



METAL WORKS



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In the dynamic landscape of construction, the integration of metal works services stands as a cornerstone for structural strength, durability, and aesthetic appeal. Our comprehensive metal works services are tailored to meet the diverse needs of modern construction projects, offering a one-stop solution for crafting robust frameworks, intricate designs, and functional components. As a reliable partner in construction endeavors, our metal works services encompass a wide spectrum of offerings, ensuring excellence in every aspect of metal fabrication and installation.

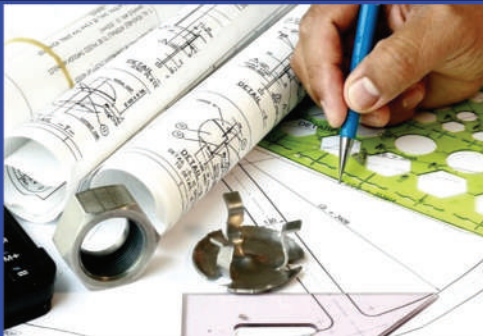


STEEL STRUCTURE

Steel structure services at Elite usually involve the design, fabrication, and erection of structures primarily made of steel. These services cater to a wide range of construction projects, including commercial, industrial, and residential buildings.

There are several phases applied:

DESIGN AND ENGINEERING	FABRICATION	INSTALLATION
<ul style="list-style-type: none">▪ Conceptualization and design of steel structures based on client requirements and project specifications.▪ Structural analysis to ensure the strength, stability, and safety of the steel structure.▪ Detailed engineering drawings and plans.	<ul style="list-style-type: none">▪ Procurement of high-quality steel materials.▪ Cutting, welding, and shaping of steel components in accordance with the approved design.▪ Quality control and testing of fabricated steel elements.	<ul style="list-style-type: none">▪ On-site assembly and installation of steel components.▪ Rigging and lifting services for heavy steel elements.▪ Coordination with other construction trades to ensure seamless integration with the overall project.



PROJECT MANAGEMENT

- Planning and scheduling to meet project deadlines.
- Budgeting and cost control throughout the construction process.
- Regular communication and collaboration with clients, architects, and other stakeholders.

QUALITY ASSURANCE AND COMPLIANCE

- Adherence to industry standards and building codes.
- Quality assurance processes to ensure the durability and safety of the steel structure.
- Upgrading or modifying existing steel structures to meet current standards or new purposes.
- Strengthening of structures for increased load-bearing capacity.



HOW STEEL STRUCTURE IS USED?

IN BUILDINGS

- It is used in structural sections as they provide a strong, stiff frame for the building.
- Reinforcing bars as they add tensile strength and stiffness to concrete
- Steel is used because it binds well to concrete, has a similar thermal expansion coefficient and is strong and relatively cost-effective.
- It is used in sheet products such as roofing, purlins, internal walls, ceilings, cladding, and insulating panels for exterior walls.
- Steel is also found in many non-structural applications in buildings, such as heating and cooling equipment and interior ducting.
- Internal fixtures and fittings such as rails, shelving and stairs are also made of steel.



IN INFRASTRUCTURE

- It is used and required for bridges, tunnels, rail tracks, and in constructing buildings such as fueling stations, train stations, ports, and airports.
- It is used in underground pipelines to distribute water to and from housing, and to distribute gas. The rest is mainly rebar for power stations and pumping houses.



TYPES OF STEEL STRUCTURE

BUILDING FRAME STRUCTURE

It consists of steel beams and columns that are versatile and can form spaces of near-infinite sizes and layouts. It is commonly used in buildings with many similar units (office buildings, apartment buildings, high-rises, etc.) because of their adaptability



PORTAL FRAME STRUCTURE

Low-rise or single-story structures with wide spans and open floors that are commonly used for warehouses, barns, and other applications where large, open spaces are required at low cost.



TRUSS STRUCTURE

It is made up of an upper and lower chord with webbing in between, it weighs far less and uses less steel than standard web beams. At the same time, the rigidity of the frame is greater and it can help control deflections. They are commonly used in bridges, TV towers, and roofs with large spans.



