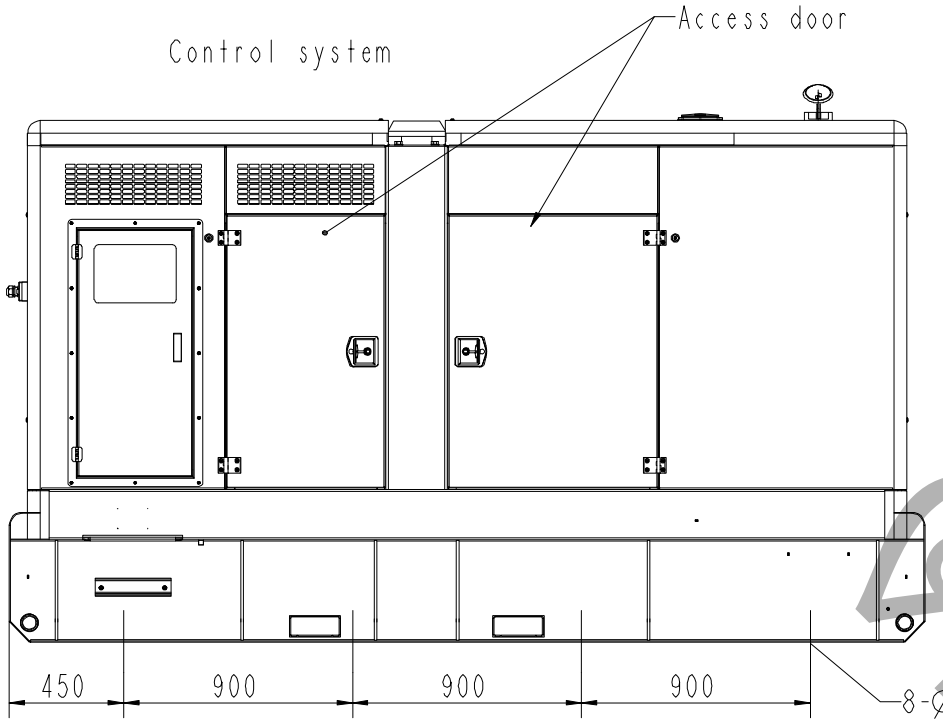
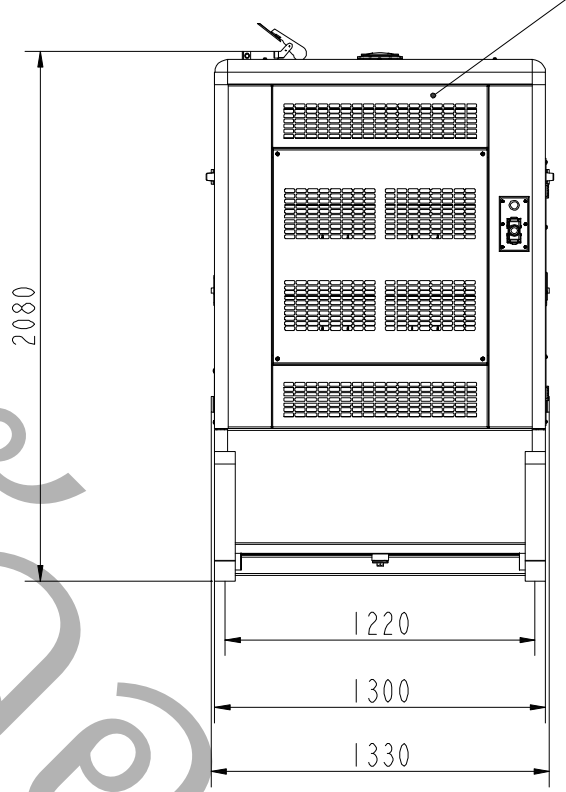
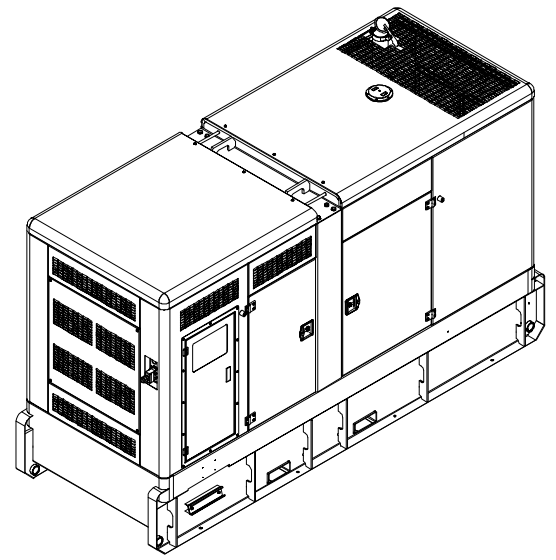
