DREES & SOMMER GROUP

ANNUAL REPORT 2018

DREES & SOMMER

GROUP OPERATING RESULT 2018

424.9
MILLION EUROS
Sales

47.7
MILLION EUROS
Operating result

33.3 %
Equity ratio

Approx.
3,280
employees

41
International locations

GROUP OPERATING RESULT 2018

PROFIT & LOSS STATEMENT

			(in euros)
1.	Revenues	306,378,552	
2.	Change in work in progress	113,640,124	
3.	Other operating income	4,868,504	424,887,180
4.	Expenditure for purchased services	56,893,329	
5.	Personnel expenses	241,381,758	
	a) Wages and salaries	212,167,895	
	b) Social security costs and pension fund	29,213,862	
6.	Depreciation	7,636,235	
7.	Other operating expenses	71,275,187	377,186,510
8.	Income from shareholdings	543,235	
9.	Income from other securities and from long-term loans	445,931	
10.	Interest and other expenses	1,022,484	–33,319
11.	**Operating result**		**47,667,352**
12.	Taxes on income and earnings	16,281,597	
13.	Other taxes	375,527	16,657,124
14.	**Net income**		**31,010,228**
15.	Shares held by other shareholders		42,350
16.	Profit brought forward less dividends		–5,857,197
17.	Changes in equity as the result of purchase or sale of own shares		–3,134,222
18.	**Group balance sheet profit**		**22,061,159**

PROFIT & LOSS STATEMENT

Group sales grew by 44.8 million euros to 424.9 million euros (prior year 380.1 million euros). At 377.2 million euros, expenditure is up 40.6 million euros on the prior year figure of 336.6 million euros. The operating result increased by 2.7 million euros to 47.7 million euros in the period under report. Net income for the year is 31.0 million euros.

BALANCE SHEET

The transfer of the balance sheet profit of 22.1 million euros – together with subscribed capital, capital reserves and revenue reserves – results in equity of 55.1 million euros. Our equity ratio is 33.3%. Accruals for pensions, taxes and variable remuneration rose by 2.9 million euros to 67.0 million euros. Liabilities such as for Trade payables to suppliers and subcontractors increased to 33.2 million euros, up 1.3 million euros on prior year. Payments received on account of orders rose by 1.0 million euros to 8.4 million euros due to invoice timing. In 2018, the company issued profit participation rights to employees. These are shown as loans totaling 1.9 million euros.

This results in a balance sheet total of 165.6 million euros for fiscal 2018 (prior year 161.7 million euros).

BALANCE SHEET

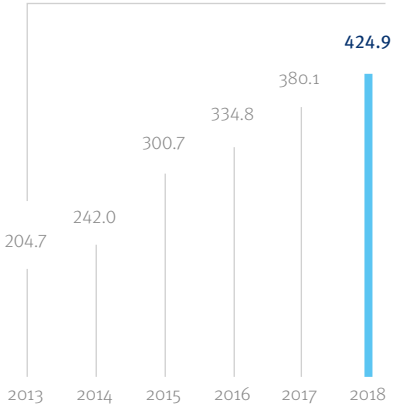
ASSETS

		(in euros)
A.	**Fixed assets**	
I.	Intangible assets	13,667,352
	1. EDP software, licenses	3,893,801
	2. Good will resulting from capital consolidation	9,773,551
II.	Tangible assets	25,733,664
	1. Land, rights equivalent to real property rights, and buildings	7,949,793
	2. Other assets, operating equipment, fixtures and fittings	15,499,156
	3. Payments on account and tangible assets under construction	2,284,714
III.	Financial assets	3,929,704
	1. Shareholdings	1,861,006
	2. Other securities lending	2,068,698
B.	**Current assets**	
I.	Inventories	0
	1. Work in progress	549,583,234
	./. Advances received	−549,583,234
II.	Receivables and other assets	72,879,061
	1. Trade receivables	60,602,002
	2. Receivables from shareholdings	222,916
	3. Other assets	12,054,143
III.	Securities	9,442,085
	1. Other securities	9,442,085
IV.	Checks, cash on hand, cash in banks	36,495,722
C.	**Deferred income (other)**	1,476,961
D.	**Prepaid taxes**	1,940,000
E.	**Positive difference from asset allocation**	0
	Balance sheet total	**165,564,548**

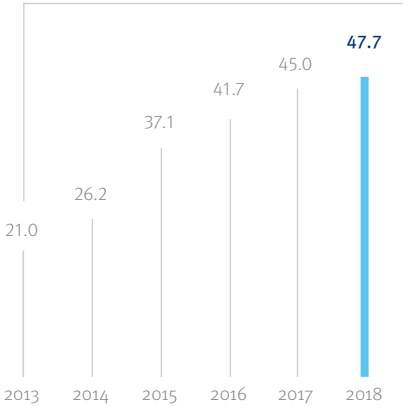
LIABILITIES

		(in euros)
A.	**Equity**	
I.	Subscribed capital	13,222,286
	less nominal value of treasury shares	−418,207
II.	Capital reserves	22,335,259
III.	Revenue reserves	98,104
IV.	Net income	22,061,159
V.	Change in equity due to exchange rate difference	−707,424
VI.	Minority interests	−1,507,644
		55,083,534
B.	**Accruals**	
	1. Accruals for pensions	3,076,764
	2. Provisions for taxation	7,894,781
	3. Other accruals	56,009,438
		66,980,983
C.	**Liabilities**	
	1. Bonds	1,858,501
	2. Liabilities to financial institutions	0
	3. Payments received on account of orders	8,365,873
	4. Trade payables	14,717,705
	5. Liabilities to shareholdings	12,495
	6. Other liabilities	18,429,867
		43,384,441
D.	**Deferred income (other)**	
		115,590
	Balance sheet total	**165,564,548**

SALES IN MILLION EUROS



OPERATING RESULT IN MILLION EUROS



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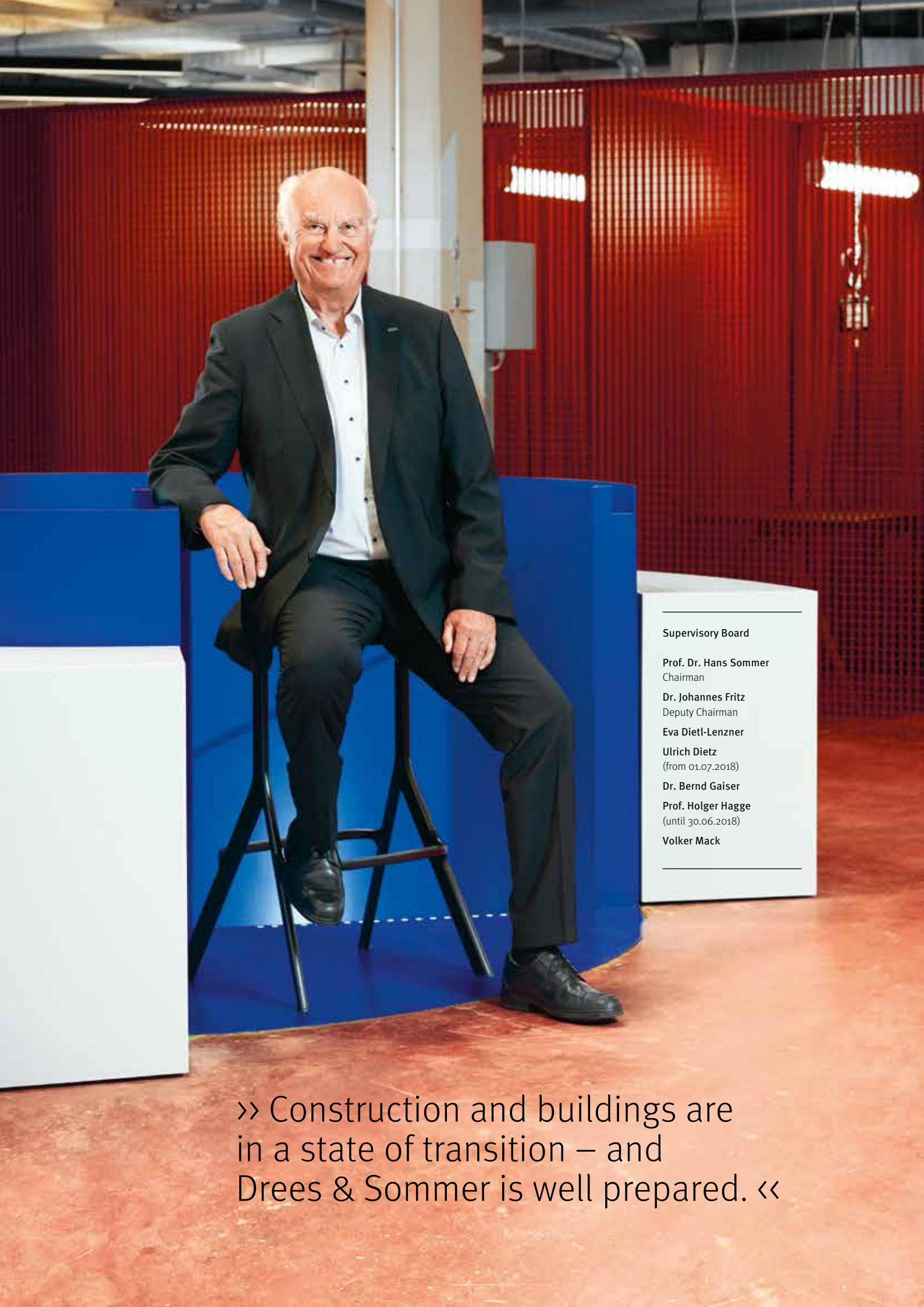


Supervisory Board

Prof. Dr. Hans Sommer
Chairman

Dr. Johannes Fritz
Deputy Chairman

Eva Dietl-Lenzner

Ulrich Dietz
(from 01.07.2018)

Dr. Bernd Gaiser

Prof. Holger Hagge
(until 30.06.2018)

Volker Mack

›› Construction and buildings are in a state of transition – and Drees & Sommer is well prepared. ‹‹

REPORT OF THE SUPERVISORY BOARD

In fiscal 2018, we fulfilled our Supervisory Board tasks in full compliance with statutory requirements, the Articles of Association and rules of procedure. At the meetings of March 8, 2018, May 14, 2018, October 18, 2018 and December 7, 2018 we discussed the Executive Board reports, the development of the company, and strategic issues against the background of general economic conditions. Any material risks were also reported to us. No risks that threaten the continued existence of the company were identified. In addition to the meetings of the Supervisory Board, the Chairman of the Supervisory Board conferred with the Executive Board every three weeks.

Annual and consolidated financial statements 2018

The annual financial statements and the consolidated financial statements of Drees & Sommer SE were prepared by the Executive Board in accordance with the provisions of the German Commercial Code (HGB). Baker Tilly Roelfs – appointed by the Annual General Meeting as Auditor – audited the 2018 annual financial statements and the consolidated financial statements, including the management reports. Baker Tilly Roelfs performed the audit in accordance with article 317 HGB (German Commercial Code) and in compliance with the auditing principles issued by the German Institute of Public Accountants (IDW). The annual and consolidated financial statements were approved without reservation.

The annual financial statement and management report, the consolidated financial statement and group management report, the Auditor's reports, and the Executive Board's proposal for the appropriation of net income of Drees & Sommer SE were made available to all members of the Supervisory Board in a timely manner.

We examined these documents and discussed them at our meeting on May 14, 2018 in the presence of the Auditor. We duly approved the Auditor's reports. At our meeting on May 13, 2019, we approved the annual financial statement, the consolidated financial statement, and the management reports prepared by the Executive Board. We discussed and approved the Executive Board's proposal that the net income of Drees & Sommer SE be used to pay a dividend of €1.72 per share, and that the balance – and the amount allocatable to own shares held by the SE – be carried forward to new account. The financial and earnings position of the company, medium-term financial and investment planning, and the interests of shareholders were taken into account in making this decision. We also passed our proposed resolutions for the Annual General Meeting.

Changes to the Executive Board and Supervisory Board

As previously announced, Peter Tzeschlock left the Executive Board on June 30, 2018. We have refrained from appointing a successor to date. Prof. Holger Hagge stepped down from the Supervisory Board effective June 30, 2018. We thank him for the many years of professional support he has given us since 2012. We were able to secure the services of Ulrich Dietz of GFT Technologies SE as a new member of the Supervisory Board. He has already brought new impetus since taking up his duties on July 1, 2018.

Stuttgart, May 13, 2019

Hans Sommer

REPORT OF THE EXECUTIVE BOARD

Executive Board and partners from left to right: Dierk Mutschler Steffen Szeidl

In partnership with clients, Drees & Sommer was able to successfully conclude numerous projects and start exciting new ones in fiscal 2018. In this interview, Dierk Mutschler and Steffen Szeidl look back on the year, while at the same time outlining the key approaches that Drees & Sommer will take in the future.

How would you sum up fiscal 2018?

Steffen Szeidl: Supported by very strong domestic markets and our colleagues' dedicated efforts, we were once again able to significantly increase group sales from €380 million to just under €425 million, while at the same time increasing operating profit. But what was more important for us was that the excellent market situation allowed us to increase our investment in the future. In other words, we acted counter-cyclically, starting crucial innovative projects that will ensure high market share and good margins should the markets weaken.

Drees & Sommer has been operating very successfully for some time now. Since 2009, the number of employees has increased by 250%. Is that the result of the extended housing boom?

Dierk Mutschler: We have, of course, benefitted from that situation. But above all, the growth is the result of our capacity to offer and combine interdisciplinary technical, construction, real estate, digital and sustainability know-how from a single source. We bring architects together with engineers, economists, chemists, designers and ecologists throughout the entire real estate life cycle: From the initial idea and analysis to construction and smooth operation to design of innovative work environments and mobility concepts.

How do you know at Drees & Sommer which technologies will meet tomorrow's demands?

Steffen Szeidl: Instead of brooding or looking into a crystal ball, our corporate culture has long been characterized by a strong will to innovate and bring about change. We encourage our employees to experiment, to try things out. We are closely involved in current developments because our intensive collaboration in research projects and with universities means that we work closely with promising start-ups and encourage the participation of our clients and business partners. We want to continue developing new business models based on digital technologies and continuing the digital transformation of the real estate industry. But it is also essential to constantly question the processes, methods and tools our existing areas of business use.

Dierk Mutschler: Current responses include Building Information Modeling (BIM), Lean, and Modularization, which are covered in greater detail in the 2018 Annual Report. Only these approaches enable 'the future of construction'. It is crucial to question existing processes, reimagine them, and simply stay agile. Modularization and industrial construction, in particular – both of which support good architectural practice – can cut costs, reduce construction time and enhance quality.

You mentioned start-ups. How do you work with them?

Steffen Szeidl: We see our key strength in acting as an interpreter: We translate between the world of the start-ups and that of the market. We can help start-ups develop brilliant ideas in a way that the market understands and that allows them to reach market maturity. And we have access to the relevant clients. In particular, we can contribute our industry-specific know-how, office space, practical projects, capital, and a lot of time. We are primarily working on intelligently associating and analyzing different types of planning, building and user data to identify and generate new business models.

You recently acquired a majority holding in EPEA, the company founded by chemist Prof. Dr. Braungart, who has been largely responsible for promoting the Cradle to Cradle principle, or C2C for short. How does this holding fit into the picture?

Steffen Szeidl: It is a great fit, because for decades Drees & Sommer has been pursuing 'the blue way', aiming to combine economy and sustainability. Take Green Buildings, for example. Here, we have played a key role in the development and promotion of certification systems. In view of the fact that the construction industry is one of the largest consumers of raw materials, the real estate industry has a great responsibility when it comes to resource management. The C2C concept is about the circular economy – preserving and reusing raw materials for products, processes and buildings without degradation. We see the scope for new approaches here, particularly in conjunction with digital technologies.

Dierk Mutschler: In addition to a business model, we also see our company's obligation to the built environment and our responsibilities towards future generations. In-house, we use the term 'grandchildable'. To ensure our buildings meet these criteria, sustainability and digitization concepts, in particular, are becoming increasingly important alongside tried and tested energy concepts.

Where do you see scope for improvement with regard to the company's digital technology?

Steffen Szeidl: Like many companies, we have an untapped wealth of data from tens of thousands of projects over the past five decades. Building, user, communication and process data lies dormant in different data formats and systems. Data centering is the buzzword for tapping this wealth and using it to develop new business models. With InterfaceMA – founded in 2013 as a PropTech company with investment from us – we are in the process of developing powerful standardized interfaces for this purpose. In future, our joint solutions will not only benefit us, but also owners and investors, as well as asset, facility and fund managers.

Modern leadership concepts are moving further and further away from the conventional hierarchical approach, which is often still practiced. What is your company's approach and how do you work in an industry that is still largely conventional?

Dierk Mutschler: 'Good ideas – no limits' has been a mission statement since the company's foundation. That's why we have long had the flat hierarchies that modern leadership concepts now demand. In our company, everyone can have their say to contribute and realize ideas – from the intern to Executive Board members. A culture of failure is also important, allowing us to test ideas and learn from mistakes. We also have a strong spirit of 'intrapreneurship', including, for example, a long-standing employee bonus program and the opportunity to acquire shares in the company. Exciting work and projects – as well as modern office concepts – also enhance our attractiveness as an employer.


EVOLUTION
REVOLUTION
DISRUPTION

How do you promote and manage innovation in your company?

Steffen Szeidl: Our Innovation Center allows any colleague to work freely on innovation-related initiatives – we provide support in the form of space, time and expertise. A platform allows anyone to see the current initiatives and their status. And our Innovation Hubs at various regional offices are also open to start-ups and clients, and for research purposes.

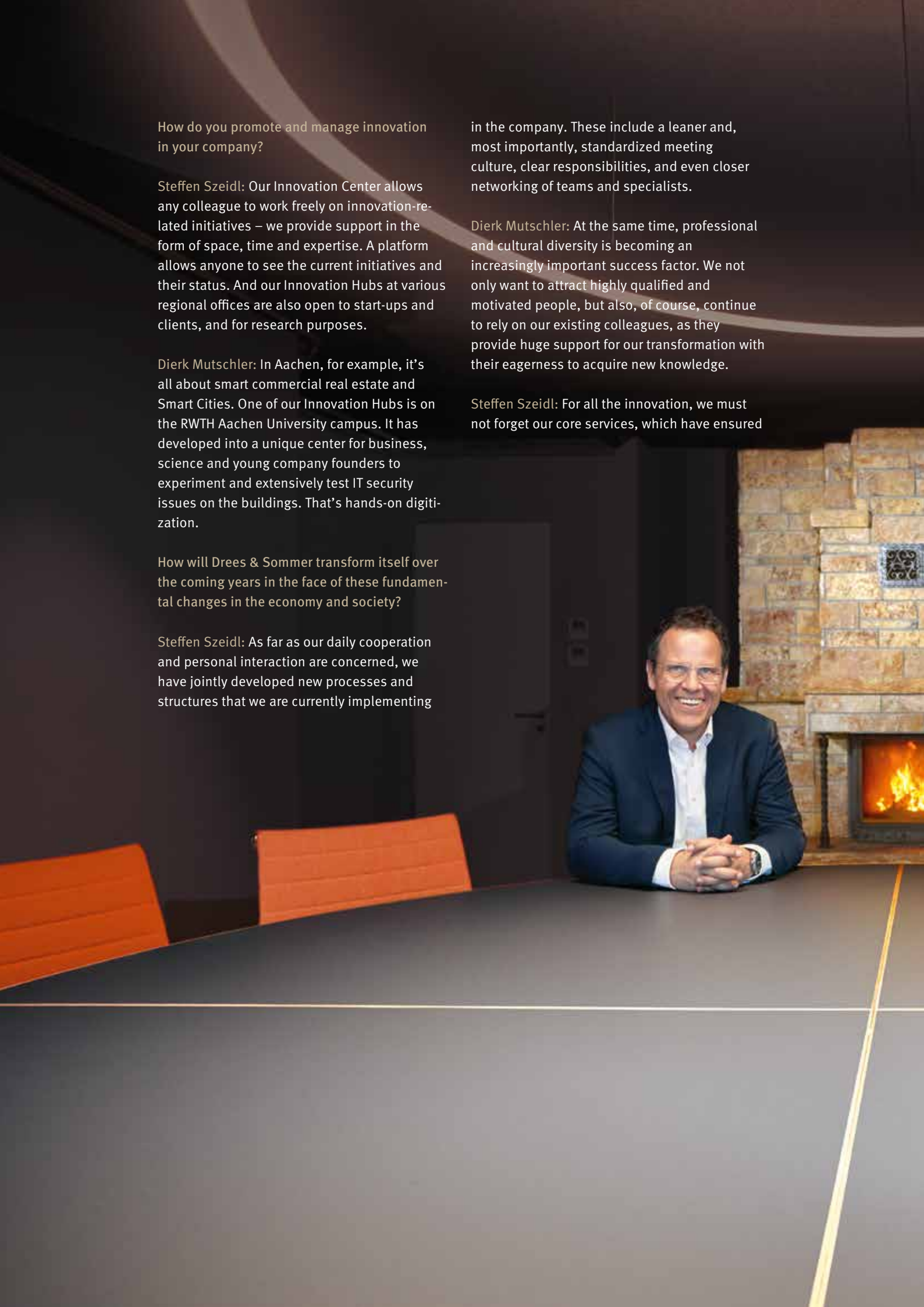
Dierk Mutschler: In Aachen, for example, it's all about smart commercial real estate and Smart Cities. One of our Innovation Hubs is on the RWTH Aachen University campus. It has developed into a unique center for business, science and young company founders to experiment and extensively test IT security issues on the buildings. That's hands-on digitization.

How will Drees & Sommer transform itself over the coming years in the face of these fundamental changes in the economy and society?

Steffen Szeidl: As far as our daily cooperation and personal interaction are concerned, we have jointly developed new processes and structures that we are currently implementing in the company. These include a leaner and, most importantly, standardized meeting culture, clear responsibilities, and even closer networking of teams and specialists.

Dierk Mutschler: At the same time, professional and cultural diversity is becoming an increasingly important success factor. We not only want to attract highly qualified and motivated people, but also, of course, continue to rely on our existing colleagues, as they provide huge support for our transformation with their eagerness to acquire new knowledge.

Steffen Szeidl: For all the innovation, we must not forget our core services, which have ensured



profitable growth over many years and establish the environment in which innovations can be developed.

How do you see the company's future, also with regard to Drees & Sommer's international commitment?

Steffen Szeidl: In the past, Drees & Sommer's internationalization was a key driver of our success, not least because of outstanding commitment on the part of many employees. That is not going to change in the future. In addition to our path to growth in the DACH region, we are specifically targeting national markets in Europe, such as in the Netherlands and the United Kingdom. Today, we are also heavily involved in global growth regions such as Russia, China, and the Arabian Peninsula. Our clients from the key sectors automotive, life science, health care and hospitality benefit from our international delivery capability and networking.

The trend in the real estate industry – both nationally and internationally – is towards integrated execution models. What is Drees & Sommer's take on this?

Dierk Mutschler: Basically, it's about taking responsibility. Market players want well-conceived solutions that work, so we put our money on execution models that focus on management, planning and implementation know-how from a single source, rather than on the interface. But this is only possible because of the trust that our clients place in us and the fact that our colleagues embrace the 'Dreso Spirit' day in, day out. So a huge thank you to all of you for our joint success in 2018.