STEEL GRID STRUCTURE

Rods connected to form a grid pattern that distributes stress across the structure. The grid framework can be a two-dimensional plane or it can form a three-dimensional shape such as a reticulated shell.



METAL FABRICATION

Metal fabrication involves the manufacturing of sheet metal and flat metals, shaping them into specific forms. The process initiates with sheet metal approximately a quarter of an inch thick or less, possessing sufficient pliability to adopt diverse shapes. Skilled metal fabricators use various techniques to modify the sheet metal, crafting it into desired shapes. Additionally, custom fabrication is a related practice where new custom parts are created by employing innovative combinations of these processes.

Metal fabricators carry out these tasks, they operate in large-scale manufacturing operations or specialized fabrication shops, which can cater to general fabrication services or offer specialization for industries like medical and IT.

Throughout the metal fabrication process, various additional parts may be incorporated, including but not limited to plate metal, expanded metal, formed metal, welding wire, hardware, fittings, and castings. The specific processes and components utilized depend on the particular job at hand.



COMMON USED METAL

STEEL

ALUMINUM

COPPER

BRASS

BRONZE

TITANIUM



METAL FABRICATION PROCESS

CUTTING



Cutting involves removing excess material from a metal sheet or bar to achieve the desired shape. Common cutting methods include shearing, sawing, and plasma cutting.

BENDING



Bending is the process of shaping metal by applying force to it. Press brakes and rollers are commonly used for bending metal.

WELDING



Welding joins two or more pieces of metal together using heat and often filler material. Common welding methods include MIG, TIG, and arc welding.

MACHINING



Machining involves the removal of material from a metal work piece using cutting tools. CNC (Computer Numerical Control) machining is a precise and automated form of machining.

ASSEMBLY



Assembly involves combining fabricated metal components, sometimes with non-metal elements like fasteners or gaskets, to create a finished product.

STAINLESS STEEL FABRICATION

Stainless steel fabrication is the process of shaping, cutting, and assembling stainless steel into various structures and components. Stainless steel, known for its corrosion resistance, durability, and aesthetic appeal, is widely used in diverse industries for construction, manufacturing, and design applications.

Some of the fabricated stainless steel construction products you will find include stainless steel stairs, handrails, and aesthetic components.



PROCESS

- **Design and Planning:** The specifications and requirements of the stainless steel structure or component is defined then a detailed engineering drawings and plans are developed.
- **Material Selection:** The appropriate grade of stainless steel is chosen based on the intended use and environmental conditions.
- **Cutting:** Various cutting methods are used such as laser cutting, water jet cutting, or shearing to shape stainless steel sheets or sections.
- **Forming and Bending:** Bending and forming techniques are employed to give the stainless steel the desired shape and contour.
- **Welding:** Stainless steel components are joined through welding processes like TIG (Tungsten Inert Gas) or MIG (Metal Inert Gas).
- **Machining:** Machining processes are utilized to achieve precise dimensions and finishes.
- **Assembly:** The fabricated stainless steel components are assembled into the final product or structure.
- **Finishing:** Surface finishes like polishing, passivation, or coating are applied to enhance corrosion resistance and aesthetics.

