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ATAÇELİK

ATAÇELİK is an integrated construction company capable of performing all of the "Production-Erection-Design" system which required for realizing a steel project with its experienced staff. Performance of these processes in the same facility enhances the speed and quality of the construction and simplifies the work to be performed by users. ATAÇELİK is one of the leading companies in that a significant part of construction projects are made into products produced in a controlled environment in its factory in Adapazarı.

Having an integrated point of view ATAÇELİK produces Zee-Cee profiles and Composite Flooring panels required for steel constructions under ATAPROFİL and ATAPANEL brands.

The understanding of a combined Production-Erection-Design is the most important advantage of the operation system of ATAÇELİK in that any structural problem encountered during the process of production is detected and solved at the phase of designing. ATAÇELİK design group cooperates with static design and architectural groups of the companies served to realize all detailing works focused on required principles. This allows making it possible to avoid any problem in organizing the production and installation of detail agreements required by different units.

Steel structure modeling and all drawings for production as well as material lists can be created within a short period of time thanks to CAD programs and all structural parts (columns, beams, purlins, braces) using CNC controlled full automatic machines in the factory, by sending the required data through the software. All elements constituting the construction are connected using pre-stressed bolts and no cutting and welding is performed at the site with minimal cutting and modification. All parts are numbered and are cut to size and drilled in the factory. Central procurement simplifies coordination of shipment and installation of parts made compatible to each other.

ATAÇELİK is the steel producer of highest production capacity in Turkey with an annual production of 17.000 tons. With its steel construction production, dimensioning, connection, sanding, painting processes and production lines with full automatic systems in its plant in Adapazarı, equipped with latest technology ATAÇELİK has become one of the fastest and assertive companies of the sector capable of performing all operations including sanding, shop primer painting, CNC oxygen cutting, CNC plasma cutting, fabricated with submerged arc weld profile production line, CNC profile drilling-marking, sheet drilling-marking, CNC hydraulic 8m folding press, guillotine, profile-sheet punch cutting, Zee-Cee thin walled profile line, painting - drying, composite deck floor panel line leading the company to be the most assertive organization to deliver products on time and in such quality complying with Eurocode/AISC standards.

STEEL STRUCTURES FROM THE PAST TO DATE...

In history, the use of iron materials in engineering structures began two hundred years ago. However, the history of wooden and masonry road bridges go down to 2500 years before.

Athough steel and iron is known since ages ago in the history of man they were used only for manufacturing weapons and articles due to inability of extensive production.

After the beginning of raw iron and font production uing high furnace method developed in England in the 18th Century, it was possible to use iron as construction material.

The first engineering structures built using iron material are the "bridges" and "font" is the first material used in steel buildings.

In 1700's... the Architecture meets the steel.

• In 1778 the first road bridge is constructed in England, in the vicinity of Coalbrookdale with a span of 31 m is still used.

• 1796 - A road bridge was constructed on Striegauer River in Schlesien region of Germany. The bridge is the oldest font bridge in the European Continent.

• 1875 - The age of font arch bridges was terminated upon introduction of forged steel structure materials with high tensile strength and providing new opportunities for engineers.

Whereafter bridges with solid body, main beam and cage main beam began to be constructed using forged steel.

• In 1846, Britannia railway bridge was constructed in England on Menai Strait, with 140 m span, solid body box main bridge.

• 1857 - Weichsel Bridge constructed in Dirschau in West Prussia with 131 m span and and tight textured cage main beam.

• With the invention of Bessemer (1855), Siemens-Martin (1864), and Thomas (1879) methods, raw iron is qurified when in fluid form, which enables extensive cast steel.

The production of cast steel increased with the introduction of electric furnaces since the beginning of the 20th century. Consequently, forged steel is fully superceded by cast steel since 1890. And with the beginning of using cast steel, modern steel building technique emerges and considerable progress is achieved in this field.

