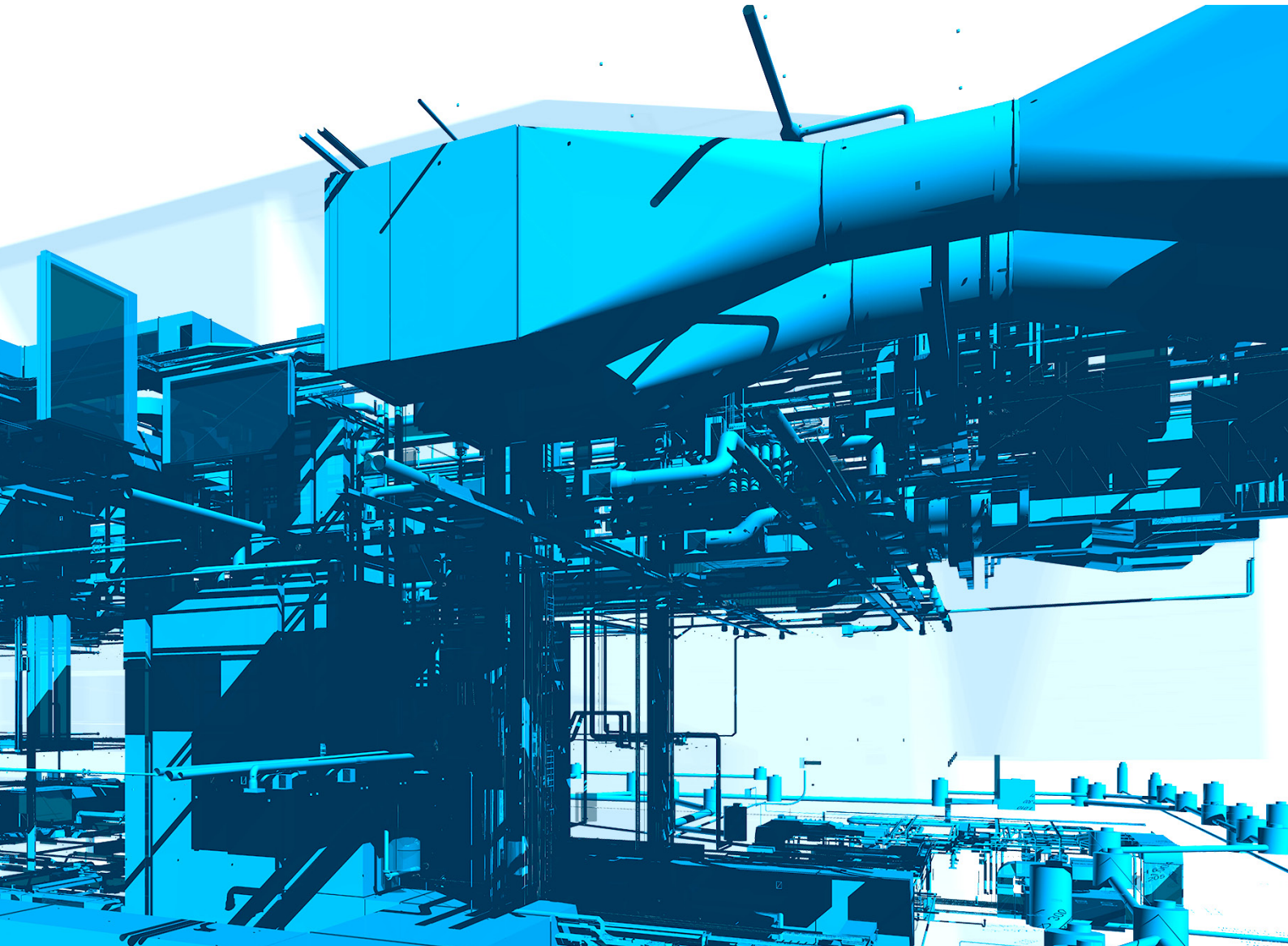
GERBER ARCHITEKTEN & BUROHAPPOLD ENGINEERING

A UNIQUELY INTEGRATED TEAM DESIGNING AND BUILDING WITH

BIM



A UNIQUELY INTEGRATED DESIGN TEAM

FOR OVER A DECADE WE ARE SUCCESSFULLY COLLABORATING USING BIM ON OUR PROJECTS.