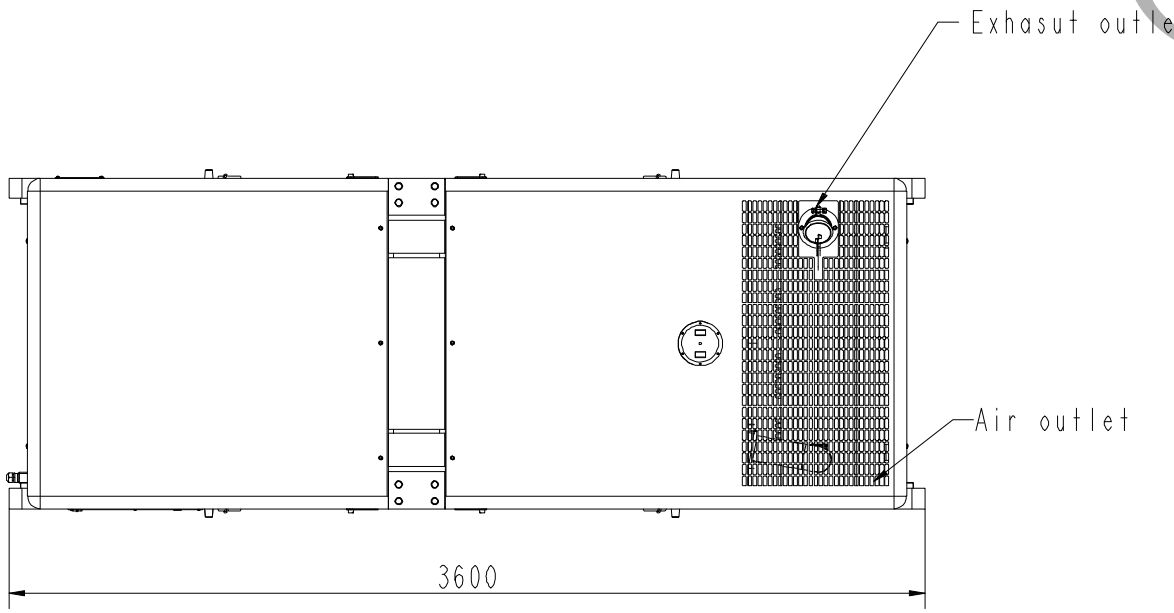
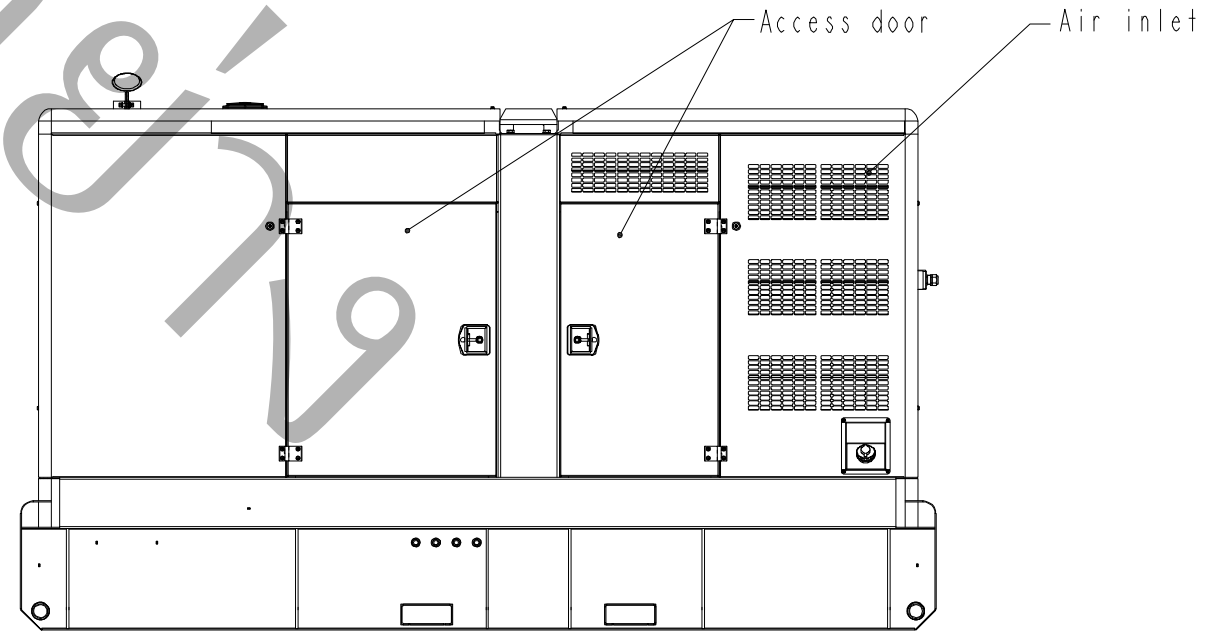




