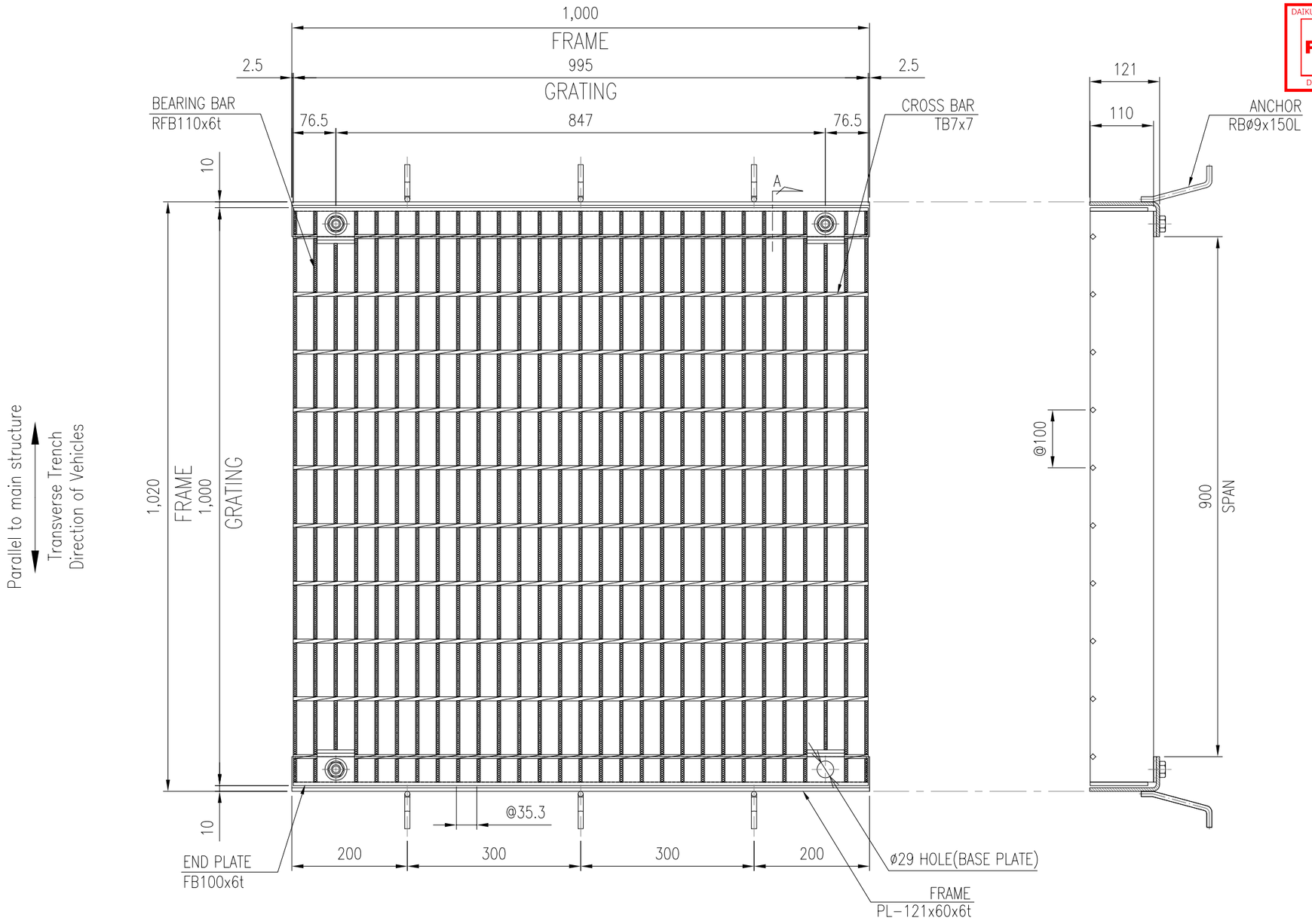
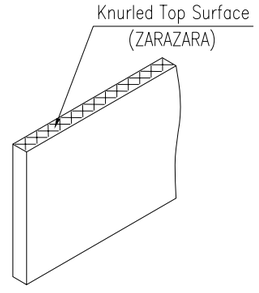
DAIKURE (THAILAND) CO.,LTD. REVISED DESIGN DEPARTMENT

