1.6 DESIGN OF SIMPLE AND ECCENTRIC WELDED CONNECTIONS

Welding is the procedure of joining two metal portions in the molten state with or without pressure.

• Electric-arc-welding is commonly used.

• Part of metal to be welded is melted by using electric arc or oxyacetylene flame along with a weld rod.

• Arc heat will melt both the metal part and rod at the same time.

• Fusion happens as welding rod material flows across the arc.

• Welding rod used may be shielded or unshielded.

• In the shielded type, electrode will be coated with mineral compounds (flux) producing a gaseous shield which helps to avoid oxygen and thus stabilizing the arc.

• Shielded type improves the quality of work.

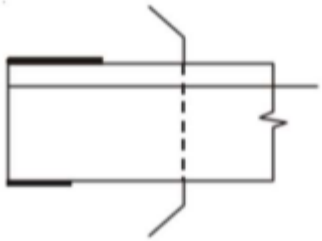
TYPES OF WELDS

• Two commonly used types are

1. Fillet weld 2. Butt (groove) weld

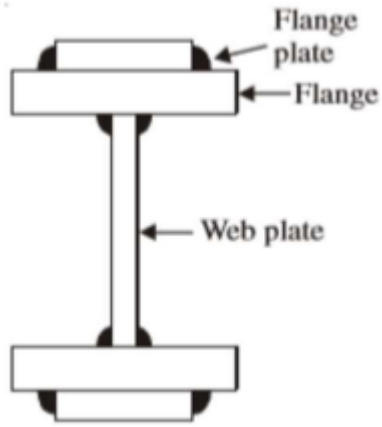
FILLET WELD • Used for lap joints 1. When two plates overlap each other.

2. When a truss member is required to be connected to a gusset plate

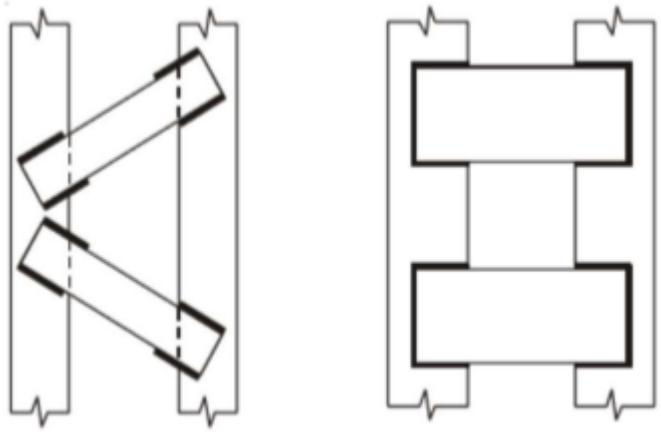


FILLET WELD

4. When plates are joined to form beams e.g., plate girder. Welds are used to connect web plate with flange plate and also to connect flange to flange plates.



5. Lacing and battering connection in columns



ECCENTRIC WELDED BRACKET CONNECTION

Case 1: In-plane loading • Consider a joint in which bracket plate is welded to a flange of a column using fillet weld. Let shape of weld line be “C”. • Consider unit length of weld (say 1 mm).