The width b_P of the attached plating to be considered for the calculation of the geometric properties of primary supporting members analyzed through beam structural models is to be taken, in m, equal to:

- where the plating extends on both sides of the primary supporting member:

  $b_P = \min (s; 0,2\ell)$

- where the plating extends on one side of the primary supporting member (i.e. primary supporting members bounding an opening):

  $b_P = \min (0,5s; 0,1\ell)$

b) Web of primary member not directly welded on the attached plating (floating frame):

The attached plating is normally to be disregarded for the calculation of the primary supporting member geometric properties.

3.2 Cut-outs and large openings

3.2.1 General

Cut-outs and large openings in primary supporting member webs may be taken into account as defined in the present sub-article, when deemed necessary.

3.2.2 Cut-outs in web

Cut-outs for the passage of ordinary stiffeners are to be as small as possible and well rounded with smooth edges.

In general, the height of cut-outs is to be not greater than 50% of the height of the primary supporting member.

3.2.3 Location of cut-out in web

As a general rules, where openings such as lightening holes or duct routing for pipes, electrical cable,..., are cut in primary supporting members, they are to be equidistant from the face plate and the attached plate. As a rule, their height is not to be more than 20% of the primary supporting member web height.

The length of the openings is to be not greater than:

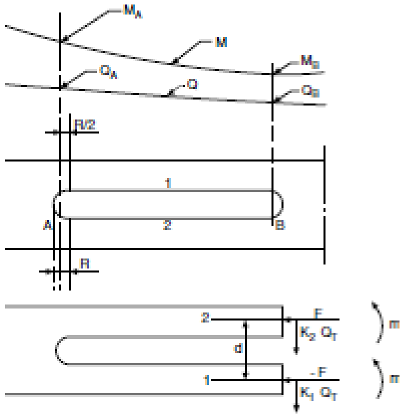
- at the end of primary member span: 25% of the distance between adjacent openings
- elsewhere: the distance between adjacent openings.

Openings may not be fitted in way of toes of end brackets.

3.2.4 Large openings

In case of large openings as shown in Fig 7, the secondary stresses in primary supporting members are to be considered for the reinforcement of the openings, where deemed necessary.

Figure 7 : Large openings in primary supporting members - Secondary stresses



The secondary stresses may be calculated in accordance with the following procedure.

Members (1) and (2) are subjected to the following forces, moments and stresses:

$$F = \frac{M_A + M_B}{2d}$$

$$m_1 = \left|\frac{M_A - M_B}{2}\right| K_1$$

$$m_2 = \left|\frac{M_A - M_B}{2}\right| K_2$$

$$\sigma_{F1} = 10\frac{F}{S_1}$$

$$\sigma_{F2} = 10\frac{F}{S_2}$$

$$\sigma_{m1} = \frac{m_1}{w_1} 10^3$$

$$\sigma_{m2} = \frac{m_2}{w_2} 10^3$$

$$\tau_1 = 10\frac{K_1 Q_T}{S_{w1}}$$

$$\tau_2 = 10\frac{K_2 Q_T}{S_{w2}}$$

where:

M_A, M_B : Bending moments, in kN.m, in sections A and B of the primary supporting member

m_1, m_2 : Bending moments, in kN.m, in (1) and (2)

d : Distance, in m, between the neutral axes of (1) and (2)

σ_{F1}, σ_{F2} : Axial stresses, in N/mm², in (1) and (2)

σ_{m1}, σ_{m2} : Bending stresses, in N/mm², in (1) and (2)

Q_T : Shear force, in kN, equal to Q_A or Q_B, whichever is greater

τ_1, τ_2 : Shear stresses, in N/mm², in (1) and (2)