$$F_1 = \frac{2.347(1.34) - 8.594(0.835) - 1.172(2.72)}{1.50}$$

$$= -4.812 \text{ T/m}$$

$$F_2 = \frac{2.347(0.16) + 8.594(2.335) + 1.172(4.22)}{1.50}$$

$$= 16.92 \text{ T/m}$$

Moment @ R_1 = $4.812(0.16)$ = 0.77 T-m/m

Moment @ F_2 = $4.812(1.90) + 2.347(1.34)$ = 10.36 T-m/m

Moment @ R_2 = $4.812(2.335) + 2.347(2.175) - 16.92(0.835)$

= 2.212 T-m/m

Moment Max คือ 10.36 T-m/m

การรับแรงต้านของดิน ที่ใช้ Moment = 22.7 T-m/m > 10.36

(O.K.)

5. ค่าของ F_y ในการคำนวณทาง Steel design ได้มีการเผื่อไว้ในสูตรการคำนวณอยู่แล้ว ซึ่งคุณสมบัติของเหล็ก WF ที่ใช้เป็นเหล็ก A36 ;

$$E = 2.10 \times 10^6 \text{ ksc}$$

yield point 2250 - 2530 ksc

Ultimate 4070 - 5620 ksc

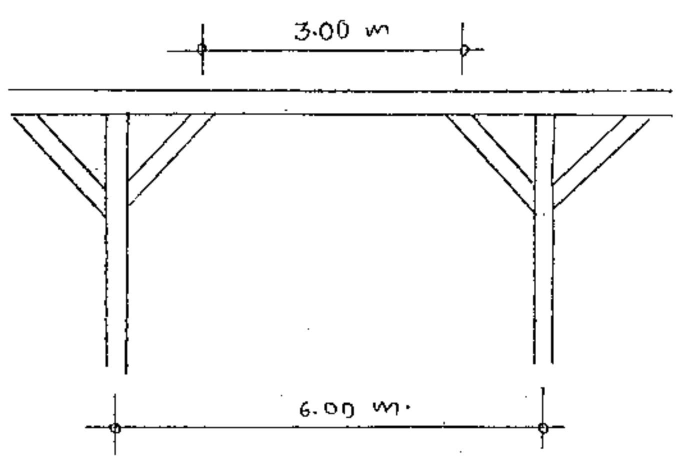
ความหนาแน่น ≃ 7.85 T/m^3

Steel Design

$$F.S. = \frac{5}{8} + \frac{3}{8}\frac{\left(\frac{KL}{r}\right)}{\sqrt{\frac{2\pi^2E}{F_y}}} - \frac{1}{8}\left[\frac{\left(\frac{KL}{r}\right)}{\sqrt{\frac{2\pi^2E}{F_y}}}\right]^3$$

จาก
$$F_a = \frac{F_y}{F.S.}\cdot\left[1 - \frac{\left(\frac{KL}{r}\right)^2}{2\sqrt{\frac{2\pi^2E}{F_y}}^{\,2}}\right]$$

6. Strut Beam คิด Effective length = 3.00 m.



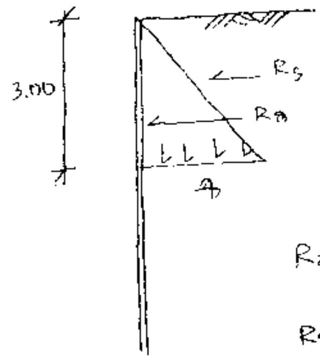
JOB: CITY LAKE TOWER — JOB NO.

LOCATION: — SUBJECT: STRUT

DATE: — SHEET NO. 1 OF 1

BY: CHAY (แชน) — CHKD BY:

วิธีการอัด STRUT บริเวณ SEPTIC TANK กรณีที่ถอนเหล็กชีทค้ำแนวรอบ STRUT ได้ SHEET PILE ในกรณี CANTILEVER 3.00 ม.



Bulk density BD = 1.62 T/m^3

Unconfined Compressive Strength Q_u = 4.36 T/m^2

$c = \frac{Q_u}{2} = 2.18$ T/m^2

$R_a = \frac{1}{2}(BDH^2) = \frac{1}{2} \times 1.63 \times 3^2 = 7.335$ T/linear m

$R_s = 1 \times 3.0$

Total Force = 10.335 T/liner m

Force ที่กระทำ STRUT ในระยะ 5.00 m

∴ Force on Strut = 50.335 T

$\sigma = \frac{P}{A} =$ [A = 200 cm^2 Used H-beam 310 × 550]

$= \frac{50.335 \times 1000}{200}$

$= 251.675$ ksc

$\epsilon = \frac{\sigma}{E}$ [$E = 2.04 \times 10^6$ ksc]

$= \frac{251.675}{2.04 \times 10^6} = 1.234 \times 10^{-4}$

$\Delta L = \epsilon \times L$ [L = 10.50 m]

$= 1.234 \times 10^{-4} \times 10.50$

$= 0.129$ cm

∴ STRUT อยู่ใน COMPRESSION STRESS ที่มีการหดตัว 0.129 cm.

ทำเพื่ออัด STRUT จะไม่ส่งผลให้ดินหรือเกิดการเคลื่อนตัวแต่อย่างใด

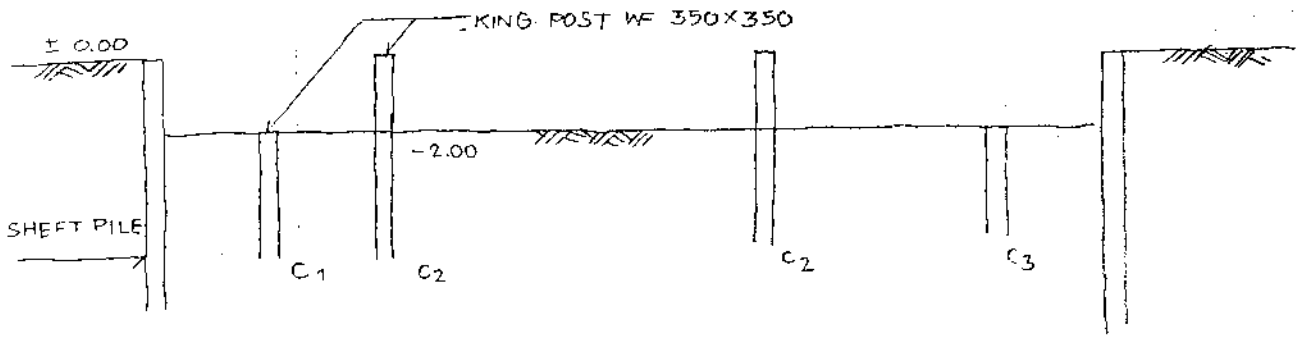
CONSTRUCTION AND ENGINEERING SERVICES CO., LTD.

