FILE No. FK-06

上海浦東国際空港詳細設計調査
航空給油施設

最終報告書
資料編

タンク基礎計算書

平成 年 月

国際協力事業団

改訂	日付	頁	摘要

SHANGHAI PUDONG INTERNATINAL AIRPORT

T-201~208 TANK.

FOUNDATION.

1. 概要

1. 本計画検討計算書は SHANHAI PUDONG INTERNATIONAL AIRPORT の T-701～708 TANK基礎に適用する。

2. 準拠基準

基礎の設計は 屋外タンク貯蔵所基礎の規制基準 及び 日本土木学会, 日本建築学会, その他関連する規準等に準拠する。

3. 基礎概要

1). 今回建設する基礎は, コンクリートリングを用いた砕石基礎とし, コンクリートリング内部・下部・外部を所定の砕石転圧基礎を築造する

2). 基礎の表面はアスファルトコンクリート敷き転圧とし, 厚さ50mm以上とする。

3). 支持地盤はセメント深層混合攪拌工法
又はバイブロフローテーション工法による
地盤改良を行う。

4. 屋外タンク貯蔵所基礎の規制基準による検討.

(盛り土)

砕石リングの天端の側板からタンク内側までの距離

$l = 3.0^{m} \geqq 2.0^{m}$ OK.

リング高さ

$h = 3.5^{m} \geqq 2.0^{m}$ OK

リング直下及び砕石リングの平板載荷試験値

$K_{30} \geqq 20\ kg/cm^{3}$ OK.

以外の基礎部

$K_{30} \geqq 10\ kg/cm^{3}$ OK

リングの天端幅 $50^{cm} \geqq 40^{cm}$ OK

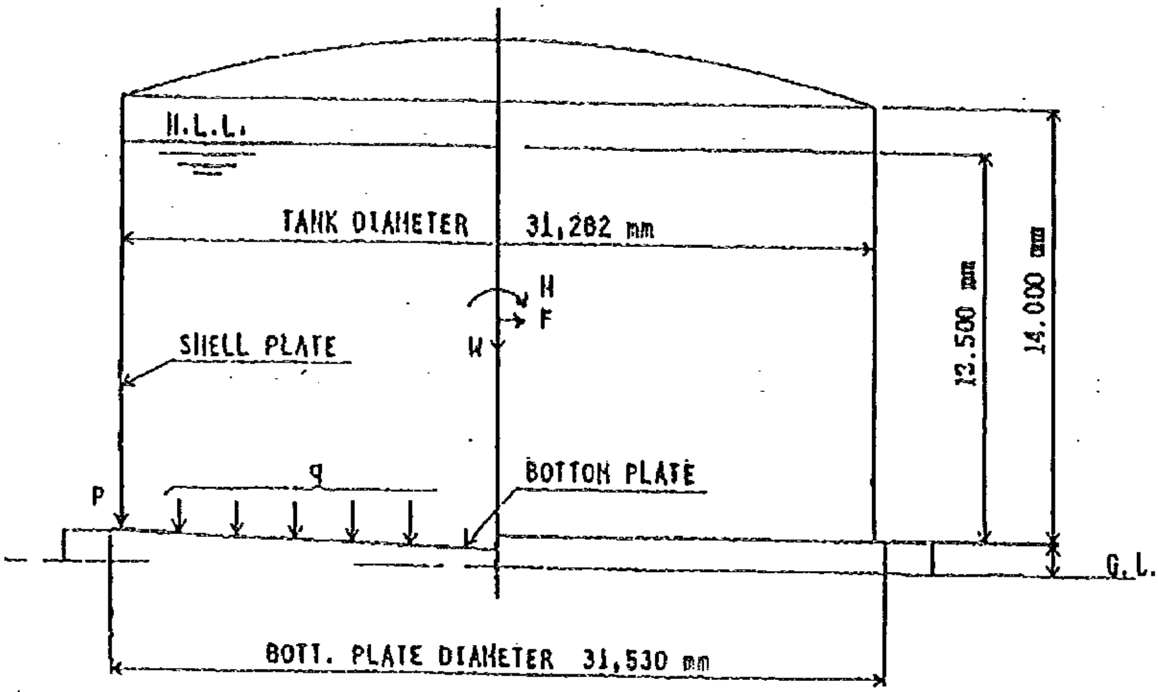
リングの根入深さ $2.0^{m} \geqq 1.3^{m}$ OK
地表面高

犬走りの勾配 1/10 OK

犬走りの幅 $2.0^{m} > 1.5^{m}$ OK

5. LOADING DATA.

T-201 ~ 208 LOADING DATA



Notes : 1). Specific gravity of content. 1.0

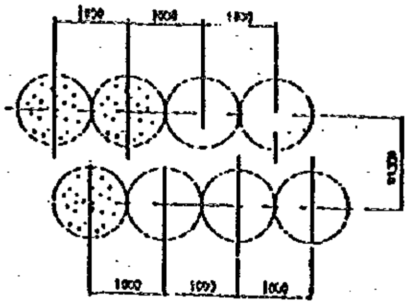
2). Seismic coefficient. kh = 0.3398 & kv = 0.1699

3). Uniform wind load. q = 0.255 t/m²

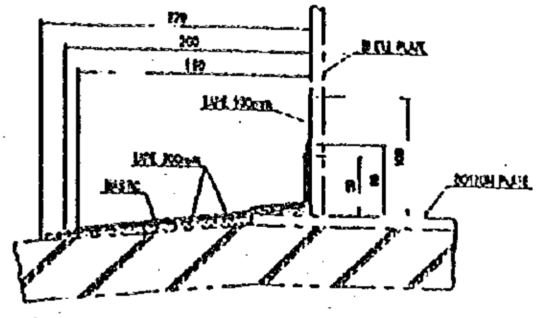
CONDITION	WEIGHT (W)	VERTICAL LOAD ON FOUNDATION		M: OVERTURNING MOMENT ON FOUNDATION	
		P:LINE LOAD	q:UNIFORM LOAD	DUE TO SEISMIC (F = 1,787 t)	DUE TO WIND (F = 86 t)
EMPTY	248 t	2.02 t/m	0.1 t/m²	---------	663 t-m
OPERATING	10,635 t	L : 2.13 t/m S :15.39 t/m	L : 13.6 t/m² S : 15.8 t/m²	20,167 t-m	663 t-m
HYD'C TEST	11,008 t	2.02 t/m	14.1 t/m²	---------	---------

6. 概念图

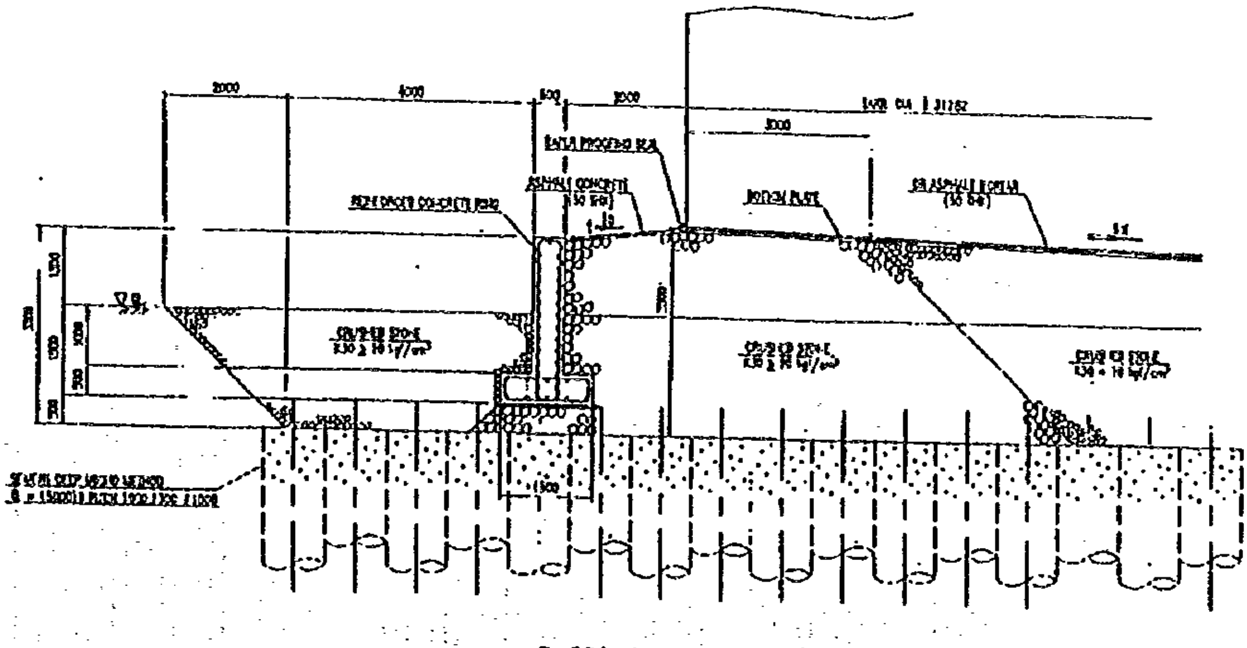
6-1. SEMENT DEEP MIXING 工法



SEMENT DEEP MIXING PLAN

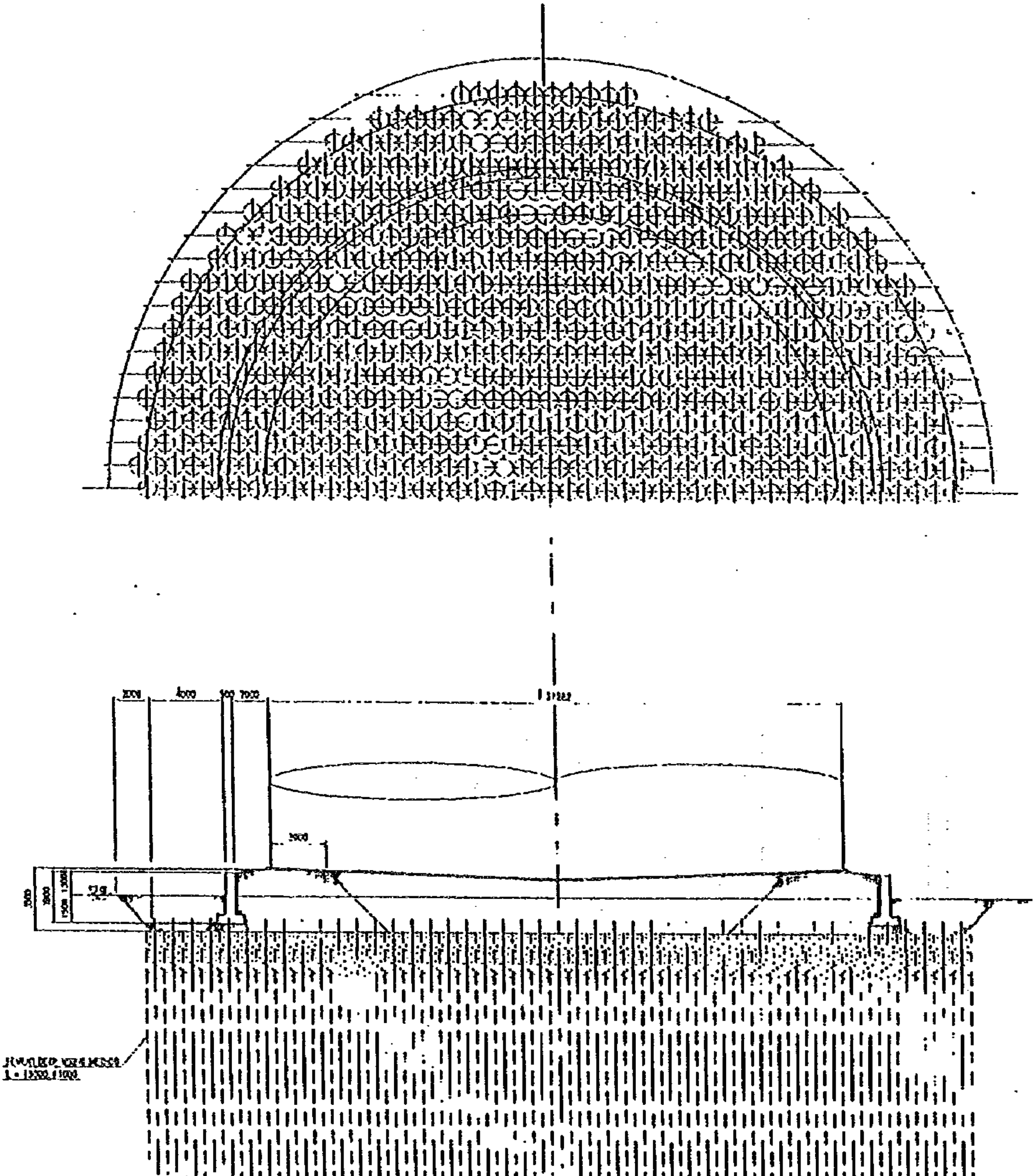


DETAIL OF WATER PROOFING SEAL



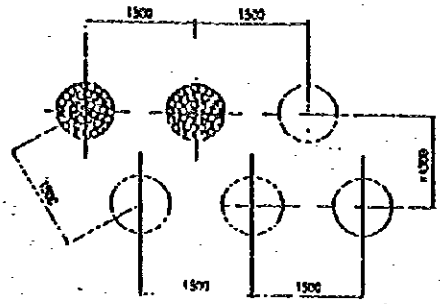
T-201~208 TANK FOUNDATION

SHANGHAI PUDONG INTERNATIONAL AIRPORT
T-201~208 TANK FOUNDATION
SCALE | DWG. FD-210
JANUARY 1997 JAPAN INTERNATIONAL COOPERATION AGENCY

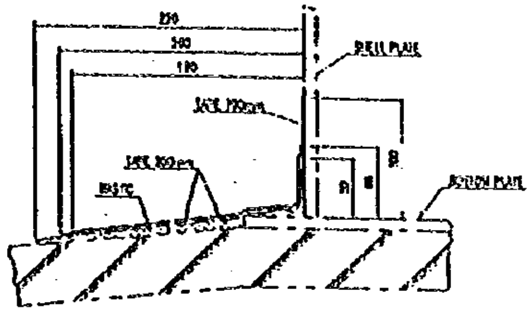


T-201~208 TANK FOUNDATION

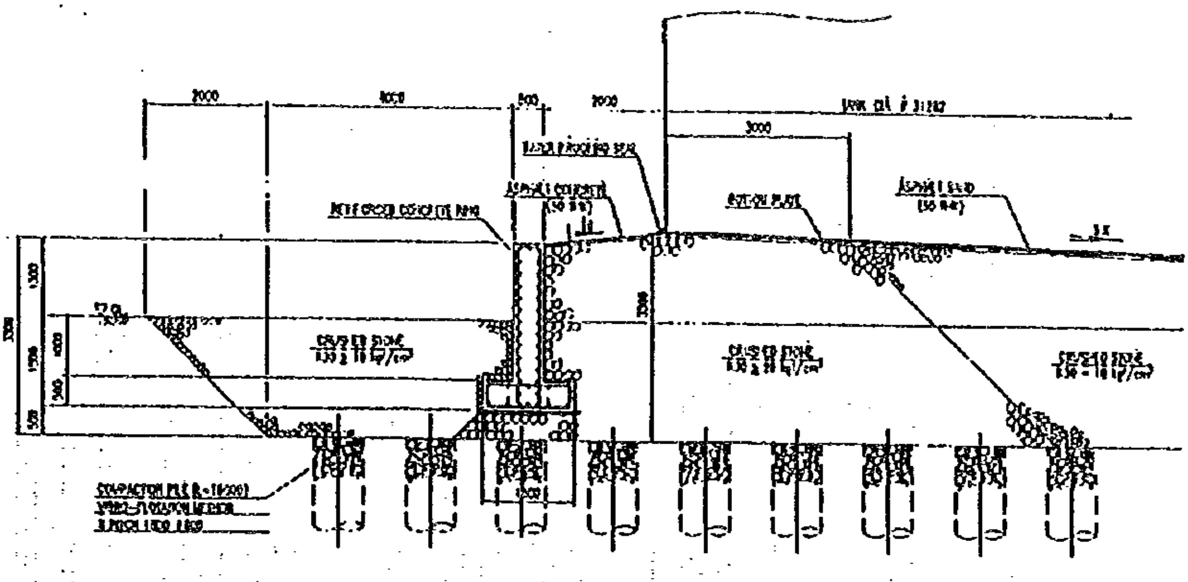
6-2. COMPACTION PILE 2:E



COMPACTION PILE PLAN

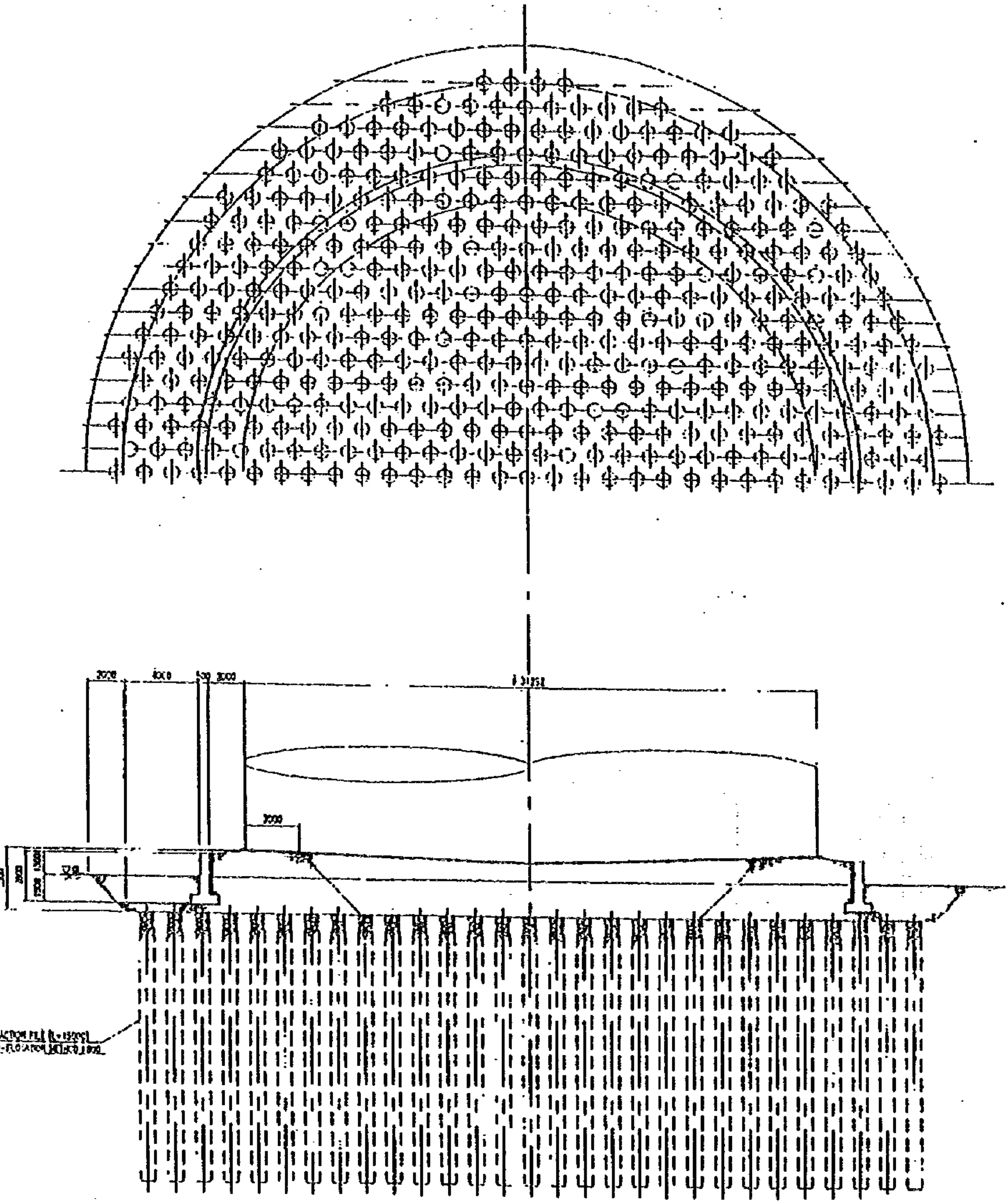


DETAIL OF WATER PROOFING SEAL



T-201~208 TANK FOUNDATION

SHANGHAI PUDONG INTERNATIONAL AIRPORT
T-201~208 TANK FOUNDATION
SCALE / DWG. FD-24A
JANUARY 1997 JAPAN INTERNATIONAL COOPERATION AGENCY

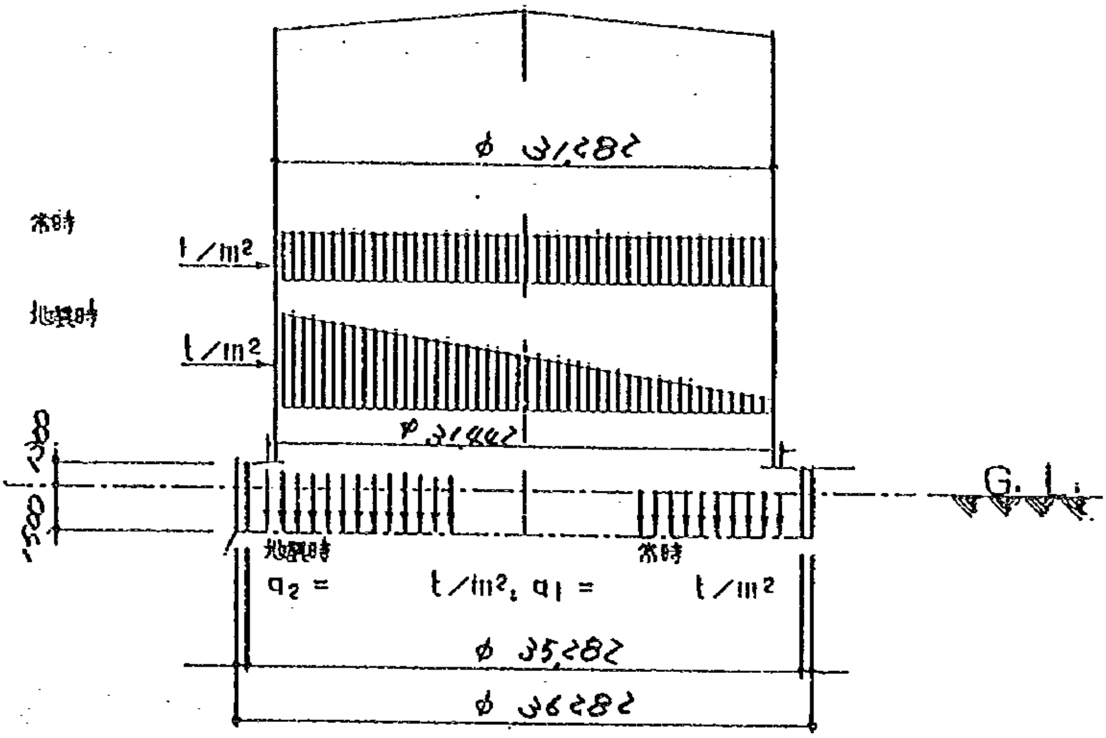


T-201~208 TANK FOUNDATION

7. 地盤の支持力の計算

$$q_{d1} = 1.3C \cdot N_c + 0.3\gamma_1 \cdot B \cdot N_r + \gamma_2 \cdot D_f \cdot N_q$$

安全率　常時 3　地震時 2



q_{d1}は、地盤の極限支持力 (t/m²)
q_{dl}は、局部的地盤の極限支持力 (t/m²)
Cは、粘着力 (t/m²)
N_c、N_q及びN_rは、支持力係数（右の図により土の内部摩擦角からそれぞれ求める値）
γ_1及びγ_2は、それぞれ根入の下方及び上方の土の有効単位体積重量 (t/m³)
Bは、特定屋外貯蔵タンクの直径 (m)
D_fは、地表面からの根入深さ (m)

改良地盤の許容支持力

平均 $\bar{N} = 25$ …… 砕石転圧締固め、仮定値。

内部摩擦角：ϕ

$\phi = \sqrt{N \cdot 15} + 15^\circ$ …… 設計用

$\phi = \sqrt{25 \times 15} + 15^\circ = 34.3 \longrightarrow 34^\circ$

支持力係数グラフより

$N_r = 16$

$N_q = 22$

土の粘着力 $C = 0$,

$B = 31.382^m$ タンク直径

$\gamma_1 = 1.0\ t/m^3$ 水中での土の単位体積重量

$\gamma_2 = 1.9\ t/m^3$, $D_f = 3.3^m$ 根入深さ

$q_{d1} = 1.3C \cdot N_c + 0.3 \cdot \gamma_1 \cdot B \cdot N_r + \gamma_2 \cdot D_f \cdot N_q$

$= 0 + 0.3 \times 1.0 \times 31.382 \times 16 + 1.9 \times 3.3 \times 22$

$= 150 + 138 = 288\ t/m^2$

D_f を無視した場合（根入深さを無視）

$q_{d1} = 150\ t/m^2$ 地盤の極限支持力

砕石基礎重量

$$W_F = 35.28^2 \times \frac{\pi}{4} \times 3.3 \times 1.9 = 6126^t$$

コンクリートリング基礎重量

$$W_R = 35.78 \times \pi \times 0.5 \times 2.8 \times 2.5 = 393^t$$

$$65.19^t$$

常時 : q_L

$$q_1 = 13.6 \ t/m^2$$

$$q_2 = \frac{6519}{36.28^2 \times \pi/4} = 6.31 \ t/m^2$$

$$q_3 = \frac{2.13}{3.5 \times 1.0} = 0.61 \ t/m^2$$

GL-2.0 m

$q_L = 20.52 \ t/m^2$

地盤改良後の地盤の支持力

常時 安全率 3

設計用

$$q_L = \frac{q_{d1}}{3} = \frac{150}{3} = 50 \ t/m^2 \rightarrow 30 \ t/m^2$$

地震時 安全率 2

$$q_S = \frac{q_{d1}}{2} = \frac{150}{2} = 75 \ t/m^2 \rightarrow 45 \ t/m^2$$

地震時

$$q_1 = 20.31 \times \frac{31.442^2}{36.282^2} = 15.25 \ t/m^2$$

$$q_2 = 6.31 \ t/m^2$$

$$q_3 = 15.39 \times \frac{1}{3.5 \times 1.0} = 4.4 \ t/m^2$$

$$q_s = q_1 + q_2 + q_3 = 15.25 + 6.31 + 4.4$$
$$= 25.96 \ t/m^2$$

地盤の支持力の検討

常時 $q_L = 20.52 \ t/m^2 < 30 \ t/m^2$ OK

地震時
$q_s = 25.96 \ t/m^2 < 45 \ t/m^2$ OK

8. コンクリートリングの計算

タンク荷重　（鉛直力）

タンク計算によるローデング

常時鉛直力　　　$W = 10{,}635\ \mathrm{t}$

地震時

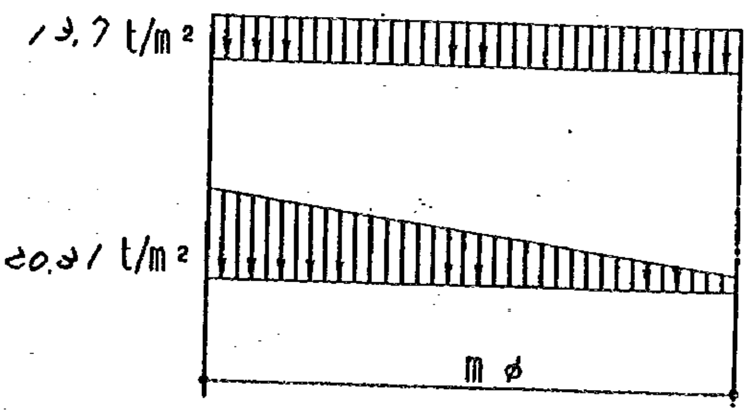
$M = 20{,}167\ \mathrm{tm}$

$$p_1 = \frac{M}{\pi \cdot R^3 / 4} = \frac{20167}{\pi \times 15.721^3 / 4} = 6.61\ \mathrm{t/m^2}$$

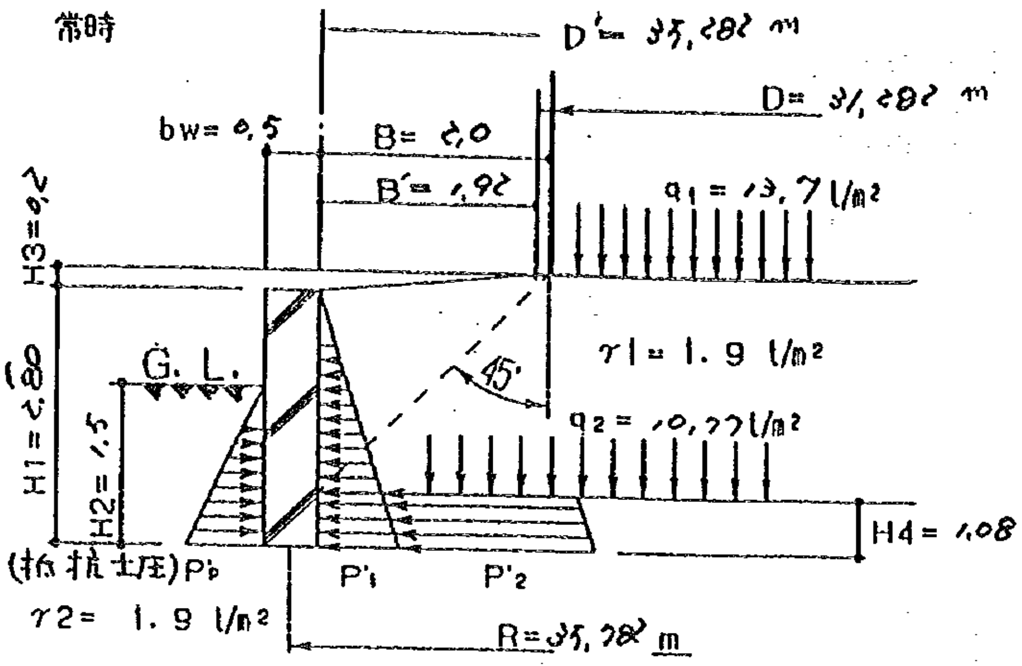
$$p_2 = \frac{W}{\pi \cdot R^2} = \frac{10635}{\pi \times 15.721^2} = 13.7\ \mathrm{t/m^2}$$

常時

地震時



常時



P'1 =H1*γ1*Ko= 2.8 × 1.9 × 0.5 = 2.66 t/m²

P'p =H2*γ2*Ko= 1.5 × 1.9 × 0.5 = 1.43 t/m²

$$q_2 = \frac{q_1 * D^2}{(D+2B')^2} = \frac{13.7 \times 31.282^2}{35.282^2} = 10.77 \ t/m^2$$

H4=H1+H3-B'/tan45° = 2.8 + 0.2 - 1.92/1 = 1.08 m

P'2 = 10.77 × 0.5 = 5.38

Pp =1/2*P'p *H2= 0.5 × 1.43 × 1.5 = 1.07 t/m

P1 =1/2*P'1 *H1= 0.5 × 2.66 × 2.8 = 3.73 t/m

P2 =P'2 *H4= 5.38 × 1.08 = 5.81 t/m

リングに作用する全荷重 P.

