3331

內政部 函

機關地址：台北市徐州路五號
傳　真：

受文者：中華民國結構工程技師全國聯合會公會

速別：特急件
密等及解密條件：
發文日期：中華民國九十年一月十五日
發文字號：台九十內營字第九〇八二一七五號
附件：正副本均含附件

主旨：檢送業界已通用之建築結構用電子計算機程式一覽表，請錄案查照辦理。

說明：

一、依本部營建署九十年一月十五日八十九營署建管字第九〇六〇四三號函送「研商如何落實建築技術規則建築構造編第七條第四次會議」會議紀錄（如附件一）辦理。

二、按建築技術規則建築構造編第七條：「使用電子計算機程式之結構計算，可以設計標準、輸入值、輸出值等能以符合結構計算規定之資料，代替計算書。但所用電子計算機程式必須先經直轄市、縣（市）主管建築機關備案。當地主管建築機關認為有需要時，應由設計人提供其他方法證明電子計算機程式之確實，作為以後同樣設計之應用。」依前揭規定，使用電子計算機程式之結構計算，可以設計標準、輸入值、輸出值等能以符合結構計算規定之資料，代替計算書，但所用電子計算機程式必須先經直轄市、縣（市）主管建築機關備案；但不包括結構斷面及配筋設計程式者。

三、唯為簡化前揭備案程序以資便民，關於業界已通用之建築結構用電子計算機程式，經請中華民國建築師公會全國聯合會、中華民國土木技師公會全國聯合會、中華民國結構工程技師公會全國聯合會提供，並召會研商彙整後，共計十八種，如附件二所列。嗣後使用前揭電子計算機程式進行建築物結構計算者，其電子計算機程式得免再向各直轄市、縣（市）主管建築機關備案。

送白訂執筆

正本：台北市政府工務局、高雄市政府工務局、基隆市政府、台北縣政府、桃園縣政府、新竹市政府、新竹縣政府、苗栗縣政府、台中縣政府、台中市政府、彰化縣政府、南投縣政府、雲林縣政府、嘉義縣政府、嘉義市政府、台南縣政府、台南市政府、高雄縣政府、屏東縣政府、台東縣政府、花蓮縣政府、宜蘭縣政府、澎湖縣政府、金門縣政府、連江縣政府、交通部國道高速公路局、科學工業園區管理局、經濟部加工出口區管理處、台北水源特定區管理委員會、墾丁國家公園管理處、玉山國家公園管理處、陽明山國家公園管理處、太魯閣國家公園管理處、雪霸國家公園管理處、金門國家公園管理處、中華民國建築師公會全國聯合會、中華民國土木技師公會全國聯合會、中華民國結構工程技師全國聯合會公會、財團法人中華建築中心、內政部中部辦公室（營建業務）、本部建築研究所、

副本：本部營建署建築管理組四份（均含附件）

部長 張博雅

依權責劃分規定授權業務主管決行

六、結論：

有關如何落實建築技術規則建築構造編第七條之一案，經邀集各地方政府、有關機關及公會代表研商，獲致決議整理如後：

（一）關於業已通用之建築結構用電子計算機程式，經請中華民國建築師公會全國聯合會、中華民國土木技師公會全國聯合會、中華民國結構工程技師公會全國聯合會提供，並於本次會議中討論審查後，共計十八種，如下所列：

編號	程式名稱	版本
1.	ETABS	5.XX（XX為01-99）
2.	ETABS	6.XX（XX為01-99）
3.	ETABS PLUS	5.XX （XX為01-99）
4.	ETABS PLUS	6.XX （XX為01-99）
5.	S-ETABD	不限版本
6.	ANSYS	不限版本
7.	BSAD	結清江建築師事務所，89年版
8.	GTSTRUDL	不限版本
9.	MSAP	朱聖浩，89年版
10.	SAFE	不限版本
11.	SAP 90	不限版本
12	SAP 2000	6.XX（XX為01-99）
13.	SAP 2000	7.XX（XX為01-99）
14.	STAAD III	不限版本
15.	STAAD/PRO	2000
16.	STRAP	7.XX （XX為01-99）
17.	STRAP	8.XX （XX為01-99）
18.	TABS	不限版本

（二）前揭經本署公佈之建築物結構用電子計算機程式得免檢向各直轄市、縣（市）政府備案。

（三）非屬前揭本署公佈之建築物結構用電子計算機程式，仍應向各直轄市、縣（市）政府備案，備案時須檢具申請書及中華民國建築師公會全國

設計資料:

（一）概述：

本工程為地上二層之一般農舍新建工程。

（二）結構系統:

本工程以鋼筋混凝土柱、樑為結構系統，基礎採用鋼筋混凝土獨立基腳，以 S-ETABD 程式分析，依法規規定之強度設計法設計。

（三）材料強度:

混 凝 土:Fc'=210 kg/cm^2

鋼 筋:Fy =4200 kg/cm^2（竹節筋）號數 > =#6

Fy =2800 kg/cm^2（竹節筋）號數 < =#5

（四）設計荷重:

呆荷重:

混凝土: 2.4 T/M^3

屋頂隔熱 :100 kg/m^2

室內樓地版面飾: 50 kg/m^2

活荷重:

屋頂層 : 200 kg/m^2

二層 : 200 kg/m^2

（五）耐震設計規範: 依九十五年一月修訂之建築物耐震設計規範

最小設計水平總橫力： V = SaDIW/(1.4*1.5*FU)

用途係數 I=1.0

振動週期 T=0.070*Hn^(3/4)

（六）地耐力:需詳各基地地質鑽探報告書，工址土壤地耐力為 8 t/m^2 以上適用，8 t/m^2 以下不適用。

（七）電腦程式: S-ETABD(V2000.0)

（八）樓層荷重資料:

	屋 頂 層	二 層
樓版	400	400
屋頂隔熱	100	---
面飾	---	100
其他	100	100
呆載重	600	600
活載	200	200

建物名稱: 鄉村地區住宅新建工程-方案三

一. 震區選擇 (SsD 與 S1D 以及 SsM 與 S1M 係數)

建物地上 2 層樓

縣市	鄉鎮市區	SsD	S1D	SsM	S1M
		0.8	0.45	1.0	0.55

二. 構造種類及系統

結構系統韌性容量：R= 4.0
起始降伏地震力放大倍數：αy= 1.5
用途係數： I= 1.0

三. 近斷層調整因子 (NA. NV)

本工址屬一般工址,不需調整近斷層調整因子.