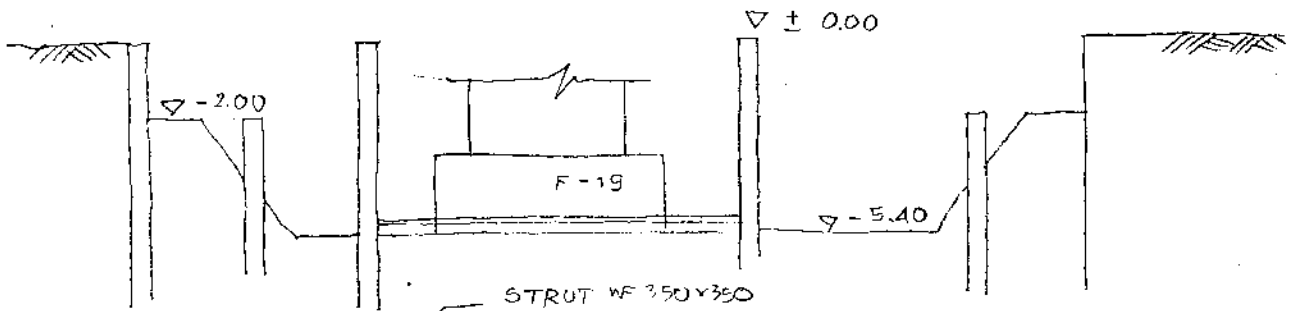
JOB ..... JOB NO. .....

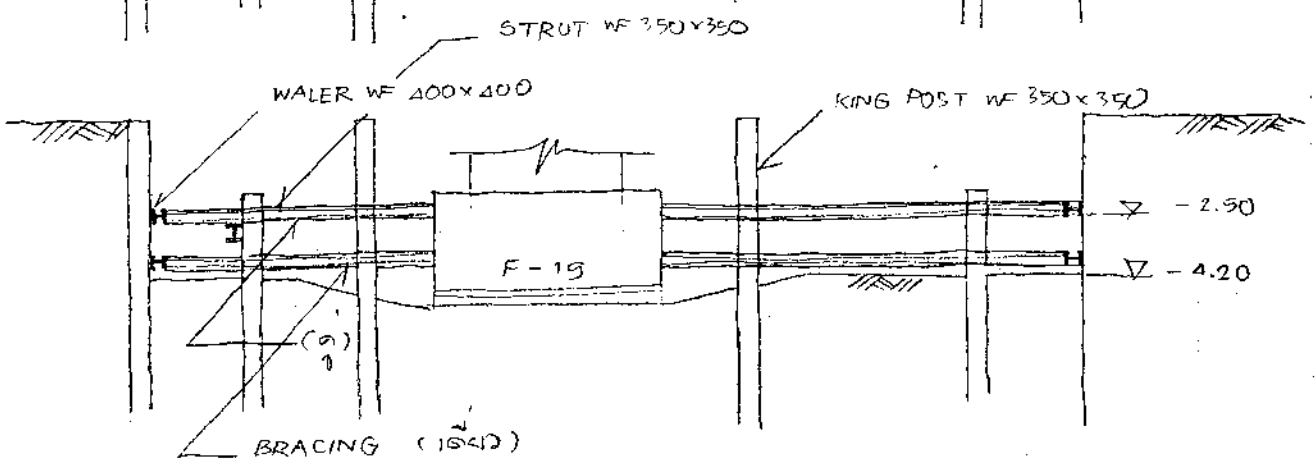
LOCATION .....

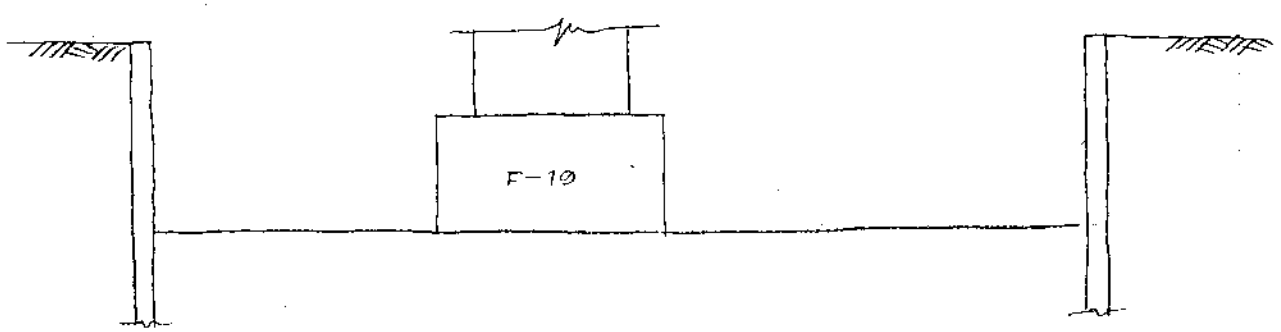
DATE ..... SUBJECT .....

BY ..... CHKD BY ..... SHEET NO. 2 OF 1









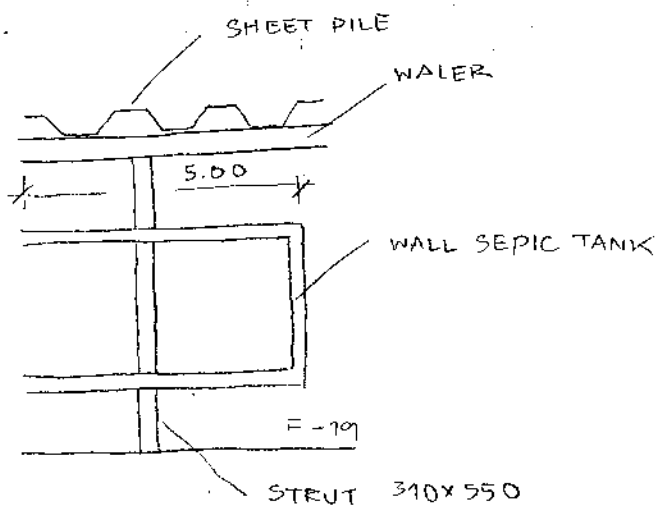
CONSTRUCTION AND ENGINEERING SERVICES CO., LTD.

