



WELDED WIDE-FLANGE SHAPES (WWF): TYPES OF COMPONENTS, COMPOSITION, CUSTOM FABRICATION AND ADVANTAGES

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SUMMARY

Fabricated from steel plates in varying thicknesses, welded wide-flange (WWF) shapes can be custom-made according to your construction needs. Fabrication and welding techniques impact the cost of WWF shapes.

WELDED WIDE-FLANGE SHAPES (WWF)

Canam-Buildings welded wide-flange (WWF) shapes are structural components fabricated from steel plate to form beams, columns, overhead crane tracks and various other steel shapes. The substitution of traditional beams and columns by WWF shapes provides a number of benefits as discussed later in this article.

Types of WWF shapes

Canam fabricates various types of plate girder. These include WWF shapes included in the [CISC Handbook of Steel Construction](#) as well as other types of sections that feature flanges and webs of various widths and thicknesses. The following standard plate thicknesses are widely available:

Plate thickness

IMPERIAL (in.)												
1/4	3/8	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	4

METRIC (mm)														
10	11	14	16	20	22	25	28	30	35	40	45	50	55	60

Steel grade

Canam normally uses steel with a maximum elasticity of 50.8 ksi (350 MPa) ([CAN/CSA G40.21 standard grade 350W](#)) and also 50 ksi (345 MPa) ([ASTM A992, A572 grade 50](#)). Other steel grades can also be used according to project specifications.

Fabrication and welding

WWF sections are bench-welded using a submerged arc which provides an exceptional weld quality. The sections are fabricated using fillet weld with size according to the design specifications or with full penetration welds if required. WWF shapes usually function as a column or a beam where loads can be static (dead, snow and live loads) or dynamic (overhead cranes).

The fillet weld at the flange/web junction is usually made continuous according to the shear flow between the connected elements of the WWF section. It is preferable that the design engineer specify the size of the weld to ensure that the various load requirements are met (ie: calculation of fatigue).

Cost factors

Welding and scheduling are the two main factors that impact the cost of WWF shapes. Welding typically represents at least 40% to 50% of the total piece costs. If sections are required in under ten weeks, costs will increase since the steel may have to be

purchased from a warehouse resulting in splices required in the flanges and web. For schedules over ten weeks, plates can be purchased custom-made from a mill for welded sections of 40 to 70 ft. (12 to 21 m) without splices, thereby reducing both fabrication time and costs.

Customized shapes for special projects

Canam-Buildings fabricates many types of WWF sections such as non-symmetrical shapes, T-beams and I-beams (Figure 1).

It is also possible to camber WWF sections by cutting the web with a plasma torch to ensure maximum precision. It can be advantageous and economical to replace a non-standard W or WWF shapes by a Canam-Buildings custom-made shape. This allows for the fabrication of an optimal section with the required camber in a reduced time schedule.



Figure 1
I-shaped welded beam

Benefits

The use of Canam-Buildings WWF shapes instead of standard beams or columns provides a number of advantages as follows:

- Fast delivery schedule
- Availability in various lengths and thicknesses
- Custom-made shapes and sizes
- Professional design support
- Exceptional service and flexibility



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