

## STEEL STRUCTURE ENGINEERING

### ANCHOR BOLT REQUIRED BURIED LENGTH

**INPUT DATA**    PGM RUN    V1.2

* Item Name	E-1004	* Description	PES21
* Concrete COmpressive Strength, Cc	210	Kg/cm <sup>2</sup> * Bolting Factor, C	1.4
Bolt Size	M24x3	Bolt Glade	F10T

#### RESULT OF CALCULATION

1. 체결토크, Ta=0.35*k (1+1/Q)*As*d	86.4	Kg-cm	2. 내력, σy=	112.0	Kgf/mm <sup>2</sup>
3. 체결축력, Ft=0.7*σy*As	27,679.7	Kgf	4. Required Buried Length, L1=(2*Ft/(π *Cy)*0.5	290	mm

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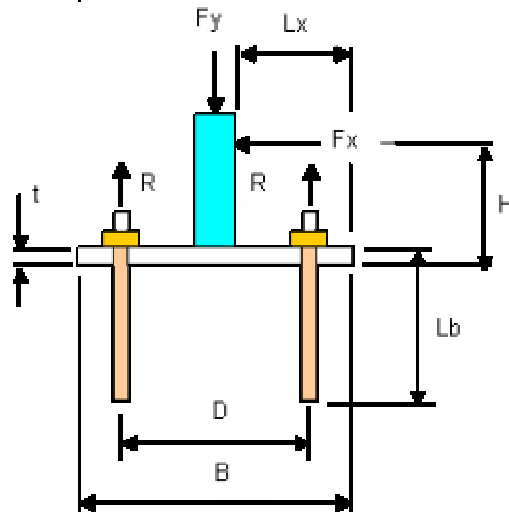
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## STEEL STRUCTURE ENGINEERING

### ANCHOR BOLT REQUIRED BURIED LENGTH, $L \leq 400\text{mm}$

**INPUT DATA**    PGM RUN    V1.0

* Item Name	E-1004	* Description	PES21
** Base plate allowable stress, Sa	1160	Kg/cm <sup>2</sup>	* Base plate width, B
			300
			mm
* Anchor distance, D	200	mm	* Support center to base bottom, H
			300
			mm
* Base plate length, A	500	mm	* Horizontal Load, Fx
			700
			Kgf
* Vertical load, Fy	1000	Kgf	* Moment arm on base plate, Lx
			130
			mm
* Factor, f=ly/lx	0.5		* Concrete compressive strength, Fc
			210
			Kg/cm <sup>2</sup>
* Bolt Size	M16x2		



### RESULT OF CALCULATION

* Anchor force, $R=3/2 \cdot F_x \cdot H/D$	1,575	Kgf	* Load on base plate, $Q=F_x/2+R$	1,925	Kgf
* Unit load on base plate, $u=Q/(A \cdot B/2)$	2.57	Kg/cm <sup>2</sup>	* Bending moment per unit load, $M=u \cdot L_x^2 \cdot f$	217	Kgf
* Base plate thickness, $t=(M \cdot 6/S_a)^{0.5}$	10.6	mm	* Anchor Axial strength, $bc=4 \cdot F_c/100, < 9 \text{Kg/cm}^2$	9.0	Kg/cm <sup>2</sup>
* Anchor bolt length, $L_b=R/bc \cdot \pi \cdot d$	348	mm			

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## STEEL STRUCTURE ENGINEERING

### ANCHOR BOLT REQUIRED EMBED LENGTH

**INPUT DATA**    PGM RUN    V1.0

* Item Name	E-1004		* Description	PES21
* Concrete COmpressive Strength, Cc	24	Mpa	* Safety Factor, k	3
* Bolt Size	M24x3	<input checked="" type="radio"/>	* Bolt Glade	SS400

#### RESULT OF CALCULATION

1. 볼트단면적, A	452	mm <sup>2</sup>	2. 볼트 최대축 력 Ft = σ <sub>u</sub> * A	18,086.4	Kgf
3. 볼트원주길이, R	75.4	mm	4. 매설 유효 길 이, Le = A * c / R	100	mm
5. 응력비, c = σ <sub>1</sub> / σ <sub>2</sub>	16.7		6. 문함 요구 길 이, L = Le * k	300	mm

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## STEEL STRUCTURE ENGINEERING

ANCHOR BOLT 요구 매입 길이

**INPUT DATA** PGM RUN **V1.0**

* ITEM NO	E-1004		* DESCRIPTION	pes21
* 볼트 규격	24	M	* 볼트허용 응력, $\sigma_a$	1000      kgf/cm <sup>2</sup>
* 볼트 재질	A307-B		* 콘크리트압축강도, $\sigma_c$	210      kgf/cm <sup>2</sup>

### RESULT OF CALCULATION

* 앵카볼트 단면적, A	3.5	cm <sup>2</sup>	* 앵카볼트 허용 인장력, $T = A_s * \sigma_a$	3,461.9	kgf
* 콘크리트 부착응력, $\tau_a = 0.64 \sqrt{\sigma_c} * 1.2$	11.1	Kgf/cm <sup>2</sup>	* 앵카볼트 매입길이, $L = T / \pi * D * \tau_a$	472	mm

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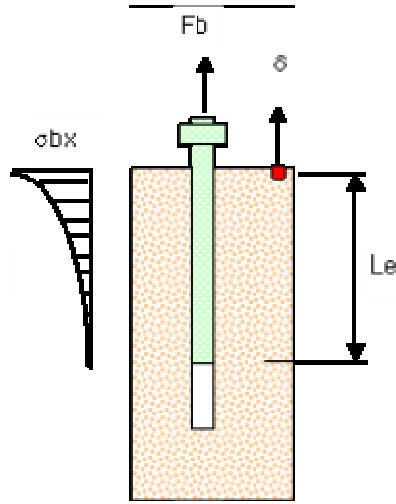
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## STRUCTURE ENGINEERING

### ANCHOR BOLT DEFORMATION

**INPUT DATA** PGM RUN **V1.0**

* Item Name	<input type="text" value="E-1004"/>	* Description	<input type="text" value="PES21"/>
<b>DESIGN DATA</b>			
* Bolt force, Fb	<input type="text" value="2000"/> Kgf	* Embedded length, Le	<input type="text" value="200"/> mm
* Bolt Diameter, d	<input type="text" value="24"/> mm	* Modulus of Elasticity, E	<input type="text" value="20389"/> Kg/mm <sup>2</sup>



#### RESULT OF CALCULATION

* Bolt sectional Area, As	<input type="text" value="452.4"/> mm <sup>2</sup>	* Deformation, $\delta = Fb \cdot Le / E \cdot As$	<input type="text" value="0.0434"/> mm
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# STEEL STRUCTURE ENGINEERING

## STD ANCHOR BOLT EMBEDDED LENGTH

**INPUT DATA** PGM RUN **V1.0**

* ITEM NO	E-1004	* DESCRIPTION	pes21
		* Bolt size	1"

Based on ACI , committee 530 on Masonary Structure, assumed ASTM A36, Yield stress=36ksi, Concrete compression strength=2,000 psi, Edge distance=12 Bolt Diameter

### RESULT OF SEARCH

* Cross-Sectional Area	506	mm^2	* Embedded Depth	178	mm
* Allowable Shear load	998	Kgf			

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