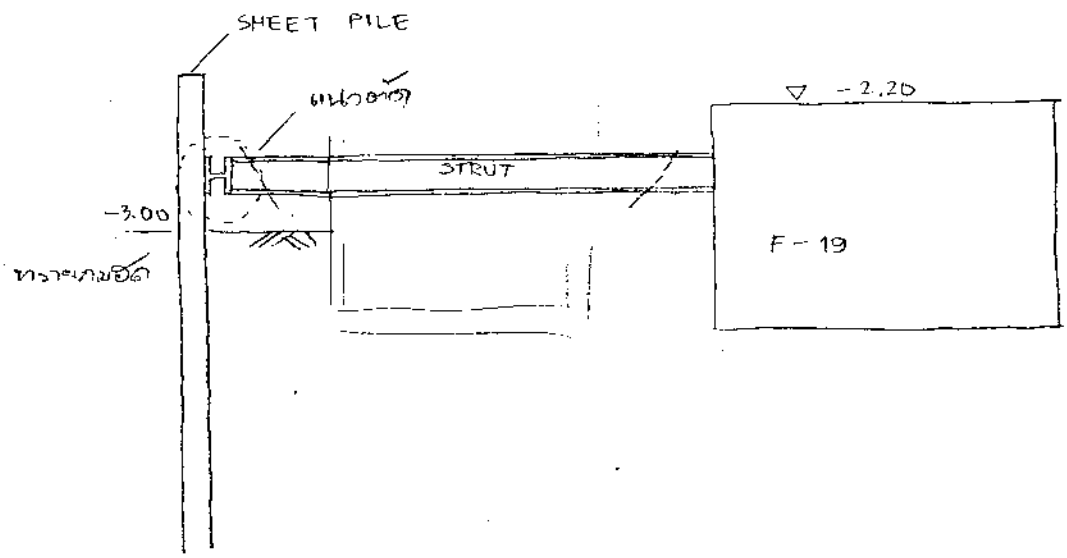
JOB ..... JOB NO. .....

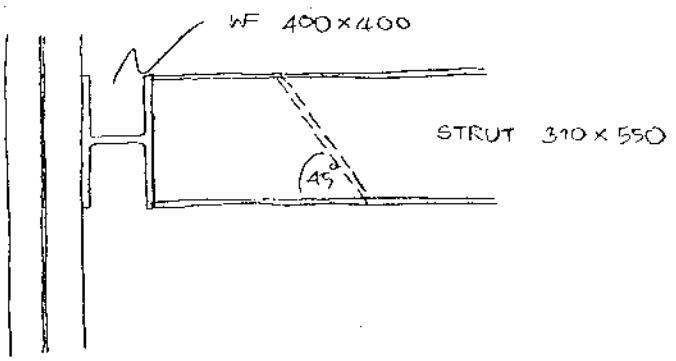
LOCATION .....

DATE ..... SUBJECT .....

BY ..... CHKD BY ..... SHEET NO. 3 OF 1







STABILITY ANALYSIS FOR : AIG-TOWER

LOCATION : Surawong Road
ENGINEER : Mr.Chay Sangsawai
FILENAME : b:\aig

SEISMIC CASE NO.1 SEISMIC COEFFICIENT = 0.00

NO. OF BOUNDARY LINES = 19

NO. OF POINTS ON BOUNDARY LINE 1 = 2

BOUNDARY LINE 1
1 X COORD. = -50.00 Y COORD. = -16.50
2 X COORD. = 50.00 Y COORD. = -16.50

NO. OF POINTS ON BOUNDARY LINE 2 = 2

BOUNDARY LINE 2
1 X COORD. = -50.00 Y COORD. = -15.00
2 X COORD. = 0.00 Y COORD. = -15.00

NO. OF POINTS ON BOUNDARY LINE 3 = 4

BOUNDARY LINE 3
1 X COORD. = 0.00 Y COORD. = 1.00
2 X COORD. = 0.00 Y COORD. = -15.00
3 X COORD. = 0.30 Y COORD. = -15.00
4 X COORD. = 0.30 Y COORD. = 1.00

NO. OF POINTS ON BOUNDARY LINE 4 = 2

BOUNDARY LINE 4
1 X COORD. = 0.30 Y COORD. = -15.00
2 X COORD. = 50.00 Y COORD. = -15.00

NO. OF POINTS ON BOUNDARY LINE 5 = 2

BOUNDARY LINE 5
1 X COORD. = -50.00 Y COORD. = -13.50
2 X COORD. = 0.00 Y COORD. = -13.50

NO. OF POINTS ON BOUNDARY LINE 6 = 2

BOUNDARY LINE 6
1 X COORD. = 0.30 Y COORD. = -13.50
2 X COORD. = 50.00 Y COORD. = -13.50

NO. OF POINTS ON BOUNDARY LINE 7 = 2

BOUNDARY LINE 7
1 X COORD. = -50.00 Y COORD. = -12.00

```
  2 X COORD. =     0.00          Y COORD. =  -12.00

NO. OF POINTS ON BOUNDARY LINE 8 = 2

BOUNDARY LINE  8
  1 X COORD. =     0.30          Y COORD. =  -12.00
  2 X COORD. =    50.00          Y COORD. =  -12.00

NO. OF POINTS ON BOUNDARY LINE 9 = 2

BOUNDARY LINE  9
  1 X COORD. =   -50.00          Y COORD. =  -10.50
  2 X COORD. =     0.00          Y COORD. =  -10.50

NO. OF POINTS ON BOUNDARY LINE 10 = 2

BOUNDARY LINE  10
  1 X COORD. =     0.30          Y COORD. =  -10.50
  2 X COORD. =    50.00          Y COORD. =  -10.50

NO. OF POINTS ON BOUNDARY LINE 11 = 2

BOUNDARY LINE  11
  1 X COORD. =   -50.00          Y COORD. =   -9.00
  2 X COORD. =     0.00          Y COORD. =   -9.00

NO. OF POINTS ON BOUNDARY LINE 12 = 2

BOUNDARY LINE  12
  1 X COORD. =     0.30          Y COORD. =   -9.00
  2 X COORD. =    50.00          Y COORD. =   -9.00

NO. OF POINTS ON BOUNDARY LINE 13 = 2

BOUNDARY LINE  13
  1 X COORD. =   -50.00          Y COORD. =   -7.50
  2 X COORD. =     0.00          Y COORD. =   -7.50

NO. OF POINTS ON BOUNDARY LINE 14 = 2

BOUNDARY LINE  14
  1 X COORD. =     0.30          Y COORD. =   -7.50
  2 X COORD. =    50.00          Y COORD. =   -7.50

NO. OF POINTS ON BOUNDARY LINE 15 = 2

BOUNDARY LINE  15
  1 X COORD. =   -50.00          Y COORD. =   -6.00
  2 X COORD. =     0.00          Y COORD. =   -6.00

NO. OF POINTS ON BOUNDARY LINE 16 = 2

BOUNDARY LINE  16
  1 X COORD. =   -50.00          Y COORD. =   -4.50
  2 X COORD. =     0.00          Y COORD. =   -4.50
```

NO. OF POINTS ON BOUNDARY LINE 17 = 2

BOUNDARY LINE 17

1 X COORD. =	-50.00	Y COORD. =	-3.00
2 X COORD. =	0.00	Y COORD. =	-3.00

NO. OF POINTS ON BOUNDARY LINE 18 = 2

BOUNDARY LINE 18

1 X COORD. =	-50.00	Y COORD. =	-1.50
2 X COORD. =	0.00	Y COORD. =	-1.50

NO. OF POINTS ON BOUNDARY LINE 19 = 6

BOUNDARY LINE 19

1 X COORD. =	-50.00	Y COORD. =	0.00
2 X COORD. =	0.00	Y COORD. =	0.00
3 X COORD. =	0.00	Y COORD. =	1.00
4 X COORD. =	0.30	Y COORD. =	1.00
5 X COORD. =	0.30	Y COORD. =	-6.00
6 X COORD. =	50.00	Y COORD. =	-6.00

