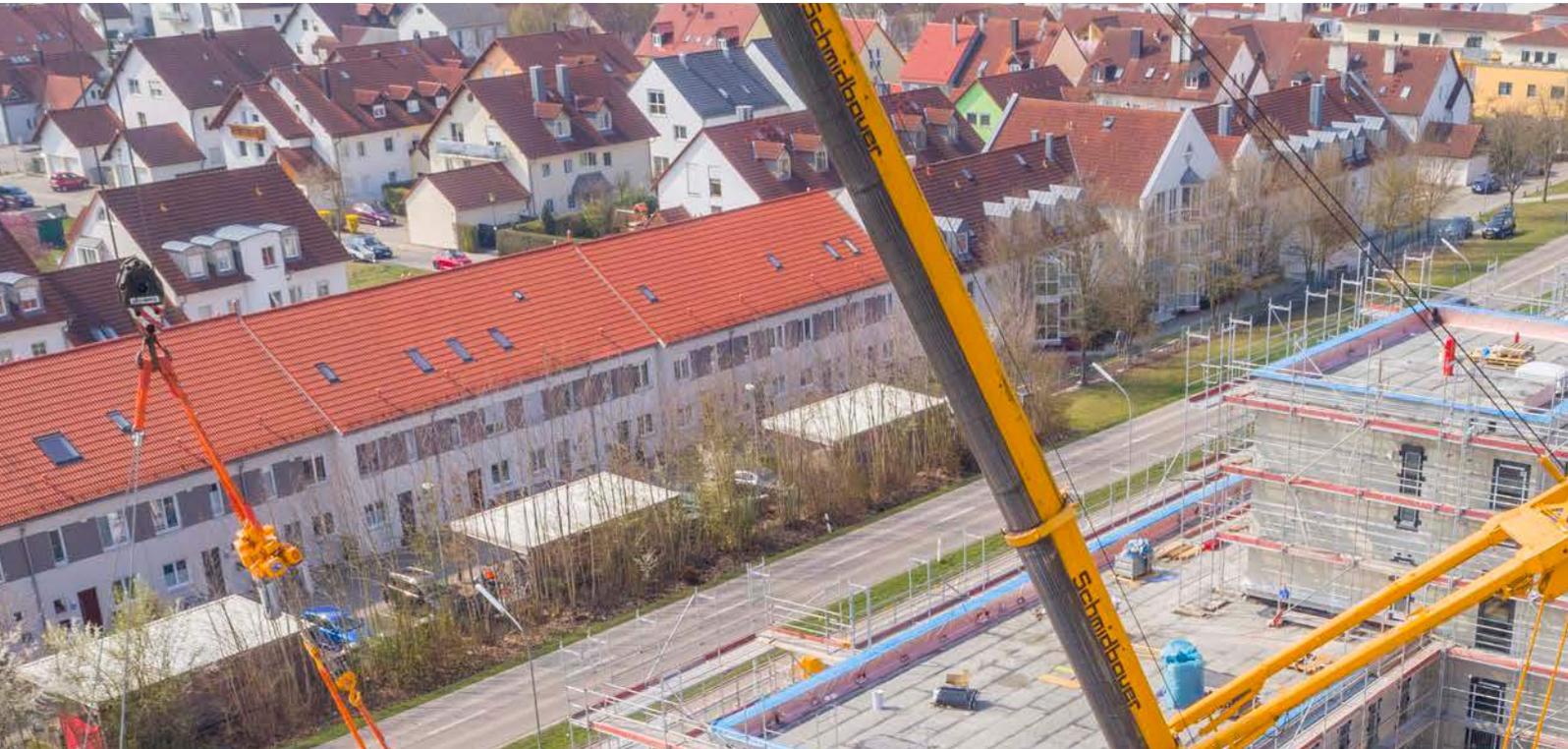


For faster construction



Affordable Housing

Product Catalogue

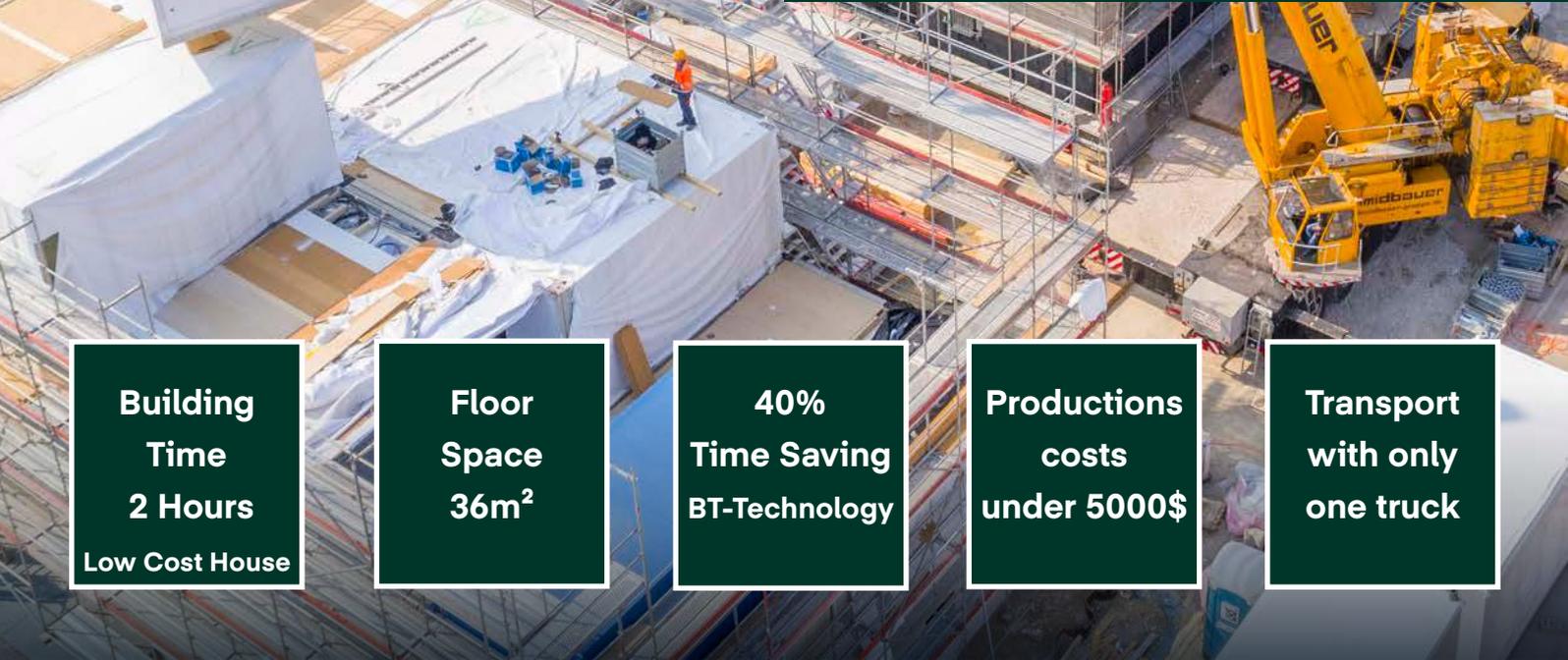
Building Time
2 Hours
Low Cost House

Floor Space
36m²

40% Time Saving
BT-Technology

Productions costs
under 5000\$

Transport with only one truck





Call us:
+49 391 7352 0

Write to us:
projects@bt-innovation.de

www.bt-innovation.de



BT INNOVATION - FOR FASTER CONSTRUCTION

We Change the Way We Build with Concrete

B.T. INNOVATION GMBH

is a company in the construction supply industry which is successfully established on the national and international market since 1991. We are active with over 60 employees at our headquarters in Magdeburg. Our range of services ranges from development and sales of innovative products to technologies for the construction site and precast industry and consulting. Our international team is consisting of experienced sales specialists and engineers who develop and commercialize products and solutions for worldwide distribution. Increasing numbers in international protective rights, patents and product certifications as well as building regulatory approvals verify the successful development activity.

PRODUCTS & TECHNOLOGIES FOR THE CONSTRUCTION SITE

Our products for the construction site are characterized by groundbreaking approaches and an easy handling. They were specially designed for the use on construction sites for an easy installation with less workforce and without high assembly costs.

SEALANTS AND WATERPROOFING

Our sealing products are the ideal choice for sealing fresh or hardened concrete. Regardless of joint or surface sealing, we have the right product for every situation.

PRODUCTS & TECHNOLOGIES FOR THE PRECAST CONCRETE INDUSTRY

Our wide range of solutions from areas of magnet and formwork technology increases the performance and profitability of every production. The patented products from BT innovation constantly redefine the status quo in the industry.

BUTTERFLY BATTERY® MOULD