Stuttgart, May 13, 2019

Dierk Mutschler Steffen Szeidl

BUILDING
THE FUTURE

How will we live and work in the future? Most of our grandchildren will probably not buy cars in the future, but mobility packages. A similar trend for housing is conceivable. People will buy residential services tailored to their stage in life, instead of rigid home ownership. Space for production facilities is rented for the life cycle of a product, etc.

In large production plants, manufacturing robots assemble individual components from the 3D printer into houses or parts of buildings, which are then placed or put together on site. Is this all fiction? Not at all!

In the past, buildings and construction processes have not developed nearly as fast as products and processes in other industries, such as the automotive industry or mechanical engineering. Yet new impetus is now coming from different directions:

- digitalization and networking of buildings and processes;
- the dissatisfaction of investors with long construction periods and high costs;
- the discrepancy between high demand and very low supply;
- the often inadequate quality of buildings;
- the increased demands of users.

These trends and the resulting requirements could be interpreted as a resurgence of prefabricated construction. There is already malicious talk of concrete slab construction 3.0. In this setting, industrial production with a catalogue of limited modules leads to short construction times. In the case of large batch sizes, it also results in cost savings, e. g. in certain segments of residential construction.

In contrast, Drees & Sommer follows the path of individual architecture with modularized planning. This approach enables our clients to pursue individual solutions that match their core business and are tailored to their brand language. Factors such as functionality, degree of digitalization and sustainability play a central role in this individualized approach.

Yet industrialized construction is also essential for cost-effective implementation of these solutions. The basis for this is a digital and modular planning process: Building Information Modeling (BIM). Many years ago, Drees & Sommer started referring to the integrated approach to projects of this type as the blue way: a combination of economy and ecology, coupled with digital and modular innovations, such as blockchain technology for smart contracts through to digital replacement of the land register. We currently use artificial intelligence (AI) for contract recognition, data structuring and process optimization – but this is only the beginning.

However, building for the future is basically about action on behalf of future generations.

the blue way

SUCCESFULL PROJECTS

For us at Drees & Sommer, however, it has always been important not only to look to the future, but also to implement feasible innovations in the present. For this reason, we have designed a model for successful project management, the main components of which are outlined below.

We basically divide a project into two levels:

› LEVEL 1 – Project definition: definition of content and architectural design of future-proof buildings, combined with the right organization of project management

› LEVEL 2 – Project implementation: successful construction management through modular planning and construction.

In LEVEL 1, the client's ideas and visions are analyzed thoroughly in order that we can then provide advice on the key contents of sustainable buildings. The goals for the client's 'product', developed together with the client on this basis, are clearly defined and recorded as performance specifications. A draft architectural design is developed using the performance specifications as a guideline and lastly the project organization is defined.

In LEVEL 2, modular planning using Building Information Modeling (BIM) initially forms the basis for modular construction, using the architectural design as the starting point. This is because it has been proven that the segmentation of buildings into repetitive modules based on the lean approach simplifies prefabrication, logistics, assembly and system integration to such an extent that buildings which are more cost-effective can be built. This also cuts construction time without reducing architectural quality. Even though planning is specific to the particular project, our concept enables the client to obtain a high-quality building on favorable terms. However, we also have to coordinate the entire process professionally from the beginning and integrate all participants into the project with enthusiasm.

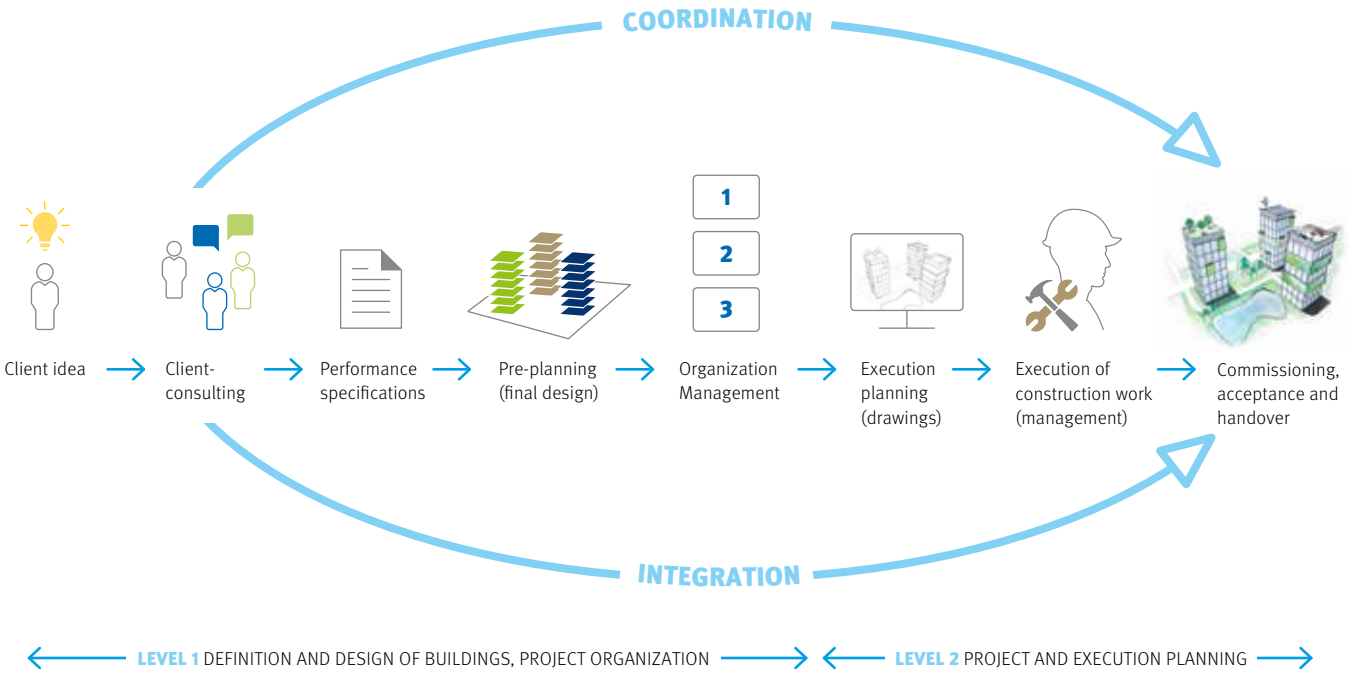


Fig. 1:
Procedure from the idea to the finished product

LEVEL 1 DEFINITION OF PROJECTS OF THE FUTURE

How do Drees & Sommer experts approach a project of this nature? In a kick-off meeting or initial workshop, they firstly analyze what the client really wants and the impact that particular issues have on the client's ideas. Consequently, the crucial questions for a client are: What do I actually want to do in the building later on? What must my building be able to do after completion? What is the best way to use or market it? What is required for this? What do I expect from the architecture? How can I be sure that project management will be handled properly? In this phase, a successful client product requires competent contact persons as advisers with practical experience, who will get on to the track of the requirement together with the client.

CONTENT-RELATED BUILDING CONSULTING

From today's perspective, buildings will be smart and intelligent in the near future and ideally networked both internally and externally with users and the surrounding district. The mixed-use type of building will become increasingly established, as it makes urban diversity a possibility. This is usually required increasingly for public or private-sector amenities, while the upper floors of such buildings will be dedicated to housing or office work.

Vegetation and water will be important topics both for buildings and for neighborhoods, as will digitalization and circular economy approaches.

Fig. 2:
Current topics relating to buildings of the future

Fig. 3:
A modern working environment in a revitalized existing building (Bain & Company, Headquarters Zurich)

Organization of Work and Processes

The use envisaged for a future building determines the basis for the planning approach. Intergenerational communal housing, for example, could increasingly take its place alongside traditional family structures, at least in urban areas. And much more is possible, e. g. 'housing tailored to the individual's stage in life' as a service.

In office buildings, for example, these are now called working environments, which are determined by efficiency on the one hand and work-life balance on the other. Consulting in this area also includes a reference to subsequent change management in order to 'take along' the employees into their new environment.

In the healthcare sector, on the other hand, the focus is initially on aspects of cost-effective medical care, but also on issues related to residential construction, such as rehab facilities, care homes, etc. As a result, each industry has different key specialist areas, which are covered by our various experts.

Depending on the sector, the requirements give rise to a specific space allocation plan. It comprises various spatial modules and a function plan that maps all interrelationships in the use of the space as well as transport infrastructure. Logical fit-out grids for office buildings or residential modules can also be discussed as a basis for organization, as is the case for manufacturing processes and plant design in industrial facilities.

Digitalization and Building Technology

At Expo Real 2018, Drees & Sommer raised the question as to what is the right degree of digitalization. The reason why this matters is because, within just a few years, houses designed today will shape our reality and become part of smart cities. In order to retain some room for manoeuver with regard to operation and design, clients need to take a good look at the issue of customized smart building for the future.

In addition to energy and sustainability concepts, designs should also incorporate digitalization concepts. These are important for aspects such as optimal control of lighting and space conditioning, and the question of user control – from room management to facial recognition, and from indoor navigation to tracking of everything. In smart buildings, planning data interacts with building and user data to achieve this. If work stations or areas are not allocated on a permanent basis, an app shows the user on entering the building where there are vacancies. If there is an increase in the CO_2 content of the air in a much-used conference room, the ventilation turns itself up. Everything seems possible. As to whether everything is useful, or necessary in a specific case, Drees & Sommer's consulting service helps clients decide.

Some examples of pioneering buildings in which many of these visions are already a reality include The Ship in Cologne, Hammerbrooklyn Digital Campus in Hamburg, and cube berlin. In these construction projects, which were all overseen by Drees & Sommer, users and their needs were the focus of all efforts right from the

Fig. 4:
Projects such as cube berlin (© CA Immo), The Ship in Cologne, and the Hammerbrooklyn Digital Campus in Hamburg are milestones on the path to a future in which digital buildings will be the norm

development stage. The building's artificial intelligence learns from data on the operation of the building, the users and the environment, and uses the data to make suggestions for improvement. For instance, unused areas in buildings of the future will no longer need heating or cooling, ventilation or lighting. What is particularly interesting, as the costs of these smart buildings amount three to five percent of the total investment, they are currently little more expensive than conventional buildings.

Urban Greenery and Water Usage

Plants and water are becoming major design considerations for buildings and entire districts. Greener cities are the basis for a healthier living environment. Trees and shrubs form spatial building blocks that help to improve the urban climate, water management, biodiversity and the city's image.

On average, the temperature in urban areas is significantly higher than in rural locations. Pavements and buildings capture the sun's heat and then release it. Combined with exhaust emissions and the concentration of human activity this drives up the temperature. The greenery on façades and ground floors absorbs the heat and slows down the warming effect. Evaporating water has a cooling effect, while rooftop greenery insulates buildings, and trees provide shade. Green spaces also increase biodiversity and enhance the quality of the surroundings. The current trend towards urban farming is becoming well-established, thus reducing the need to transport food over long distances from outside the city and providing a local source of fresh vegetables.

Fig. 5:
Greenery improves the microclimate

Many cities now have to deal with the growing problem of channeling rainwater safely away after heavy downpours. Equally, during dry periods, we need to be able to draw on stores of water. It follows that cities need to be designed with the capacity to store that water on a temporary basis. In this context, green zones can play an important role.

Circular Economy (Cradle to Cradle, C2C)

In the future, circular economy topics will play a greater role, both in relation to building materials and in operating the facility. Buildings can be seen as depositories of raw materials, which will release their resources at the end of their service life.
So far, however, many buildings have been geared primarily towards energy efficiency. Although this makes operating the building more sustainable, it causes an increase in the negative environmental impact of the building materials required for this purpose and their production. In addition, potential for value added is lost.

The proportion of materials costs in construction projects is generally between 20 and 30 percent. If the building materials cannot be reused after demolition, these investments are lost. In addition, the owner pays a lot of money for disposal of the waste materials. However, if the materials are brought back to the same quality level via recycling, the raw material value remains after the lifetime of the real estate comes to an end.

Cradle to Cradle also creates new business models. An example of this would be a manufacturer no longer selling the product, but its function. The client no longer purchases the lamps, but the light. This leasing concept is closely linked to C2C. In this way, the manufacturer can re-process its raw materials after the end of the product life cycle, while the user can forget about maintenance and replacement.

At its headquarters in Stuttgart, Drees & Sommer has been successfully testing a living showroom for Cradle to Cradle products on its premises for several years now. The previously dark middle zone in the building was completely revitalized on the basis of C2C principles. All materials are tested to ensure that they are free from harmful substances and are recyclable. A flora wall gives the room a 'green' atmosphere and humidifies the dry office air. The newly developed LED daylight ceiling with textile hangings absorbs sound. The C2C swivel chairs are fully recyclable and come with a take-back guarantee.

Performance Specifications and Feasibility Study as Agreed Target

At the conclusion of the content-related future workshops with the client, Drees & Sommer's specialists neatly summarize all agreements in a performance specification document. This forms the basis for all further design stages. The performance specifications consist of:

› space allocation plan for work and process requirements;
› functional allocation plan and information regarding adaptability for alternative uses;
› specifications regarding digitalization, building technology and energy management;
› ideas on planting and water management;
› ideas on recyclability (C2C).

These performance specifications form the basis for architect competitions, and enable participants to concentrate on their planning tasks. Massing studies are carried out to determine whether the space requirements in the space allocation plan are manageable in view of the building laws for the intended site. The spaces are then adjusted if necessary.

Architectural Design

There are different options for finding an architectural design to suit the client's criteria, which is then brought in line with the urban development requirements:
› appointing an architect directly;
› appointing three to five architects jointly;
› running a competition.

In the first two cases, the architect and the clients can be more closely involved in the particular design. On the other hand, a competition generates more ideas. In each case, we verify that the performance specifications have been complied with, and check the space efficiency, the degree of construction difficulty, and the construction costs. An optimization phase generally follows, involving detailed discussion of the designs by one or two architects and the client.

This concludes the project preparation in terms of content and planning.

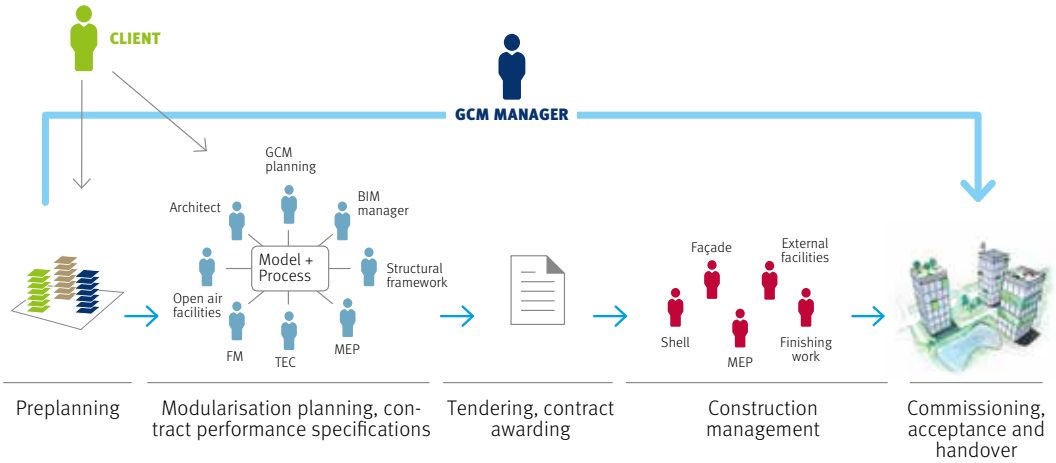
Fig. 6:
Drees & Sommer's C2C living showroom in Stuttgart

NEW ORGANIZATIONAL FORMS FOR CONSTRUCTION IN THE FUTURE

The first step is to hold the usual organizational consultation, in particular establishing the line-up of the client and/or its executive bodies. This depends in turn, however, on which management model is chosen. This is because new (collaborative, integrated and digital) planning methods and the lean approach are becoming more and more widespread. Depending on which of these management models is chosen, the role of the client may also change. For this reason, three management models are described below. When applied correctly, they can be expected to produce very successful results.

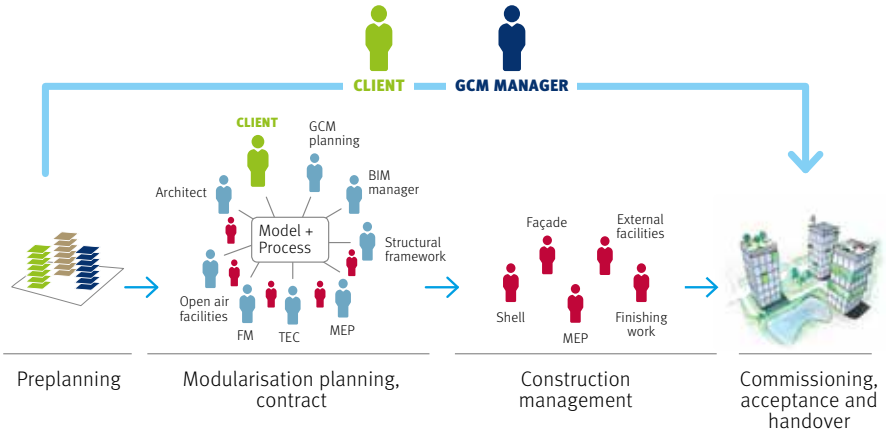
CONVENTIONAL MODEL
WITH GENERAL CONSTRUCTION MANAGEMENT (GCM)

t_{TOTAL} = 100 %



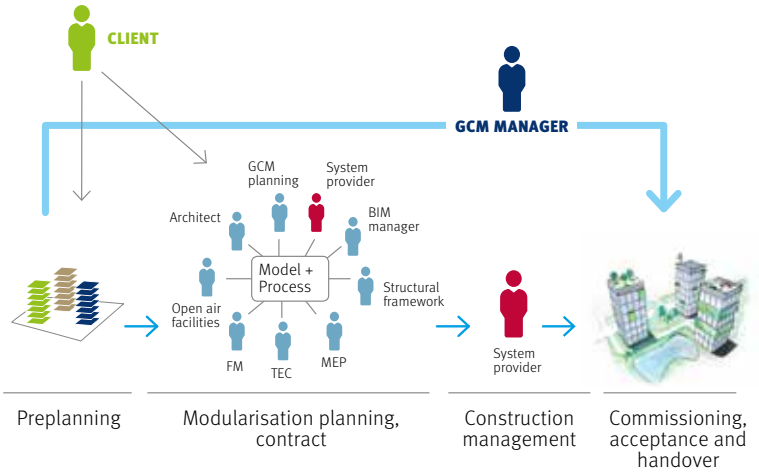
COOPERATIVE MODEL
WITH INDIVIDUAL COMPANIES (e.g. IPD)

t_{TOTAL} = +/- 80 %



COOPERATIVE MODEL
WITH SYSTEM PROVIDERS

t_{TOTAL} = +/- 50 %



Conventional Model with General Construction Management (GCM)

This model, which has long been widespread in the Anglo-American sphere, is based on the assumption that planning has been completed and thought through to the end before construction work is put out to tender and awarded. Compared to the usual procedure in Germany of overlapping planning and execution, this does result in greater security in relation to costs and deadlines, but also in a significantly longer construction period.

The process is nevertheless generally conventional, with the result that integrated planning takes place without involving the companies implementing the plans. As a consequence, their expertise cannot be included in the planning at this stage. The result is that, between completion of the planning and award of the contracts, quite a long adjustment process must often be carried out with the companies executing the project, in order to improve the implementation and cost-effectiveness. Nevertheless, this model considerably increases security in relation to costs and deadlines. However, there is no guarantee.

Cooperative Model with Individual Companies (e. g. Integrated Project Delivery – IPD)

The thinking behind the open book partnership model came from the idea of bringing contractors on board early, with the client becoming part of the team.

In the first planning stage, the project managers develop a design with the client on the basis of the architectural concept. This ‘clarification of ideas’ is the basis for requests in the market in relation to the individual trades, or groups of trades. Depending on the trade concerned, regional and interregional providers are checked by Drees & Sommer to determine their capabilities and reliability. A letter of intent (LOI) is issued to suitable providers, and they are incorporated into further plans. They can introduce their specific modules and design proposals, with costs being continuously monitored. When the design is completed, contract performance specifications may be developed for the tenderers taking part, who have themselves contributed to drawing them up.

The comission of the tendering and contract award stage means that production of prefabricated modules and work on the construction site can start immediately. This reduces construction time and increases cost certainty.If the client does not wish to be part of the partnership model, Drees & Sommer can perform the role of the client as the consortium manager (construction partner model).

Cooperative Model with System Providers

Another interesting model is partnership with a system provider in the field of modular or prefabricated construction. In this case, the first step is limited to basic planning, in which the input from the requirements specification is brought into line with the architect‘s design and the planning requirements are defined. General construction management (GCM) then holds discussions with various providers and determines to what extent they are suitable for implementing the planning requirements, and on what terms.

After the decision for a supplier has been made, the supplier, in coordination with GCM, takes over the planning implementation for manufacture of the room modules or building elements, along with integration of building services (mechanical, electrical and plumbing equipment, MEP) and finishing work. GCM coordinates everyone involved, including contractors for the foundation/conventional basements. It also monitors costs and deadlines on behalf of the client.

The construction time can be further reduced substantially using this model, usually combined with a general maximum price (GMP) or a price guarantee. Here, too, Drees & Sommer can enter into a partnership with the product supplier and offer the complete package as a turnkey product.

LEVEL 2 MODULAR DESIGN AND CONSTRUCTION

In the past 10 years, the productivity of the construction industry has risen by less than three percent, in contrast to mechanical engineering and the automotive industry (Industry 4.0), not to mention the information and communications sector. There is clearly huge unexploited potential for an increase in production, which could be increased to a large extent by the use of digitalization and modularization.

INTEGRATED DESIGN WITH BIM

The widespread use of building information modeling (BIM), a cooperative design method, is fundamental to modular construction.

BIM enables virtual representation of design, construction and operation processes. This means that the building already exists as a virtual 3D model – a 'digital twin' – before the foundations are laid. Generalists and specialists work closely together in the BIM process. The objective is to form the results of the different disciplines (architecture, structural framework, façade, construction materials, building technology etc.) into an optimized building system geared to the specific client's requirements. The individual designers can initially work with their own software and model their own design areas, but these are always integrated into a combined overall model for coordination via industry foundation class (IFC) interfaces.

The interaction between the independent components of BIM and modularization enables the design and construction to be optimized.

Modularization with BIM

Modularization establishes the arrangement adopted by all the designers in BIM and used throughout all the design phases as a basic principle. The starting point for the modular design is a project coordinate system. It arranges the geometry of the building from the smallest to the largest structures on the basis of a uniform modular coordination into regular subareas. These are primarily derived from the space utilization concept and the need for adaptability of the building.

Once a building design is settled by a project coordinate system of this kind, the modularization of the design starts. The project team breaks up the building structure into subtasks (modules). The modularization incorporates the entire building structure, from the shell and the façade to the finishing work, building technology and interior design.

Processing Levels of BIM

In addition to the geometric and descriptive data in BIM 3D, further information can be linked with the model. The primary management-related uses are time and costs, which offers completely new opportunities for controlling.

Further possible uses are the provision of information on ecology and the use of the prepared data on operation (FM). Information on security, in relation to both the building itself and its operation, is also becoming increasingly important.