RADIUS DECREMENT = 0
MIN. DEPTH OF TALLEST SLICE = 0
NO. OF CIRCLES = 8
NO. OF SLICES = 10
NO. OF ADD. RADII = 3
ID NO. FOR FIRST CIRCLE =1
NO. OF BOTTOM LINES =1,
LINE NO.=1 BEG NO.=1 END NO.= 2

SOIL NO.	COHESION	FRIC.ANGLE	UNIT WEIGHT
1	7.19	0.0	1.690
2	7.00	0.0	1.690
3	250.00	0.0	7.000
4	7.00	0.0	1.690
5	6.20	0.0	1.690
6	6.20	0.0	1.690
7	2.65	0.0	1.690
8	2.65	0.0	1.690
9	2.29	0.0	1.690
10	2.29	0.0	1.690
11	1.82	0.0	1.690
12	1.82	0.0	1.690
13	2.04	0.0	1.690
14	2.04	0.0	1.690
15	1.75	0.0	1.690
16	1.98	0.0	1.690
17	1.69	0.0	1.690
18	1.70	0.0	1.690

NO SEEPAGE
USE GRID
COORD. OF GRID POINTS 1,2,AND 3

POINT 1 X COORD . = -5.00
POINT 2 X COORD . = 25.00
POINT 3 X COORD . = 25.00

Y COORD. = 4.00
Y COORD. = 4.00
Y COORD. = 35.00

X INCREMENT = 0.0

Y INCREMENT = 0.0

NO. OF DIVISIONS BETWEEN POINTS 1 AND 2 = 7
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3 = 7

---------- TOP ----------

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STABILITY ANALYSIS FOR : AIG-TOWER

==========

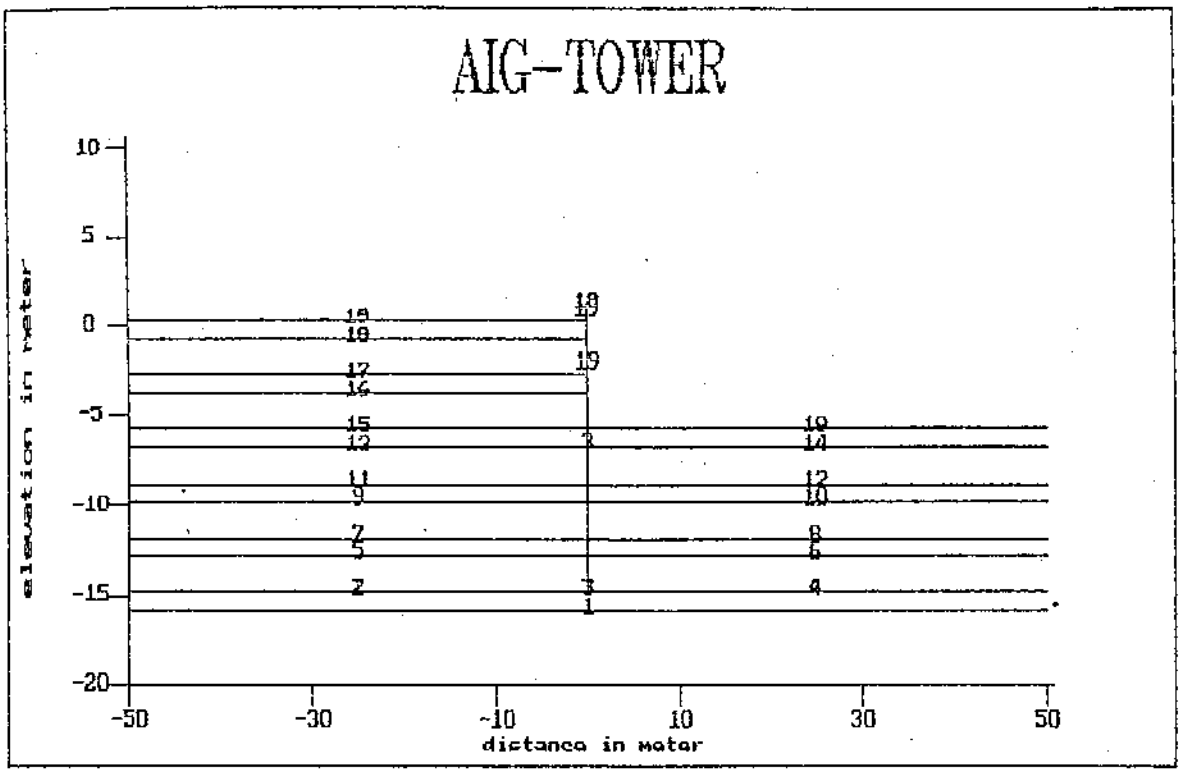
LOCATION : Surawong Road
ENGINEER : Mr.Chay Sangsawai
FILENAME : b:\aig
SEISMIC CASE : 1
SEISMIC COEFFICIENT : 0.00

COORDINATE		RADIUS	LOWEST FS
X	Y	m.	
-5.0	4.0	20.50	2.9662
-0.7	4.0	15.06	2.2509
3.6	4.0	15.98	2.2175
7.9	4.0	20.50	2.9023
12.1	4.0	20.50	4.5782
16.4	4.0	20.50	9.1455
20.7	4.0	20.50	1000000
25.0	4.0	20.50	1000000
-5.0	8.4	20.29	2.6757
-0.7	8.4	13.47	2.1888
3.6	8.4	20.20	2.2408
7.9	8.4	20.45	2.4792
12.1	8.4	24.93	4.0544
16.4	8.4	24.93	5.8249
20.7	8.4	24.93	1000000
25.0	8.4	24.93	1000000
-5.0	12.9	24.72	2.4873
-0.7	12.9	23.90	2.1854
3.6	12.9	24.56	2.2948
7.9	12.9	24.58	2.5078
12.1	12.9	24.63	3.4795
16.4	12.9	29.36	5.1682
20.7	12.9	29.36	8.7317
25.0	12.9	29.36	1000000
-5.0	17.3	29.07	2.4271
-0.7	17.3	28.87	2.1248
3.6	17.3	27.35	2.2731
7.9	17.3	33.79	2.4227
12.1	17.3	29.09	3.1508
16.4	17.3	33.79	4.5720
20.7	17.3	33.79	6.9198
25.0	17.3	33.79	1000000
-5.0	21.7	32.40	2.5647
-0.7	21.7	33.30	2.1542
3.6	21.7	33.36	2.1265
7.9	21.7	33.67	2.2622
12.1	21.7	33.28	2.8141
16.4	21.7	33.73	4.0083
20.7	21.7	38.21	6.0345
25.0	21.7	37.32	12.1182

