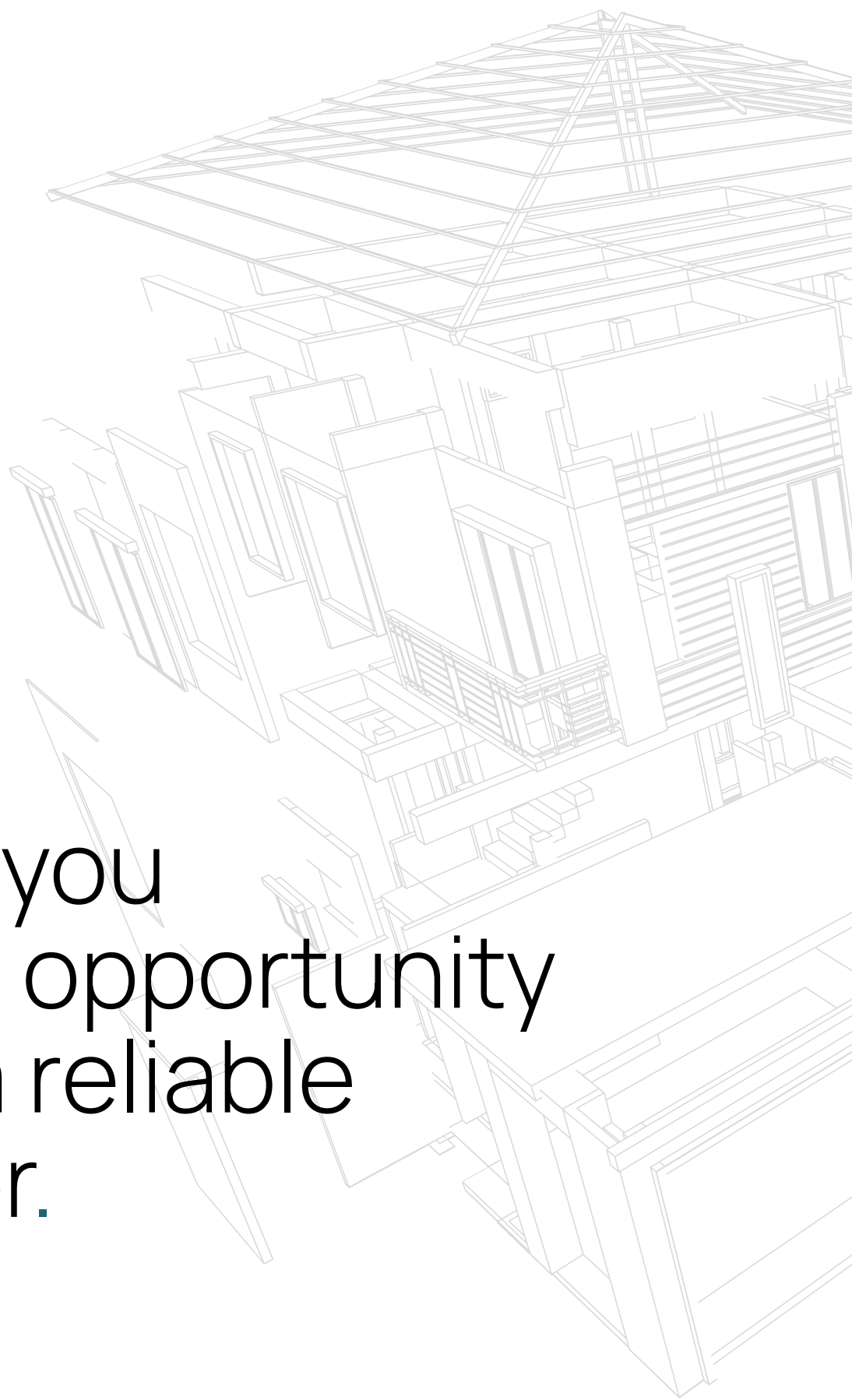
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Thank you  
for the opportunity  
to be a reliable  
partner.