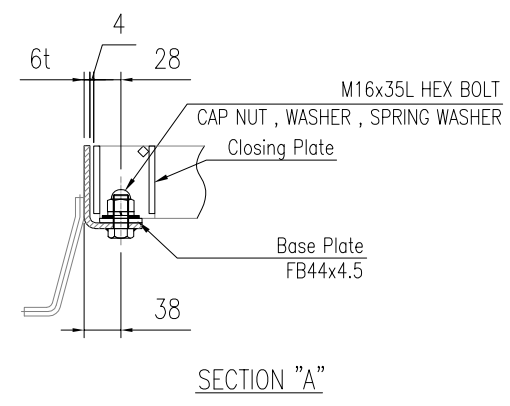
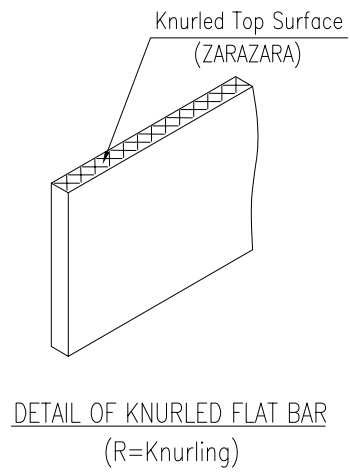


DETAIL GRATING FOR GUTTER SPAN 500 MM.
(Q'TY 1 SET.)



- NOTE**
- TYPE OF GRATING : RFB70x6 BBP=35.3 , TB6x6 TBP=100
END PLATE : FB65x6
 - TYPE OF FRAME : PL-81x60x6t (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

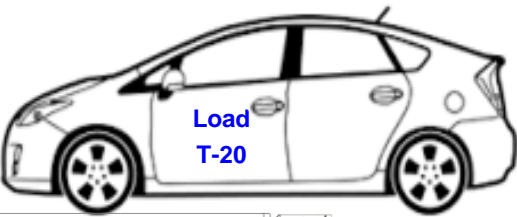
PROJECT TITLE		Typical_Drawing					
CHECKED BY	CHATCHAI	DETAIL GRATING FOR GUTTER				1	
DRAWN BY	THITIKORN.P	Span = 500				2	1
DATE DRAWN	24/04/2020	DDR NO.	DDR20177	JOB NO.	-	DWG.NO.	DW20177F04
REV.		REV. DATE		DESCRIPTION	SCALE	NTS	REV.
1	06/05/2020	Add Page 1/2					

Grating,Strength calculation

1. Design Condition

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 = 50 cm. (L' = 50 cm.)**
 Allowable stress $\sigma_a = 18 \text{ kN/cm}^2$ **18**
 Allowable bending $\delta/L = 1 / 300$

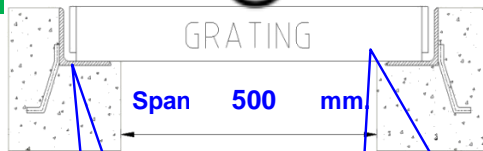
← *Input*



Parallel to main structure

2. Grating, Cressection performance

Main structure **FB70x6**
Pitch (p) = **3.53 cm.**
 Cross-sectional performance, others
 • Geometrical moment of iner $I = 17.15 \text{ cm}^4/\text{piece}$
 • Section modulus $Z = 4.9 \text{ cm}^3/\text{piece}$
 • Young's modulus $E = 20000 \text{ kN/cm}^2$



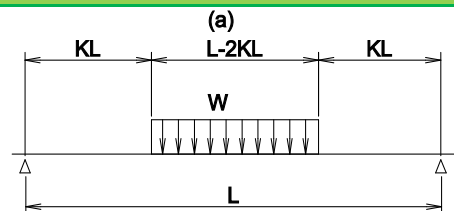
Frame

Grating : **FB70x6**
 BB Pitch : **35.3 mm.**

3. Load, Bending moment

3.1 Loading form

$$K = \frac{L - a}{2L} = \frac{50 - 20}{2 \times 50} = 0.300$$



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)

$$W = w p (L - 2KL) = 0.112 \times 3.53 \times (50 - 2 \times 0.3 \times 50) = 7.9$$

3.4 Bending moment (: kN · cm)

$$M = \frac{W(L + 2KL)}{8} = \frac{7.9 \times (50 + 2 \times 0.3 \times 50)}{8} = 79$$

4. Stress

$$\sigma = \frac{M}{Z} = \frac{79}{4.9} = 16.14 \text{ kN/cm}^2 \leq \sigma_a \text{ kN/cm}^2$$

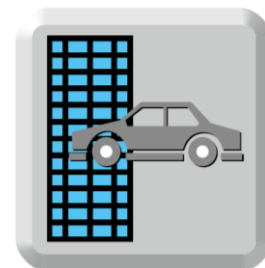
O.K.

5. Bending (Deflection)

$$\delta = \frac{W L^3 (1 + 2K) (5 - 4K^2)}{384 E I} = \frac{7.9 \times 50^3 \times (1 + 2 \times 0.3) \times (5 - 4 \times 0.3^2)}{384 \times 20000 \times 17.15} = 0.0557 \text{ cm.}$$

$$\delta/L = 1 / 898 \leq 1 / 300$$

O.K.



Parallel to main structure