Emergency stop switches



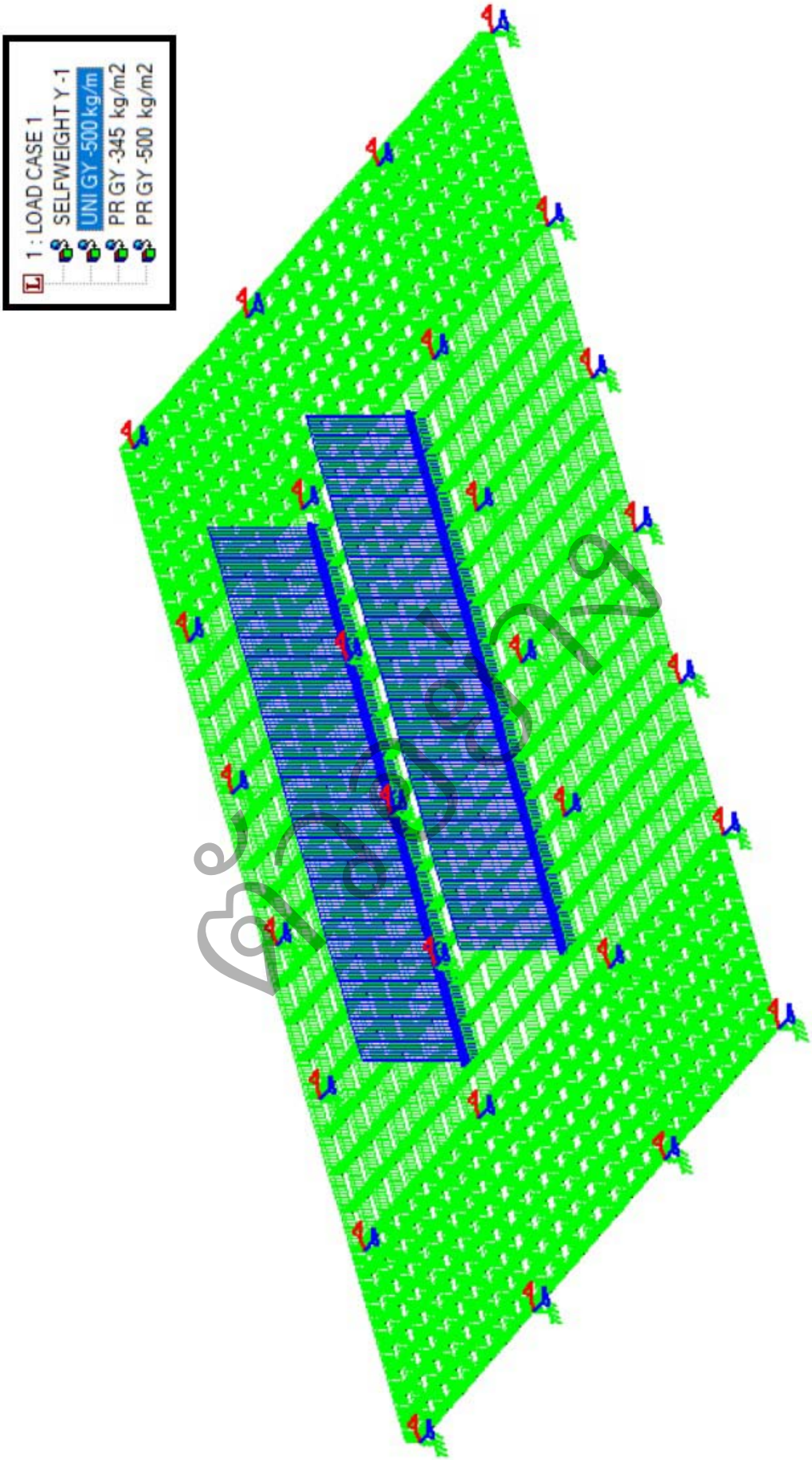