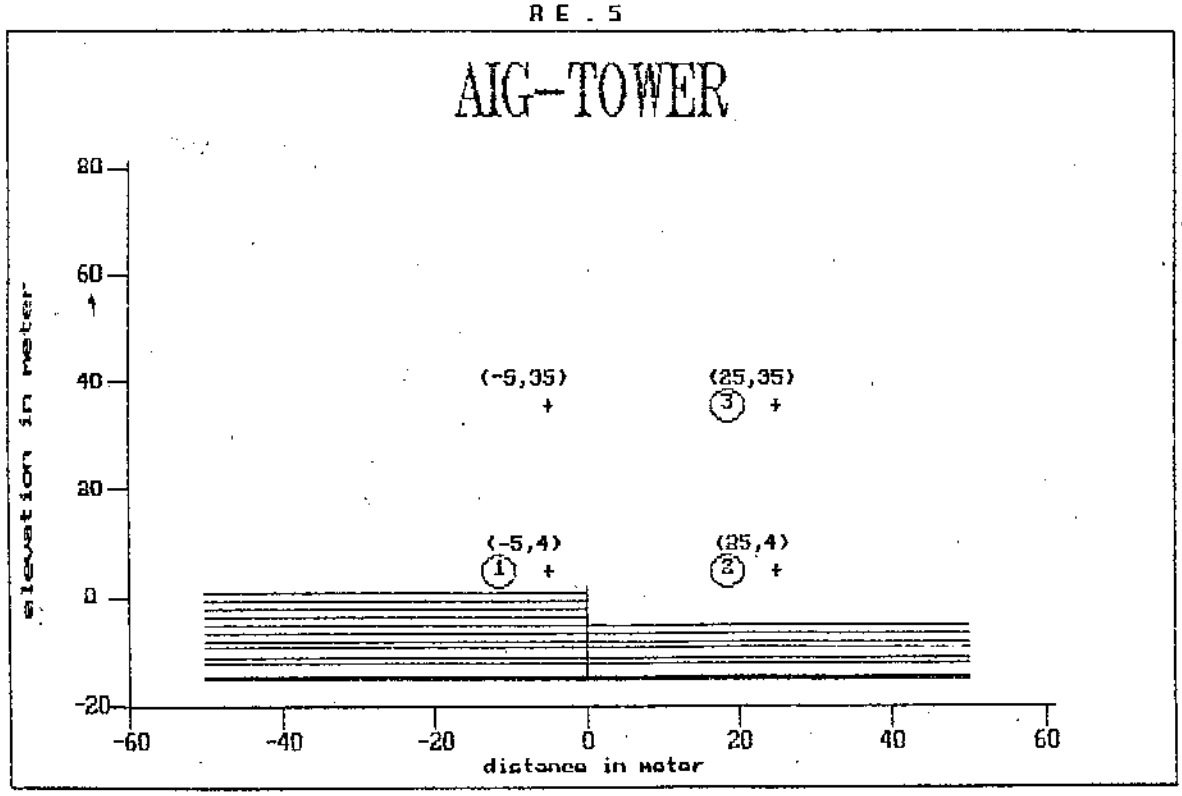
	-5.0	26.1		36.80		2.5455	
	-0.7	26.1		37.72		2.1889	
	3.6	26.1		37.78		2.1901	
	7.9	26.1		38.03		2.3255	
	12.1	26.1		37.54		2.8038	
	16.4	26.1		37.85		3.8136	
	20.7	26.1		42.64		5.5192	
	25.0	26.1		40.72		10.0877	
	-5.0	30.6		40.67		2.6613	
	-0.7	30.6		42.15		2.2264	
	3.6	30.6		42.20		2.2523	
	7.9	30.6		42.42		2.4002	
	12.1	30.6		42.32		2.8603	
	16.4	30.6		42.47		3.6549	
	20.7	30.6		46.85		5.3618	
	25.0	30.6		44.30		9.6081	
	-5.0	35.0		45.61		2.5447	
	-0.7	35.0		46.58		2.2653	
	3.6	35.0		46.62		2.3127	
	7.9	35.0		46.81		2.4713	
	12.1	35.0		46.66		2.8950	
	16.4	35.0		46.73		3.5857	
	20.7	35.0		50.05		5.0201	
	25.0	35.0		48.02		8.2595	

---------- END ----------

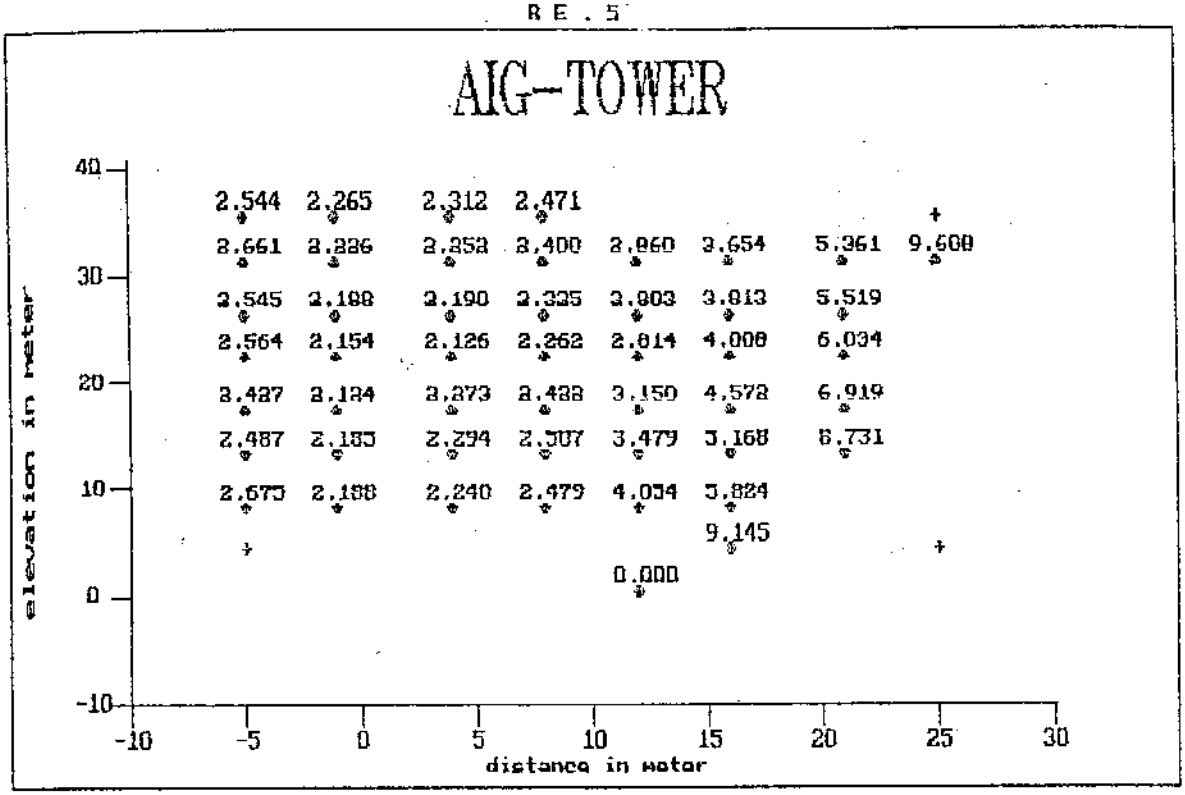
R E . 5


AIG-TOWER
elevation in meter
distance in meter
10
5
0
-5
-10
-15
-20
-50
-30
-10
10
30
50