P=P1 +P2 -P'p = 3.73 + 5.81 − 1.07 = 8.47 t/m.

鉄筋は. SD295A を使用する. σsa=1800 kg/cm² ×0.8 → 1440 kg/cm²

必要鉄筋量. At

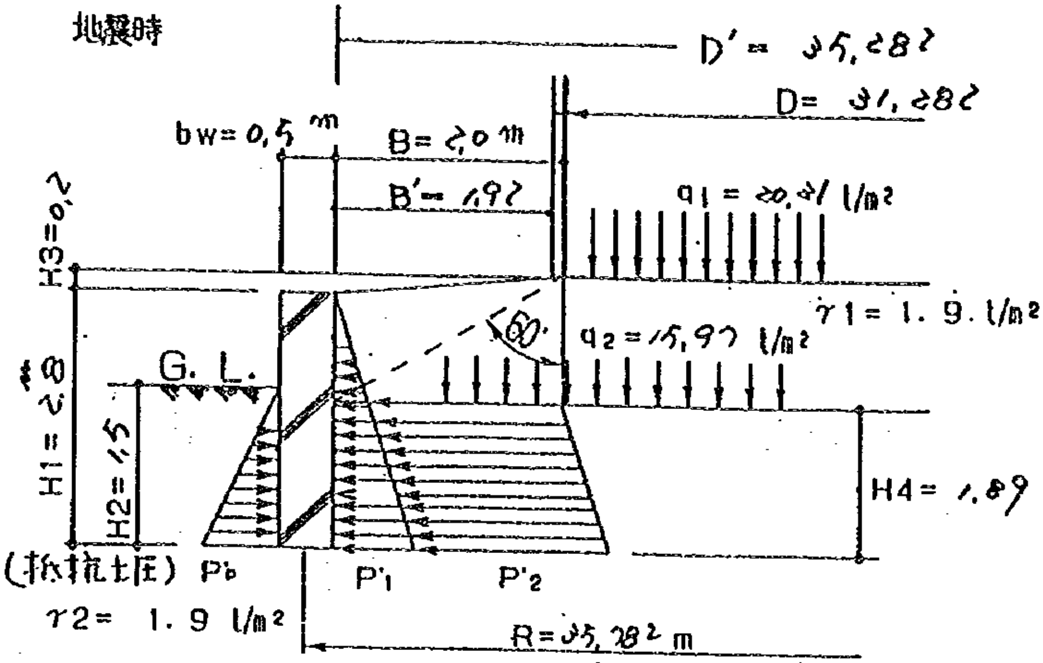
$$At = \frac{P*R}{\sigma sa} = \frac{8.47 \times 35.282}{1.44} = 210 \ cm^2 \rightarrow 248.3 \ cm^2$$

(64-D22)

鉄筋の存在応力. σt

$$\sigma t = \frac{P*R}{At} = \frac{8.47 \times 35.282 \times 1000}{248.3} = 1221 \ kg/cm^2$$

地震時



$P'_1 = H * \gamma_1 * K_0 =$ 2,8 × 1,9 × 0,5 = 2,66 t/m²

$P'_p = H * \gamma_2 * K_0 =$ 1,5 × 1,9 × 0,5 = 1,43 t/m²

$$q_2 = \frac{q_1 * D^2}{(D+2B')^2} = \frac{20{,}31 \times 31{,}282^2}{35{,}282^2} = 15{,}97 \ \text{t/m}^2$$

$H4 = H1 + H3 - B'/\tan 60° =$ 3,0 − 1,92/1,732 = 1,89

$P'_2 =$ 15,97 × 0,5 = 7,99 t/m²

$P_p = 1/2 * P'_p * H2 =$ 0,5×1,43×1,5 = 1,07 t/m

$P_1 = 1/2 * P'_1 * H1 =$ 0,5×2,66×2,8 = 3,73 t/m

$P_2 = P'_2 * H4 =$ 7,99×1,89 = 15,1 t/m

リングに作用する全荷重 P.

$P = P_1 + P_2 - P_p =$ 3,73+15,1−1,07 = 17,76 t/m

鉄筋は、SD295A を使用する。 σsa=1800 kg/cm²

必要鉄筋量. At

$$At = \frac{P*R}{\sigma sa} = \frac{17{,}76 \times 35{,}282}{2{,}7} = 235{,}37 \ \text{cm}^2 \longrightarrow 248.3 \ \text{cm}^2$$

(64−D22)

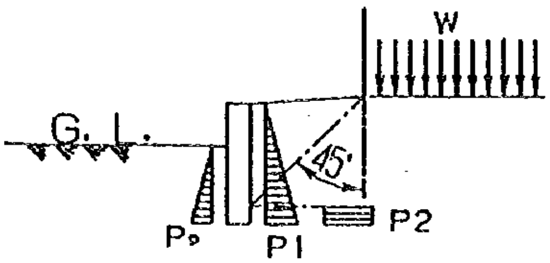
鉄筋の存在応力. σt

$$\sigma t = \frac{P*R}{At} = \frac{17{,}76 \times 35{,}282 \times 1000}{248{,}3} = 2560 \ \text{kg/cm}^2$$

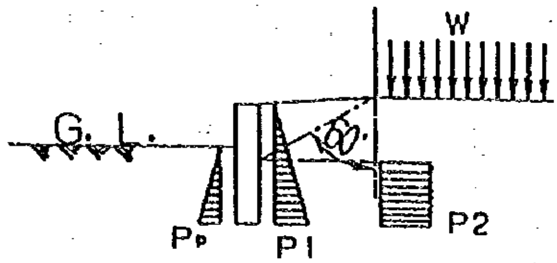
鉄筋コンクリートリングの計算

円周方向引張り力計算のまとめ

〔常 時〕



（地震時）



		常時	地震時
タンク荷重分布角度		45°	60°
タンク荷重	W	13.7 t/m²	20.31 t/m²
主働土圧係数	Ko	0.50	0.50
リングに作用する側圧	P1	3.73 t/m	3.73 t/m
リングに作用する側圧	Pp	1.07 t/m	1.07 t/m
タンク荷重による側圧	P2	5.81 t/m	15.1 t/m
合計側圧	P	8.47 t/m	17.76 t/m
円周方向引張り力	T	303 t	635 t
鉄筋量 (SD295A)		248.3 cm²	248.3 cm²
鉄筋の応力度	σt	1221 kg/cm²	2560 kg/cm²
鉄筋の許容応力度	σsa	1800x0.8 =1440 kg/cm²	1800x1.5 =2700 kg/cm²

8. 杭体の検討

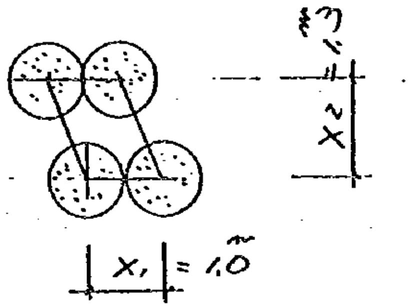
CEMENT DEEP MIXING

杭式改良地盤

改良率：a_p

$$a_p = \frac{A_p}{x_1 \cdot x_2}$$

A_p：杭体1本の改良面積



$$A_p = \frac{1.0^2 \times \pi}{4} = 0.785^{m^2}$$

$$a_p = \frac{0.785}{1.0 \times 1.3} = 0.6 \quad > 0.5 \quad \text{OK.}$$

改良幅：$B > \frac{D}{2}$

$D = 15^m$　改良深さ

直径 44^m　$A_円 = \frac{44^2 \times \pi}{4} = 1520^{m^2}$

正方形に置換

$$B = \sqrt{1520} = 39^m$$

改良深さ

$$\therefore B = 19^m > \frac{15}{2} = 7.5^m \quad \text{OK}$$

$$\frac{B}{D} = \frac{19}{15} = 1.26$$

実績範囲 OK.

改良地盤の平均せん断強度

$$\bar{\tau} = \alpha_p \cdot C_p = \alpha_p \cdot \left(\frac{q_{uck}}{2} \right)$$

C_p：杭体のせん断強度

q_{uck}：杭体の設計基準強度

q_{uck} ：1.0〜4.0 kg/cm^2 の範囲が望ましいことより設計用として 3.0 を採用

$$\bar{\tau} = 0.6 \times \left(\frac{3.0}{2} \right) = 0.9 \ kg/cm^2$$

すべり破壊の検討

改良地盤の許容せん断応力度は一般的に大故省略.

杭体の検討

σ_{uck}：杭体の設計基準強度

$$\sigma_{uck} = 3.0\ kg/cm^2$$

Fs：安全率

$$w_1 = 1.9 \times 1.3 = 2.47\ t/m^2$$

$$w_2 = 13.6\ t/m^2 \times \frac{31.28^2}{35.28^2} = 10.7\ t/m^2$$

} 13.2 t/m^2 ↓ 1.32 kg/cm^2

$$\gamma_E \cdot H_E = 1.32\ kg/cm^2$$

$$\alpha_p = 0.6$$

$$Fs = \frac{\sigma_{uck}}{(\gamma_E \cdot H_E / \alpha_p)} = \frac{3.0}{(1.32/0.6)}$$

$$= 1.36 > 1.0 \quad OK$$

Shanghai Pudong International Airport
Fuel Storage Depot
Design Calculation Sheet of
$10000M^3$ Cone Bottom Tank

I、The Specification and Standard for Calculation

1、Design specification for petrochemical vertical cyclinder steel welding storage tank (SH3046-92)

2、Specification for load of constracture (GBJ9-8T)

3、It will be fortified that the earthquake is of 7 magnitude in shanghai area.

II、Calculation Parameter of Oil Storage Tank

Spherical Roof R=37.272m

see Figure-1.

III、Design of Shell Thickness

The design thickness on each course of the tank shell filled with water shall be determined as follows:

$$t = 4.9\frac{(H-0.3)D}{[\sigma]\varphi} + C_1$$

where:

H —Vertial height form the bottom of shell to the top of, (m)

D = 31.12 (M) (inside diameter of oil storage tank)

[σ] = 157 (MPa) (allowable stress of steel plate)

φ = 0.9 (weld line factor)

Calculated results are listed as follows:

Height of shell on each course (m)	Calculation thickness ofshell on each course (mm)	C_1 (mm)	Design specified thickness on each course (mm)
H_1=14.04	t_1=15.63	0.8	18
H_2=12.45	t_2=13.91	0.8	16
H_3=10.90	t_3=12.24	0.8	14
H_4=9.35	t_4=10.56	0.8	12
H_5=7.80	t_5=8.89	0.8	10
H_6=6.24	t_6=6.91	0.8	8
H_7=4.68	t_7=5.23	0.5	7
H_8=3.12	t_8=3.54	0.5	7
H_9=1.56	t_9=1.86	0.5	7

IV、Design of the tank bottom

The thickness of the tank bottom shall be in conformity with the structure requirement.

1、The specification thickness of medium-sige steel plate shall be in accordance with table 4.1.1 .

It should not be less than 6mm, the account for the corrosion allowance 1mm.

It shall not be less than 7mm. This design is used for cone medium-sige plate with the thickness of 10mm.

2、The thickness of the bottom plate shall be in accordance with the figure 4.1.2.

It should not be less than 6 mm, the account for the corrosion allowance 1mm, it should not be less than 9 mm.

This design is used for cone tank with the bottom plate of 12mm in thickness.

V 、Design of Tank Roof

1、Calculation parameter of tank roof

sketch for the tank roof calculation see Figure - 2.

The δ of specification thickness of roof plate is 6mm, it account for the corrosion allowance 1mm, the δ of calculation thickness is 5mm.

where: R =37.272m

the max. distance of radial girder and longitudial girder is L_1 and L_2 equal to 1374mm.

the max. distance of radial girder and longitudial girder is b_1 and b_2 equal to 10mm.

2、External pressure calculation of tank roof:

$q_E=q_1+q_2=637+1200=1837(Pa)$

$q_1=\frac{4846.2}{\pi R^2}(kgf/M^2)=637Pa$ (cause by the sole weight of the tank roof with 48462kg)

$q_2=1200Pa=120Kgf/m^2$

3、Allowable external pressure calculation

$$[P]=0.1E\left(\frac{t_m}{R}\right)^2\sqrt{\frac{t_e}{t_m}}$$

$E=210\times10^3$ (MPa) (modulus of elasticity for steel)

$R=37.272$ (m)

$t_e=5$ (mm) (roof thickness from calculation)

$$t_m=\sqrt[3]{\frac{t_{1m}^3+2t_e^3+t_{2m}^3}{4}}$$

$h_1=h_2=60(mm)$

see Figure - 3.

$$Z_x=\frac{60\times10\times30+1374\times5\times62.5}{60\times10+1375\times5}=59.9\ mm$$

$e_1=e_2=2.6$ mm (distance between combination section of the girder and the roof plate and intermedia section of the roof plate)

$$n_1=1+\frac{b_1h_1}{t_el_1}=1+\frac{10\times60}{5\times1374}=1.087$$

$n_2 = n_1 = 1.087$

$$t_{1m}^3 = 12[\frac{h_1 b_1}{l_1}(\frac{h_1^2}{3} + \frac{h_1 t_1}{2} + \frac{t_e^2}{4}) + \frac{t_e^3}{12} - n_1 t_e e_1^2]$$

$$= 12[\frac{60 \times 10}{1374}(\frac{60^2}{3} + \frac{60 \times 5}{2} + \frac{5^2}{4}) + \frac{5^3}{12} - 1.087 \times 5 \times 2.6^2]$$

$= 6791.1\ mm^3$

$t_{2m}^3 = t_{1m}^3 = 6791.1\ mm^3$

then: $$t_m = \sqrt[3]{\frac{t_{1m}^3 + 2t_e^3 + t_{2m}^3}{4}} = \sqrt[3]{\frac{6791.1 + 2 \times 5^3 + 6791.1}{4}} = 15.122\ mm$$

$$[p] = 0.1 \times E(\frac{t_m}{R})^2(\frac{t_e}{t_m})^{1/2} = 0.1 \times 210 \times 10^3 \times (\frac{15.122}{37.272})^2(\frac{5}{15.122})^{1/2}$$

$= 1988\ Pa$

the external pressure of tank roof: $q_E = 1837\ Pa$

$q_E < [p]$ (1837 Pa<1988 Pa)

Conclusion: Regarding above calculation, the tank roof has been proved that it is safe and stability. (The calculation is based on δ of roof equal to 5mm, and the sole weight calculation is base on δ equal to 6mm)

Ⅵ、Seismic Calculation:

1、Check the calculation of the overturning moment due to seismic force applies to the bottom of oil storage in accordance with the specification for the seismic design of petrochemical steel equipment (SH3048—93)

The FH of the lateral earthquake force of the oil storage shall be determined as follows:

$F_H = K_z \alpha m_e g$

$H_w = 14.04$ (height form the bottom of the tank shell to the liquid level, in m)

$R = 15.56$ m (inside radius of the tank)

$m = 780 \times 10^4$ kg (weight of the content of the tank)

$$\frac{H_w}{R} = \frac{14.04}{15.56} = 0.9 < 1.5$$

The ϕ of the moving content coefficient shall be determined as follows:

$$\phi = \frac{tgh(\sqrt{3}\frac{R}{H_w})}{\frac{\sqrt{3}R}{H_w}} = \frac{tgh(\sqrt{3}\frac{15.56}{14.04})}{\frac{\sqrt{3} \times 15.56}{14.04}} = 0.50$$

$m_e = m\phi = 780 \times 10^4 \times 0.50 = 390 \times 10^4$ kg

$g = 9.8\ m/s^2$

from Figure 4.3.2, $k_z = 0.40$

According to the earthquake of 7 magnitude, soil condition at site of Ⅱ level and Tg equal to 0.30, from Figure 4.3.1:

$\alpha = \alpha_{max} = 0.23$

$F_H = K_z \alpha m_e g = 0.40 \times 0.23 \times 390 \times 10^4 \times 9.8 = 3516240$ (N)

The M_1 of the overturning moment due to the lateral earthquake force applies to the bottom of the tank shell shall be determined as follows :

$M_1 = 0.45 F_H H_w = 0.45 \times 3516240 \times 14.04 = 22215604$ (N.m)

The M_0 of the resisting overturning moment generated from the tank and the content shall be determined as follows :

$F = 780 \times 10^4$(weight of the content)$+22.7 \times 10^4 = 802.7 \times 10^4$ (kg)

$F = 8027 \times 10^4$(N)

$M_0 = FR = 8027 \times 10^4 \times 15.56 = 1249001200$ (N.m)

$M_1 < M_0$ $(22215604 < 1249001200)$

Conclusion: Due to M_1 far less than M_0, the tank is safe.

2、Seismic Calculation of the shell:

(1) The F_t of the uplift force applies by per unit length of the tank bottom shall be determined as follows :

$$F_t = \frac{4M_1}{D_1^2 \pi} = \frac{4 \times 22215604}{14.04^2 \pi} = 143494 \text{ (N/m)}$$

(2) The F_L of the resisting uplight force applied by per unit length of the tank bottom shall be determined as follows :

$$F_L = 99 \delta_b \sqrt{\sigma_Y H_w \gamma_s} + \frac{N_1}{\pi D_1}$$

where: $\delta_b = 0.012$ m

$\sigma_Y = 235$ MPa $= 235 \times 10^6$ (Pa) —(the yield point of the bottom plate)

$\gamma_s = 0.78$ (specific gravity of the content of the tank)

$N_1 = 0.8 \times 217 \times 10^4 = 1736 \times 10^3$ (N)

$$F_L = 99 \delta_b \sqrt{\sigma_Y H_w \gamma_s} + \frac{N_1}{\pi D_1}$$

$$= 99 \times 0.012 \sqrt{235 \times 10^6 \times 14.04 \times 0.78} + \frac{1736 \times 10^3}{\pi \times 31.12} = 78024 \text{(N/m)}$$

$$F_L < F_t < 2 F_L$$

(3) The σ_c of the longitudial stress applied by the bottom of the tank shell shall be determined as follows :

$$\sigma_c = \frac{N_1}{A_1} + i\frac{M_1}{Z_1}$$

where :

$$i = 0.4(\frac{F_t}{F_l})^2 - 0.7\frac{F_t}{F_l} + 1.3$$

$$= 0.4(\frac{143494}{78024})^2 - 0.7 \times \frac{143494}{78024} + 1.3$$

$=1.366$ (uplift coefficient of the tank bottom)

$$\sigma_c = \frac{N_1}{A_1} + i\frac{M_1}{Z_1} = \frac{1736 \times 10^3}{1.76} + 1.366 \times \frac{22215604}{13.684} = 3204028 \text{ (Pa)}$$

$A_1 = \pi D_1 \delta_1 = \pi \times 31.12 \times 0.018 = 13.684 (m^3)$ (section area of the bottom ring of the tank shell)

$Z_1 = 0.785 D_1^2 \delta 1 = 0.785 \times 31.12^2 \times 0.018 = 13.684 (m^3)$ (the resisting moment of the section area of the bottom ring of the tank shell)

(4) The σ_{cr} of the longitudial critical stress of the bottom ring of the tank shell shall be determined as follows :

$$\sigma_{cr} = K_C E \frac{\delta_1}{D_1}$$

where :

$$K_C = 0.0915(1 + 0.0429\sqrt{\frac{H}{\delta_1}})(1 - 0.1706 \times \frac{D_1}{H})$$

$$= 0.0915(1 + 0.0429\sqrt{\frac{14.04}{0.018}})(1 - 0.1706 \times \frac{31.12}{14.04}) = 0.125$$

$E = 210 \times 10^9$ (Pa)

$$\sigma_{cr} = K_C E \frac{\delta_1}{D_1} = 0.125 \times 210 \times 10^9 \times \frac{0.018}{31.12} = 15183162 \text{ (Pa)}$$

(5) The $[\sigma_{cr}]$ of the allowable critical stress of the bottom ring of the tank shell shall be determined as follows :

$$[\sigma_{cr}] = \frac{\sigma_{cr}}{1.5\eta}$$

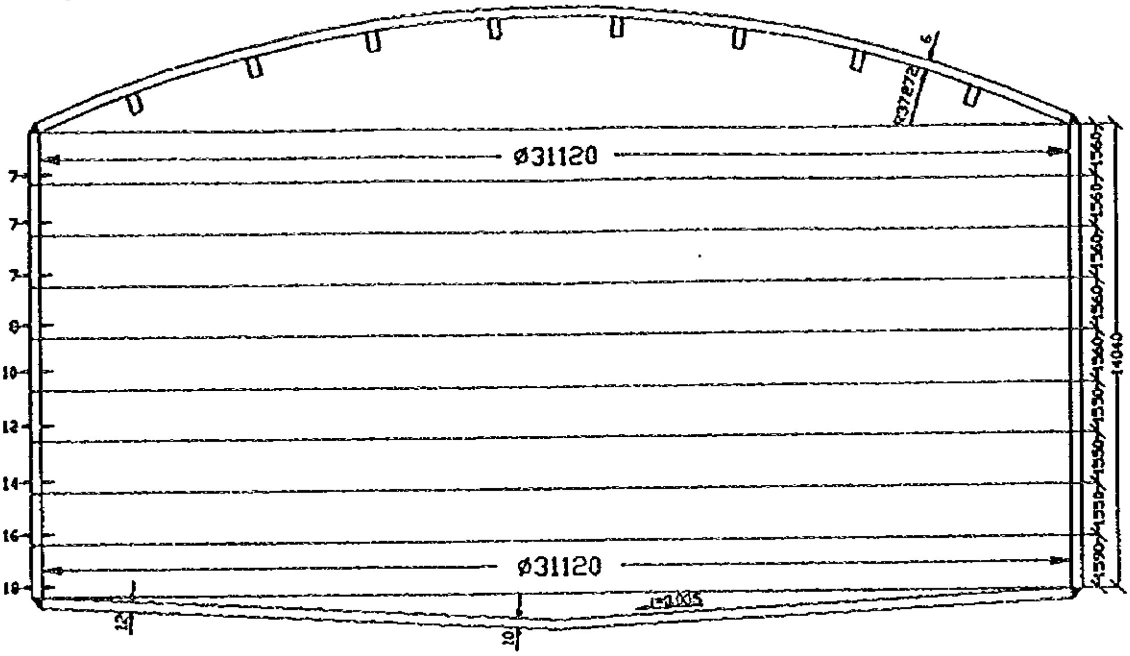
from table 4.1.2, $\eta = 1.10$ (safety factor)

$$[\sigma_{cr}] = \frac{\sigma_{cr}}{1.5\eta} = \frac{15183162}{1.5 \times 1.1} = 9201916 \text{ (Pa)}$$

Due to $\sigma_c < [\sigma_{cr}]$ {3204028<9201916(Pa)}

Conclusion : The seismic calculation of the tank shell has proved that the shell of the oil storage is safe.