WE ARE LEADING BIM EXPERTS AND INVITE YOU TO SHARE THE BENEFITS OF OUR EXPERIENCE.

For over a decade, Gerber Architekten and BuroHappold have successfully collaborated on a variety of projects, using BIM as an advanced planning and process tool. We consider ourselves leading BIM experts and are eager to share the benefits of BIM with our clients.

Gerber Architekten

Gerber Architekten, with over 50 years of practice, offers a wealth of expertise, competence and excellence. Our staff consists of architects, interior designers, landscape designers, engineers and surveyors located in our offices in Dortmund, Hamburg, Berlin, Riyadh and Shanghai.

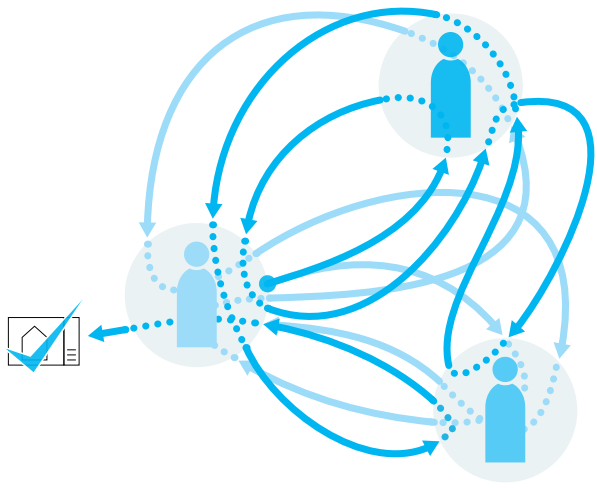
Our services range from consulting, project development for all project stages including cost and construction management and also general planning. Through intensive communication with our clients, we develop common goals in order to develop exciting and quality designs which are produced efficiently and economically.

BUROHAPPOLD ENGINEERING

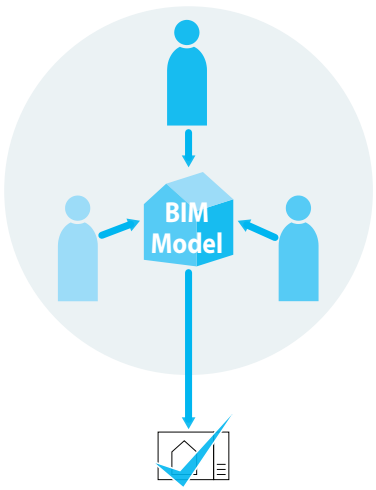
BuroHappold celebrates 40 years since Sir Ted Happold founded 'BuroHappold' and began solving the most complex and challenging design problems the world could throw at them.

Today our canvas is broader than buildings alone. We design urban environments, transit hubs, city districts and entire cities.

We celebrate our engineers and their fervent, creative minds that bring a spark of inspiration to each challenge, pushing the boundaries of each opportunity to grow, flourish and regenerate environments to the benefit of all.



There are many partners collaborating on a project . . .



. . . BIM makes Data central and coordination simple.

BIM IS THE NEW INDUSTRY BENCHMARK

BIM IS TRANSFORMING CONSTRUCTION AND REVOLUTIONIZING THE DESIGN PROCESS.

