STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK

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PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Date	June-26

1 General

1.1 Scope

This document covers Structural design criteria for construction of the proposed TOILET BLOCK

1.2 **IS codes**

The Following IS codes have been referred

S.No	Code	Description IS codes
1	IS 875-1987, 2015 (PART-II & III)	Code of Practice for design loads for buildings & structures
2	IS-1893-2016 (PART-1)	Criteria for earth quake resistance of design structures
3	IS 456-2000	Codes of practice for plain and reinforced structures

1.3

Material	Property	Value	Units	Remarks
Concrete	Density	25	Kn/Cum	
Brick	Density	20	Kn/Cum	
Soil	Density	18	Kn/Cum	

1.4 Site Information

Site Location : KHARAGPUR

Wind Speed: As per IS 875-part-3 1987 the basic wind speed considered as 44 m/sec

Seismic Zone: Zone III

Soil Parameters

The safe bearing capacity of soil is 10t/m2 @1.5 m below FGL

2 Description of the structure

Structure	RCC Building
No of Floors	Ground Floor
Usage Of building	Toilet
Total Length of the building	16.75 m
Width of the building	7.5m
Total height of the building above ground level:	3.0 m

3 Design philosophy

The structure will be designed for Ground Floor .The structure will be modelled as a space frame and structural packages such as STAAD PRO will be used for the design and analysis of the structure

All reinforced concrete structures will be designed in accordance with IS:456-2000: - Codes of Practice for Plain and Reinforced Structures", adopting limit state method

4 Analysis of structure

4.1 Basic Loads

4.2 Dead Load

Dead Loads are calculated on basis of unit weights of materials

1. Reinforced cement concrete = 25 KN/m^3
2. Brick work = 20 KN/m^3

a) self weight of modeled members

self weight of modeled members are calculated automatically based on the geometry will be included in the analysis

Description	Load KN/m^2
Floor finishes	1.25

4.3 Imposed Load

Description	**Load KN/m^2**
Roof Slabs	0.75

4.4 Wind Load (WL)

Wind loads are considered as per IS 875-2016

Design Wind pressure Pz = 0.6*vz2

Vz = design wind velocity

= Vb*k1*k2*k3

k1 = 1 (risk coeff from table 1 of IS 875-part III)

k2 = 1.05 terrain, height & structure size factor (from table-2 of IS 875-PART III , for ht 10m : catogory 2 :Class B)

k3 = 1

Vb = 44 m/s

Vz = 46.2 m/s

Pz = 1280.664 N/m2

Say 128 Kg/m2

4.5 Seismic Loads

Seismic loads are considered in accordance with IS1893-2016.

Factor	Description	Clause	Value
Z	Zone Factor	1893-2016 (PART-1) Table -	0.16
I	Importance Factor	1893-2016 (PART-1) Table -	1
R	Response Reduction Factor	1893-2016 (PART-1) Table -	3

W (seismic weight) = Full dead load of structure + 25% /50% of imposed loads

As the building ht (above ground level) is less than 40m, the building will be analysed by the seismic coefficient method .

4.6.1 Basic Loads

Dead Load (DL)
Live Load (LL)
Wind load (WL)
Seismic Loads (EQ)

4.6.2 Load Combinations

LOAD COMBINATIONS FACTORED

The load combinations are as follows:

S/n	Load Combination
1	1.5 DL+1.5 LL
2	1.2 DL+1.2 LL+ 1.2 WL(X)
3	1.2 DL+1.2 LL+ 1.2 WL(-X)
4	1.2 DL+1.2 LL+ 1.2 WL(Z)
5	1.2 DL+1.2 LL+ 1.2 WL(-Z)
6	1.5 DL+1.5 WL(X)
7	1.5 DL+1.5 WL(-X)
8	1.5 DL+1.5 WL (Z)
9	1.5 DL+ 1.5 WL(-Z)
10	0.9 DL+ 1.5 WL(X)
11	0.9 DL+ 1.5 WL(-X)
12	0.9 DL+ 1.5 WL(Z)
13	0.9 DL+ 1.5 WL(-Z)
14	1.2 DL+1.2 LL+1.2 SL(X)
15	1.2 DL+1.2 LL+1.2 SL(-X)
16	1.2 DL+1.2 LL+1.2 SL(Z)
17	1.2 DL+1.2 LL+1.2 SL(-Z)
18	1.5 DL+1.5 EQ(X)
19	1.5 DL+1.5 EQ(-X)
20	1.5 DL+1.5 EQ (Z)
21	1.5 DL+ 1.5 EQ(-Z)
22	0.9 DL+ 1.5 EQ(X)
23	0.9 DL+ 1.5 EQ(-X)
24	0.9 DL+ 1.5 EQ(Z)
25	0.9 DL+ 1.5 EQ(-Z)

5.1.

Column Design results From Staad Output

Concrete M25

SNO	Grid Mkd	Column Design Details				Ties	COLUMN MKD
		Size	Column mb-no	Reinforcement in mm2	Bars		
1	A1	230X450	72 8	1756	6-Y20+2-Y12	Y8-150	C3
2	A2	230X450	78 52	1511	8-Y16	Y8-150	C2
3	A4	230X450	80 58	830	8-Y12	Y8-150	C1
4	A6	450x230	76 35	2047	6-Y20+2-Y12	Y8-150	C3
5	B3	230X450	73 9	840	8-Y12	Y8-150	C1
6	B4	230X450	112 111	800	8-Y12	Y8-150	C1
7	C2	230X450	117 118	1080	8-Y16	Y8-150	C2
8	D1	230X450	74 18	2500	8-Y20	Y8-150	C4
9	D3	230X450	75 19	1289	8-Y16	Y8-150	C2
10	D5	230X450	116 115	1445	8-Y16	Y8-150	C2
11	D6	230X450	77 39	1660	8-Y16	Y8-150	C2
12	E1	230x300		600	6-Y12	Y8-150	C5
13	E2'	230x300		500	6-Y12	Y8-150	C5
14	E3	230x300		600	6-Y12	Y8-150	C5
15	E3'	230x300		600	6-Y12	Y8-150	C5