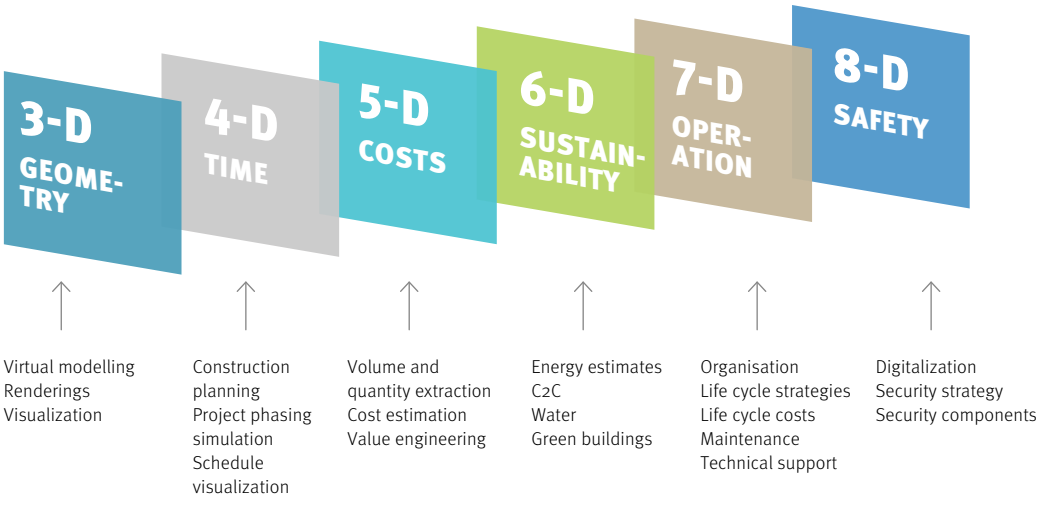


Fig. 7:
Extension stages of BIM

Planning with Modular Construction Kits

The planning approach is complemented by design integration. On the basis of the different module catalogs and the interfaces defined between the modules, the experts from the different design disciplines, such as architects, interior designers and building technology professionals, put them together again to form a functioning whole. The planners work with a predefined modular construction kit, with standards and platforms forming the basis for the design. Clients and designers define what is suitable for modular design and what is designed and executed separately on the building. In general, BIM is ideally suited to the early involvement of contractors in the design, as this enables joint development of optimal modular construction kits. Multiple existing modules can usually be used – in addition to internet offerings.

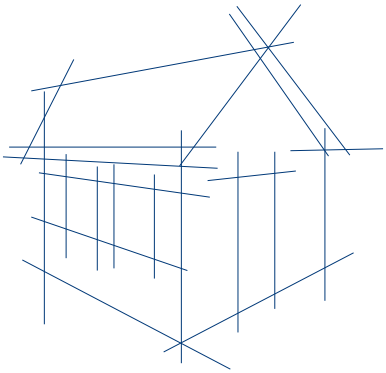
Building Configurator

Use of a configurator can result in the creation of a largely completed BIM model. The modules are already available in detail with all the necessary information in a project-related modular construction kit. The BIM data is linked to the manufacturing machines by close cooperation with the production partners. Modular design therefore has great potential to increase efficiency, as many decision cycles become unnecessary and duplication of efforts is minimized. The planning and design processes are significantly faster and far less prone to errors.

Advantages of Modular Design

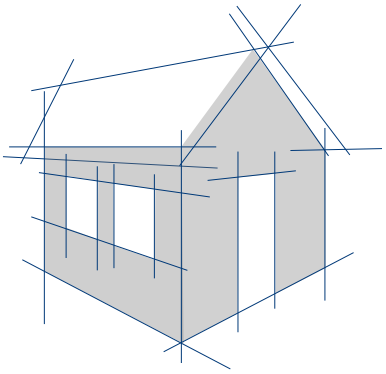
The advantages of the modular design and design integration process are clear:

- cost-efficient buildings with individual architecture;
- design and planning security, and construction quality achieved through a significant reduction in complexity of up to 80 percent;
- rapid and flexible response to changed requirements;
- reduction in design and planning costs because errors are quickly identified and avoided;
- almost unlimited potential for increasing the degree of prefabrication in construction;
- flexibility for later operation can be incorporated into the modular construction kit;
- construction times reduced by more than 20 percent.

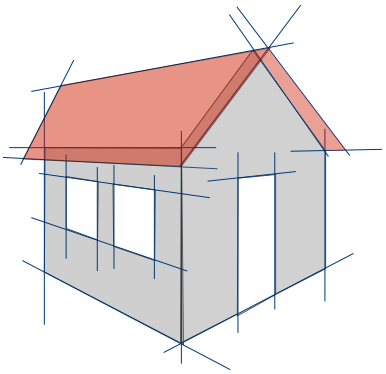


Geometric definitions

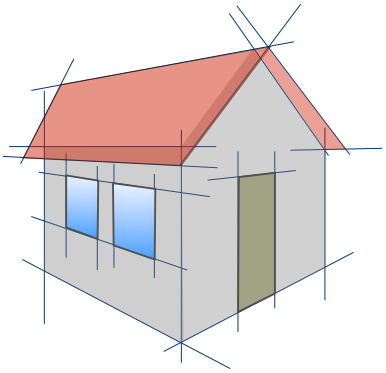
Modular construction kit



Assembly of elements
Construction



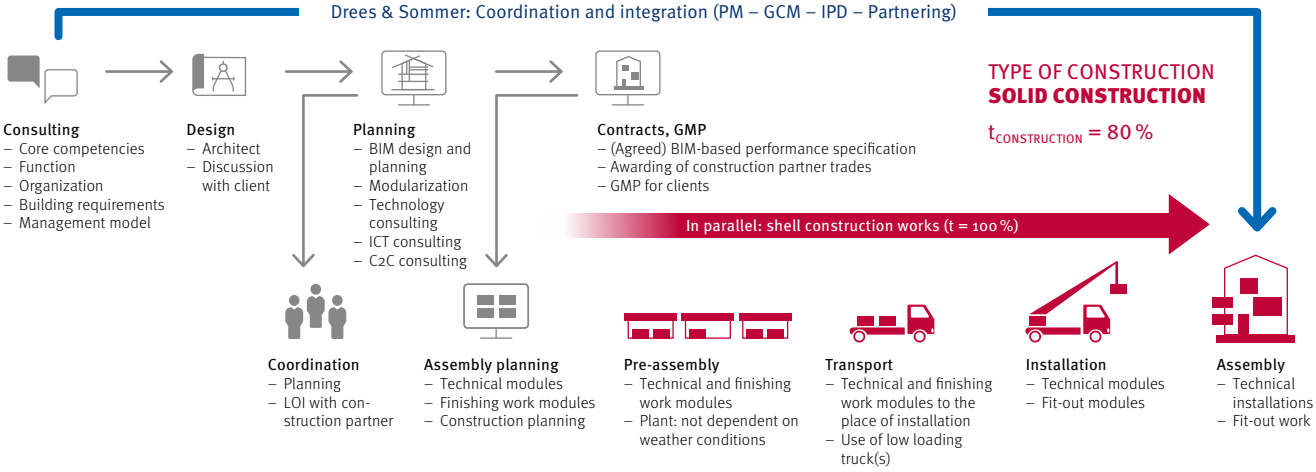
Assembly of roof elements



Assembly of elements
façade etc.

VARIANTS FOR A MODULAR CONSTRUCTION PROCESS

On the basis of modular BIM design and planning, different levels of modular construction are possible. The advantages of the variants described below can only be fully exploited if the contractors participate in cooperative design and planning processes through BIM at an early stage by the issuing of letters of intent (see also organizational models on page 17).



TYPE A: Solid Construction (Hybrid Concrete), Unitized Façade, Modular Finishing Work

With this model, the project team builds a conventional shell on a concrete base, but they use the most advanced formwork systems in combination with precast concrete units and steel structural elements. This enables construction times to be shortened even when concrete is used.

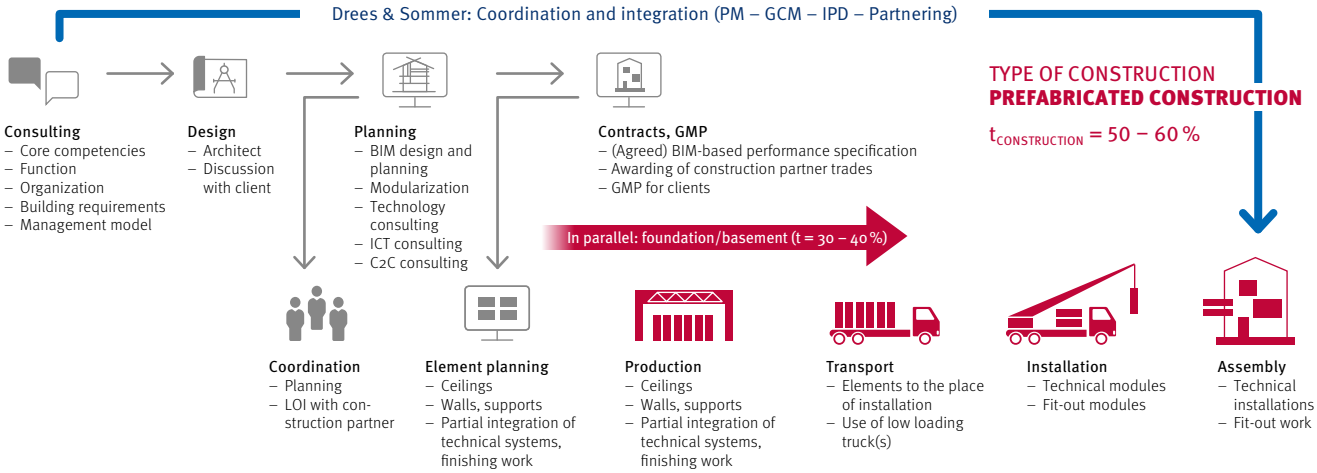
With most construction projects, it is noticeable that the shell is built relatively quickly, but then nothing further happens for a long time. To avoid this, immediately after the BIM design has been drawn up jointly with the contractors (following the issuing of LOIs to the contractors) the project team draws up the contract performance specifications with costs for the contract awards, and the construction contracts can be entered into at short notice. The inclusion of contractors in a cooperative arrangement enables the process of assembly by these contractors to be carried out in a short space of time according to lean principles immediately after (or overlapping) the completion of the shell.

In comparison with a conventional process, this would mean a reduction of around 20 percent in construction times. Construction costs can also be reduced by this procedure by at least 10 percent, as the contractors are contributing their particular expertise to the design from an early stage. This also significantly increases cost certainty. In addition, maximum prices can be agreed on this basis when the BIM design is completed.

If individual trades exceed their cost estimates, an optimization process takes place. If this is unsuccessful, the project team negotiates with other providers. To ensure the integration capacity, Drees & Sommer is geared towards general construction management (GCM), with general planning, BIM management and construction management for all trades.

Solid construction is suitable for all types of buildings. Its advantage is that it allows architects to create free-form, organic shapes. This applies museums, concert halls and theaters in particular, but also to high-rise buildings and special CI buildings. Solid construction is therefore traditionally used for single buildings without a high degree of repetition.

Further advantages of solid construction are its capacity for sound insulation, heat and cold storage, fire prevention and earthquake resistance. Its long service life is both an advantage and a disadvantage. With regard to flexible changes, it is a disadvantage. However, sand as a resource is running out, and the environmental damage caused by its deconstruction is increasing. Cement production also releases large quantities of greenhouse gases, and recycling of concrete buildings is comparatively difficult.



TYPE B: Prefabricated Construction Method (Wood/Hybrid) with Partial Installation

Prefabricated construction is mainly used in timber construction. As the name implies, the building is made up of horizontal and vertical elements which mainly consist of timber. They generally have five prefabricated serial elements:

› supports;
› ceiling beams;
› ceiling panels;
› wall and façade elements.

The prefabricated construction method can be used to create relatively individualized buildings, although this requires a consistent grid system. The major advantages in terms of structural stability are that this system is lighter than concrete and masonry structures, and especially that it is produced with a renewable raw material.

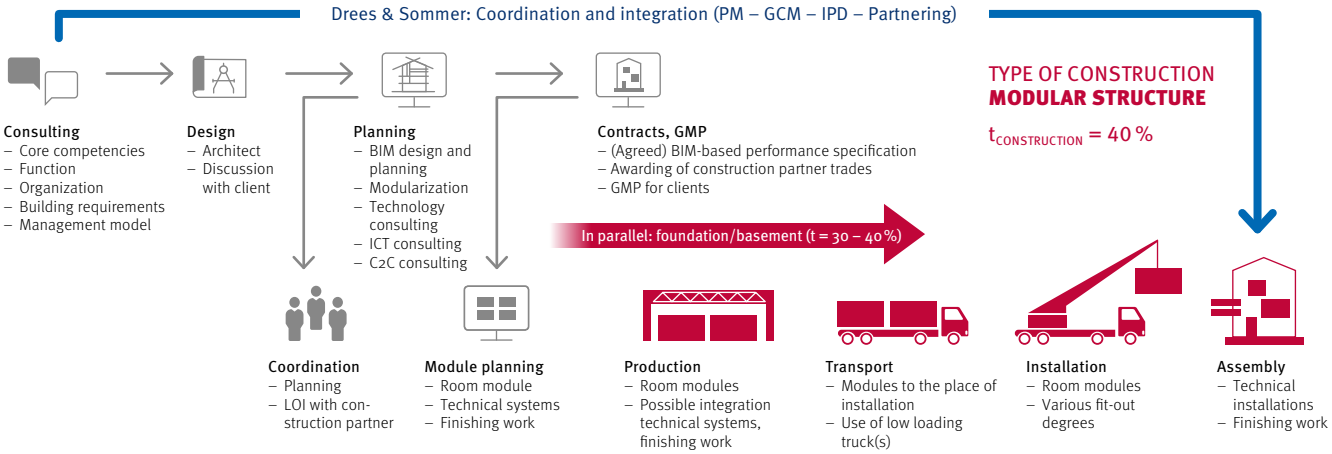
Fig. 8:
Wooden prefabricated construction
(Erne Holzbau)

The basis of the planning is initially the same as for conventional construction methods. But the grid dimensions for the building depend to a major extent on the preferred structural grids of the suppliers. In principle, this means that selecting the supplier also means choosing the grid. In any case, the structural design and the planning of the load-bearing structure are mainly transferred to the supplier.

Prefabricated construction involves detailed work in advance on floor, wall and ceiling elements. Windows, doors and parts of the building services installations are also integrated. If these elements are already 'finished' in the factory, they can be quickly assembled on the building site.

The foundations and the basement are produced conventionally, parallel to the prefabricated elements. On the building site, the supplier assembles the factory-made elements so that, in a very short time, the shell is erected with a tight exterior envelope. This means that no moisture can enter the building in inclement weather, and the remaining finishing work then commences immediately. The quality of the building is very good because of the high dimensional accuracy, although it depends on the subsequent trades. Compared with conventional solid construction, building times can be reduced by 40 to 50 percent, although the costs are around the same, as prefabrication is still done by hand.

In combination with a concrete core, it is currently possible to obtain planning permission for buildings that are 80 to 100 meters (the limitation is due to fire safety considerations). Wood is a renewable raw material with good insulation properties and is easily recyclable – another advantage with regard to C2C principles.



TYPE C: Room Cell or Room Module Construction (Steel/Wood/Concrete)

The principle of room cells is a further step towards industrial prefabrication. In this process, three-dimensional modules are constructed with complete load-bearing capacities, and in some cases with a high degree of finishing. This is based on an industrially prefabricated variable steel frame, wooden or concrete structure, which is filled in with dry construction materials. The transport capacity determines the maximum dimensions of the individual modules.

The architect has a certain amount of freedom in the module grid. But round and especially organic building forms are difficult to implement and very costly in module construction. The number of floors possible depends on the material and the cost-effectiveness (structural stability). Room cells made of reinforced concrete can be built up to seven floors high, and steel modules up to five or six. Wooden modules are cost-effective up to four floors.

Prefabrication in production buildings means that the weather cannot impact the quality or the schedule. Standardization means that the modules can be manufactured to a consistently high standard of quality, and the double-layer wall and ceiling/floor systems results in good physical properties.

The modules are stackable, and theoretically they can be completely fitted out in the factory. The façade and roof can also be added there. Room modules made of wood or steel are particularly cost-effective for large numbers of identical modules in a module system, or where extremely short construction times are required. This makes them well suited for use for kindergartens, schools or university buildings, as they can be built during vacation times and be ready to move into when the next semester starts. This process is also an interesting alternative for office and administration buildings, particularly for vertical extensions or temporary buildings. In healthcare facilities such as hospitals, room cells enable extensions to be added to existing complexes with hardly any interruption in daily use. Construction times can be reduced by up to 60 percent in comparison with a conventional solid construction, depending on the number of below-ground level floors.

Standardized concrete modules are primarily designed for residential construction. The modules are produced in a small number of different lengths and are manufactured and fitted out industrially. They can be configured for different apartment sizes by horizontal addition and vertical stacking. They are a possible solution for social housing, but also for student accommodation and microapartments.

Fig. 9:
Room modules in steel (left and middle: ADK) and wood (right: Erne)

DREES & SOMMER'S ROLE IN **BUILDING THE FUTURE**

Drees & Sommer's USP is that we understand the building as a whole in relation to the urban setting and the environment. In addition, we combine inhouse not only the management skills, but also the planning expertise required in all disciplines.

And to make sure that this is not just theory, we are also able to realize this with our construction managers and put it into operation. This makes it quite simple to describe the objectives of Drees & Sommer for our clients.

- Depending on individual requirements, we develop digitalized buildings that enable technical and functional operation to be optimized, minimize energy requirements and open up new business models for building owners.
- We are researching options for eliminating possible negative influences from the use of hardware during digitalization through neutralization.
- Through the targeted use of plants and water, we create a pleasant and healthy microclimate while saving water charges and wastewater costs.
- We save time and money through modular planning using BIM and modularized management processes optimized for the specific case.
- In combination with modular construction and C2C, we transform the buildings into recyclable stores of raw materials, which still represent value even after the period of use.
- If the building is to be sold sooner than planned, our real estate experts will ensure that a good selling price is obtained, due to the optimal condition of the building.

In recent years, Drees & Sommer has positioned itself through internal developments and mergers in such a way that the client can be consistently advised and assisted, from the initial idea to the handover and utilization of the project.

Everything you need to know about the technical terms used can be found in our glossary.
dreso.com/en/company/glossary

COORDINATION/ INTEGRATION

In general, Drees & Sommer as project manager performs the coordination of all the processes required for implementing a particular construction project, from consulting through handover. To coordinate these processes in the best possible way, all project participants must be integrated and organized at the right time and in the right way. In addition, Drees & Sommer also offers its clients more extensive support throughout all phases, as described below.

1

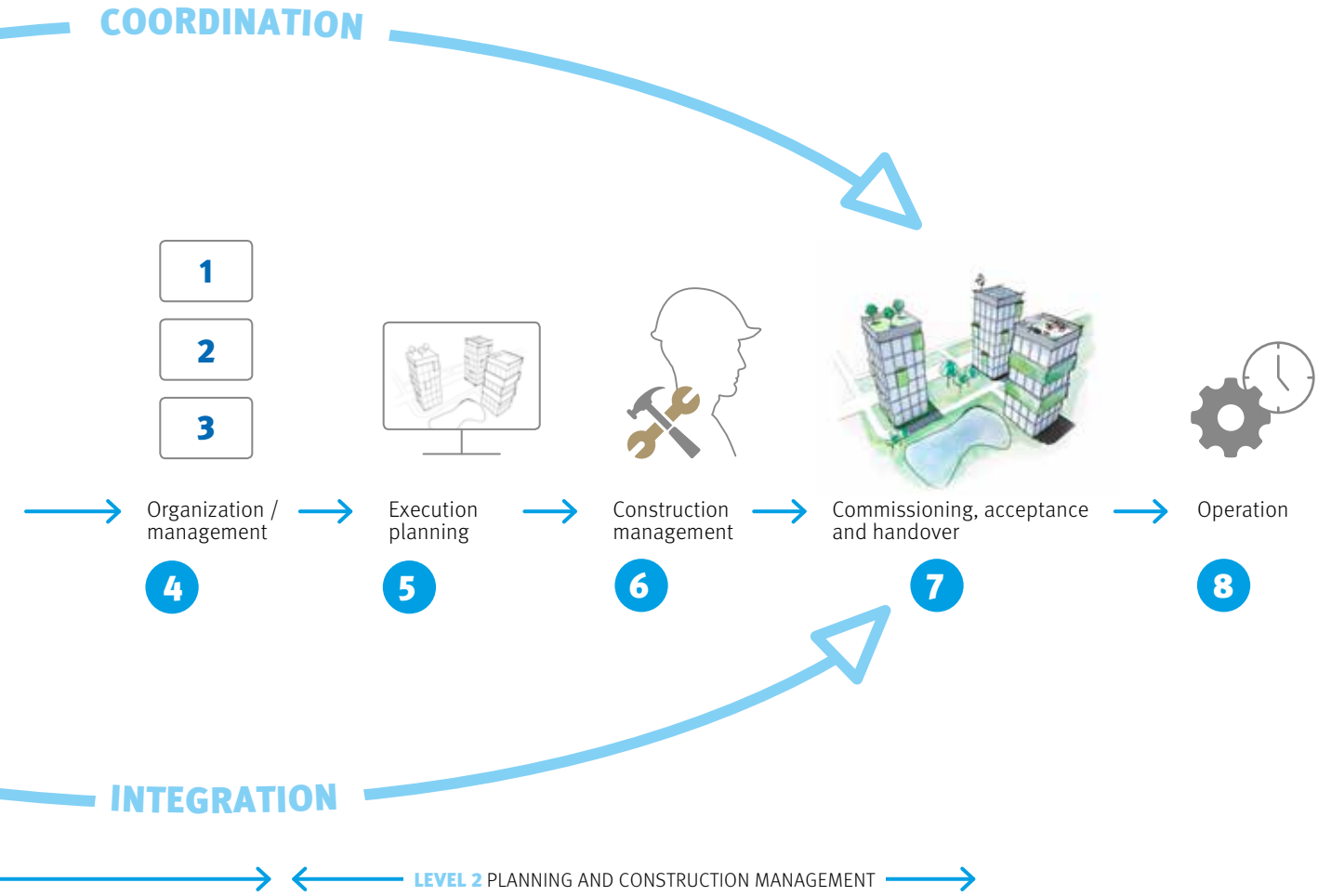
To advise the client before the actual start of the project, Drees & Sommer experts on the sector and property in question are assigned as a consulting team. In addition to organization of work and processes, specific industry expertise is particularly important in this respect.

2

Our project management initially prepares the requirements specification based on the results of the consulting sessions. It then adds content relating to construction law and contract law. In this phase, we also provide advice on the right management model for the construction project.

3

In the conceptual phase, several architects are usually invited to submit proposals, or an architectural competition is held. Drees & Sommer performs the preparation and organization, as well as the prelimi-



nary evaluation and comparison of the designs for compliance with the specifications. It also calculates the expected costs. The degree of difficulty in relation to implementation is also assessed.

4

As described in LEVEL 1, we advise clients on the right way to manage the process.

5

In the planning phase, we offer management services such as agile planning control and BIM coordination. BIM planning for all cost groups and the modularization are also provided as part of general construction management (GCM). An essential element in this respect is to establish a sustainable proposal using energy systems with future viability, taking into account the digitalization strategy. Backed by our expertise in plant and production planning, we not only focus on the buildings, but also ensure that production uses optimum processes. Depending on the organizational management concept, we also integrate the right implementing companies into the planning.

6

We also perform construction management as part of GCM. Logistics planning and lean construction management are also included. With models such as integrated project deliveryor construction using product suppliers, we also assume some of the risks for projects yet to be defined, and offer turnkey construction using selected partners.