Figure-1 :



Sketch for the oil storage calculation

Figure-3 :

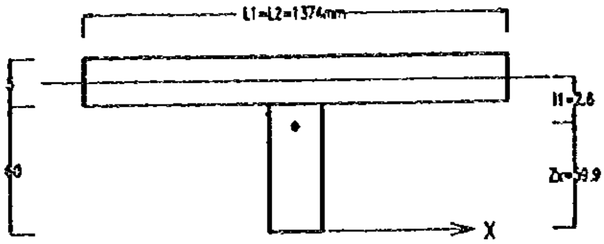
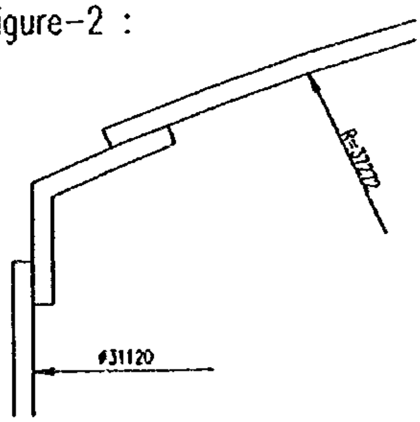
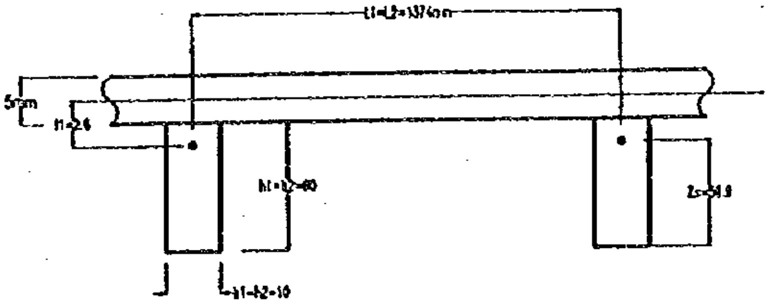


Figure-2 :





Sketch for the tank roof calculation

上海浦东国际机场使用油库

$100M^3$锥底油罐设计计算书

中国民航机场建设总公司
中国民航机场规划设计研究总院
1997.4.30

一、设计依据

1、《石油化工钢制设备抗震设计规范》（SH3048-93）.

2、《建筑结构荷载规范》（GBJ9-8T）.

3、上海地区地震裂度按7度设防.

二、罐体计算参数

罐体计算简图见附图一

1、 D=5.8m

2、 Hw=4.91m　　Hw'=7.962m

3、 m=131258Kg（装水重）　m'=102381（装航煤储液质量）

4、 $F_{自重}$=88270(N)—空罐自重

三、校核地震作用对储罐底面的倾倒力矩:

按《石油化工钢制设备抗震设计规范》（SH3048--93）进验算，储罐的水平地震作用力 F_H.

$F_H=K_Z \alpha m_e g$

Hw/R=4.91/2.9=1.7>1.5

Kz 一综合影响系数

α 一水平地震影响系数

m_e 一等效质量（Kg）

m 一储液质量

Ø一动液系数

Ø一 1-0.4357R/Hw=1-0.4357X2.9/4.91=0.74266

m_e=Øm=0.74266X102381=76034Kg

查表 4.3.2 得 Kz=0.45

α 按地震烈度 7 度，场地类别Ⅱ， Tg=0.30 查图 4.2.1

得$\alpha=\alpha_{max}=0.23$

$g=9.8m/s^2$

$F_H=K_Z\alpha m_e g=0.45X0.23X76034X9.8=77121(N)$

水平地震作用对储罐底面的倾倒力矩 M_1

$M_1=0.45F_H H_W=0.45X77121X7.962=276317(N.m)$

油罐和储液产生的稳定力矩（抗倾倒力矩） Mo

F=102381(油重）+8827(罐自重)=111208Kg=1112080N

$M_o=FR=1112080X2.9=3225032(N.m)$

$M_o>M_1$

结论:Mo 远远大于 M1，地震作用下油罐不会倾倒，安全.

四、罐壁抗震验算（同上按 SH3048 — 93 验算)

1、罐底周边单位长度上的提离力 Ft

$F_t=4M_1/\pi D^2=4X276317/\pi X5.8^2=10458(N/m)$

2、罐底周边单位长

度上的提离反抗力 F_L

$F_L=99\delta b\sqrt{\sigma_y H_w \rho_s}+N_1/\pi D_1$

$\delta_b=0.012m$

$\sigma_y=235MPa=235X10^6$ (Pa)

$H_w=4.91m$

$\rho_s=0.78$(航煤比重)

$N_1=0.8X88270=70616(N)$

$D_1=5.8m$

$F_L=99\delta_b\sqrt{\sigma_y H_w \rho_s}+N_1/\pi D_1$

$=99X0.012\sqrt{235X6^6X4.91X0.78}+70616/\pi X5.8=39516(N/m)$

$F_t<F_L$ (10458N/m<39516N/m)

则罐壁底部的竖向压应力σ_c按下式计算

$\sigma_c=N_1/A_1+M_1/Z_1$

$A_1=\pi D_1\delta_1=\pi X5.8X0.008=0.146(m^2)$

$E_1=0.785D_1^2\delta_1=0.785X5.8^2X0.008=0.211(m^3)$

$\sigma_c=N_1/A_1+M_1/Z_1=70616/0.146+276317/0.211=1793230$ (Pa)

底圈罐壁的竖向临界应力 σ_{cr}

$\sigma_{cr}=K_cE\delta_1/D_1$

$K_c=0.0915(1+0.0429\sqrt{H/\delta 1})(1-0.1706D_1/H)$

$=0.0915(1+0.0429\sqrt{4.91/0.008})(1-0.1706X5.8/4.91)$

$=0.151$

$E=210X10^9$ (Pa)—(钢的弹性模量)

$\sigma_{cr}=K_cE\delta_1/D_1=0.151X210X10^9X0.008/5.8=43737931$ (Pa)

容许临界应力$[\sigma_{cr}]$

$[\sigma_{cr}]=\sigma_{cr}/1.5\eta$

η一重要度系数 查表 4.1.2 得$\eta=1.10$

$[\sigma_{cr}]=\sigma_{cr}/1.5\eta=43737931/1.5X1.1=26507837$ (Pa)

$\sigma_c<[\sigma_{cr}]$ (1793230Pa<26507837 Pa)

结论：罐壁抗震验算安全.

五、验算风荷载引起的倾倒力矩

1、上海地区基本风压 $W_o=0.60KN/m^2$ (查 GBJ 9-8T)

2、体型系数

$Wod^2=0.60X5.8^2=20.18$

$\mu_a=0.8$

风力 F

$F=\mu_a WoDH$

H=7336mm=7.336mm （总体高度）

$F=\mu_a WoDH=0.8X0.60X5.8X7.336=20.42$ (KN)=20420N

风载引起的倾倒力矩 M'

M'=1/2FH=1/2X20420X7.336=74901(N.m)

油罐自重产生的抗倾倒力矩 Mo'（空罐）

$Mo'=F_{自重}R=88270X2.9=255983$(N.m)

$M'<Mo'$ 安全.

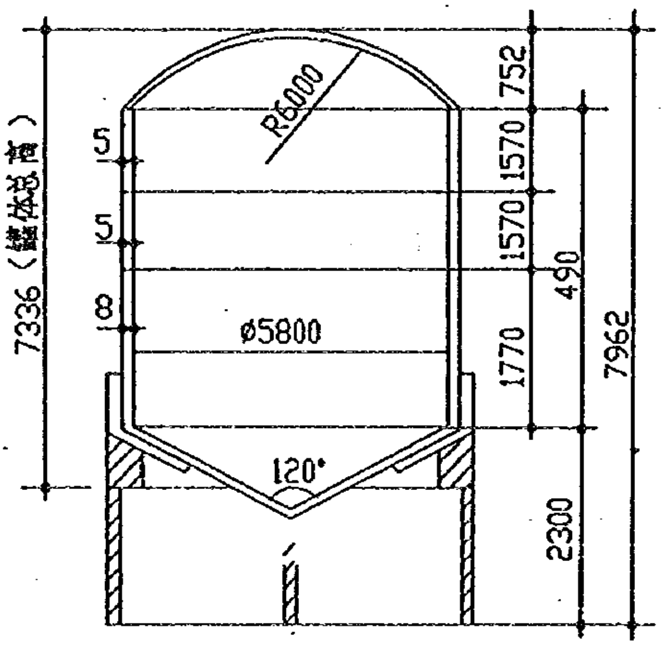
结论：空罐时不会被风载倾倒，是安全的.

总结论：通过以上计算，该设备上海地区地震按 7 度设防是安全的，并有相当大的安全储备（安全系数）. 验算风荷载抗倾倒力矩远大于风荷载引起的倾倒力矩，是安全的.

此种结构型式的罐在我国已有重庆、武汉、济南、沈阳、西宁（青海）、厦门、宁波、桂林、贵阳、昆明、长沙等十多个机场投产使用，其强度和稳定性实践证明是可靠的.

针对上海地区的风载，地震等情况进行验算，结论是安全的.

100M³锥底油罐附图一



罐体计算简图

Fuel depot fire fighting calculation sheet

1 . Basic Data

1.1 Six $10000M^3$ fuel tank; tank diameter: D=31.2M.

1.2 Foam mixture supply strength: $6l/min.m^2$; Foam expansion: 3; Time: 30min.

1.3 Cooling water supply strength to the tank on fire is $2.5l/min.m^2$, that to the adjacent tank is $1.0l/min.m^2$; Cooling time is: 6hours.

2 . Caculating formula

2.1 Fuel tank liquid surface area

$A=\pi D^2/4=3.14\times 31.2^2/4=764M^2$

2.2 Foam mixfure demand

2.2.1 Foam mixture demand of the foam generater

$Q_1=764\times 6l/min.m^2=4584l/min=76.4l/s$

2.2.2 Foam mixture deman of foam branch

$Q_2=Nq=4\times 8=32l/s$

2.2.3 Foam mixture demand of foam monitor

$Q_3=Nq'=1\times 32=32l/s$

2.2.4 Total foam mixture demand

$Q=Q_1+Q_2+Q_3=140.4l/s$

2.3 Foam demand (foaming expansion: 3)

$Q'=Q\times 3=421.2l/s$

2.4 The namber of the high back-pressure foam generator

2 each PCY1800 2 each PCY1350

2.5 Foam concentrate demand

2.5.1 Concentrate demand of foam generator

$W_1=(2\times 1800+2\times 1350)\times 0.06\times 30/1000=11.34T$

2.5.2 Foam mixture demand of foam branch

$W_2=4\times 8\times 0.06\times 30\times 60/1000=3.456T$

2.5.3 Number of foam branch

$W_3=32\times 0.06\times 30\times 60/1000=3.456T$

$W=W_1+W_2+W_3=18.25T$

According to the above formula, 20-ton foam concentrate tank shall be selected.

2.6 Fire fighting water demand

$Q_p=0.94\times Q=0.94\times 140.4=132l/s$

Standing foam mixing water demand

2.7 Diameter of foam nozzle outlet

$$D'=\sqrt{\frac{4\times 3\times 6\times 764}{60000\times 3.14\times 3}}=0.32m=350mm$$

2.8 Oil tank cooling water demand

2.8.1 Burning tank cooling water demand

$Q_{s1}=nAq=1\times 764\times 2.5=1910l/min=114.6m^3/h$

2.8.2 Adiacent tank cooling water demand

$Q_{s2}=nAq'=2\times 764\times 1.0=1528l/min=91.7m^3/h$

2.8.3 Standing water demand of the fixed cooling water system

$Q'_s=Q_{s1}+Q_{s2}=206.3m^3/hr$

2.8.4 Firhydrant water demand (Four hydrants are in operation simultaneously)

$Q_{s3}=15\ l/s\times 4=60\ l/s=216\ m^3/hr$.

2.8.5 Foam-water moninor water demand cone is in operation).

$Q_{s4}=32ls/l\times 1=32l/s=115.2m^3/hr$

2.8.6 Total cooling water demand (cooling time : 6hr)

$Q_s=(Q_s'+Q_{s3}+Q_{s4})\times 6=3225m^3$

2.8.7 Standing fire-fighting water demand (10% resure water)

$Q=(Q_p+Q_s)\times 1.1=3808.8m^3$

2.8.8 Volume of fire-fighting water pool:

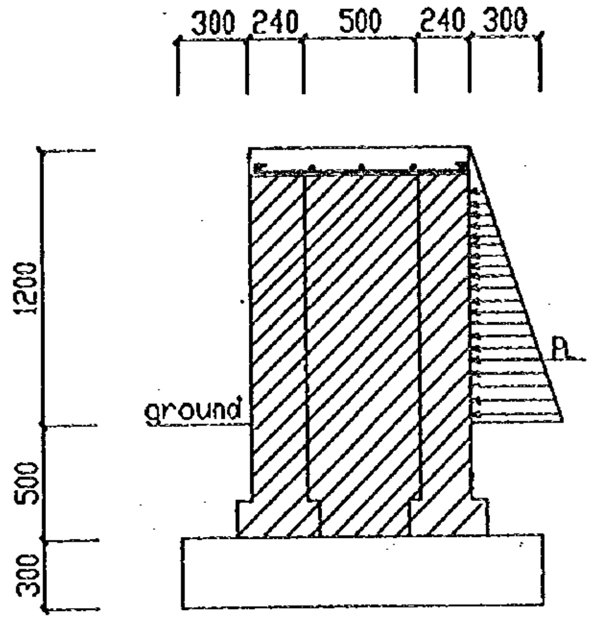
Two $2000m^3$ pools are selected

2.8.9 Selection of pump:

Three 200D-43 × 3 foam pumps (Two in operation, One stand by);
Q=53 ~ 96l/s H=135.9 ~ 110m

Four 8sh-6 cooling water pump (Three in operation, One standby);
Q=50 ~ 80l/s H=100 ~ 82.5m

Caculation of Fire Dike



R_L-liquid unit weight

P_L--resultant force standard data of static liquid pressure per metre length of the dike up the caculated section

H1-the distance from caculated section to liquid surface

H0-the distance from the resultantforce position of static liquid pressure per metre length of the dike up the caculated section to the caculated section

M_L-moment standard data of the caculated section exerted by the resultant force of static liquid pressure per metre length of the dike up the caculated section

s-load effect combined design data

G-self weight

r-unit weight

B1-width of fire dike

H1-height of fire dike

$P_L=1/2R_LH^2=1/2X10X1.2^2=7.2(KN/M)$

$H_0=1/3H1=1/3X1.2=0.4(M)$

$M_L=P_LH_0=7.2X0.4=2.88(KN.M)$

$G=r.B1H1=19X0.98X1.2=22.344(KN)$

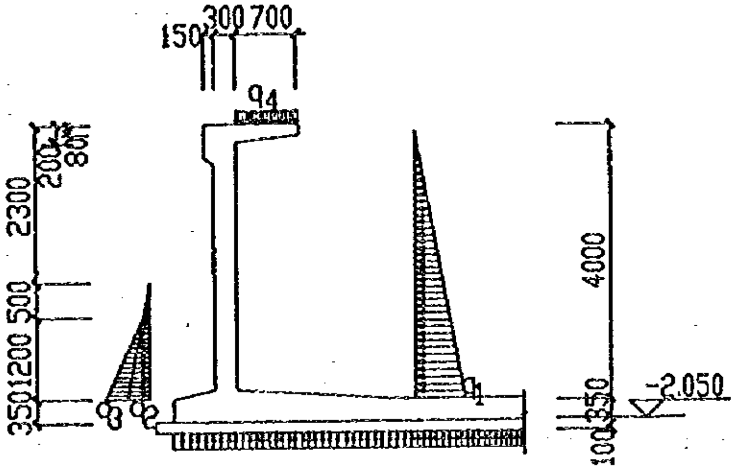
$S=1.0X22.344+1.1X7.2=30.264(KN)\leq\frac{R}{\eta}$

η-structure important coefficient

R-design data of force resistance of fire dike(according to code)

thus satisfy the section strength request

Caculation of Fire Pond



I.basic data:

the depth of groundwater :	h1=1.2m
water unit weight :	$10KN/M^3$
cement mortar unit weight:	$20KN/M^3$
reinforced concrete unit weight:	$25KN/M^3$
soil unit weight:	$18KN/M^3$
angle of internal friction :	$\phi=30^0$
ground permitted bearing pressure:	$R=8KN/M^2$

II.caculation of fire pond wall:

1.load caculation: $q1=40KN/M^2$

soil pressure: $q2=1.7\times18\times tg^2(45^0-30^0/2)=10.2(kN/M^2)$

groundwater pressure: $q3=1.2\times[1-0.65\times tg^2(45^0-30^0/2)]=9.36(KN/M^2)$

weigth of passage slab: $25\times0.09=22(KN/M^2)$

live load of passage slab: $1KN/M^2$

$q4=3.2KN/M^2$

2.analysis of internal force(the moment is positive if the internal side of the wall is tensed)

fixed-end moment of passage slab: $M=1/2\times3.2\times0.7^2=0.784(KN/M^2)$

wall moment under water pressure(the wall is regarded as catilever beam)

bottom: $M1=1/6\times40\times4^2=106.7(KN.M)$

concrete:C30,from the table:

$M=107.69, As=1350$

thus,wall reinforcement(internal side) Φ 14@110 As=1399

according to the same reason,the wall moment under soil pressure:

$M_2=1/6\times10.2\times1.7^2+1/6\times9.36\times1.2^2$

$=7.16(KN.M)$

$M=7.16+M_4=7.16+0.784=7.944(KN.M)$

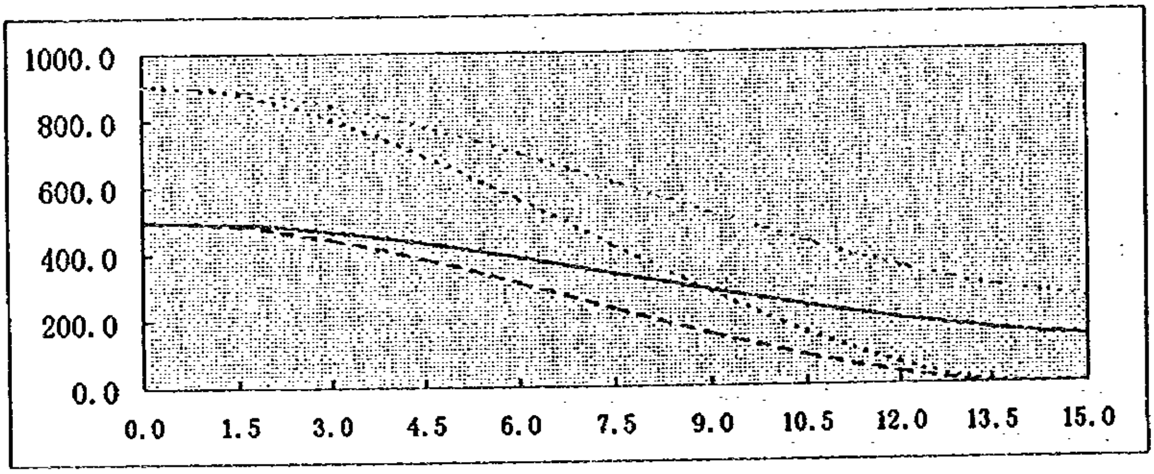
wall reinforcement(external side): Φ12@200,As=565

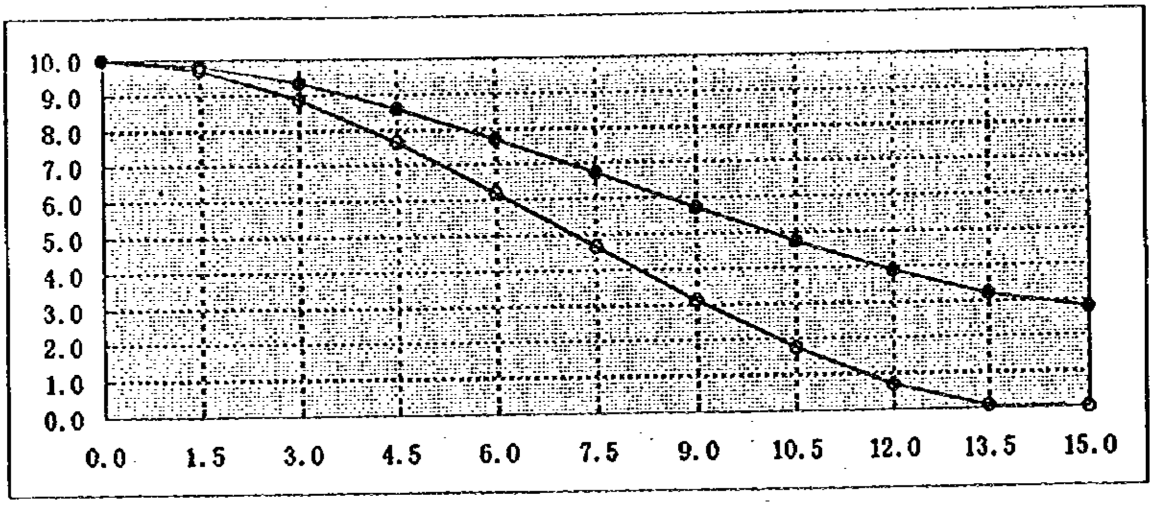
horizontal reinforcing bar of the pond wall: Φ12@200

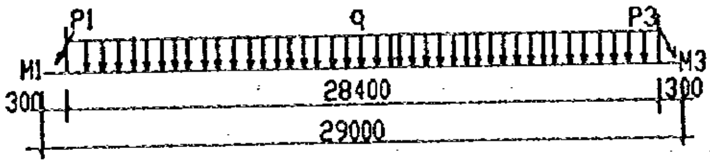
THE CALCULATION FOR THE REINFORCEMENT OF RAFT FOUNDATION OF OIL TANK

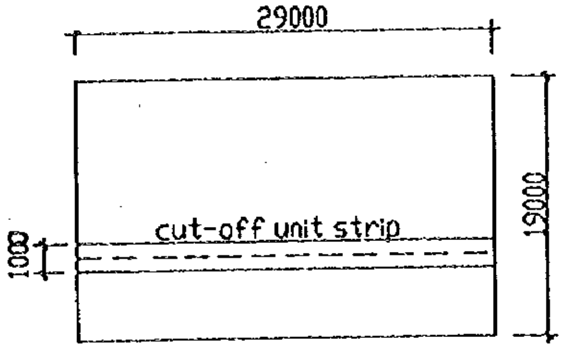
R	v	p_{z0}	h	D	$(W)_{r=0}$	ζ
15	0.3	66	0.6	504.4	97.9	0.55

r	m_r	m_{r1}	m_ϕ	$m_{\phi 1}$	n_r	n_ϕ	A_{sr}	$A_{s\phi}$
0.0	498.3	906.0	498.3	906.0	10.0	10.0	3133	3133
1.5	483.1	878.4	489.5	890.0	9.7	9.8	3038	3078
3.0	442.0	803.7	465.3	846.0	8.8	9.3	2780	2926
4.5	381.9	694.4	429.3	780.6	7.6	8.6	2402	2700
6.0	309.6	562.9	385.0	700.0	6.2	7.7	1947	2421
7.5	231.8	421.5	335.8	610.5	4.6	6.7	1458	2111
9.0	155.4	282.6	285.2	518.5	3.1	5.7	977	1793
10.5	87.3	158.7	236.7	430.3	1.7	4.7	549	1488
12.0	34.1	62.0	193.7	352.3	0.7	3.9	214	1218
13.5	2.7	5.0	159.9	290.7	0.1	3.2	17	1005
15.0	0.0	0.0	138.6	252.0	0.0	2.8	0	872









IIIcaculation of base slab:

.wall weight:

$P1=2.5X[0.3X4+(0.08+0.2)X1/2X0.85]=2.5(1.2+0.119)=3.3(KN/M)$

botton moment of wall:

$M=106.7KN.M$

.weight of base slab:

$q1=2.5x0.35=0.88(KN/M^3)$

Water pressure:

$q2=40KN/M^2$

1.caculation datas:

half length of cut-off unit strip: L=14.5M

thickness of cut-off unit strip: H=0.35M

flexible number index of cut-off unit strip:

$$T=10X\frac{E_0}{E_h}X\frac{L^3}{H^3}=10X\frac{60}{2.6X10^5}X\frac{14.5^3}{0.35^3}=164$$

characteristic-value

$$L=h\sqrt[3]{\frac{E_h}{6E_0}}=0.35X\sqrt[3]{\frac{2.6X10^5}{6X60}}=3.14(M)$$

conversion length of cut-off unit strip:

$$\lambda=\frac{2L}{L}=\frac{2X14.5}{3.14}=9.24$$

2. when the pond is full of water:

load on the cut-off unit strip:

$P1=P3=33KN$

$q=0.88+4=48.8(KN/M)$

moment of cut-off unit strip under varied loads(the moment is positive when the bottom side is tensed)

$Mq=\overline{Mq}.L^2.q=3.14^2x48.8x\overline{Mq}=481\overline{Mq}$

$Mp1=\overline{Mp1}.L.P1=3.14X33X\overline{Mp1}=103.62\overline{Mp1}$

$Mp3=\overline{Mp3}.L.p3=103.62\overline{Mp3}$

$Mm1=\overline{Mm1}.m=-106.7\overline{Mm1}$

$Mm3=\overline{Mm3}.m=106.7\overline{Mm3}$

$\overline{Mq},\overline{Mp1},\overline{Mp2},\overline{Mp3},\overline{Mm1},\overline{Mm3}$ refers to the table:

3.when the pond is empty:

$P1=P3=33KN$ $m1=m3=0$

$q=8.8$

$Mq=\overline{Mq}.L^2.q=8.8x3.13^2x\overline{Mq}=86.8\overline{Mq}$

$Mp1=\overline{Mp1}.L.p1=3.14x33x\overline{Mp1}=103.62\overline{Mp1}=Mp3$

thus the caculated moment:

$Mmax=73KNM$

$Mmin=-68.5KNM$

according to the permitted crack width =0.2mm,

reinforcement of top surface and bottom surface:

Φ12@100(M=74.4KN.M)

THE CALCULATION SHEET FOR THE CEMENT SOIL PILE APPLIED IN GROUND TREATMENT OF 10000m³ OIL TANK AREA IN PU DONG AIRPORT

Geological condition:

stratum	thickness m	compressive modules MPa	side resistance kPa	end resistance kPa	strength kPa
②-1	1.9	6.3	12		110
②-2	7.2	10.4	14		120
③	0.9	3.4	8		70
④	9	2.2	8	160	55
⑤-1	5.5	3.7	12	400	80
⑤-2	3	4.4	12		
⑦-1	6.2	11.3			

The cement soil pile is to be 15.0m long and the pile diameter is 700mm. Then the single pile load-bearing capacity is

$P=0.7\times\pi\times(1.9\times 12+7.2\times 14+0.9\times 8+5\times 8)=375.6(kN)$

Assuming the strenth of the pile itself is 1000kPa, the load-bearing capacity of its own is $P=1000\times 0.7^2\times\pi/4=384.5(kN)>375.6(kN)$

The pile distribution density(the area assigned to a single pile):

$(375.6-\pi\times 0.35^2\times 110\times 0.5)/(180-110\times 0.5)=2.84$

If the triangle shape is adopted, the distance between piles is

$2.84/0.866=1.81(m)$

let s=1.80m

The checking calculation for the soft stratum(Stratum ④):

the force applied on the pile at the top level of Stratum ④ is

$3.142\times 0.7\times 5\times 8+\pi\times 0.35^2\times 160=149.5kN$

The additional stress at the top of Stratum ④ is

$p'=180\times 32^2/(32+9)^2-149.5/(1.8^2\times 0.866)=56kPa$(satisfied)

Note: no adjustment of capacity arisen from the depth and width of the foudation is considered.

The calculation of ring wall:

Circular tension: $170\times(1-\sin 32°)\times 30.9/2=1234.7(kN/m)$

circular reinforcement: $1234.7\times 10^3/310=3982.8(mm^2)$

adopt Φ 20 a 150 $A_S=4189.3(mm^2/m)$

Fuel Oil Storage Transformer Caplculation Sheet

一. Power Supply Scheme:

The Fuel Oil Storage is I class load, There are 2 incoming feeders connect to 2 HV busbar, with bustie connect them the LV system is same Normally, bustie open, 2 transformer work in 50% load, if 1 commercial power failed, the incoming switch open, bustie close, automatically, the transformer work in 100% load. The fire fighting pump and process pumps don t'work simultaneously.