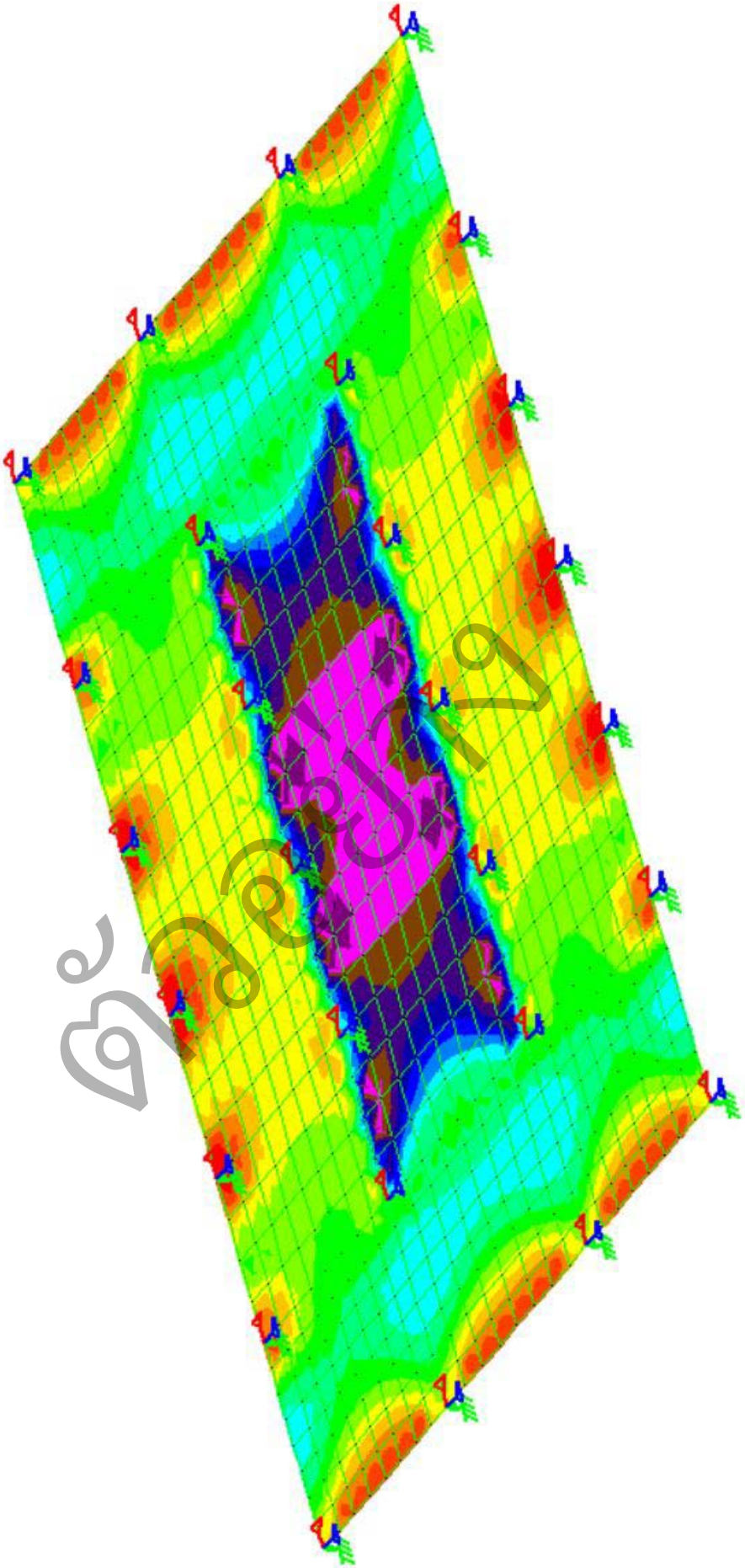


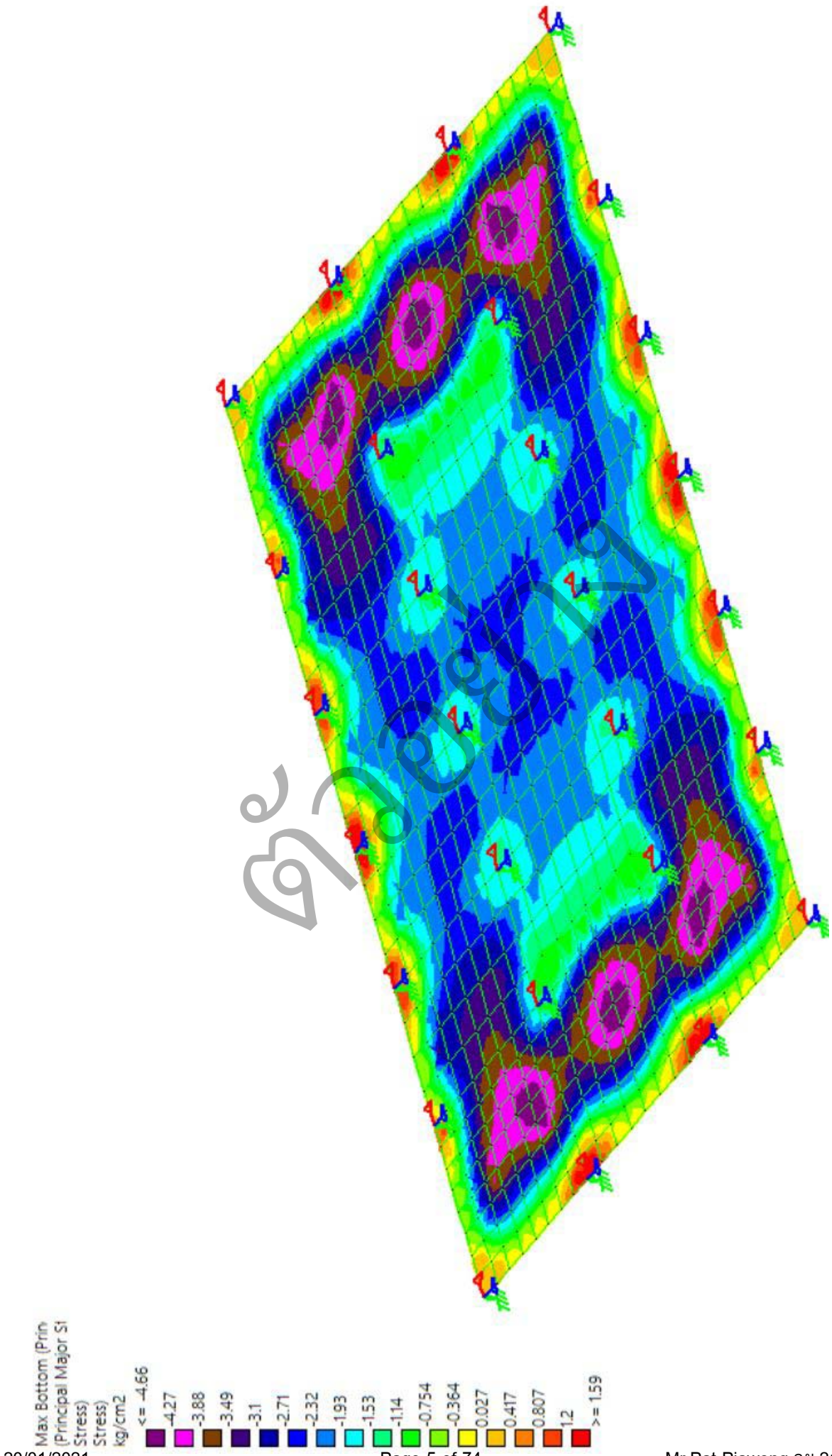
Dry weight(kg)

