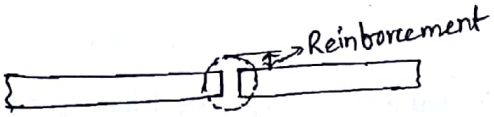
3. Welded Connection

→ Various types of weld used are;

1. Butt weld
2. Fillet weld
3. Plug weld
4. Slot weld.

· Butt weld ;

· It is also known as "Groove weld", It is provided when the membess to be jointed are lined up. various types of butt weld are;

i) 

* Square butt weld

ii) 

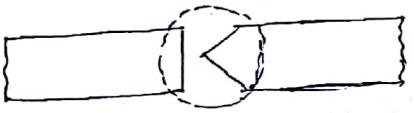
* single V-butt weld

iii) 

* Double V-butt weld

iv) 

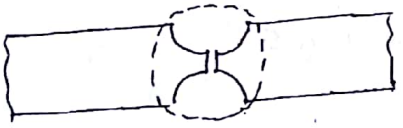
* Single Bevel butt weld



* Double Bevel butt weld

vi) 

* single U-butt weld

i) 

* Double U-butt weld

viii) 

* Single J-butt weld

* Double J-butt weld

→ A square groove weld is provided for sections less than 8mm. Above this a single U, V or) double U, V etc groove welds are provided.

→ Butt weld is most suitable for alternating stresses provided that complete penetration is ensured.

→ Whenever complete penetration is ensured strength of weld is taken same as that of parent metal.

→ Reinforcement should not be taken into account in strength calculation.

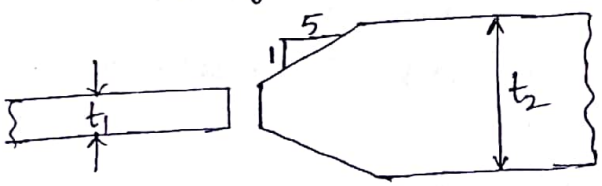
→ Due to stress Concentration, reinforcement is not suitable for alternating stresses. hence in that case weld surface is made flush. In any case the reinforcement should not exceed 3mm

→ For incomplete penetration effective throat thickness is taken as minimum thickness of weld common to parts being jointed.

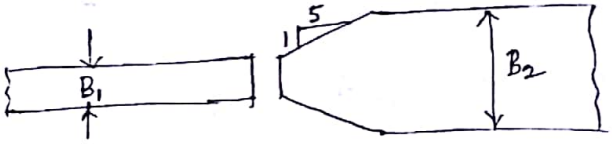
→ However if the thickness of common part is not given, effective throat thickness for incomplete penetration is taken as $\frac{5}{8}$ times the minimum thickness of main plates being jointed.

→ If the difference of thickness of two plates being jointed;

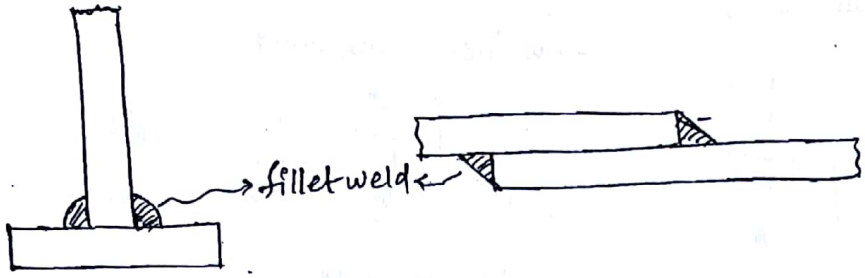
i.e, $t_2 - t_1 > \frac{t_1}{4}$ or) 3mm which ever is greater then we provide Tapering in the thicker plate & Tapering should not be greater than 1 in 5.



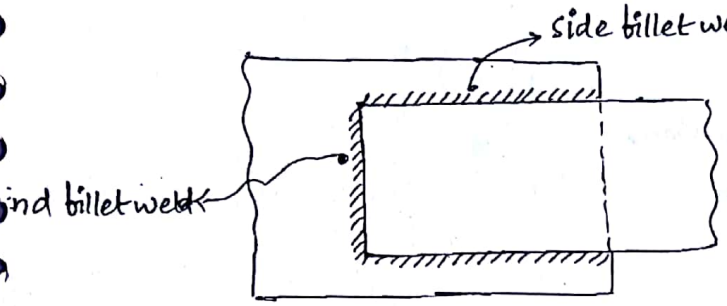
→ Similar criteria is applicable for width of plate



3. Fillet weld ;

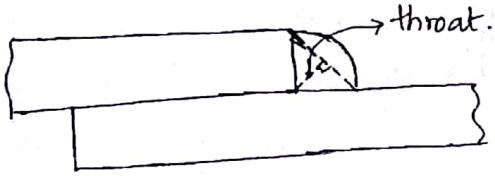


→ Fillet welds are provided when two members to be jointed are in different plane.