四. 地盤種類 (I. II. III. IV)

依表 2-3,本工址屬第三類地盤(軟弱地盤).

五. 工址放大係數 (Fa. Fv)

表 2-2(a) 短週期結構之工址放大係數 Fa (線性內插求值)
表 2-2(b) 長週期結構之工址放大係數 Fv (線性內插求值)
SsD= 0.8 Fa= 1.0 ,SsM= 1.0 Fa= 1.0
S1D= 0.45 Fv= 1.5 ,S1M= 0.55 Fv= 1.4

六. 工址水平譜加速度係數 (SDS 與 SD1 及 SMS 與 SM1)

一般工址：SDS = Fa SsD; SMS= Fa SsM (2-4)
SD1 = Fv S1D; SM1= Fv S1M

SDS= 1.0 x0.8 =0.8 ; SMS= 1.0 x1.0 =1.0
SD1= 1.5 x0.45 =0.675; SM1= 1.4 x0.55 =0.77

七. 建築物基本振動週期及短週期. 中長週期分界(ToD. ToM)

依(2-10)鋼筋混凝土、鋼骨鋼筋混凝土等之基本振動週期:

Tcode = 0.07 h <3/4> = 0.07 x 6.8 <3/4> = 0.295 sec

依(2-8), 一般工址及近斷層工址:

ToD = SD1 / SDS = 0.675/0.8 = 0.844 sec
ToM = SM1 / SMS = 0.77/1.0 = 0.77 sec

八. 建築物設計振動週期 (Tdesign)

依由動力分析求得 Tdyna = 0.295 sec
查表 2-7 週期上限係數 CU, 依 SD1=0.675,線性內插求得 Cu = 1.2

Tdesign = Min(Cu x Tcode, Tdyna) = Min(1.2 x 0.295, 0.295)= 0.295 sec

九. 容許韌性容量 (Ra. Fu)

結構系統韌性容量 R, 查表 1-3(步驟二已完成), R= 4.0
依(2-13),一般工址及近斷層工址: Ra = 1 + (R-1)/1.5 = 1+(4.0 - 1)/1.5 = 3.0
依(2-15), Fu = 2.236

FuM = 2.646

十. 工址設計與最大考量水平譜加速度係數 (SaD. SaM)

查表 2-6(a) 一般工址或近斷層區域之工址設計水平譜加速度係數 SaD
0.2 ToD <= T <= ToD
SaD = SDS = 0.800

0.2 ToM <= T <= ToM
SaM = SMS = 1.000

十一. 最小設計水平總橫力 VD

$$(SaD/Fu)m = \begin{cases} 0.52\ SaD/Fu + 0.144; & 0.3 < SaD/Fu < 0.8 \\ 0.70\ SaD/Fu; & SaD/Fu >= 0.8 \end{cases} \quad ...(2\text{-}2)$$

(SaD/Fu) = (0.8/ 2.236) = 0.358 ; 0.3 < SaD/Fu <= 0.8

(SaD/Fu)m = 0.52 (SaD/Fu) + 0.144= 0.52 x 0.358 + 0.144 = 0.33

VD = I/(1.4 ay) (SaD/Fu)m W ...(2-3)

VD = 1.0/(1.4 x 1.5) x 0.33 x W = 0.157 W

十二. 避免中小度地震降伏之設計地震力 V*

一般工址: V* = I Fu/(4.2 ay) (SaD/Fu)m W ...(2-16a)

V* = 1.0 x 2.236/(4.2 x 1.5) x 0.33 x W = 0.117 W

十三、 避免最大考量地震崩塌之設計地震力 VM

VM = I/(1.4 ay) (SaM/FuM)m W ...(2-16c)

$$(SaM/FuM)m = \begin{cases} 0.52\ SaM/FuM + 0.144; & 0.3 < SaM/FuM < 0.8 \\ 0.70\ SaM/FuM; & SaM/FuM >= 0.8 \end{cases} \quad ...(2\text{-}16d)$$

(SaM/FuM) = (1.0/ 2.646) = 0.378 ; 0.3 < SaM/FuM <= 0.8

(SaM/FuM)m = 0.52 (SaM/FuM) + 0.144= 0.52 x 0.378 + 0.144 = 0.341

VM = 1.0/(1.4 x 1.5) x 0.341 x W = 0.162 W

十四、 工址最小設計水平總橫力 Vdesign

Vdesign = Max(VD, V*, VM)
= Max(0.157W, 0.117W, 0.162W)
= 0.162W

十五. 計算層間相對側位移角的地震力 (T_drift_control)

依由動力分析求得 Tdyna = 0.295 sec
查表 2-7 週期上限係數 CU, 依 SD1=0.675,線性內插求得 CU = 1.2

由規範 2.16 節：若基本振動週期係以結構力學方法計算，
所得 T 值不必受小於經驗公式週期 CU 倍的限制。
∴ T = Max(Cu x Tcode, Tdyna) = Max(1.2 x 0.295, 0.295)= 0.354 sec

Ra = 3.0 (as before)
依(2-15), Fu = ?
∵ 0.2ToD <= T <= 0.6 ToD ∴ Fu = 2.236

查表 2-6(a) 一般工址或近斷層區域之工址設計水平譜加速度係數, SaD =?
因 0.2 ToD <= T <= ToD
故 SaD = SDS = 0.800

$$(SaD/Fu)m = \begin{cases} = SaD/Fu; & SaD/Fu <= 0.3 \\ = 0.52\ SaD/Fu + 0.144; & 0.3 < SaD/Fu < 0.8 \\ = 0.70\ SaD/Fu; & SaD/Fu >= 0.8 \end{cases} \quad ...(2\text{-}2)$$

因 (SaD/Fu) = (0.8/ 2.236) = 0.358 ; 0.3 < SaD/Fu <= 0.8
故 (SaD/Fu)m = 0.52 (SaD/Fu) + 0.144= 0.52 x 0.358 + 0.144 = 0.33

V_drift_control = I Fu/4.2 (SaD/Fu)m W ...(2-16a)

V_drift_control = 1.0 x 2.236/4.2 x 0.33 x W = 0.1757 W

2.16.2 建築物間隔:
本工址之設計地震力由(2-16)式控制
以 Fu＝3.0，由(2-15)式反求 Ra* = 5.000
間隔倍數 = 0.6 x 1.4 x ay x Ra*
= 0.6 x 1.4 x 1.500 x 5.000 = 6.3000
最大間隔倍數 = Max(3.780, 6.300) = 6.300

