Procedia of Theoretical and Applied Sciences

International Symposium of Life Safety and Security

ISSN: 2795-5621 Available: http://procedia.online/index.php/applied/index

BUILDING STRUCTURES, METAL STRUCTURES

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Annotation: Rolled steel is used in the manufacture of building structures such as frames and frames of industrial buildings, farms for various purposes.

***Keywords*:** rolled profiles, fasteners, node elements, symbol, seams.

Metal structures are mostly used in buildings of industrial and civil construction, which have significant spans in length. Metal building structures are made of carbon steel of ordinary quality and low-alloy structural steel. For the manufacture of mass building structures, rolled steel (hot-rolled profiles) are most often used. Along with hot-rolled profiles, thin-walled profiles are also used, formed in a cold state by stamping, flexible or rolled from a steel sheet or tape.

The configuration of the cross section determines the profile of the rolled steel and its name. The most common profiles of rolled steel are shown below: angular equal-pole, angular unequal-pole, T-bar, I-beam, channel, etc. Rolled steel is used in the manufacture of such building structures as frames and frames of industrial buildings, farms for various purposes. It is used for columns and beams, both integral and composite sections, for the construction of stairs, various masts and towers.

The truss is a load-bearing structure and is a "flat" rod system designed to maintain the covering of the building.

Features of the MK (advantages and disadvantages), requirements for them metal structures have the following advantages: Reliability. The material (steel, aluminum alloys) has a large uniformity of structure. Lightness. Metal structures are the lightest. Industriality. The manufacture and installation of metal structures is carried out by specialized organizations using high-performance equipment. Impenetrability. They have high strength and density, impermeability to gases and liquids.

Metal structures have disadvantages:

1. Corrosion. Insecurity from a humid environment, an atmosphere polluted with aggressive gases, steel corrodes (oxidizes) and collapses. Therefore, special alloying elements are included in the steel, covered with protective films (varnishes, paints, etc.).
2. Low fire resistance. Steel at a temperature of 200The modulus of elasticity decreases with, and at a temperature of 600C, the steel completely passes into a plastic state. Aluminum alloys pass into a plastic state at 300C. Therefore, metal structures are protected by fire-resistant linings (concrete, ceramics, special coatings, etc.).

When designing metal structures, the following requirements must be taken into account: operating conditions, metal economy (high cost), transportability (transportation in parts or in whole using appropriate vehicles), manufacturability – the use of modern technological techniques that reduce labor intensity, high–speed installation, assembly in the shortest possible time, durability - is determined by the terms of physical and moral wear,

ISSN: 2795-5621 Available: http://procedia.online/index.php/applied/index

Aesthetics The design should have harmonious forms. The main principle of design is to achieve three main indicators: saving steel, increasing labor productivity in manufacturing, reducing labor intensity and installation time, which determine the cost of the structure.

This is achieved through the use of low-alloy and high-strength steels, economical rolled and bent profiles, the introduction of spatial, prestressed, hanging, tubular, etc. structures into construction, the improvement of calculation methods and the search for constructive optimal solutions using computers. In addition, standard solutions have been developed for frequently repeated structural elements - columns, trusses, crane beams, window and lantern openings, radio masts, towers, power line supports, tanks, etc.

Today, long products are widely used in industry, construction, mechanical engineering, oil production, and energy complexes. Agriculture cannot function normally without the use of long products.

Long products are manufactured on a rolling machine using hot or cold rolling technology. Carbon steel of standard quality is used for production. Sometimes low-carbon steels are used for the manufacture of long products. Long products are divided into two main profiles: mass consumption and special purpose. Long products for special purposes are made by individual order.

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