

10

Friday

2015

Week 15

Day 100-205

03

04

Appointments

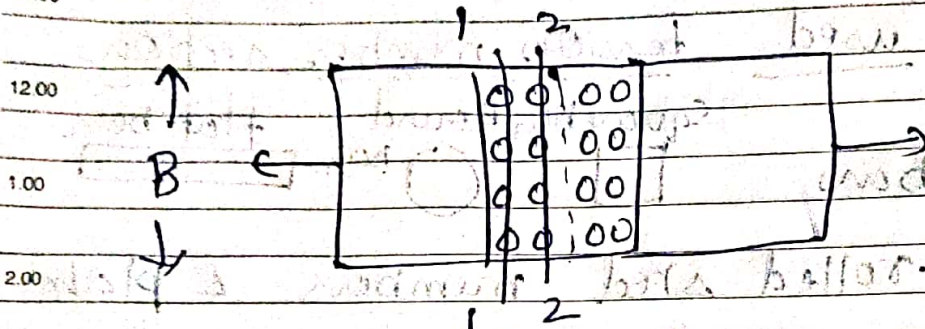
9.00

Net sectional area = Gross sectional area - deduction for hole

(i)

In case of plate
a) chain riveting

11.00



3.00

$$\text{Net sectional area} = (B - nd) t$$

4.00

B = width of plate

5.00

n = No. of rivet along the section under consideration

6.00

d = Gross dia of rivet

7.00

t = thickness of plate

Net sectional area along 1-1 = $(B - nd) t$

PRIORITIES

2-2 = $(B - 4d) t$

MAY	MTWTFSS	JUN	WA	MTWTFSS
05	1 2 3	23	1 2 3 4 5 6 7	
06	4 5 6 7 8 9 10	24	8 9 10 11 12 13 14	
07	11 12 13 14 15 16 17	25	15 16 17 18 19 20 21	
08	18 19 20 21 22 23 24	26	22 23 24 25 26 27 28	
09	25 26 27 28 29 30 31	27	29 30	

2015

Week 15

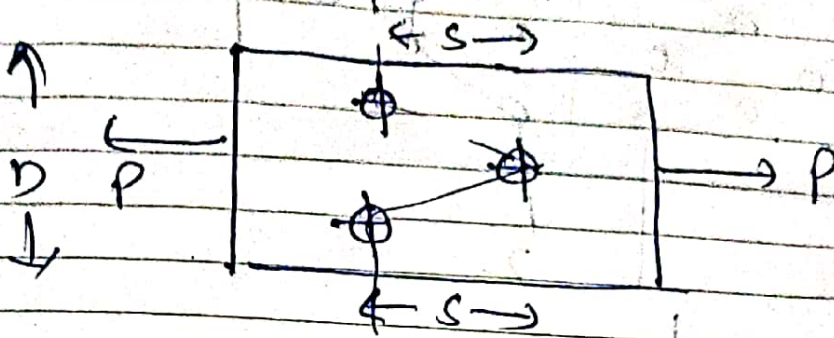
Day 101-264

April

11

Saturday

Zig - Zag riveting

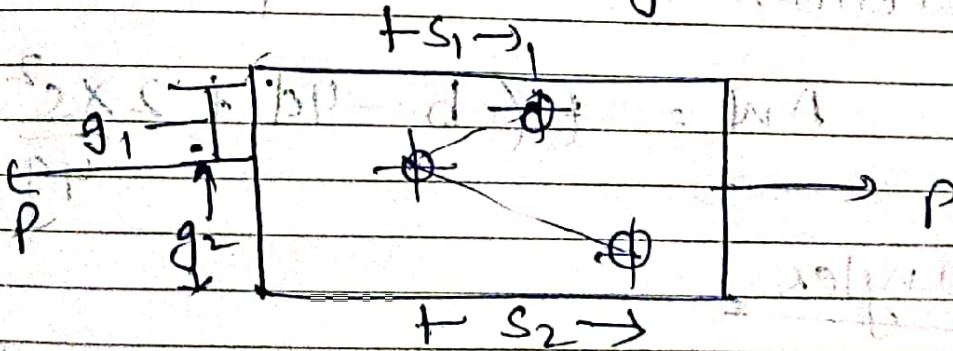


$$A_{net} = t \left[b - nd + \frac{n's^2}{4g} \right]$$

n' = NO. of inclined planes in the section.

s = pitch

g = gauge distance



102-263 • Sunday 12

$$A_{net} = t \left[b - nd + \left[\frac{s_1^2}{4g_1} + \frac{s_2^2}{4g_2} \right] \right]$$