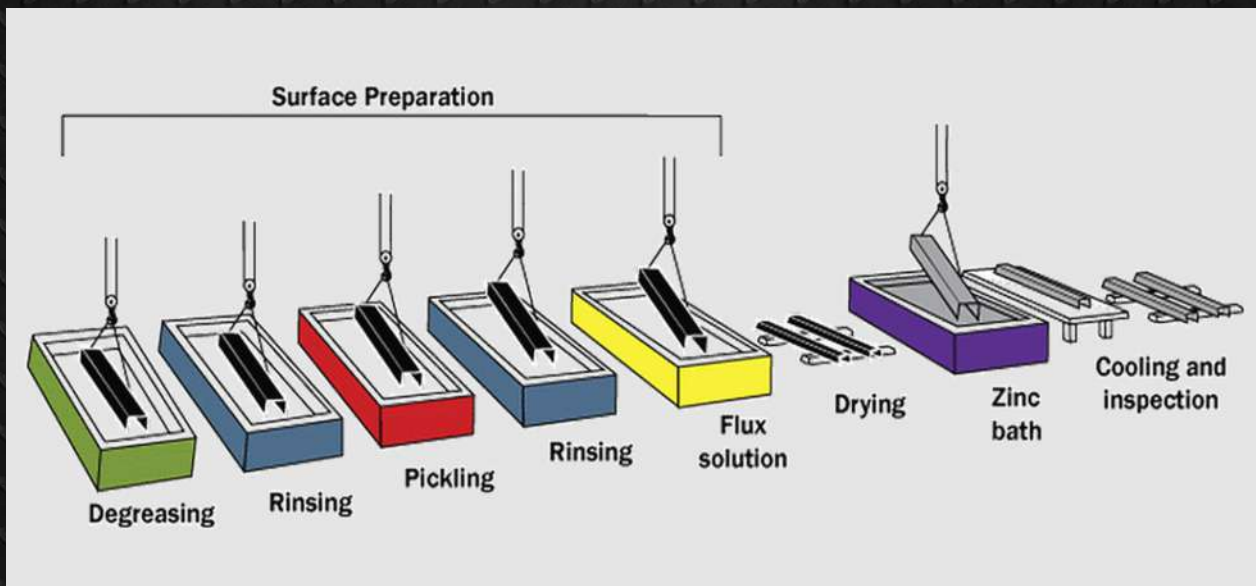
TYPES

- **Sheet Metal Fabrication:** Involves cutting, bending, and shaping stainless steel sheets to create various components.
- **Structural Fabrication:** Focuses on the construction of larger stainless steel structures such as frames, beams, and columns.
- **Pipe and Tube Fabrication:** Includes cutting, bending, and welding stainless steel pipes and tubes for applications like pipelines or handrails.
- **Custom Fabrication:** Involves the creation of unique and custom-designed stainless steel components based on specific requirements.



HOT-DIP GALVANIZED FABRICATIONS

Hot-dip galvanizing is a process used to protect steel and iron from corrosion by applying a protective zinc coating. This method involves immersing the metal in a bath of molten zinc, which forms a metallurgical bond with the surface of the steel or iron. The resulting coating provides excellent corrosion resistance, making hot-dip galvanizing a popular and effective method for extending the lifespan of metal structures in various applications.



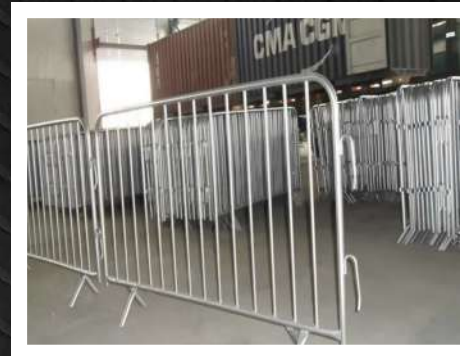
USAGE

Hot-dip galvanizing is extensively used in our field; we use this technique in the following:

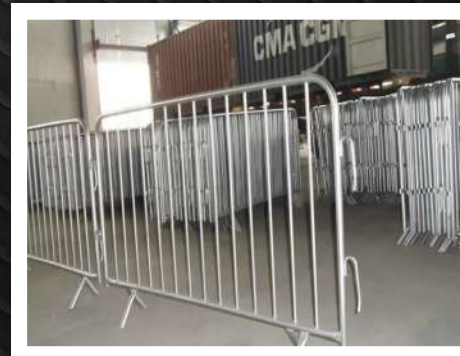
Structural Steel: Hot-dip galvanizing is widely employed to protect structural steel members in buildings and bridges. This includes beams, columns, and other components that form the framework of structures. The galvanized coating helps prevent corrosion and enhances the durability of these critical elements.



