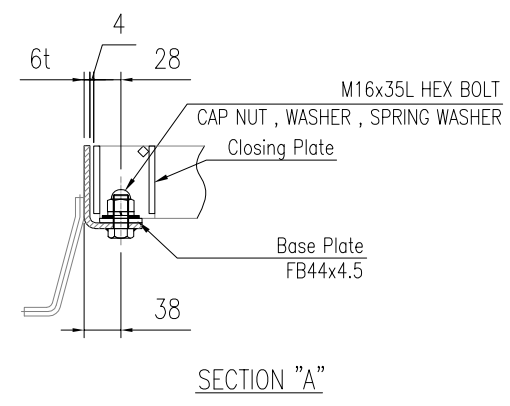
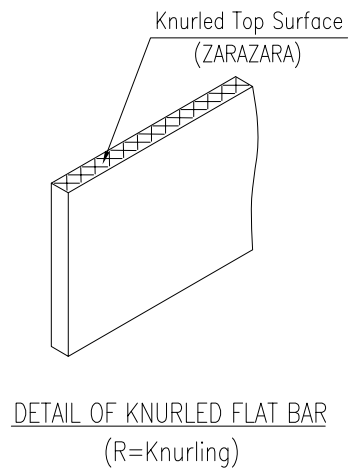


DETAIL GRATING FOR GUTTER SPAN 900 MM.  
(Q'TY 1 SET.)



- NOTE**
- TYPE OF GRATING : RFB95x6 BBP=35.3 , TB7x7 TBP=100  
END PLATE : FB85x6
  - TYPE OF FRAME : PL-106x60x6t (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 = 900				2	1
DATE DRAWN	24/04/2020	DDR NO.	DDR20177	JOB NO.	-	DWG.NO.	DW20177F08
REV.	REV.DATE	DESCRIPTION					
1	06/05/2020	Add Page 1/2					
SCALE	NTS						

**Grating,Strength calculation**

**1. Design Condition**

← Input

**Load T-20**

Load on one rear wheel P = 80 kN.  
Contact area a x b = 20 cm. x 50 cm.

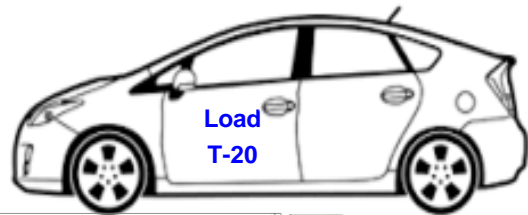
**Vehicle direction Parallel to main structure**

Impact coefficient i = 0.4

**Span L = 90 cm. (L' = 90 cm.)**

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

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



**2. Grating, Cressection performance**

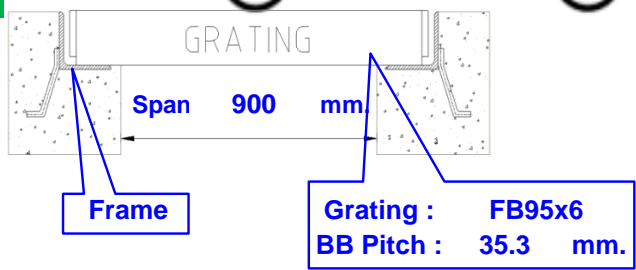
**Main structure FB95x6**

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

Cross-sectional performance, others • Geometrical moment of iner  
 $I = 42.869 \text{ cm}^4/\text{piece}$

• Section modulus  
 $Z = 9.025 \text{ cm}^3/\text{piece}$

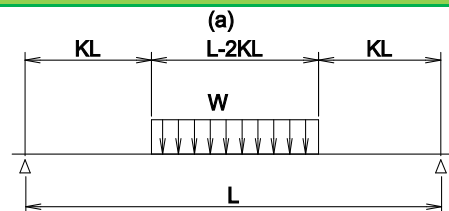
• Young's modulus  
 $E = 20000 \text{ kN/cm}^2$



**3. Load, Bending moment**

**3.1 Loading form**

$$K = \frac{L - a}{2L} = \frac{90 - 20}{2 \times 90} = 0.389$$



**3.2 Load (per unit area : kN/cm2)**

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

**3.3 Load (main structure per one : kN)**

$$W = w p (L - 2KL) = 0.112 \times 3.53 \times (90 - 2 \times 0.389 \times 90) = 7.9$$

**3.4 Bending moment (: kN · cm)**

$$M = \frac{W(L + 2KL)}{8} = \frac{7.9 \times (90 + 2 \times 0.389 \times 90)}{8} = 158$$

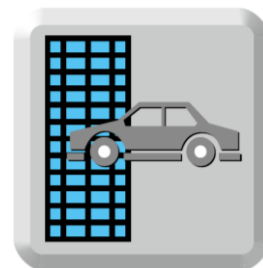
**4. Stress**

$$\sigma = \frac{M}{Z} = \frac{158}{9.025} = 17.51 \text{ kN/cm}^2 \leq \sigma_a \text{ kN/cm}^2 \text{ O.K.}$$

**5. Bending (Deflection)**

$$\delta = \frac{W L^3 (1 + 2K) (5 - 4K^2)}{384 E I} = \frac{7.9 \times 90^3 \times (1 + 2 \times 0.389) \times (5 - 4 \times 0.389^2)}{384 \times 20000 \times 42.869} = 0.1367 \text{ cm.}$$

$$\delta/L = 1 / 658 \leq 1 / 300 \text{ O.K.}$$



Parallel to main structure