April

13

Monday

2015

Week 16

Day 103-262

MAR	Wk	M	T	W	T	F	S	S	APR	Wk	M	T	W	T	F	S	S
	9	30	31	.	.	.	.	1		14	.	.	1	2	3	4	5
	10	2	3	4	5	6	7	8		15	6	7	8	9	10	11	12
	11	9	10	11	12	13	14	15		16	13	14	15	16	17	18	19
	12	16	17	18	19	20	21	22		17	20	21	22	23	24	25	26
	13	23	24	25	26	27	28	29		18	27	28	29	30	31		

03

04

Appointments

9.00 C>

10.00

11.00

12.00

1.00

2.00

3.00

4.00

5.00

6.00

7.00

Net sectional area along 1-1

$$A_{net} = t \left[b - 5d + \frac{4 \times s^2}{4g} \right]$$

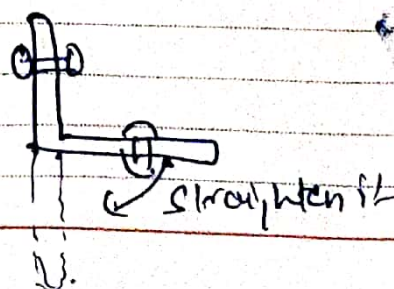
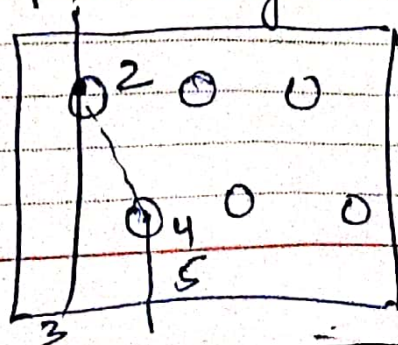
Net sectional area along 2-2

$$A_{net} = t \left[b - 4d + \frac{2 \times s^2}{4g} \right]$$

(2) For angles

a) Angle with it both legs connected. In such case, it is assumed that legs are straight & after straightening the legs are in the same plane.

PRIORITIES



05	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
06	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

2015

Week 16

Day 104-261

April

14

Tuesday

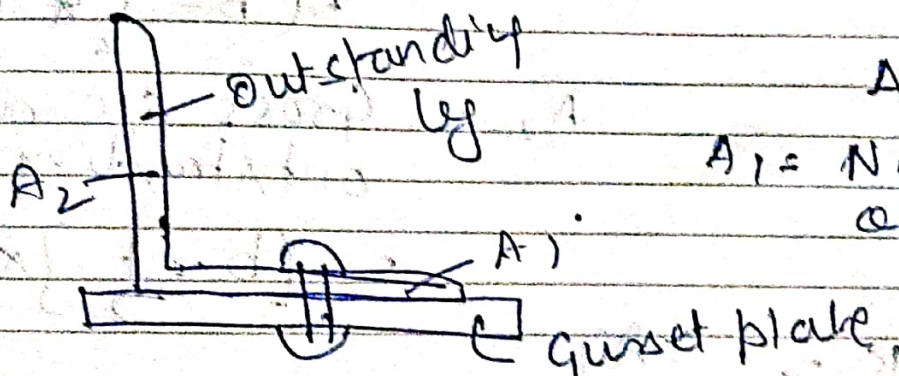
Net section area 1-2-3

$$A_{net} = (b - nd) t$$

Net section area 1-2-4-5

$$A_{net} = \left[b - nd + \frac{n's^2}{4g} \right] t$$

b) For single angle connected by one leg only



$$A_{net} = A_1 + A_2$$

A_1 = Net section area of connected leg

$$A_1 = t \left[\text{length of leg} - \frac{1}{2} \text{ thickness} - nd \right]$$

$$A_2 = \text{gross section area of outstanding leg} \\ = t \left[\text{length of leg} - \frac{1}{2} \text{ thickness} \right]$$

$$K = \frac{3A_1}{3A_1 + A_2}$$

April

15

Wednesday

2015

Week 16

Day 105-260

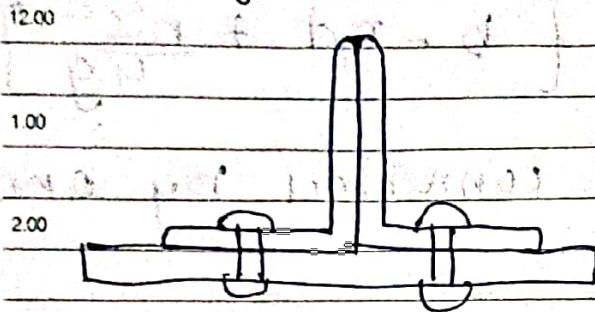
MAR	Wk	M	T	W	T	F	S	S	APR	Wk	M	T	W	T	F	S	S
9	30	31	.	.	.	.	.	1		14	.	.	1	2	3	4	5
10	2	3	4	5	6	7	8			15	6	7	8	9	10	11	12
11	9	10	11	12	13	14	15			16	13	14	15	16	17	18	19
12	16	17	18	19	20	21	22			17	20	21	22	23	24	25	26
13	23	24	25	26	27	28	29			18	27	28	29	30	.	.	.