Guardrails and Handrails: Galvanized guardrails and handrails are commonly used for safety barriers on roads, bridges, balconies, staircases, and platforms. The corrosion resistance of hot-dip galvanized steel ensures that these components maintain their structural integrity and safety features over time.



Fencing and Gates: Galvanized steel is frequently used for fencing and gates in construction. Whether it's perimeter fencing for industrial sites, security fencing, or decorative fencing around residential properties, hot-dip galvanizing provides a protective coating that extends the life of the components.



Utility Poles and Transmission Towers: Galvanized steel is employed in the construction of utility poles and transmission towers for power distribution and telecommunication purposes. The corrosion resistance of hot-dip galvanized coatings ensures the longevity of these structures in outdoor environments.



PIPES' INSTALLATION

There are different kinds of pipes used in Infrastructure projects like:

Drainage pipes: Pipes designed to facilitate the efficient removal of excess water from various areas and play a vital role in preventing water accumulation, erosion, and potential damage to structures. They are used in a variety of settings, including residential, commercial, industrial, and agricultural applications.



HDPE pipes: High-density polyethylene (HDPE) pipes are a type of plastic pipe made from the polymer known as high-density polyethylene. HDPE is a versatile thermoplastic material commonly used for various applications, mainly water supply and firefighting, due to its favorable properties like its durability, flexibility, lightweight, longevity, chemical resistance, leak-free joints, and smooth interior.



Irrigation pipes: They play a multifaceted role in infrastructure construction, supporting agricultural activities, enhancing urban green spaces, contributing to environmental sustainability, and ensuring the efficient use of water resources. Integrating irrigation systems into infrastructure projects demonstrates a commitment to long-term functionality, aesthetics, and environmental responsibility.



PORTABLE CABINS

Portable cabins are compact, transportable structures that are designed for temporary or semi-permanent use. These cabins are often used in various settings, including construction sites, remote locations, events, and as temporary housing solutions. They offer the advantage of being easily transported, assembled, and disassembled, providing flexibility and quick deployment.



COMPONENTS

- **Frame:** Made of steel or aluminum, this frame provides the overall support and stability of the structure.
- **Walls:** They are constructed using panels made from materials like steel, aluminum, or composite materials. These panels may have insulation to provide thermal comfort.
- **Roof:** It is designed to protect the interior from weather elements. It is often made of the same materials as the walls and may include insulation for temperature control.
- **Flooring:** It can be made of various materials such as plywood, vinyl, or laminate. Some cabins may have elevated floors with insulation to enhance thermal performance.
- **Windows and Doors:** They are equipped with windows for natural light and ventilation. These components are typically made of durable materials, and windows may have options for security and insulation.
- **Insulation:** Insulation is crucial for maintaining a comfortable interior temperature. It may be incorporated within the walls, roof, and floor to regulate heat and cold.
- **Electrical and Plumbing Systems:** Depending on the purpose of the cabin, it may come equipped with electrical wiring, outlets, and lighting. Some cabins may also have basic plumbing systems for sinks and toilets.



PROCESS

- **Design:** Portable cabins are designed based on the intended use and customer requirements. The design includes considerations for size, layout, insulation, and the inclusion of specific features like windows, doors, and utilities.
- **Fabrication:** Once the design is finalized, the components are fabricated off-site in a factory. This process allows for precise manufacturing and quality control. The use of standardized components enables quick assembly.
- **Transportation:** Portable cabins are transported to their intended location using trucks or other means of transportation. Their compact design allows for easy shipping.
- **Assembly:** On-site assembly typically involves placing the structural frame, connecting walls, adding the roof, and installing doors and windows. Depending on the design, some cabins may be assembled in a matter of days.
- **Utilities Connection:** If the cabin includes electrical or plumbing systems, on-site connection to utilities may be necessary. This step ensures that the cabin is fully functional for its intended use.
- **Finishing Touches:** Once the cabin is assembled and connected to utilities, finishing touches such as interior furnishings, fixtures, and any additional customization are added.