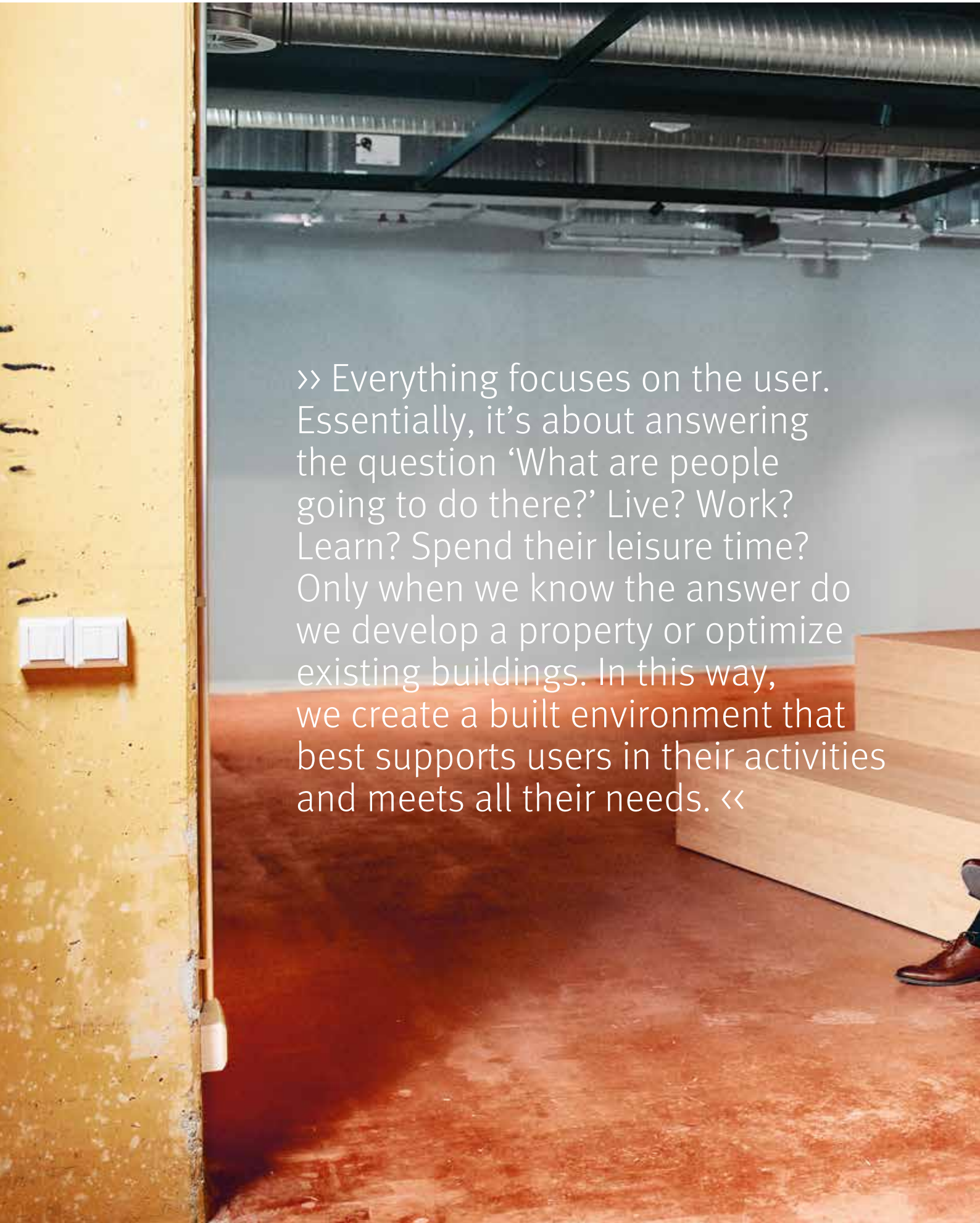
7

On completion of the construction phase, we manage commissioning, acceptance and handover. A highly specialized team is available for this work. Planning a relocation must also be remembered, especially with increasing IT requirements or ensuring the smooth functioning of production lines.

8

Naturally we also assist our clients during operation, from facility management consulting through support for change management.

Partners from left to right:
Martin Becker, Ralph Scheer, Veit Thurm



›› Everything focuses on the user. Essentially, it's about answering the question 'What are people going to do there?' Live? Work? Learn? Spend their leisure time? Only when we know the answer do we develop a property or optimize existing buildings. In this way, we create a built environment that best supports users in their activities and meets all their needs. ‹‹

AAREAL BANK TAKES ON A BRAND-NEW LOOK

Aareal Bank has redesigned its headquarters in Wiesbaden, opting for a contemporary interior design language.

›› Contemporary brand-specific design for heritage-listed 1950s ensemble. ‹‹

Aareal Bank is a leading international provider of financing solutions and services specializing in the real estate industry. The bank wanted to express this positioning in the building's visual identity. The Frankfurt-based Design Consulting team implemented a custom design that fits the brand perfectly: It is solid, premium-quality, and contemporary.

In addition to providing expertise on aspects such as fire prevention and structural analysis, the key challenge in the project was the sensitive handling of the heritage-protected architecture. An atrium flooded with natural light is the focal point of the Aareal Campus and provides access to the various levels of the building. Travertine, a light-colored limestone, is the main facing material. It is used with different surface finishes for the floor and walls. The visual highlight of the waiting area is the custom-designed round luminaire.

› Feasibility study, project management, engineering, brand architecture, design consulting, consulting and implementation of a new work environment including the conduct of user workshops, design of outdoor areas ‹

As a first step, the experts conducted a feasibility study for individual buildings and developed an overarching campus strategy. At the start of the project – up to 2016 – the team also supported the client by providing project management and engineering expertise.

During the project, the team worked closely with the execution architect. The Executive Board's conference area was completed in May 2016, the foyer in October 2017. The bank was then able to open the new lobby area, coffee bar, conference area, project rooms, and the pilot area for the new work environment in March 2018. The finishing touch was the completion of the outdoor areas and the facade portal in June 2018 as the campus's new calling card.

The involvement of the buildings' users played a major role in the success of the project. The Design Consulting team conducted numerous workshops with them to establish the bank's future approach to work. This resulted in the development of a new work environment in addition to numerous flexible project rooms.

Client:
Terrain-Aktiengesellschaft Herzogpark (TAG), Wiesbaden

Project duration:
June 2015 – May 2018

Architect:
apd architektur+ingenieurbüro, Frankfurt (design)

Key project data:
GFA: 580 m² (Building 5), 2,500 m² (Building 12)

Ideal both for creative exchange and work requiring a high level of concentration, the new work environment is perfectly aligned with Aareal Bank's requirements – both visually and functionally.

OFFICE AND LABORATORY BUILDING: TENANT REQUIREMENTS FULLY MET

MULNV also leased 150 of the 600 parking spaces in the newly built multistorey car park for its staff.

In 2012, the Ministry for Environment, Agriculture, Conservation and Consumer Protection of the State of North Rhine-Westphalia (MULNV) set out to find new premises for its Düsseldorf-based employees. Drees & Sommer supported project developer Aurelis by providing comprehensive services to tailor the property to the requirements of some 400 staff.

When MULNV published an Europe-wide tender announcing that it was searching for new premises, Aurelis hired the experts from Drees & Sommer to undertake a feasibility study to determine the suitability of the Quarter 1 of the Duisburger Freiheit site. Following a positive finding, Aurelis developed a design for an office and laboratory building on one of its own sites that met all MULNV requirements. The first steps were preliminary planning to achieve cost certainty and the development of an initial lease offering. Thanks to Drees & Sommer support, the preliminary planning phase was successfully completed despite extreme time pressure, allowing the lease offering to be submitted in time for approval.

Impressed by the successful planning and pleased with the central location near the main station, MULNV signed the lease agreement with Aurelis, allowing construction to begin. The two office and laboratory buildings connected by a glass bridge were supplemented by a multistorey car park garage, in which MULNV rented 150 parking spaces for its employees. As project manager, Drees & Sommer worked closely with the future user to ensure that the buildings – especially the laboratories – met the requirements of the diverse disciplines involved, which included biology, organic chemistry, radiology, ecotoxicology, and instrumental and elemental analysis.

› Feasibility study, project management, Project Communication System (PCS), GC controlling, technical & economic controlling, Green Building certification, commissioning management, facility management consulting, tenant coordination, vendor due diligence ‹

The interdisciplinary team from Drees & Sommer also managed to meet or beat all schedule, quality and cost goals. For example, the review and revision of the foundation concept significantly reduced investment costs, and the revision of the building services equipment concept also cut future operating costs. As a result of a comprehensive energy concept, the efficiency of the building envelopes of the office and laboratory buildings exceeded Energy Conservation Ordinance requirements by 50 percent and 30 percent respectively. The use of district heating and solar panels, and Drees & Sommer experts support for the certification process also contributed to the building being awarded DGNB and LEED Gold.

All this enabled Aurelis to sell the property during the execution phase – before the buildings were finally handed over to their future users at the end of November 2018. This resulted in a copybook-perfect project development for Aurelis and the delivery of premises that fully meet MULNV's exacting demands.

Client:
aurelis Real Estate GmbH & Co. KG, Eschborn

Project duration:
November 2012 – November 2018

Architect:
agn, Ibbenbühren

Key project data:
– GFA (offices): 9,836 m²
– GFA (laboratory): 11,278 m²

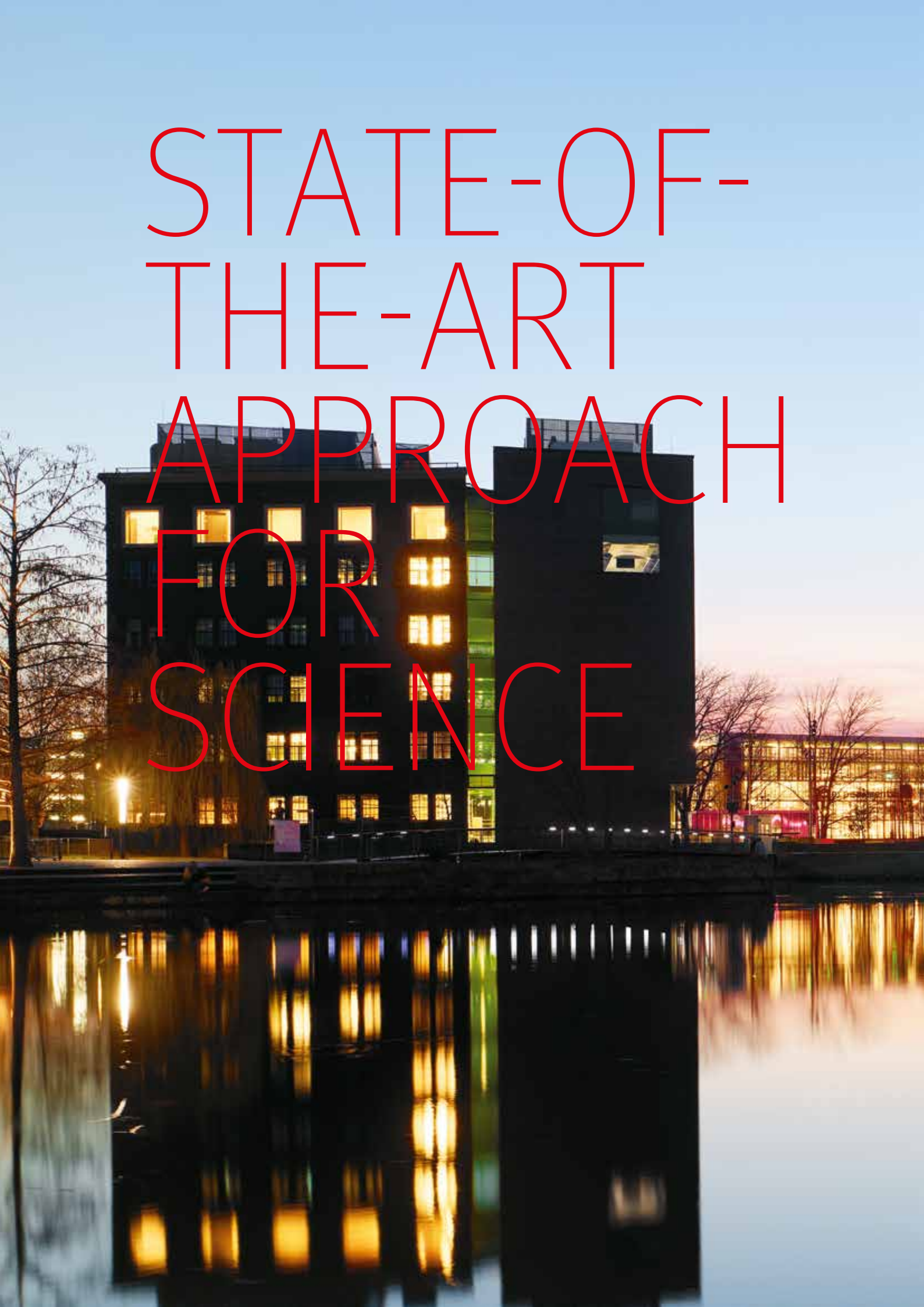
The laboratories meet the exacting demands of the diverse disciplines involved.

›› Exemplary project development through interdisciplinary support from a single source. ‹‹

Partners from left to right:
Thomas Häusser, Patrick Theis, Dr. Peter Mösle

›› We have developed a stage gate process to turn ideas into innovations. Our Innovation Center supports ideas with potential on their path to market maturity, with a structured, step-by-step approach. From the first pitch and the development of a business case and prototype through, potentially, to rollout. ‹‹

STATE-OF-THE-ART APPROACH FOR SCIENCE



Heilbronn has a new landmark: At the end of March, 2019, the newly extended experimenta opened its doors on an island in the River Neckar. Visitors to Germany's largest science center can not only experience science first-hand, but also become researchers themselves. Drees & Sommer assumed full responsibility for the building, which sets standards in many different ways.

The principal, Schwarz Real Estate, commissioned Drees & Sommer back in 2012. As General Construction Manager, Drees & Sommer undertook project management, planning and construction management. The team achieved cost and schedule stability through interdisciplinary system planning, FM during planning, and commissioning management services.

The building features unique, premium-quality architecture – including Europe's only Science Dome with a rotating auditorium, the interior of which is dominated by a 360-degree projection dome. The central experimenta building consists mainly of a sophisticated helical steel composite structure, which is embedded into groundwater as the result of the island location.

One of the special challenges during the planning and execution of the project was demonstrating the feasibility of building on the island site. The user also had to be fully integrated into the established building, for which the specialists drew on past experience from numerous museum and exhibition projects. Archaeological excavations – which continued for about a year – also required a careful approach to construction site organization.

› General Construction Management (GCM), general technical planning (BSE, structural consulting, building physics, facade), facility management consulting, Building Information Modeling (BIM) ‹

Because of the complex geometry of the building, Drees & Sommer decided from the outset to use Building Information Modeling (BIM). Drees & Sommer applied the BIM principle of building a digital twin in addition to the physical building – using a seamless 3D planning model, for example – right from the draft design stage. This allowed collisions to be detected early and ensured optimal positioning of walls, doors, and cable and pipe routing to be optimized.

Digital modularization enabled the specialist engineers to develop a large number of identical facade elements, substantially simplifying logistics during execution and speeding construction. This was particularly important, because the opening date for the building was set from the beginning of the project, due to the neighboring Federal Horticultural Show in 2019.

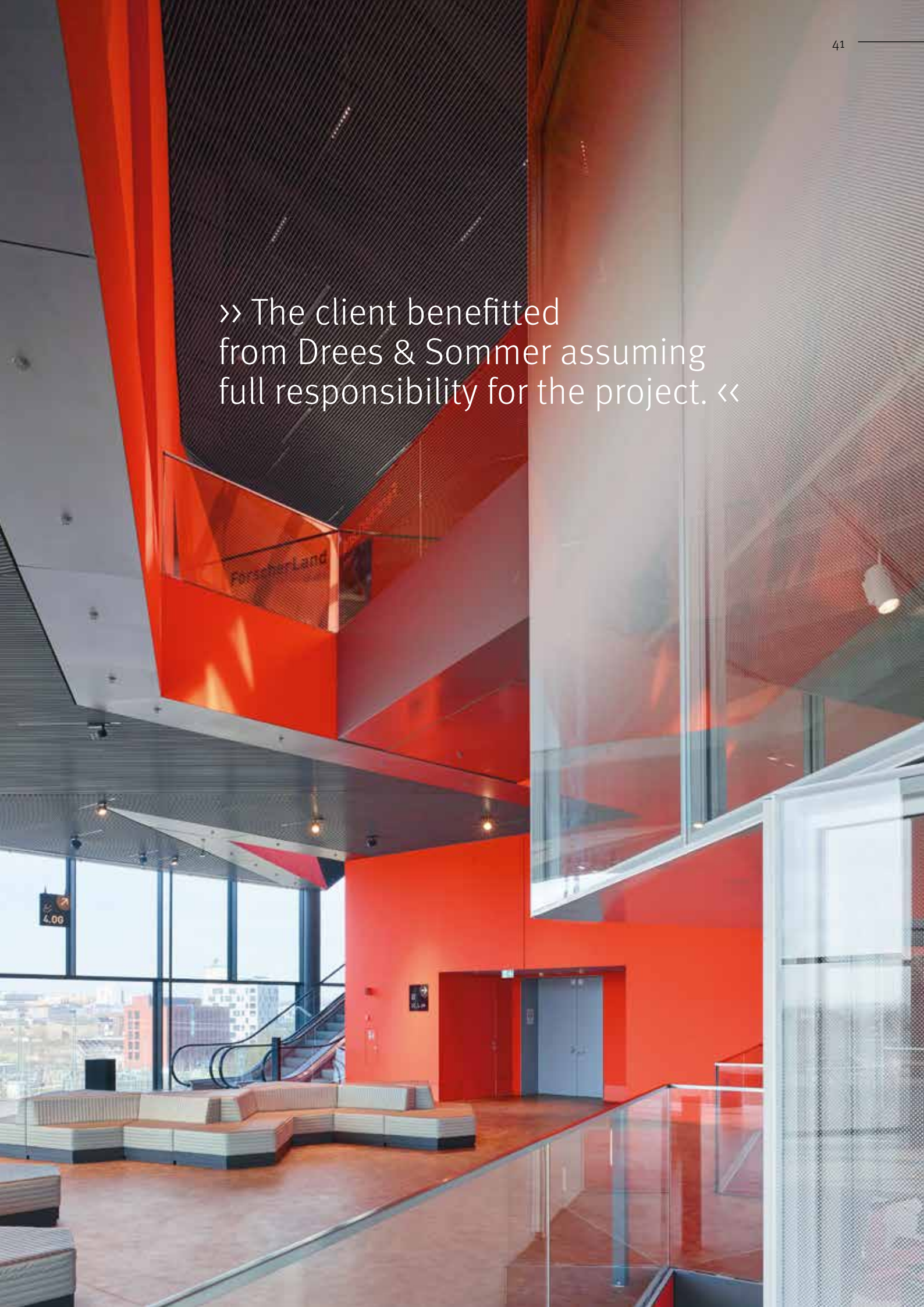
The project team fully complied with all requirements, and also advised the client on the offices and work environments, as well as on facility management issues during the planning phase.

Client:
Schwarz Real Estate GmbH & Co. KG, Heilbronn

Project duration:
August 2012 – March 2019

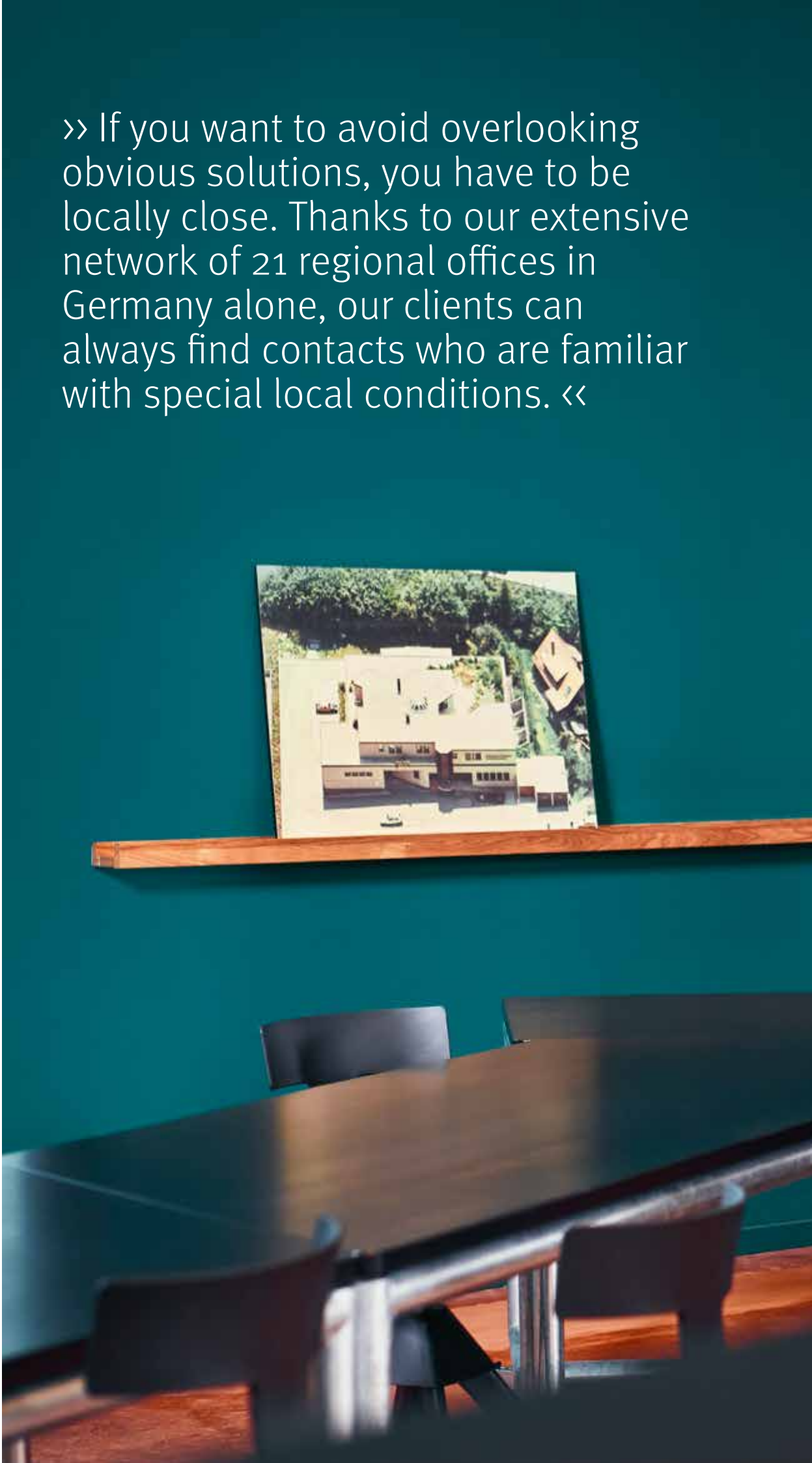
Architects:
- Sauerbruch Hutton, Berlin
- studioinges, Berlin (established building)

Key project data:
- GFA:
  - New building 18,000 m²
  - Established building 7,800 m²
- Gross volume:
  - New building 110,000 m³
  - Established building 32,800 m³



› The client benefitted from Drees & Sommer assuming full responsibility for the project. ‹

›› If you want to avoid overlooking obvious solutions, you have to be locally close. Thanks to our extensive network of 21 regional offices in Germany alone, our clients can always find contacts who are familiar with special local conditions. ‹‹



Partners
from left to right:
Mirco Beutelspacher
Thomas Jaißle

COST-EFFICIENT CONSTRUCTION FOR THE PUBLIC SECTOR

Erlangen-Höchstadt's district administration building was beginning to show its age. The new building also had to allow the consolidation of eight separate offices into a single central building. As the project controller, Drees & Sommer not only completed the project within schedule, but also achieved considerable cost savings.