Today, parts of steel bearing system are prepared in steel shops in weld joined large parts to the extent possible, considering the means of transport.

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ADVANTAGES OF STEEL STRUCTURE

The steel has in high levels, basic properties which other construction materials fail to have or have in low levels.

• Steel is a homogenous and isotropic material. Its production is safe since it is kept under strict and continuous control.

• Steel is a highly resistant material. The ratio of its specific gravity to the load it bears is very small. In other words it is light. Most of the other materials may bear a limited quantity of effective load while bearing its own weight. Own weight of steel may even be ommitted in preliminary calculations.

• Since its own weight is lower than reinforced concrete, the foundation foots are smaller. Sometimes, even this feature is the factor to prefer steel as the skeleton for structures in unsuitable ground conditions.

• Considering all construction costs, the steel construction is found to be economic.

• The bearing system is about 20% to 35% of the construction cost. This provides considerable advantage in terms of budget.

• Reinforced concrete foundation cost of steel structures is 20-30% lower than the cost of a same design made using reinforced concrete.

• The elasticity module of steel is higher than other construction materials (11 times compared to reinforced concrete). This means a behavior consistent with stability problems, dynamic loads, vibrations.

• Steel is a ductile material. It has a high capality of deformation (18 time more than reinforced concrete). This is a highly efficient property in dampening of earthquake energy.

• Steel bearing elements are processed in factory and therefore installation at the jobsite is highly independent of weather conditions and this shortens the time of construction.

• Steel construction elements provide opportunities of modification and reinforcement. In addition, they may be demolished and erected in anywhere else.

• Steel structural elements work under full load at the time of erection. Steel has no problems of setting or acquiring resistance. Therefore construction time is short.

• Steel construction eliminates formwork and scaffolding costs with a good planning.

• Economic life of steel structure is measured to be 80 to 100 years.

• It provides to pass wide spans in industrial buildings (factories, stores, hangars, etc.).

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PRODUCTION LINE

MACHINERY LINE	STATUS
SANDING	FULL AUTOMATIC COMPUTER CONTROLLED
SHOP PRIMER PAINTING	FULL AUTOMATIC COMPUTER CONTROLLED
CNC OXYGEN CUTTING	FULL AUTOMATIC COMPUTER CONTROLLED
CNC PLASMA CUTTING	FULL AUTOMATIC COMPUTER CONTROLLED
FABRICATED WITH SUBMERGED ARC WELD PROFILE PRODUCTION LINE	FULL AUTOMATIC COMPUTER CONTROLLED
CNC PROFILE DRILLING-MARKING	FULL AUTOMATIC COMPUTER CONTROLLED
SHEET DRILLING-MARKING	FULL AUTOMATIC COMPUTER CONTROLLED
CNC HYDRAULIC 8M 400TONS FOLDING PRESS	FULL AUTOMATIC COMPUTER CONTROLLED
GUILLOTINE 6M-12M	FULL AUTOMATIC COMPUTER CONTROLLED
PROFILE, SHEET PUNCH CUTTING	FULL AUTOMATIC COMPUTER CONTROLLED
ZEE-CEE THIN WALLED PROFILE LINE	FULL AUTOMATIC COMPUTER CONTROLLED
PAINTING - DRYING	FULL AUTOMATIC COMPUTER CONTROLLED
COMPOSITE DECK FLOOR PANEL LINE	FULL AUTOMATIC COMPUTER CONTROLLED