二. Load character:

1.process character:

aviation diesel oil pump : 110KW*10, 45KW*2

waste oil pump: 18.5KW*2

2.Fire Fighting Pump

cooling water pump: 110KW*4

foam pump: 155KW*3

3.electrice load for bulidings

power: 400KW

lighting: 40kw

三.load calcuation (refer to 'industrial and civil electric design mannel')

$P_{js} = K_{\Sigma p} \Sigma (K_x P_e)$

$= 0.8(110*10+45*2+18.5*2)+0.8*0.75*400+0.9*0.8*40$

$= 1152$ Kw

$Q_{js} = K_{\Sigma q} \Sigma (K_x P_e \, tg\theta)$

$= 0.95*[0.8(110*10+45*2+18.5*2)]*0.75+0.93*(0.75*400)*0.75$

$+0.97*(0.8*40)*0.48$

$= 925$ Kvar

$S_{js} = \sqrt{P_{js}^2 + Q_{js}^2}$

$=1556$ KVA

The transformer capacity can be decided as 1600KVA.

Calculation Book -50-

I. Name of Project: Shanghai Pudong Airport Oil Depot Oil Pump Shed
II. Seismic intensity: 7
III. Frame seismic grade: 3
IV. Structure importance parameter: Ro=1.0
V. Site soil type: IV
VI. Soil endurance: R=110KPa
VII. Foundation load-bearing layer elevation:
VIII. Materials: column -- C30 beam board -- C30

Load:

1. Living load:

roof 0.7KN/m2

2. Static load:

roof	ceiling	0.50KN/m2
structure layer (110mm)		2.75KN/m2
roof (roof 1)		5.35KN/m2
total		8.60KN/m

3. Wind load: 0.55 KN/m2

X. Selection of main members

1. Side column 450x450mm
2. Main beam (L=7500mm)
   bxh=350x750mm
   bxh=300x650mm
   bxh=350x850mm
3. Board thickness
   h=110mm

XI. Design basis

1. Current national architecture & structure standards and codes;
2. Shanghai City's << Base Foundation Design Codes >> DBJ08--11--89;
3. Shanghai City's << Base Treatment Technical Codes >> DBJ08--40--94;
4. Shanghai City's << Building Anti-seismic Design Standards >> DBJ08--09--92;

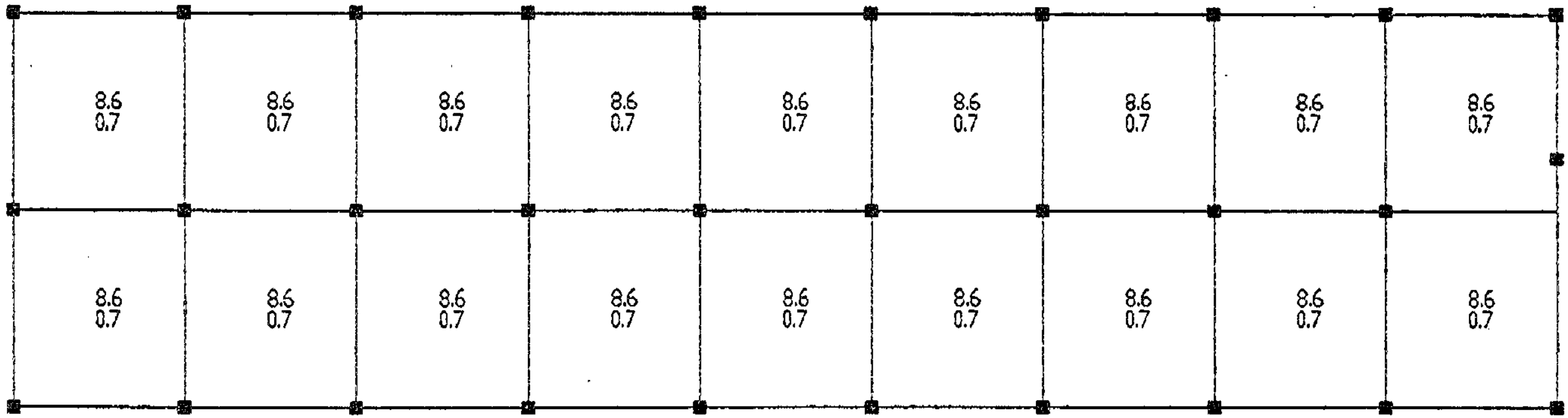
XII. Computer programs

China Building Science Research Institue CAD Engineering Department

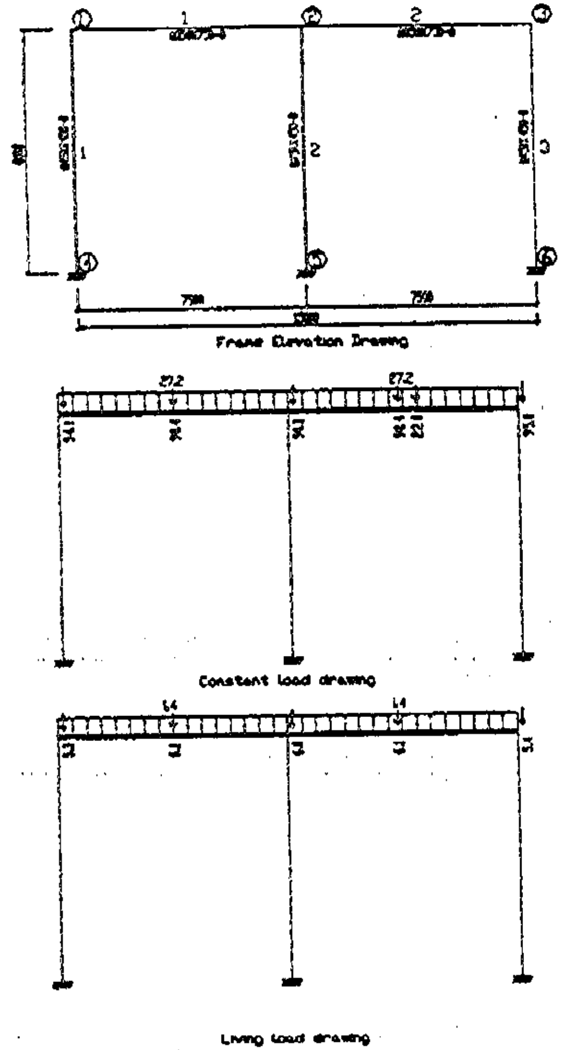
PMCAD	August, 1996
PK	August, 1996
JCCAD	August, 1996

XIII. Conclusion:

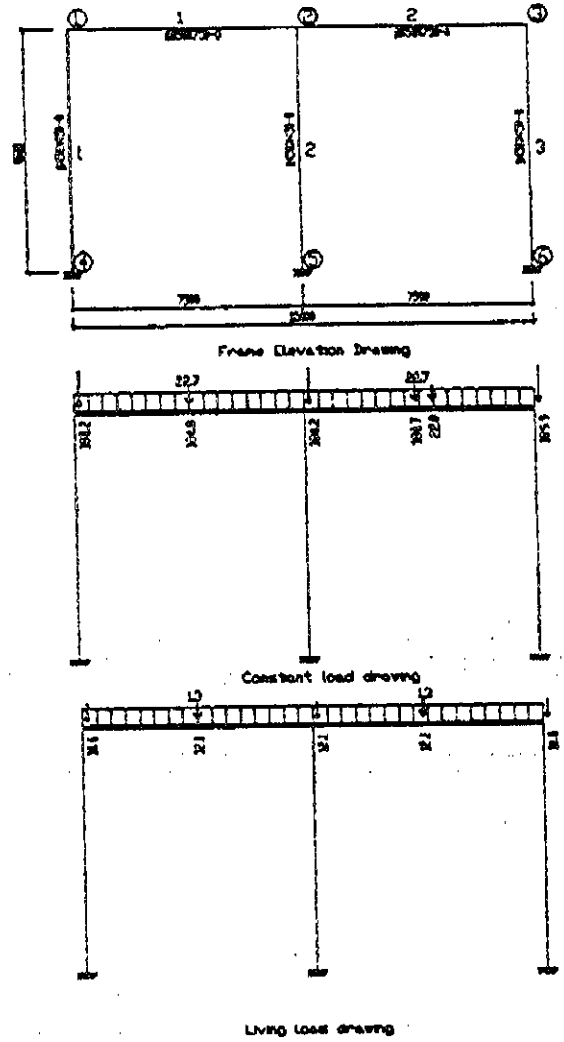
It is concluded from calculation above, the integral strength and deformation of structure meet the design requirements, the geometric dimensions also meet the requirements of strength and deformation regulated by Codes. The primary data of structural model, major calculation results, combining results of main internal forces of each member, structural layout, internal force drawing, reinforcing results of major members refer the next page, based on which construction drawings are made.



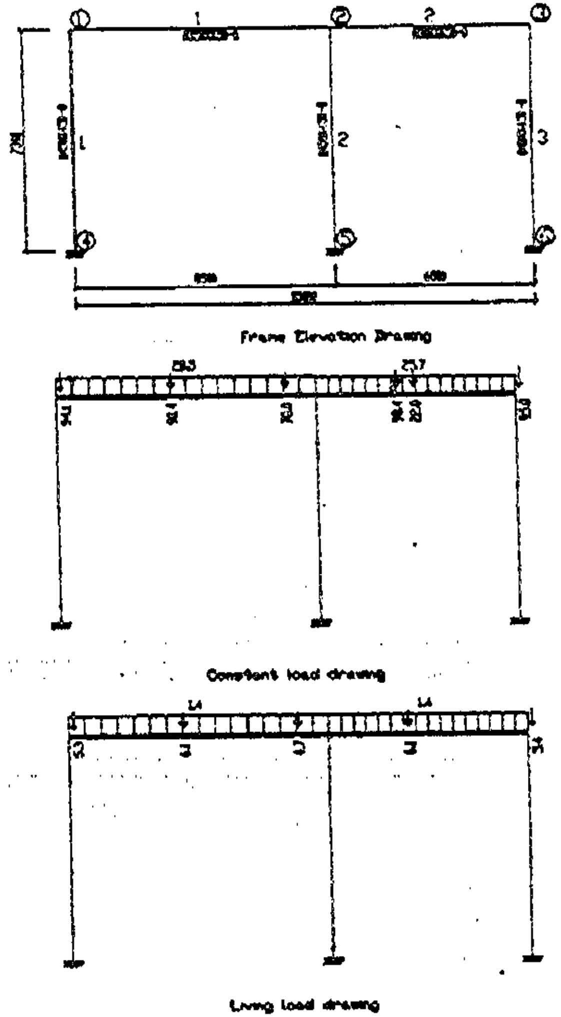
Floor Load



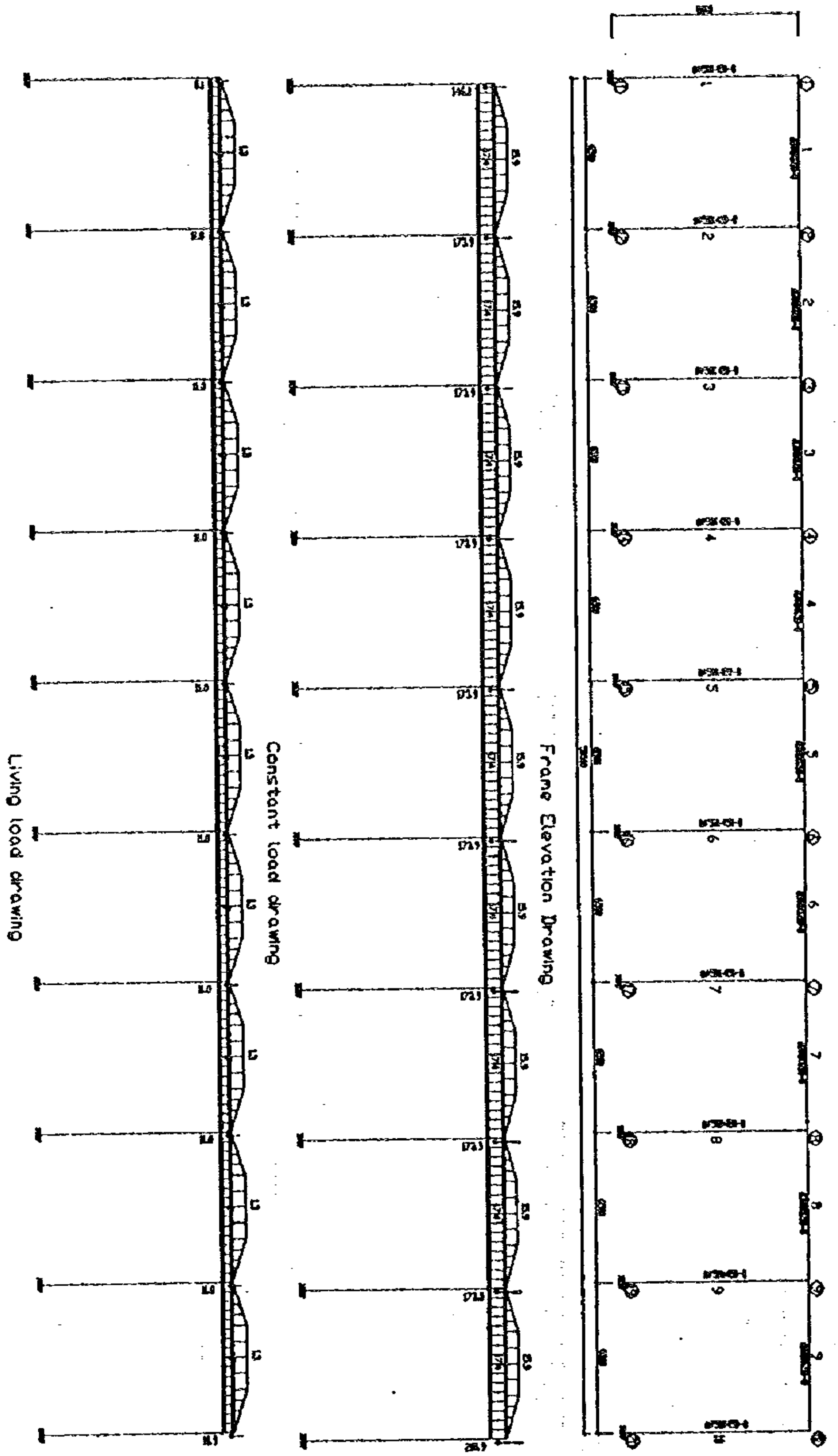
KJ-1 DRAWING



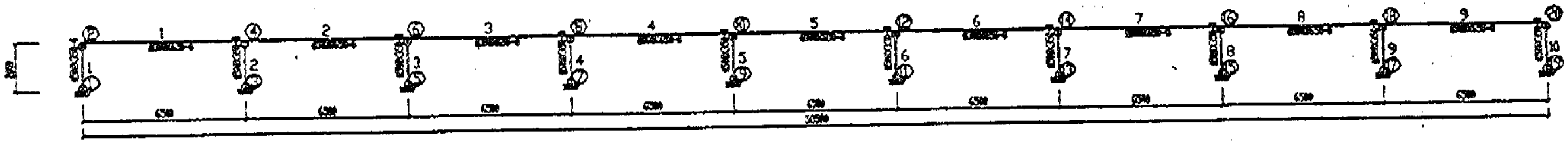
KJ-2 DRAWING



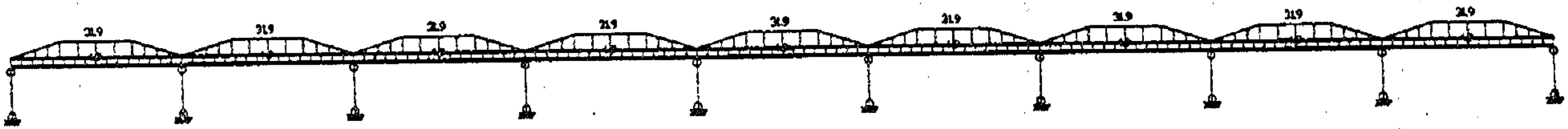
KJ-3 DRAWING


Frame Elevation Drawing
Constant load drawing
Living load drawing

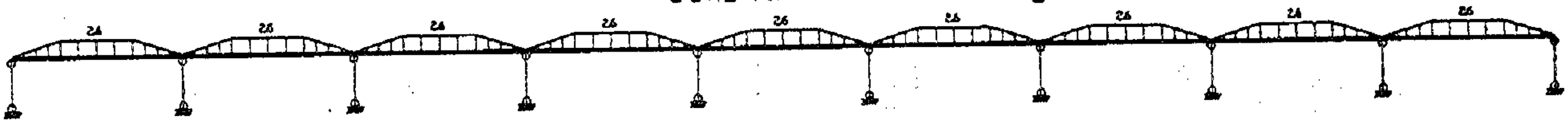
KJ-4 DRAWING



Frame Elevation Drawing



Constant load drawing



Living load drawing

LL-1 drawing

****** KJ-1 Calculation result ******

OUTPUT DATA

---- Zhong xin xi ------

6 3 2 0 3 2 1 0 2 0 0 2 1
0
1.00 1.00
0

OUTPUT DATA

------- Jiao Dian Zuo Biao --------

(1) 0.00 8.00 (2) 7.50 8.00 (3) 15.00 8.00 (4) 0.00 0.00
(5) 7.50 0.00 (6) 15.00 0.00

OUTPUT DATA

------- Zhu Guan Lian Hao --------

(1) 4 1 (2) 5 2 (3) 6 3

------- Liang Guan Lian Hao --------

(1) 1 2 (2) 2 3

OUTPUT DATA

------- Zhi Zuo Yue Shu Xin Xi --------

(1) 4111 (2) 5111 (3) 6111

OUTPUT DATA

------- Shang Xia Zhu Jian Dian Pian Xin --------

(1) 0.00 (2) 0.00 (3) 0.00 (4) 0.00 (5) 0.00 (6) 0.00

OUTPUT DATA

------- Biao Zhun Jie Mian Xin Xi --------

(1) 1, 450, 450, 6
(2) 1, 350, 750, 6

OUTPUT DATA

----- Zhu Ji Suan Chang Du(After consider steel) ------

(1) 1.00 (2) 1.00 (3) 1.00

OUTPUT DATA

---- Zhu Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1) 1 0 0 (2) 1 0 0 (3) 1 0 0

---- Liang Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1) 2 0 0 (2) 2 0 0
IIQQ= 27

STIF COMPUTE
DEAD COMPUTE
JOINT LOAD: JR XM XN

```
                        1        0.00       94.10
                        2        0.00       90.10
                        3        0.00       95.00
                        0

 COLUMN LOAD:            JC          KL          P          X          KX
                        0

 BEAM     LOAD:          NE       LI       KL          P          X          P1          X1
KL          P            X           P1       X1
                                 1          2                    1        27.20        0.00
4        90.40        3.75
                                 1          3                    4        22.00        4.18
1        27.20        0.00
                                    4       90.40        3.60

                            **DEAD   LOAD**

            STIF COMPUTE
            LIVE COMPUTE
 JOINT   LOAD:          JR         XM          XN
                        1         0.00        5.30
                        2         0.00        6.00
                        3         0.00        5.40
                        0

 COLUMN LOAD:            JC          KL          P          X          KX
                        0

                            **LIVE   LOAD**
 BEAM     LOAD:          NE       LI       KL          P          X          P1          X1
KL          P            X           P1       X1
                                 1          2                    1         1.40        0.00
4         6.10        3.75
                                 1          2                    1         1.40        0.00
4         6.10        3.60

            EART COMPUTE
         1          7       4.00          0          1       1.00          0

            1
         975.700

            1      T=   0.7818
            1.000
           78.056

                            **DISPLACEMENT**
   (  1) 0.012   (  2) 0.012   (  3) 0.012   (  4) 0.000   (  5) 0.000   (  6) 0.000

            3
         975.700

            1      T=   0.7818
            1.000
           78.056

                            **DISPLACEMENT**
```

(1)-0.012 (2)-0.012 (3)-0.012 (4) 0.000 (5) 0.000 (6) 0.000
COMBI COMPUTE

COMBINATION AND REINFORCEMENT

Concrete COLUMN 1(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V
1	-26.21	295.67	-9.71	-51.47	-247.07	9.71	2	-21.84	246.39	-8.09	-42.89	-205.89	8.09
3	-26.21	295.67	-9.71	-51.47	-247.07	9.71	4	-21.84	246.39	-8.09	-42.89	-205.89	8.09
5	-26.21	295.67	-9.71	-50.87	-245.69	9.64	6	-21.84	246.39	-8.09	-42.29	-204.51	8.03
7	-28.07	312.08	-10.41	-55.81	-264.85	10.48	8	-23.70	262.80	-8.79	-47.23	-223.67	8.86
9	-28.00	313.45	-10.48	-55.81	-264.85	10.48	10	-23.63	264.17	-8.86	-47.23	-223.67	8.86
11	-26.28	294.29	-9.64	-50.87	-245.69	9.64	12	-21.91	245.01	-8.03	-42.29	-204.51	8.03
13	-26.21	295.67	-9.71	-50.96	-245.90	9.65	14	-21.84	246.39	-8.09	-42.38	-204.72	8.04
15	-27.79	309.62	-10.30	-55.16	-262.18	10.36	16	-23.42	260.34	-8.69	-46.58	-221.01	8.74
17	-27.73	310.78	-10.36	-55.16	-262.18	10.36	18	-23.36	261.51	-8.74	-46.58	-221.01	8.74
19	-26.27	294.50	-9.65	-50.96	-245.90	9.65	20	-21.90	245.22	-8.04	-42.38	-204.72	8.04
21	-26.21	295.67	-9.71	-50.96	-245.90	9.65	22	-21.84	246.39	-8.09	-42.38	-204.72	8.04
23	-27.79	309.62	-10.30	-55.16	-262.18	10.36	24	-23.42	260.34	-8.69	-46.58	-221.01	8.74
25	-27.73	310.78	-10.36	-55.16	-262.18	10.36	26	-23.36	261.51	-8.74	-46.58	-221.01	8.74
27	-26.27	294.50	-9.65	-50.96	-245.90	9.65	28	-21.90	245.22	-8.04	-42.38	-204.72	8.04
29	137.79	269.67	22.54	70.38	-220.49	-22.57	30	143.26	220.40	24.16	78.91	-179.41	-24.19
31	-204.32	328.69	-42.26	-174.92	-280.68	42.29	32	-198.69	278.24	-40.60	-166.03	-238.23	40.62
33	-204.28	329.28	-42.29	-174.92	-280.68	42.29	34	-198.66	278.73	-40.62	-166.03	-238.23	40.62
35	137.76	269.09	22.57	70.38	-220.49	-22.57	36	143.22	219.91	24.19	78.91	-179.41	-24.19

NO 31 As= 1132. M= -204.32 N= 328.69 NO 31 As= 1084. M= -174.92 N= -280.68
GG= 709.

Concrete COLUMN 2(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V

1	-3.45	608.70	-1.16	-5.86	-560.10	1.16	2	-2.87	507.25	-0.97	-4.88	-466.75	0.97
3	-3.45	608.70	-1.16	-5.86	-560.10	1.16	4	-2.87	507.25	-0.97	-4.88	-466.75	0.97
5	-1.00	631.33	-0.34	-1.71	-574.34	0.34	6	-0.42	529.88	-0.15	-0.74	-480.99	0.15
7	-5.89	623.14	-1.99	-10.00	-582.93	1.99	8	-5.32	521.69	-1.79	-9.03	-489.58	1.79
9	-3.44	645.77	-1.16	-5.86	-597.17	1.16	10	-2.87	544.32	-0.97	-4.88	-503.82	0.97
11	-3.45	608.70	-1.16	-5.86	-560.10	1.16	12	-2.87	507.25	-0.97	-4.88	-466.75	0.97
13	-1.37	627.94	-0.46	-2.33	-572.21	0.46	14	-0.79	526.49	-0.27	-1.36	-478.86	0.27
15	-5.53	620.98	-1.86	-9.38	-579.51	1.86	16	-4.95	519.53	-1.67	-8.40	-486.16	1.67
17	-3.44	640.21	-1.16	-5.86	-591.61	1.16	18	-2.87	538.76	-0.97	-4.88	-498.26	0.97
19	-3.45	608.70	-1.16	-5.86	-560.10	1.16	20	-2.87	507.25	-0.97	-4.88	-466.75	0.97
21	-1.37	627.94	-0.46	-2.33	-572.21	0.46	22	-0.79	526.49	-0.27	-1.36	-478.86	0.27
23	-5.53	620.98	-1.86	-9.38	-579.51	1.86	24	-4.95	519.53	-1.67	-8.40	-486.16	1.67
25	-3.44	640.21	-1.16	-5.86	-591.61	1.16	26	-2.87	538.76	-0.97	-4.88	-498.26	0.97
27	-3.45	608.70	-1.16	-5.86	-560.10	1.16	28	-2.87	507.25	-0.97	-4.88	-466.75	0.97
29	183.24	618.40	36.15	142.62	-566.21	-36.15	30	183.74	515.33	36.29	143.30	-471.84	-36.29
31	-191.86	614.89	-38.48	-154.33	-569.89	38.48	32	-190.92	512.41	-38.22	-153.06	-474.91	38.22
33	-190.55	624.59	-38.12	-152.55	-575.99	38.12	34	-189.83	520.49	-37.93	-151.58	-479.99	37.93
35	181.93	608.70	35.80	140.84	-560.10	-35.80	36	182.65	507.25	35.99	141.82	-466.75	-35.99

NO 32 As= 992. M= -190.92 N= 512.41 NO 32
As= 860. M= -153.06 N= -474.91
GG= 709.

Concrete COLUMN 3(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)

Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V
1	28.61	309.43	10.87	58.37	-260.83	-10.87	2	23.84	257.86	9.06	48.64	-217.36	-9.06
3	28.61	309.43	10.87	58.37	-260.83	-10.87	4	23.84	257.86	9.06	48.64	-217.36	-9.06
5	30.48	325.81	11.57	62.67	-278.57	-11.63	6	25.71	274.24	9.76	52.94	-235.10	-9.82
7	28.61	309.43	10.87	57.80	-259.47	-10.81	8	23.84	257.86	9.06	48.07	-216.00	-9.00
9	30.39	327.17	11.63	62.67	-278.57	-11.63	10	25.62	275.60	9.82	52.94	-235.10	-9.82
11	28.71	308.07	10.81	57.80	-259.47	-10.81	12	23.94					

256.50 9.00 48.07 -216.00 -9.00
13 30.20 323.35 11.47 62.02 -275.91 -11.52 14 25.43
271.78 9.66 52.30 -232.44 -9.71
15 28.61 309.43 10.87 57.88 -259.67 -10.82 16 23.84
257.86 9.06 48.15 -216.20 -9.01
17 30.12 324.51 11.52 62.02 -275.91 -11.52 18 25.36
272.94 9.71 52.30 -232.44 -9.71
19 28.69 308.27 10.82 57.88 -259.67 -10.82 20 23.92
256.70 9.01 48.15 -216.20 -9.01
21 30.20 323.35 11.47 62.02 -275.91 -11.52 22 25.43
271.78 9.66 52.30 -232.44 -9.71
23 28.61 309.43 10.87 57.88 -259.67 -10.82 24 23.84
257.86 9.06 48.15 -216.20 -9.01
25 30.12 324.51 11.52 62.02 -275.91 -11.52 26 25.36
272.94 9.71 52.30 -232.44 -9.71
27 28.69 308.27 10.82 57.88 -259.67 -10.82 28 23.92
256.70 9.01 48.15 -216.20 -9.01
29 207.33 342.44 43.43 181.80 -294.42 -43.45 30 201.20
289.70 41.57 171.77 -249.69 -41.59
31 -134.79 283.44 -21.38 -63.47 -234.26 21.41 32 -140.75
231.87 -23.19 -73.15 -190.88 23.22
33 207.28 343.02 43.45 181.80 -294.42 -43.45 34 201.16
290.19 41.59 171.77 -249.69 -41.59
35 -134.74 282.86 -21.41 -63.47 -234.26 21.41 36 -140.71
231.38 -23.22 -73.15 -190.88 23.22

NO 29 As= 1143. M= 207.33 N= 342.44 NO 29
As= 1125. M= 181.80 N= -294.42
GG= 709.