The patented Butterfly Battery® Mould enables the stationary production of precast concrete parts with up to 4 times the productivity. The Butterfly Battery® Mould combines the advantages of the horizontal preparation with those of vertical production.

LOW COST HOUSING

Our „Low Cost Housing“ concept offers an affordable high quality living space. A solid 36m² house made of concrete with a kitchen, bathroom and two bedrooms can be set up in 2 hours with the use of the BT-Spannschloss® (turnbuckle). This is only one example out of many more possibilities.

CONSULTING

Whether a new precast concrete plant is built, an existing plant is planned to be modernized or resources should be used more efficiently – we stand by our customers with our extensive know how and expertise as a consultant.

SPEED, QUALITY AND COST EFFICIENCY FOR SUCCESSFUL HOUSING PROJECTS

Housing Projects

The world population is currently increasing at a faster rate than ever in the past. Our cities are growing rapidly. More and more people need affordable housing. Although this population growth is concentrated in the world's developing countries, other reasons like natural disasters, wars, economic crises and regional instabilities make shortage of living areas a mutual challenge for most countries including industrial ones.

It is clear that for a large deficit in housing, there has to be a highly efficient, economical system, based on the very latest construction material knowledge and production technology. The system should consider technical feasibility, the client's individual wishes, economical execution and the needs of future residents.

Any compatible system must be designed according to individual and regionally different requirements. This is how our production solution, benefiting from economies of scale, lessons learned, and best practice approaches, has been developed. The basic idea of the solution is that the maximum dimensions of structures should not be determined by transport limitations.