十六、 水平地震力之豎向分配

T = 0.295 sec
for strength:
Total Base Shear V = Max. of (V1, V2, V3)
= 0.1622 x 609.000 = 98.76 ton
Ft = 0.0 (因 T < 0.7)
for drift control:
Total Base Shear V = 0.1757 x 609.000 = 107.01 ton
Ft = 0.0 (因 T < 0.7)

FL.	W(i) ton	△H(i) m	H(i) m	W(i)xH(i) ton-m	F(i) ton	Fs(i) ton
RFL	219.00	3.40	6.80	1489.20	52.24	56.61
2FL	390.00	3.40	3.40	1326.00	46.52	50.40
	609.00			2815.20	98.76	107.01

OVERTURNING MOMENT = 513.393 t-m

**** TH-RCD (RC Beam Design) --- Ver 2000.0 ****

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NUMBER OF TOTAL FRAMES..... 1
NUMBER OF TOTAL STORIES..... 2
NUMBER OF BEAM FORCES..... 7
NUMBER OF COMBINATION FORCES..... 19
DESIGN METHOD ..... USD
DUCTILE DESIGN ..... YES

DESIGN DATA (KG/CM2 OR CM)

STORY	Fc'	Fy	Fyv	ES	MAIN	STIRR	BAR-COV
1	210.0	4200.0	2800.0	2040000.	# 7	# 3	6.00
2	210.0	4200.0	2800.0	2040000.	# 7	# 3	6.00

LOAD COMBINATION FACTOR

NO.	1	2	3	4	5	6	7
1	1.400	1.700	.000	.000	.000	.000	.000
2	1.400	.000	1.700	.000	.000	.000	.000
3	1.400	1.700	1.700	.000	.000	.000	.000
4	1.050	1.275	1.275	1.402	.000	.000	.000
5	1.050	1.275	1.275	-1.402	.000	.000	.000
6	1.050	1.275	1.275	.000	1.402	.000	.000
7	1.050	1.275	1.275	.000	-1.402	.000	.000
8	1.050	1.275	1.275	.000	.000	1.402	.000
9	1.050	1.275	1.275	.000	.000	-1.402	.000
10	1.050	1.275	1.275	.000	.000	.000	1.402
11	1.050	1.275	1.275	.000	.000	.000	-1.402
12	.900	.000	.000	1.430	.000	.000	.000
13	.900	.000	.000	-1.430	.000	.000	.000
14	.900	.000	.000	.000	1.430	.000	.000
15	.900	.000	.000	.000	-1.430	.000	.000
16	.900	.000	.000	.000	.000	1.430	.000
17	.900	.000	.000	.000	.000	-1.430	.000
18	.900	.000	.000	.000	.000	.000	1.430
19	.900	.000	.000	.000	.000	.000	-1.430

** FRAME --(1)

(LVL 1) BAY- 1 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	21.02	7.89	21.03	6-# 7	2-# 7	6-# 7	-28.47	-12.00	-28.48
BOT As	11.08	6.03	11.08	3-# 7	2-# 7	3-# 7	16.41	9.31	16.40
STR Av	10.47	8.36	10.47	# 3@13	# 3@17	# 3@13	20.49	18.33	20.49
				9-#3@10		9-#3@10			

(LVL 1) BAY- 2 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	20.38	7.40	20.40	6-# 7	2-# 7	6-# 7	-27.76	-11.31	-27.78
BOT As	10.19	7.27	10.20	3-# 7	2-# 7	3-# 7	13.72	11.11	13.71
STR Av	11.59	9.47	11.59	# 3@12	# 3@15	# 3@12	21.63	19.47	21.63
				9-#3@10		9-#3@10			

(LVL 1) BAY- 3 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	12.53	4.79	14.21	4-# 7	2-# 7	4-# 7	-18.32	-7.48	-20.47

BOT As	6.26	6.16	7.10	2-# 7	2-# 7	2-# 7	9.19	9.51	5.22
STR Av	6.83	4.71	6.74	# 3@20	# 3@21	# 3@21	16.77	14.61	16.68
				9-#3@10		9-#3@10			

(LVL 1) BAY- 4 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	13.62	4.98	13.95	4-# 7	2-# 7	5-# 7	-19.72	-7.75	-20.15
BOT As	6.81	5.60	6.98	2-# 7	2-# 7	3-# 7	5.30	8.68	7.41
STR Av	8.05	5.92	8.03	# 3@17	# 3@21	# 3@17	18.02	15.84	18.00
				9-#3@10		9-#3@10			

(LVL 1) BAY- 5 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	16.18	5.62	16.40	5-# 7	2-# 7	5-# 7	-22.91	-8.71	-23.17
BOT As	8.09	6.83	8.20	3-# 7	2-# 7	3-# 7	7.79	10.49	7.39
STR Av	10.43	8.32	10.42	# 3@13	# 3@17	# 3@13	20.45	18.29	20.44
				9-#3@10		9-#3@10			

(LVL 1) BAY- 6 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	16.05	5.60	13.52	5-# 7	2-# 7	4-# 7	-22.75	-8.68	-19.60
BOT As	8.03	6.18	6.76	3-# 7	2-# 7	2-# 7	7.95	9.54	10.05
STR Av	7.99	5.99	8.11	# 3@17	# 3@21	# 3@17	17.95	15.92	18.08
				9-#3@10		9-#3@10			

(LVL 1) BAY- 7 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	12.47	4.77	14.14	4-# 7	2-# 7	4-# 7	-18.24	-7.44	-20.39
BOT As	6.23	6.16	7.07	2-# 7	2-# 7	2-# 7	9.11	9.51	5.14
STR Av	6.83	4.71	6.74	# 3@20	# 3@21	# 3@21	16.77	14.61	16.68
				9-#3@10		9-#3@10			

(LVL 1) BAY- 8 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	13.63	5.01	14.03	4-# 7	2-# 7	5-# 7	-19.74	-7.81	-20.25
BOT As	6.82	5.60	7.02	2-# 7	2-# 7	3-# 7	5.32	8.68	7.52
STR Av	8.05	5.92	8.04	# 3@17	# 3@21	# 3@17	18.02	15.84	18.00
				9-#3@10		9-#3@10			