5.2. SUPPORT REACTIONS FROM STAAD OUTPUT

	Node	L/C	Force-X Mton	Force-Y Mton	Force-Z Mton	X MTon-m	Moment-Y MTon-m	t-Z MTon-
A1	1	1 SEISMIC LOAD IN X -	-0.885	-1.629	-0.011	-0.022	-0.024	1.49
		2 SEISMIC LOAD IN Z -	-0.009	-1.105	-1.234	-2.494	0.008	0.02
		3 WIND X	-0.381	-0.466	0.051	0.095	-0.012	0.63
		4 WIND -X	0.135	0.24	0.021	0.041	0.008	-0.23
		5 WIND Z	0.012	-0.588	-0.73	-1.459	-0.011	-0.02
		6 WIND -Z	-0.038	0.672	0.867	1.734	0.029	0.06
		7 DL	0.245	17.081	1.088	0.992	0.006	-0.2
		9 LL	-0.024	1.11	-0.038	-0.033	0.002	0.03
B3	2	1 SEISMIC LOAD IN X -	-1.084	-1.08	0.052	0.039	-0.019	1.71
		2 SEISMIC LOAD IN Z -	-0.024	-1.684	-1.405	-2.902	0.03	0.03
		3 WIND X	-0.194	-0.169	0.002	-0.01	-0.003	0.3
		4 WIND -X	0.248	0.191	-0.032	-0.051	0.003	-0.39
		5 WIND Z	-0.023	-0.518	-0.854	-1.591	0.017	0.03
		6 WIND -Z	0.037	0.32	1.345	2.332	-0.024	-0.06
		7 DL	-0.068	16.772	0.893	0.887	-0.011	0.11
		9 LL	0.013	1.067	0.051	0.057	0	-0.01
D1	10	1 SEISMIC LOAD IN X -	-1.108	-1.148	-0.012	-0.023	0.001	1.89
		2 SEISMIC LOAD IN Z -	0.006	-1.025	-1.368	-2.628	0.004	-0.01
		3 WIND X	-0.302	-0.199	0.054	0.098	0.016	0.5
		4 WIND -X	0.289	0.221	0.023	0.042	0.006	-0.48
		5 WIND Z	-0.012	-0.907	-0.775	-1.499	-0.011	0.02
		6 WIND -Z	0.03	1.266	0.926	1.798	0.037	-0.05
		7 DL	0.663	24.112	-1.111	-1.158	0.007	-0.62
		9 LL	-0.018	2.146	0.039	0.036	0.001	0.02
D3	11	1 SEISMIC LOAD IN X -	-1.348	1.198	-0.139	-0.146	0.006	2.13
		2 SEISMIC LOAD IN Z -	0.004	0.795	-1.639	-3.127	0.018	-0.01
		3 WIND X	-0.348	0.221	-0.033	-0.043	-0.017	0.54
		4 WIND -X	0.337	-0.204	0.002	-0.018	0.006	-0.53
		5 WIND Z	-0.014	-0.282	-1.028	-1.764	0.027	0.02
		6 WIND -Z	0.033	1.312	1.692	2.699	-0.045	-0.05
		7 DL	-0.237	42.748	-0.623	-0.567	-0.004	0.28
		9 LL	0.014	4.94	0.015	0.023	-0.002	-0.02
A6	24	1 SEISMIC LOAD IN X -	-0.844	1.797	0.139	0.212	-0.025	1.43
		2 SEISMIC LOAD IN Z -	0.01	-1.62	-1.393	-2.841	-0.016	-0.01
		3 WIND X	-0.123	0.271	0.043	0.074	-0.013	0.21
		4 WIND -X	0.269	-0.374	0.007	0.027	-0.025	-0.45
		5 WIND Z	0.018	-0.518	-0.553	-1.083	-0.021	-0.03
		6 WIND -Z	0.006	0.448	0.496	0.977	0.013	-0.01
		7 DL	-0.518	19.94	1.499	1.422	0	0.56
		9 LL	0.01	1.122	-0.059	-0.061	0.001	-0.01