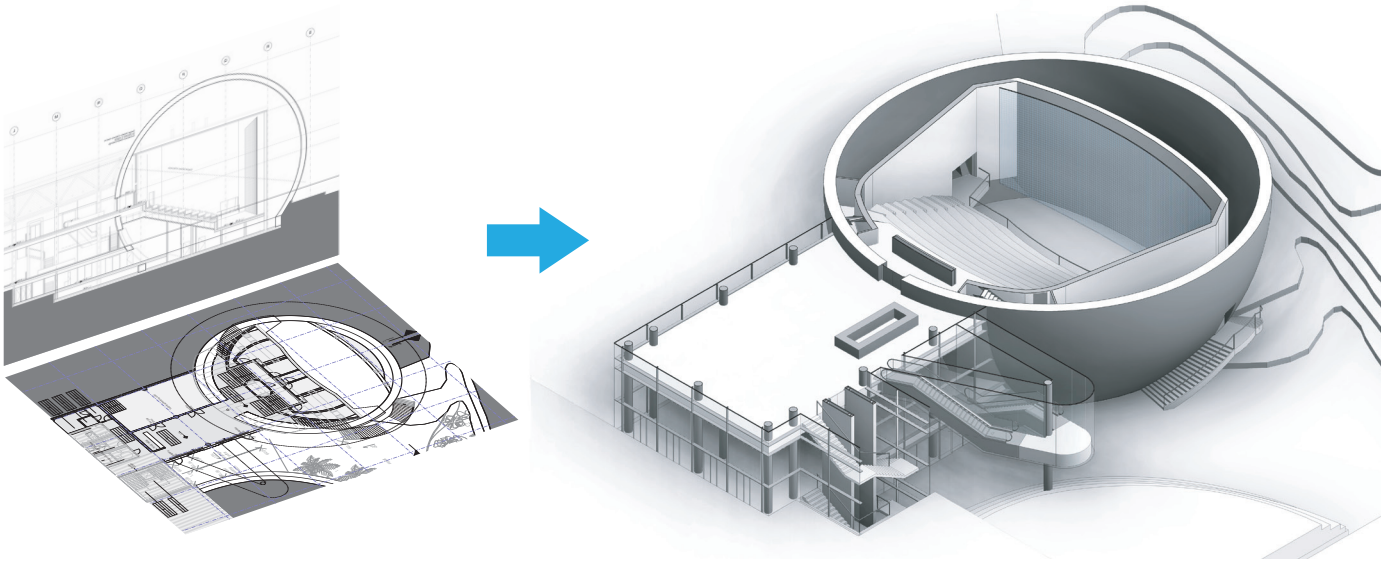
BIM IS BUILDING THE ENTIRE BUILDING VIRTUALLY BEFORE YOU ACTUALLY BUILD IT.

BIM stands for Building Information Modeling and represents the process of development and use of a computer generated model to simulate planning, design, construction and operation of a facility. The resulting model, is a data-rich, object-oriented and parametric digital representation of the facility, from which data can be extracted and analysed to generate information.

BIM is rapidly transforming building design, construction and operations and the adoption is introducing innovations across the entire value chain.

"BIM, and of BIM virtual design and construction are chosen most often by construction industry professionals as the technologies best positioned to boost productivity. Project collaboration tools rank second among top technologies and management strategies to improve productivity." (Economist Intelligence Unit Report, 2015)

Over the last two decades, BIM has evolved the way buildings were previously described in two dimensional views of plans, sections, elevations to dynamic three dimensional "smart object" building elements and systems. Twenty years ago we had to imagine how a building would fit together in three dimensions. Today, we model fully in three dimensions before we start to actually construct the building.



In the past we had to imagine how a building would fit together from 2D Plans... now we create a full 3D before we start to build it.

THE PROCESS IS SMART

WITH BIM WE IMPROVE THE COLLABORATIVE DESIGN PROCESS AND COMMUNICATION.

WITH BIM WE PROVIDE CONSISTENT INFORMATION AVAILABLE TO ALL PARTIES.

When developing the design, we coordinate our work in a collaborative BIM model that is live, continually updated by designers and engineers and made available to all involved.

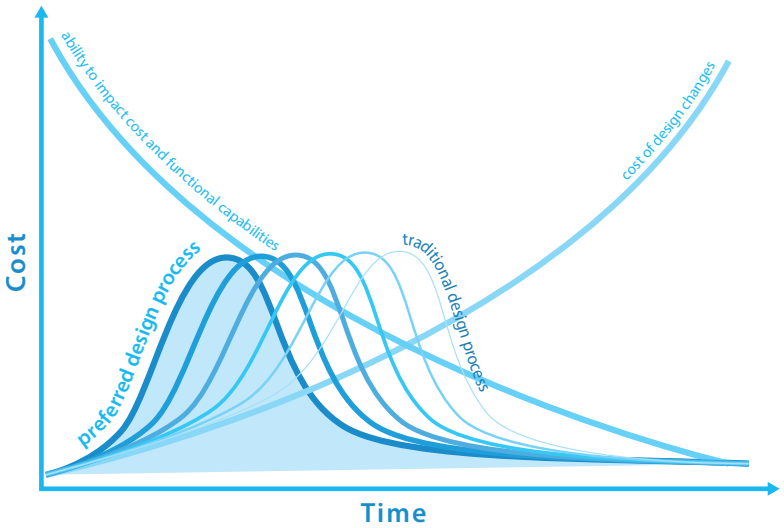
The coordinated 'single source of truth', combined with high availability, results in higher transparency, speeds up decision making and increases the overall efficiency of our project delivery.