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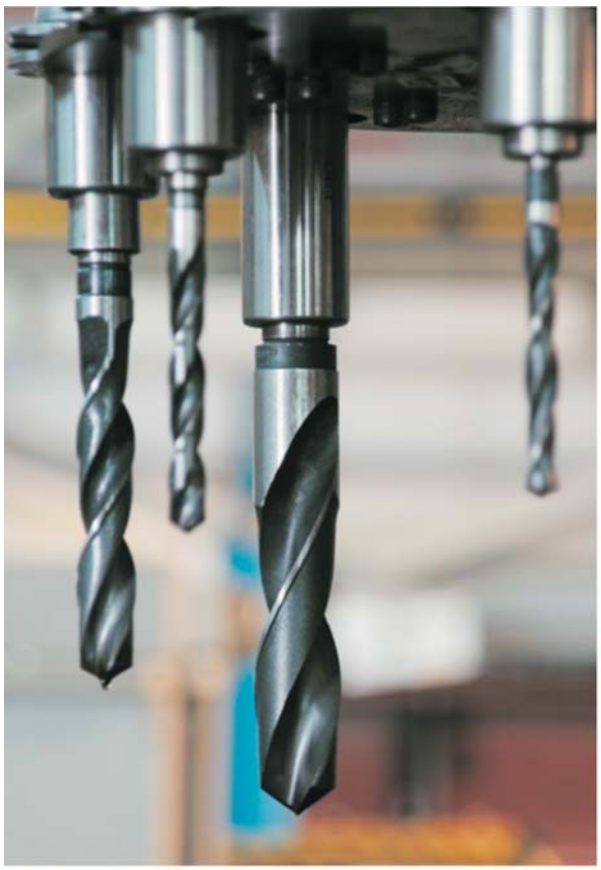


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PRODUCTION LINE

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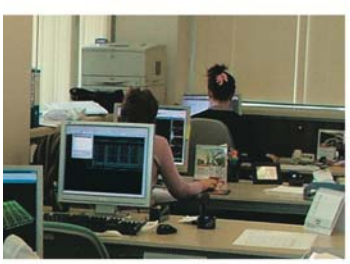
Ataçelik design group has organized to work only on projets produced and installed by Ataçelik. However, ATAÇELİK system is capable of providing high level of coordination to working with any other design group preferred by customers.

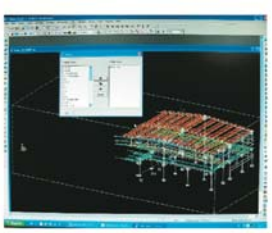
Design works begin by defining all load, snow and seismic loads considering the location of the region. In addition, crane loads, and the loads of lighting and other installations are defined in compliance with the requirements of the owner and the work flow. The bearing system is defined according to the architectural design. After obtaining the loads from the superstructure, static and reinforced concrete design is prepared for reinforced concrete foundations. While designing steel constructions, all details are based on that welding operations are performed at the factory under control and the remaining connections are made at the site using bolts.

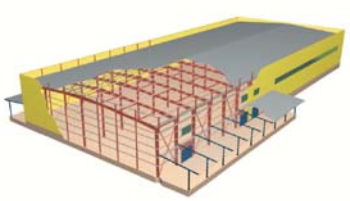
Calculations related to elements to be used for anchoring the steel superstructure to reinforced concrete foundations are made at this phase.

Static designs are developed by the technical team using computer programs of latest technology in compliance with Turkish Standards and international design standards (AISC-Eurocode). All details are defined in computer environment thanks to three dimensional drawings prepared based on statistical analyses. Construction elements are produced automatically based on this order and therefore the possibility of error in erection is nearly zero.

When working on connection details, compatibility among various elements, including the form of anchoring the steel construction to foundations, facade and roof coatings, rain gutters and downpipes is provided.







PURLINS

Building elements that transfer wind and snow loads acting on the roof cover to trusses or to bearing beams. They may be made of solid webbed extruded profiles or instead thin walled Z-Cross section elements manufactured by cold formed may be used. Z profiles are produced of required length in the factory, with galvanize coating and with holes drilled in compliance with the design.

"Z" section thin walled purlin.

MAIN BEARING SYSTEMS

These are column-beam bearing systems consisting of building elements made of extruded solid webbed profiles or created by welding of sheet metal. All prefabricated beams are manufactured in profile lines using submerged arc welding technology. The elements are cut and holes are drilled precisely on CNC machine tools.