03

04

Appointments

9.00 Case-III For a pair of angles placed back to back [or a single tee connected by only one leg of each angle (or by flange of tee) to the same side of gusset plate.



$$A_{net} = A_1 + A_2 K \quad (\text{Same as before})$$

A_1 = Net Sectional Area of connected legs

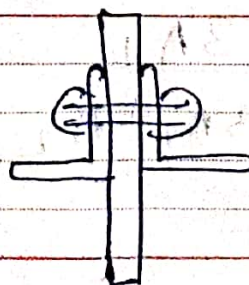
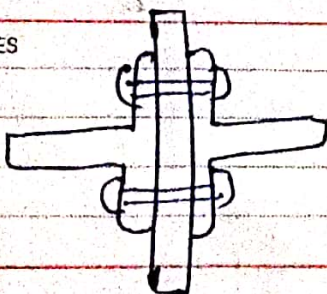
$$= (b - \frac{t}{2} n d) \times t$$

A_2 = Gross G/S area of outstanding leg

$$= (b - \frac{t}{2}) \times d$$

$$K = \frac{S A_1}{S A_1 + A_2}$$

11.00 Case-IV For double angles or tee placed back to back & connected to each side of a gusset or each side of rolled section.



PRIORITIES

DAY	WK	M	T	W	T	F	S	S	JUN	WK	M	T	W	T	F	S	S
05	18					1	2	3		23	1	2	3	4	5	6	7
	19	4	5	6	7	8	9	10		24	8	9	10	11	12	13	14
	20	11	12	13	14	15	16	17		25	15	16	17	18	19	20	21
	21	18	19	20	21	22	23	24		26	22	23	24	25	26	27	28
	22	25	26	27	28	29	30	31		27	29	30					

06

2015

Week 16

Day 105/254

April

16

Thursday

Net effective area =

Gross area =

Deduction for rivet hole.

Allowable stress in Axial tension (steel) as per IS: 226 - 1975

Form of Rolled section of Tension Member

Dia / Thickness

σ_{at}

1) Plates, flats, angles, beams, channel & Tee-section

Up to & including 20 mm

150

② Above 20 & ≤ 40 mm

144

③ > 40 mm

132

2) Bar (square, round & hexagonal)

up to 20 mm

150

> 20 mm

144

Design of Tension Member

① Calculation of required net area

A_{net} requ ⇒

Axial load

σ_{at}

σ_{at} = 150 N/mm² [If not given]

April

17

Friday

2015

Week 16

Day 107-258

MAR	WK	M	T	W	T	F	S	S	APR	WK	M	T	W	T	F	S	S
	9	30	31	.	.	.	.	1		14	.	.	1	2	3	4	5
	10	2	3	4	5	6	7	8		15	6	7	8	9	10	11	12
	11	9	10	11	12	13	14	15		16	13	14	15	16	17	18	19
	12	16	17	18	19	20	21	22		17	20	21	22	23	24	25	26
	13	23	24	25	26	27	28	29		18	27	28	29	30	.	.	.

03

04

Appointments

9.00

② selection of suitable section.

10.00

Try a suitable section from steel table having sectional area > 2064 in case of riveted joint & 10% in case welded joint

11.00

12.00

1.00

③ Calculated net section of selected sec.

2.00

a> single angle or double angle -

3.00

one rivet hole from each angle

4.00

b> Flat or plates - one rivet hole for 15 cm width of member

5.00

6.00

c> Double channel - 2 rivet hole from each channel web or rivet hole from each flange

7.00

d> Four angle (I SA) forming box

= 2 rivet hole from each angle

PRIORITIES

MAY		M T W T F S S							JUN		Wk	M T W T F S S						
16	17	 1 2 3							23	1	2	3	4	5	6	7		
18	19	4 5 6 7 8 9 10							24	8	9	10	11	12	13	14		
20	21	11 12 13 14 15 16 17							25	15	16	17	18	19	20	21		
22	23	18 19 20 21 22 23 24							26	22	23	24	25	26	27	28		
24	25	25 26 27 28 29 30 31							27	29	30							

2015

Week 16

Day 108-257

April

18

Saturday

06

④ Check for Sectional area

Net Sectional area calculated in 3 step >

Net area required [step 1]

⑤ Check for Slenderness ratio

$$\lambda = \frac{l_{eff}}{r_{min}}$$

As per IS-800

① If the tension member is normally acting as a tie member but subjected to possible stress reversal due to loads other than wind or seismic, $\lambda \nless 150$

② A member normally acting as tie but subjected to possible stress reversal of stress resulting from action of wind or earthquake forces shall have $\lambda \nless 250$

⑦ Design of end connection.

PRIORITIES