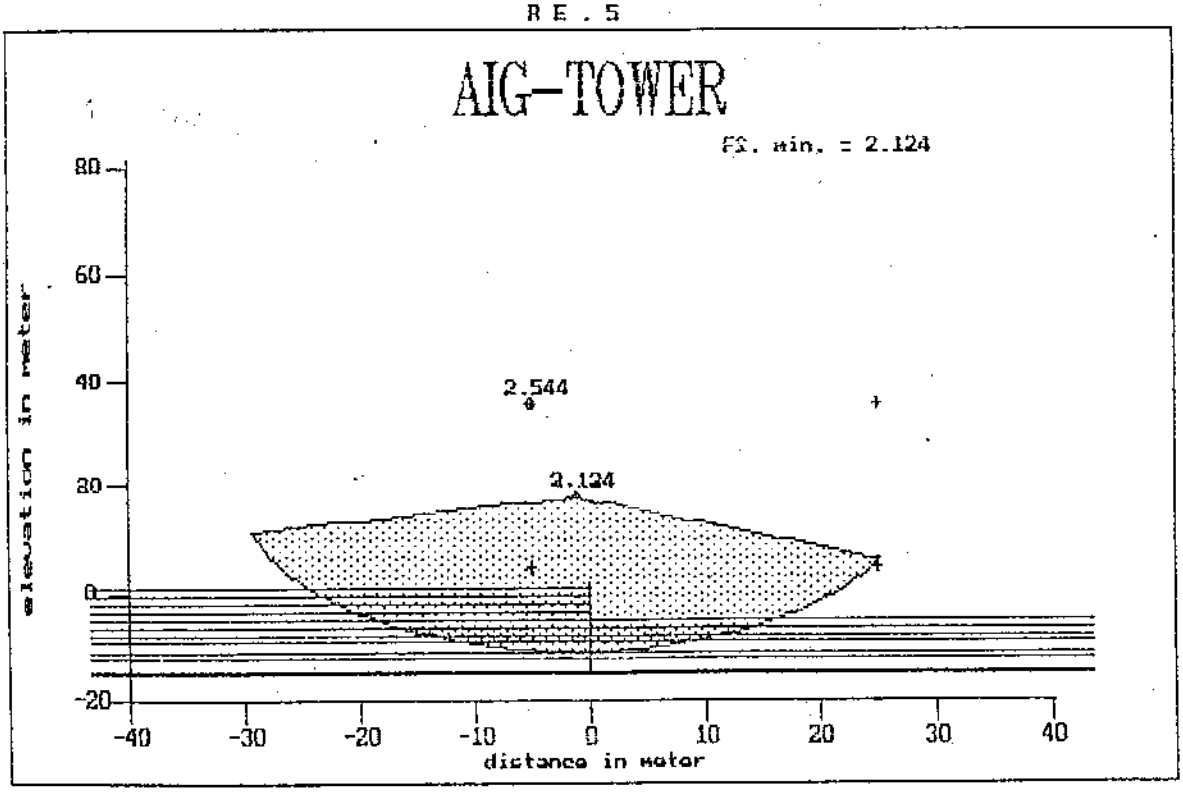
R E . 5


AIG-TOWER
elevation in meter
distance in meter
(-5,35)
(25,35)
(-5,4)
(25,4)
1
2
3
80
60
40
20
0
-20
-60
-40
-20
0
20
40
60

RE.5


AIG-TOWER
2.544 2.265 2.312 2.471
3.661 3.286 3.353 3.400 3.860 3.654 5.361 9.600
3.545 3.188 3.190 3.325 3.803 3.813 5.519
3.564 3.154 3.126 3.262 3.814 4.008 6.034
3.427 3.184 3.273 3.438 3.150 4.572 6.919
3.487 3.183 3.294 3.307 3.479 3.168 6.731
3.675 3.188 3.240 3.479 4.054 3.824
9.145
0.000
elevation in meter
distance in meter

RE.5

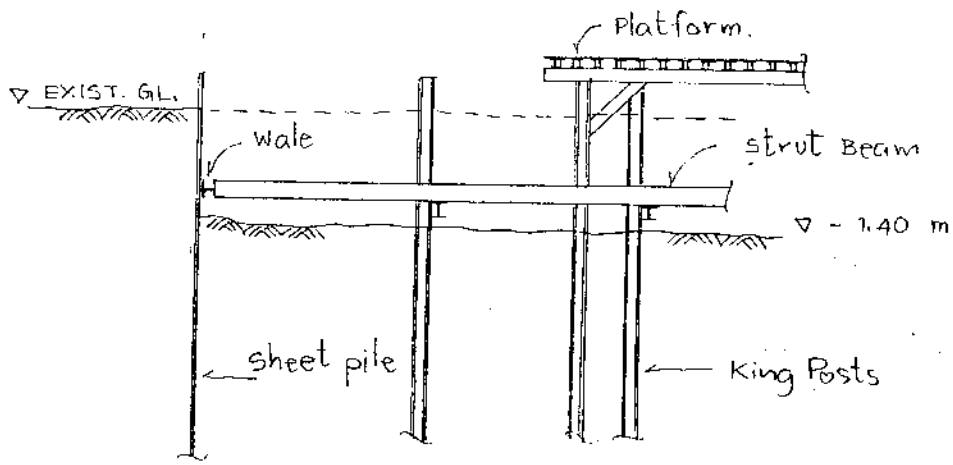

AIG-TOWER
FS. min. = 2.124
2.544
2.124
elevation in meter
distance in meter

SEQUENCE OF BASEMENT CONSTRUCTION

STAGE 1 : 1.1. Site clearing and Installation of King posts & Sheet piles.

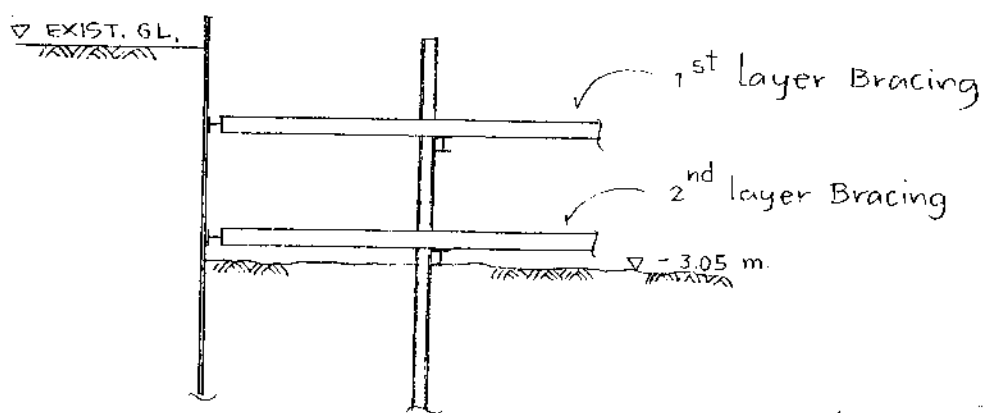
1.2. Excavation down to Level -1.40 m. and Install First layer Bracings system. (Wale & Strut)

1.3. Installation of Platform system. (Gangway)



STAGE 2 : 2.1. Excavation down to -3.05 m.