If, for example, the client makes a change, all other parties involved see the change and can respond instantly. There is not less communication than before, rather it is better targeted, streamlined and without delays. Furthermore, fabricators and manufacturers can get involved earlier.

The costs of design changes increase as the project progresses. We aim at detecting possible errors and conflicts of planning at an early stage so that design changes are less expensive.

Our concept of a collaborative and highly coordinated design process supported by our integrated clash management helps us prevent errors more easily and diminish expensive changes during construction.

The early involvement of all parties, who work simultaneously with us on the project and the efficient and transparent cooperation in one coordinated model, as well as the great visualizations, support the unobstructed execution at the construction site.



Time and Cost, Mc Leamy Curve

5%
saving on construction costs

97%
cost forecasting

AND HAS BENEFITS FOR YOU

BIM MAKES YOU MORE COMPETITIVE.

BIM WILL LEAD TO REDUCED DESIGN AND CONSTRUCTION COSTS.

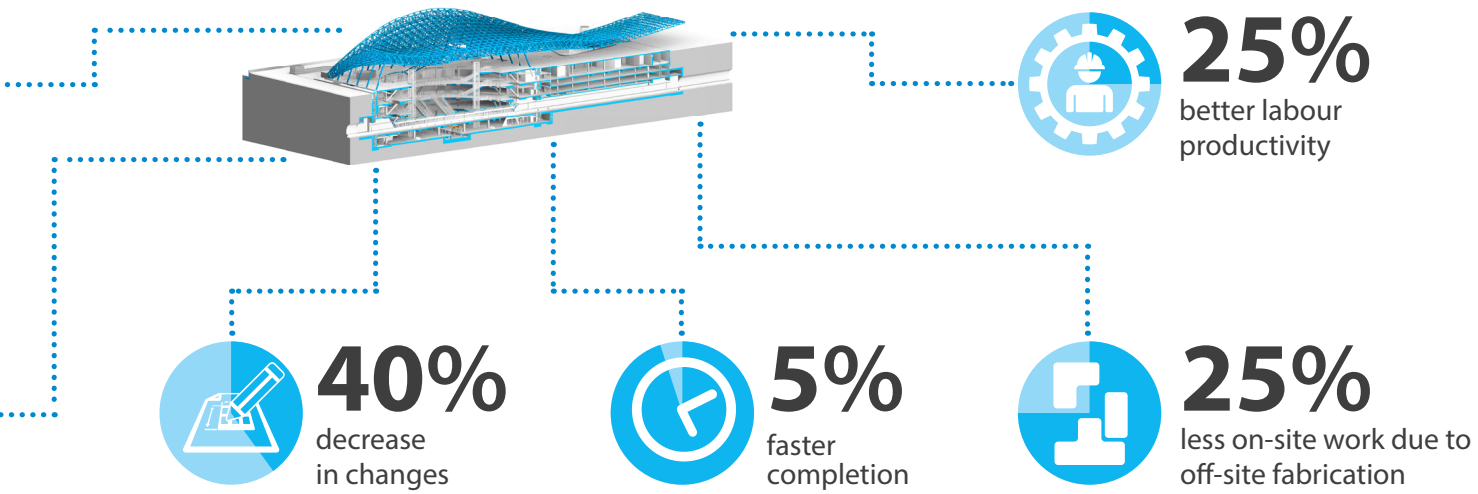
Findings prove that all parties involved benefit from using BIM by becoming more competitive due to a combination of factors such as improved reliability of outcome and a maximised profit margin, higher quality construction, greater customer satisfaction and reduced costs.

Findings also show that BIM improves the project information mobility and therefore leads to enhanced collaboration and increased productivity. The consequence is the reduction of design iterations, as well as improvements of schedule, cost and ROI.

And there is also the brand building factor: Embracing the BIM method and collaborating with industry leading practices, that use BIM, promotes an industry leader image.