The architectural competition for the new building resulted in a design for a four-storey building with two underground levels to be built in the center of Erlangen. In addition to customer service centers, the design provided for a large council chamber and a multipurpose space.

› Project control, project lead function for relocation, relocation management, Project Communication System (PCS) ‹

Client:
Erlangen-Höchstadt district

Project duration:
March 2014 – November 2018

Architect:
AllesWirdGut Architekten, Vienna

Key project data:
- GFA: 23,300 m²
- Workplaces: Approx. 400
- Construction costs: €39.2m gross

In 2014, Drees & Sommer was awarded the contract for project control as part of the Public Procurement Ordinance process. Adherence to the budget and schedule were extremely important to the client. The experts put the project on track to success by defining procedures and parameters at an early stage and through close collaboration with the client. Coordination with users was particularly important, as their requirements not only varied greatly, but also increased over the course of the project. Experts from other areas of the Group were involved to ensure a smooth transition into the new building.

The project was completed below budget, in part thanks to stringent contract award management. The deadlines for the move into the building and handover were met. Other success factors included a sound approach to costing and a resilient master schedule.

›› Deadlines and qualities met, costs even undercut. ‹‹

FRANKFURT'S OLD TOWN TAKES ON A NEW OLD LOOK

Frankfurt's new Old Town has been built between the Dom (cathedral), Römer (City Hall) and St Paul's. What makes this construction project unique and particularly demanding is the replication of the quarter destroyed during the Second World War. The mix of reconstructed and new buildings blends perfectly into the historic setting. Drees & Sommer provided schedule, cost and buyer management services for the flagship project.

In good company:
The winners of the 2019 MIPIM Awards.
The DomRömer quarter took out the ‘Best Urban Regeneration Project’ category.

›› Complex quarter project completed on schedule and within budget. ‹‹

Following the demolition of Frankfurt's Technical City Hall, a new quarter was to be built on a site of some 7,000 m² in the middle of the Old Town. A survey quickly established that citizens wanted the new design to be based on the historic appearance of what was once Germany's largest medieval Old Town. A special-purpose entity – DomRömer GmbH, a one hundred percent subsidiary of the city of Frankfurt – was given responsibility for the development, planning and realization of the quarter.

Drees & Sommer supported the design of the precinct. This involved coordinating numerous project participants: Over 100 companies, including 20 different architectural firms, were involved in construction. Rehabilitation of established infrastructure presented a further challenge. For example, the public underground car park had to be preserved and the impact on the underground railway tunnel beneath the site had to be taken into account. The experts ensured that the complex project was completed on schedule and within budget, and advised the client on building services equipment for the new buildings. They also attended to buyers of apartments and ensured a smooth process from the signing of the purchase contract to move-in.

› Project management, BSE consulting, buyer management ‹

Client:
DomRömer GmbH, Frankfurt

Project duration:
February 2012 – March 2019

Key project data:
- 35 buildings, of which:
  - 15 reconstructions
  - 20 new buildings
- Construction costs: Approx. €200m

A total of 35 buildings – 15 faithful reconstructions and 20 new buildings – were built in the historic site boundaries of 1944. Recovered historical facade parts, so-called spolia, which were installed in the facades, further enhanced the authenticity. So with the support of Drees & Sommer experts, a vibrant quarter was created that uniquely combines the past and the present, provides housing, and also features museums, cafés, restaurants and businesses that make it an attractive destination. And the project has been a complete success: In March 2019, the quarter won one of the coveted MIPIM Awards at the international property event of the same name, taking out the 'Best Urban Regeneration Project' award.

Left page, partners from left to right:
Klaus Hirt, Rino Woyczyk

Right page, partners from left to right:
Dr. Thomas Harlfinger, Stefan Heselschwerdt

›› We enjoy putting together the best teams for our clients' projects – pairing industry know-how with local expertise to deliver impressive results. ‹‹

NEW KNOWLEDGE HUB IN THE RUHR METROPOLITAN REGION

›› Drees & Sommer was the client's key point of contact for the project. ‹‹

On July 19, 2018, the EBZ Business School, University of Applied Sciences in Bochum celebrated the official opening of its new building in the presence of federal and state politicians and representatives from regional industry. Drees & Sommer was responsible for General Construction Management (GCM) and thus for the entire construction project.

In view of the growing number of people attending vocational training, university and continuing education courses, the EBZ Business School management decided to build a new facility on Springorum Allee in Bochum. The goal was to create an innovative and cost-efficient educational building that does justice to EBZ's position as a leading address for innovation in the real estate industry.

The Drees & Sommer project team provided numerous services as part of GCM. These included general technical planning (also entailing the development of an energy and climate concept), drawing up a functional performance specification, management and award of contracts, and overall technical management of the project. Drees & Sommer specialists had previously managed the architectural competition.

› General Construction Management (GCM) with services including general technical planning, functional performance specification, and overall technical management ‹

The new EBZ building has function and seminar rooms and offices. The latest technologies make it a real-life laboratory that allows 'live' testing of all possible approaches to optimizing the energy efficiency of buildings. Digital tools and methods were used from the early stages of the planning and construction process. The project team also implemented interfaces for future digitization modules, which the EBZ wants to use for its building automation chair.

The client benefited primarily from having Drees & Sommer available as a reliable point of contact throughout the entire project. This efficient project structure paved the way to meeting all cost and schedule targets – despite the client's exacting demands and major changes being made during the construction process. The close proximity to the decisive principal and the rapid and permanent deployment of in-house specialists also meant the project team took on a truly consultative role.

Client:
EBZ Business School GmbH, Bochum

Project duration:
April 2016 – November 2018

Architect:
Gerber Architekten, Dortmund

Key project data
- GFA: 2,858 m²
- Construction costs: €10.5m gross

INDUSTRY KNOW-HOW ENSURES SUCCESS

Client:
Octapharma Produktionsgesellschaft Deutschland mbH, Springe

Project duration:
July 2015 – June 2021

Key project data:
- GFA: 3,650 m²
- Gross volume: 21,900 m³
- Project cost: Approx. €160m net

›› The team optimized structures and existing organization and processes. ‹‹

Octapharma is expanding its production capacity in the Hannover region, thus making a significant contribution to the long-term viability of the site. A Drees & Sommer Expert Team provided project management and LCM® support to the company.

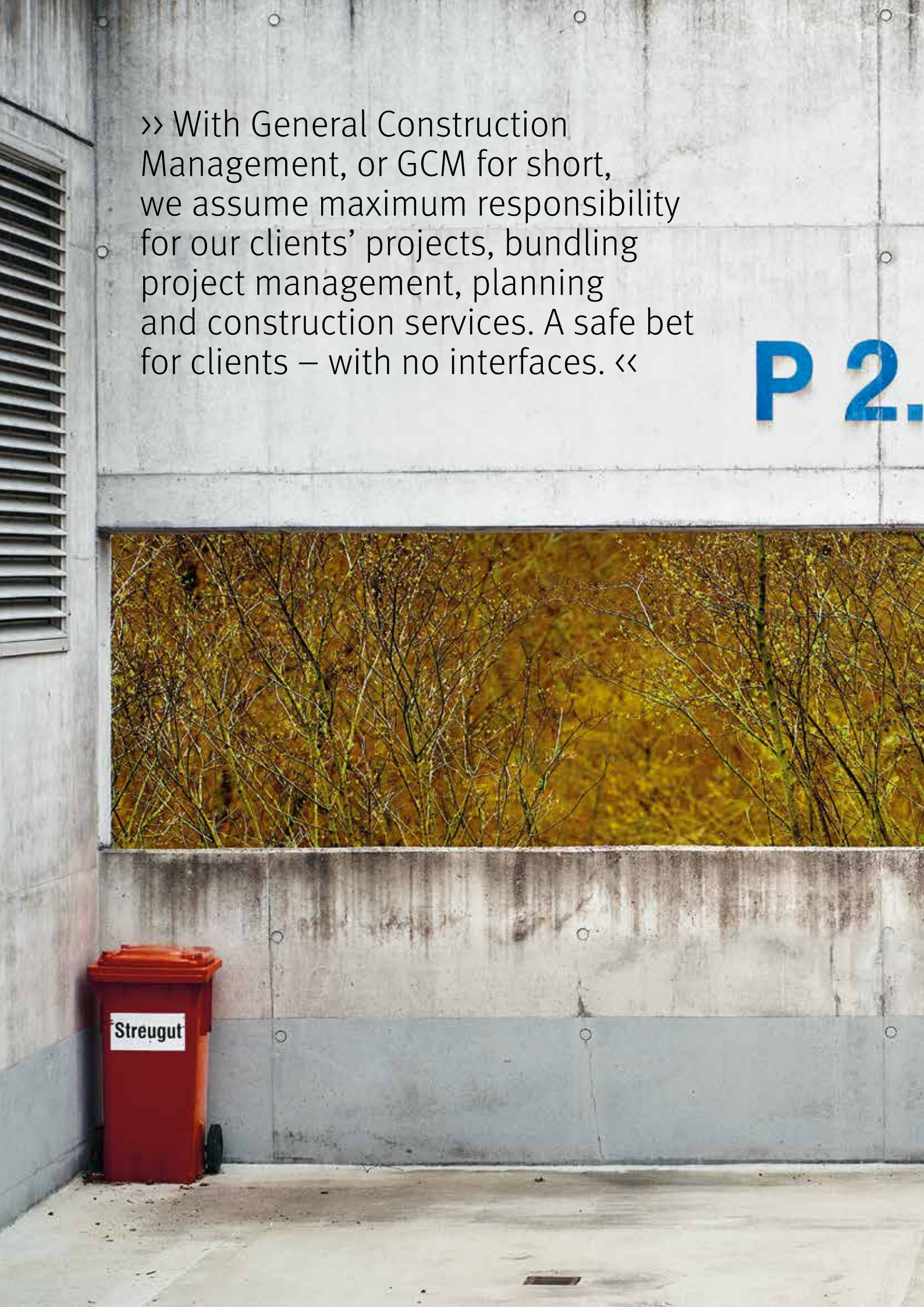
Octapharma is one of the world's largest pharmaceutical companies involved in the development, manufacture and distribution of pharmaceuticals derived from human blood plasma. The company is building several new production facilities at its site in Springe, Germany. Like the media supply systems needed for production, the new facilities are being installed in established buildings and integrated into the manufacturing process without interrupting operations. This results in complex operational demands, which – together with the client's ambitious schedule – pose considerable challenges for all parties involved.

Following services provided by Drees & Sommer to Octapharma at its Heidelberg and Dessau sites, in mid-2015 the Group again turned to the industry experts for support with the Springe project. The Life Sciences team, which had already been involved in the initial phases of the project, subsequently optimized key structures and existing organization and processes. It also worked with stakeholders to develop schedules and cost structures. At the same time, Drees & Sommer assumed planning responsibility for the first albumin production line subproject, thus ensuring the start of facility expansion in January 2016.

› LCM®, lean site management, construction management, project management ‹

As the project progressed, the specialists took on additional roles, such as coordination and schedule control for pharmaceutical qualification and validation measures. For the second subproject – fractionation – the customer commissioned Drees & Sommer with lean site management, construction management, and site coordination and monitoring. Thanks to LCM® coordination, the experts significantly improved structuring of construction site processes and substantially reduced construction time.

The new albumin plant has been successfully producing for the global market since mid-2018. In the meantime, the mechanical implementation of the second subproject – involving commissioning as well as qualification and validation measures – is also nearing completion.



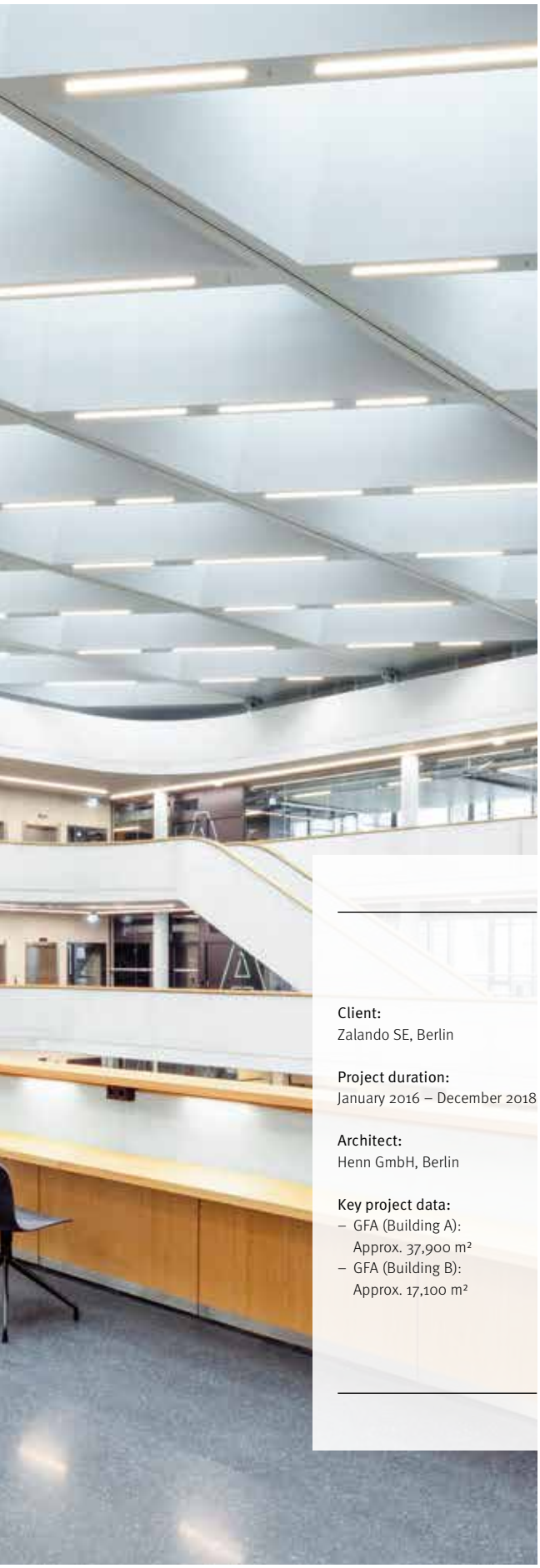
›› With General Construction Management, or GCM for short, we assume maximum responsibility for our clients' projects, bundling project management, planning and construction services. A safe bet for clients – with no interfaces. ‹‹

Partners
from left to right:
Michel de Haan
Markus Weigold
Prof. Dr. Michael Bauer

COMPANY HEADQUARTERS FORMS THE HEART OF THE NEW CAMPUS

Zalando has been headquartered in Berlin since its foundation in 2008. A new campus now unites the majority of the offices previously dispersed across the city. Drees & Sommer's interdisciplinary team of experts ensured that the new company headquarters in the heart of the campus met the client's exacting demands.


›› Maximum cost control despite
numerous change requests. ‹‹



Client:
Zalando SE, Berlin

Project duration:
January 2016 – December 2018

Architect:
Henn GmbH, Berlin

Key project data:
- GFA (Building A): Approx. 37,900 m²
- GFA (Building B): Approx. 17,100 m²

Whereas individual departments of Zalando were previously scattered in offices across Berlin, the company has now brought most of them together in the two buildings that form the new company headquarters in the Friedrichshain district. The special feature of the building project is that Zalando itself will be the main tenant. The Drees & Sommer experts were engaged to represent Zalando's interests in dealings with the principal and the investor. It was their extensive experience in consulting and planning similar construction projects that ultimately convinced the client.

› Tenant and user management, technical design review, quality assurance during construction, construction controlling, commissioning support, acceptance and handover processes ‹

Drees & Sommer joined the project as the application for planning approval was being lodged. A lease agreement based on Zalando's wishes and requirements had already been signed. After reviewing the existing project criteria, the experts started by establishing project standards and defining subprojects, interfaces, milestones and processes. In constant exchange with the client, they asserted its interests in dealings with the landlord and coordinated client change requests with the project participants involved in execution. They also ensured adherence to all cost, schedule and quality targets, and supported the commissioning, acceptance and handover processes.

The flexible integration of Drees & Sommer experts and the spirit of trust and cooperation between them and the client allowed the new company headquarters to be handed over to Zalando in October 2018. Impressive features of the headquarters include attractive, flexible and creative work environments, short paths of communication, and a modern, transparent design. The new building also impresses from a sustainability perspective – not least in the form of its DGNB Gold certification.

Partners
from left to right:
Claus Bürkle
Christopher Vagn Philipsen
Dr. Jürgen Laukemper

›› Our clients need well-designed mobility concepts. Development planning for cities, districts and individual properties needs to be efficient and environmentally friendly. How can this be achieved? For example, by building over existing infrastructure and supplementing current means of transport – such as cars, trains and bicycles – with innovative solutions such as cable cars. ‹‹

LAYING THE GROUND-WORK FOR BRIDGE REMEDIATION

Although experts consider the risk of a bridge collapse in Germany – like the one that occurred in Genoa in August 2018 – to be very low, many bridges have been neglected over recent decades. But bridge remediation and construction work places unique demands on professional planning and management.

Many roads and permanent ways in Germany are in a poor state of repair. In particular, numerous bridges are showing signs of deterioration. Several sources put the necessary nationwide investment volume at around €17 billion by 2030.

A further statistic illustrates the urgency of the situation: Two thirds of the bridges are more than 35 years old, and very few have undergone comprehensive remediation. Since their construction, loads have increased considerably, both in terms of vehicle weight and traffic volume, particularly in the case of heavy goods vehicles.

In addition to damage to the road surface, corrosion and concrete spalling are on the increase. Many bridges now have inadequate load capacity or are showing signs of fatigue. There are often defects in expansion joints, seals and safety features.

One example is the important Rhine bridge on the A1 autobahn between Leverkusen and Cologne. The project includes the upgrade of the A1 between Köln-Niehl and Leverkusen-West. Road Construction NRW, the company owned by the state of North Rhine-Westphalia, is building a completely new bridge, because the old one, built in the 1960s, can no longer be remediated due to extensive damage. Numerous challenges await Drees & Sommer as the technical project controller within a consortium: As well as rerouting traffic, particular attention must be paid to construction site contamination. The fact that the autobahn has been closed to heavy goods vehicles for a number of years means that the project is very much in the public eye.

›› Two thirds of bridges are over 35 years old. Very few have been comprehensively remediated so far. Loads have increased significantly and funding is difficult for local authorities. ‹‹

There is usually only a tight window of opportunity for the remediation of railway bridges – as here in the case of a Drees & Sommer project near Hanover.

In practice, bridge remediation and construction projects often face completely different issues. It is not just a matter of taking the impact on traffic into account at an early stage, but also of defining the duration of the project and considering the impacts the various measures along the axis have on each other.

This also applies to rail construction projects. In Hanover, for example, Deutsche Bahn is upgrading several railway bridges at once. The remediation measures have to be closely synchronized with rail operations, as track closures sometimes have to be scheduled two years in advance. The window for execution is then also extremely short, as once they have been defined, closures can no longer be changed. Drees & Sommer takes responsibility for the dedicated phase of construction processes at an early stage. This results in lean processes during realization.

Often, it is minor details that determine the success of a project. Issues such as space requirements for temporary measures and construction work, environmental impacts and environmental audits also play a role.

Intersections pose a particular challenge, such as when a road bridge crosses a waterway. Finally, there are issues of approval. For example, a remediation project may require an Environmental Impact Assessment (EIA) and approval even if there no significant changes are being made to a bridge. Longer planning lead time is one of the impacts of this. Time usually proves to be a critical factor.

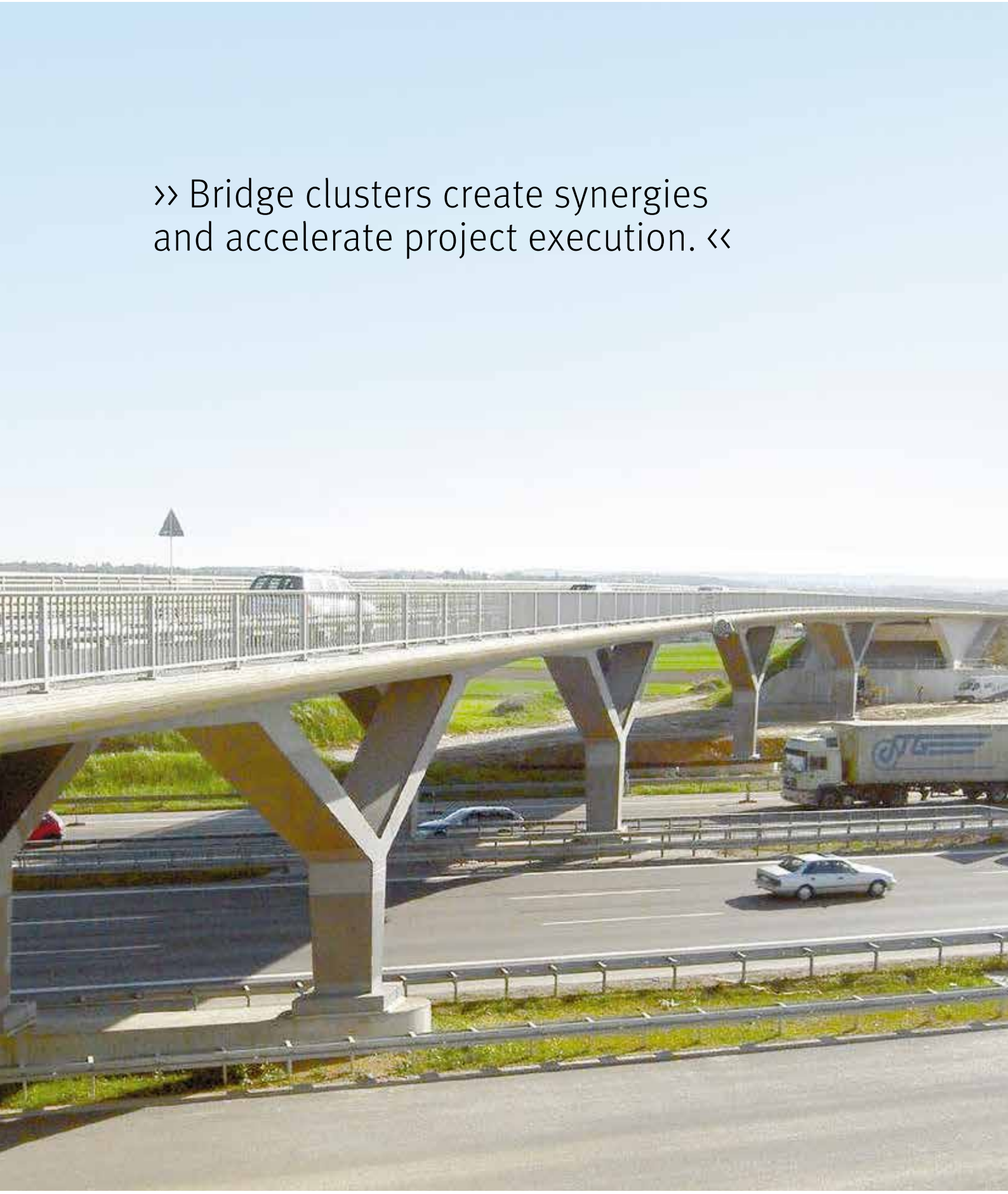
Drees & Sommer is representing the client for a bridge over the A66 near Rödelheim, part of the 'Hessen Mobil' bridge package.