Nonprismatic sectional solid webbed frame.

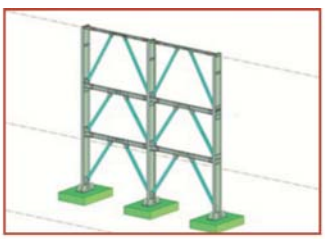
MULTI-STOREY BUILDINGS

Schools, hospitals, parking lots and multi-storey buildings may be classified under this group. Flooring and steel beams of these buildings are usually designed as composite system. Columns with beams are cut in the factory and holes are drilled for joining then, all erection work is performed with bolts.

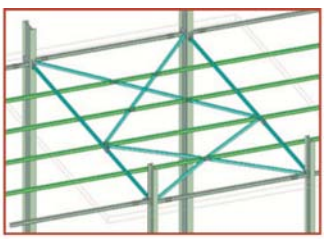
COMPOSITE SYSTEMS

These are bearing systems created by co-functioning of reinforced concrete slabs, steel sheets and steel beams as shearing elements. Mechanical flanges in the body of the floor panel provide functioning of concrete and steel sheet in full interaction with each other and in this combination the steel sheet serves as rainforcement for the concrete slab. The steel sheet in the flooring is used to avoid shrinkage cracks. Rainforcement grid mat may be placed at upper part of bearing areas in accordance with design criteria. Extruded solid webbed profiles or fabricated beams may be used as steel beams. Designers are given 3 alternatives, namely 0.8 mm, 1 mm and 1.2 mm depending on the load and the spons to be passed. Sheets are protected by galvanization against the corrosive effect of the concrete and the external conditions.

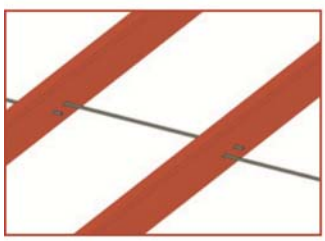
Central façade bracings.



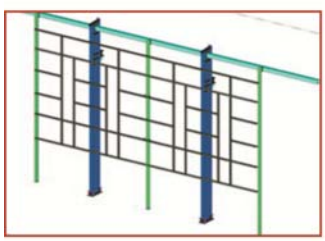
Eccentric façade bracings.



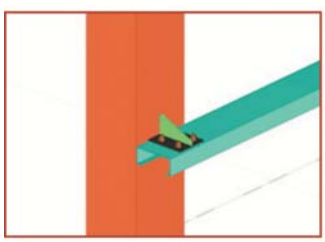
Roof bracings.



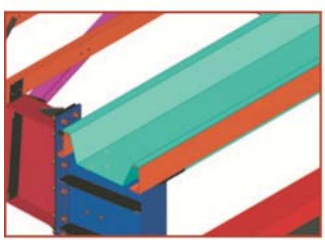
Roof tension bars.



Façade bands.



"C" section thin walled façade band.



Rain gutter from cellular steel unit.

BRACINGS

Building elements to maintain the stability of the building under the effect of lateral forces (wind, earthquake) on roof and façade planes. They are manufactured of circular bars or extruded solid profiles in accordance with the design. As in other parts of the building, bracings are made with bolts.

TENSION BARS

Elements with circular cross-section and threaded ends, supporting roof purlins to bear the coating materials and other snow loads thereon and similarly supporting the façade bands in bearing the facade covering materials. These elements are galvanized for protection.

FAÇADE BANDS

Building elements bearing the façade elements and wind loads. They may be manufactured of extruded solid webbed profiles or may be made of thin walled, cold forged elements with C cross section. Cee profiles are produced of required length in the factory, with galvanize coating and with holes drilled in compliance with the design.

RAIN GUTTERS

Manufactured by bending 2-2.5 mm thick St37 grade steel sheet according to the architectural design. Delivered as galvanized or black sheet according to requirement.