Furthermore the visualisations created with BIM enable a better understanding of proposed designs leading to fewer problems related to planning errors during construction, such as coordination issues or construction errors.

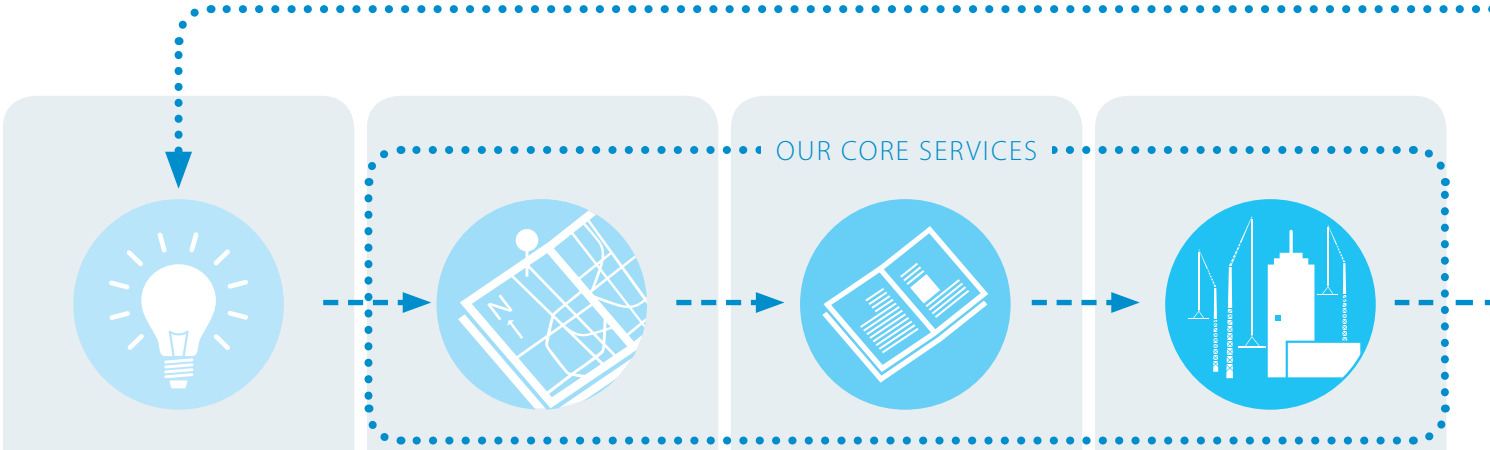
Besides producing a more coherent and high-quality design, BIM enables more client involvement. This is especially beneficial in large, complex building projects. Not only the quality of the final design improves but also the generation of construction documents, positively impacting the ability to plan construction phasing and logistics.



Benefits of BIM at Construction Stage

CRADLE TO CRADLE ASSET AND

OUR EXTENDED SERVICES



PROJECT INCEPTION

Realistic Lifecycle Costing Analysis to evaluate business case

DESIGN

Exploring multiple customised design iterations

Efficient collaboration in a shared data platform supported by clash detection management

Enabling to make informed decisions at key points in earlier stages of the design

Better understanding through enhanced visualisations

Integrated engineering analysis and simulations for an optimised scheme

Live BoQs and costs

DOCUMENTATION

Consistent documentation in a shared BIM environment

Connected information to better manage when late changes occur

Streamlined document control process

Custom outputs from the model

Better communication of requirements and specifications

No loss of information when transition through project stages

CONSTRUCTION

Construction sequencing to coordinate material ordering, fabrication, and delivery schedules for all building components

3D Visualisation on site for efficient practise with less mistakes

Engaging contractors and model sharing earlier enables better preparation and feedback

Reducing remedial works due to enhanced quality control and design coordination

Reducing project time and improving workflow due to earlier involvemenet of fabricators

Reduction of wastages and better implementation of lean construction techniques

PROJECT MANAGEMENT WITH BIM

OPERATION

Increasing building efficiency through performance monitoring and integrated building management

Supporting the collection, processing and use of performance data.