(LVL 1) BAY- 9 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	16.35	5.69	16.57	5-# 7	2-# 7	5-# 7	-23.11	-8.82	-23.37
BOT As	8.17	6.83	8.28	3-# 7	2-# 7	3-# 7	8.00	10.49	7.60
STR Av	10.43	8.32	10.42	# 3@13	# 3@17	# 3@13	20.45	18.29	20.44
				9-#3@10		9-#3@10			

(LVL 1) BAY- 10 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	16.12	5.63	13.52	5-# 7	2-# 7	4-# 7	-22.83	-8.72	-19.59
BOT As	8.06	6.18	6.76	3-# 7	2-# 7	2-# 7	8.05	9.54	10.04
STR Av	7.99	5.99	8.11	# 3@17	# 3@21	# 3@17	17.95	15.92	18.08
				9-#3@10		9-#3@10			

(LVL 1) BAY- 11 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	18.30	6.83	18.33	5-# 7	2-# 7	5-# 7	-25.41	-10.48	-25.45
BOT As	9.15	6.03	9.16	3-# 7	2-# 7	3-# 7	13.31	9.31	13.29
STR Av	9.31	7.20	9.31	# 3@15	# 3@19	# 3@15	19.31	17.14	19.30
				9-#3@10		9-#3@10			

(LVL 1) BAY- 12 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	13.29	4.92	13.28	4-# 7	2-# 7	4-# 7	-19.30	-7.67	-19.29
BOT As	6.64	6.72	6.64	2-# 7	2-# 7	2-# 7	8.49	10.32	8.50
STR Av	6.77	4.66	6.77	# 3@21	# 3@21	# 3@21	16.72	14.55	16.71

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                                9-#3@10         9-#3@10

(LVL  1)   BAY- 13 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    14.36   5.17  14.36|   4-# 7   2-# 7   4-# 7|  -20.66   -8.05  -20.66
BOT As     7.18   8.08   7.18|   2-# 7   3-# 7   2-# 7|    8.13   12.27    8.13
STR Av     7.89   5.77   7.89|  # 3@18  # 3@21  # 3@18|   17.85   15.69   17.85
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 14 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    15.14   5.63  15.69|   4-# 7   2-# 7   4-# 7|  -21.64   -8.72  -22.31
BOT As     7.57   5.85   7.85|   2-# 7   2-# 7   2-# 7|   10.23    9.05    8.15
STR Av     6.80   4.68   6.76|  # 3@20  # 3@21  # 3@21|   16.74   14.58   16.70
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 15 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    14.58   5.15  14.58|   4-# 7   2-# 7   4-# 7|  -20.93   -8.02  -20.94
BOT As     7.29   5.62   7.29|   2-# 7   2-# 7   2-# 7|    7.38    8.70    7.51
STR Av     6.77   4.66   6.78|  # 3@21  # 3@21  # 3@21|   16.71   14.56   16.72
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 16 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    15.57   5.34  15.56|   4-# 7   2-# 7   5-# 7|  -22.16   -8.30  -22.15
BOT As     7.78   6.86   7.78|   2-# 7   2-# 7   2-# 7|    6.86   10.52    6.74
STR Av     7.89   6.95   9.07|  # 3@18  # 3@20  # 3@15|   17.86   16.90   19.06
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 17 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    15.73   5.64  15.19|   5-# 7   2-# 7   4-# 7|  -22.35   -8.73  -21.70
BOT As     7.86   5.83   7.60|   2-# 7   2-# 7   2-# 7|    8.13    9.02   10.20
STR Av     7.94   4.68   6.80|  # 3@17  # 3@21  # 3@20|   17.91   14.58   16.74
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 18 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    15.90   5.94  16.38|   5-# 7   2-# 7   5-# 7|  -22.56   -9.18  -23.15
BOT As     7.95   5.85   8.19|   2-# 7   2-# 7   3-# 7|   11.17    9.05    9.01
STR Av     9.27   5.93   8.01|  # 3@15  # 3@21  # 3@17|   19.26   15.85   17.97
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 19 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    15.20   5.41  15.20|   5-# 7   2-# 7   5-# 7|  -21.70   -8.40  -21.70
BOT As     7.60   5.62   7.60|   3-# 7   2-# 7   3-# 7|    8.16    8.70    8.30
STR Av     9.31   7.20   9.31|  # 3@15  # 3@19  # 3@15|   19.30   17.15   19.31
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 20 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    16.20   5.60  16.18|   5-# 7   2-# 7   5-# 7|  -22.93   -8.68  -22.90
BOT As     8.10   6.86   8.09|   3-# 7   2-# 7   3-# 7|    7.63   10.52    7.51
STR Av    10.43   8.31  10.42|  # 3@13  # 3@17  # 3@13|   20.44   18.28   20.44
                                9-#3@10         9-#3@10

(LVL  1)   BAY- 21 ( 35.0x 50.0)  NET SPAN= 555.00
           LEFT   MID.  RIGHT|  RE-BAR                |  FORCES  (T-M OR T)
TOP As    16.42   5.95  15.95|   5-# 7   2-# 7   5-# 7|  -23.19   -9.20  -22.63
BOT As     8.21   5.83   7.98|   3-# 7   2-# 7   3-# 7|    8.99    9.02   11.14
STR Av     9.30   7.22   9.33|  # 3@15  # 3@19  # 3@15|   19.29   17.17   19.33
                                9-#3@10         9-#3@10
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(LVL 1) BAY- 22 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	15.57	5.88	15.57	4-# 7	2-# 7	4-# 7	-22.16	-9.10	-22.17
BOT As	7.79	6.72	7.79	2-# 7	2-# 7	2-# 7	11.42	10.32	11.42
STR Av	6.78	4.66	6.77	# 3@21	# 3@21	# 3@21	16.72	14.56	16.71
				9-#3@10		9-#3@10			

(LVL 2) BAY- 1 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	16.61	6.27	16.65	5-# 7	2-# 7	5-# 7	-23.42	-9.66	-23.47
BOT As	8.30	6.61	8.32	3-# 7	2-# 7	3-# 7	12.29	10.16	12.26
STR Av	9.31	7.19	9.31	# 3@15	# 3@19	# 3@15	19.30	17.14	19.30
				9-#3@10		9-#3@10			

(LVL 2) BAY- 2 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	16.38	5.97	16.43	5-# 7	2-# 7	5-# 7	-23.14	-9.22	-23.21
BOT As	8.19	7.95	8.22	3-# 7	2-# 7	3-# 7	10.20	12.08	10.16
STR Av	10.43	8.31	10.42	# 3@13	# 3@17	# 3@13	20.44	18.28	20.44
				9-#3@10		9-#3@10			