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Cold Formed Profiles

ZEE-CEE bearing profiles used as secondary bearing system are manufactured by cold forming technology of the required size in the computer controlled production line. Ataçelik profile production line is capable of drilling the profiles in required numbers and groups. ZEE-CEE bearing profiles, important elements particularly of industrial construction designing are also the auxiliary elements necessary for an economic building design. The annual capacity of ATAPROFİL production line is 60.000 tons.

Fabricated Profiles

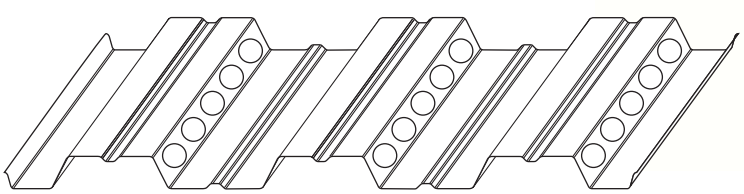
Ataçelik Fabricated Profile line is capable of manufacturing profiles of appropriate size according to requirements using sheet metal, whenever the supply can not meet the demand of the local market. The production line also produces solutions for economic construction designs and architectural static requirements.

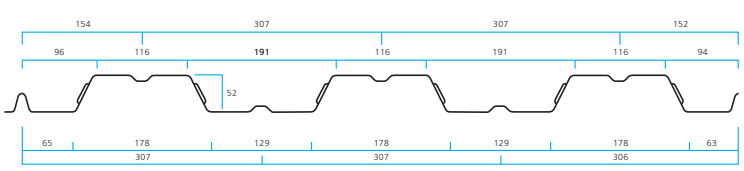
Composite Deck Floor Panels

ATAPANEL Composite Deck Floor Panels used particularly in flooring systems of multi-storey steel constructions are manufactured by cold forming of galvanized sheet metal in computer controlled production line. Combined with the opportunity of producing updated and technological auxiliary elements of any required length without any loss, the panels provide the opportunity of a superior and economic design.

Advantages of Composite Deck Floor Panels

- The sheet metal resting on steel beams during the construction creates a work platform for workes and a storage site for materials.
- It functions as a formwork for concrete and eliminates formwork costs.
- By means of mechanical connections on its body, it functions in full interaction with the concrete and functions as a reinforcement at positive moment zones.
- It is lighter than concrete slabs of equivalent height but has a higher capacity for bearing loads.
- After beginning cooperation with concrete, the resulting composite flooring reduced vibration and enhances the level of comfort of use.
- Simply portable and storable.
- Can be produced at any required length in compliance with handling conditions.
- Gaps between steel beams and sheet metal gutters provide space for electrical installation, plumbing, etc.
- Its galvanized structure provides protection against the corrosive effect of the concrete and of the external ambient conditions.





THE CONDITION OF STEEL CONSTRUCTION IN TURKISH INDUSTRIAL SECTOR

If we look at the current position of steel construction in Turkish construction sector, we see that it is not in the place it deserves. This is due to several causes. Steel structures require much more qualified technical staff both during production and erection. In addition, the calculation of steel can not be made using standard approach and steel is not a material that can be produced in any workshop. For this reason, steel structures have not been sufficiently used in the construction sector which is the locomotive sector in Turkey.

Steel structures in Turkey were the choice of industrial buildings primarily based on wide spans allowed by high resistance of steel and higher construction speed compared to other methods. However, earthquakes experienced to date showed that it will be right to prefer steel not only for industrial buildings, but also for all kinds of buildings in Turkey resting on the 1st degree earthquake zone.

The earthquake experienced in Erzincan in 1992 caused a physical and socioeconomical loss of USD 10,000 per person and USD 1 billion in total.

It was observed that in an earthquake in which average intensity is MSK VIII, approximately 50% of 4- to 6-storey reinforced concrete buildings in the city had to be rebuilt or to undergo a serious repairing-reinforcement. Limited industrial and infrastructure network in Erzincan prevented the figure to elevate to a higher level.