BT innovation is developing solutions for the construction and precast concrete industry. Precast construction is a cost-efficient, fast and sustainable building method for large housing projects that does not compromise on quality. In fact, it is the industrialised solution for construction projects.

Our innovations reduce the production time in the precast concrete plant and accelerate the installation process on site. The production of complex and formwork smooth surfaces of high-grade appearance becomes possible with the change of perspective inherent in the butterfly formwork® technology. This involves filling the formwork with self-compacting concrete (SCC).

The butterfly formwork® is the most advantageous system for the serial production of required precast elements of large panel structural system in different dimensions and specifications. The panels can be used in low cost, affordable or even high end housing projects.



Township in Cebu²

AFFORDABILITY THROUGH INNOVATIVE PREFABRICATION TECHNOLOGIES

Affordable Housing

House design optimisation, efficient prefabrication technology, and effortless assembly of the houses on site are the main keys to reach affordable housing solutions. B.T. innovation GmbH has worked on this concept by introducing a simple and practical room layout with an optimised wall thickness as a benchmark. It is a perfect example of the Butterfly Battery Mould production. The house is connected with the patented BT-Spannschloss® (the cutting-edge turn-buckle system for dry connections) and set up in only two hours.

Smart construction systems are composed of large-panel elements including precast load-bearing walls and slabs for various solutions in modular construction as apartment buildings, office buildings, hotels, administrative buildings and similar structures.

The approach of BT's affordable housing concept is to improve local value chains by creating jobs and using local material resources. The houses should be prefabricated and assembled in the target country by local workers using local materials. Thus, an efficient precast technology is delivered by BT, and also a skilled labour force is trained.

Housing projects are never exactly identical. Depending on the project requirements, precast panels with different heights, widths, thicknesses and insulation types may be needed. The production equipment should be able to cover the necessary dimensions and output capacity accordingly.

The pictures below illustrate an affordable housing project in Russia. The precast elements were connected with the patented BT-Spannschloss®.



DUTCH
architectural
studio



SAFE, STABLE AND FAST HOUSES AS A BENCHMARK FOR THE BUTTERFLY BATTERY MOULD

Low Cost Housing

In order to fulfil the necessary safety and quality requirements, the basic low cost house design was recently introduced by BT.

Important factors in reducing the product's final costs in this design are as follows:

- a) A completely tailored prefabrication facility with 6 m long casting compartments in order to reduce preparatory formwork setting.
- b) Optimised number of structural elements which easily fit the designed Butterfly Battery Mould.
- c) Meaningful saving in material usage due to minimised element thickness and coffered pattern of slabs.
- d) Increasing time efficiency by applying patented connectors between elements which subsequently reduce assembly costs (labour and equipment) on site.

A detailed and examined calculation shows that the proposed concept for production in large quantities can cut down the turnkey price of a house to less than 250 €/m² (with material costs for shell construction of less than 100 €/m²).

Further upgrades in terms of area, wall thickness, insulation and architectural diversity are possible.

Low Cost House:

- ::: All structural elements prefabricated in the Butterfly Battery Mould
- ::: A stable house of 6 m x 6 m made up of concrete elements
- ::: 2 bedrooms, 1 living room, 1 bathroom and a small kitchen, in just 36 m²
- ::: Erectable in 2 hours, due to the dry connection with the BT-Spannschloss®
- ::: Possibility to disassemble and move
- ::: Possibility to extend or modify
- ::: Light structure due to 6 cm wall thickness
- ::: Transportable in containers