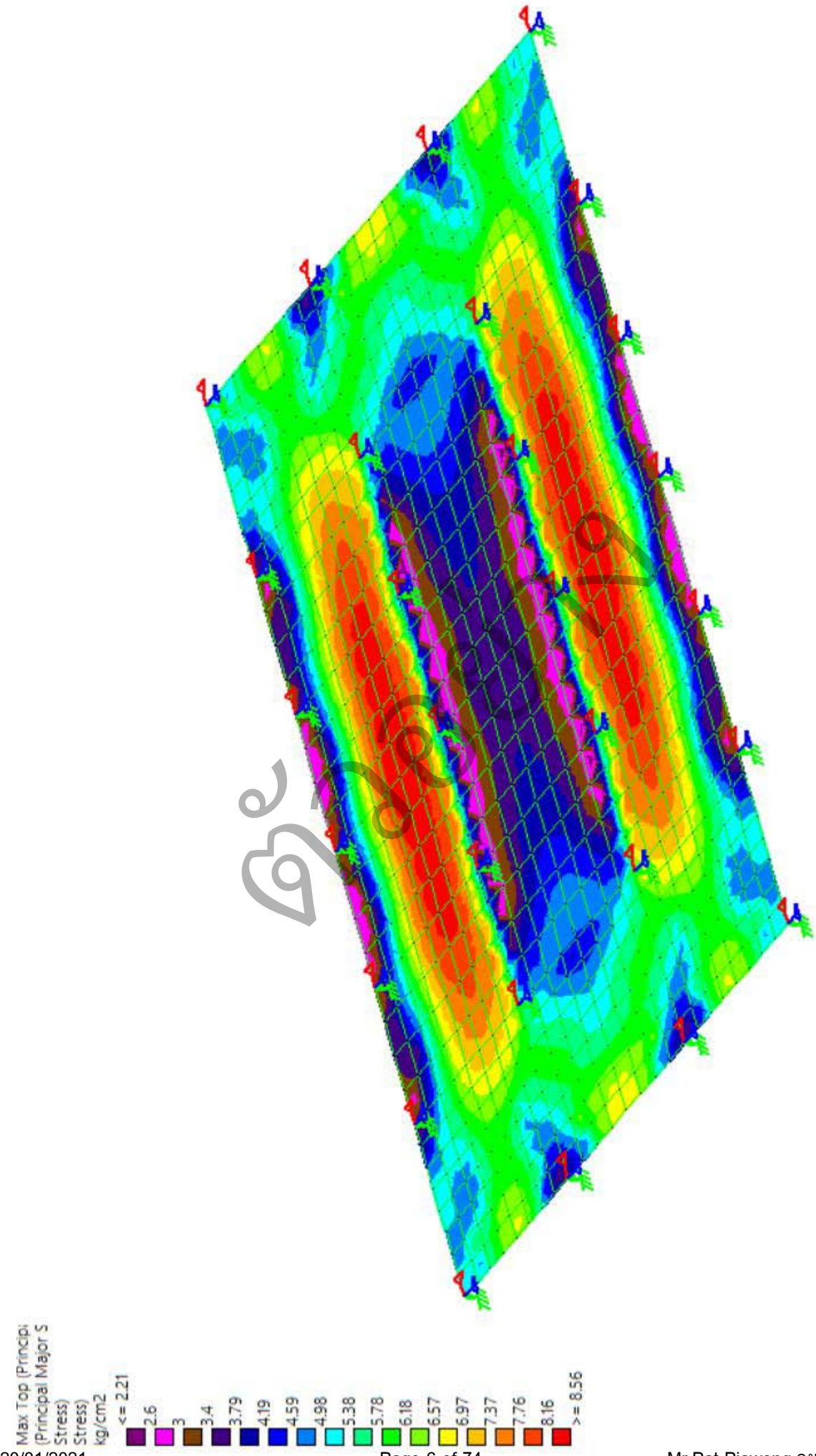
2928.12

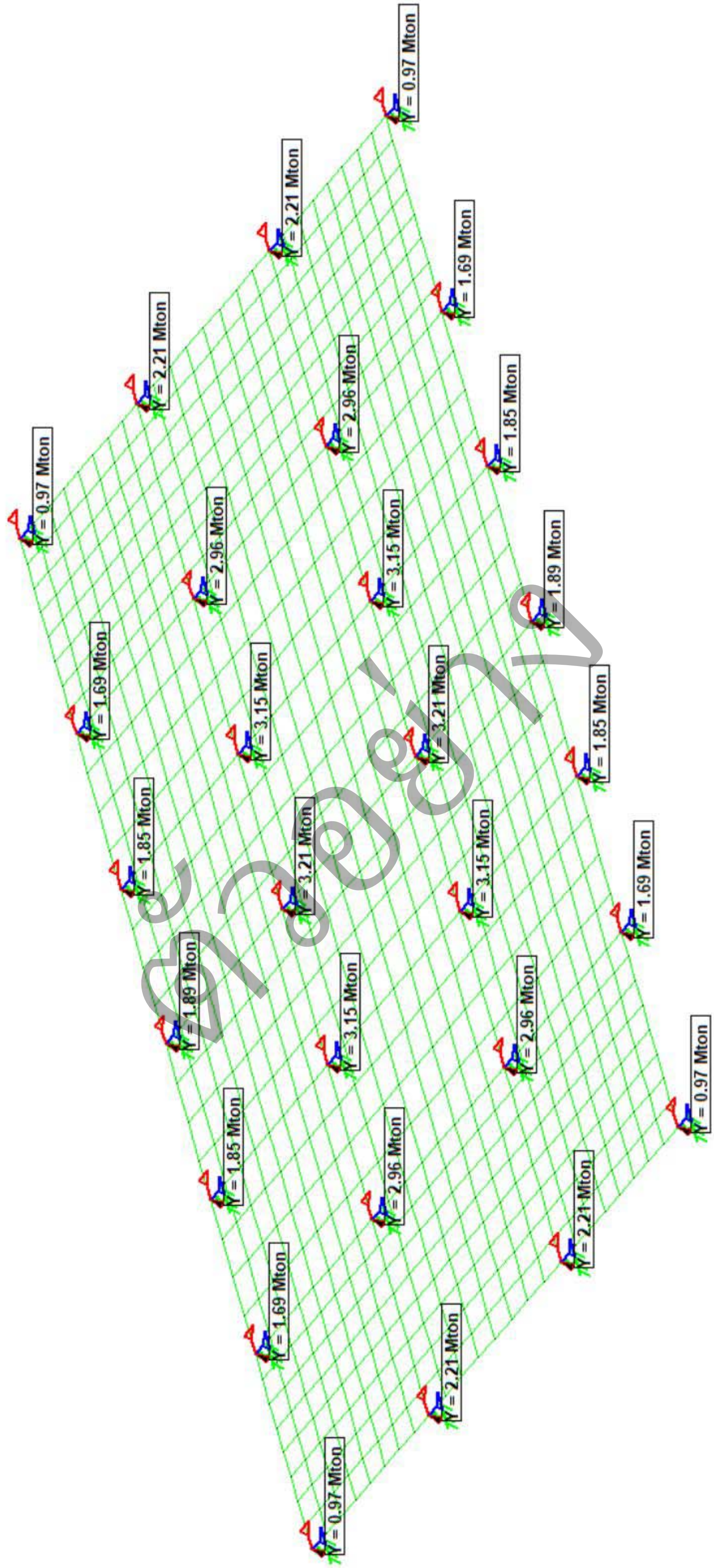
	REV.	DATE	DETAILS	TITLE :	Scale:
	0	2020-09-25	-	AC250S 6LTAA8.9-G2 - UCDI274K 250 KVA	NTS
					Units: mm.
				Drawing No: INS-01	Sheet: 1 Of: 1