Concrete BEAM 1(SECTION TYPE= 1 ANG= 0, L= 7.50)
Section property: B= 350, H= 750
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= -78.91 -132.10 -182.85 -220.53 -245.13 -256.65 -255.10 -172.16 -
87.98 -8.18 0.00 0.00 0.00
As(1)= 788. 455. 634. 768. 922. 1066. 1145. 801.
403. 28. 0. 0. 788.
As(2)= 788. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 788.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 174.92 83.77 13.90 0.00 0.00 0.00 0.00 0.00
0.00 38.30 162.26 299.29 453.58
As(1)= 788. 287. 47. 0. 0. 0. 0. 0.
0. 130. 599. 1172. 1913.
As(2)= 788. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 1913.

Vl= 164.58 NO 13 Vr= 251.23 NO 15 Asv/s= 0.50 As(3)=
788. Umaxb= 0.004 Umaxt= 0.007

Concrete BEAM 2(SECTION TYPE= 1 ANG= 0, L= 7.50)
Section property: B= 350, H= 750
BOTTOM
SECTION 1 2 3 4 5 6 7 8

9 10 11 12 13
M= 0.00 0.00 0.00 -24.78 -116.80 -209.68 -284.12 -289.15 -
269.76 -237.28 -191.72 -133.09 -73.15
As(1)= 788. 0. 0. 84. 538. 982. 1287. 1225.
1041. 829. 665. 458. 788.
As(2)= 788. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 788.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 459.44 296.56 150.90 19.37 0.00 0.00 0.00 0.00
0.00 0.00 6.45 82.92 181.80
As(1)= 1944. 1159. 545. 66. 0. 0. 0. 0.
0. 0. 22. 284. 788.
As(2)= 1944. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 788.

Vl= 265.02 NO 13 Vr= 177.18 NO 15 Asv/s= 0.50 As(3)=
788. Umaxb= 0.005 Umaxt= 0.007
PK1 COMPUTE END
Callculation book Oil Depot Oil pump shed
1

****** KJ-2 Calculation Result ******

OUTPUT DATA

---- Zhong xin xi ------

6 3 2 0 3 2 1 0 2 0 0 2 1
0
1.00 1.00
0

OUTPUT DATA

------- Jiao Dian Zuo Biao --------

(1) 0.00 8.00 (2) 7.50 8.00 (3) 15.00 8.00 (4) 0.00 0.00
(5) 7.50 0.00 (6) 15.00 0.00

OUTPUT DATA

------- Zhu Guan Lian Hao --------

(1) 4 1 (2) 5 2 (3) 6 3

------- Liang Guan Lian Hao --------

(1) 1 2 (2) 2 3

OUTPUT DATA

------- Zhi Zuo Yue Shu Xin Xi --------

(1) 4111 (2) 5111 (3) 6111

OUTPUT DATA

------- Shang Xia Zhu Jian Dian Pian Xin --------

(1) 0.00 (2) 0.00 (3) 0.00 (4) 0.00 (5) 0.00 (6) 0.00

OUTPUT DATA

------- Biao Zhun Jie Mian Xin Xi --------

(1) 1, 450, 450, 6
(2) 1, 350, 750, 6

OUTPUT DATA

----- Zhu Ji Suan Chang Du(After consider steel) -----

(1) 1.00 (2) 1.00 (3) 1.00

OUTPUT DATA

---- Zhu Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1) 1 0 0 (2) 1 0 0 (3) 1 0 0

---- Liang Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1) 2 0 0 (2) 2 0 0

IIQQ= 27

STIF COMPUTE
DEAD COMPUTE

JOINT LOAD: JR XM XN
1 0.00 188.20
2 0.00 180.20
3 0.00 189.90
0

COLUMN LOAD: JC KL P X KX
0

BEAM LOAD: NE LI KL P X P1 X1
KL P X P1 X1
1 2 1 22.70 0.00
4 180.80 3.75
1 3 4 22.00 4.18
1 22.70 0.00
4 180.70 3.60

DEAD LOAD

STIF COMPUTE
LIVE COMPUTE
JOINT LOAD: JR XM XN
1 0.00 10.60
2 0.00 12.10
3 0.00 10.80
0

COLUMN LOAD: JC KL P X KX
0

LIVE LOAD

BEAM LOAD: NE LI KL P X P1 X1
KL P X P1 X1
1 2 4 12.10 3.75
1 1.30 0.00
1 2 4 12.10 3.60
1 1.30 0.00

EART COMPUTE
1 7 4.00 0 1 1.00 0

1
1381.650

1 T= 0.9304
1.000
101.900

DISPLACEMENT
(1) 0.016 (2) 0.016 (3) 0.016 (4) 0.000 (5) 0.000 (6) 0.000

3
1381.650

1 T= 0.9304
1.000
101.900

DISPLACEMENT

(1)-0.016 (2)-0.016 (3)-0.016 (4) 0.000 (5) 0.000 (6) 0.000

COMBI COMPUTE

COMBINATION AND REINFORCEMENT

Concrete COLUMN 1(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)

Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V
1	-33.78	430.27	-12.58	-66.90	-381.67	12.58	2	-28.15	358.56	-10.49	-55.75	-318.06	10.49
3	-33.78	430.27	-12.58	-66.90	-381.67	12.58	4	-28.15	358.56	-10.49	-55.75	-318.06	10.49
5	-33.78	430.27	-12.58	-66.03	-379.71	12.49	6	-28.15	358.56	-10.49	-54.88	-316.10	10.39
7	-36.40	456.66	-13.57	-73.06	-410.03	13.67	8	-30.77	384.95	-11.48	-61.91	-346.41	11.57
9	-36.32	458.63	-13.67	-73.06	-410.03	13.67	10	-30.69	386.91	-11.57	-61.91	-346.41	11.57
11	-33.87	428.31	-12.49	-66.03	-379.71	12.49	12	-28.24	356.60	-10.39	-54.88	-316.10	10.39
13	-33.78	430.27	-12.58	-66.16	-380.00	12.50	14	-28.15	358.56	-10.49	-55.01	-316.39	10.40
15	-36.01	452.71	-13.43	-72.14	-405.77	13.51	16	-30.38	380.99	-11.33	-60.99	-342.16	11.41
17	-35.94	454.37	-13.51	-72.14	-405.77	13.51	18	-30.31	382.66	-11.41	-60.99	-342.16	11.41
19	-33.85	428.60	-12.50	-66.16	-380.00	12.50	20	-28.22	356.89	-10.40	-55.01	-316.39	10.40
21	-33.78	430.27	-12.58	-66.16	-380.00	12.50	22	-28.15	358.56	-10.49	-55.01	-316.39	10.40
23	-36.01	452.71	-13.43	-72.14	-405.77	13.51	24	-30.38	380.99	-11.33	-60.99	-342.16	11.41
25	-35.94	454.37	-13.51	-72.14	-405.77	13.51	26	-30.31	382.66	-11.41	-60.99	-342.16	11.41
27	-33.85	428.60	-12.50	-66.16	-380.00	12.50	28	-28.22	356.89	-10.40	-55.01	-316.39	10.40
29	180.43	396.34	29.52	92.21	-346.90	-29.56	30	187.47	324.63	31.62	103.30	-283.43	-31.66
31	-266.29	475.51	-55.12	-228.27	-427.76	55.16	32	-259.02	401.92	-52.95	-216.68	-362.12	52.98
33	-266.24	476.36	-55.16	-228.27	-427.76	55.16	34	-258.98	402.62	-52.98	-216.68	-362.12	52.98
35	180.39	395.50	29.56	92.21	-346.90	-29.56	36	187.43	323.93	31.66	103.30	-283.43	-31.66

NO 31 As= 1542. M= -266.29 N= 475.51 NO 31 As= 1376. M= -228.27 N= -427.76

GG= 709.

Concrete COLUMN 2(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)

Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER

NUMBER	M	N	V	M	N	V
1	-3.33	811.56	-1.15	-5.88	-762.96	1.15
2	-2.78	676.30	-0.96	-4.90	-635.80	0.96
3	-3.33	811.56	-1.15	-5.88	-762.96	1.15
4	-2.78	676.30	-0.96	-4.90	-635.80	0.96
5	0.15	847.50	0.02	0.00	-781.98	-0.02
6	0.70	712.24	0.21	0.98	-654.82	-0.21
7	-6.80	830.97	-2.32	-11.77	-799.29	2.32
8	-6.24	695.71	-2.13	-10.79	-672.13	2.13
9	-3.32	866.91	-1.15	-5.89	-818.31	1.15
10	-2.76	731.66	-0.96	-4.91	-691.16	0.96
11	-3.33	811.56	-1.15	-5.88	-762.96	1.15
12	-2.78	676.30	-0.96	-4.90	-635.80	0.96
13	-0.37	842.10	-0.16	-0.89	-779.12	0.16
14	0.18	706.85	0.03	0.09	-651.96	-0.03
15	-6.28	828.06	-2.15	-10.89	-793.84	2.15
16	-5.72	692.80	-1.95	-9.91	-666.68	1.95
17	-3.32	858.61	-1.15	-5.89	-810.01	1.15
18	-2.76	723.35	-0.96	-4.91	-682.85	0.96
19	-3.33	811.56	-1.15	-5.88	-762.96	1.15
20	-2.78	676.30	-0.96	-4.90	-635.80	0.96
21	-0.37	842.10	-0.16	-0.89	-779.12	0.16
22	0.18	706.85	0.03	0.09	-651.96	-0.03
23	-6.28	828.06	-2.15	-10.89	-793.84	2.15
24	-5.72	692.80	-1.95	-9.91	-666.68	1.95
25	-3.32	858.61	-1.15	-5.89	-810.01	1.15
26	-2.76	723.35	-0.96	-4.91	-682.85	0.96
27	-3.33	811.56	-1.15	-5.88	-762.96	1.15
28	-2.78	676.30	-0.96	-4.90	-635.80	0.96
29	240.83	826.96	47.60	188.14	-771.11	-47.60
30	241.22	689.13	47.71	188.71	-642.59	-47.71
31	-249.15	819.88	-49.90	-199.92	-778.53	49.90
32	-248.15	683.23	-49.63	-198.52	-648.77	49.63
33	-247.29	835.28	-49.40	-197.40	-786.68	49.40
34	-246.60	696.07	-49.21	-196.42	-655.57	49.21
35	238.97	811.56	47.10	185.62	-762.96	-47.10
36	239.66	676.30	47.29	186.60	-635.80	-47.29

NO 32 As= 1278. M= -248.15 N= 683.23 NO 32
As= 1093. M= -198.52 N= -648.77
GG= 709.

Concrete COLUMN 3(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V
1	36.33	442.73	13.74	73.56	-394.13	-13.74
2	30.28	368.94	11.45	61.30	-328.44	-11.45
3	36.33	442.73	13.74	73.56	-394.13	-13.74
4	30.28	368.94	11.45	61.30	-328.44	-11.45
5	38.98	469.06	14.73	79.65	-422.40	-14.81
6	32.92	395.27	12.44	67.39	-356.71	-12.52
7	36.33	442.73	13.74	72.74	-392.20	-13.65
8	30.28	368.94	11.45	60.48	-326.51	-11.36
9	38.85	471.00	14.81	79.65	-422.40	-14.81
10	32.79	397.21	12.52	67.39	-356.71	-12.52

11 36.46 440.80 13.65 72.74 -392.20 -13.65 12 30.40
367.01 11.36 60.48 -326.51 -11.36
13 38.58 465.11 14.58 78.74 -418.16 -14.65 14 32.53
391.32 12.29 66.48 -352.47 -12.36
15 36.33 442.73 13.74 72.86 -392.49 -13.66 16 30.28
368.94 11.45 60.60 -326.80 -11.37
17 38.47 466.76 14.65 78.74 -418.16 -14.65 18 32.42
392.97 12.36 66.48 -352.47 -12.36
19 36.44 441.09 13.66 72.86 -392.49 -13.66 20 30.38
367.30 11.37 60.60 -326.80 -11.37
21 38.58 465.11 14.58 78.74 -418.16 -14.65 22 32.53
391.32 12.29 66.48 -352.47 -12.36
23 36.33 442.73 13.74 72.86 -392.49 -13.66 24 30.28
368.94 11.45 60.60 -326.80 -11.37
25 38.47 466.76 14.65 78.74 -418.16 -14.65 26 32.42
392.97 12.36 66.48 -352.47 -12.36
27 36.44 441.09 13.66 72.86 -392.49 -13.66 28 30.38
367.30 11.37 60.60 -326.80 -11.37
29 269.49 487.95 56.27 234.90 -440.18 -56.31 30 261.68
412.28 53.91 222.21 -372.47 -53.94
31 -177.25 408.80 -28.37 -85.52 -359.37 28.41 32 -184.82
335.01 -30.66 -97.72 -293.82 30.69
33 269.42 488.78 56.31 234.90 -440.18 -56.31 34 261.63
412.97 53.94 222.21 -372.47 -53.94
35 -177.18 407.97 -28.41 -85.52 -359.37 28.41 36 -184.76
334.32 -30.69 -97.72 -293.82 30.69

NO 29 As= 1556. M= 269.49 N= 487.95 NO 29
As= 1416. M= 234.90 N= -440.18
GG= 709.

Concrete BEAM 1(SECTION TYPE= 1 ANG= 0, L= 7.50)
Section property: B= 350, H= 750
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= -103.30 -163.53 -226.92 -279.36 -320.86 -351.42 -371.02 -243.53 -
118.05 -5.09 0.00 0.00 0.00
As(1)= 788. 565. 791. 981. 1227. 1503. 1725. 1148.
544. 17. 0. 0. 788.
As(2)= 788. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 788.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 228.27 116.67 28.04 0.00 0.00 0.00 0.00 0.00
0.00 56.23 220.55 395.80 587.96
As(1)= 796. 401. 95. 0. 0. 0. 0. 0.
0. 192. 833. 1583. 2551.
As(2)= 796. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 2667.

Vl= 195.56 NO 13 Vr= 307.52 NO 15 Asv/s= 0.50 As(3)= 788.
Umaxb= 0.007 Umaxt= 0.010

Concrete BEAM 2(SECTION TYPE= 1 ANG= 0, L= 7.50)
Section property: B= 350, H= 750

```
      BOTTOM
   SECTION      1        2        3        4        5        6        7        8
9        10       11       12       13
         M=     0.00     0.00     0.00   -25.01  -152.58  -288.20  -391.52  -376.85  -
339.89  -291.97  -233.11  -163.31  -97.72
      As(1)=    788.     0.       0.       85.      707.     1371.    1828.    1629.
1320.    1028.    814.     565.     788.
      As(2)=    788.     0.       0.       0.       0.       0.       0.       0.
0.       0.       0.       0.       788.
      TOP
   SECTION      1        2        3        4        5        6        7        8
9        10       11       12       13
         M=     593.85   391.74   206.48   32.15    0.00     0.00     0.00     0.00
0.00     0.00     22.75    116.81   234.90
      As(1)=    2584.    1561.    765.     109.     0.       0.       0.       0.
0.       0.       77.      401.     820.
      As(2)=    2702.    0.       0.       0.       0.       0.       0.       0.
0.       0.       0.       0.       820.

      Vl=  323.53    NO 13     Vr=  205.82    NO 15    Asv/s=  0.50    As(3)=  788.
Umaxb=  0.007        Umaxt=  0.010
     PK1  COMPUTE  END
```

****** KJ-3 Calculation Result ******

OUTPUT DATA

---- Zhong xin xi ------

6 3 2 0 3 3 1 0 2 0 0 2 1
0
1.00 1.00
0

OUTPUT DATA

------- Jiao Dian Zuo Biao --------

(1) 0.00 7.30 (2) 8.50 7.30 (3) 15.00 7.30 (4) 0.00 0.00
(5) 8.50 0.00 (6) 15.00 0.00

OUTPUT DATA

------- Zhu Guan Lian Hao --------

(1) 4 1 (2) 5 2 (3) 6 3

------- Liang Guan Lian Hao --------

(1) 1 2 (2) 2 3

OUTPUT DATA

------- Zhi Zuo Yue Shu Xin Xi --------

(1) 4111 (2) 5111 (3) 6111

OUTPUT DATA

------- Shang Xia Zhu Jian Dian Pian Xin --------

(1) 0.00 (2) 0.00 (3) 0.00 (4) 0.00 (5) 0.00 (6) 0.00

OUTPUT DATA

------- Biao Zhun Jie Mian Xin Xi --------

(1) 1, 450, 450, 6
(2) 1, 350, 850, 6
(3) 1, 300, 650, 6

OUTPUT DATA

----- Zhu Ji Suan Chang Du(After consider steel) ------

(1) 1.00 (2) 1.00 (3) 1.00

OUTPUT DATA

---- Zhu Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1) 1 0 0 (2) 1 0 0 (3) 1 0 0

---- Liang Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1) 2 0 0 (2) 3 0 0
IIQQ= 27

STIF COMPUTE
DEAD COMPUTE

JOINT LOAD: JR XM XN
1 0.00 94.10
3 0.00 95.00
0

COLUMN LOAD: JC KL P X KX
0

BEAM LOAD: NE LI KL P X P1 X1
KL P X P1 X1
1 3 1 28.50 0.00
4 90.40 3.75
4 70.00 7.50
1 3 1 25.70 0.00
4 22.00 3.18
4 90.40 2.60

DEAD LOAD

STIF COMPUTE
LIVE COMPUTE
JOINT LOAD: JR XM XN
1 0.00 5.30
3 0.00 5.40
0

COLUMN LOAD: JC KL P X KX
0

LIVE LOAD

BEAM LOAD: NE LI KL P X P1 X1
KL P X P1 X1
1 3 1 1.40 0.00
4 6.10 3.75
4 4.70 7.50
1 2 1 1.40 0.00
4 6.10 2.60

EART COMPUTE
1 7 4.00 0 1 1.00 0

1
950.934

1 T= 0.6806
1.000
76.075

DISPLACEMENT

(1) 0.009 (2) 0.009 (3) 0.009 (4) 0.000 (5) 0.000 (6) 0.000

3
950.934

1 T= 0.6810
1.000
76.075

DISPLACEMENT

(1)-0.009 (2)-0.009 (3)-0.009 (4) 0.000 (5) 0.000 (6) 0.000

COMBI COMPUTE

COMBINATION AND REINFORCEMENT

Concrete COLUMN 1(SECTION TYPE= 1, ANG= 0, Lx= 7.30, Ly= 7.30)

Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V
1	-39.30	335.91	-15.92	-76.91	-291.56	15.92	2	-32.75	279.93	-13.27	-64.10	-242.97	13.27
3	-39.30	335.91	-15.92	-76.91	-291.56	15.92	4	-32.75	279.93	-13.27	-64.10	-242.97	13.27
5	-39.27	343.30	-15.91	-76.45	-297.74	15.88	6	-32.72	287.31	-13.25	-63.63	-249.15	13.23
7	-42.00	347.47	-17.02	-82.62	-304.33	17.04	8	-35.45	291.48	-14.36	-69.80	-255.74	14.39
9	-41.75	356.07	-17.03	-82.55	-311.72	17.03	10	-35.19	300.08	-14.37	-69.73	-263.13	14.37
11	-39.53	334.70	-15.90	-76.52	-290.36	15.90	12	-32.98	278.72	-13.24	-63.70	-241.76	13.24
13	-39.27	342.19	-15.91	-76.52	-296.82	15.89	14	-32.72	286.21	-13.25	-63.70	-248.22	13.24
15	-41.60	345.74	-16.85	-81.77	-302.42	16.87	16	-35.05	289.75	-14.20	-68.95	-253.82	14.22
17	-41.38	353.04	-16.86	-81.71	-308.70	16.86	18	-34.83	297.06	-14.21	-68.89	-260.10	14.21
19	-39.49	334.88	-15.90	-76.58	-290.54	15.90	20	-32.94	278.90	-13.25	-63.76	-241.94	13.25
21	-39.27	342.19	-15.91	-76.52	-296.82	15.89	22	-32.72	286.21	-13.25	-63.70	-248.22	13.24
23	-41.60	345.74	-16.85	-81.77	-302.42	16.87	24	-35.05	289.75	-14.20	-68.95	-253.82	14.22
25	-41.38	353.04	-16.86	-81.71	-308.70	16.86	26	-34.83	297.06	-14.21	-68.89	-260.10	14.21
27	-39.49	334.88	-15.90	-76.58	-290.54	15.90	28	-32.94	278.90	-13.25	-63.76	-241.94	13.25
29	108.49	316.78	17.05	37.86	-271.91	-17.06	30	116.67	260.26	19.70	50.65	-222.88	-19.71
31	-208.17	363.17	-49.36	-193.94	-319.34	49.37	32	-199.74	306.36	-46.63	-180.71	-269.83	46.63
33	-208.04	366.85	-49.36	-193.91	-322.50	49.36	34	-199.63	309.43	-46.63	-180.69	-272.47	46.63
35	108.35	313.09	17.06	37.83	-268.74	-17.06	36	116.56	257.19	19.71	50.62	-220.24	-19.71

NO 31 As= 1103. M= -208.17 N= 363.17 NO 31 As= 1168. M= -193.94 N= -319.34

GG= 709.

Concrete COLUMN 2(SECTION TYPE= 1, ANG= 0, Lx= 7.30, Ly= 7.30)

Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER

M N V M N V
1 14.54 576.06 6.23 30.94 -531.71 -6.23 2 12.11
480.05 5.19 25.78 -443.09 -5.19
3 14.54 576.06 6.23 30.94 -531.71 -6.23 4 12.11
480.05 5.19 25.78 -443.09 -5.19
5 17.93 596.71 7.52 36.99 -552.36 -7.52 6 15.51
500.70 6.48 31.83 -463.74 -6.48
7 12.21 590.21 5.39 27.12 -545.87 -5.39 8 9.78
494.20 4.35 21.96 -457.25 -4.35
9 15.60 610.87 6.68 33.16 -566.52 -6.68 10 13.18
514.86 5.64 28.01 -477.90 -5.64
11 14.54 576.06 6.23 30.94 -531.71 -6.23 12 12.11
480.05 5.19 25.78 -443.09 -5.19
13 17.42 593.61 7.33 36.08 -549.27 -7.33 14 15.00
497.60 6.29 30.92 -460.65 -6.29
15 12.56 588.09 5.51 27.69 -543.74 -5.51 16 10.13
492.08 4.47 22.53 -455.12 -4.47
17 15.44 605.64 6.61 32.83 -561.30 -6.61 18 13.02
509.64 5.57 27.67 -472.68 -5.57
19 14.54 576.06 6.23 30.94 -531.71 -6.23 20 12.11
480.05 5.19 25.78 -443.09 -5.19
21 17.42 593.61 7.33 36.08 -549.27 -7.33 22 15.00
497.60 6.29 30.92 -460.65 -6.29
23 12.56 588.09 5.51 27.69 -543.74 -5.51 24 10.13
492.08 4.47 22.53 -455.12 -4.47
25 15.44 605.64 6.61 32.83 -561.30 -6.61 26 13.02
509.64 5.57 27.67 -472.68 -5.57
27 14.54 576.06 6.23 30.94 -531.71 -6.23 28 12.11
480.05 5.19 25.78 -443.09 -5.19
29 188.58 583.50 43.37 165.70 -539.15 -43.37 30 185.25
486.01 42.23 160.11 -449.05 -42.23
31 -151.67 583.54 -30.71 -102.87 -539.19 30.71 32 -154.49
486.52 -31.69 -107.75 -449.56 31.69
33 -149.85 592.39 -30.16 -100.28 -548.04 30.16 34 -152.98
493.89 -31.23 -105.59 -456.94 31.23
35 186.76 574.64 42.81 163.11 -530.30 -42.81 36 183.73
478.63 41.77 157.96 -441.68 -41.77

NO 30 As= 923. M= 185.25 N= 486.01 NO 29
As= 862. M= 165.70 N= -539.15
GG= 709.

Concrete COLUMN 3(SECTION TYPE= 1, ANG= 0, Lx= 7.30, Ly= 7.30)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER
M N V M N V
1 22.92 266.51 9.69 47.83 -222.16 -9.69 2 19.10
222.09 8.08 39.86 -185.14 -8.08
3 22.92 266.51 9.69 47.83 -222.16 -9.69 4 19.10
222.09 8.08 39.86 -185.14 -8.08
5 24.63 274.85 10.51 52.10 -230.50 -10.51 6 20.81
230.43 8.90 44.13 -193.47 -8.90
7 22.71 272.46 9.50 46.67 -228.12 -9.50 8 18.89
228.05 7.89 38.70 -191.09 -7.89
9 24.59 282.36 10.49 52.02 -238.02 -10.49 10 20.77
237.95 8.88 44.04 -200.99 -8.88

11 22.75 264.95 9.52 46.75 -220.60 -9.52 12 18.93
220.53 7.91 38.78 -183.57 -7.91
13 24.37 273.60 10.39 51.46 -229.25 -10.39 14 20.55
229.18 8.77 43.49 -192.22 -8.77
15 22.74 271.57 9.53 46.84 -227.22 -9.53 16 18.92
227.15 7.92 38.87 -190.20 -7.92
17 24.34 279.99 10.37 51.39 -235.64 -10.37 18 20.52
235.57 8.76 43.42 -198.61 -8.76
19 22.78 265.18 9.55 46.91 -220.83 -9.55 20 18.96
220.76 7.93 38.94 -183.81 -7.93
21 24.37 273.60 10.39 51.46 -229.25 -10.39 22 20.55
229.18 8.77 43.49 -192.22 -8.77
23 22.74 271.57 9.53 46.84 -227.22 -9.53 24 18.92
227.15 7.92 38.87 -190.20 -7.92
25 24.34 279.99 10.37 51.39 -235.64 -10.37 26 20.52
235.57 8.76 43.42 -198.61 -8.76
27 22.78 265.18 9.55 46.91 -220.83 -9.55 28 18.96
220.76 7.93 38.94 -183.81 -7.93
29 176.18 293.80 39.39 146.62 -249.45 -39.39 30 171.25
248.79 37.72 138.34 -211.83 -37.72
31 -118.08 245.35 -19.74 -49.63 -201.00 19.74 32 -122.84
200.50 -21.34 -57.52 -163.55 21.34
33 176.16 297.02 39.39 146.59 -252.67 -39.39 34 171.24
251.47 37.71 138.32 -214.51 -37.71
35 -118.06 242.12 -19.73 -49.60 -197.78 19.73 36 -122.82
197.82 -21.34 -57.49 -160.86 21.34

NO 29 As= 943. M= 176.18 N= 293.80 NO 29
As= 877. M= 146.62 N= -249.45
GG= 709.

Concrete BEAM 1(SECTION TYPE= 1 ANG= 0, L= 8.50)
Section property: B= 350, H= 850
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= -50.65 -141.05 -229.29 -299.96 -353.05 -388.55 -350.40 -280.56 -
197.18 -106.63 -14.51 0.00 0.00
As(1)= 893. 425. 697. 992. 1301. 1536. 1437. 1154.
802. 383. 43. 0. 893.
As(2)= 893. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 893.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 193.94 64.73 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 71.44 246.17 478.99
As(1)= 893. 193. 0. 0. 0. 0. 0. 0.
0. 0. 214. 794. 1758.
As(2)= 893. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 1758.