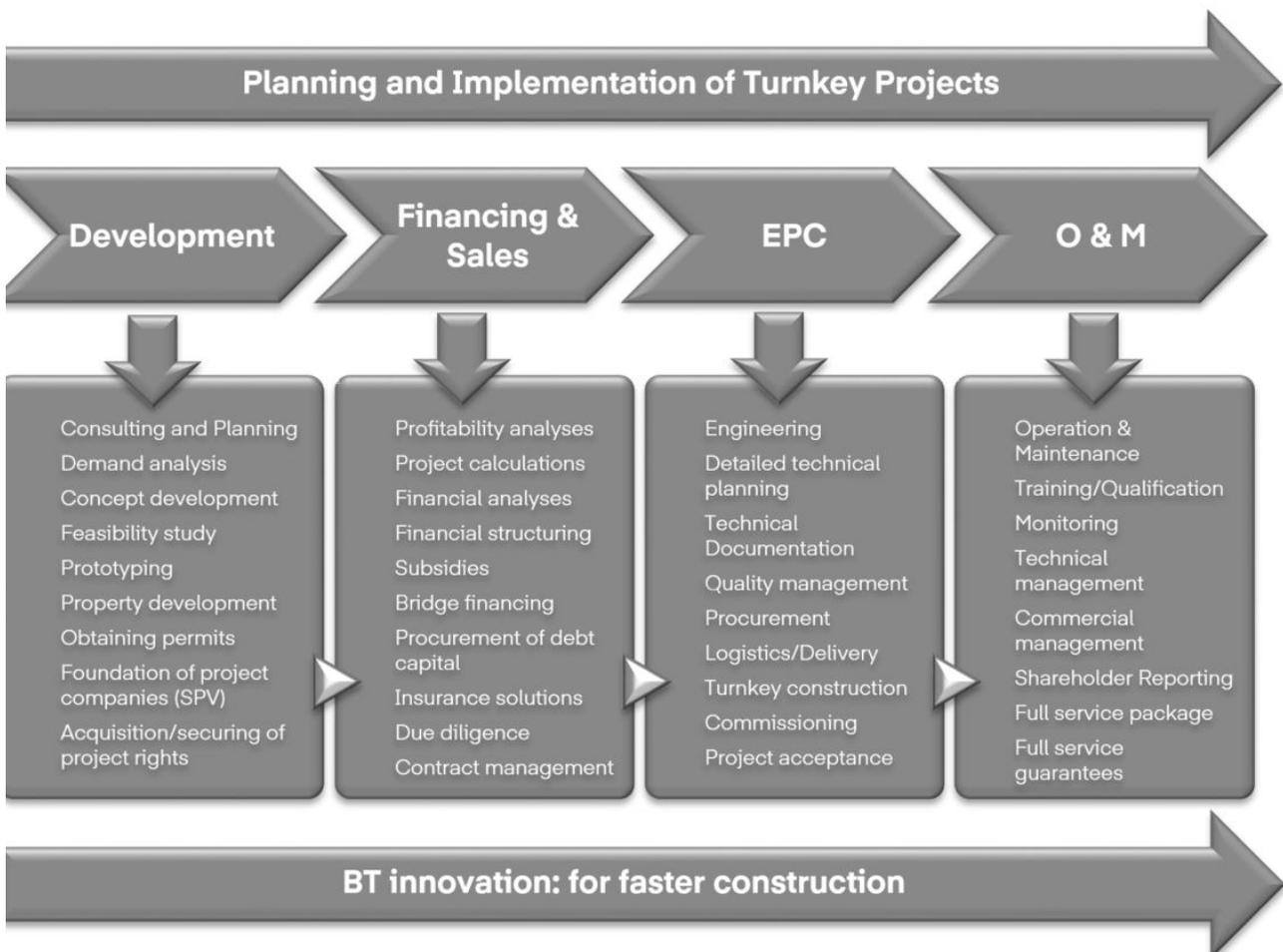
HAND IN HAND TO BRING THE ADVANTAGES OF TECHNOLOGY INTO HOUSING PROJECTS

How does it work?

Starting with a building drawing or project scope is a good foundation, but it's not sufficient for realizing precast elements. Our service begins with consulting, clarifying the project's exact requirements, and rephrasing them in terms of precast elements. After defining element characteristics and quantities, we design the production plant and calculate optimized investment capital.

We prioritize designing a production plant that allows for future expansion, facilitating the implementation of other projects or entering new markets. Key elements in supply chain management, such as concrete supply, storage, and transport capacity, are carefully estimated.

With BT's expertise in planning and designing efficient precast concrete factories, we rely on an interdisciplinary network of specialists with practical experience in the entire value creation process. This allows us to tailor solutions to individual customer goals, providing comprehensive technical support for housing projects. From layout optimization to capacity analysis and initial budget estimates, we ensure a smooth project implementation, including the installation of prefabrication machinery and workforce training. Our services encompass workflow analysis, process optimization, and extension planning, aiming not only to deliver efficient precast solutions but also to transfer knowledge and support project implementation.



SAFE, STABLE AND FAST HOUSES AS A BENCHMARK FOR THE BUTTERFLY BATTERY MOULD

Target group

Target groups are primarily sections of the population that are poor and growing rapidly, who need high quality housing, and also governments and aid agencies who are dependent on rapid assistance in the wake of natural disasters or in crisis regions where they have to deal with large numbers of refugees. Against this backdrop, B.T. innovation GmbH has set itself the task of developing a building concept which is specially designed for the poorest sections of population and for victims of natural disasters.

As a company in the construction and prefabricated concrete industry, B.T. innovation GmbH has been active on an international level for many years. Through its intensive contacts with business partners in Eastern Europe, South America, Asia, the Arab countries and Africa, the company has been able to gain experience of various building systems and to make an in-depth study of their requirements and demands.

Concept

BUILDING MATERIALS

The houses are basically built of concrete. Concrete is one of the most frequently used building materials in the world and can therefore be produced almost anywhere to a reasonable grade with raw materials that are available locally. It is easy to work with and can be formed into virtually any shape. Concrete has sufficiently good physical properties for building; it is very robust and therefore perfectly well-suited for constructing solid durable buildings.



Exposed concrete⁴



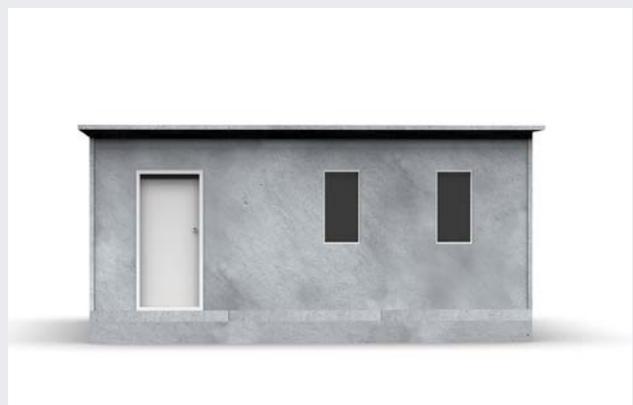
Precast element

WITH INNOVATIVE THINKING TO YOUR PROJECT SUCCESS

DESIGN

The standard design for the Low Cost Housing Concept will have two different base formats measuring 36m² and 48m² respectively. One layout, similar to that illustrated below, is planned to be used for both versions, since it offers an optimal arrangement of rooms.

