Features of the Execution of Drawings of Metal Structures and Geometric Schemes

Feruza Islomovna Mamurova, Javohir Tursunnazar ogli Ozodjonov
Tashkent State transport University

Abstract: With a detailed image of the structure, all its visible parts and connections located in close proximity to the observer are drawn, and the invisible ones are only those that are located close to the visible ones. Invisible elements separated from visible ones by an air layer are not shown in the drawing.

Rules for the execution of drawings of metal structures manufactured at machine-building enterprises of all industries.

Views on drawings of metal structures are usually arranged as follows: the top view in the projection connection is above the main view, the bottom view is under the main view, the right view is to the right of the main view, the left view is to the left of the main view. Above each view (except the main one), an inscription of type "A" is made, and the direction of view is indicated by an arrow marked with the corresponding letter. This arrangement of individual images (views) is obtained by projecting using the third angle method (method A).

If you need to show some part of the structure, then on the main or some other view, the direction of view can be shown as a section or cross-section, and the image itself should be accompanied by an inscription: 1-1 or 2-2, etc., and the image can be located anywhere on the sheet.

With a detailed image of the structure, all its visible parts and connections located in close proximity to the observer are drawn, and the invisible ones are only those that are located close to the visible ones. Invisible elements separated from visible ones by an air layer are not shown in the drawing.

Metal structures without rolling profiles can be depicted in drawings without rounding. The conditional image of the profiles and their dimensions indicate as shown in the Table. 13. If the structural element consists of a single profile or the drawing shows the actual number of profiles included in the section and their ctual location, then the number of profiles is not indicated. After the cross-section size of the profile, it is allowed to specify the length of the part, which is separated from the cross-section value by a "dash" sign, for example: û75Û8 – 3500. Information about the dimensions of the profile should be applied parallel to its image, on the shelf of the callout line or without it .

The bevels in the drawings of structural elements are indicated by linear dimensions or using a right triangle, the hypotenuse of which coincides with the edge of the image. The cathets represent the values of their lengths (Fig. 7).

The diameters of the holes, rivets, and bolts indicate the callout lines on the shelf. If the holes, rivets or bolts are located on the same axis, then their size is indicated from the axis. In the case when the dimensions are arranged in a group, they are circled with a thin wavy line and the remote inscription is indicated from this line. When the same holes are located on the axes, their dimensions and number are indicated in accordance with Figure 8.

The location of the elements of metal structures in a building or structure is given on special marking schemes.

The geometric scheme of the farm is called its image, where the elements of the lattice are drawn conditionally in one line. The geometric scheme determines the shape and main dimensions of the truss – span, height and center distances between its individual nodes. These distances, indicated in millimeters, are placed directly above the grid elements without outriggers and dimension lines. In design practice, the geometric scheme also notes the efforts in a particular rod, which are placed under the image of the rod. If available, only the dimensions between the nodes are indicated on the left side, and only the forces are indicated on the right. For a symmetrical design, it is recommended to draw a diagram of half of the structure.

The geometric scheme is drawn with solid main lines in the upper left part of the sheet at a scale of 1:100 or 1:200, depending on the size of the farm.

Construction objects consist of separate parts-structures. A building structure is understood as a separate independent part of a building or structure (building frame, foundation, basement, blind area, covering

Structural elements that are supplied to the construction site in a ready-made form for the installation of the building are called construction products (column, crossbar, floor slab, reinforcing frame, etc.). Typical construction products come ready-made from factories and factories to the construction site, where they are assembled using lifting cranes.

Concrete is an artificial stone-like material obtained as a result of hardening of a mixture consisting of a binder, water and aggregates.

Reinforced concrete is a building material in which a monolithic whole of concrete and steel reinforcement are connected. In a reinforced concrete element, concrete and reinforcement work together, while the properties of both materials are rationally used. Concrete resists compressive forces well and stretches many times worse, so the concrete beam collapses at a relatively low load due to the formation of cracks in the stretched zone, while the strength of the compressed zone is still far from destruction.

The stretched zone of the reinforced concrete beam is steel reinforcement, which has a high tensile resistance. At the same time, the load-bearing capacity of the beam increases by 10-20 times. Favorable working conditions are created for steel in reinforced concrete, since concrete protects the reinforcement from corrosion and temperature fluctuations.

When the reinforced concrete structure is stretched, the concrete will initially stretch together with the reinforcement, but the elongation can reach a value at which cracks will appear in the weak points of the concrete. To prevent this from happening, the concrete is compressed by pre-tensioning the reinforcement. In this case, the tensile forces arising from operational loads are absorbed by the preliminary compression of concrete. Reinforced concrete structures, in which the reinforcement is stretched before concreting, they are called structures with prestressed reinforcement. The pre-voltage can be obtained mechanically or electrothermically.

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