(LVL 2) BAY- 5 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	17.11	6.05	17.13	5-# 7	2-# 7	5-# 7	-24.02	-9.34	-24.04
BOT As	8.56	7.39	8.57	3-# 7	2-# 7	3-# 7	9.16	11.29	9.25
STR Av	10.43	8.31	10.43	# 3@13	# 3@17	# 3@13	20.44	18.28	20.44
				9-#3@10		9-#3@10			

(LVL 2) BAY- 9 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	17.75	6.31	17.78	5-# 7	2-# 7	5-# 7	-24.77	-9.72	-24.81
BOT As	8.87	7.39	8.89	3-# 7	2-# 7	3-# 7	9.94	11.29	10.01
STR Av	10.43	8.31	10.43	# 3@13	# 3@17	# 3@13	20.44	18.28	20.44
				9-#3@10		9-#3@10			

(LVL 2) BAY- 11 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	15.55	5.85	15.65	4-# 7	2-# 7	4-# 7	-22.14	-9.05	-22.26
BOT As	7.77	6.61	7.83	2-# 7	2-# 7	2-# 7	11.05	10.16	10.97
STR Av	6.78	4.66	6.77	# 3@21	# 3@21	# 3@21	16.72	14.56	16.71
				9-#3@10		9-#3@10			

(LVL 2) BAY- 14 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	11.33	4.27	12.80	3-# 7	2-# 7	4-# 7	-16.74	-6.66	-18.66
BOT As	5.67	6.21	6.40	2-# 7	2-# 7	2-# 7	6.62	9.57	3.99
STR Av	5.57	4.70	6.75	# 3@21	# 3@21	# 3@21	15.48	14.59	16.69
				9-#3@10		9-#3@10			

(LVL 2) BAY- 15 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	11.78	3.93	11.67	4-# 7	2-# 7	4-# 7	-17.33	-6.14	-17.19
BOT As	5.89	5.71	5.83	2-# 7	2-# 7	2-# 7	3.46	8.84	3.69
STR Av	6.77	4.66	6.78	# 3@21	# 3@21	# 3@21	16.71	14.56	16.72
				9-#3@10		9-#3@10			

(LVL 2) BAY- 16 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	12.48	4.22	12.65	4-# 7	2-# 7	4-# 7	-18.26	-6.41	-18.48
BOT As	6.24	7.04	6.33	2-# 7	2-# 7	2-# 7	3.12	10.79	2.85
STR Av	7.90	5.78	7.89	# 3@18	# 3@21	# 3@18	17.86	15.70	17.85
				9-#3@10		9-#3@10			

(LVL 2) BAY- 17 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	

TOP As	12.88	4.29	11.38	4-# 7	2-# 7	3-# 7	-18.77	-6.69	-16.81
BOT As	6.44	6.16	5.69	2-# 7	2-# 7	2-# 7	3.93	9.51	6.58
STR Av	6.75	4.40	5.57	# 3@21	# 3@21	# 3@21	16.69	13.32	15.48
				9-#3@10		9-#3@10			

(LVL 2) BAY- 18 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	11.46	4.31	12.92	3-# 7	2-# 7	4-# 7	-16.91	-6.75	-18.82
BOT As	5.73	6.21	6.46	2-# 7	2-# 7	2-# 7	6.78	9.57	4.16
STR Av	5.57	4.70	6.75	# 3@21	# 3@21	# 3@21	15.48	14.59	16.69
				9-#3@10		9-#3@10			

(LVL 2) BAY- 19 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	11.92	3.97	11.79	4-# 7	2-# 7	4-# 7	-17.52	-6.23	-17.35
BOT As	5.96	5.71	5.89	2-# 7	2-# 7	2-# 7	3.63	8.84	3.88
STR Av	6.77	4.67	6.78	# 3@21	# 3@21	# 3@21	16.71	14.56	16.72
				9-#3@10		9-#3@10			

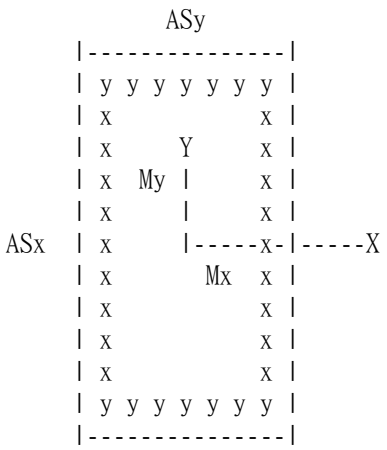
(LVL 2) BAY- 20 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	12.61	4.26	12.77	4-# 7	2-# 7	4-# 7	-18.43	-6.49	-18.64
BOT As	6.31	7.04	6.39	2-# 7	2-# 7	2-# 7	3.29	10.79	3.02
STR Av	7.90	5.78	7.89	# 3@18	# 3@21	# 3@18	17.86	15.70	17.85
				9-#3@10		9-#3@10			

(LVL 2) BAY- 21 (35.0x 50.0) NET SPAN= 555.00

	LEFT	MID.	RIGHT	RE-BAR			FORCES	(T-M OR T)	
TOP As	13.01	4.34	11.50	4-# 7	2-# 7	3-# 7	-18.95	-6.78	-16.97
BOT As	6.51	6.16	5.75	2-# 7	2-# 7	2-# 7	4.11	9.51	6.75
STR Av	6.75	4.40	5.57	# 3@21	# 3@21	# 3@21	16.69	13.32	15.48
				9-#3@10		9-#3@10			

**** TH-RCD (Uni-Axial RC Column Design) --- Ver 2000.0 ****



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//J-97039
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NUMBER OF TOTAL FRMAES----------- 1
NUMBER OF STORIES---------------- 2
NUMBER OF DESIGN COLS.IN A FLOOR- 16
NUMBER OF COL LINES IN ONE FRAME- 16
NUMBER OF STORIES IN ONE CYCLE--- 2
NUMBER OF INPUT FORCES (NLD)----- 7
NUMBER OF COMBINATION FORCES----- 19
SECTION DESING METHOD------------ USD
END REINFORCEMENT---------------- 80.0%

DESIGN DATA KG/CM2 OR CM)

Fcp	Fy	Fyv	Es	MAIN	TIE	BAR-COV
210.0	4200.0	2800.0	2040000.	# 7	# 3	7.00
210.0	4200.0	2800.0	2040000.	# 7	# 3	7.00