According to region and demand there are also two different types of roof envisaged. In the one design there is the classic gabled roof and in the other a flat roof version.



Moreover, there are various possible designs for the flat roofed version. On the one hand there is a multifloored design with an external staircase and on the other a duplex version.



PRODUCTION PROCESS

The manufacture of the pre-cast concrete components is carried out using a special portable and spacesaving battery mould. This technology makes it possible to produce building components in the direct vicinity of the building site in a mobile field factory. This type of production presents the following benefits as compared to the traditional approach:

- The production process is simple and easy to use.
- The surfaces are smooth on both sides so that no further finishing is required.
- A large amount can be produced in a relatively small area (one house per mould).
- It provides flexibility in terms of the appropriate production site.

Prerequisites for implementing the actual construction of the houses are know-how and technical equipment. It is envisaged that the local workforce would be trained to handle the equipment under the professional guidance of B.T. innovation GmbH. They would be trained to produce the components and to erect the prefabricated houses. In this way, jobs are created in the target area, local supply chains are strengthened and the project is likely to be accepted more readily at the local level.



Battery formwork closed



Hardened forms



Remove of the first wall unit



Completed wall element

TRANSPORT

Transport of the building components can be carried out using a shipping pallet modified by B.T. for instance. It is possible to transport all the components of the house on this pallet.

The advantage of this technology is that the load of components can be carried directly on the alternating system of the load carrier. This means that costly transshipment and expensive standing times for trucks can be avoided.



Step 1



Step 2



Step 3



Step 4

JOINING AND CONNECTING TECHNIQUE

In order to achieve very short construction times, so-called “dry” joining techniques are used. For this, the BTSpanschloss® (turnbuckle) developed by B.T. innovation GmbH is well-suited. It allows the simple and precise connection of the individual pre-cast concrete components and it makes it possible to construct the house in just two hours! No tools are needed to connect the components. This saves a lot of time and money. After construction, the BT-Spanschloss® is immediately fully weight bearing and remains so for the long term. The BT-Spanschloss® has been certified as approved for general construction by the German Institute for Structural Engineering.



1. Construction using a crane



2. Putting the wall components in



3. Joining system with BT-Spanschloss®



4. BT-Spanschloss®



5. Constructing the gabled roof



6. Assembling the gabled roof



7. Assembling the other side of the roof



8. The finished house in just 2 hours!

Sealing technique

In order to stop water, dust or insects from penetrating the house, the RubberElast® sealing tape used for “dry” joining is particularly suitable. It can be handled extremely quickly and is not dependent on temperature. The material is glued securely to the concrete components by applying contact pressure. At the same time, the material remains permanently elastic. As a safeguard, it has been approved by the Materials Testing Institute in Brunswick.

InnoElast® is suitable for individually sealing concrete, construction joints and attaching windows, doors, passageways and for joins on the roof.



InnoElast®



RubberElast®

FITTINGS

The pre-cast components are designed in such a way that an extremely high level of prefabrication is achieved. All the individual components are prepared so that a house can be occupied immediately after putting together the individual components and only a few finishing steps are necessary. Electricity, water and sewage systems are already included in the wall components. These just need to be connected to the relevant networks when assembling the house (if available).

If there is no corresponding service infrastructure available, alternative options can also be considered, such as:

- a rainwater collection butt to supply the house with potable and household water
 - solar panels mounted on the roof to supply the house with electricity.
-

FOR GREATER EFFICIENCY

Benefits

- ✓ Very rapid construction: 2 hours!
- ✓ Lasting value for a long time due to the concrete construction
- ✓ High quality, low cost solution
- ✓ A small number of different components necessary
- ✓ Good relationship between stability and mass
- ✓ Very good reproducibility
- ✓ Can (almost) be produced locally
- ✓ Industrial mass production with local raw materials
- ✓ Supply chains in the target areas are preserved
- ✓ Safety in crisis regions and in areas of natural disaster
- ✓ Standardised technology
- ✓ Guaranteed short training period
- ✓ The B.T. modular building approach using concrete is designed above all for use in warm climates (mass storage volume of concrete)



Workers' housing estate - Colombia



I am Home Projekt – Senegal

WHAT WE OFFER

Range of Services and Expertise

Due to their extensive project involvement, our consultants have a very broad practical knowledge. Nevertheless, over the years, certain consulting focuses have arisen, which represent our current core expertise.

1. Advice on the Design and Realisation of Precast Plants

The optimisation of organisational and production processes within the precast plant is becoming increasingly significant. Regardless of whether it is a question of reviewing and improving organisational processes, IT structures, material and information flow, planning capacity expansion or the construction of new production facilities - with our extensive technological knowhow and personal experience, we can help you to develop customised solutions for your project - efficiently and independently of manufacturers.

