

NOTE

1. TYPE OF GRATING : RFB65x6 BBP=35.3 , TB6x6 TBP=100
END PLATE : FB55x6
2. TYPE OF FRAME : PL-76x60x6t (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 = 400 | | | | 2 | 1 |
| DATE DRAWN | 27/04/2020 | DDR NO. | DDR20178 | JOB NO. | - | DWG. NO. | DW20178F03 |
| REV. | | REV. | | | | | |

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

SCALE

NTS



DAIKURE (THAILAND) CO. , LTD.

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

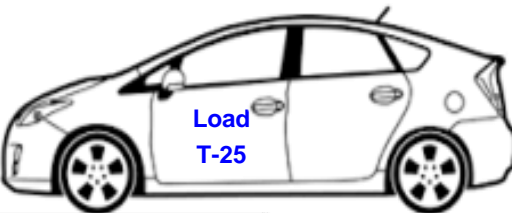
Impact coefficient $i = 0.4$

Span $L = 40 \text{ cm.}$ ($L' = 40 \text{ cm.}$)

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

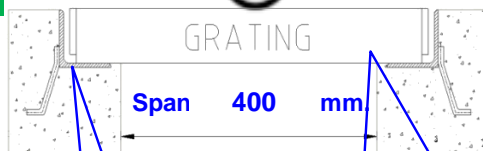
Main structure FB65x6

Pitch (p) = 3.53 cm.

Cross-sectional performance, others
 • Geometrical moment of iner $I = 13.731 \text{ cm}^4/\text{piece}$

• Section modulus $Z = 4.22 \text{ cm}^3/\text{piece}$

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



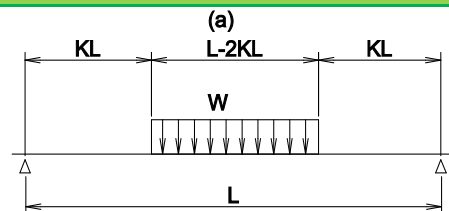
Frame

Grating : **FB65x6**
 BB Pitch : **35.3 mm.**

3. Load, Bending moment

3.1 Loading form

$$K = \frac{L - a}{2L} = \frac{40 - 20}{2 \times 40} = 0.250$$



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)

$$W = w p (L - 2 K L) = 0.14 \times 3.53 \times (40 - 2 \times 0.25 \times 40) = 9.9$$

3.4 Bending moment (: kN · cm)

$$M = \frac{W(L + 2 K L)}{8} = \frac{9.9 \times (40 + 2 \times 0.25 \times 40)}{8} = 74$$

4. Stress

$$\sigma = \frac{M}{Z} = \frac{74}{4.22}$$

$$= 17.56 \text{ kN/cm}^2 \leq \sigma_a \text{ kN/cm}^2 \quad \text{O.K.}$$

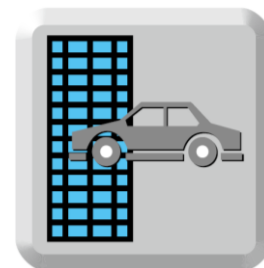
5. Bending (Deflection)

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

$$= \frac{9.9 \times 40^3 \times (1 + 2 \times 0.25) \times (5 - 4 \times 0.25^2)}{384 \times 20000 \times 13.731}$$

$$= 0.0427 \text{ cm.}$$

$$\delta/L = 1 / 937 \leq 1 / 300 \quad \text{O.K.}$$



Parallel to main structure