COLUMN INDEX

F.NO	NCL	COLUMN NO	X-F.NO > 0	Y-F.NO < 0							
1	16	1	2	3	4	5	6	7	8	9	10	11	12
		13	14	15	16								

LEVEL LOAD REDUCTION FACTOR
.40 .30

DESIGN INDEX YES=0 NO=1
0 0

LOAD COMBINATION FACTOR

NO.	1	2	3	4	5	6	7
1	1.400	1.700	.000	.000	.000	.000	.000
2	1.400	.000	1.700	.000	.000	.000	.000
3	1.400	1.700	1.700	.000	.000	.000	.000
4	1.050	1.275	1.275	1.402	.000	.000	.000
5	1.050	1.275	1.275	-1.402	.000	.000	.000
6	1.050	1.275	1.275	.000	1.402	.000	.000
7	1.050	1.275	1.275	.000	-1.402	.000	.000
8	1.050	1.275	1.275	.000	.000	1.402	.000

```
  9  1.050  1.275  1.275   .000   .000 -1.402   .000
 10  1.050  1.275  1.275   .000   .000   .000  1.402
 11  1.050  1.275  1.275   .000   .000   .000 -1.402
 12   .900   .000   .000  1.430   .000   .000   .000
 13   .900   .000   .000 -1.430   .000   .000   .000
 14   .900   .000   .000   .000  1.430   .000   .000
 15   .900   .000   .000   .000 -1.430   .000   .000
 16   .900   .000   .000   .000   .000  1.430   .000
 17   .900   .000   .000   .000   .000 -1.430   .000
 18   .900   .000   .000   .000   .000   .000  1.430
 19   .900   .000   .000   .000   .000   .000 -1.430


*** OUTPUT UNIT :   DIMENSION ---------------- CM
                    PU, VU ------------------ T
                    MU ----------------------- T-M
                    AS, ASax1 --------------- CM2
                    AV, AHXconf, AHYconf ---- CM2/M

****************************** COLUMN NO   1 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  28.3   Nll =   9.2   Mdlx=   1.2  Mllx=    .8  Meqx=  13.3
  Neqx=   9.1   Neqy=   6.8   Mdly=   1.1  Mlly=    .8  Meqy=  10.3

1    C  1  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X  17/  9    20.44    38.42    10.31   1.56  25.31  20.25   5.66  #3@ 22
  Y  19/ 11    15.96    33.91     8.37   1.03  16.75          5.66  #3@ 22

2    C  1  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X   9/  9    19.78    24.42    12.28   1.51  24.50  20.25   5.66  #3@ 22
  Y  11/ 11    14.30    22.17     8.66    .93  15.13          5.66  #3@ 22

****************************** COLUMN NO   2 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  28.3   Nll =   9.2   Mdlx=   1.1  Mllx=    .8  Meqx=  13.3
  Neqx=   8.9   Neqy=   6.0   Mdly=  -1.1  Mlly=   -.8  Meqy=  11.3

1    C  2  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X  16/  8    20.42    38.14    10.29   1.56  25.27  20.25   5.66  #3@ 22
  Y  15/  7    17.46    32.92    -9.18   1.22  19.69          5.66  #3@ 22

2    C  2  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X   8/  8    19.81    24.40    12.31   1.52  24.56  20.25   5.66  #3@ 22
  Y   7/  7    14.50    22.03    -8.63    .96  15.49          5.66  #3@ 22

****************************** COLUMN NO   3 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  41.8   Nll =  15.1   Mdlx=   1.3  Mllx=   1.0  Meqx=  12.0
  Neqx=   8.5   Neqy=    .7   Mdly=    .0  Mlly=  -1.0  Meqy=  12.2

1    C  3  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X  17/  9    18.72    49.77     9.62   1.24  20.04  20.25   5.66  #3@ 22
  Y  18/ 18    17.77    38.60    -9.67   1.23  19.90          5.66  #3@ 22

2    C  3  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
```

```
  X   9/  9    19.64    34.04    12.16   1.47  23.84  20.25   5.66  #3@ 22
  Y  18/ 18    15.01    19.39    -9.48   1.03  16.66          5.66  #3@ 22

****************************** COLUMN NO   4 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  41.8   Nll =  15.1   Mdlx=   1.3  Mllx=    .9  Meqx=  12.0
  Neqx=   8.5   Neqy=   1.3   Mdly=    .0  Mlly=   1.0  Meqy=  13.4

1    C  4  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X  16/  8    18.70    49.81     9.59   1.23  19.98  20.25   5.66  #3@ 22
  Y  14/ 14    19.50    39.42    10.69   1.44  23.38          5.66  #3@ 22

2    C  4  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X   8/  8    19.69    34.06    12.20   1.48  23.93  20.25   5.66  #3@ 22
  Y  14/ 14    15.33    19.53     9.58   1.06  17.13          5.66  #3@ 22

****************************** COLUMN NO   5 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  14.0   Nll =   4.5   Mdlx=   2.2  Mllx=   1.0  Meqx=  12.0
  Neqx=   3.0   Neqy=   3.1   Mdly=   2.6  Mlly=   1.1  Meqy=  11.3

1    C  5  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X   9/  9    20.15    20.91    11.73   1.56  25.31  20.25   5.66  #3@ 22
  Y  11/ 11    19.67    22.53    11.89   1.51  24.40          5.66  #3@ 22

****************************** COLUMN NO   6 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  21.2   Nll =   7.7   Mdlx=   -.2  Mllx=  -1.1  Meqx=  15.1
  Neqx=    .6   Neqy=   3.2   Mdly=   2.9  Mlly=   1.3  Meqy=  11.6

1    C  6  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X  16/ 16    21.96    19.93   -13.32   1.76  28.54  20.25   5.66  #3@ 22
  Y  11/ 11    20.64    32.55    12.55   1.59  25.81          5.66  #3@ 22

****************************** COLUMN NO   7 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  52.6   Nll =  20.2   Mdlx=    .1  Mllx=   1.0  Meqx=  12.5
  Neqx=   4.2   Neqy=    .0   Mdly=    .2  Mlly=   1.0  Meqy=  12.1

1    C  7  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X  16/ 17    18.11    41.36     9.82   1.26  20.44  20.25   5.66  #3@ 22
  Y  19/ 19    17.75    47.34     9.59   1.14  18.53          5.66  #3@ 22