Enabling efficient facility management

Recording models with links to all facility information as serial codes, warranties, and the operation and maintenance history of all the building components

Digital operation and maintenance manuals with embedded technical information

Streamlining change management by assisting in space reconfiguration and scenario planning

RENOVATE, REFIT, REPURPOSE

Providing the history of the asset and eliminating the need to remeasure, redraw and rediscover

Pinpointing elements within a model by classification, enabling management of any replacement, recall, or warranty issue

DEMOLITION & RECYCLING

Enabling demolition process and waste disposal by showing quantities and inventory of materials

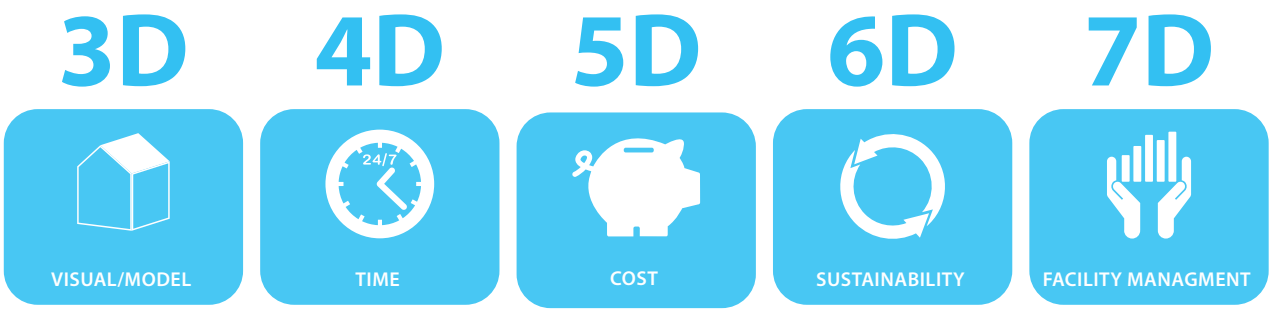
BIM HAS MULTIPLE DIMENSIONS

BIM IS MORE THAN A 3D MODEL. IT INCLUDES A 4TH, 5TH, 6TH AND 7TH DIMENSION.

BIM is multidimensional and much more than just a 3D model of a building. Components of our BIM models embed agreed additional information specific to the further dimensions of time (4D), cost (5D), simulations and sustainability (6D) and facility management (7D).

The **3rd dimension**, the 3D building model made of parametric 3D objects relating to each other, creates the basis for all building information modeling. Besides designing and coordinating in a 3D enviroment it allows for the attachment of additional information. Enhanced 3D visualisation tools are integrated into the design process in order to generate animation videos, walk-throughs and photorealistic still images. These enable our clients and all stakeholders to virtually experience, fully understand the design proposals and identify any issues or difficulties encountered.

The **4th dimension** of the model connects the time. Besides the scheduling of project stages, it is possible to explore options, manage solutions and optimise results relative to time. Specifically, optimised construction, collaborative and transparent project implementation, partnering with the supply chain and production of components are all possibilities with BIM.



WHICH CREATE SYNERGIES

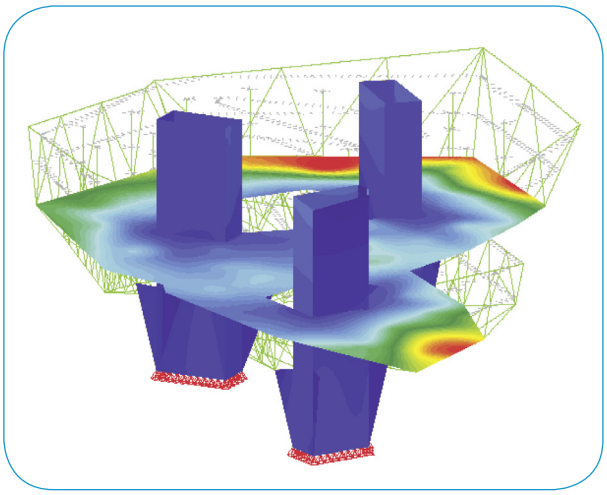
THE DIMENSIONS DON'T STAND ALONE BUT CREATE SYNERGIES THAT SAVE TIME AND MONEY.

All dimensions are not stand alone instead they create synergies. By including parameters for time and cost for instance, we facilitate the work of logistics planners and quantity surveyors. We have the ability to produce construction sequence schedules and animations that are driven by the time parameters within the modeled elements. Using BIM tools, we have the ability to compare the most diverse factors and find the optimum value to meet the objectives of our clients.