As part of Hessen Mobil's pilot project 'Project management services – project control and lead function for extensive infrastructure remediation', for example, Drees & Sommer infrastructure experts managed the planning for several bridges. They structured the measures based on similarity of remediation work or the structures involved, and formed appropriate clusters. They then awarded the clusters to the same planners and assessors, resulting in considerable synergies during execution.

When Stuttgart's new Trade Fair Center was built, the project involved the construction of an important bridge as part of the road access. The project included connections to Stuttgart Airport, the planned airport train station, the planned light rail, and the A8 and B27 roads. Drees & Sommer acted as client representative and lead house for the complex project.

A systematic approach is generally required to overcome the challenges posed by crumbing bridges. For this reason, Drees & Sommer's first step in remediation and new construction projects is to undertake a feasibility study. Contract, supplementary claims and risk management are used as part of the management of individual services to minimize risks. The company also offers multiproject management tailored specifically to bridges to increase generate synergies in execution (planning and construction). This can lead to a higher project volume with no increase in personnel.

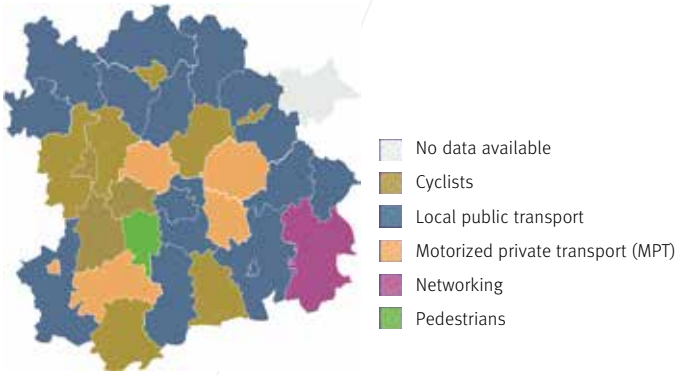
›› Bridge clusters create synergies and accelerate project execution. ‹‹



MOBILIZING THE MUNICH METROPOLITAN REGION

METROPOLREGION MÜNCHEN

›› Knowledge is mobility: The foundation for future-proof mobility solutions has been laid. ‹‹



Drees & Sommer and Hendricks & Schwartz were awarded the contract to undertake a 'networking study' to enhance the attractiveness of the Munich metropolitan area and launch a sustainable mobility concept. The goal of the study was to bring all the stakeholders together, consolidate knowledge and impartially promote the development of innovative solutions.

Scan the QR code to access the project website.

The study includes a detailed overview of existing mobility projects and recommends courses of action based on a professional analysis of existing infrastructure, modes of transport, and interfaces. The key goal is to achieve higher-level integration of the individual measures. As the preliminary stage of the project, the study also provides an optimal basis for developing a long-term integrated mobility concept. Regional mobility professionals surveyed more than 2,000 respondents to determine the current status of the mobility infrastructure. They included representatives from all districts, local authorities and cities, as well as numerous institutions and companies in the region.

› Networking study with survey of regional authorities, institutions and companies, development of a database and website, moderation and presentation of the process, organization of a mobility conference, development of recommended courses of action ‹

Client:
Europäische Metropolregion München e.V.

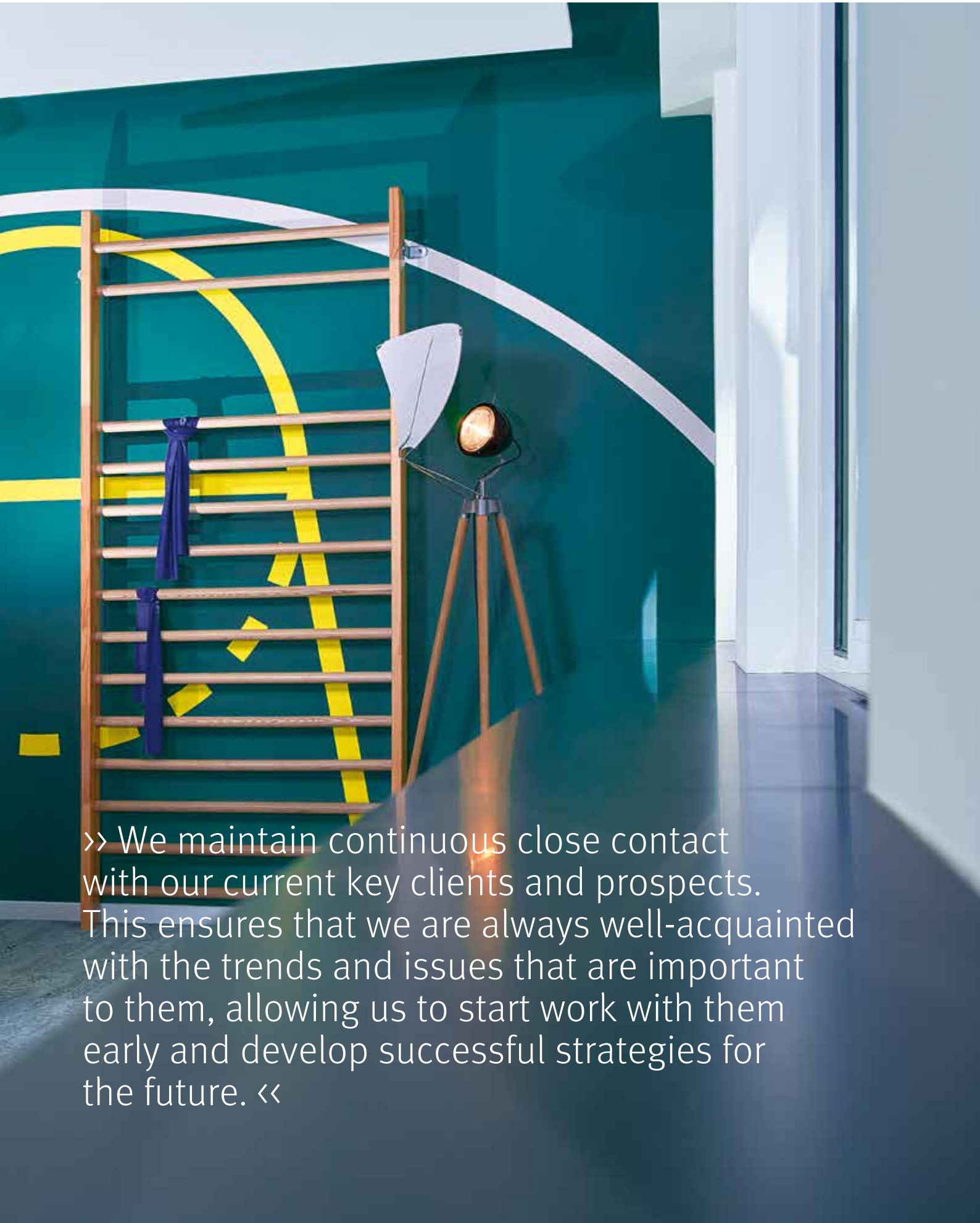
Project duration:
November 2017 – December 2018

Key project data:
- 26 administrative districts, 6 independent towns
- 26,000 km² covered
- 6 million inhabitants
- 1.5 million commuters per day
- 716 million passengers in Munich Transportation Authority (2017)
- 300 mobility projects surveyed

One of the experts' key tasks was developing a comprehensive database that includes projects and concepts at different stages of development. The database features an overview of mobility solutions, contacts, and more detailed information. There is also a short report recommending courses of action.

The majority of the 300 or so projects fall into the categories local public transport (28%), cycling (25%) and motorized private transport (MPT) (20%). 15 percent of the projects are attributable to multimodal and networked transport, areas that will continue to grow in importance. These projects include mobility stations, sharing systems and digital solutions for connected mobility – for example, in a standardized app. The study found that innovative e-vehicles and cargo bikes are also future-proof. The cooperation partners presented their findings to the public in December 2018. The participants at the final conference voted to select projects in four categories.

Partners from left to right:
Sascha Hempel, Marc Schömbs, Sascha Kilb



›› We maintain continuous close contact with our current key clients and prospects. This ensures that we are always well-acquainted with the trends and issues that are important to them, allowing us to start work with them early and develop successful strategies for the future. ‹‹

EXISTING OFFICES TRANSFORMED INTO HIGH-TECH HEADQUARTERS

As part of the BBC's long-term real estate strategy, the corporation wanted to transform part of their iconic Television Centre in London into a high-tech, agile, global headquarters for its commercial arm, BBC Worldwide. Drees & Sommer experts supported the project with facility management consulting and project management.

The helical staircase connects all six light-filled floors, creating an open and inspiring work environment.

›› Demanding remodeling project completed on schedule and within budget. ‹‹

Client:
BBC Worldwide Ltd., London / BBC Commercial Holdings Ltd., London

Project duration:
January 2017 – December 2018

Architect:
HOK, London

Key project data:
GFA: 11,000 m²

During this complex project, Drees & Sommer had to work with two stakeholders: BBC Worldwide – which has since merged with BBC Studios to form a new company under the BBC Studios name – and landlord BBC Commercial Holdings. Drees & Sommer UK was appointed as project manager, with additional responsibility for managing the design team and other project participants.

In addition to the gutting of 11,000 m² of office space – including the removal of significant amounts of asbestos – the refurbishment also involved major structural work. The shell and core design required a new steel substructure and punching through the existing concrete slabs to form an atrium, opening up the building across all the floors.

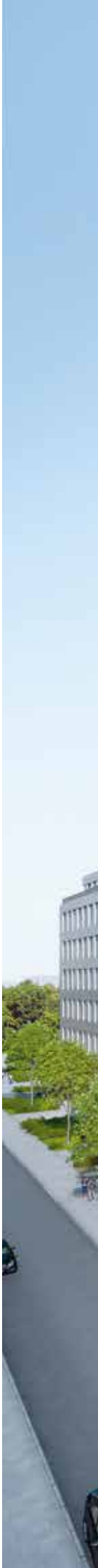
› Facility management consulting, project management ‹

To create the new high-tech office space that the client required, floor to ceiling height was increased and a stunning new central staircase installed as part of the design to create a flexible collaborative work environment. A significant amount of new workplace collaboration tools and technology was installed around the building to support agile working and the creation of digital content.

Project management by Drees & Sommer ensured that the demanding project was completed successfully and in keeping with all cost, schedule and quality targets.

PROMISING FUTURE FOR WESTEND SKY

Westend Sky is an attractive new property in the Frankfurt office real estate market. The building offers tenants upscale flexible office space on 13 above-ground levels in a prime Westend location.



›› Vacant property revitalized and successfully repositioned. ‹‹

After SEB-Bank moved out in 2013, the 1970s building initially stood empty. Deka Immobilien Investment GmbH launched a comprehensive construction project under the name 'Westend Sky' to make Ulmenstrasse 30 a sought-after address again. A nine-storey annex was added to the existing building, elegantly extending the perimeter block development towards Bockenheimer Landstrasse. The building was gutted, and the facade and a large proportion of the building systems equipment were completely replaced.

Drees & Sommer has been involved in this demanding project since January 2015. Acting as project controller, the team's responsibilities included ensuring on-schedule completion, acceptance and handover. Deka also attached great importance to LEED Gold sustainability certification. The confined site space in the inner-city location posed significant challenges for the organization of building site logistics. It was also important to ensure good communication with neighbors from an early stage of the project. Tenant requests had to be integrated into the planning and construction processes and special requirements had to be coordinated. Drees & Sommer implemented a modular execution system. This ensured agile market communication and helped ensure that Westend Sky was fully leased one year after the completion of the basic fitout.

› Project control, project lead function, tenant management and tenant coordination, cost controlling, planning control, technical & economic construction consulting, site coordination & monitoring, scheduling ‹

Drees & Sommer developed a tender and contract award strategy that takes the project-specific requirements into account. The team provided intensive support to the client during this process. The experts worked with the planners to identify cost-saving measures, and introduced a detailed cost controlling system in the following stages of the project. Overall, Deka benefited from close cooperation, a high level of continuity, and fast, direct flow of information throughout the construction project.

The basic fitout was completed in December 2017 and the first two tenants – a leading corporate law firm and a multinational insurance brokerage and consulting firm – moved into their office space in Westend Sky at the beginning of 2018. The remaining tenant fitouts and the public restaurant on the ground floor will be completed by September 2019.

Client:
Deka Immobilien Investment GmbH, Frankfurt

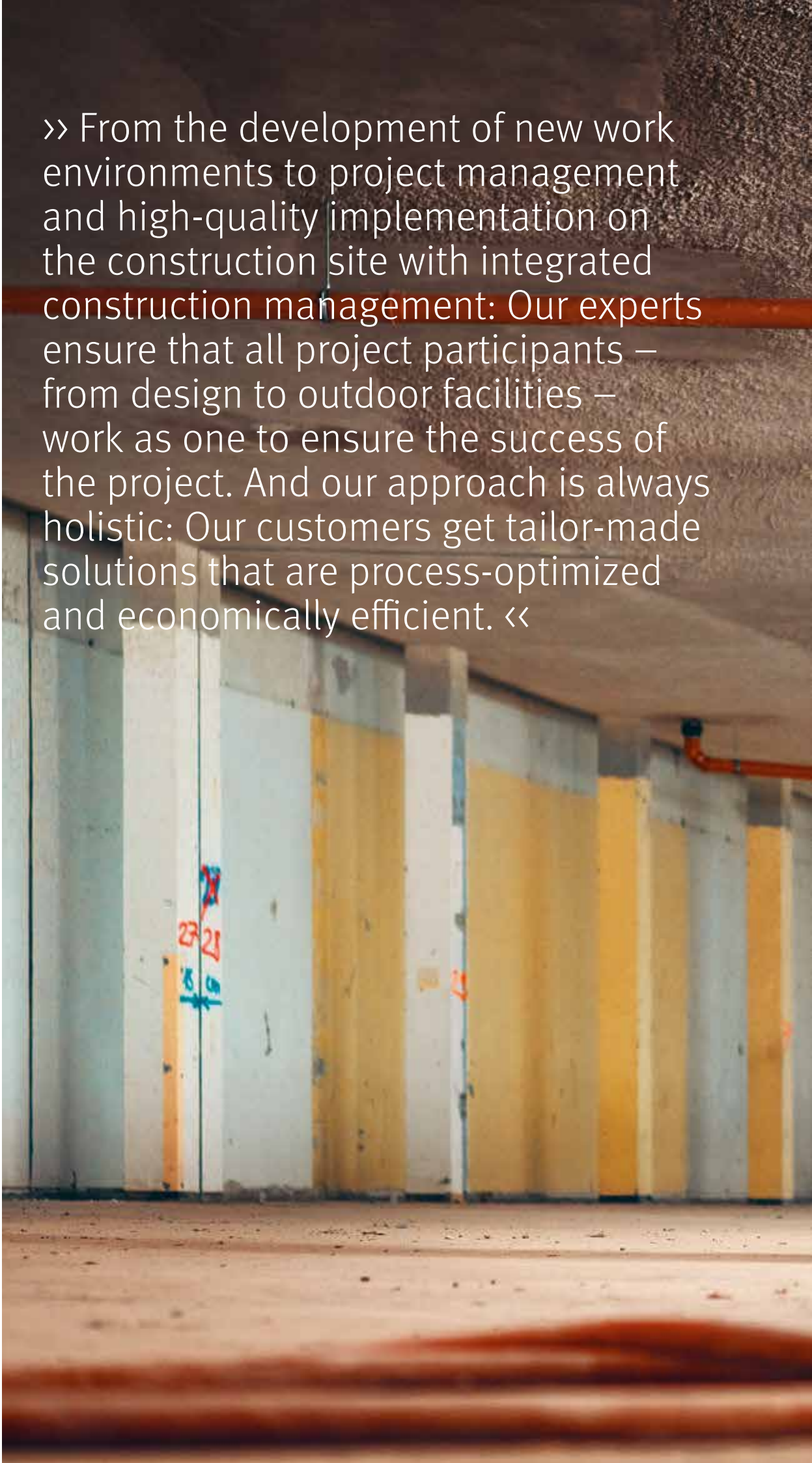
Project duration:
January 2015 – June 2019

Architects:
- Pischulti + Münchenberg Architekten, Maintal (basic fitout)
- Just Burgeff Architekten, Frankfurt (tenant fitout)

Key project data:
- GFA: 24,200 m²
- Total leasable area: Approx. 13,000 m² (offices and food & beverage outlets)
- Car parking spaces: 132
- Construction costs: Approx. €47.2m
- Sustainability certification: LEED Gold

Thanks to powerful visualizations, potential tenants were able to get an accurate picture of the generously appointed offices at an early stage – and opt for Westend Sky.

The 13 floors can be divided into open-plan, hybrid or one-person offices as required, thus offering discerning tenants maximum scope to express their corporate culture.

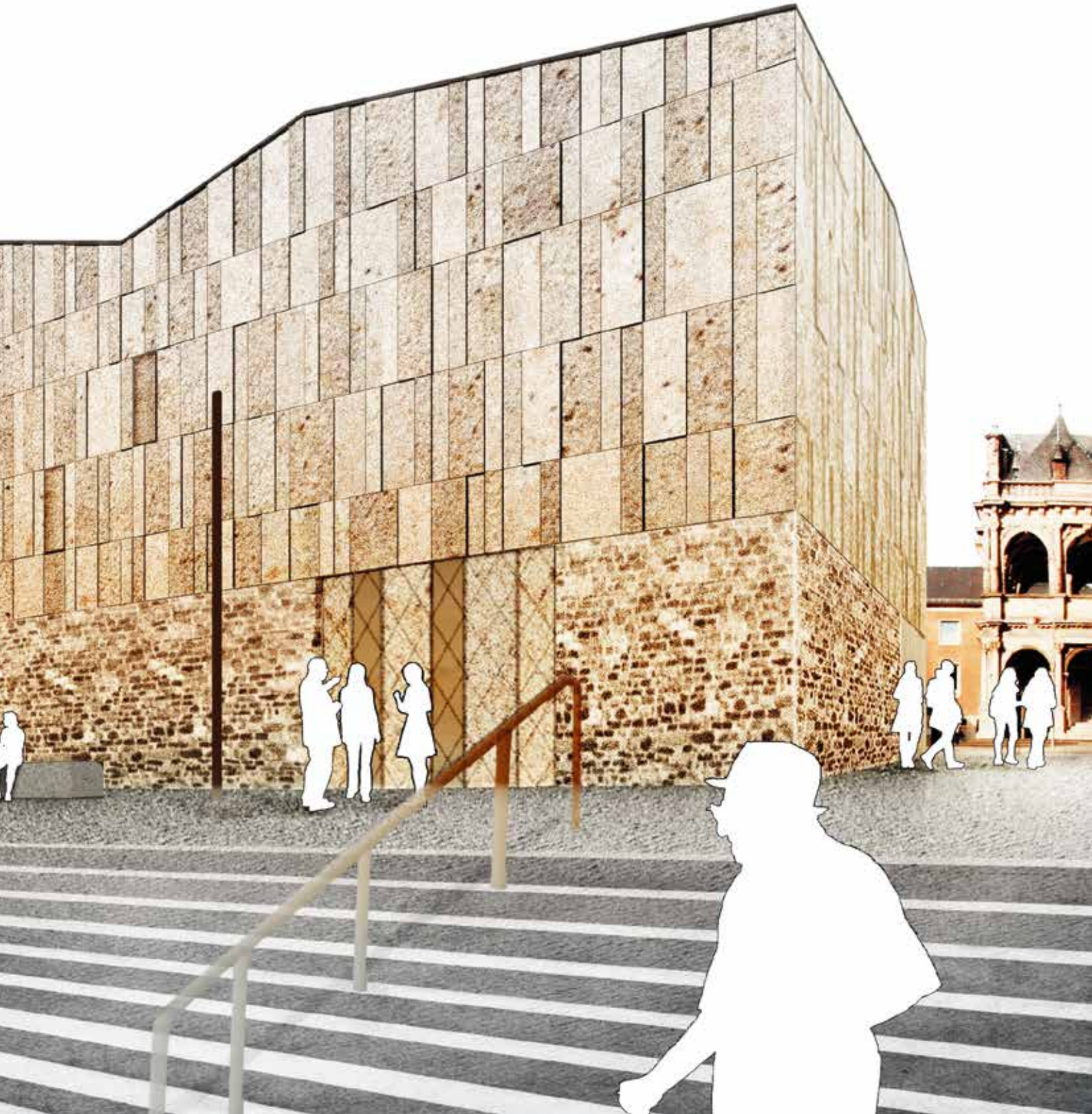


›› From the development of new work environments to project management and high-quality implementation on the construction site with integrated construction management: Our experts ensure that all project participants – from design to outdoor facilities – work as one to ensure the success of the project. And our approach is always holistic: Our customers get tailor-made solutions that are process-optimized and economically efficient. ‹‹

Partners
from left to right:
Boris Matisic
Frank Reuther
Daniel Seibert

ANCIENT AND MODERN: STEP BACK IN TIME

A unique museum landscape is taking shape close to Cologne cathedral. Drees & Sommer is acting as consultant to the city council.



›› The city of Cologne is benefitting from open communication and close cooperation. ‹‹

Over a quarter of a million historical artifacts – with origins ranging from the Roman era to the end of the 19th century – have been discovered in the so-called Archeological Zone in front of Cologne's historic City Hall. The Cologne city council's now plans to build a museum in the center of the city and put the artifacts on display. The excavation site has been covered and an underground exhibition with a 600-meter tour has been built. The Jewish 'MiQua' museum is being built in a very appropriate location – on the adjacent site of the medieval Jewish Quarter. MiQua stands for Museum in the Quarter – and sounds like the Hebrew 'mikveh', the name for a ritual immersion bath, an example of which was discovered during excavations.

The city of Cologne is building the museum and will operate the building and the archeological monument. Following completion, the Rheinland Regional Council (LVR) will take over trusteeship of the museum, including responsibility for the exhibition concept.

› Project management, commissioning management, FM consulting ‹

Drees & Sommer has been supporting the project since 2013, providing project management, facility management consulting, delivery information, and commissioning management services. Construction started mid-2016. The inner-city construction site between the historical City Hall and the 'Spanischer Bau' presents an enormous challenge for all involved. Not only must they ensure continued operation of both buildings, but must also take extreme care not to damage the archeological monuments. 14,000 tonnes of sand were used to protect excavations during the civil engineering works and construction of the floor slab. In December 2018, work started on gradually removing the sand from the excavation site using a special vacuum device. Even while sand extraction was underway, work continued underground on the tour through the excavated sites and above ground on the new museum building.

This is far from being a routine project for the Drees & Sommer project managers, who develop solutions to every challenge and maintain close contact with the client and the other project participants. The museum and the underground exhibition are expected to be handed over the user, LVR, at the end of 2020.

Client:
City of Cologne

Project duration:
2013 – 2021

Architect:
Wandel Lorch Architekten, Saarbrücken

Key project data:
– GFA: Approx. 13,800 m²
– Construction costs: €77m gross

Visitors are fascinated by the 600-meter tour through the underground exhibition area.