D6	27	1 SEISMIC LOAD IN X -	-1.261	2.718	0.052	0.127	-0.021	2.04	
		2 SEISMIC LOAD IN Z -	0.005	1.477	-1.365	-2.813	-0.021	-0.01	
		3 WIND X	-0.326	0.497	0.029	0.06	-0.01	0.52	
		4 WIND -X	0.323	-0.548	0.024	0.043	0.012	-0.52	
		5 WIND Z	-0.013	0.519	-0.54	-1.065	0.001	0.02	
		6 WIND -Z	0.032	-0.546	0.491	0.975	0.016	-0.05	
		7 DL	-0.147	17.56	-1.265	-1.274	0.017	0.19	
		9 LL	0	1.287	0.061	0.049	-0.002	-0	
A2	33	1 SEISMIC LOAD IN X -	-0.884	1.225	-0.074	-0.085	-0.01	1.48	
		2 SEISMIC LOAD IN Z -	-0.01	-1.813	-1.223	-2.569	0.005	0.02	
		3 WIND X	-0.379	0.362	-0.085	-0.156	0.102	0.62	
		4 WIND -X	0.136	-0.178	-0.008	-0.028	0.035	-0.23	
		5 WIND Z	0.012	-0.679	-0.565	-1.131	-0.019	-0.02	
		6 WIND -Z	-0.038	0.547	0.44	0.873	0.046	0.06	
		7 DL	-0.356	15.191	0.429	0.265	0.004	0.4	
		9 LL	0.014	1.072	-0.071	-0.09	0.003	-0.01	
A4	37	1 SEISMIC LOAD IN X -	-0.816	-1.18	0.014	0.013	-0.036	1.4	
		2 SEISMIC LOAD IN Z -	0.009	-5.615	-1.857	-3.559	-0.014	-0.01	
		3 WIND X	-0.118	-0.159	0.002	0.002	-0.02	0.2	
		4 WIND -X	0.263	0.248	-0.024	-0.04	-0.025	-0.44	
		5 WIND Z	0.018	-2.073	-0.959	-1.748	-0.015	-0.03	
		6 WIND -Z	0.005	1.669	0.755	1.378	0.007	-0.01	
		7 DL	0.415	10.102	0.245	0.219	0.004	-0.37	
		9 LL	-0.012	0.318	-0.004	-0.024	0.001	0.01	
C2	64	1 SEISMIC LOAD IN X -	-1.031	-1.518	0.002	-0.011	-0.032	1.77	
		2 SEISMIC LOAD IN Z -	-0.022	1.579	-1.275	-2.622	0.034	0.02	
		3 WIND X	-0.206	-0.18	-0.072	-0.143	-0.036	0.35	
		4 WIND -X	0.241	0.302	-0.023	-0.043	-0.002	-0.4	
		5 WIND Z	-0.028	0.547	-0.587	-1.149	0.019	0.04	
		6 WIND -Z	0.041	-0.382	0.473	0.908	-0.066	-0.07	
		7 DL	0.196	13.352	-0.523	-0.672	-0.017	-0.14	
		9 LL	0.011	1.359	0.035	0.008	-0.002	-0.01	
B4	66	1 SEISMIC LOAD IN X -	-2.548	1.324	0.01	0.01	-0.019	4.89	
		2 SEISMIC LOAD IN Z -	-0.047	4.944	-0.788	-1.242	-0.008	0.07	
		3 WIND X	-0.472	0.2	0.002	0.002	-0.01	0.88	
		4 WIND -X	0.62	-0.213	-0.01	-0.014	-0.018	-1.15	
		5 WIND Z	-0.052	1.884	-0.376	-0.587	-0.032	0.09	
		6 WIND -Z	0.096	-1.472	0.297	0.464	0.025	-0.16	
		7 DL	0.218	24.177	0.037	0.032	-0.01	-0.06	
		9 LL	-0.002	2.366	-0.001	-0.007	0.003	-0.01	
D5	69	1 SEISMIC LOAD IN X -	-1.416	-1.738	-0.061	-0.029	-0.013	2.19	
		2 SEISMIC LOAD IN Z -	0.005	0.652	-1.201	-2.904	-0.022	-0.01	
		3 WIND X	-0.358	-0.334	-0.005	0.006	-0.007	0.55	
		4 WIND -X	0.354	0.327	0.031	0.044	-0.004	-0.54	
		5 WIND Z	-0.015	0.163	-0.487	-1.079	-0.026	0.02	
		6 WIND -Z	0.035	-0.114	0.597	1.272	0.01	-0.06	
		7 DL	-0.288	30.096	-0.618	-0.495	-0.002	0.33	
		9 LL	-0.001	3.565	-0.018	-0.051	0	0	

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	

5.2.1 Checking of footings for max basepressure combination FOR F1

NET SBC = 10 t/m2 Density Of Soil= 1.8 t/m3 DIST b/W FNL & FGL/FFL= 0.75 m(over burden soil wt)