Excerpt for our Service Portfolio

✓ Feasibility studies

✓ Identification of needs and production capacities

✓ Individual & integral plant design for precast plants

✓ Plant structuring/arrangement of production halls, storage areas, etc.

✓ System layout/arrangement of machines and systems

✓ Calculation of staffing requirements

✓ Cost estimates and economic feasibility calculations

✓ Creation of machinery and equipment lists, technical specifications

✓ Realisation - either as a consultant or main contractor

✓ Obtaining and examining bids

✓ Preparation of tender documents and specifications

✓ Coordinating the selection of machinery manufacturers

✓ Coordination and supervision of assembly and initial operation

✓ Information procurement and transfer of information during construction

✓ Interface descriptions

✓ Training measures for managers and workers

✓ Process analysis/analysis of critical points in production and administration

✓ Constant monitoring of project progress

WHAT WE BELIEVE IN

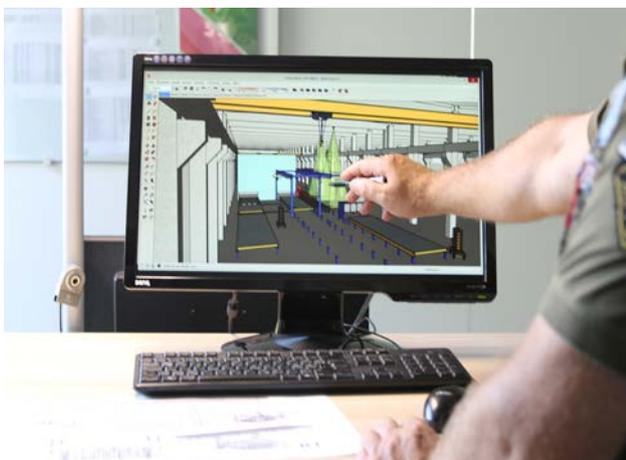
Consulting and Turnkey Solutions since 1991

Our Philosophy Expertise, Experience und International scope

Our experienced consultants are specialists in the field of precast concrete production. Expert scientific and engineering knowledge coupled with international practical experience help to ensure the competitiveness and effectiveness of each company in this industry. We share our consultants' in-depth knowledge with our clients. The design and construction of efficient precast plants is a part of our everyday work; we have gained expertise in building technology in over 70 countries around the world, and our success can be seen across the globe, in the projects we have implemented. We understand the specifics of not only the European market, but also the international one.

Joining forces for success - a complete solution

Our consultants will manage your project plans from start to finish. They act as an interface between the client and the supplier; every responsibility and process is clearly defined.



Depending on your business plans and goals, we can provide both a total solution as well as individual, modular consulting services from our consulting portfolio. Our philosophy is to offer a one-stop solution - from initial briefings through to project completion, and if desired, also a total solution for implementing your project.

Relevance and Independence

It is a well known fact that knowledge has a short half-life in technology-based industries. This also applies to the precast concrete industry. Continuous knowledge development and consultant training is therefore a large part of our day-to-day operations. Through our various partnerships with technical universities, we always have a finger on the pulse of the latest trends and developments, and also on the latest proven practical solutions. For customer-specific issues, we are also able to implement „non-industry“ solutions.

Our advice is always given independently to that of machine manufacturers. We are a solution-orientated consulting service that places the emphasis on the client's requirements and is committed to the client's objectives.