1 : LOAD CASE 1
SELFWEIGHT Y -1
UNI GY -500 kg/m
PR GY -345 kg/m2
PR GY -500 kg/m2


Global Moment
X
kg-m/m
<= -1068
-997
-925
-853
-781
-709
-638
-566
-494
-422
-350
-279
-207
-135
-63.3
8.5
>= 80.3

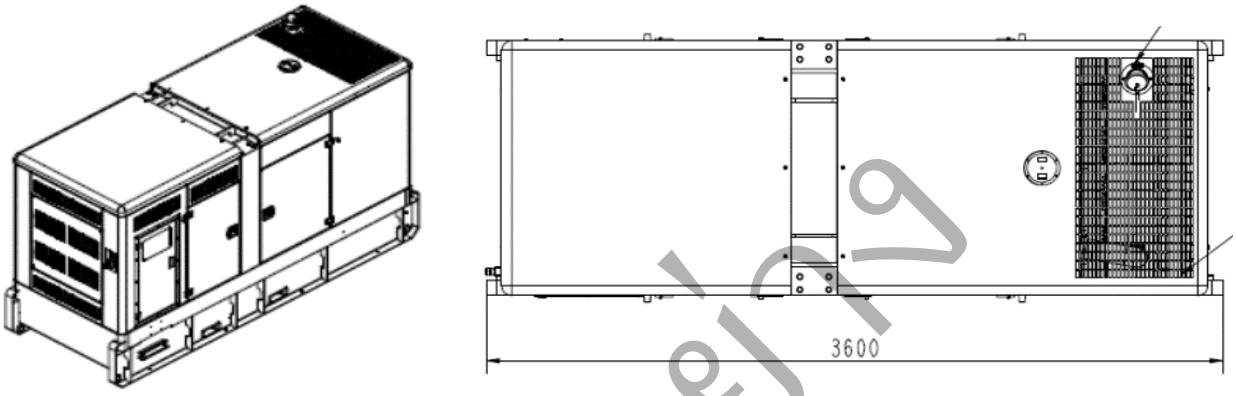

Max Bottom (Prin
(Principal Major St
Stress)
Stress)
kg/cm2
<= -4.66
-4.27
-3.88
-3.49
-3.1
-2.71
-2.32
-1.93
-1.53
-1.14
-0.754
-0.364
0.027
0.417
0.807
1.2
>= 1.59


Max Top (Principi
(Principal Major S
Stress)
Stress)
kg/cm2
<= 2.21
2.6
3
3.4
3.79
4.19
4.59
4.98
5.38
5.78
6.18
6.57
6.97
7.37
7.76
8.16
>= 8.56

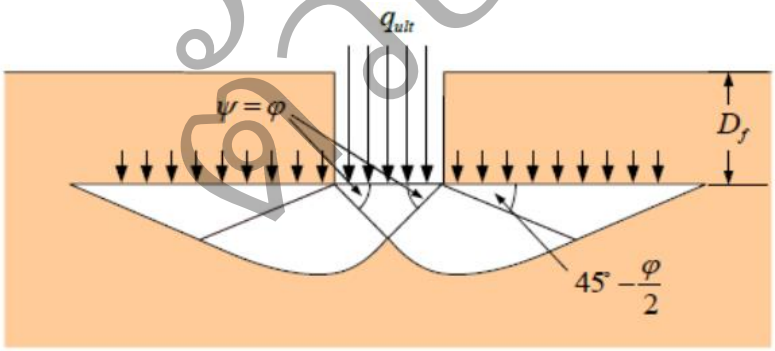

Y = 0.97 Mton
Y = 2.21 Mton
Y = 1.69 Mton
Y = 2.21 Mton
Y = 2.96 Mton
Y = 1.85 Mton
Y = 0.97 Mton
Y = 2.96 Mton
Y = 3.15 Mton
Y = 1.89 Mton
Y = 1.69 Mton
Y = 3.15 Mton
Y = 3.21 Mton
Y = 1.85 Mton
Y = 1.85 Mton
Y = 3.21 Mton
Y = 3.15 Mton
Y = 1.69 Mton
Y = 1.89 Mton
Y = 3.15 Mton
Y = 2.96 Mton
Y = 0.97 Mton
Y = 1.85 Mton
Y = 2.96 Mton
Y = 2.21 Mton
Y = 1.69 Mton
Y = 2.21 Mton
Y = 0.97 Mton

RECHECK SOIL BEARING CAPCITY OF DIESEL GENERATOR FOUNDATION

foundation W =	1.80	m., L =	4.00	m.
area, A =	7.20	m^2		
equipment weight =	2.928	t		
everage weight =	0.41	t/m^2		
used W_{avg} =	1.00	t/m^2		
line load =	0.41	t/m, used	0.50	t/m