SHOWROOM SHINES A LIGHT ON THE PAST AND THE FUTURE

Lighting company Osram has created an impressive World of Light at its Munich headquarters to enable visitors to experience the fascination of light. Acting as project controller, Drees & Sommer coordinated the complex project and ensured that all schedule, budget and quality targets were met.

›› Proactive control of all stakeholders in the client's interest. ‹‹

Client:
Osram GmbH, Munich

Project duration:
September 2016 –
September 2018

Architects:
– Ranger Design, Stuttgart
– CL-Map, Munich

Key project data:
GFA: Approx. 1,400 m²

When Osram moved its headquarters to the north of Munich at the end of 2012, the company was deliberately choosing a location where it was surrounded by international technology groups. By taking this step into the future, however, Osram was also leaving part of its heritage behind as it left its traditional headquarters of over 45 years in the south of Munich. Which is why an idea quickly gained traction: Creating a World of Light at the new headquarters to showcase the company's rich tradition and offer a glimpse of the future.

› Project control, prime contractor site coordination & monitoring (controlling), facility management consulting ‹

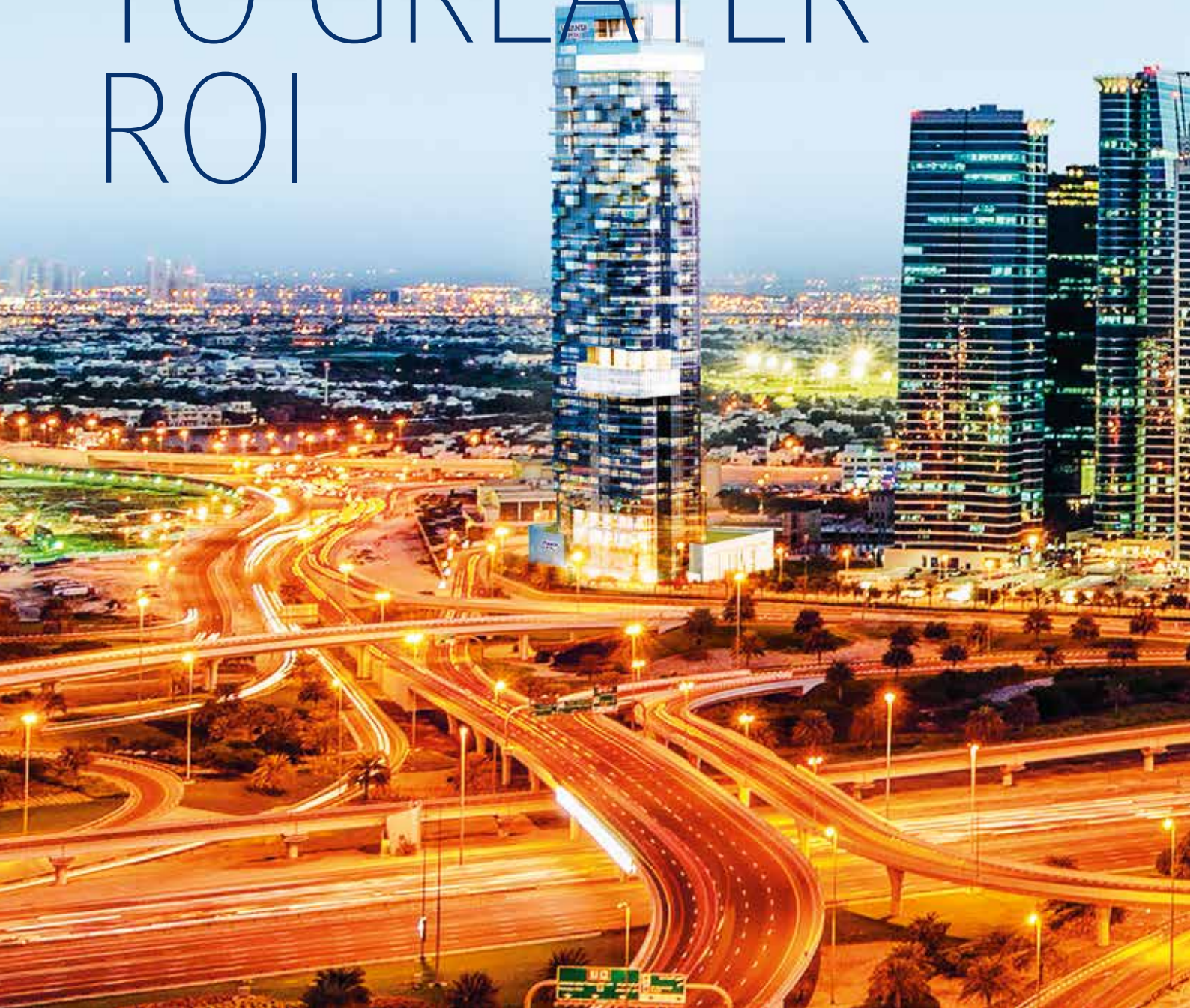
The World of Light was installed on the ground and first floors of the Osram Lighthouse. Drees & Sommer acted as project controller, supporting the complex remodeling work, which also involved modifications to the load-bearing structure and facade of the high-rise. The primary objective was the coordination and control of the general planner for the partial demolition work and basic fitout, as well as the general contractor for the final fitout and exhibition equipment, who was awarded the contract following a design competition. The various business units to be presented in the showroom were involved in regular meetings.

The World of Light was finally opened in October 2017 after a construction period of only seven months, meeting all its schedule, cost and quality targets, and just in time for Osram's 111th anniversary celebrations. Since then, the multifunctional light spectacular has been presenting Osram's history and current products, while at the same time exploring future innovations. The 70 m² light box, for example, uses special spotlights to offer visitors spectacular light shows. The client was so pleased with the result that Drees & Sommer experts were then commissioned to manage further adjustments and alterations in the showroom. Following their positive experiences with facility management consulting at the Osram Lighthouse, Osram also asked Drees & Sommer to provide support during the commissioning of the World of Light and its unusual equipment.

Partner on the left page:
Philipp Späth

Right page, partners from left to right:
Bernhard Unseld, Gabriele Walker-Rudolf

A THREE-PRONGED APPROACH TO GREATER ROI



Drees & Sommer's Middle East experts predict greater opportunities for the digitization and revitalization of built assets and for Adaptive Modular Design as a construction tool across the regional construction sector.


VIVANTA

›› A wide range of services ensures value for the client throughout the project life cycle. ‹‹

Government support through long-term economic diversification plans – such as Abu Dhabi Vision 2030 and Saudi Vision 2030 – will result in increased construction sector momentum. This will counteract the slowdown in construction activity resulting from the fall in oil prices and subsequent cuts to project spending during 2018. Drees & Sommer consultants predict that the Vision programs will boost key sectors including hospitality, healthcare and infrastructure, while tourism and gradually stabilizing oil prices will contribute to higher investment. Saudi Arabia and the UAE will remain the largest regional markets.

Developers and investors are expected to focus increasingly on Return on Investment (ROI). Adaptive Modular Design, digitization at the planning stage, and revitalization during the operation phase are the key enablers of increased ROI. As the level of construction industry digitization in the Middle East is substantially lower than in other parts of the world, this presents a key growth opportunity.

Drees & Sommer has launched the Dubai-based Innovation Hub to promote the integration of innovative planning, construction and operating models in the region. The Innovation Hub develops completely new business models and digital solutions, and adapts existing models and systems to the local culture, economy, and environment.

Revitalization projects will also play an important role, especially in the hospitality sector, as 67 percent of hotels in Dubai were built more than a decade ago and are nearing the end of their life cycle. For new buildings, the emphasis is on greater ROI and market attractiveness through smarter engineering as well as user-centric and energy-saving features.

Located in Dubai's Jumeirah Lake Towers (JLT) district, the Taj Hotel and The Residences development is a prime example of this. Sharing premises in the 200-meter mixed-used tower with the 5-star Taj Hotel, The Residences features 81 exclusive apartments, each equipped with an innovative home automation system to reduce energy consumption, cut operating costs, and be fully adaptable to the owner's needs. Drees & Sommer experts supported Signature DT Real Estate Development with project and construction management, providing the client with a single point of contact and ensuring the successful completion of the demanding project.

In 2019, Drees & Sommer will deliver a number of projects throughout the Middle East incorporating the latest digital construction technologies. Although higher capital expenditure on construction projects throughout the region will mean greater opportunities for digital transformation, the main challenge facing the sector is training staff at the operational level and replacing the traditional processes currently being used as standard.

Collocated in an impressive mixed-use tower with the Taj Hotel, The Residencies development features 81 exclusive apartments with innovative home automation.

THE FIRST OF ITS KIND

The aim of the new LSL production facility of F. Hoffmann-La Roche AG is to bring innovative drugs to market as quickly as possible. Roche commissioned a proven partner – Drees & Sommer – to act as general planner.

The ‘Late Stage Development & Small Molecules Launch Facility’ (LSL for short) is not the first time F. Hoffmann-La Roche AG has moved with the zeitgeist. Because only where development and production collaborate effectively can innovative pharmaceuticals have a chance of helping the sick quickly in times of increasingly costly and time-consuming regulatory approval processes. The LSL produces drugs such as tablets, hard gelatin capsules, granules and powders.

The new production facility is the first of its kind, but just one element of a major strategic development at Roche’s headquarters in Basel and on the neighboring Kaiseraugst site, with which the pharmaceutical company – over a period of just a few years – is setting itself up for the future. For Roche, the well-being of its employees everywhere is always a key priority, as it is they who drive innovation.

Client:
F. Hoffmann-La Roche AG, Kaiseraugst

Project duration:
April 2014 – April 2019

Architect:
Burckhardt+Partner Architekten AG, Basel

Key project data:
- GFA: 18,500 m²
- Gross volume: 98,000 m³
- Total cost: Approx. CHF 200m

›› Responding rapidly to new developments – the general planner acted in just the same way as the new building is designed to operate. ‹‹

Roche expected its production facility for low molecular weight synthetic molecules to be a state-of-the-art facility in terms of organization and flexibility.

Drees & Sommer has successfully supported a number of Roche projects, but in this project, is acting as general planner for a production facility for the first time. The client's expectations were huge. The LSL was to be nothing less than a state-of-the-art facility in terms of organization and flexibility, while at the same time providing an attractive high-quality work environment for staff. The challenge that people in the building will constantly face in the future – responding quickly and intelligently to new developments – was already a factor during building's development.

› General planning/GCM, project management, BSE planning, energy design, building physics, facade planning, construction site logistics, user management, scheduling, document management as per GMP requirements ‹

In addition to overall project management, Drees & Sommer's tasks included general planning for the building and BSE, scheduling and document management as per GMP requirements. The strategic goals for the building were fine-tuned during the development process. The project team – comprising the principal, general planners and architects – examined different variants for the shape of the building and ultimately created an attractive, but above all functional facility that included a reserve of several flexible-use areas that could be put into operation quickly as required.

Some 30 Drees & Sommer colleagues were involved, and their extensive project management expertise and experience in the life sciences sector were crucial to the successful completion of the project despite unexpected hurdles.

›› In-depth knowledge of how data from planning, execution and operation is linked is required make BIM – Building Information Modeling – a success. ‹‹

Partners
from left to right:
Andreas Schele
Jürgen Brandstetter

SEAMLESS INTEGRATION FROM PLANNING TO OPERATION

In Basel, the FELIX PLATTER University Center for Geriatric Medicine opened the doors of its new building on schedule after only six years of planning and construction. Building Information Modeling (BIM) played a key role in the project from the outset. Thanks to BIM2FM – newly developed and used in practice for the first time – data from planning and execution can now also be used during building operation.

wörner traxler richter; Fotograf: Frank Blümler, Frankfurt am Main

Fotograf: Derek Li Wan Po

Flooded with natural light, the modern new building – with five above-ground and two underground levels – replaces the old building, which dates back to 1967. The principal decided on the construction project because as the old building was no longer able to meet current structural and operational requirements.

› Overall project management on behalf of the principal, project and information management including client representation, user management, technical project controlling and design review for shell construction, building envelope, fitout, building services equipment and environment, cost and schedule controlling, quality assurance, document control, BIM consulting, anti-claim management ‹

Bidders were required to submit their projects as BIM models as part of a two-stage full-service competition. Building Information Modeling was used throughout the entire project – including in Facility Management. The FELIX PLATTER University Center for Geriatric Medicine project gave this newly developed BIM2FM approach a chance to prove itself in practice for the first time. Thanks to BIM2FM, the planning data – data on architecture, load-bearing structure and building services equipment – can also be used later during operation. This data is not simply transferred, but continuously synchronized and updated. Benefits include making the maintenance and repair of plant and equipment much more efficient.

Drees & Sommer initially won the public tender for project and information management. The project team convinced the client with its combination of expertise, team spirit and focus on outcomes. As a result, the experts were subsequently awarded the contract for general project management for the client.

In particular, the client benefited from the company's ability to offer the full range of services from a single source: The team was able to quickly bring in-house experts from the extensive Drees & Sommer network into the project as required. This allowed the ambitious project to be successfully completed at the specified level of quality and within schedule and budget.

Client:
FELIX PLATTER University Center for Geriatric Medicine, Basel

Project duration:
August 2013 – April 2019

General contractor:
Arge HandinHand c/o
- Marti Gesamtleistungen, Bern
- BAM Deutschland and BAM Swiss

Architects:
- Wörner Traxler Richter Architekten, Frankfurt
- Holzer Kobler Architekturen, Zurich

Key project data:
- GFA: 45,800 m²
- Levels: 7
- Patient rooms: 176
- Beds: 280

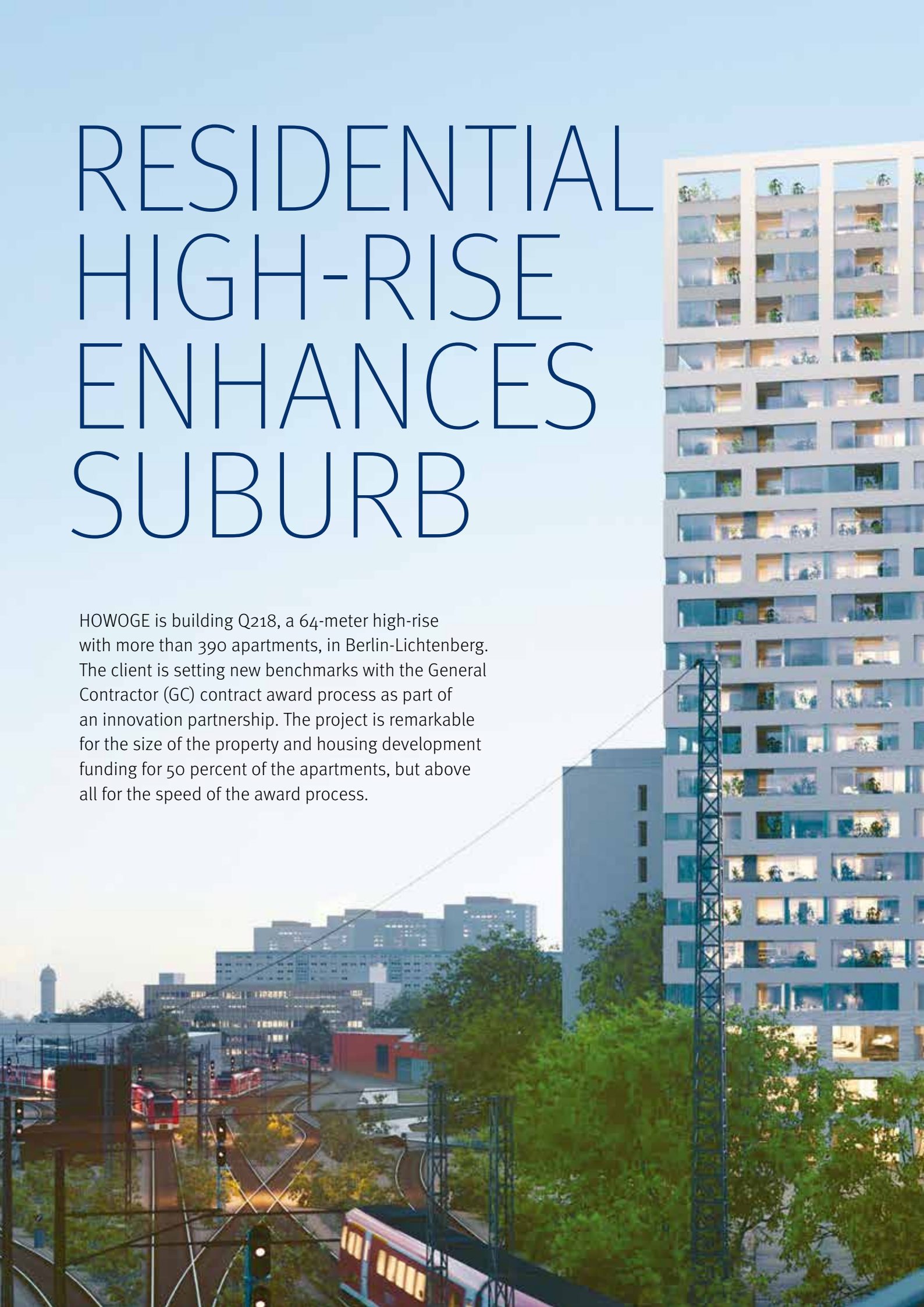
›› The first hospital building in Europe to use a seamless BIM approach. ‹‹

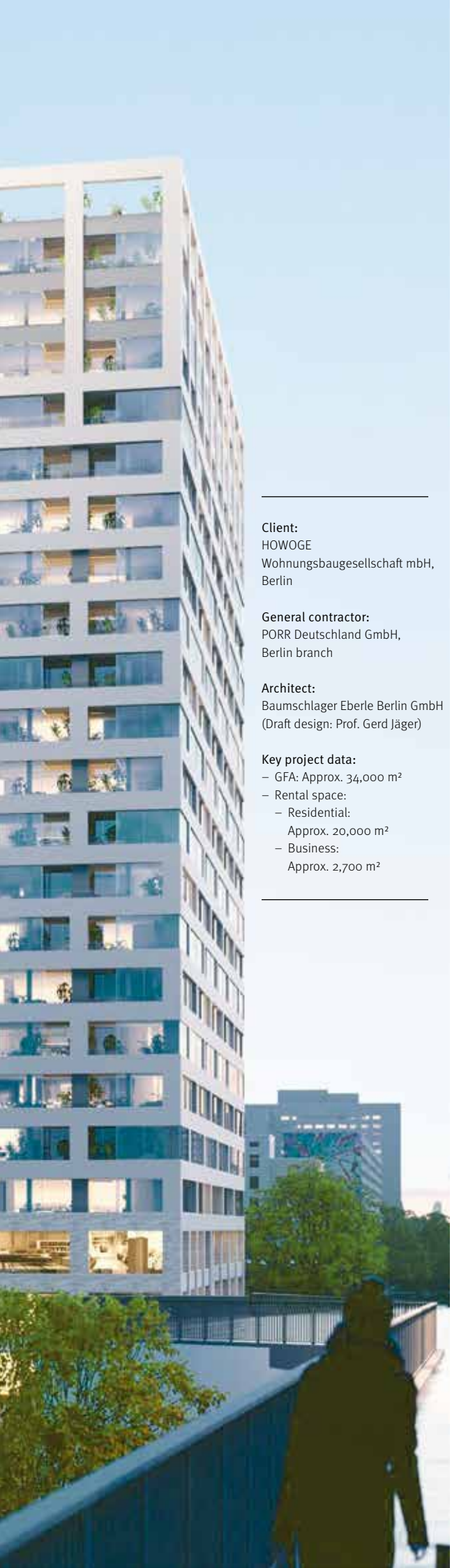
COMP MODEL	PLANNING MODEL		FM-MODEL	
APRIL 2013	NOVEMBER 2014	JULY 2015	NOVEMBER 2018	APRIL 2019
COMPETITION	PLANNING	EXECUTION	TRIAL OPERATION	OPERATION

Fotograf: Derek Li Wan Po

RESIDENTIAL HIGH-RISE ENHANCES SUBURB

HOWOGE is building Q218, a 64-meter high-rise with more than 390 apartments, in Berlin-Lichtenberg. The client is setting new benchmarks with the General Contractor (GC) contract award process as part of an innovation partnership. The project is remarkable for the size of the property and housing development funding for 50 percent of the apartments, but above all for the speed of the award process.





›› Comprehensive support in all areas from in-house professionals. ‹‹

Client:
HOWOGE Wohnungsbaugesellschaft mbH, Berlin

General contractor:
PORR Deutschland GmbH, Berlin branch

Architect:
Baumschlager Eberle Berlin GmbH (Draft design: Prof. Gerd Jäger)

Key project data:
- GFA: Approx. 34,000 m²
- Rental space:
  - Residential: Approx. 20,000 m²
  - Business: Approx. 2,700 m²

Drees & Sommer was awarded the contract following a public tender process. Experience with many innovative and challenging residential construction projects was one of the factors in Drees & Sommer's favor.

With Q218, the client – the Berlin-based housing construction company HOWOGE – had set itself the goal of planning and realizing a new building complex in a prominent location. In addition to housing, the building offers space for complementary businesses, such as co-working office space and gyms. The challenge was to meet the exacting targets for affordable rents and quality standards, while enhancing the existing housing mix by providing many small units in the district.

The design is for a 22-storey residential high-rise. The building will be located on a 4,600 square meter site and is divided into a three-storey plinth area, a 15-storey middle zone and a four-storey upper zone, and will provide some 20,000 square meters of living space.

› Project control, consulting services including BIM consulting, commissioning, acceptance and handover management, BSE system planning, and energy concept ‹

With legal support from GSK Stockmann, Drees & Sommer developed a variant of the negotiation process for the project, based on the so-called innovation partnership, for which the experts selected a special contract award process. This meets the challenges of a bidding market characterized by high demand for construction services with measures including an intensive project market analysis.

Following the architectural competition, Drees & Sommer – as project controller – supported the contract award process for general contractor services, and advised the principal on the initiation of BIM. In-house engineers also drew up a holistic BSE system plan and a holistic energy concept.

The project is currently in the partnering phase. The contract partners are further aligning the tender documents prepared by the GC with the principal's goals to determine the final budget. They are also meeting the requirements for obtaining the necessary regulatory permits. Construction is scheduled to start at the end of 2019.