2    C  7  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X  17/  9    13.13    28.61     8.98    .75  12.19  20.25   5.66  #3@ 22
  Y  19/ 11    14.75    23.36     9.35    .97  15.71          5.66  #3@ 22

****************************** COLUMN NO   8 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  53.2   Nll =  20.4   Mdlx=    .1  Mllx=  -1.1  Meqx=  12.8
  Neqx=   3.6   Neqy=    .0   Mdly=    .2  Mlly=   1.0  Meqy=  13.2

1    C  8  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
```

```
  X  17/ 17    18.75    42.65    10.16   1.34  21.69  20.25   5.66  #3@ 22
  Y  15/ 15    19.46    47.84    10.59   1.36  22.03          5.66  #3@ 22

2    C  8  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X  16/  8    13.39    28.60    -9.03    .78  12.66  20.25   5.66  #3@ 22
  Y  15/  7    15.08    23.31     9.45   1.01  16.29          5.66  #3@ 22

****************************** COLUMN NO   9 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  14.0   Nll =   4.6   Mdlx=   2.3  Mllx=   1.1  Meqx=  12.4
  Neqx=   3.5   Neqy=   3.8   Mdly=  -2.6  Mlly=  -1.1  Meqy=  14.0

1    C  9  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X   8/  8    20.80    21.89    12.33   1.63  26.42  20.25   5.66  #3@ 22
  Y   7/  7    23.45    23.53   -13.89   1.92  31.15          5.66  #3@ 22

****************************** COLUMN NO  10 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  14.0   Nll =   4.5   Mdlx=   2.2  Mllx=   1.0  Meqx=  12.0
  Neqx=   3.5   Neqy=   3.2   Mdly=  -2.6  Mlly=  -1.1  Meqy=  11.3

1    C 10  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X   5/  5    20.06    21.90    11.68   1.55  25.12  20.25   5.66  #3@ 22
  Y  10/ 10    19.67    22.58   -11.88   1.51  24.39          5.66  #3@ 22

****************************** COLUMN NO  11 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  21.2   Nll =   7.7   Mdlx=   -.2  Mllx=  -1.1  Meqx=  15.1
  Neqx=    .5   Neqy=   3.2   Mdly=  -2.9  Mlly=  -1.3  Meqy=  11.6

1    C 11  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X  12/ 12    21.87    19.30   -13.28   1.75  28.38  20.25   5.66  #3@ 22
  Y  10/ 10    20.63    32.52   -12.55   1.59  25.80          5.66  #3@ 22

****************************** COLUMN NO  12 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  53.2   Nll =  20.4   Mdlx=    .1  Mllx=   1.0  Meqx=  12.3
  Neqx=   4.4   Neqy=    .8   Mdly=   -.1  Mlly=  -1.1  Meqy=  12.2

1    C 12  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X  12/ 13    17.78    41.59     9.56   1.22  19.75  20.25   5.66  #3@ 22
  Y  18/ 18    17.91    46.82    -9.74   1.17  18.98          5.66  #3@ 22

2    C 12  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
  X  13/  5    14.05    29.29     9.48    .85  13.77  20.25   5.66  #3@ 22
  Y  18/ 18    15.01    23.20    -9.50   1.00  16.18          5.66  #3@ 22

****************************** COLUMN NO  13 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  53.8   Nll =  20.7   Mdlx=    .1  Mllx=  -1.1  Meqx=  12.6
  Neqx=   3.9   Neqy=    .8   Mdly=   -.1  Mlly=  -1.1  Meqy=  13.4

1    C 13  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASax1     AV     Tie
```

```
  X  13/ 13    18.42    42.87     9.90   1.29  20.96  20.25   5.66  #3@ 22
  Y  14/ 14    19.65    47.28   -10.77   1.39  22.55          5.66  #3@ 22

2    C 13  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X  12/  4    14.32    29.29    -9.54    .88  14.25  20.25   5.66  #3@ 22
  Y  14/ 14    15.33    23.10    -9.60   1.03  16.74          5.66  #3@ 22

****************************** COLUMN NO  14 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  14.0   Nll =   4.6   Mdlx=   2.3  Mllx=   1.1  Meqx=  12.4
  Neqx=   3.7   Neqy=   3.6   Mdly=   2.6  Mlly=   1.2  Meqy=  14.0

1    C 14  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X   4/  4    20.75    22.73    12.31   1.62  26.30  20.25   5.66  #3@ 22
  Y   6/  6    23.45    23.28    13.89   1.92  31.15          5.66  #3@ 22

****************************** COLUMN NO  15 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  28.2   Nll =   9.2   Mdlx=   1.2  Mllx=    .7  Meqx=  10.6
  Neqx=   8.1   Neqy=   6.6   Mdly=  -1.1  Mlly=   -.8  Meqy=  10.3

1    C 15  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X  13/  5    16.41    37.01     8.25   1.07  17.33  20.25   5.66  #3@ 22
  Y  18/ 10    15.97    33.86    -8.38   1.03  16.76          5.66  #3@ 22

2    C 15  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X   5/  5    18.61    24.02    11.83   1.38  22.43  20.25   5.66  #3@ 22
  Y  10/ 10    14.34    22.14    -8.69    .94  15.20          5.66  #3@ 22

****************************** COLUMN NO  16 ******************************

FOUNDATION DESIGN DATA: (NO FACTOR)
  Ndl =  28.3   Nll =   9.2   Mdlx=   1.1  Mllx=    .9  Meqx=  10.6
  Neqx=   8.1   Neqy=   6.0   Mdly=   1.1  Mlly=    .8  Meqy=  11.3

1    C 16  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X  12/  4    16.37    36.97     8.21   1.07  17.25  20.25   5.66  #3@ 22
  Y  14/  6    17.47    33.17     9.19   1.22  19.69          5.66  #3@ 22

2    C 16  (  45.0 x  45.0)   KL/Rx=  22.3   KL/Ry=  22.3
DIR   LOAD        MU       PU       VU    Pg%     As  ASaxl     AV     Tie
  X   4/  4    18.70    24.05    11.90   1.39  22.58  20.25   5.66  #3@ 22
  Y   6/  6    14.54    22.08     8.65    .96  15.55          5.66  #3@ 22
```

(FILE : j.OUT)