2.2. Installation 2nd layer Bracings system.

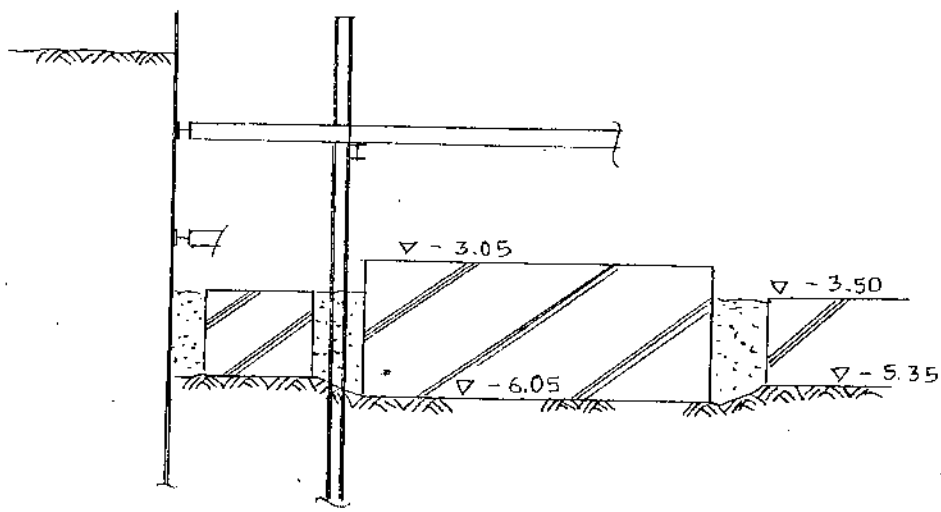


STAGE 3 : 3.1. Excavation down to Approximate level - 5.35 to - 6.05 m.

3.2. Pour Lean concrete and Foundation.

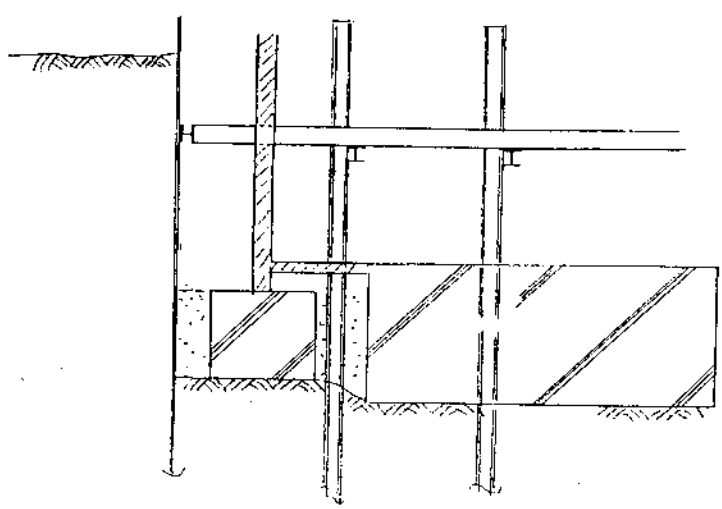
3.3. Backfill earth to level -3.50 m. with Compaction

3.4. Dismantle 2nd layer Bracings.



STAGE 4 : 4.1. Pour Ground beam and Basement slab.

4.2. Pour Basement retaining wall with Block-outs for Struts.



STAGE 5 : 5.1. Pour Ground floor slab.

5.2. Backfill sand around Basement retaining wall wit

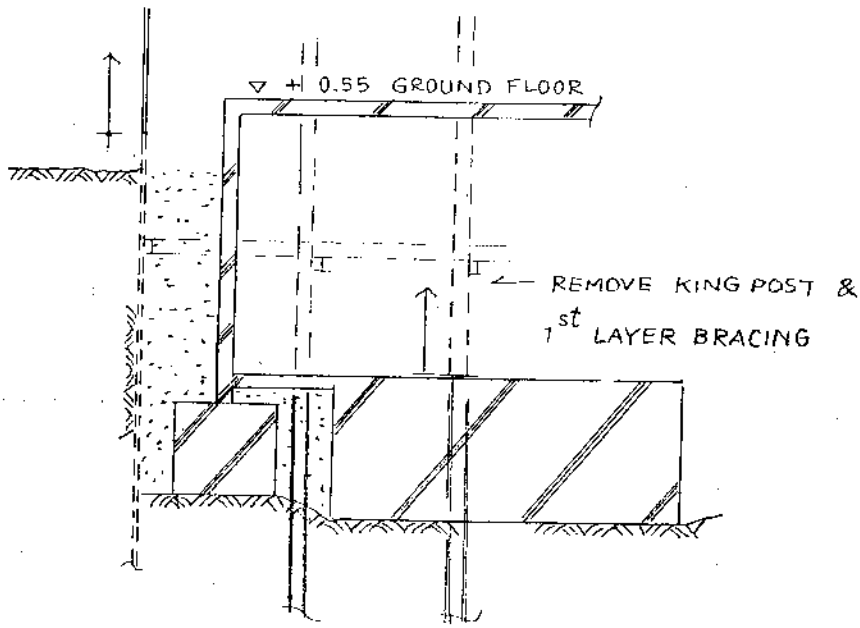
5.3. Compaction.

