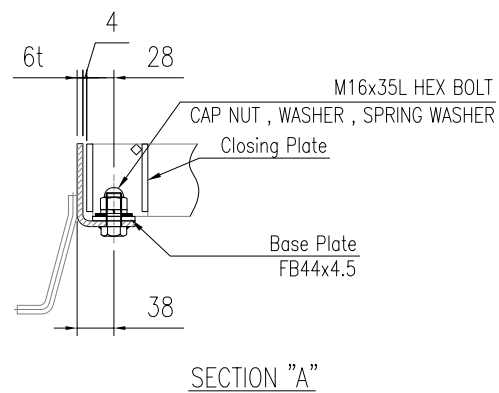
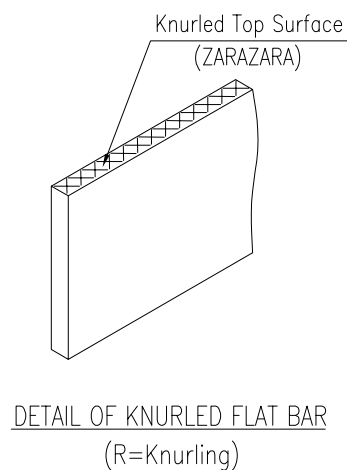


DETAIL GRATING FOR GUTTER SPAN 200 MM.
(Q'TY 1 SET.)



NOTE

1. TYPE OF GRATING : RFB32x5 BBP=35.3 , TB6x6 TBP=100
END PLATE : FB25x6
2. TYPE OF FRAME : PL-43x60x6t (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-14 (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 = 200				2	1
DATE DRAWN	23/04/2020	DDR NO.	DDR20176	JOB NO.	-	DWG. NO.	DW20176F01
REV.		REV. DATE		DESCRIPTION	SCALE	NTS	REV. 0

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

1. Design Condition

Load T-14

Load on one rear wheel $P = 56 \text{ kN}$.
 Contact area $a \times b = 20 \text{ cm.} \times 50 \text{ cm.}$

Vehicle direction Parallel to main structure

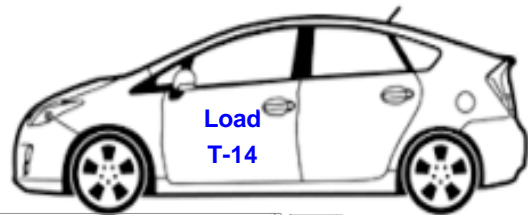
Impact coefficient $i = 0.4$

Span $L = 20 \text{ cm.}$ ($L' = 20 \text{ cm.}$)

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

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

← *Input*



2. Grating, Cressection performance

Main structure FB32x5

Pitch (p) = 3.53 cm.

Cross-sectional performance, others • Geometrical moment of iner
 $I = 1.365 \text{ cm}^4/\text{piece}$

• Section modulus
 $Z = 0.85 \text{ cm}^3/\text{piece}$

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

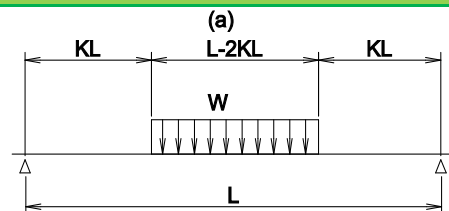


**Grating : FB32x5
 BB Pitch : 35.3 mm.**

3. Load, Bending moment

3.1 Loading form

$$K = \frac{L - a}{2L} = \frac{20 - 20}{2 \times 20} = 0.000$$



3.2 Load (per unit area : kN/cm2)

$$w = \frac{P(1+i)}{a b} = \frac{56 \times (1 + 0.4)}{20 \times 50} = 0.0784$$

3.3 Load (main structure per one : kN)

$$W = w p (L - 2KL) = 0.0784 \times 3.53 \times (20 - 2 \times 0 \times 20) = 5.5$$

3.4 Bending moment (: kN · cm)

$$M = \frac{W(L + 2KL)}{8} = \frac{5.5 \times (20 + 2 \times 0 \times 20)}{8} = 14$$

4. Stress

$$\sigma = \frac{M}{Z} = \frac{14}{0.85}$$

$$= 16.29 \text{ kN/cm}^2 \leq \sigma_a \text{ kN/cm}^2 \quad \text{O.K.}$$

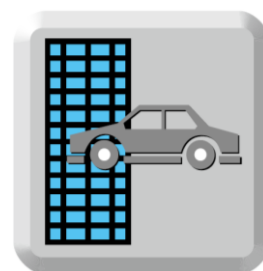
5. Bending (Deflection)

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

$$= \frac{5.5 \times 20^3 \times (1 + 2 \times 0) \times (5 - 4 \times 0^2)}{384 \times 20000 \times 1.365}$$

$$= 0.0211 \text{ cm.}$$

$$\delta/L = 1 / 948 \leq 1 / 300 \quad \text{O.K.}$$



Parallel to main structure