Vl= 206.42 NO 13 Vr= 335.52 NO 15 Asv/s= 0.50 As(3)= 893.
Umaxb= 0.005 Umaxt= 0.006

Concrete BEAM 2(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650

```
        BOTTOM
    SECTION      1         2         3         4         5         6         7         8
9         10        11        12        13
          M=      0.00      0.00      0.00      0.00    -67.31   -141.39   -166.06   -169.51   -
163.66  -148.51  -124.07   -90.34    -57.52
    As(1)=       585.        0.        0.        0.      360.      772.      840.      782.
670.      603.      501.      362.      585.
    As(2)=       585.        0.        0.        0.        0.        0.        0.        0.
0.        0.        0.        0.       585.
        TOP
    SECTION      1         2         3         4         5         6         7         8
9         10        11        12        13
          M=    429.30    291.06    166.10     50.43      0.00      0.00      0.00      0.00
0.00      0.00     28.77     78.82    146.62
    As(1)=      2287.     1426.      774.      215.        0.        0.        0.        0.
0.        0.       114.      315.      595.
    As(2)=      2416.        0.        0.        0.        0.        0.        0.        0.
0.        0.        0.        0.       595.

    Vl=  257.13    NO 13    Vr=  135.45   NO 15    Asv/s=   0.49    As(3)=   585.
Umaxb=  0.004        Umaxt=  0.012
      PK1  COMPUTE  END
```

****** KJ-4 Calculation result ******

OUTPUT DATA

---- Zhong xin xi ------

```
 20   10    9    0   10    2    1    0    2    0    0    2    1    0
 1.00  1.00
  0
```

OUTPUT DATA

------- Jiao Dian Zuo Biao --------

```
( 1)  0.00  8.00   ( 2)  6.50  8.00   ( 3) 13.00  8.00   ( 4) 19.50  8.00
( 5) 26.00  8.00   ( 6) 32.50  8.00   ( 7) 39.00  8.00   ( 8) 45.50  8.00
( 9) 52.00  8.00   (10) 58.50  8.00   (11)  0.00  0.00   (12)  6.50  0.00
(13) 13.00  0.00   (14) 19.50  0.00   (15) 26.00  0.00   (16) 32.50  0.00
(17) 39.00  0.00   (18) 45.50  0.00   (19) 52.00  0.00   (20) 58.50  0.00
```

OUTPUT DATA

------- Zhu Guan Lian Hao --------

```
( 1)  11   1   ( 2)  12   2   ( 3)  13   3   ( 4)  14   4   ( 5)  15   5
( 6)  16   6   ( 7)  17   7   ( 8)  18   8   ( 9)  19   9   (10)  20  10
```

------- Liang Guan Lian Hao --------

```
( 1)  1   2   ( 2)  2   3   ( 3)  3   4   ( 4)  4   5   ( 5)  5   6
( 6)  6   7   ( 7)  7   8   ( 8)  8   9   ( 9)  9  10
```

OUTPUT DATA

------- Zhi Zuo Yue Shu Xin Xi --------

```
( 1)  11111   ( 2)  12111   ( 3)  13111   ( 4)  14111   ( 5)  15111
( 6)  16111   ( 7)  17111   ( 8)  18111   ( 9)  19111   (10)  20111
```

OUTPUT DATA

------- Shang Xia Zhu Jian Dian Pian Xin --------

```
( 1) 0.00  ( 2) 0.00  ( 3) 0.00  ( 4) 0.00  ( 5) 0.00  ( 6) 0.00  ( 7) 0.00
( 8) 0.00  ( 9) 0.00  (10) 0.00  (11) 0.00  (12) 0.00  (13) 0.00  (14) 0.00
(15) 0.00  (16) 0.00  (17) 0.00  (18) 0.00  (19) 0.00  (20) 0.00
```

OUTPUT DATA

------- Biao Zhun Jie Mian Xin Xi --------

```
( 1)    1,  450,  450,  6
( 2)    1,  300,  650,  6
```

OUTPUT DATA

----- Zhu Ji Suan Chang Du(After consider steel) ------

```
( 1) 1.00  ( 2) 1.00  ( 3) 1.00  ( 4) 1.00  ( 5) 1.00  ( 6) 1.00  ( 7) 1.00
( 8) 1.00  ( 9) 1.00  (10) 1.00
```

OUTPUT DATA

---- Zhu Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1)	1	0	0	(2)	1	0	0	(3)	1	0	0
(4)	1	0	0	(5)	1	0	0	(6)	1	0	0
(7)	1	0	0	(8)	1	0	0	(9)	1	0	0
(10)	1	0	0								

---- Liang Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

(1)	2	0	0	(2)	2	0	0	(3)	2	0	0
(4)	2	0	0	(5)	2	0	0	(6)	2	0	0
(7)	2	0	0	(8)	2	0	0	(9)	2	0	0

IIQQ= 111

STIF COMPUTE
DEAD COMPUTE

JOINT LOAD:

JR	XM	XN
1	0.00	146.10
2	0.00	173.90
3	0.00	173.90
4	0.00	173.90
5	0.00	173.90
6	0.00	173.90
7	0.00	173.90
8	0.00	173.90
9	0.00	173.90
10	0.00	200.90
0		

COLUMN LOAD:

JC	KL	P	X	KX
0				

BEAM LOAD: NE LI KL P X P1 X1
KL P X P1 X1

NE	LI	KL	P	X	P1	X1
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					
1	2	1	17.40	0.00		6
15.90	1.88					

DEAD LOAD

STIF COMPUTE
LIVE COMPUTE

JOINT LOAD:	JR	XM	XN
	1	0.00	8.10
	2	0.00	11.00
	3	0.00	11.00
	4	0.00	11.00

	5	0.00	11.00
	6	0.00	11.00
	7	0.00	11.00
	8	0.00	11.00
	9	0.00	11.00
	10	0.00	10.90
	0		

COLUMN LOAD: JC KL P X KX
0

LIVE LOAD

BEAM LOAD: NE LI KL P X P1 X1
KL P X P1 X1

1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88
1 2 1 0.70 0.00 6
1.30 1.88

EART COMPUTE
1 7 4.00 0 1 1.00 0

1
3720.724

1 T= 0.8628
1.000
293.673

DISPLACEMENT

(1) 0.014 (2) 0.014 (3) 0.014 (4) 0.014 (5) 0.014 (6) 0.014 (7) 0.014
(8) 0.014 (9) 0.014
(10) 0.014 (11) 0.000 (12) 0.000 (13) 0.000 (14) 0.000 (15) 0.000 (16) 0.000 (17)

(10) 0.014 (11) 0.000 (12) 0.000 (13) 0.000 (14) 0.000 (15) 0.000 (16) 0.000 (17)
0.000 (18) 0.000
(19) 0.000 (20) 0.000

10
3720.724

1 T= 0.8628
1.000
293.673

DISPLACEMENT

(1)-0.014 (2)-0.014 (3)-0.014 (4)-0.014 (5)-0.014 (6)-0.014 (7)-0.014

(8)-0.014 (9)-0.014
(10)-0.014 (11) 0.000 (12) 0.000 (13) 0.000 (14) 0.000 (15) 0.000 (16) 0.000 (17)
0.000 (18) 0.000
(19) 0.000 (20) 0.000

COMBI COMPUTE

COMBINATION AND REINFORCEMENT

Concrete COLUMN 1(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V
1	-20.19	317.54	-7.61	-40.69	-268.94	7.61	2	-16.83	264.61	-6.34	-33.91	-224.11	6.34
3	-20.19	317.54	-7.61	-40.69	-268.94	7.61	4	-16.83	264.61	-6.34	-33.91	-224.11	6.34
5	-19.85	316.77	-7.48	-40.00	-268.17	7.48	6	-16.48	263.85	-6.21	-33.22	-223.35	6.21
7	-21.98	335.84	-8.28	-44.29	-287.24	8.28	8	-18.61	282.91	-7.02	-37.51	-242.41	7.02
9	-21.98	335.84	-8.28	-44.29	-287.24	8.28	10	-18.61	282.91	-7.02	-37.51	-242.41	7.02
11	-19.85	316.77	-7.48	-40.00	-268.17	7.48	12	-16.48	263.85	-6.21	-33.22	-223.35	6.21
13	-19.90	316.88	-7.50	-40.11	-268.28	7.50	14	-16.53	263.96	-6.23	-33.32	-223.46	6.23
15	-21.71	333.09	-8.18	-43.75	-284.49	8.18	16	-18.35	280.17	-6.91	-36.97	-239.67	6.91
17	-21.71	333.09	-8.18	-43.75	-284.49	8.18	18	-18.35	280.17	-6.91	-36.97	-239.67	6.91
19	-19.90	316.88	-7.50	-40.11	-268.28	7.50	20	-16.53	263.96	-6.23	-33.32	-223.46	6.23
21	-19.90	316.88	-7.50	-40.11	-268.28	7.50	22	-16.53	263.96	-6.23	-33.32	-223.46	6.23
23	-21.71	333.09	-8.18	-43.75	-284.49	8.18	24	-18.35	280.17	-6.91	-36.97	-239.67	6.91
25	-21.71	333.09	-8.18	-43.75	-284.49	8.18	26	-18.35	280.17	-6.91	-36.97	-239.67	6.91
27	-19.90	316.88	-7.50	-40.11	-268.28	7.50	28	-16.53	263.96	-6.23	-33.32	-223.46	6.23

29 160.96 283.74 26.88 86.27 -235.14 -26.88 30 165.14 230.88
28.14 93.01 -190.38 -28.14
31 -212.22 358.84 -42.34 -168.91 -310.24 42.34 32 -207.85 304.61 -
41.02 -161.87 -264.11 41.02
33 -212.22 358.84 -42.34 -168.91 -310.24 42.34 34 -207.85 304.61 -
41.02 -161.87 -264.11 41.02
35 160.96 283.74 26.88 86.27 -235.14 -26.88 36 165.14 230.88
28.14 93.01 -190.38 -28.14

NO 32 As= 1170. M= -207.85 N= 304.61 NO 31 As=
1022. M= -168.91 N= -310.24
GG= 709.

Concrete COLUMN 2(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER M
N V M N V

1 4.68 503.42 1.72 9.12 -454.82 -1.72 2 3.90 419.52
1.44 7.60 -379.02 -1.44
3 4.68 503.42 1.72 9.12 -454.82 -1.72 4 3.90 419.52
1.44 7.60 -379.02 -1.44
5 6.22 511.37 2.28 12.06 -462.76 -2.28 6 5.44 427.46
2.00 10.54 -386.95 -2.00
7 3.42 527.08 1.27 6.76 -478.49 -1.27 8 2.65 443.18
0.99 5.24 -402.69 -0.99
9 4.87 536.06 1.78 9.37 -487.46 -1.78 10 4.09 452.16
1.49 7.85 -411.66 -1.49
11 4.78 502.39 1.78 9.44 -453.79 -1.78 12 4.00 418.48
1.49 7.92 -377.98 -1.49
13 5.99 510.17 2.20 11.62 -461.57 -2.20 14 5.21 426.27
1.91 10.10 -385.76 -1.91
15 3.61 523.54 1.34 7.11 -474.94 -1.34 16 2.83 439.63
1.05 5.59 -399.14 -1.05
17 4.84 531.17 1.77 9.33 -482.57 -1.77 18 4.06 447.26
1.48 7.81 -406.76 -1.48
19 4.76 502.54 1.77 9.40 -453.94 -1.77 20 3.98 418.64
1.48 7.88 -378.14 -1.48
21 5.99 510.17 2.20 11.62 -461.57 -2.20 22 5.21 426.27
1.91 10.10 -385.76 -1.91
23 3.61 523.54 1.34 7.11 -474.94 -1.34 24 2.83 439.63
1.05 5.59 -399.14 -1.05
25 4.84 531.17 1.77 9.33 -482.57 -1.77 26 4.06 447.26
1.48 7.81 -406.76 -1.48
27 4.76 502.54 1.77 9.40 -453.94 -1.77 28 3.98 418.64
1.48 7.88 -378.14 -1.48
29 210.75 519.22 41.82 165.99 -470.62 -41.82 30 209.64 434.75
41.50 164.26 -394.25 -41.50
31 -198.91 501.17 -38.33 -147.50 -452.57 38.33 32 -199.77 415.58 -
38.58 -148.85 -375.08 38.58
33 210.03 529.81 41.61 164.84 -481.21 -41.61 34 209.04 443.57
41.32 163.30 -403.07 -41.32
35 -198.18 490.58 -38.11 -146.35 -441.98 38.11 36 -199.17 406.75 -
[illegible]

38.40 -147.89 -366.25 38.40

NO 29 As= 1126. M= 210.75 N= 519.22 NO 29 As=
962. M= 165.99 N= -470.62
GG= 709.

Concrete COLUMN 3(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER M
N V M N V
1 -0.82 476.31 -0.33 -1.80 -427.71 0.33 2 -0.68 396.93 -
0.27 -1.50 -356.43 0.27
3 -0.82 476.31 -0.33 -1.80 -427.71 0.33 4 -0.68 396.93 -
0.27 -1.50 -356.43 0.27
5 0.44 498.93 0.14 0.71 -450.33 -0.14 6 0.58 419.55
0.20 1.01 -379.05 -0.20
7 -2.12 483.59 -0.82 -4.41 -434.99 0.82 8 -1.98 404.21 -
0.76 -4.11 -363.71 0.76
9 -0.98 508.43 -0.37 -1.99 -459.83 0.37 10 -0.84 429.05 -
0.32 -1.69 -388.55 0.32
11 -0.70 474.09 -0.30 -1.71 -425.49 0.30 12 -0.56 394.70 -
0.25 -1.41 -354.20 0.25
13 0.25 495.54 0.07 0.34 -446.94 -0.07 14 0.39 416.15

0.13 0.64 -375.65 -0.13
15 -1.92 482.50 -0.74 -4.02 -433.90 0.74 16 -1.78 403.11 -
0.69 -3.72 -362.61 0.69
17 -0.95 503.61 -0.36 -1.96 -455.01 0.36 18 -0.82 424.23 -
0.31 -1.66 -383.73 0.31
19 -0.71 474.42 -0.30 -1.72 -425.82 0.30 20 -0.58 395.04 -
0.25 -1.42 -354.54 0.25
21 0.25 495.54 0.07 0.34 -446.94 -0.07 22 0.39 416.15
0.13 0.64 -375.65 -0.13
23 -1.92 482.50 -0.74 -4.02 -433.90 0.74 24 -1.78 403.11 -
0.69 -3.72 -362.61 0.69
25 -0.95 503.61 -0.36 -1.96 -455.01 0.36 26 -0.82 424.23 -
0.31 -1.66 -383.73 0.31
27 -0.71 474.42 -0.30 -1.72 -425.82 0.30 28 -0.58 395.04 -
0.25 -1.42 -354.54 0.25
29 199.96 483.48 38.60 148.87 -434.88 -38.60 30 200.02 402.48
38.63 148.99 -361.98 -38.63
31 -202.02 481.95 -39.27 -152.51 -433.35 39.27 32 -201.74 402.05 -
39.18 -152.02 -361.55 39.18
33 -201.42 492.60 -39.08 -151.47 -444.00 39.08 34 -201.23 410.92 -
39.02 -151.16 -370.42 39.02
35 199.35 472.84 38.41 147.83 -424.24 -38.41 36 199.51 393.61
38.47 148.13 -353.11 -38.47

NO 31 As= 1090. M= -202.02 N= 481.95 NO 32 As=
869. M= -152.02 N= -361.55
GG= 709.

Concrete COLUMN 4(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V
1	0.31	482.20	0.10	0.51	-433.60	-0.10	2	0.26	401.84	0.09	0.43	-361.34	-0.09
3	0.31	482.20	0.10	0.51	-433.60	-0.10	4	0.26	401.84	0.09	0.43	-361.34	-0.09
5	1.74	505.02	0.62	3.23	-456.42	-0.62	6	1.69	424.66	0.60	3.14	-384.16	-0.60
7	-1.10	489.62	-0.41	-2.17	-441.02	0.41	8	-1.16	409.25	-0.43	-2.25	-368.75	0.43
9	0.46	514.52	0.14	0.66	-465.92	-0.14	10	0.41	434.15	0.12	0.58	-393.65	-0.12
11	0.18	480.12	0.07	0.40	-431.52	-0.07	12	0.12	399.76	0.05	0.31	-359.26	-0.05
13	1.52	501.60	0.54	2.82	-453.00	-0.54	14	1.47	421.23	0.53	2.73	-380.73	-0.53
15	-0.89	488.51	-0.33	-1.76	-439.91	0.33	16	-0.94	408.14	-0.35	-1.85	-367.64	0.35
17	0.44	509.67	0.13	0.64	-461.07	-0.13	18	0.38	429.31	0.12	0.55	-388.81	-0.12
19	0.20	480.43	0.08	0.42	-431.83	-0.08	20	0.14	400.07	0.06	0.33	-359.57	-0.06
21	1.52	501.60	0.54	2.82	-453.00	-0.54	22	1.47	421.23	0.53	2.73	-380.73	-0.53
23	-0.89	488.51	-0.33	-1.76	-439.91	0.33	24	-0.94	408.14	-0.35	-1.85	-367.64	0.35
25	0.44	509.67	0.13	0.64	-461.07	-0.13	26	0.38	429.31	0.12	0.55	-388.81	-0.12

27	0.20	480.43	0.08	0.42	-431.83	-0.08	28	0.14	400.07	0.06	0.33	-359.57	-0.06
29	202.19	492.50	39.28	152.46	-443.90	-39.28	30	202.00	410.50	39.22	152.18	-370.00	-39.22
31	-201.41	484.87	-39.07	-151.42	-436.27	39.07	32	-201.35	403.97	-39.05	-151.31	-363.47	39.05
33	201.50	496.57	39.07	151.36	-447.97	-39.07	34	201.43	413.89	39.05	151.26	-373.39	-39.05
35	-200.73	480.80	-38.86	-150.32	-432.20	38.86	36	-200.78	400.58	-38.88	-150.40	-360.08	38.88

NO 29 As= 1084. M= 202.19 N= 492.50 NO 30 As= 865. M= 152.18 N= -370.00
GG= 709.

Concrete COLUMN 5(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER	M	N	V	M	N	V	NUMBER	M	N	V	M	N	V
1	-0.03	480.98	-0.01	-0.08	-432.38	0.01	2	-0.02	400.82	-0.01	-0.07	-360.32	0.01
3	-0.03	480.98	-0.01	-0.08	-432.38	0.01	4	-0.02	400.82	-0.01	-0.07	-360.32	0.01

5 1.37 503.72 0.49 2.58 -455.12 -0.49 6 1.37 423.55
0.50 2.59 -383.05 -0.50
7 -1.42 488.41 -0.52 -2.75 -439.81 0.52 8 -1.41 408.25 -
0.52 -2.73 -367.75 0.52
9 -0.16 513.27 -0.05 -0.21 -464.67 0.05 10 -0.16 433.11 -
0.04 -0.20 -392.61 0.04
11 0.12 478.86 0.02 0.05 -430.26 -0.02 12 0.12 398.70
0.02 0.06 -358.20 -0.02
13 1.16 500.31 0.42 2.18 -451.71 -0.42 14 1.16 420.14
0.42 2.19 -379.64 -0.42
15 -1.21 487.30 -0.44 -2.35 -438.70 0.44 16 -1.20 407.13 -
0.44 -2.33 -366.63 0.44
17 -0.14 508.43 -0.04 -0.19 -459.83 0.04 18 -0.14 428.26 -
0.04 -0.18 -387.76 0.04
19 0.09 479.18 0.02 0.03 -430.58 -0.02 20 0.10 399.01
0.02 0.04 -358.51 -0.02
21 1.16 500.31 0.42 2.18 -451.71 -0.42 22 1.16 420.14
0.42 2.19 -379.64 -0.42
23 -1.21 487.30 -0.44 -2.35 -438.70 0.44 24 -1.20 407.13 -
0.44 -2.33 -366.63 0.44
25 -0.14 508.43 -0.04 -0.19 -459.83 0.04 26 -0.14 428.26 -
0.04 -0.18 -387.76 0.04
27 0.09 479.18 0.02 0.03 -430.58 -0.02 28 0.10 399.01
0.02 0.04 -358.51 -0.02
29 201.60 490.60 39.11 151.60 -442.00 -39.11 30 201.48 408.81
39.08 151.43 -368.31 -39.08
31 -201.66 484.29 -39.14 -151.77 -435.69 39.14 32 -201.53 403.59 -
39.10 -151.56 -363.09 39.10
33 -200.99 494.94 -38.93 -150.68 -446.34 38.93 34 -200.97 412.47 -
38.93 -150.66 -371.97 38.93
35 200.93 479.95 38.91 150.52 -431.35 -38.91 36 200.92 399.94
38.91 150.52 -359.44 -38.91

NO 31 As= 1086. M= -201.66 N= 484.29 NO 32 As=
865. M= -151.56 N= -363.09

GG= 709.

Concrete COLUMN 6(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER M
N V M N V
1 0.03 480.98 0.01 0.08 -432.38 -0.01 2 0.02 400.82
0.01 0.07 -360.32 -0.01
3 0.03 480.98 0.01 0.08 -432.38 -0.01 4 0.02 400.82
0.01 0.07 -360.32 -0.01
5 1.42 503.81 0.52 2.75 -455.21 -0.52 6 1.42 423.65
0.52 2.74 -383.15 -0.52
7 -1.36 488.32 -0.49 -2.58 -439.72 0.49 8 -1.37 408.15 -
0.49 -2.59 -367.65 0.49
9 0.17 513.27 0.05 0.22 -464.67 -0.05 10 0.17 433.10
0.05 0.21 -392.60 -0.05
11 -0.12 478.86 -0.02 -0.05 -430.26 0.02 12 -0.12 398.70 -
0.02 0.06 -358.20 0.02

0.02 -0.06 -358.20 0.02
13 1.21 500.39 0.45 2.35 -451.79 -0.45 14 1.21 420.22
0.44 2.34 -379.72 -0.44
15 -1.16 487.22 -0.42 -2.18 -438.62 0.42 16 -1.16 407.05 -
0.42 -2.19 -366.55 0.42
17 0.15 508.42 0.04 0.20 -459.82 -0.04 18 0.15 428.26
0.04 0.19 -387.76 -0.04
19 -0.09 479.18 -0.02 -0.03 -430.58 0.02 20 -0.10 399.01 -
0.02 -0.04 -358.51 0.02
21 1.21 500.39 0.45 2.35 -451.79 -0.45 22 1.21 420.22
0.44 2.34 -379.72 -0.44
23 -1.16 487.22 -0.42 -2.18 -438.62 0.42 24 -1.16 407.05 -
0.42 -2.19 -366.55 0.42
25 0.15 508.42 0.04 0.20 -459.82 -0.04 26 0.15 428.26
0.04 0.19 -387.76 -0.04
27 -0.09 479.18 -0.02 -0.03 -430.58 0.02 28 -0.10 399.01 -
0.02 -0.04 -358.51 0.02
29 201.66 490.89 39.14 151.77 -442.29 -39.14 30 201.53 409.09
39.10 151.57 -368.59 -39.10
31 -201.60 484.00 -39.11 -151.60 -435.40 39.11 32 -201.48 403.31 -
39.08 -151.42 -362.81 39.08
33 201.00 494.94 38.94 150.69 -446.34 -38.94 34 200.98 412.47
38.93 150.66 -371.97 -38.93
35 -200.93 479.95 -38.91 -150.52 -431.35 38.91 36 -200.92 399.94 -
38.91 -150.52 -359.44 38.91

NO 31 As= 1085. M= -201.60 N= 484.00 NO 32 As=
864. M= -151.42 N= -362.81
GG= 709.

Concrete COLUMN 7(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER M
N V M N V
1 -0.31 482.20 -0.10 -0.51 -433.60 0.10 2 -0.25 401.84 -
0.09 -0.43 -361.34 0.09
3 -0.31 482.20 -0.10 -0.51 -433.60 0.10 4 -0.25 401.84 -
0.09 -0.43 -361.34 0.09
5 1.11 505.02 0.41 2.17 -456.42 -0.41 6 1.16 424.65
0.43 2.26 -384.15 -0.43

7 -1.73 489.63 -0.62 -3.22 -441.03 0.62 8 -1.68 409.26 -
0.60 -3.14 -368.76 0.60
9 -0.45 514.52 -0.14 -0.65 -465.92 0.14 10 -0.40 434.15 -
0.12 -0.57 -393.65 0.12
11 -0.18 480.12 -0.07 -0.40 -431.52 0.07 12 -0.12 399.76 -
0.05 -0.31 -359.26 0.05
13 0.90 501.60 0.33 1.77 -453.00 -0.33 14 0.95 421.23
0.35 1.85 -380.73 -0.35
15 -1.52 488.51 -0.54 -2.82 -439.91 0.54 16 -1.47 408.15 -
0.53 -2.73 -367.65 0.53
17 -0.43 509.67 -0.13 -0.63 -461.07 0.13 18 -0.38 429.31 -
0.12 -0.55 -388.81 0.12
19 -0.20 480.43 -0.08 -0.42 -431.83 0.08 20 -0.14 400.07 -

0.06 -0.33 -359.57 0.06
21 0.90 501.60 0.33 1.77 -453.00 -0.33 22 0.95 421.23
0.35 1.85 -380.73 -0.35
23 -1.52 488.51 -0.54 -2.82 -439.91 0.54 24 -1.47 408.15 -
0.53 -2.73 -367.65 0.53
25 -0.43 509.67 -0.13 -0.63 -461.07 0.13 26 -0.38 429.31 -
0.12 -0.55 -388.81 0.12
27 -0.20 480.43 -0.08 -0.42 -431.83 0.08 28 -0.14 400.07 -
0.06 -0.33 -359.57 0.06
29 201.42 491.47 39.07 151.42 -442.87 -39.07 30 201.35 409.47
39.05 151.31 -368.97 -39.05
31 -202.19 485.90 -39.28 -152.46 -437.30 39.28 32 -202.00 405.00 -
39.22 -152.18 -364.50 39.22
33 -201.50 496.57 -39.07 -151.36 -447.97 39.07 34 -201.42 413.89 -
39.05 -151.26 -373.39 39.05
35 200.73 480.80 38.86 150.32 -432.20 -38.86 36 200.78 400.58
38.88 150.40 -360.08 -38.88

NO 31 As= 1088. M= -202.19 N= 485.90 NO 32 As=
868. M= -152.18 N= -364.50
GG= 709.