GROSS SBC = 12.7 t/m2 SBC for WL/EQ= 15.2 t/m2 Depth of found fromFGL 1.5 m

Footing marked	Column Node	L/C	Fy	Mx	Mz	Column Size		Footing Size			self weight	overburden soil wt	P	Mx	My	A	Zx	Zy	P/A	MX/ZX	MY/Zy	Pmax	Pmin	Pmax net	SBC factor	final SBC
						ZD	YD	Th of foting	Along X	Along Z																
F1	1	101	18.2	0.96	-0.17	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.2	0.96	0.17	3.61	1.14	1.1432	9.20	0.84	0.15	10.18	8.21	7.48	1.00	7.48
		102	17.7	1.05	0.46	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.7	1.05	0.46	3.61	1.14	1.1432	9.07	0.92	0.40	10.39	7.75	7.69	1.25	6.15
		103	18.4	1.00	-0.39	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.4	1.00	0.39	3.61	1.14	1.1432	9.26	0.87	0.34	10.48	8.05	7.78	1.25	6.23
		104	17.6	-0.50	-0.19	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.6	0.50	0.19	3.61	1.14	1.1432	9.04	0.44	0.16	9.64	8.43	6.94	1.25	5.55
		105	18.9	2.69	-0.11	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.9	2.69	0.11	3.61	1.14	1.1432	9.38	2.36	0.09	11.83	6.93	9.13	1.25	7.31
		106	16.6	1.09	0.43	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.6	1.09	0.43	3.61	1.14	1.1432	8.76	0.95	0.38	10.09	7.44	7.39	1.00	7.39
		107	17.3	1.03	-0.42	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.3	1.03	0.42	3.61	1.14	1.1432	8.96	0.90	0.37	10.23	7.69	7.53	1.00	7.53
		108	16.5	-0.47	-0.22	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.5	0.47	0.22	3.61	1.14	1.1432	8.73	0.41	0.19	9.32	8.13	6.62	1.00	6.62
		109	17.8	2.73	-0.13	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.8	2.73	0.13	3.61	1.14	1.1432	9.08	2.38	0.12	11.58	6.58	8.88	1.00	8.88
		110	16.6	0.94	1.32	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.6	0.94	1.32	3.61	1.14	1.1432	8.75	0.82	1.15	10.72	6.78	8.02	1.25	6.41
		111	19.8	0.98	-1.65	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	34.8	0.98	1.65	3.61	1.14	1.1432	9.65	0.86	1.45	11.95	7.35	9.25	1.25	7.40
		112	17.1	-1.54	-0.15	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.1	1.54	0.15	3.61	1.14	1.1432	8.89	1.34	0.13	10.37	7.41	7.67	1.25	6.14
		113	19.3	3.45	-0.18	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	34.3	3.45	0.18	3.61	1.14	1.1432	9.50	3.02	0.16	12.69	6.32	9.99	1.25	7.99
		114	15.5	0.97	1.29	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.5	0.97	1.29	3.61	1.14	1.1432	8.44	0.85	1.13	10.42	6.46	7.72	1.00	7.72
		115	18.7	1.01	-1.68	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.7	1.01	1.68	3.61	1.14	1.1432	9.34	0.89	1.47	11.70	6.99	9.00	1.00	9.00
		116	16.0	-1.50	-0.18	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.0	1.50	0.18	3.61	1.14	1.1432	8.58	1.31	0.16	10.06	7.11	7.36	1.00	7.36
		117	18.2	3.49	-0.21	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.2	3.49	0.21	3.61	1.14	1.1432	9.20	3.05	0.18	12.43	5.96	9.73	1.00	9.73
		118	14.9	0.99	0.45	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.9	0.99	0.45	3.61	1.14	1.1432	8.29	0.86	0.39	9.55	7.03	6.85	1.00	6.85
		119	15.6	0.93	-0.40	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.6	0.93	0.40	3.61	1.14	1.1432	8.48	0.82	0.35	9.65	7.32	6.95	1.00	6.95
		120	14.8	-0.57	-0.20	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.8	0.57	0.20	3.61	1.14	1.1432	8.25	0.50	0.17	8.92	7.59	6.22	1.00	6.22
		121	16.0	2.63	-0.12	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.1	2.63	0.12	3.61	1.14	1.1432	8.60	2.30	0.10	11.00	6.21	8.30	1.00	8.30
		122	13.7	0.87	1.31	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.8	0.87	1.31	3.61	1.14	1.1432	7.97	0.76	1.15	9.87	6.06	7.17	1.00	7.17
		123	17.0	0.92	-1.66	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.0	0.92	1.66	3.61	1.14	1.1432	8.87	0.80	1.45	11.12	6.62	8.42	1.00	8.42
		124	14.3	-1.60	-0.16	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.3	1.60	0.16	3.61	1.14	1.1432	8.11	1.40	0.14	9.65	6.57	6.95	1.00	6.95
		125	16.5	3.39	-0.19	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.5	3.39	0.19	3.61	1.14	1.1432	8.72	2.96	0.17	11.85	5.59	9.15	1.00	9.15

