METHODS OF CONVEYING INSTRUCTIONS FROM THE DESIGNER TO THE FABRICATOR OF WELDED CONSTRUCTION.

By H. E. Grove.

Electric welding is making its presence felt in all directions, and efforts are everywhere being made to simplify and standardise office procedure. Drawings may be divided into two classes—First, those necessary for public structures, buildings or residences where the public or the owner desires to know from the drawing the nature of the building or structure, and to ascertain its conformity to the local regulations and to its environment; and second, engineering drawings. In the latter the less that appears on the drawing the better, provided that it is adequate. The elimination of every unnecessary line, mark or word from the drawings is very desirable, for much labour is involved in their preparation, and confusion is liable to arise in the shop from an over elaborate drawing. The author has for many years been studying the problem of simplification of drawings for welded work, and it is now his practice not to indicate welding on the drawing, save in exceptional cases; rather is it the practice to indicate where welding is absent. The necessary instructions are better incorporated on a Welding List Sheet, and standing instructions.

First, the standing instructions are that (a) every fillet must be a 45° mitre with a convex face; (b) every fillet must be continuous; (c) the strength of the weld will be specified on the Welding List Sheet by the deposit in inches of weld per electrode stick; (d) the contours and sizes of the butt welds depend upon the instructions for the preparation of the steel members. Only the exceptions to the above rules are noted on the drawings.

The headings on the Welding List sheet include the following:

<table>
<thead>
<tr>
<th>Sheet No.</th>
<th>Mark</th>
<th>No. off</th>
<th>Lengths of weld in inches per member</th>
<th>Total length of weld: in inches, in feet</th>
<th>Electrode: Size, deposit inches per stick, number required</th>
<th>Remarks</th>
</tr>
</thead>
</table>

The Welding List is compiled by the draftsman who makes the drawing, and the two are complementary. This ensures that the draftsman thoroughly understands the welding requirements himself before the drawings are placed in the hands of those responsible for the fabrication and erection. The Welding List also indicates at a glance to the foreman, or others concerned, exactly what welding is required on the members shown on the corresponding drawing. He is instantly able to prepare his estimates or his requisitions.
After the various members of a joint are tack welded or clamped in place, the Inspecting Welder marks thereon in chalk the necessary welding.

A Welding Return is prepared and signed by the Inspecting Welder from the welders' log sheets, showing electrodes and amperage used; and this is forwarded to the drawing office, where the draftsman checks the quantities against the Welding List and the drawing. If correct he affixes his signature thereto, and it is filed. If there is a lack of correspondence between them he reports the delinquency to his superior officer, who institutes an enquiry.

The headings on the Welding Return Sheet include the following:

Welder|Job No.|Sheet No.|Mark No.|off welded|Amps.|Symbol
Feet welded|Electrodes used|Time|Remarks: Time not welding,
Reasons, etc.

Separate Welding Lists are prepared for the shop and field.

Now, coming to the system of checking. The Inspecting Welder checks the welders' log sheets, and he inspects the quality of the work. The Welding Return is made out in duplicate, and the Inspecting Welder signs them and stamps them both with a rubber stamp expressing either approval or disapproval, with reasons. The foreman, after scrutiny, signs them and returns one to the office, where the draftsman handles it as before described. The Inspecting Welder has no responsibility, except that when he approves the Return he accepts himself responsibility for the welders' work, and thereby relieves them of it. If he is in any way dissatisfied with the work, he relieves himself of responsibility by signifying his disapproval on the Return. As the foreman has to countersign the Return he takes great pains to see that nothing is permitted to interfere with the carrying out of the instructions, and proper completion of the work, and he keeps a sharp eye on the welders. At the same time nothing the Inspecting Welder may do will relieve the foreman of any responsibility, and the Inspecting Welder, while conscientiously carrying out his duties, is protected by the management.

How far the above procedure may be adopted in other organisations remains to be seen; but it should prove quite workable. In fact, the author is aware of two instances where this procedure has been adopted with perfect success. In one of them, where work is being carried out by contract, the use of the Welding List and Returns is being accepted as evidence that the required deposits have been laid down.
The President, in moving a vote of thanks to Mr. Grove, said the position was that where plans were being prepared for a public body it might be suggested that it would be necessary to put more on the drawings, so that at a glance at the drawings they might perceive where the welding was, whereas for a contract or other purpose the drawing with practically nothing on it and a complete schedule of the type submitted by Mr. Grove would give all that was necessary for the contractor in a more definite and clear way than could be made on a drawing to ordinary scale.

Mr. Grove said that was so. The idea was that nothing was lost. The draftsman missed nothing, and was able to treat every joint on its own merits, and could specify every joint, and had a record of everything that had to be done upon that drawing, and had also the means of checking back to see if the instructions were carried out.

Mr. J. O. Ramsay asked if the inspector could be depended upon as a guarantee of the strength of the weld.

Mr. A. C. Mitchell said he found great difficulty in putting on drawings information to be dealt with by the welder. Just recently a pamphlet was distributed to various engineering firms in Melbourne with reference to standardisation of symbols and various matters to be placed on drawings. He had been asked to criticise that, but had not at his disposal all the knowledge Mr. Grove had placed before them. The welder, no matter what was placed on the drawing, was inclined to use his own discretion. On the welding test shown by Mr. Grove there was an item regarding amperage, which was a most important matter, and that was where the inspector came in.

Mr. H. E. Grove, in reply, said the human element was always cropping up. The inspector realised that all he had to do was to tell honestly what there was about a job he did not like. The foreman was the man ultimately responsible, and the inspector was responsible to him. Therefore the foreman kept the inspector keyed up to his job. The welding return supplied the necessary evidence to the office that the work had been carried out in accordance with instructions. There was no doubt that welding was leading to the simplification of design, and that was a position, he thought, they should welcome. The more economical a process could be made, the greater chance it had of expanding, owing to its reduced cost; and thus more people would ultimately be required to carry it out.
Library Digitised Collections

Author/s:
Grove, Harry Ernest

Title:
Methods of conveying instructions from the designer to the fabricator of welded cons

Date:
1931

Persistent Link:
http://hdl.handle.net/11343/24726

File Description:
Methods of conveying instructions from the designer to the fabricator of welded cons