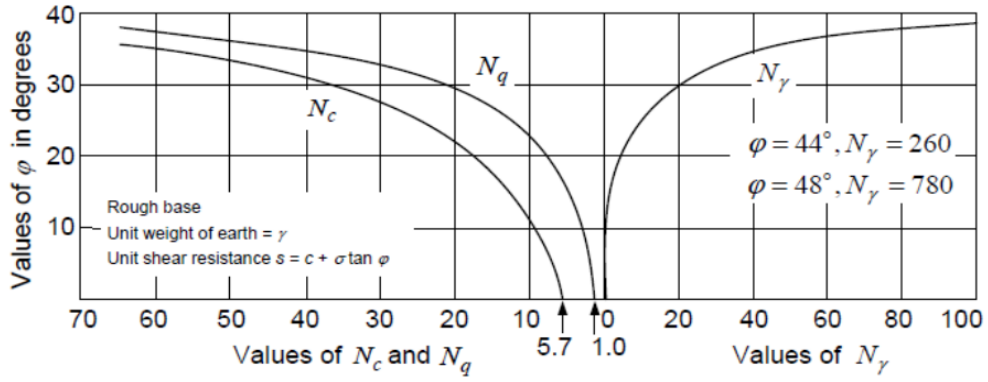
Failure machanism of Terzaghi



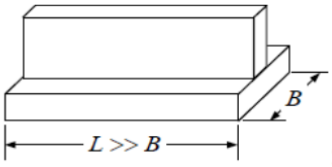
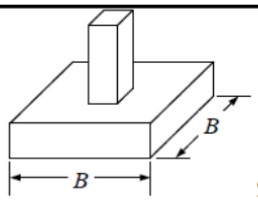
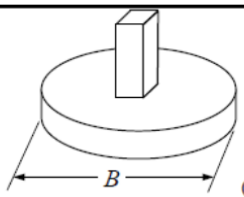
Bearing capacity and bearing capacity factor equation of Terzaghi

Terzaghi	$q_{ult} = cN_c + qN_q + \frac{1}{2}\gamma BN_\gamma$	
$N_c = (N_q - 1)\cot\varphi$	$N_q = \exp^{2\left(\frac{3}{4}\pi - \frac{\varphi}{2}\right)\tan\varphi}$	$N_\gamma = \frac{\tan\varphi}{2}\left(\frac{K_{p\gamma}}{\cos^2\varphi} - 1\right)$

The relationship between bearing capacity factor and ϕ (Terzaghi 1943)



Shape factors for bearing capacity equation

Footing type	Equation
 Strip	$q_{ult} = cN_c + qN_q + \frac{1}{2}\gamma BN_\gamma$
 Square	$q_{ult} = (1.3)cN_c + qN_q + (0.8)\frac{1}{2}\gamma BN_\gamma$
 Circular	$q_{ult} = (1.3)cN_c + qN_q + (0.6)\frac{1}{2}\gamma BN_\gamma$

Bearing capacity equation

φ	N_c	N_q	N_γ
0	5.14	1.0	0.0
1	5.4	1.1	0.1
2	5.6	1.2	0.2
3	5.9	1.3	0.2
4	6.2	1.4	0.3
5	6.5	1.6	0.4
6	6.8	1.7	0.6
7	7.2	1.9	0.7
8	7.5	2.1	0.9
9	7.9	2.3	1.0
10	8.3	2.5	1.2
11	8.8	2.7	1.4
12	9.3	3.0	1.7
13	9.8	3.3	2.0
14	10.4	3.6	2.3
15	10.8	3.9	2.6
16	11.5	4.3	3.0
17	12.4	4.8	3.5
18	13.2	5.3	4.1
19	13.9	5.8	4.7
20	14.8	6.4	5.4
21	15.9	7.1	6.2
22	16.8	7.8	7.1
23	18.1	8.7	8.2
24	19.3	9.6	9.4
25	20.8	10.7	10.9

φ	N_c	N_q	N_γ
26	22.3	11.9	12.6
27	23.9	13.2	14.5
28	25.8	14.7	16.7
29	27.8	16.4	19.3
30	30.1	18.4	22.4
31	32.6	20.6	26.0
32	35.5	23.2	30.2
33	38.7	26.1	35.2
34	42.1	29.4	41.0
35	46.1	33.3	48.0
36	50.7	37.8	56.4
37	55.6	42.9	66.2
38	61.3	48.9	78.0
39	67.9	56.0	92.3
40	75.3	64.2	109.4
41	83.9	73.9	130.2
42	93.7	85.4	155.6
43	105.1	99.0	186.5
44	118.4	115.3	224.6
45	133.9	134.9	271.8
46	152.1	158.5	330.3
47	173.6	187.2	403.6
48	199.3	222.3	496.0
49	229.9	265.5	613.1
50	266.9	319.1	763.0
51	311.8	386.0	955.8

γ = 2.20 t/m^3

ϕ = 40.00

c = 0.00 t/m^2

N_c = 75.31 N_q = 64.19 N_γ = 109.41

founation thickness = 0.20 m.

γ_c = 2.40 t/m^3

cN_c = 0.00 t/m^2 shape factor = 1.3

qN_q = 30.81 t/m^2 shape factor = 1.8

$1/2\ \gamma BN_\gamma$ = 120.35 t/m^2

$q_{ult} = (1.3)0 + (1.8)30.81 + 120.35$

= 175.81 t/m^2

F.S. = 3.00

q_{all} = **58.60** t/m^2 **> Wavg OK**

Soil Spring

Ks = Kb*A kg/m

Soil Subgrade Reaction

No	Subgrade	K (lb/in2)	Avg.	Kb (kg/m3)
1	Plastic Clay	50 - 100	75	2,076,000
2	Silt and Silty Clay	100 - 200	150	4,152,000
3	Sands, Clayey Gravels	200 - 300	250	6,920,000
4	Gravel	300 or more	400	11,072,000
	1 lb/in2 = 27.68 g/cm3 =	27,680 kg/m3		

W = 1.00 m
L = 1.00 m
A = 1.00 m2
Kb = 6,920,000 kg/m3

Ks = 6,920,000 kg/m

DIESEL GENERATOR REINFORCEMENT

slab thickness = 0.20 m

Mc = 7.421x1.00x(17^2) = 2,145 kg-m

Mmax = 1,068 kg-m **< Mc OK**

As = [(1068x100)] / [(1700x0.917x17)]