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK																								
F1	2	101	17.8	0.94	0.10	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.9	0.94	0.10	3.61	1.14	1.1432	9.10	0.83	0.08	10.01	8.19	7.31	1.00	7.31
		102	17.7	0.93	0.40	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.7	0.93	0.40	3.61	1.14	1.1432	9.05	0.82	0.35	10.22	7.89	7.52	1.25	6.02
		103	18.0	0.89	-0.29	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.0	0.89	0.29	3.61	1.14	1.1432	9.15	0.78	0.26	10.19	8.12	7.49	1.25	5.99
		104	17.3	-0.65	0.13	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.3	0.65	0.13	3.61	1.14	1.1432	8.96	0.57	0.11	9.63	8.28	6.93	1.25	5.55
		105	18.2	3.28	0.04	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.2	3.28	0.04	3.61	1.14	1.1432	9.19	2.87	0.03	12.09	6.29	9.39	1.25	7.51
		106	16.6	0.88	0.41	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.6	0.88	0.41	3.61	1.14	1.1432	8.76	0.77	0.36	9.89	7.63	7.19	1.00	7.19
		107	17.0	0.84	-0.28	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.0	0.84	0.28	3.61	1.14	1.1432	8.86	0.73	0.24	9.83	7.88	7.13	1.00	7.13
		108	16.3	-0.70	0.14	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.3	0.70	0.14	3.61	1.14	1.1432	8.66	0.62	0.12	9.40	7.92	6.70	1.00	6.70
		109	17.1	3.22	0.05	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.1	3.22	0.05	3.61	1.14	1.1432	8.89	2.82	0.05	11.76	6.03	9.06	1.00	9.06
		110	16.8	0.98	1.80	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.8	0.98	1.80	3.61	1.14	1.1432	8.80	0.86	1.58	11.24	6.36	8.54	1.25	6.83
		111	18.9	0.91	-1.61	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.9	0.91	1.61	3.61	1.14	1.1432	9.40	0.79	1.41	11.60	7.20	8.90	1.25	7.12
		112	16.2	-1.96	0.13	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.2	1.96	0.13	3.61	1.14	1.1432	8.63	1.71	0.11	10.46	6.81	7.76	1.25	6.21
		113	19.5	3.85	0.06	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	34.5	3.85	0.06	3.61	1.14	1.1432	9.57	3.36	0.06	12.99	6.15	10.29	1.25	8.23
		114	15.7	0.93	1.82	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.7	0.93	1.82	3.61	1.14	1.1432	8.51	0.81	1.59	10.91	6.11	8.21	1.00	8.21
		115	17.9	0.85	-1.60	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.9	0.85	1.60	3.61	1.14	1.1432	9.10	0.74	1.40	11.25	6.96	8.55	1.00	8.55
		116	15.1	-2.02	0.14	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.1	2.02	0.14	3.61	1.14	1.1432	8.34	1.76	0.12	10.22	6.45	7.52	1.00	7.52
		117	18.5	3.79	0.08	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.5	3.79	0.08	3.61	1.14	1.1432	9.27	3.32	0.07	12.66	5.89	9.96	1.00	9.96
		118	14.9	0.79	0.40	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.9	0.79	0.40	3.61	1.14	1.1432	8.29	0.69	0.35	9.33	7.25	6.63	1.00	6.63
		119	15.3	0.75	-0.29	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.3	0.75	0.29	3.61	1.14	1.1432	8.39	0.65	0.25	9.30	7.49	6.60	1.00	6.60
		120	14.6	-0.79	0.13	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.6	0.79	0.13	3.61	1.14	1.1432	8.20	0.69	0.11	9.00	7.39	6.30	1.00	6.30