SIMPLE, TRANSPARENT UND SUCCESSFUL

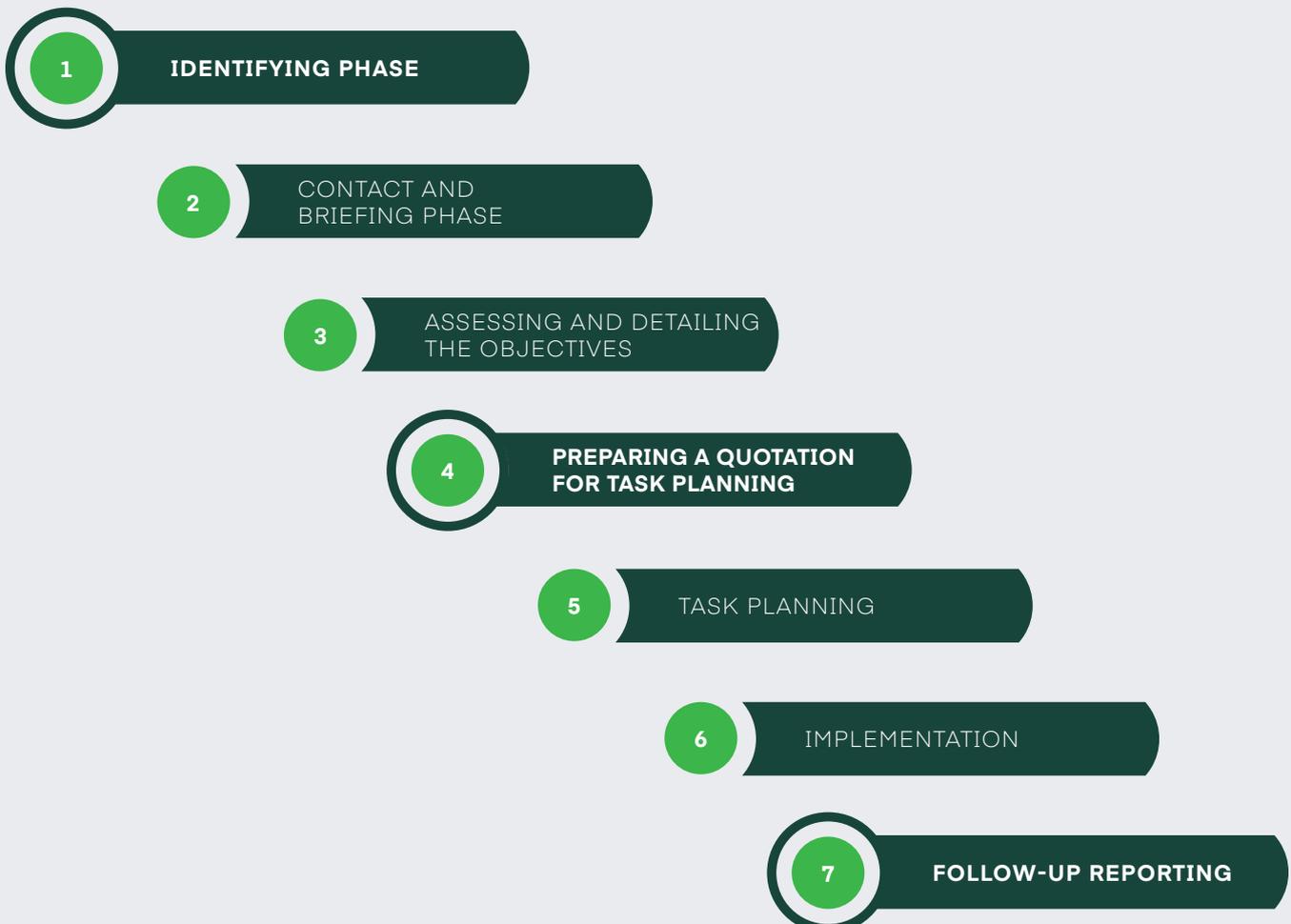
The BT-Consulting-Process

Consulting for your precast plant.
A joint consultation process with your success in mind.

Customers interested in our consulting services often ask about the operational progression of our projects. Questions such as: "Who directs each process?", "Who takes on the essential roles in terms of over all project management?", "Who is responsible for decision-making?"

Therefore, we would like to demonstrate our approach using the following example.

Our Process chain: 7 collective steps to a successful project



THE DRY CONNECTION FOR 2 OR 3 PRECAST CONCRETE ELEMENTS

BT-Spannschloss® - Benefits

- ✓ **Saving time - saving costs**
Precise positioning during the production process through BT magnet technology
- ✓ **Immediately force-fitting** and resilient connection
- ✓ Approved dry connection (**ETA-19/0013**)
- ✓ **Can be disassembled** if required
- ✓ **In combination with the RubberElast® unbeatable**

01



02



03



01 Insert the BT-Spannschloss® bolts in the recess

02 Place and tighten the bolts

03 Finished 3-Point connection

A house goes on a journey into the world

The housing deficit is a global challenge that affects not only developing countries but also industrialised countries. Valuable industry knowledge and experience allowed B.T. innovation GmbH to recognise early on the need of the construction industry for a time and cost-efficient concept that also combines sustainable and ecological aspects.

As a result of years of research and development, BT innovation introduced an innovative living space concept a few years ago that enables the construction of high-quality, safe living space in a very short time. The aim of the development work was to create quickly erected, solid concrete houses with thin walls - the butterfly house. These key factors not only make the house affordable for a large number of people, but at the same time meet the quality requirements. It is named after the highly efficient production technology used to manufacture the precast concrete elements, the Butterfly Formwork®.

The butterfly house concept first attracted public attention when a regional television team from MDR documented the quick assembly of the house in just two hours. This sparked interest in the butterfly house concept, particularly among governments, private sector actors and companies looking for affordable solutions to housing needs in their countries.

The complete assembly of the prototype in less than two hours was possible with the application of the patented pre-fabricated connection system BT-Spannschloss® (turnbuckle).

With this composite element, walls are simply screwed together on the building site and connected in a friction-locked and immediately loadable manner. Welding or other time-consuming measures such as concreting are completely eliminated on the building site. For later prototypes of butterfly houses with thin walls of 6 cm, BT innovation introduced the smallest turnbuckle in the range, the BT-Spannschloss (turnbuckle) M12.

In addition to the quick assembly, the advantage of a screw connection is also the simple disassembly. Precast concrete elements or houses that have been connected with the BT-Spannschloss (turnbuckle) can be dismantled afterwards and, for example, moved to another location. This is a helpful feature for temporarily created living and working spaces at project locations, for example after natural disasters.

The RubberElast® compression sealant tape is applied to the dry joints of the prefabricated parts of the butterfly house and seals the house against water, dust and insects. Due to the pressure created when connecting the concrete parts, the material adheres automatically and securely to the elements and remains permanently elastic.

In April 2019, BT innovation agreed with a partner from Kenya to deliver a prototype of the butterfly house manufactured in Magdeburg.



