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## BF Engineering

Design and construction of complete buildings of any area and purpose

- in industrial environment at modern robotized facilities
- with the use of advanced resource-saving technologies
- to reduce time and costs of manufacturing, transportation and installation of a building to reduce operating costs and optimize the payback period buildings
- to reduce operating costs and to optimize the payback period of a building
- with quality confirmed by the European certificates ISO 9001:2008, EN 1090

### Additional services

- Redesign of existing structures to optimize object costs
- Adaptation of foreign projects and consulting
- General contracting, construction and assembly works, contract supervision

## BF Engineering purposes

BF Engineering was established within BF Group to perform detailed and phased work with specific projects for specific Customers. Such approach is especially important for our Customers who lack experienced project engineers, designers and constructors to select the optimal structure of a building both appropriate for the operation of facilities located therein and corresponding to the local environmental conditions. However, the Customers who have such specialists on their staff, as a rule, are able to optimize their calculations only upon consultation with BF Engineering.

BF Engineering was established because, as experience has shown, large manufacturers face a lot of internal production and supply issues. They are often unable to get involved with the Customer's issues, especially during the entire period planning, specification, design, manufacturing, installation and, commissioning of a building.

The optimal Functionality - Quality - Economical efficiency factor for the building can be achieved through detailed timely and complex solution of problems arising at any of the above mentioned phases.

BF Engineering guides the Customer step-by-step, from formulation of an idea by way of a technical specification to commissioning of the facility! We are always at your side.

The Customer's costs are similar to factory prices.

## BF Engineering advantages

Even using the most advanced technologies we are not always able to improve the weight of any object. That is why designers and manufacturers working with the same technology usually coordinate with the Customer the cost per ton of a structure rather than the cost of the entire building. The higher the building weight, the more they earn, just as the transportation and construction companies. In addition to the above mentioned direct costs, excessive weight for the Customer also means the increase in the cost of footing and ground works.

The uniqueness of BF Engineering is that it applies high-performance robotized European equipment and several most advanced technologies intended to reduce original cost of any building and to increase its operating characteristics (including energy savings):

- by reducing the weight of frame, walls and roofing of a building
- by improving building transportability
- by accelerating building design and manufacturing processes
- by weight saving and accelerating transportation and building installation

With BF Engineering you can coordinate the cost per square meter of a building rather than the cost per ton of metal.

BF Engineering will reduce the payback period for your facility and increase its operating characteristics.

## Payback Period Reduction

The improvement of construction metal structures depends on problem solutions. The main problems include:

1. reduction of steel-intensity of a structure;
2. increase in work quality and efficiency during manufacturing of structures;
3. increase in work quality and efficiency during installation of structures;
4. increase in transportability of structures;
5. reduction of cost of associated general construction works;
6. reduction of cost of buildings and structures installation;
7. reduction of cost of buildings and structures disposal.

The improvement of construction metal structures depends on problem solutions. The main problems include:

Reduction of steel-intensity of a structure and increase in work quality and efficiency during manufacturing of structures is achieved by means of:

- SIN beams produced on modern fully automated lines, with normal and variable cross-sections – flanged beam with variable height and with thin vertical wall (up to 3 mm) with increased stability provided by corrugation
- Roll-formed sections produced on modern fully automated rolled lines, with  $\Pi$ , C, Z,  $\epsilon$  cross-sections and thickness of up to 4 mm with hole punching in the wall and flanges (when used as girders, these ensure significant weight saving)
- Highly professional design team focused on weight saving of metal structures

Increase in work quality and efficiency during installation of structures

- Is ensured by the automated lines and CNC machines made by ZEMAN (Austria), MESSER (Germany), FICEP (Italy), GIETART (The Netherlands)

- Modern software that transmits design drawings directly to machines
- Highly professional design team focused on manufacturability of metal structures

## Increase in work quality and efficiency during installation of structures

- Precision bolt joints allow to entirely avoid the necessity for welding operations during installation, and the quality of welding operations performed in industrial environment is higher than that of the welding operations performed in the field environment
- Automatic indexation of parts
- 3D object model with the indication of indexes and location of all parts forwarded for installation.
- Easy installation = fast construction = payback period reduction
- Highly professional design team focused on increasing the ease of installation

## Increase in transportability of structures

- Speed and ease of bolt joints installation allows dividing all structures into transportable parts without compromising the installation quality and speed
- Highly professional design team focused on transportability of structures

## Reduction of cost of associated general construction works

- Steel intensity reduction = weight reduction = load reduction = reduction of foundation costs, ground works costs, etc.
- Replacing trusses with SIN beams allows improving the building height and reducing the amount of building materials and building weight.
- Sandwich panels with PUR/PIR fillers = weight reduction as compared to mineral wool panels

## Reduction of cost of buildings and structures installation

- Improved building height as compared to structures based on trusses reduces the building volume to be heated and air conditioned
- Sandwich panels with PUR/PIR filler = increase in heat protection as compared to mineral wool panels

## Reduction of cost of buildings and structures disposal

- Disposal of buildings with dismantlable metal frame brings returns instead of losses