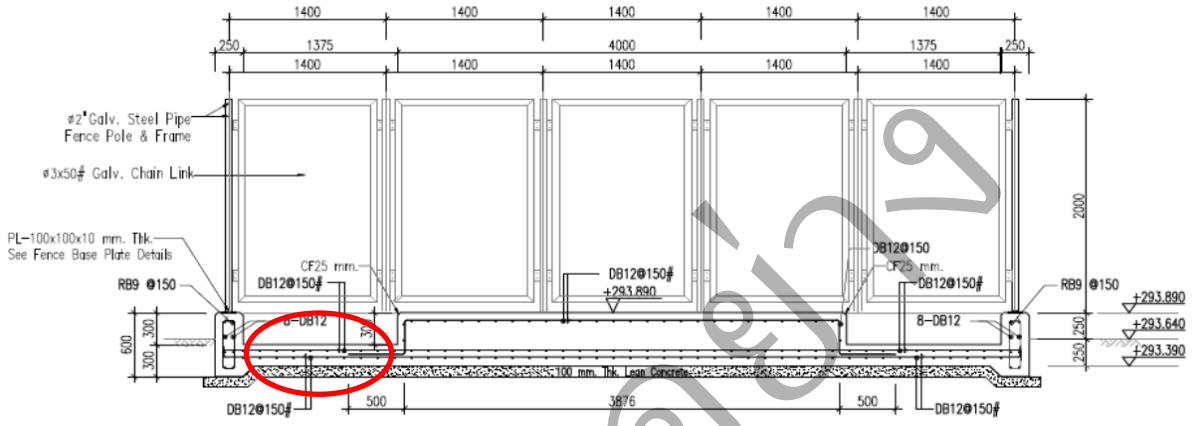
= 4.03 cm^2

used DB- 12 mm @ 0.28 m , S = 0.15 m

As = 7.54 cm^2

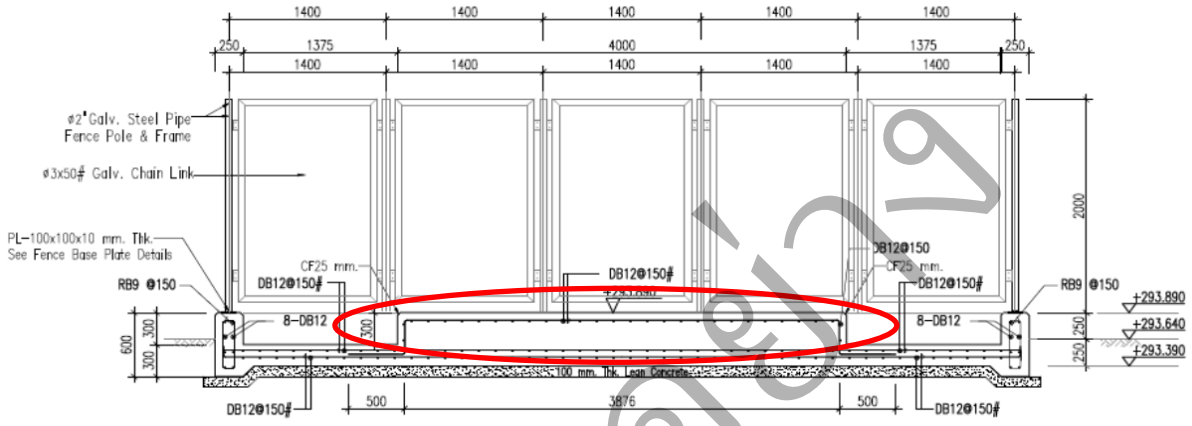
Minimum Reinforcement for Slab 0.20 m.,thk.

Wide =	1.00	m	thk. =	0.20	m
Area , A =	20x100	cm			
=	2,000.00	cm^2			
As-min =	2000x0.0018	cm	(ว.ส.ท.3407, SD40)		
=	3.60	cm^2			
Try DB-	12	mm @	3.18	bars	
Spacing	31.42	cm			
Used	15.00	cm			



Minimum Reinforcement for Slab 0.30 m.,thk.

Wide =	1.00	m	thk. =	0.30	m
Area , A =	30x100	cm			
=	3,000.00	cm^2			
As-min =	3000x0.0018	cm	(ว.ส.ท.3407, SD40)		
=	5.40	cm^2			
Try DB-	12	mm @	4.77	bars	
Spacing	20.94	cm			
Used	15.00	cm			



FENCE BEAM

W = 0.25 m, D = 0.60 m, d = 57 cm

L = 1.00 m

selfweight = 0.25x0.6 x2,400 = 360 kg/m

SDL = 150 kg/m (chain link weight)

Total load = 510 kg/m

Mc = 12.646x0.25x(57^2) = 10,272 kg-m

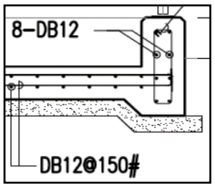
Mmax = 64 kg-m **< Mc OK**

As = (63.75x100)/(1700x0.895x57)

= 0.07 cm^2

As-min = (14/4000)x0.25x57

= 4.99 cm^2 8-DB 12 mm. for As-min



DB- 12 mm, no. of bar 2 bar

As = 2.26 cm^2

used 2 - DB 12 As = 2.26 cm^2 **> As OK**

Vc = 0.29xSQRT(240)0.25x57

= 6,402 kg

Vmax = 255 kg **< Vc OK**

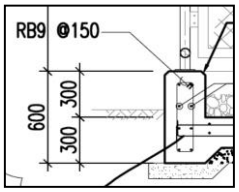
Used RB- 9 mm, Str. = 1 set

As,str = 1.27 cm^2

S = (1.27x1200x57) / (255-6402)

= -14.1 Cm ใช้ 15 Cm

Used 1 RB-9 mm @ 15 cm



Chain link size	1"	1 1/2"	2"	2 1/2"
No.10 (3.2mm.)	5.20	3.65	2.74	2.36
No.11 (2.8mm.)	4.27	2.93	2.34	1.85
No.12 (2.2mm.)	3.41	2.38	1.93	1.21

* unit-kg/m^2