Based on this example, it is possible to estimate the magnitude of the injury that Turkish economy will suffer due to an earthquake loss that may occur in İstanbul accounting for 1/6 of the population and 1/2 of the economic potential.

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FREQUENTLY ASKED QUESTIONS ON STEEL CONSTRUCTIONS

1. Are Steel Constructions Economic?
2. How is the appearance of a Completeded Steel Structure?
3. Do Steel Constructions Have Thermal and Acoustic Insulation?
4. Why does a Steel Construction Have More Resistance to Earthquake?
5. Are there any Applications for Steel Multi-storey Buildings?
6. How is Fire Resistance of Steel Constructions?
7. How is the Flooring Systems of Steel Multi-storey buildings?

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1. Are Steel Constructions Economic?

When steel constructions are considered together with the ground and earthquake zone, they are not costlier than their alternative, reinforced concrete buildings. Particularly, when expenses to be made until completion of the building are calculated and compared to other types of buildings based on total cost and not only on bearing systems, it will be seen that steel constructions are more economic. ATAÇELİK considers building cost as a whole and provides its customers more economic solutions by performing all designing-production-erection phases in the same center.

2. How is the appearance of a Completeded Steel Structure?

The building may have classical external and internal appearance according to architectural demands. Particularly in multi-storey buildings solutions which have been usual for housing may be applied. ATAÇELİK designs according to final appearance of the building considering your requirements and wishes.

3. Do Steel Constructions Have Thermal and Acoustic Insulation?

We must think first if we are satisfied of the thermal and acoustic insulation in the reinforced concrete buildings in which we are living currently. Although specified in building standarts applicable in Turkey, we can solve these problems only now by bagging using new facade panels and using insulation panels indoors. Similarly and without any additional cost on the steel bearing system thermal and acoustic insulation in steel constructions can be provided beyond the usual standards. ATAÇELİK produces comfort houses by considering sound, heat and humidity conditions in buildings under its responsibility.

4. Why does a Steel Construction Have More Resistance to Earthquake?

The requirement for ductility which is the basis for earthquake resistance is a natural property of steel. The negative effect of the building weight in case of an earthquake is considerably reduced in steel constructions. Controlled quality of steel materials and production and controllability of the building both during production and erection as well as during use render steel constructions highly resistant against earthquake.

FREQUENTLY ASKED QUESTIONS ON STEEL CONSTRUCTION

5. Are there any Applications for Steel Multi-storey Buildings?

ATAÇELİK and qualified Steel Construction companies have several applications. There are local companies capable of serving in Architecture, Electrical and Plumbing systems required in Designing-Production-Erection phase and until using. As Turkish companies we can make similar applications also in other countries.

6. How is Fire Resistance of Steel Constructions?

Fire resistance of reinforced concrete buildings is calculated with the thickness of concrete covering the reinforcement and is called bar distance piece. Plaster layer after completion of reinforced concrete structure has no use in terms of fire. Fire resistance of usual buildings is totally based on the bar distance piece left in the site and we know that this application is frequently omitted. Fire safety is provided at a higher level in steel constructions. Steel elements are coated with fire resisting plates, may be coated by cement based spraying fire foam or coated with fire resisting paints or may be coated with concrete similar to reinforced concrete buildings. Each of these alternative applications passing through controlled calculation and processing can provide fire safety complying with international standards.

7. How is the Flooring Systems of Steel Multi-storey buildings?

A resonancy is felt in wide span parts of usual reinforced concrete buildings. In general, tis is completely solved in steel constructions by using COMPOSITE FLOORING system. Composite Floor Panels are applied on steel beams and they are fixed to steel beams with Studs passing through Composite Floor Panels. The reinforcement grid placed in the flooring is only to prevent cracking of the concrete slab and COMPOSITE FLOORING is provided with steel beams, panels and studs of sufficient number. Using this method, concrete and steel beam elements function together and wide floor spons can be passed by considering vibration comfort.