Concrete COLUMN 8(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER M
N V M N V
1 0.82 476.31 0.33 1.80 -427.71 -0.33 2 0.68 396.93
0.27 1.50 -356.43 -0.27
3 0.82 476.31 0.33 1.80 -427.71 -0.33 4 0.68 396.93
0.27 1.50 -356.43 -0.27
5 2.12 498.99 0.82 4.41 -450.39 -0.82 6 1.98 419.61
0.76 4.11 -379.11 -0.76
7 -0.43 483.52 -0.14 -0.70 -434.92 0.14 8 -0.57 404.14 -
0.20 -1.00 -363.64 0.20
9 0.99 508.42 0.37 2.00 -459.82 -0.37 10 0.85 429.04
0.32 1.70 -388.54 -0.32
11 0.70 474.09 0.30 1.71 -425.49 -0.30 12 0.56 394.70
0.25 1.41 -354.20 -0.25
13 1.92 495.59 0.74 4.02 -446.99 -0.74 14 1.79 416.20
0.69 3.72 -375.70 -0.69
15 -0.25 482.44 -0.07 -0.33 -433.84 0.07 16 -0.38 403.05 -
0.13 -0.63 -362.55 0.13
17 0.96 503.61 0.37 1.97 -455.01 -0.37 18 0.83 424.22
0.31 1.67 -383.72 -0.31
19 0.71 474.42 0.30 1.72 -425.82 -0.30 20 0.58 395.04

0.25 1.42 -354.54 -0.25
21 1.92 495.59 0.74 4.02 -446.99 -0.74 22 1.79 416.20
0.69 3.72 -375.70 -0.69
23 -0.25 482.44 -0.07 -0.33 -433.84 0.07 24 -0.38 403.05 -
0.13 -0.63 -362.55 0.13
25 0.96 503.61 0.37 1.97 -455.01 -0.37 26 0.83 424.22
0.31 1.67 -383.72 -0.31

27 0.71 474.42 0.30 1.72 -425.82 -0.30 28 0.58 395.04
0.25 1.42 -354.54 -0.25
29 202.03 488.55 39.27 152.51 -439.95 -39.27 30 201.74 407.55
39.18 152.03 -367.05 -39.18
31 -199.96 476.88 -38.60 -148.87 -428.28 38.60 32 -200.01 396.98 -
38.62 -148.99 -356.48 38.62
33 201.42 492.59 39.08 151.48 -443.99 -39.08 34 201.24 410.92
39.02 151.16 -370.42 -39.02
35 -199.35 472.84 -38.41 -147.83 -424.24 38.41 36 -199.51 393.61 -
38.47 -148.13 -353.11 38.47

NO 29 As= 1085. M= 202.03 N= 488.55 NO 30 As=
865. ,M= 152.03 N= -367.05
GG= 709.

Concrete COLUMN 9(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER M
N V M N V
1 -4.68 503.42 -1.72 -9.12 -454.82 1.72 2 -3.90 419.52 -
1.44 -7.60 -379.02 1.44
3 -4.68 503.42 -1.72 -9.12 -454.82 1.72 4 -3.90 419.52 -
1.44 -7.60 -379.02 1.44
5 -3.43 527.11 -1.27 -6.77 -478.52 1.27 6 -2.65 443.20 -
0.99 -5.25 -402.71 0.99
7 -6.22 511.37 -2.28 -12.06 -462.76 2.28 8 -5.44 427.46 -
2.00 -10.54 -386.95 2.00
9 -4.87 536.09 -1.78 -9.38 -487.49 1.78 10 -4.09 452.18 -
1.49 -7.86 -411.68 1.49
11 -4.78 502.39 -1.78 -9.44 -453.79 1.78 12 -4.00 418.48 -
1.49 -7.92 -377.98 1.49
13 -3.61 523.55 -1.34 -7.12 -474.96 1.34 14 -2.83 439.65 -
1.05 -5.60 -399.16 1.05
15 -5.99 510.17 -2.20 -11.62 -461.57 2.20 16 -5.21 426.27 -
1.91 -10.10 -385.76 1.91
17 -4.84 531.19 -1.77 -9.34 -482.59 1.77 18 -4.06 447.28 -
1.49 -7.82 -406.78 1.49
19 -4.76 502.54 -1.77 -9.40 -453.94 1.77 20 -3.98 418.64 -
1.48 -7.88 -378.14 1.48
21 -3.61 523.55 -1.34 -7.12 -474.96 1.34 22 -2.83 439.65 -
1.05 -5.60 -399.16 1.05
23 -5.99 510.17 -2.20 -11.62 -461.57 2.20 24 -5.21 426.27 -
1.91 -10.10 -385.76 1.91
25 -4.84 531.19 -1.77 -9.34 -482.59 1.77 26 -4.06 447.28 -
1.49 -7.82 -406.78 1.49
27 -4.76 502.54 -1.77 -9.40 -453.94 1.77 28 -3.98 418.64 -
1.48 -7.88 -378.14 1.48
29 198.91 501.18 38.33 147.50 -452.58 -38.33 30 199.77 415.58
38.58 148.85 -375.09 -38.58
31 -210.75 519.22 -41.82 -165.99 -470.62 41.82 32 -209.64 434.75 -
41.50 -164.26 -394.25 41.50

33 -210.03 529.82 -41.61 -164.85 -481.22 41.61 34 -209.04 443.58 -
41.32 -163.31 -403.08 41.32

35 198.18 490.58 38.11 146.35 -441.98 -38.11 36 199.17 406.75
38.40 147.89 -366.25 -38.40

NO 31 As= 1126. M= -210.75 N= 519.22 NO 31 As=
962. M= -165.99 N= -470.62
GG= 709.

Concrete COLUMN 10(SECTION TYPE= 1, ANG= 0, Lx= 8.00, Ly= 8.00)
Section property: B= 450, H= 450

NUMBER M N V M N V NUMBER M
N V M N V
1 20.19 383.30 7.61 40.69 -334.70 -7.61 2 16.83 319.41
6.34 33.91 -278.91 -6.34
3 20.19 383.30 7.61 40.69 -334.70 -7.61 4 16.83 319.41
6.34 33.91 -278.91 -6.34
5 21.97 405.50 8.28 44.26 -356.90 -8.28 6 18.60 341.62
7.01 37.48 -301.12 -7.01
7 19.85 382.53 7.48 40.00 -333.93 -7.48 8 16.48 318.65
6.21 33.22 -278.15 -6.21
9 21.97 405.50 8.28 44.26 -356.90 -8.28 10 18.60 341.62
7.01 37.48 -301.12 -7.01
11 19.85 382.53 7.48 40.00 -333.93 -7.48 12 16.48 318.65
6.21 33.22 -278.15 -6.21
13 21.70 402.17 8.18 43.73 -353.57 -8.18 14 18.34 338.29
6.91 36.94 -297.79 -6.91
15 19.90 382.64 7.50 40.11 -334.04 -7.50 16 16.53 318.76
6.23 33.32 -278.26 -6.23
17 21.70 402.17 8.18 43.73 -353.57 -8.18 18 18.34 338.29
6.91 36.94 -297.79 -6.91
19 19.90 382.64 7.50 40.11 -334.04 -7.50 20 16.53 318.76
6.23 33.32 -278.26 -6.23
21 21.70 402.17 8.18 43.73 -353.57 -8.18 22 18.34 338.29
6.91 36.94 -297.79 -6.91
23 19.90 382.64 7.50 40.11 -334.04 -7.50 24 16.53 318.76
6.23 33.32 -278.26 -6.23
25 21.70 402.17 8.18 43.73 -353.57 -8.18 26 18.34 338.29
6.91 36.94 -297.79 -6.91
27 19.90 382.64 7.50 40.11 -334.04 -7.50 28 16.53 318.76
6.23 33.32 -278.26 -6.23
29 212.21 426.28 42.33 168.90 -377.68 -42.33 30 207.85 360.81
41.02 161.86 -320.31 -41.02
31 -160.96 349.50 -26.88 -86.28 -300.90 26.88 32 -165.14 285.68 -
28.14 -93.01 -245.18 28.14
33 212.21 426.28 42.33 168.90 -377.68 -42.33 34 207.85 360.81
41.02 161.86 -320.31 -41.02
35 -160.96 349.50 -26.88 -86.28 -300.90 26.88 36 -165.14 285.68 -
28.14 -93.01 -245.18 28.14

NO 30 As= 1135. M= 207.85 N= 360.81 NO 29 As=
980. M= 168.90 N= -377.68
GG= 709.

Concrete BEAM 1(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9

10 11 12 13
M= -93.01 -115.27 -138.13 -151.38 -153.39 -143.35 -121.23 -91.87 -73.49 -
52.24 -25.82 0.00 0.00
As(1)= 585. 464. 559. 615. 623. 607. 586. 494. 336.
208. 102. 0. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 168.91 102.91 51.90 8.68 0.00 0.00 0.00 0.00 0.00
20.70 87.11 166.28 255.59
As(1)= 689. 414. 206. 34. 0. 0. 0. 0. 0.
82. 349. 678. 1063.
As(2)= 689. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 1063.

Vl= 130.06 NO 13 Vr= 167.48 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.005

Concrete BEAM 2(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 0.00 -7.77 -31.89 -51.92 -61.22 -69.72 -76.57 -72.05 -
55.48 -31.28 -1.99 0.00
As(1)= 585. 0. 31. 126. 213. 327. 373. 351. 288.
221. 124. 8. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 220.30 145.67 81.07 26.81 0.00 0.00 0.00 0.00 0.00
26.01 73.09 131.90 201.78
As(1)= 909. 591. 324. 106. 0. 0. 0. 0. 0.
103. 292. 533. 829.
As(2)= 909. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 829.

Vl= 140.61 NO 13 Vr= 132.61 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.005

Concrete BEAM 3(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 -5.71 -35.05 -59.83 -76.73 -81.58 -78.18 -74.53 -69.24 -
52.25 -28.67 0.00 0.00
As(1)= 585. 23. 139. 238. 307. 387. 419. 382. 277.
208. 113. 0. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 208.87 135.86 74.01 24.43 0.00 0.00 0.00 0.00 0.00

22.71 74.40 138.68 213.20
As(1)= 859. 550. 296. 97. 0. 0. 0. 0. 0.
90. 297. 562. 878.
As(2)= 859. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 878.

Vl= 138.26 NO 13 Vr= 140.05 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.005

Concrete BEAM 4(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 0.00 -27.95 -51.37 -68.25 -73.43 -76.34 -78.50 -72.98 -
55.41 -30.52 -0.59 0.00
As(1)= 585. 0. 111. 204. 272. 374. 409. 375. 291.
220. 121. 2. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 211.58 137.77 74.16 23.02 0.00 0.00 0.00 0.00 0.00
25.50 75.69 137.65 210.74
As(1)= 871. 558. 296. 91. 0. 0. 0. 0. 0.
101. 302. 557. 867.
As(2)= 871. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 867.

Vl= 138.80 NO 13 Vr= 138.46 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.004

Concrete BEAM 5(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 -0.78 -30.73 -55.66 -73.26 -78.80 -76.83 -74.21 -69.19 -
52.47 -29.07 -0.33 0.00
As(1)= 585. 3. 122. 221. 293. 377. 412. 377. 276.
209. 115. 1. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 211.11 137.83 75.70 25.39 0.00 0.00 0.00 0.00 0.00
22.73 73.71 137.29 211.12
As(1)= 869. 558. 302. 100. 0. 0. 0. 0. 0.
90. 294. 556. 869.
As(2)= 869. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 869.

Vl= 138.76 NO 13 Vr= 138.76 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.004

Concrete BEAM 6(SECTION TYPE= 1 ANG= 0, L= 6.50)

Section property: B= 300, H= 650

BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 -0.59 -30.52 -55.41 -72.98 -78.50 -76.34 -73.43 -68.25 -
51.37 -27.95 0.00 0.00
As(1)= 585. 2. 121. 220. 291. 375. 409. 374. 272.
204. 111. 0. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 210.74 137.65 75.69 25.50 0.00 0.00 0.00 0.00 0.00
23.02 74.16 137.77 211.58
As(1)= 867. 557. 302. 101. 0. 0. 0. 0. 0.
91. 296. 558. 871.
As(2)= 867. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 871.

Vl= 138.46 NO 13 Vr= 138.80 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.004

Concrete BEAM 7(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 0.00 -28.67 -52.25 -69.24 -74.54 -78.18 -81.58 -76.73 -
59.83 -35.05 -5.71 0.00
As(1)= 585. 0. 113. 208. 277. 382. 419. 387. 307.
238. 139. 23. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 213.20 138.68 74.40 22.71 0.00 0.00 0.00 0.00 0.00
24.43 74.01 135.86 208.87
As(1)= 878. 562. 297. 90. 0. 0. 0. 0. 0.
97. 296. 550. 859.
As(2)= 878. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 859.

Vl= 140.05 NO 13 Vr= 138.26 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.005

Concrete BEAM 8(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 -2.00 -31.28 -55.48 -72.05 -76.57 -69.70 -61.20 -51.92 -

31.89 -7.77 0.00 0.00
As(1)= 585. 8. 124. 221. 288. 351. 373. 326. 213.
126. 31. 0. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9

10 11 12 13
M= 201.77 131.90 73.09 26.01 0.00 0.00 0.00 0.00 0.00
26.82 81.08 145.69 220.30
As(1)= 829. 533. 292. 103. 0. 0. 0. 0. 0.
106. 324. 591. 909.
As(2)= 829. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 909.

Vl= 132.60 NO 13 Vr= 140.61 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.005

Concrete BEAM 9(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 0.00 0.00 -25.82 -52.24 -73.49 -91.85 -121.22 -143.34 -153.39 -
151.38 -138.14 -115.28 -93.01
As(1)= 585. 0. 102. 208. 335. 494. 585. 607. 623.
615. 559. 464. 585.
As(2)= 585. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 585.
TOP
SECTION 1 2 3 4 5 6 7 8 9
10 11 12 13
M= 255.59 166.30 87.13 20.72 0.00 0.00 0.00 0.00 0.00
8.68 51.90 102.91 168.90
As(1)= 1063. 678. 349. 82. 0. 0. 0. 0. 0.
34. 206. 414. 689.
As(2)= 1063. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 689.

Vl= 167.48 NO 13 Vr= 130.06 NO 15 Asv/s= 0.43 As(3)= 585.
Umaxb= 0.003 Umaxt= 0.005
COMPUTE END

****** LL-1 Calculation Result ******

OUTPUT DATA

---- Zhong xin xi ------

20 10 9 0 10 2 1 0 5 30 30 2 0
0
0.90 1.00
0

OUTPUT DATA

------- Jiao Dian Zuo Biao --------

(1) 0.00 -2.00 (2) 0.00 0.00 (3) 6.50 -2.00 (4) 6.50 0.00
(5) 13.00 -2.00 (6) 13.00 0.00 (7) 19.50 -2.00 (8) 19.50 0.00
(9) 26.00 -2.00 (10) 26.00 0.00 (11) 32.50 -2.00 (12) 32.50 0.00
(13) 39.00 -2.00 (14) 39.00 0.00 (15) 45.50 -2.00 (16) 45.50 0.00
(17) 52.00 -2.00 (18) 52.00 0.00 (19) 58.50 -2.00 (20) 58.50 0.00

OUTPUT DATA

------- Zhu Guan Lian Hao --------

(1) 1 2 (2) 3 4 (3) 5 6 (4) 7 8 (5) 9 10
(6) 11 12 (7) 13 14 (8) 15 16 (9) 17 18 (10) 19 20

------- Liang Guan Lian Hao --------

(1) 2 4 (2) 4 6 (3) 6 8 (4) 8 10 (5) 10 12
(6) 12 14 (7) 14 16 (8) 16 18 (9) 18 20

OUTPUT DATA

------- Zhi Zuo Yue Shu Xin Xi --------

(1) 1111 (2) 3111 (3) 5111 (4) 7111 (5) 9111
(6) 11111 (7) 13111 (8) 15111 (9) 17111 (10) 19111

OUTPUT DATA

------- Shang Xia Zhu Jian Dian Pian Xin --------

(1) 0.00 (2) 0.00 (3) 0.00 (4) 0.00 (5) 0.00 (6) 0.00 (7) 0.00
(8) 0.00 (9) 0.00 (10) 0.00 (11) 0.00 (12) 0.00 (13) 0.00 (14) 0.00
(15) 0.00 (16) 0.00 (17) 0.00 (18) 0.00 (19) 0.00 (20) 0.00

OUTPUT DATA

------- Biao Zhun Jie Mian Xin Xi --------

(1) 1, 300, 650, 6
(2) 1, 500, 350, 6

OUTPUT DATA

---- Zhu Ji Suan Chang Du(After consider steel) ------

(1) 1.00 (2) 1.00 (3) 1.00 (4) 1.00 (5) 1.00 (6) 1.00 (7) 1.00
(8) 1.00 (9) 1.00 (10) 1.00

OUTPUT DATA

---- Zhu Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

```
( 1)   2   3   0 ( 2)   2   3   0 ( 3)   2   3   0
( 4)   2   3   0 ( 5)   2   3   0 ( 6)   2   3   0
( 7)   2   3   0 ( 8)   2   3   0 ( 9)   2   3   0
(10)   2   3   0
```

---- Liang Bu Zhi(Hao)Jie Mian Hao,Jiao Jie,Jiao Du -----

```
( 1)   1   0   0 ( 2)   1   0   0 ( 3)   1   0   0
( 4)   1   0   0 ( 5)   1   0   0 ( 6)   1   0   0
( 7)   1   0   0 ( 8)   1   0   0 ( 9)   1   0   0
     IIQQ=      111
```

```
        STIF COMPUTE
        DEAD COMPUTE
JOINT  LOAD:   JR       XM        XN
               0

COLUMN LOAD:    JC       KL        P        X        KX
               0

BEAM   LOAD:   NE     LI      KL       P       X       P1       X1
KL      P       X      P1      X1
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
                       1       2               1       4.90     0.00
6     31.90   1.88
```

DEAD LOAD

```
        STIF COMPUTE
        LIVE COMPUTE
JOINT  LOAD:   JR       XM        XN
               0

COLUMN LOAD:    JC       KL        P        X        KX
               0

BEAM   LOAD:   NE     LI      KL       P       X       P1       X1
KL      P       X      P1      X1
               1      1       6      2.60    1.88
               1      1       6      2.60    1.88
               1      1       6      2.60    1.88
               1      1       6      2.60    1.88
```

1	1	6	2.60	1.88
1	1	6	2.60	1.88
1	1	6	2.60	1.88
1	1	6	2.60	1.88
1	1	6	2.60	1.88

COMBI COMPUTE

COMBINATION AND REINFORCEMENT

Concrete COLUMN 1(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 6 As= 0. M= -0.02 N= 66.42 NO 6
As= 0. M= -0.04 N= -66.42
GG= 350.

Concrete COLUMN 2(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= 0.01 N= 205.59 NO 12
As= 0. M= 0.01 N= -205.59
GG= 350.

Concrete COLUMN 3(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= 0.00 N= 167.76 NO 12
As= 0. M= 0.00 N= -167.76
GG= 350.

Concrete COLUMN 4(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= 0.00 N= 177.65 NO 12
As= 0. M= 0.00 N= -177.65
GG= 350.

Concrete COLUMN 5(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= 0.00 N= 175.17 NO 12
As= 0. M= 0.00 N= -175.17
GG= 350.

Concrete COLUMN 6(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= 0.00 N= 175.17 NO 12
As= 0. M= 0.00 N= -175.17
GG= 350.

Concrete COLUMN 7(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= 0.00 N= 177.65 NO 12
As= 0. M= 0.00 N= -177.65
GG= 350.

Concrete COLUMN 8(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= 0.00 N= 167.76 NO 12
As= 0. M= 0.00 N= -167.76
GG= 350.

Concrete COLUMN 9(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 12 As= 0. M= -0.01 N= 205.59 NO 12
As= 0. M= -0.01 N= -205.59
GG= 350.

Concrete COLUMN 10(SECTION TYPE= 1, ANG= 0, Lx= 2.00, Ly= 2.00)
Section property: B= 500, H= 350

NO 8 As= 0. M= 0.02 N= 66.42 NO 8
As= 0. M= 0.04 N= -66.42
GG= 350.

Concrete BEAM 1(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 0.00 -47.83 -90.45 -124.25 -145.78 -153.35 -146.89 -126.41 -
91.91 -43.44 0.00 0.00 0.00
As(1)= 293. 254. 486. 675. 797. 840. 803. 687.
495. 231. 0. 0. 293.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 0.05 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 25.97 91.32 169.52
As(1)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 137. 491. 934.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 934.

Vl= 88.32 NO 1 Vr= 144.91 NO 3 Asv/s= 0.00 As(3)= 293.
Umaxb= 0.004 Umaxt= 0.005

Concrete BEAM 2(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 0.00 0.00 0.00 -13.88 -52.49 -77.13 -87.74 -84.33 -
66.90 -35.50 0.00 0.00 0.00
As(1)= 293. 0. 0. 73. 279. 413. 472. 453.
357. 188. 0. 0. 293.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.

```
        TOP
  SECTION      1        2        3        4        5        6        7        8
9       10       11       12       13
        M=    169.51   101.19    45.70     0.00     0.00     0.00     0.00     0.00
0.00    0.00    16.86    65.14   126.80
    As(1)=     933.     546.     243.       0.       0.       0.       0.       0.
0.      0.      89.     348.     689.
    As(2)=     933.       0.       0.       0.       0.       0.       0.       0.
0.      0.       0.       0.     689.

    Vl=  125.04    NO  1     Vr=  110.34    NO  3    Asv/s=   0.00      As(3)=   293.
Umaxb=  0.002         Umaxt=  0.005

        Concrete BEAM         3( SECTION TYPE=   1   ANG=   0, L=   6.50 )
      Section property:  B= 300, H= 650
        BOTTOM
  SECTION      1        2        3        4        5        6        7        8
9       10       11       12       13
        M=     0.00     0.00     0.00   -43.43   -77.47   -97.55  -103.60   -95.62   -
73.63   -37.67    0.00     0.00     0.00
    As(1)=     293.       0.       0.     230.     415.     526.     559.     515.
394.    200.      0.       0.      293.
    As(2)=     293.       0.       0.       0.       0.       0.       0.       0.
0.      0.       0.       0.     293.
        TOP
  SECTION      1        2        3        4        5        6        7        8
9       10       11       12       13
        M=    126.80    62.51    11.58     0.00     0.00     0.00     0.00     0.00
0.00    0.00    19.26    72.10   138.36
    As(1)=     689.     334.      61.       0.       0.       0.       0.       0.
0.      0.     102.     386.     755.
    As(2)=     689.       0.       0.       0.       0.       0.       0.       0.
0.      0.       0.       0.     755.

    Vl=  115.79    NO  1     Vr=  119.74    NO  3    Asv/s=   0.00      As(3)=   293.
Umaxb=  0.003         Umaxt=  0.004

        Concrete BEAM         4( SECTION TYPE=   1   ANG=   0, L=   6.50 )
      Section property:  B= 300, H= 650
        BOTTOM
  SECTION      1        2        3        4        5        6        7        8
9       10       11       12       13
        M=     0.00     0.00     0.00   -35.51   -70.75   -92.02   -99.28   -92.50   -
71.71   -36.95    0.00     0.00     0.00
    As(1)=     293.       0.       0.     188.     378.     495.     535.     498.
384.    196.      0.       0.      293.
    As(2)=     293.       0.       0.       0.       0.       0.       0.       0.
0.      0.       0.       0.     293.
        TOP
  SECTION      1        2        3        4        5        6        7        8
9       10       11       12       13
        M=    138.36    72.82    20.70     0.00     0.00     0.00     0.00     0.00
0.00    0.00    18.78    70.43   135.48
    As(1)=     755.     390.     109.       0.       0.       0.       0.       0.
0.      0.      99.     377.     738.
    As(2)=     755.       0.       0.       0.       0.       0.       0.       0.
0.      0.       0.       0.     738.
```

Vl= 118.26 NO 1 Vr= 117.28 NO 3 Asv/s= 0.00 As(3)= 293.
Umaxb= 0.003 Umaxt= 0.004

Concrete BEAM 5(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 0.00 0.00 0.00 -37.66 -72.66 -93.70 -100.71 -93.70 -
72.66 -37.66 0.00 0.00 0.00
As(1)= 293. 0. 0. 200. 389. 504. 543. 504.
389. 200. 0. 0. 293.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 135.48 70.19 18.30 0.00 0.00 0.00 0.00 0.00
0.00 0.00 18.30 70.19 135.48
As(1)= 738. 375. 96. 0. 0. 0. 0. 0.
0. 0. 96. 375. 738.
As(2)= 738. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 738.

Vl= 117.77 NO 1 Vr= 117.77 NO 3 Asv/s= 0.00 As(3)= 293.
Umaxb= 0.003 Umaxt= 0.004

Concrete BEAM 6(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 0.00 0.00 0.00 -36.95 -71.71 -92.50 -99.28 -92.02 -
70.75 -35.51 0.00 0.00 0.00
As(1)= 293. 0. 0. 196. 384. 498. 535. 495.
378. 188. 0. 0. 293.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 135.48 70.43 18.78 0.00 0.00 0.00 0.00 0.00
0.00 0.00 20.70 72.82 138.36
As(1)= 738. 377. 99. 0. 0. 0. 0. 0.
0. 0. 109. 390. 755.
As(2)= 738. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 755.

Vl= 117.28 NO 1 Vr= 118.26 NO 3 Asv/s= 0.00 As(3)= 293.
Umaxb= 0.003 Umaxt= 0.004

Concrete BEAM 7(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13

M= 0.00 0.00 0.00 -37.67 -73.63 -95.62 -103.60 -97.55 -
77.47 -43.43 0.00 0.00 0.00
As(1)= 293. 0. 0. 200. 394. 515. 559. 526.
415. 230. 0. 0. 293.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 138.36 72.10 19.26 0.00 0.00 0.00 0.00 0.00
0.00 0.00 11.58 62.51 126.80
As(1)= 755. 386. 102. 0. 0. 0. 0. 0.
0. 0. 61. 334. 689.
As(2)= 755. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 689.

Vl= 119.74 NO 1 Vr= 115.79 NO 3 Asv/s= 0.00 As(3)= 293.
Umaxb= 0.003 Umaxt= 0.004

Concrete BEAM 8(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 0.00 0.00 0.00 -35.50 -66.90 -84.33 -87.74 -77.13 -
52.49 -13.88 0.00 0.00 0.00
As(1)= 293. 0. 0. 188. 357. 453. 472. 413.
279. 73. 0. 0. 293.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 126.80 65.14 16.86 0.00 0.00 0.00 0.00 0.00
0.00 0.00 45.70 101.19 169.51
As(1)= 689. 348. 89. 0. 0. 0. 0. 0.
0. 0. 243. 546. 933.
As(2)= 689. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 933.

Vl= 110.34 NO 1 Vr= 125.04 NO 3 Asv/s= 0.00 As(3)= 293.
Umaxb= 0.002 Umaxt= 0.005

Concrete BEAM 9(SECTION TYPE= 1 ANG= 0, L= 6.50)
Section property: B= 300, H= 650
BOTTOM
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13
M= 0.00 0.00 0.00 -43.44 -91.91 -126.41 -146.89 -153.35 -
145.78 -124.25 -90.45 -47.83 0.00
As(1)= 293. 0. 0. 231. 495. 687. 803. 840.
797. 675. 486. 254. 293.
As(2)= 293. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.
TOP
SECTION 1 2 3 4 5 6 7 8
9 10 11 12 13

M= 169.52 91.32 25.97 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.05
As(1)= 934. 491. 137. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.
As(2)= 934. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 293.