Closely linked to time, the **5th dimension** connects costs to model quantities and enables effective cost management at any stage of the project. That includes Life Cycle Costing and option assessment in the early project stages. Recognizing that the running of a facility calculated over the lifetime of a building exceeds the construction cost by multiples, this BIM dimension becomes invaluable.

With the **6th dimension** of a BIM model, we provide technical simulations and sustainability assessments based on the building model. Early stage applications such as daylight, energy and climate analysis are part of our standard workflow. After adding further detail and information, the model also provides the basis for sustainable building certification.

To implement the final **7th dimension**, we feed defined information for the later operation and facility management of the building into the model. With BIM it is much more cost effective to exchange elements during operation, such as lighting and fire safety equipment whilst maintenance schedules, equipment and component specifications and other operation and maintenance information can be made easily available.



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WHAT WE CAN OFFER

OUR INTEGRATED DESIGN TEAM TAILORS BIM TO SUIT YOUR GOALS.

BIM planning
Analysing options and opportunities;
Assessing BIM requirements and defining goals and BIM strategy;
Project BIM Standard and BIM Execution Plan to define data standards and procedures between all stakeholders

BIM Execution, Management and Coordination
Managing the whole BIM information lifecycle

Conceptual Design
Through use of 3D models undertaking complex conceptual design studies and linking information to BIM process;
Practicing integrated design through early model collaboration and simulations to test and develop ideas

Simulations and Analysis
Linking data to software for bi-directional analysis and member updates

Detailed design and Clash Management
Linking to other discipline models to enable interactive design changes;
Exploring design options without affecting design programme

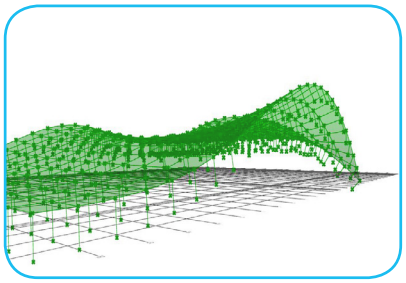
Documentation
Information within the BIM environment assures consistency of project documentation including cost calculations, specifications, drawings, schedules and images;
Direct integration of all contributing to the project

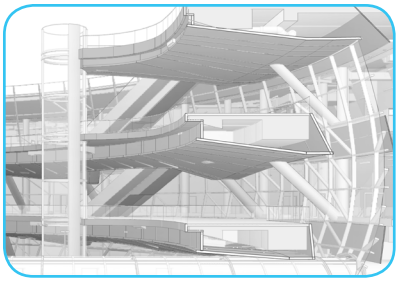
Fabrication & pre-fabrication
Selecting the software that enables us to communicate most effectively;
Providing fabricator with a full 3D data-rich model

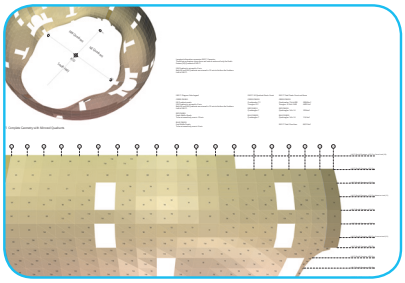
Construction 4D / 5D
Including parameters for time and cost;
Producing construction sequence drawings;
Scheduling and coding all projects with required classification to assist in the costing and purchasing of elements

Construction logistics
Checking other discipline's models, temporary works models, or other site constraints that could affect the design

Operation & Maintenance/Facility Management
Delivering Facility Management data;
Preparing guidelines and plug-ins to enable users to get information







OUR INTEGRATED DESIGN APPROACH

OUR SERVICE OFFERS AS AN INTEGRATED TEAM

By providing a broad range of engineering specialisms within a single integrated team, we are able to deliver world class buildings that add real value to our clients projects. Working across specialisms enables us to strengthen our knowledge and provide a powerful combination of smart integrated thinking and planning, across all elements of building design. This unique combination of integrated skills means we understand both the science and art of delivering great buildings, resulting in the optimal solution with minimal disruption. We also embrace partnering to ensure we offer the very best technical and sector skills to achieve high performance buildings through more efficient and creative methods.

The Team Gerber Architekten and BuroHappold Engineering is looking forward to work with you.

WWW.BUROHAPPOLD.COM

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