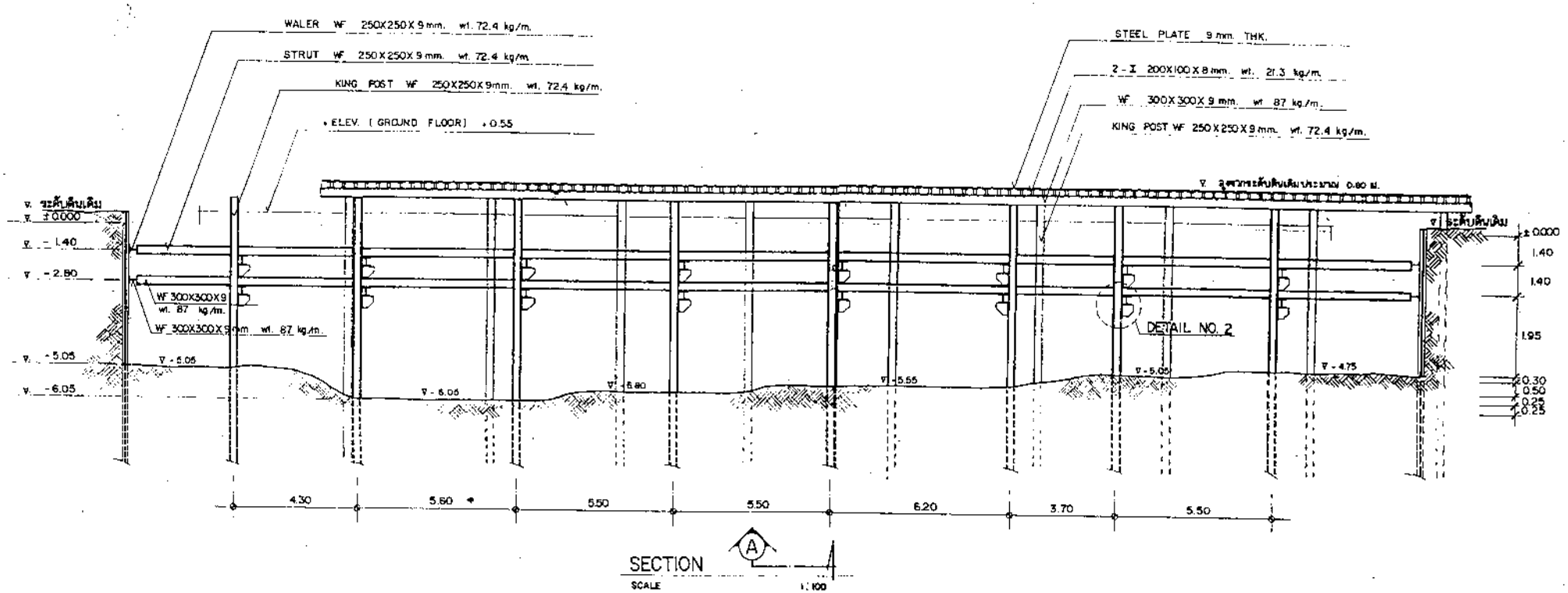
Dismantle First layer Bracings.

5.4. Remove Sheet piles.

5.5. Cut and Remove King post

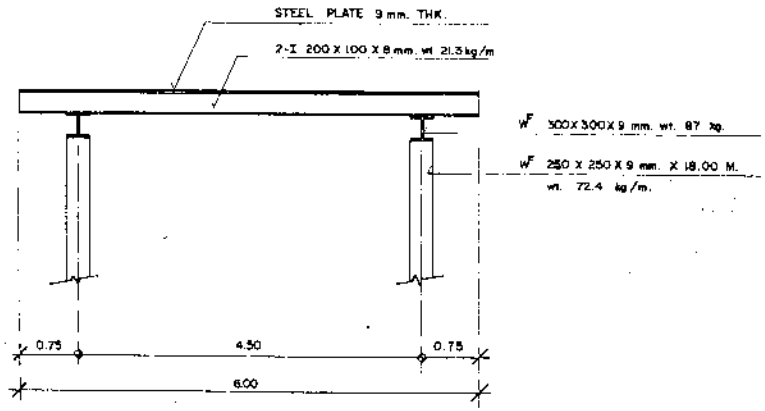
5.6. Dismantle Platform.



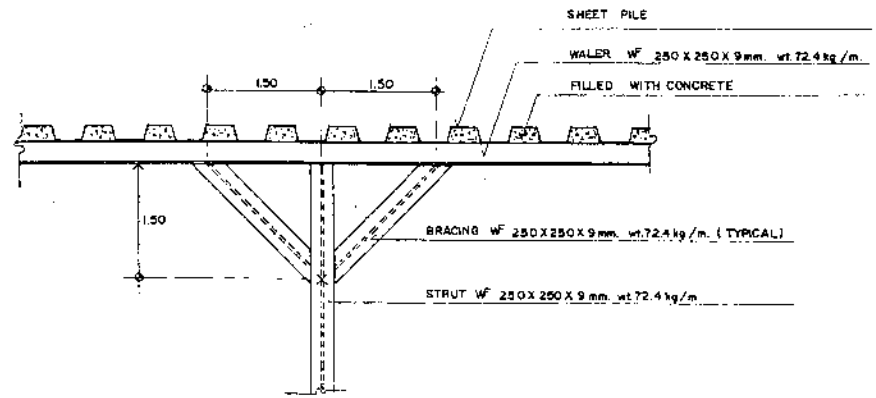


SECTION

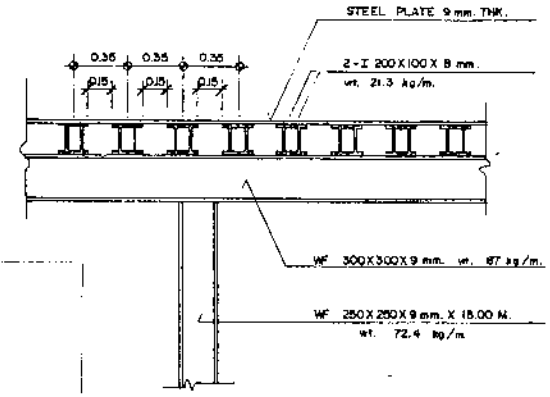
SCALE 1:100



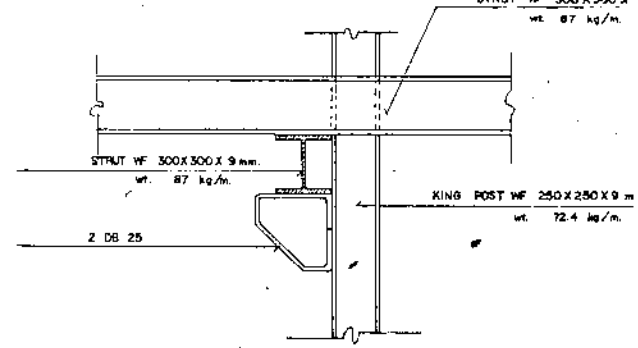
SECTION (B)
SCALE 1:50



DETAIL NO. 1 (TYPICAL BRACING)
SCALE 1:50



SECTION (C)
SCALE 1:25



DETAIL NO. 2 (TYPICAL)
SCALE 1:20

REMARK

1. UPPER BRACING
   - STRUT WF 250X250X9mm. wt. 72.4 kg./m.
   - BRACING WF 250X250X9mm wt 72.4 kg./m.
   - WALER WF 250X250X9 mm. wt. 72.4 kg/m.
2. LOWER BRACING
   - STRUT WF 300X300X9 mm. wt. 87 kg./m.
   - BRACING WF 300X300X9 mm. wt. 87 kg/m.
   - WALER WF 300X300X9 mm. wt. 87 kg./m.
3. KING POST WF 250X250X9 mm. wt. 72.4 kg/m. (L = 18.00)
4. SHEET PILE YSP U-15 wt. 58.4 kg./m. (L = 16.00)