Partners from left to right:
Norbert Otten, Thomas Hofbauer

›› We focus on the quality of lasting inner values, designing and implementing building services that make for success. ‹‹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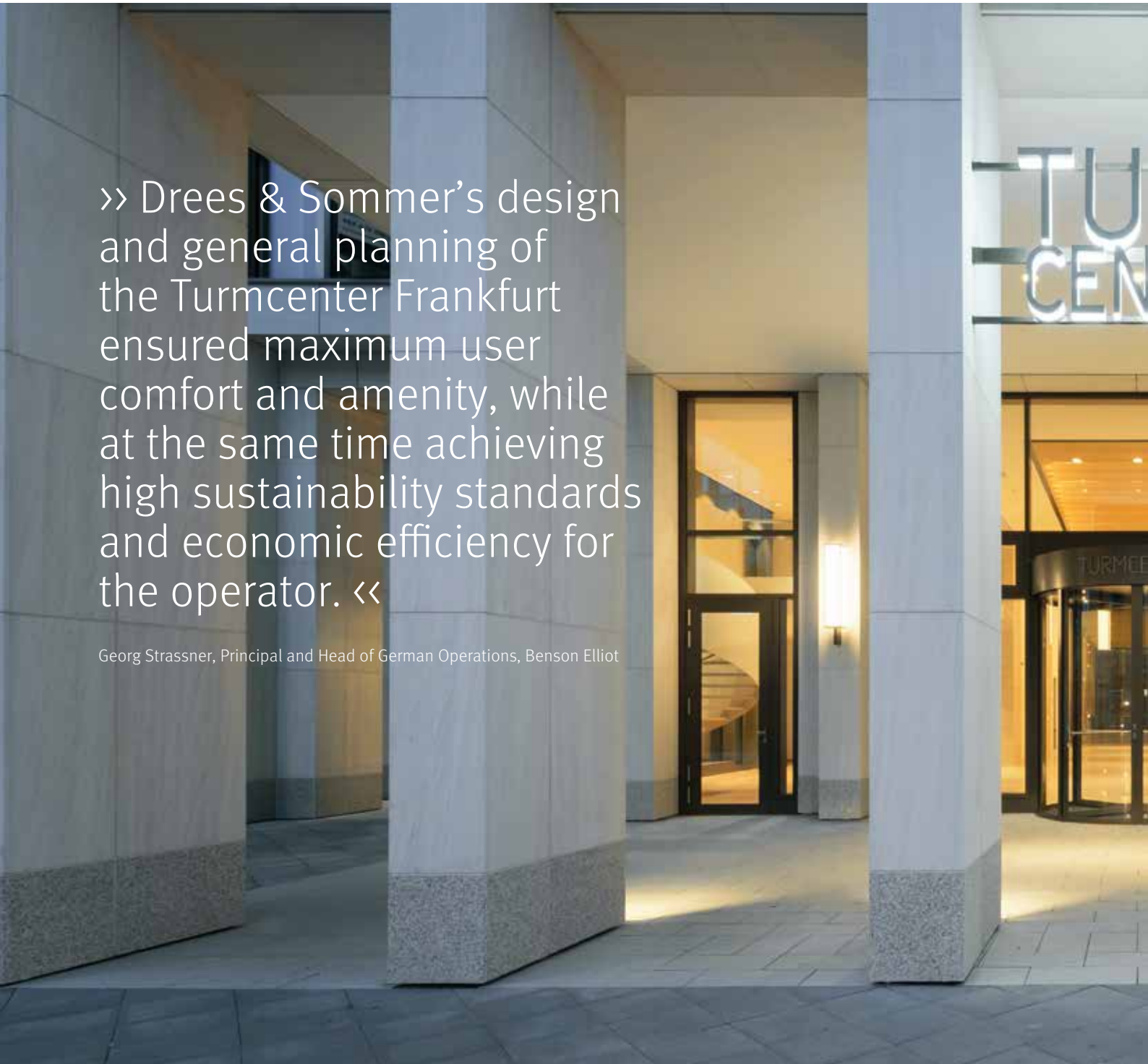
FLAGSHIP ENERGY PROJECT



›› Drees & Sommer's design and general planning of the Turmcenter Frankfurt ensured maximum user comfort and amenity, while at the same time achieving high sustainability standards and economic efficiency for the operator. ‹‹

Georg Strassner, Principal and Head of German Operations, Benson Elliot

From a concrete skeleton to pioneering Green Building. The Turmcenter Frankfurt (Frankfurt Tower Center) is a pioneer in terms of sustainability and energy efficiency. Drees & Sommer's future-oriented energy concept put the office high-rise building on track for successful general refurbishment.

For a long time, the 74-meter Turmcenter Frankfurt on the Eschersheimer Landstrasse was just a concrete skeleton: After the building had been gutted for refurbishment, the construction project came to a standstill as the result of a legal dispute. Work resumed when the building was sold to UK fund manager Benson Elliot. Drees & Sommer developed a sustainable energy concept for the 1970s high-rise with the aim of making the best possible use of its year-round potential and renewable energy. The concept substantially increased the efficiency and attractiveness of the office space and enhanced the value of the building, which paid off both during leasing of the office space and subsequent sale of the building.

It is the first office building in Germany to use the entire facade as a year-round 'energy collector'. In winter, the Turmcenter Frankfurt draws on the installed energy transfer and storage system: Warmth from the south-facing side of the building is transferred to the north-facing side, allowing office space to be heated naturally. Thanks to a combination of solar thermal energy, a heat pump and recycling of waste heat, heat generation is 90 percent regenerative. In summer, solar radiation is upcycled by the solar thermal energy system on the roof for regenerative cooling. Solar energy accounts for 65 percent of the energy used for cooling of the building, making the Turmcenter Frankfurt a pioneer in Europe.

› General technical planning, building services equipment, building physics, building ecology, Green Building certification, general planning, fire prevention ‹

With their energy design, instead of using a wide range of technologies, the Drees & Sommer experts focused on using a few innovative technologies that resulted in a substantial increase in efficiency. Annual consumption is particularly low: It is 40 percent below Energy Conservation Ordinance (EnEV) 2014 requirements and 15 percent below the Green Building standard. The technology used reduced the monthly energy cost per square meter to significantly less than one euro. The project managers also assisted with LEED Gold sustainability certification and were responsible for the implementation of the fire prevention measures.

Thanks to its innovative energy concept, the Turmcenter Frankfurt achieves the same energy balance as new buildings and ensures maximum economy by keeping ancillary costs to less than four euros per square meter. The resulting operating costs are more than 35 percent lower than for comparable high-rise buildings. At the end of 2018, Benson Elliot sold the revitalized office high-rise to the Swiss company UBS Asset Management (AM).

Client:
Benson Elliot, London

Project duration:
- Planning and construction period: January 2014 – August 2016
- Tenant fitout: December 2013 – July 2018

Key project data:
GFA: 19,299 m²

The high-rise building has 21 above-ground floors, a basement, and a penthouse above the parking garage.

SOUND MANAGEMENT ON AN ISLAND OF TRANQUILITY

Sylt has a long tradition as a holiday destination – and has maintained its exclusive status over the decades. A new upscale development is now taking shape in the northernmost part of Germany's most famous island. Hospitality and technology experts from Drees & Sommer are involved in the project.

›› Holistic engineering backed by years of experience in the Sylt hotel market. ‹‹

The exclusive Lanserhof hotel and health resort chain is building a complex with 69 guest rooms to a design reminiscent of the heritage-protected officers' mess at the top of the dune. With a gross floor area of some 20,000 square meters, it houses a treatment and medical center, a spacious spa with saunas, steam baths, relaxation areas, and an indoor and outdoor pool.

› Finance controlling, system planning, BSE planning, energy design, building ‹

Client:
LHS Entwicklung GmbH, Hamburg

Project duration:
May 2017 – April 2021

Architect:
ingenhoven architects, Düsseldorf

Key project data:
GFA: Approx. 20,000 m²
– of which about 5,000 m² for treatment and medical care
– Rooms: 69

The Drees & Sommer hospitality experts are supporting the ambitious project between the dunes and the mudflats of the Wadden Sea by providing professional finance controlling services. Plausibility checks on cost and schedule planning form part of the regular controlling reports submitted to the financing bank.

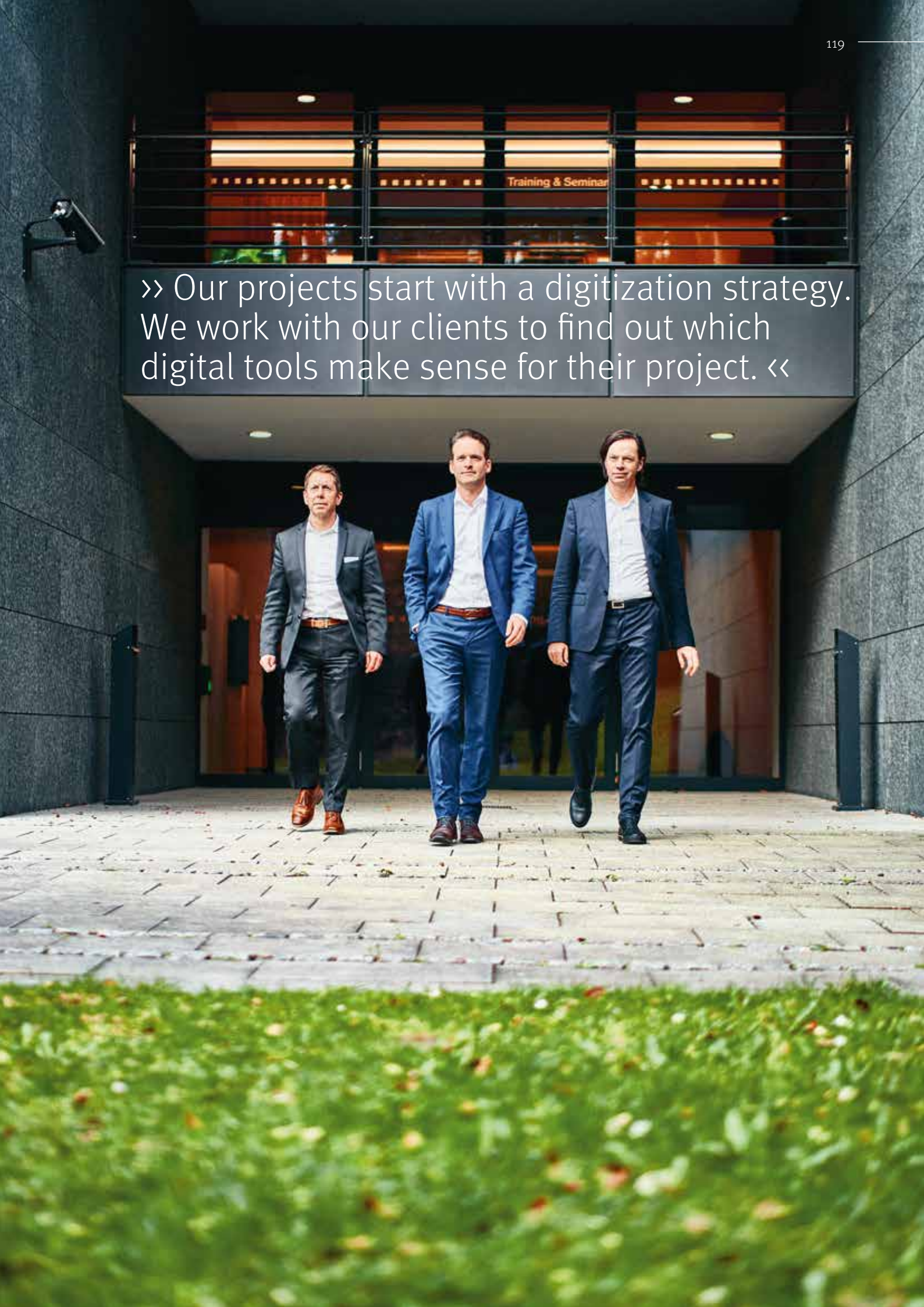
The engineering specialists at Drees & Sommer prepared an energy study to ensure that the resort meets the technical requirements and associated high standards in terms of design, acoustics and amenity. In addition to planning the building services equipment featuring an efficient and sustainable cogeneration plant, the company is also responsible for building physics and building acoustics.

One of the special challenges is project realization based on individual contract awards in a market that has its own special character with regard to infrastructure and competition.

The standout features of the main building of the Lanserhof Sylt include an indoor and outdoor pool as well as extensive lounge, and reception areas.

Left page, partners from left to right:
Matthias Schulle, Jörg Ewald-Lincke

Right page, partners from left to right:
Jörg Wohlfarth, Prof. Phillip W. Goltermann, Klaus Dederichs



›› Our projects start with a digitization strategy. We work with our clients to find out which digital tools make sense for their project. ‹‹

NEW LOGISTICS CENTER FOR SAINT-GOBAIN BUILDING DISTRIBUTION

›› 30,000 square meters of flexible, repurposable logistics space created. ‹‹

Saint-Gobain Building Distribution Deutschland GmbH (SGBDD) has built a logistics center near Magdeburg. The building materials retailer now supplies its German outlets with tiles, construction and fitout products, construction equipment and tools from this central warehouse.

Client:
Saint-Gobain Building Distribution Deutschland, Offenbach

Project duration:
February 2017 – January 2019

Architect:
phase 5, Düsseldorf

Key project data:
- GFA: 30,000 m²
- Construction costs: €20.3m (GC services)
- Workplaces: Approx 150

The new building has allowed SGBDD to consolidate two previous centers in Halle and Magdeburg and to create an additional 20 jobs. The logistics center meets the company's needs for a larger, more flexible space, more advanced technology, and state-of-the-art digital logistics processes.

The Drees & Sommer Logistics team supported SGBDD with the project, in particular with project management, intralogistics and conveyor expertise. As a first step, and at short notice, the experts performed a quick analysis of the current status of the project. They succeeded in structuring the project efficiently and clearly identifying open issues, opportunities and risks.

Based on these findings and the design and approval planning, Drees & Sommer then developed a functional performance specification and conducted a subsidy-eligible competition for the selection of a general contractor. This allowed the construction project to be completed on schedule with a cost overrun of less than two percent for changes and supplementary claims.

› Project management, GC controlling, invitation to tender and contract award for general contractor services, control of intralogistics including interface management, subsidy management ‹

One challenge throughout the planning phase was to ensure potential for alternative uses. The logistics center was to be sufficiently flexible to allow future repurposing or subletting.

During the construction phase, it was important to integrate the client's external intralogistics consultant into the overall project. The Logistics team took on this role and established successful interface management between intralogistics and construction. Throughout the project, SGBDD could count on being kept up to date and on being in a position to make informed decisions. The logistics center was commissioned on schedule in March 2019, with costs remaining within budget.

INTEGRATED SOLUTIONS FOR URBAN DISTRICTS

Many of the changes that we are currently experiencing are taking place in our cities and demand new ideas for the development of districts. With its holistic approach, Drees & Sommer develops future-oriented planning solutions for the transformation of existing districts and the development of new urban and commercial districts as well as industrial zones.

Attractive architecture and a high level of amenity: The Hansator in Münster links the Old Town and the Hansa Quarter.

Devising these future-oriented solutions is no easy task. All the more so because various stress factors create complex conflict situations. The situation is compounded by developments such as climate change, renewable energy sources, resource scarcity, digitization, and demographic change that interact with each other and impact urban centers worldwide.

Integrative approaches are required to put together a sustainable comprehensive package. At the same time, every city, district or project has its own unique conditions and therefore requires its own specific solutions.

Maidar EcoCity+ in Mongolia is a good example. This new city is being built to relieve the nearby capital Ulaanbaatar and is designed with attractive features such as compact layout, extensive car-free zones, integrated mobility services, green spaces, and a sustainable energy supply. Drees & Sommer development consultants are supporting the ambitious project.

A further megatrend that poses major challenges for quarters and cities is digitization. No technological change in recent decades has brought about such massive and lasting change to existing structures, communication processes, and habits.

Urban planning in transition

The use of innovative buildings as linking elements is also growing in importance. After a century of German urban planning culture based on the principle of zoning, a change of mindset is now taking place. The city of tomorrow will be characterized by mixed use.

One example of this can be found in Münster, Germany, where Landmarken AG is developing a vertical quarter on the east side of the main railway station. It features a balanced mix of residential, hotel, gastronomy and retail uses. The new buildings blend organically into the existing urban space, creating a link between the Old Town and the Hansa Quarter. Through holistic consulting, Drees & Sommer is ensuring that the construction project is successfully completed on schedule and within budget. The new building is also being designed and built to achieve DGNB Gold certification.

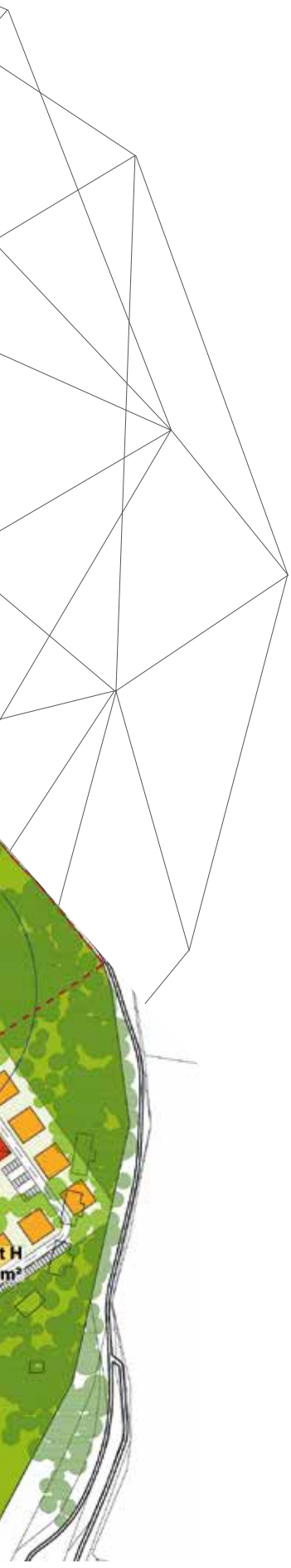
As climate change becomes more and more noticeable, especially in urban areas, sustainability is becoming a key issue in district projects. This is also the case in Berlin, where the Möckernkiez cooperative created a sustainable barrier-free social housing complex. All buildings in the car-free district were built as passive houses and meet the requirements for the energy-efficiency standard KfW 40.

Drees & Sommer experts drew up the energy and sustainability concept for the entire apartment complex. They were also responsible for the schedule, cost and quality levels of the large-scale project. This resulted in the development of a unique district that not only meets high sustainability standards, but also allows community-based, intergenerational living.

›› With the Blue City approach, Drees & Sommer experts always consider all city-related stressors. ‹‹

Exclusive apartment buildings based on a historic archetype – the Berlin Olympic Village is one of Germany's key national urban planning projects.

›› Creating holistic solutions for cities as part of a sustainable package. ‹‹



Sustainable and intergenerational – the Möckernkiez cooperative district.

Other cities and neighborhoods are also grappling with demographic change. Senior citizens often find it harder than younger people to move independently around their city as their eyesight and hearing deteriorate. Traveling long distances becomes increasingly tiring – and even dangerous.

In the UrbanLife+ research project, a team of Drees & Sommer development managers is working with other project partners to deploy technology to make everyday life easier for older people in public spaces. As part of the project, two urban districts in Mönchengladbach will use human-technology interaction (HTI) to promote future urban planning that enables safe barrier-free movement around the city for seniors.

Public accessibility is also an issue in Potsdam – albeit with a different focus. The state capital's administration has taken on the challenges of a growing city. Its offices are currently spread across a number of locations in the city. A citizen-friendly future-oriented service hub is to be developed as part of fundamental urban restructuring to make advances including minimizing travel distance and addressing the growing demand for jobs.

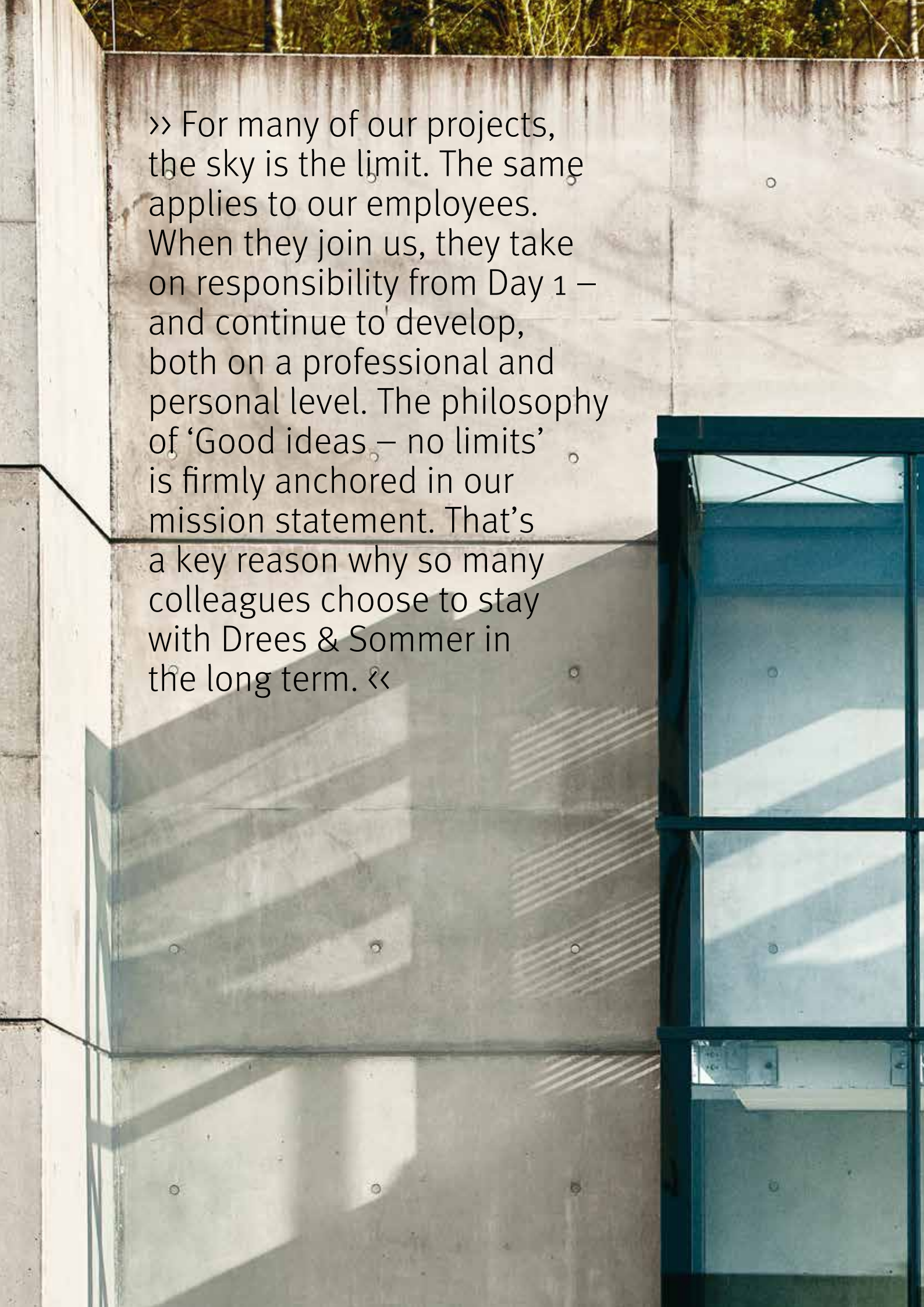
Drees & Sommer provided a sound basis for political decision-making with a site analysis, the identification of various urban land-use options, and economic feasibility studies.

Securing value creation

Urban development projects – whether undertaken by local authorities or the private sector – often qualify for subsidies. That was also the case for the Olympic Village in Berlin, where the property owner, Proges Eins GmbH, is creating new housing with the development of the abandoned site. But initially, the processes for planning, invitation to tender and contract award did not fully comply with the subsidy guidelines of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR).

The processes were modified with the help of Drees & Sommer, allowing full access to subsidies. Drees & Sommer also supported the client with overall project controlling, feasibility studies on the development of the district, profitability analyses, and investor selection processes for the further construction phases of the complex project.

All these examples show the many and varied challenges that cities and urban districts face. The Drees & Sommer experts meet these challenges with custom solutions and prioritization, always as part of an integrative approach.



›› For many of our projects, the sky is the limit. The same applies to our employees. When they join us, they take on responsibility from Day 1 – and continue to develop, both on a professional and personal level. The philosophy of ‘Good ideas – no limits’ is firmly anchored in our mission statement. That’s a key reason why so many colleagues choose to stay with Drees & Sommer in the long term. ‹‹

Partners
from left to right:
Björn Jesse
Prof. Jürgen M. Volm

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