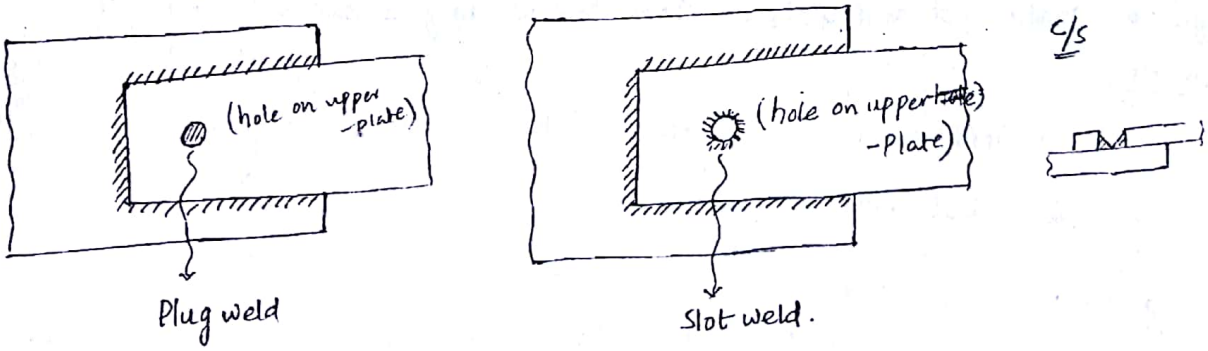


→ End fillet weld is generally stronger than the side fillet weld but according to IS 800 : 2007 there is no difference between End and side fillet welds.

Fillet weld is always assumed to resist the load by shearing action on its throat.

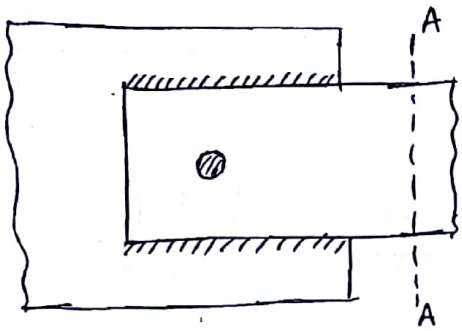


4. Plug & slot fillet weld. ;



→ In Plug welds small holes are made in one plate and is kept over another plate to be connected and then the entire hole is filled with filler material while in slot weld fillet welding is made along the periphery of hole.

→



Tensile stress distribution in plate ;

→ without plug weld

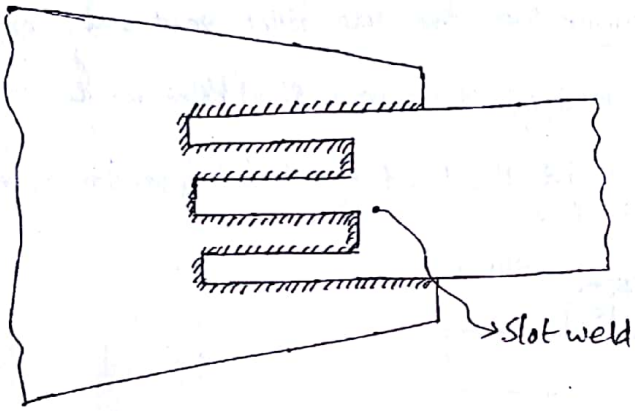
→ with Plug weld

→ As per Is code ;

a) Plug weld is not used for strength calculation.

b) It is provided to make the stress uniform

→



→ If the length of weld ~~is req~~ required is more than that can be provided in the limited overlap length we make slot and weld on sides, this welding is called "slot welding".

→ weld symbols ;

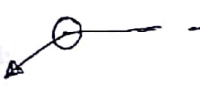
i) → Fillet weld

ii)  → Square butt weld

iii)  → single V butt weld

iv)  → single U butt weld

v)  → Double U butt weld

vi)  → all round weld , Ex :-