Vl= 144.91 NO 1 Vr= 88.32 NO 3 Asv/s= 0.00 As(3)= 293.
Umaxb= 0.004 Umaxt= 0.005
PK1 COMPUTE END

CONTENTS

1 • Design Introduction

I. Name of Project: Shanghai Pudong Airport Oil Depot & Lab

II. Structure type: one-floor brick & concrete structure

III. Foundation type: R.C. Strip foundation

IV. Aseismic intensity: 7

V. Site soil type: IV

VI. Soil endurance: R=110KPa/m2

VII. Structure importance parameter: Ro=1.0

VIII.Foundation load-bearing layer elevation:

IX. Materials: column -- C20 beam board -- C20

wall: clay brick 240mm (5.40KN/m2)

X. Load:

1. Living load: roof 0.70KN/m2

2. Static load:	roof	ceiling	0.30KN/m2
		structure layer (100mm)	2.50KN/m2
		roof (roof 1)	2.50KN/m2
		total	5.30KN/m2

XI. Selection of main members

1. Main beam (L=6600mm)

bxh=200x450

2. Board thickness: h=100mm

XII. Design basis

1. Current national architecture & structure standards and codes;
2. Shanghai City's << Base Foundation Design Codes >> DBJ08--11--89;
3. Shanghai City's << Base Treatment Technical Codes >> DBJ08--40--94;
4. Shanghai City's << Building Aseismic Design Standards >> DBJ08--09--92;
5. << Shanghai Pudong Airport Oil Depot Rock & Soil Investigation Immediate Report >> made by China Aviation Industry Investigation & Design Institute;

XIII. Computer programs

China Building Science Research Institue CAD Engineering Department

PMCAD CAD, structure plan CAD;August, 1996

PK Structural calculation & construction drawing making of R.C. Frame, framed bent and continuous beam; August, 1996

JCCAD Independent foundation & strip foundation design; August, 1996

XIV. Conclusion:

It is concluded from calculation above, the integral strength and deformation of structure meet the design requirements, the geometric dimensions also meet the requirements of strength and deformation regulated by

Codes. The primary data of structural model, major calculation results, combining results of main internal forces of each member, structural layout, internal force drawing, reinforcing results of major members refer the next page, based on which construction drawings are made.

2 • Primary data document Hys.pm (For PMCAD)

```
C---NST MST NAXIS  NYS KCL  KBE  KDK  MLOD ALIVE  MXD  MYD BLKD  DWS  BLP
   -1,  1,  18,  -1,   2,   2,   5,   1, 1.00,  1,   1, 0.00, 1.00,100.0
C---(HLA(i),i=1,NST)
 3.500,
C---(MSH(i),i=1,MST)
    1,
C---((XY(I,J),J=1,2),I=1,NJ)
     1,      0.000,      0.000
     2,      0.000,      3.300
     3,      0.000,      6.600
     4,      0.000,      9.900
     5,      0.000,     13.200
     6,      4.800,      0.000
     7,      4.800,      3.300
     8,      4.800,      6.600
     9,      4.800,      9.900
    10,      4.800,     13.200
    11,      8.100,      0.000
    12,      8.100,      3.300
    13,      8.100,      6.600
    14,      8.100,      9.900
    15,      8.100,     13.200
    16,     11.400,      0.000
    17,     11.400,      3.300
    18,     11.400,      5.100
    19,     11.400,      6.600
    20,     11.400,      7.500
    21,     11.400,      9.900
    22,     11.400,     13.200
    23,     15.000,      0.000
    24,     15.000,      0.800
    25,     15.000,      5.100
    26,     15.000,      7.500
    27,     15.000,      9.900
    28,     15.000,     13.200
    29,     17.800,      0.000
    30,     17.800,      0.800
    31,     18.600,      0.000
    32,     18.600,      0.800
    33,     18.600,      1.200
    34,     18.600,      2.400
```

```
    35,     18.600,      5.100
    36,     18.600,      7.500
    37,     18.600,      9.900
    38,     18.600,     13.200
    39,     22.200,      0.000
    40,     22.200,      1.200
    41,     22.200,      2.400
    42,     22.200,      5.100
    43,     22.200,      7.500
    44,     22.200,      9.900
    45,     22.200,     13.200
0
C---((AXIS(I),I=1,NAXIS)
     1,  5,  1,  2,  3,  4,  5,
     2,  5,  6,  7,  8,  9, 10,
     3,  7, 16, 17, 18, 19, 20, 21, 22,
     4,  6, 23, 24, 25, 26, 27, 28,
     5,  8, 31, 32, 33, 34, 35, 36, 37, 38,
     6,  7, 39, 40, 41, 42, 43, 44, 45,
     7,  8,  1,  6, 11, 16, 23, 29, 31, 39,
     8,  7,  5, 10, 15, 22, 28, 38, 45,
     9,  4,  2,  7, 12, 17,
    10,  4,  3,  8, 13, 19,
    11,  7,  4,  9, 14, 21, 27, 37, 44,
    12,  4, 18, 25, 35, 42,
    13,  4, 20, 26, 36, 43,
    14,  2, 34, 41;
    15,  3, 24, 30, 32,
    16,  2, 29, 30,
    17,  5, 11, 12, 13, 14, 15,
    18,  2, 33, 40,
0
C---(CL(i),i=1,KCL)
    1.000,  6.000,  0.240,  0.240,
    3.000,  6.000,  0.350,
C---(BE(i),i=1,KBE)
    1.000,  6.000,  0.200,  0.450,
    1.000,  6.000,  0.240,  0.300,
C---((QDK(i,j),j=1,2),i=1,KDK)
    1.500,  1.800,  0.900,  2.700,  1.050,  2.700,  0.450,  2.700,
    3.000,  2.700,
C---((HSLD(i,j),j=1,3),i=1,MLOD)
    1.000,  5.450,  0.700,
C---QUE JEI DIAN
```

```
0
C==================================================================C
C                              LAYER      1
C==================================================================C
C--BHOU   RWB   BHC   IC   ICC     IG
   0.100, 20.0,0.015, 20.0, 20.0,     2
C--((AXIS(I),I=1,NAXIS)
    1,   5,   1,   2,   3,   4,   5,
    2,   5,   6,   7,   8,   9,  10,
    3,   7,  16,  17,  18,  19,  20,  21,  22,
    4,   6,  23,  24,  25,  26,  27,  28,
    5,   8,  31,  32,  33,  34,  35,  36,  37,  38,
    6,   7,  39,  40,  41,  42,  43,  44,  45,
    7,   8,   1,   6,  11,  16,  23,  29,  31,  39,
    8,   7,   5,  10,  15,  22,  28,  38,  45,
    9,   4,   2,   7,  12,  17,
   10,   4,   3,   8,  13,  19,
   11,   7,   4,   9,  14,  21,  27,  37,  44,
   12,   4,  18,  25,  35,  42,
   13,   4,  20,  26,  36,  43,
   14,   2,  34,  41,
   15,   3,  24,  30,  32,
   16,   2,  29,  30,
   17,   5,  11,  12,  13,  14,  15,
   18,   2,  33,  40,
0
C--- ZHU ---
      70102,    1,     0.000,     0.000
        704,    1,     0.000,     0.000
        706,    1,     0.000,     0.000
        708,    2,     0.000,     0.000
      80102,    1,     0.000,     0.000
        804,    1,     0.000,     0.000
        807,    1,     0.000,     0.000
       1001,    1,     0.000,     0.000
     140102,    1,     0.000,     0.000
0
C--- LIANG ---
        505,    2,     0.000
      60102,    2,     0.000
      70607,    2,     0.000
      90203,    1,     0.000
     100203,    1,     0.000
     110203,    1,     0.000
```

0

C--- QIANG ---

10104,	0.240,	0.000	
20104,	0.240,	0.000	
30106,	0.240,	0.000	
40102,	0.240,	0.000	
40405,	0.240,	0.000	
50204,	0.240,	0.000	
50607,	0.240,	0.000	
60206,	0.240,	0.000	
70105,	0.240,	0.000	
80106,	0.240,	0.000	
901,	0.240,	0.000	
1001,	0.240,	0.000	
1101,	0.240,	0.000	
110506,	0.240,	0.000	
120102,	0.240,	0.000	
130103,	0.240,	0.000	
1401,	0.240,	0.000	
10029032,	-0.240,	-0.234,	0.000

0

C--- DONG KOU ---

10203,	1,	0.900,	0.900
202,	2,	2.100,	0.000
203,	2,	0.300,	0.000
303,	3,	0.450,	0.000
304,	4,	0.001,	0.000
701,	1,	2.400,	0.900
70203,	1,	0.900,	0.900
704,	1,	1.050,	0.900
705,	1,	0.650,	0.900
801,	1,	2.400,	0.900
80203,	1,	0.900,	0.900
80406,	1,	1.050,	0.900
901,	2,	3.600,	0.000
1101,	2,	3.600,	0.000
1105,	2,	2.400,	0.000
1106,	2,	0.300,	0.000
1201,	2,	2.400,	0.000
1202,	2,	0.300,	0.000
130102,	2,	2.400,	0.000
1303,	2,	0.300,	0.000
1401,	5,	0.300,	0.000

0

```
C=========================================================C
C--KZDJ    NV    IB    IY      INF    CC
     4,     1,    7,   2.00,    0,   1.00
EOF
1   ,2   ,3   ,4   ,5   ,6   ,A   ,G   ,B   ,D   ,F   ,C   ,
E   ,  ,  ,  ,  ,  ,
END
```

3 • Beam (L1 ~ 4) date document

C _____ zong xin xi
16, 8, 4, 0, 8, 5, 1, 0, 5,
20, 20, 2, 0, 0, .90, 1.00, 0,

C _____ jie dian zuo bia
.000, -2.000, .000, .000, 6.600, -2.000,
6.600, .000, .000, 3.000, .000, 5.000,
2.400, 3.000, 2.400, 5.000, .000, 8.000,
.000, 10.000, 4.400, 8.000, 4.400, 10.000,
.000, 13.000, .000, 15.000, 2.400, 13.000,
2.400, 15.000,

C _____ zhu guan lian hao
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,
13, 14, 15, 16,

C _____ liang guan lian hao
2, 4, 6, 8, 10, 12, 14, 16,

C _____ yue su xin xi
1111, 3111, 5111, 7111, 9111, 11111,
13111, 15111,

C _____ zhu ji suan chang du xi su
0,

C _____ zhu jie dian pian xin
0,

C _____ biao zhun jie mian
1, .24, .50,
1, .24, .30,
1, -.50, .24,
1, -.24, .24,
1, -.35, .35,
C _____ zhu jie mian hao
3, 3, 3, 3, 4, 5, 5, 4,
C _____ liang jie mian hao
1, 2, 2, 2,

CCC _____ jie dian (jing) he zai

```
  0,
CCC _____ zhu jian (jing) he zai
  0,
CCC _____ liang jian (jing) he zai
1, 2, 1,      2.3,
        6,     18.0,  1.65,
1, 2, 1,      8.1,
        6,      6.5,  1.20,
1, 1, 1,     12.7,
1, 2, 2,     12.7,  1.20,
        3,      1.8,  1.20,
CCC _____ jie dian (huo) he zai
  0,
CCC _____ zhu jian (huo) he zai
  0,
CCC _____ liang jian (huo) he zai
1, 1, 6,      2.3,  1.65,
1, 2, 6,       .8,  1.20,
        1,       .8,
1, 1, 1,       .9,
1, 1, 2,       .9,  1.20,

  88888
C _____ zhou xian pian xin
  .000,  .000,  .000,  .000,  .000,  .000,  .000,  .000,
C _____ zhi zhuo xin xi
  20000,20000,20000,20000,10000,10000,10000,10000,
C _____ ci liang xin xi
  1
  0,
  0,
  0,
  0,

 EOF
2    ,3    ,C    ,E    ,     ,6    ,A    ,     ,
L-1    ,L-2    ,L-3    ,L-4    ,
 END
```

4 • Structure analysys of Beam （L1 ~ 4） result document

II

****** PK11.EXE ******

DATA: 6/18/1997

OUTPUT DATA

16 8 4 0 8 5 1 0 5 20 20 2 0 0

.90 1.00

0

OUTPUT DATA

(1) .00 -2.00 (2) .00 .00 (3) 6.60 -2.00 (4) 6.60 .00

(5) .00 3.00 (6) .00 5.00 (7) 2.40 3.00 (8) 2.40 5.00

(9) .00 8.00 (10) .00 10.00 (11) 4.40 8.00 (12) 4.40 10.00

(13) .00 13.00 (14) .00 15.00 (15) 2.40 13.00 (16) 2.40 15.00

OUTPUT DATA

(1) 1 2 (2) 3 4 (3) 5 6 (4) 7 8 (5) 9 10

(6) 11 12 (7) 13 14 (8) 15 16

(1) 2 4 (2) 6 8 (3) 10 12 (4) 14 16

OUTPUT DATA

(1) 1111 (2) 3111 (3) 5111 (4) 7111 (5) 9111

(6) 11111 (7) 13111 (8) 15111

OUTPUT DATA

(1) 1.00 (2) 1.00 (3) 1.00 (4) 1.00 (5) 1.00 (6) 1.00 (7) 1.00

(8) 1.00

OUTPUT DATA

(1) .00 (2) .00 (3) .00 (4) .00 (5) .00 (6) .00 (7) .00

(8) .00 (9) .00 (10) .00 (11) .00 (12) .00 (13) .00 (14) .00

(15) .00 (16) .00

OUTPUT DATA

(1)	1.00	.24	.50	.00	.00	.00
(2)	1.00	.24	.30	.00	.00	.00
(3)	1.00	-.50	.24	.00	.00	.00
(4)	1.00	-.24	.24	.00	.00	.00
(5)	1.00	-.35	.35	.00	.00	.00

OUTPUT DATA

(1) 3 (2) 3 (3) 3 (4) 3 (5) 4 (6) 5 (7) 5 (8) 4
(1) 1 (2) 2 (3) 2 (4) 2

IIQQ= 60

STIF COMPUTE

DEAD COMPUTE

JOINT LOAD:	JR	XM	XN
	0		

COLUMN LOAD:	JC	KL	P	X	KX
	0				

BEAM LOAD:	NE	LI	KL	P	X	P1	X1
	1	2	1	2.30	.00		
			6	18.00	1.65		
	1	2	1	8.10	.00		
			6	6.50	1.20		
	1	1	1	12.70	.00		
	1	2	2	12.70	1.20		
			3	1.80	1.20		

DEAD LOAD

STIF COMPUTE

LIVE COMPUTE

JOINT LOAD:	JR	XM	XN
	0		

COLUMN LOAD:	JC	KL	P	X	KX
	0				

BEAM LOAD:	NE	LI	KL	P	X	P1	X1
	1	1	6	2.30	1.65		
	1	2	6	.80	1.20		
			1	.80	.00		
	1	1	1	.90	.00		
	1	1	2	.90	1.20		

COMBI COMPUTE

COMBINATION AND REINFORCEMENT

BEAM 1 (B= .240, H= .500, L= 6.60)

BOTTOM

SECTION	1	2	3	4	5	6	7
M=	.00	-72.37	-122.01	-138.70	-122.01	-72.37	.00
As(1)=	180.	539.	964.	1121.	964.	539.	180.

As(2)=	180.	0.	0.	1213.	0.	0.	180.

TOP

SECTION	1	2	3	4	5	6	7
M=	.21	.00	.00	.00	.00	.00	.21
As(1)=	180.	0.	0.	0.	0.	0.	180.
As(2)=	180.	0.	0.	0.	0.	0.	180.

Vl= 70.54 NO 1 Vr= 70.54 NO 3 As(3)= 180. Umaxb= .009 Umaxt= .002
Asv/s= .00

BEAM 2 (B= .240, H= .300, L= 2.40)

BOTTOM

SECTION	1	2	3	4	5	6	7
M=	.00	-6.37	-10.55	-12.06	-10.55	-6.37	.00
As(1)=	108.	79.	132.	152.	132.	79.	108.
As(2)=	108.	0.	0.	0.	0.	0.	108.

TOP

SECTION	1	2	3	4	5	6	7
M=	.03	.00	.00	.00	.00	.00	.03
As(1)=	108.	0.	0.	0.	0.	0.	108.
As(2)=	108.	0.	0.	0.	0.	0.	108.

Vl= 18.36 NO 1 Vr= 18.36 NO 3 As(3)= 108. Umaxb= .002 Umaxt= .001
Asv/s= .00

BEAM 3 (B= .240, H= .300, L= 4.40)

BOTTOM

SECTION	1	2	3	4	5	6	7
M=	.00	-21.99	-35.30	-39.74	-35.30	-21.99	.00
As(1)=	108.	286.	481.	551.	481.	286.	108.
As(2)=	108.	0.	0.	0.	0.	0.	108.

TOP

SECTION	1	2	3	4	5	6	7
M=	.19	.00	.00	.00	.00	.00	.19
As(1)=	108.	0.	0.	0.	0.	0.	108.
As(2)=	108.	0.	0.	0.	0.	0.	108.

Vl= 36.30 NO 1 Vr= 36.30 NO 3 As(3)= 108. Umaxb= .008 Umaxt= .001
Asv/s= .00

BEAM 4 (B= .240, H= .300, L= 2.40)

BOTTOM

SECTION	1	2	3	4	5	6	7
M=	.00	-4.86	-7.10	-6.70	-4.81	-2.57	.00

As(1)=	108.	60.	88.	83.	59.	31.	108.
As(2)=	108.	0.	0.	0.	0.	0.	108.

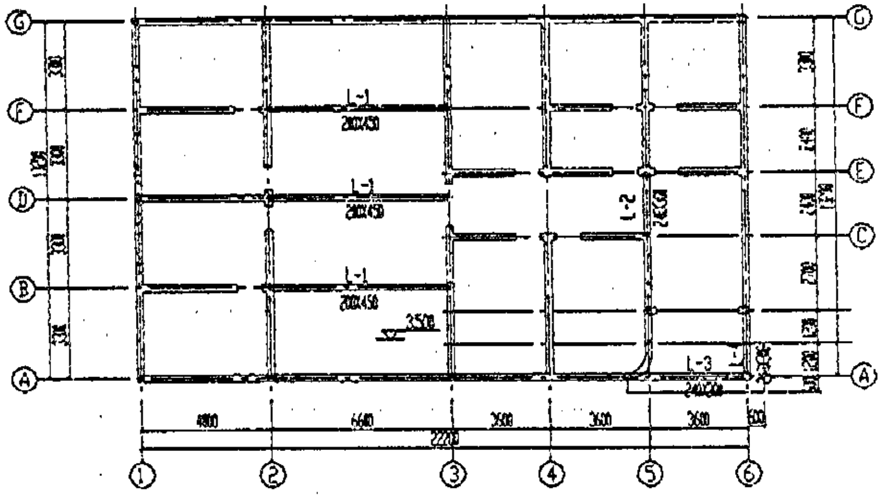
TOP

SECTION	1	2	3	4	5	6	7
M=	.02	.00	.00	.00	.00	.00	.02
As(1)=	108.	0.	0.	0.	0.	0.	108.
As(2)=	108.	0.	0.	0.	0.	0.	108.

Vl= 15.50 NO 1 Vr= 6.89 NO 3 As(3)= 108. Umaxb= .001 Umaxt= .001

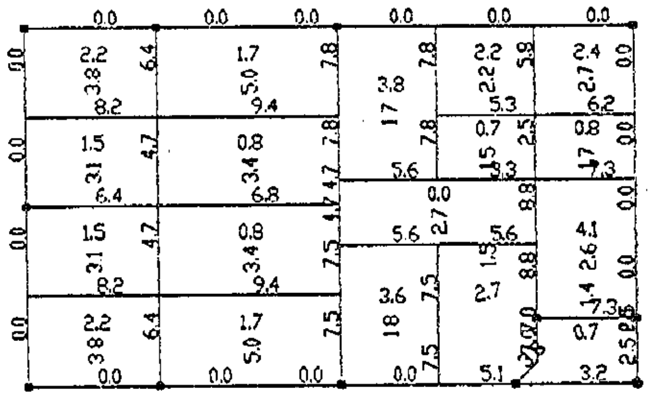
Asv/s= .00

PK1 COMPUTE END



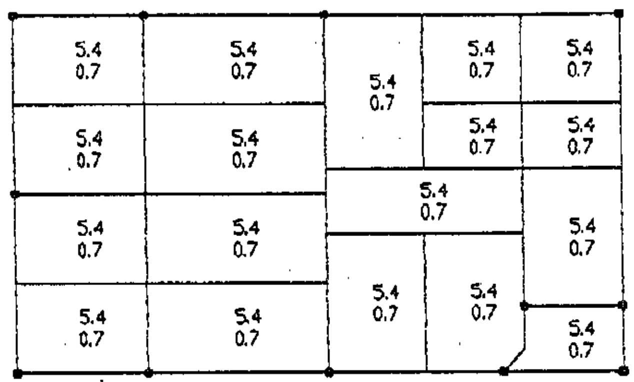
FLOOR STRUCURE PLAN(UNIT:CM) 1:100

一层结构平面图



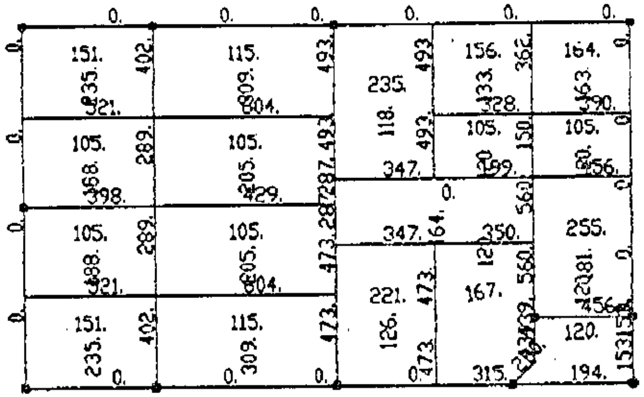
1st FLOOR CAST-IN-SITU BOARD BENDING MOMENT DRAWING (UNIT:KN-M)

现浇板弯矩图（BM,T）（单位千牛米）



1st floor (floor load)

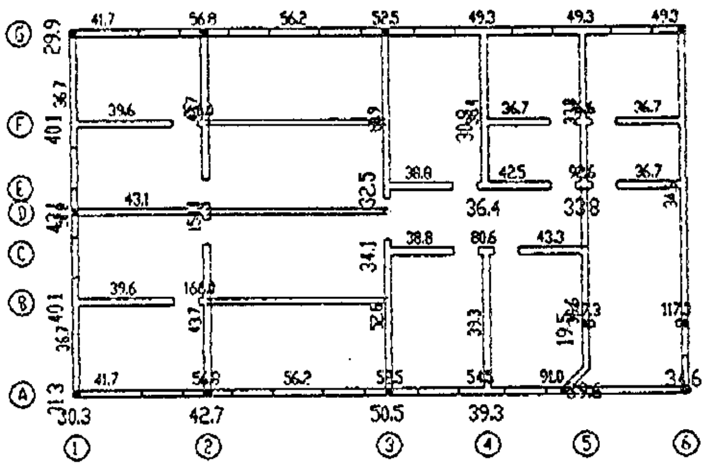
第 1 层平面（楼面荷载）



1st FLOOR CAST-IN-SITU BOARD CALCULATION REINFORCEMENT

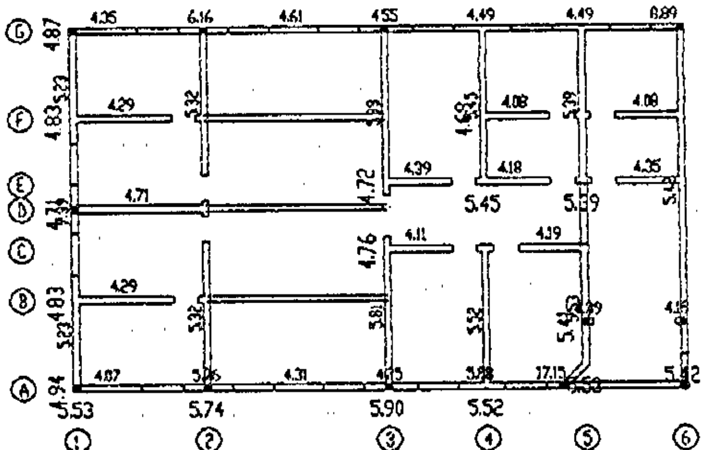
(UNIT:mm²/m;STEEL GRADE: I,II; CONCRETE:C20)

现浇板计算配筋图 (BAS.T)



WALL AXIAL FORCE DESIGN VALUE DRAWING (KN/M)

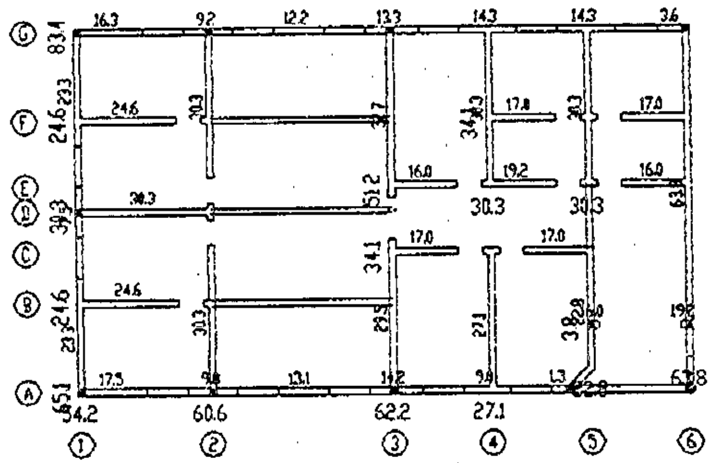
1 层墙轴力设计值图 (KN/M)



G1=3381.6 F1=270.5 V1=270.5 LD=7.0 GD=1.0 M =5.0

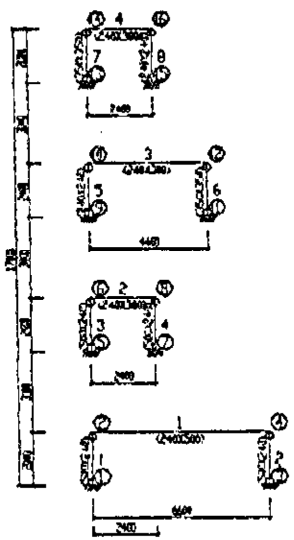
ASEISMIC CALCULATION RESULT
(RATIO BETWEEN RESISTANCE AND AFFECTION,
FIGURE IN BRACKET IS AREA OF REINFORCEMENT)

1 层抗震验算结果（抗力与效应之比 括号内为配筋面积）

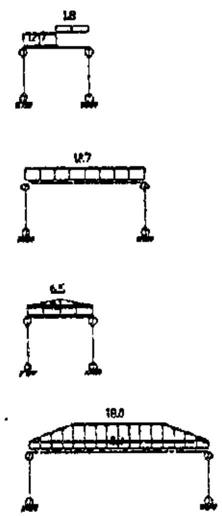


EARTHUAKE SHEAR FORCE DESIGN VALUE DRAWING (KN)

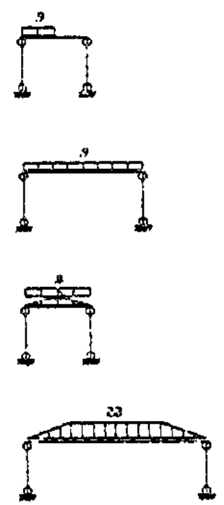
1 层地震剪力设计值图 (kN)



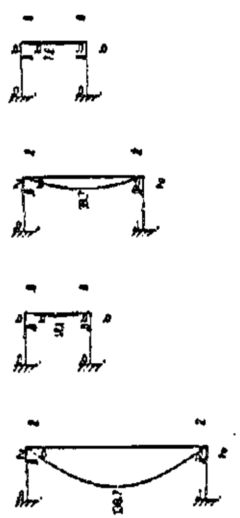
FRAME ELEVATION DRAWING



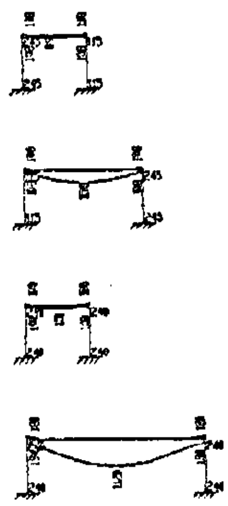
CONSTANT LOAD DRAWING



LIVING LOAD DRAWING



BENDING MOMENT OUTLINE



REINFORCEMENT OUTLINE