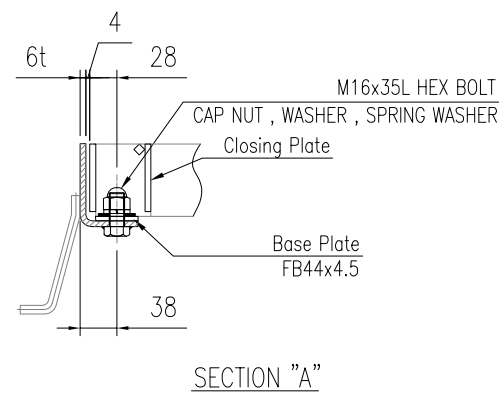
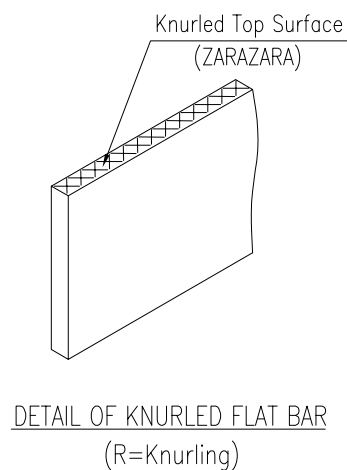


DETAIL GRATING FOR GUTTER SPAN 300 MM.
 (Q'TY 1 SET.)



NOTE

1. TYPE OF GRATING : RFB55x6 BBP=35.3 , TB6x6 TBP=100
 END PLATE : FB50x6
2. TYPE OF FRAME : PL-66x60x6t (Bending Type)
3. SURFACE FINISHING GRATING : HOT DIP GALVANIZED ASTM (A123)
4. SURFACE FINISHING FRAME : HOT DIP GALVANIZED ASTM (A123)
5. DESIGN CONDITION LOAD : HEAVY DUTY T-25 (Parallel to main structure)
 Impact coefficient = 0.4

PROJECT TITLE		Typical_Drawing					
CHECKED BY	CHATCHAI	DETAIL GRATING FOR GUTTER				1	
DRAWN BY	THITIKORN.P	Span = 300				2	1
DATE DRAWN	27/04/2020	DDR NO.	DDR20178	JOB NO.	-	DWG. NO.	DW20178F02
REV.		REV.		REV.		REV.	

1	07/05/2020	Add Page 1/2
REV.	REV. DATE	DESCRIPTION

SCALE: NTS

1. Design Condition

Load **T-25**

Load on one rear wheel $P = 100 \text{ kN}$.
 Contact area $a \times b = 20 \text{ cm.} \times 50 \text{ cm.}$

Vehicle direction **Parallel to main structure**

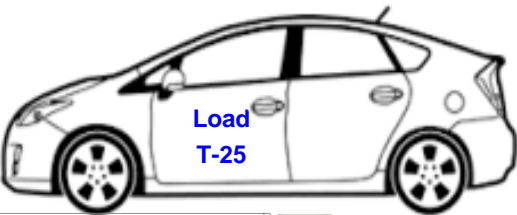
Impact coefficient $i = 0.4$

Span **$L = 30 \text{ cm.}$** ($L' = 30 \text{ cm.}$)

Allowable stress $\sigma_a = 18 \text{ kN/cm}^2$ **18**

Allowable bending $\delta/L = 1 / 300$

← Input



Parallel to main structure

2. Grating, Cressection performance

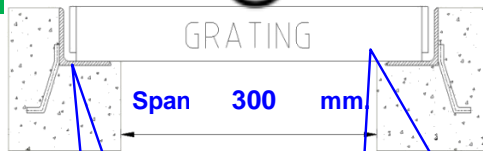
Main structure **FB55x6**

Pitch (p) = **3.53 cm.**

Cross-sectional performance, others
 • Geometrical moment of iner $I = 8.319 \text{ cm}^4/\text{piece}$

• Section modulus $Z = 3.02 \text{ cm}^3/\text{piece}$

• Young's modulus $E = 20000 \text{ kN/cm}^2$



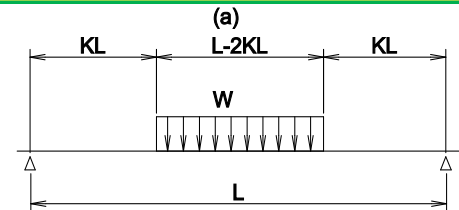
Frame

Grating : **FB55x6**
 BB Pitch : **35.3 mm.**

3. Load, Bending moment

3.1 Loading form

$$K = \frac{L - a}{2L} = \frac{30 - 20}{2 \times 30} = 0.167$$



3.2 Load (per unit area : kN/cm2)

$$w = \frac{P(1+i)}{a b} = \frac{100 \times (1 + 0.4)}{20 \times 50} = 0.14$$

3.3 Load (main structure per one : kN)

$$W = w p (L - 2KL) = 0.14 \times 3.53 \times (30 - 2 \times 0.167 \times 30) = 9.9$$

3.4 Bending moment (: kN · cm)

$$M = \frac{W(L + 2KL)}{8} = \frac{9.9 \times (30 + 2 \times 0.167 \times 30)}{8} = 49$$

4. Stress

$$\sigma = \frac{M}{Z} = \frac{49}{3.02}$$

$$= 16.35 \text{ kN/cm}^2 \leq \sigma_a \text{ kN/cm}^2 \quad \text{O.K.}$$

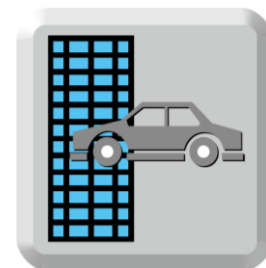
5. Bending (Deflection)

$$\delta = \frac{W L^3 (1 + 2K) (5 - 4K^2)}{384 E I}$$

$$= \frac{9.9 \times 30^3 \times (1 + 2 \times 0.167) \times (5 - 4 \times 0.167^2)}{384 \times 20000 \times 8.319}$$

$$= 0.0272 \text{ cm.}$$

$$\delta/L = 1 / 1103 \leq 1 / 300 \quad \text{O.K.}$$



Parallel to main structure