==========
//J-97039
==========

STRENGTH OF CONCRETE = 210.00 (KG/CM**2)
YIELD OF BENDING STEEL = 4200.00 (KG/CM**2)
YIELD OF SHEAR STEEL = 2800.00 (KG/CM**2)
MINIMUM PROTECTION DP= .10 (M)
BEAM PROPERTIES NBP= 1
VERTICAL LOADING NFEF= 1

DESIGN IS IN ACCORDANCE WITH ACI 318-89 USD

*** BEAM PROPERTIES

ID	Iz	Kii	Kij
1	.000000	4.00	2.00

*** BEAM PROPERTIES (CONTINUE)

ID	B	D	DE	Wt	BT	T
1	.300	.500	.500	2.400	.300	.150

*** BEAM LOADING DATA

ID	RL	COB	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
1	.500	33	.40	2.00	1.00	.40	2.00	1.00				

*** J1

NS	IBL	IBR	KFND	TFND	#M	#S
1	0	0	0	.000	7	3

SUPPORT WIDTH (M)
.350 .350

BEAM DATA

ID	SPAN	IB	DL	LL1	LL2
1	6.000	1	1	1	1

SPAN * 1* B = .300(M) D = .500(M) DE = .500(M)

REINF.	LEFT	MIDDLE	RIGHT	:		LEFT	RIGHT
TOP AS(CM2)	.000	.000	.000	:	END AV(CM2/M)	3.771	3.771
BOT AS(CM2)	.000	6.641	.000	:	QTR AV(CM2/M)	3.771	3.771
TOP MOM(T-M)	.000	.000	.000	:	END V(T)	5.058	5.058
BOT MOM(T-M)	.000	9.388	.000	:	QTR V(T)	3.229	3.229

*** MIN. AV = 3.77 CM**2/M

(FILE : slab.OUT)

==========
//J-97039
==========

STRENGTH OF CONCRETE = 210.00 (KG/CM**2)
YIELD OF BENDING STEEL = 2800.00 (KG/CM**2)
MINIMUM NET PROTECTION = 2.00 (CM)

DESIGN IS IN ACCORDANCE WITH METHOD 2 --- WSD

*** 2-RS1
DIMENSION (CM) S = 600.0 L = 600.0 T = 18.0
LOADING (KG/M**2) DL= 600.0 LL= 300.0
CONTINUE EDGES N = 2

	SHORT DIR.			LONG DIR.		
	CONT.	MID.	DISC.	CONT.	MID.	DISC.
MOM(T-M/M)	-1.62	1.22	-.81	-1.62	1.22	-.81
AS (CM2/M)	8.63	6.50	4.29	9.40	7.08	4.67
BAR	#4@ 14.5	#4@ 19.5	#4@ 29.5	#4@ 13.5	#4@ 17.5	#4@ 27.0
ARRANGE	#4@ 14.5	#4@ 19.5	#4@ 29.5	#4@ 13.5	#4@ 17.5	#4@ 27.0
	4+4@ 14.5	4+4@ 19.5	4+4@ 29.5	4+4@ 13.5	4+4@ 17.5	4+4@ 27.0

PROJECT :97039

COLUMN DESIGN OUTPUT FILE NAME = COL.OUT

DATE = 05-08-2008
TIME = 15:01:01

COL.	/------- N (t)---------/				/---------- M (t-m)------------------/					
NO.	DL	LL	EQx	EQy	DLx	LLx	EQx	DLy	LLy	EQy
1	28.3	9.2	9.1	6.8	1.2	0.8	13.3	1.1	0.8	10.3
2	28.3	9.2	8.9	6.0	1.1	0.8	13.3	-1.1	-0.8	11.3
3	41.8	15.1	8.5	0.7	1.3	1.0	12.0	0.0	-1.0	12.2
4	41.8	15.1	8.5	1.3	1.3	0.9	12.0	0.0	1.0	13.4
5	14.0	4.5	3.0	3.1	2.2	1.0	12.0	2.6	1.1	11.3
6	21.2	7.7	0.6	3.2	-0.2	-1.1	15.1	2.9	1.3	11.6
7	52.6	20.2	4.2	0.0	0.1	1.0	12.5	0.2	1.0	12.1
8	53.2	20.4	3.6	0.0	0.1	-1.1	12.8	0.2	1.0	13.2
9	14.0	4.6	3.5	3.8	2.3	1.1	12.4	-2.6	-1.1	14.0
10	14.0	4.5	3.5	3.2	2.2	1.0	12.0	-2.6	-1.1	11.3
11	21.2	7.7	0.5	3.2	-0.2	-1.1	15.1	-2.9	-1.3	11.6
12	53.2	20.4	4.4	0.8	0.1	1.0	12.3	-0.1	-1.1	12.2
13	53.8	20.7	3.9	0.8	0.1	-1.1	12.6	-0.1	-1.1	13.4
14	14.0	4.6	3.7	3.6	2.3	1.1	12.4	2.6	1.2	14.0
15	28.2	9.2	8.1	6.6	1.2	0.7	10.6	-1.1	-0.8	10.3
16	28.3	9.2	8.1	6.0	1.1	0.9	10.6	1.1	0.8	11.3

COLUMN BOTTOM DESIGN FORCE :

COMBINATION:	AXIAL LOAD	BENDING MOMENT
1.	DL + 0.5xLL	DL + LL
2.	(DL + 0.5xLL + EQx)x0.75	(DL + LL + EQx)x0.75
3.	(DL + 0.5xLL + EQy)x0.75	(DL + LL + EQy)x0.75
4.	(DL - EQx)x0.75	(DL + LL - EQx)x0.75
5.	(DL - EQy)x0.75	(DL + LL - EQy)x0.75

COL.	/------ N (t)--------/		/------ M (t-m)-----/	
NO.	DOWN-WARD	UP-WARD	Mx	My
1	32.90	0.00	11.48	9.15
2	32.90	0.00	11.40	-9.90
3	49.35	0.00	10.73	-9.90
4	49.35	0.00	10.65	10.80
5	16.25	0.00	11.40	11.25
6	25.05	0.00	-12.30	11.85
7	62.70	0.00	10.20	9.98
8	63.40	0.00	-10.35	10.80
9	16.30	0.00	11.85	-13.27
10	16.25	0.00	11.40	-11.25
11	25.05	0.00	-12.30	-11.85
12	63.40	0.00	10.05	-10.05
13	64.15	0.00	-10.20	-10.95
14	16.30	0.00	11.85	13.35
15	32.80	0.00	9.38	-9.15
16	32.90	0.00	9.45	9.90