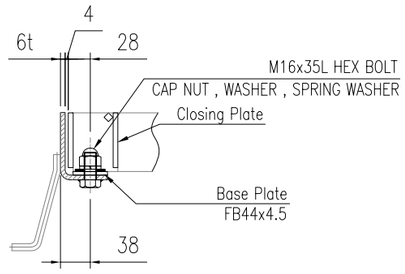
DAIKURE (THAILAND) CO.,LTD. APPROVED DESIGN DEPARTMENT



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



DETAIL OF KNURLED FLAT BAR
(R=Knurling)



SECTION "A"

NOTE

1.TYPE OF GRATING : RFB110x6 BBP=35.3 , TB7x7 TBP=100
END PLATE : FB100x6

2. TYPE OF FRAME : PL-121x60x6t (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 Span = 900						1/2	1
DRAWN BY	THITIKORN.P								
DATE DRAWN	27/04/2020	DDR NO.	DDR20178	JOB NO.	-	DWG.NO.	DW20178F08	REV.	0

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

SCALE NTS

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Grating,Strength calculation

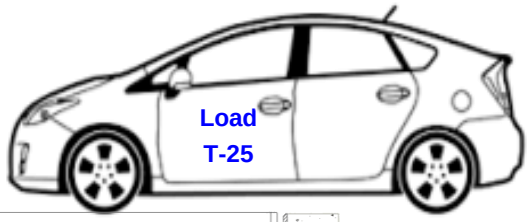
DDR20178 DAIKURE
20102-08 Revision : 00
Issued Date : 23-04-2020
Revised Date : -

1. Design Condition

← *Input*

Load			**T-25**				
Load on one rear whee	P	=	100	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	σ_a	=	18	kN / cm^2		18	
Allowable bending	δ/L	=	1	/ 300			

Parallel to main structure

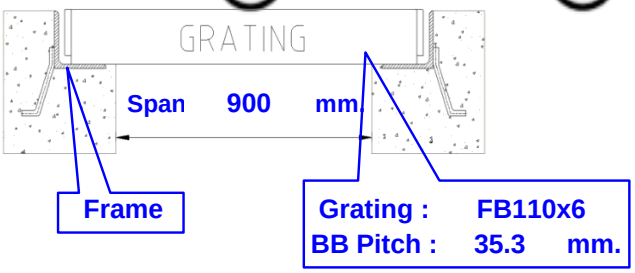


2. Grating, Cressection performance

Main structure **FB110x6**
Pitch (p) = 3.53 cm.

Cross-sectional performance,others

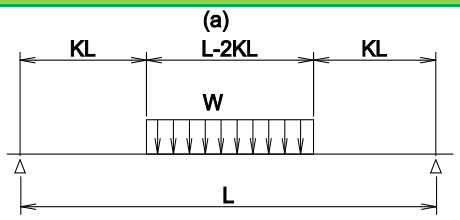
- Geometrical moment of iner
  I = 66.55 cm^4/piece
- Section modulus
  Z = 12.1 cm^3/piece
- Young's modulus
  E = 20000 kN / cm^2



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）

$$w = \frac{P(1+i)}{ab} = \frac{100 \times (1 + 0.4)}{20 \times 50} = 0.14$$

3.3 Load（main structure per one ：kN）

$$W = w\,p\,(L - 2KL) = 0.14 \times 3.53 \times (90 - 2 \times 0.389 \times 90) = 9.9$$

3.4 Bending moment (: kN・cm)

$$M = \frac{W(L + 2KL)}{8} = \frac{9.9 \times (90 + 2 \times 0.389 \times 90)}{8} = 197$$

4. Stress

$$\sigma = \frac{M}{Z} = \frac{197}{12.1}$$

$= 16.32$ kN / cm^2 ≦ σ_a kN / cm^2 **O.K.**

5. Bending (Deflection)

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

$$= \frac{9.9 \times 90^3 \times (1 + 2 \times 0.389) \times (5 - 4 \times 0.389^2)}{384 \times 20000 \times 66.55}$$

$= 0.1100$ cm.

δ/L = 1 / 818 ≦ 1 / 300 **O.K.**

Parallel to main structure