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MULTI-STOREY BUILDING

Possibilities and Advantages of multi-storey Steel Constructions

The lesser become the settlement areas in cities the higher rise the buildings. However, this ordinary development elevates the level of damage caused by extraordinary events like earthquakes. Bearing systems made of steel are much lighter compared to construction systems made of prefabricated concrete or conventional reinforced concrete. In addition, forces acting on the foundation are at minimum level since the entire system is connected to the foundation by joint. For this reason, economic and sound solutions are obtained by transferring minimum loads on weak grounds.

Multi-storey steel buildings are candidate for 'important buildings' such as schools, hospitals, etc. for their resistance to earthquake.

• Steel bearing system of a 7-storey building having a total usable area of 4500 m^2 may be produced in 11 days and can be erected in 18 days.
• Ataçelik steel bearing system provides large spons without columns, which means more use and a comfortable working area.
• ATAPANEL Composite Flooring Panel is used in multi-storey steel construction flooring system. The floor is anchored to the main bearing system with studs and a girder/floor combination is obtained. These flooring panels with a perfect adhesion and properties are designed to create an integrated structure with the concrete casted on them and to function as one single element.
• Positive bending support of composite flooring eliminates, in most cases, the requirement for main reinforcement in the concrete slab and allows creation of economic flooring. Composite panel undertakes this function and economic results are obtained. The gaps between steel beams and composite panels are used for laying installations. In addition, requirement for formwork is eliminated or minimized.
• Multi-storey steel construction flooring system minimizes the effects of probable vibration. The level of comfort provided is much superior to alternative construction systems and conventional steel construction.
• The multi-storey steel structure minimizes the load acting on the foundation by means of it being steel and it can be designed to suit the space where it is located. This provides considerable saving in cost and time in foundation constructions compared to reinforced concrete and alternative steel constructions.

General Properties of the Steel Bearing System

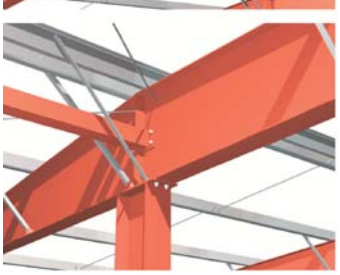
- The steel bearing system is produced in the factory and erection is completed within a very short period of time with the help of cranes.
- All elements constituting the construction (columns, beams and other auxiliary elements) are connected using pre-stressed bolts and no cutting and welding is performed at the site.
- That all elements creating the construction are exposed, allows "compliance of jobsite applications to the design" is checked simply.
- Ataçelik uses experienced staff members in designing and production processes.
- Production independent of weather conditions provides great advantage both in quality and construction planning.

Opportunities and Advantages of Ataçelik Industrial Structure

- The steel bearing system of a building with a total usable area of 5000 m^2 may be manufactured in 9 days and it can be erected within 17 days.
- Ataçelik industrial structure allows spans as long as 80 m. without columns.
- The combination of weight of steel with ATAÇELİK design results in highly economic foundation dimensions and makes excavation and applications simpler.
- The entire steel bearing system may be disassembled without any loss whenever required and transported to any place around the world by quite economic means of transport. The system is demolishable and consequently provides opportunity for temporary storage on hired land

General Properties of Ataçelik structures

- Economic.
- Manufactured and erected rapidly.
- Allows use of light wall and roof elements.
- Not dependent on certain formwork/dimensions. It can be manufactured in any length and width.
- Provides more usable area compared to alternative buildings.
- Allows the use of light wall and roof elements other than conventional roof elements.
- Allows wide spans.
- Not restricted with certain formwork/dimensions. It can be produced in any size desired.
- Resistant to earthquake.



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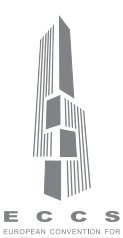

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