

- NOTE**
- TYPE OF GRATING : RFB85x6 BBP=35.3 , TB6x6 TBP=100
END PLATE : FB80x6
 - TYPE OF FRAME : PL-96x60x6t (Bending Type)
 - SURFACE FINISHING GRATING : HOT DIP GALVANIZED ASTM (A123)
 - SURFACE FINISHING FRAME : HOT DIP GALVANIZED ASTM (A123)
 - DESIGN CONDITION LOAD : HEAVY DUTY T-20 (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 = 700			2	1			
DATE DRAWN	24/04/2020	DDR NO.	DDR20177	JOB NO.	-	DWG.NO.	DW20177F06	REV.	0
1	06/05/2020	Add Page 1/2		SCALE	NTS		DAIKURE (THAILAND) CO. , LTD.		
REV.	REV.DATE	DESCRIPTION							

1. Design Condition

Load **T-20**

Load on one rear wheel $P = 80 \text{ kN}$.
 Contact area $a \times b = 20 \text{ cm.} \times 50 \text{ cm.}$

Vehicle direction **Parallel to main structure**

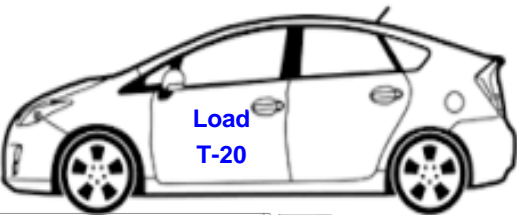
Impact coefficient $i = 0.4$

Span **$L = 70 \text{ cm.}$** ($L' = 70 \text{ cm.}$)

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

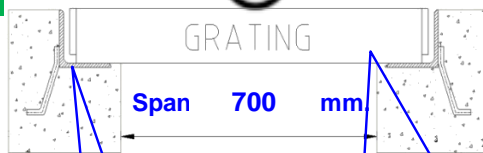
Main structure **FB85x6**

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

Cross-sectional performance, others • Geometrical moment of iner $I = 30.71 \text{ cm}^4/\text{piece}$

• Section modulus $Z = 7.23 \text{ cm}^3/\text{piece}$

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



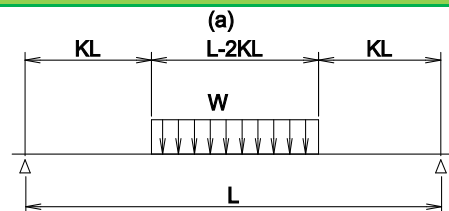
Frame

Grating : **FB85x6**
 BB Pitch : **35.3 mm.**

3. Load, Bending moment

3.1 Loading form

$$K = \frac{L - a}{2L} = \frac{70 - 20}{2 \times 70} = 0.357$$



3.2 Load (per unit area : kN/cm²)

$$w = \frac{P(1+i)}{a b} = \frac{80 \times (1+0.4)}{20 \times 50} = 0.112$$

3.3 Load (main structure per one : kN)

$$W = w p (L - 2KL) = 0.112 \times 3.53 \times (70 - 2 \times 0.357 \times 70) = 7.9$$

3.4 Bending moment (: kN · cm)

$$M = \frac{W(L + 2KL)}{8} = \frac{7.9 \times (70 + 2 \times 0.357 \times 70)}{8} = 119$$

4. Stress

$$\sigma = \frac{M}{Z} = \frac{119}{7.225} = 16.44 \text{ kN/cm}^2 \leq \sigma_a \text{ kN/cm}^2$$

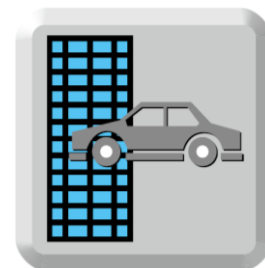
O.K.

5. Bending (Deflection)

$$\delta = \frac{W L^3 (1 + 2K) (5 - 4K^2)}{384 E I} = \frac{7.9 \times 70^3 \times (1 + 2 \times 0.357) \times (5 - 4 \times 0.357^2)}{384 \times 20000 \times 30.706} = 0.0887 \text{ cm.}$$

$$\delta/L = 1 / 789 \leq 1 / 300$$

O.K.



Parallel to main structure