Assembly of the first prototype in Magdeburg, Germany

SERIAL MODULE CONSTRUCTION WITH THE „MAXMODUL“ SYSTEM - BUTTERFLY BATTERY® MOULD

Reference Max Bögl

The Bavarian construction group Max Bögl stands for innovative serial building concepts. With over 6,000 employees and an annual turnover of more than 1.65 billion euros, Max Bögl is one of the largest German companies in the construction industry. The range of services and the depth of added value include our own concrete plants. In 2017/2018, the company invested in a precast plant for the serial production of modules for multi-storey residential construction. At the Mühlhausen site, the “maxmodul” system is now produced in serial modular construction.

The room modules for buildings up to the high-rise limit are assembled in the factory from prefabricated concrete elements. With the goal of achieving a maximum degree of prefabrication, the extension is carried out directly afterwards. The industrial environment enables controlled serial production with the highest precision. The modular construction makes production and assembly independent of the weather. Residual work on the construction site is minimised and construction times are significantly shortened. For the production of the maxmodul precast concrete elements, the Max Bögl Group relies on the technology of BT innovation, the Butterfly Formwork® and the Butterfly Battery® Mould.

Butterfly Formwork® is a removable and hinged bulkhead for battery formwork. With the use of butterfly technology, Max Bögl Modul AG combines the advantages of a classic battery formwork – namely formwork-smooth walls on both sides, compact working area for fresh concrete processing, high energy efficiency when heating the moulds and much more. – with the advantages of a horizontal pallet circulation system.

For the first time in the world, Max Bögl is using circulation technology in conjunction with battery formwork. For formwork tasks, the measuring of built-in parts, as well as the insertion and fixing of reinforcement, the Butterfly Formwork® is conveyed with friction wheel drives on fixed rollers to various cycle stations that are optimally equipped for the respective activities. The work is supported by laser projection equipment.

The stations for opening and closing the Butterfly Formwork®, as well as the magazines for the intermediate storage of prepared Butterfly Formwork® or Butterfly Formwork® with hardened precast concrete elements, work fully automatically. The control is taken over by a production master computer, which on the one hand supplies the individual machines with the necessary data and on the other communicates with the higher-level ERP system.

Concreting is also automated. The concreting process is also automated. The position of doors or windows is of course taken into account.

The entire plant was designed by the BT innovation consulting team, which also coordinated the development of additional project-specific special machines. The realisation was then carried out together with a renowned machine and plant manufacturer and a leading supplier of control technology.



Expansion line for maxmodul room modules



Modular house

maxtruder

Concrete Plants • Machinery Know How

- Modular Scalable Precast Concrete Factories
- Machines & Equipment for Long Bed Casting
- Over 400 Plants Worldwide
- Consulting & Engineering
- 70 Years Experience



maxtruder



Designed
developed and
made in Germany

Your link to precast future.

www.maxtruder.com

Company overview

Experience. The best foundation.

- Since 1954
- More than 400 projects worldwide
- Worldwide employee training and after sales service
- Premium quality - made in Germany

The safe path to the future.

Turn-key precast concrete plants.

- Competent engineering
- High German quality
- Modern technology
- Individual solutions

The most important MAX-truder message.

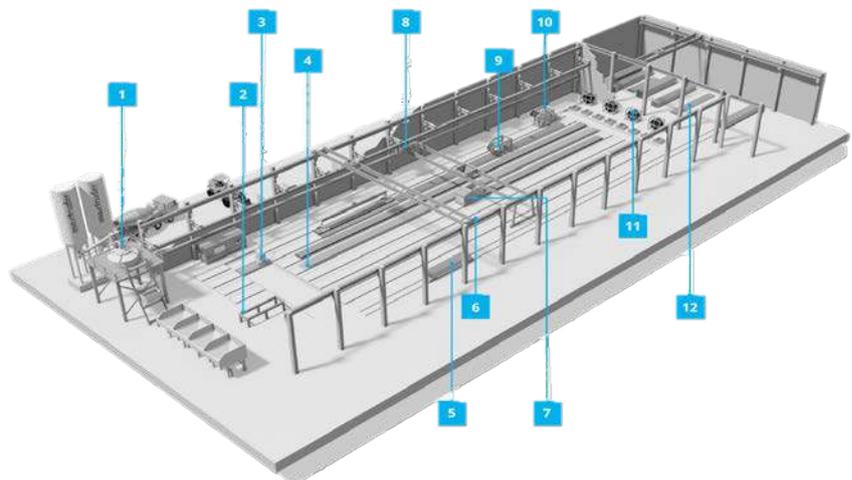
- High efficiency production plants
- Clear cost estimates reliability
- Ongoing improvement

www.maxtruder.com

Turnkey precast concrete plants

for the efficient manufacturing of prestressed concrete elements

1. Batching plant
2. Maintenance area
3. Pre- & post tensioning area
4. Production beds
5. Transport systems for finished products
6. Over head crane
7. Maxtruder
8. Automatic concrete supply
9. Concrete saw
10. Preparation machine
11. Stressing wire decoiling reel
12. Storage area





www.bt-innovation.de



B.T. innovation GmbH
Sudenburger Wuhne 60
39116 Magdeburg, Germany

Contact us:
export@bt-innovation.de
+49 391 7352 21

Follow us!