		121	15.4	3.13	0.04	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.4	3.13	0.04	3.61	1.14	1.1432	8.43	2.74	0.04	11.21	5.65	8.51	1.00	8.51
		122	14.0	0.84	1.81	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.0	0.84	1.81	3.61	1.14	1.1432	8.04	0.73	1.58	10.35	5.73	7.65	1.00	7.65
		123	16.2	0.76	-1.61	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.2	0.76	1.61	3.61	1.14	1.1432	8.64	0.66	1.41	10.71	6.57	8.01	1.00	8.01
		124	13.4	-2.10	0.13	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.4	2.10	0.13	3.61	1.14	1.1432	7.87	1.84	0.11	9.83	5.92	7.13	1.00	7.13
		125	16.8	3.70	0.07	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.8	3.70	0.07	3.61	1.14	1.1432	8.81	3.24	0.06	12.10	5.51	9.40	1.00	9.40
F1	33	101	16.3	0.18	0.39	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.3	0.18	0.39	3.61	1.14	1.1432	8.66	0.15	0.34	9.16	8.17	6.46	1.00	6.46
		102	16.6	0.02	1.01	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.6	0.02	1.01	3.61	1.14	1.1432	8.76	0.02	0.89	9.67	7.86	6.97	1.25	5.57
		103	16.1	0.15	0.17	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.1	0.15	0.17	3.61	1.14	1.1432	8.61	0.13	0.15	8.89	8.34	6.19	1.25	4.95
		104	15.6	-0.96	0.37	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.6	0.96	0.37	3.61	1.14	1.1432	8.48	0.84	0.33	9.64	7.31	6.94	1.25	5.55
		105	16.8	1.05	0.45	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.8	1.05	0.45	3.61	1.14	1.1432	8.82	0.92	0.40	10.13	7.50	7.43	1.25	5.94
		106	15.6	0.11	1.02	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.6	0.11	1.02	3.61	1.14	1.1432	8.47	0.10	0.89	9.46	7.48	6.76	1.00	6.76
		107	15.0	0.24	0.18	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.0	0.24	0.18	3.61	1.14	1.1432	8.32	0.21	0.15	8.68	7.96	5.98	1.00	5.98
		108	14.5	-0.87	0.38	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.5	0.87	0.38	3.61	1.14	1.1432	8.18	0.76	0.34	9.27	7.09	6.57	1.00	6.57
		109	15.7	1.14	0.46	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.8	1.14	0.46	3.61	1.14	1.1432	8.52	1.00	0.41	9.92	7.12	7.22	1.00	7.22
		110	17.5	0.09	1.88	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.5	0.09	1.88	3.61	1.14	1.1432	9.00	0.08	1.64	10.72	7.28	8.02	1.25	6.42
		111	15.0	0.26	-1.09	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.1	0.26	1.09	3.61	1.14	1.1432	8.33	0.23	0.95	9.51	7.14	6.81	1.25	5.45
		112	14.5	-2.39	0.41	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.5	2.39	0.41	3.61	1.14	1.1432	8.16	2.09	0.36	10.61	5.71	7.91	1.25	6.33
		113	18.1	2.74	0.38	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	33.1	2.74	0.38	3.61	1.14	1.1432	9.17	2.40	0.33	11.90	6.44	9.20	1.25	7.36
		114	16.4	0.18	1.89	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.4	0.18	1.89	3.61	1.14	1.1432	8.71	0.16	1.65	10.51	6.90	7.81	1.00	7.81

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK																								
			115	14.0	0.35	-1.08	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.0	0.35	1.08	3.61	1.14	1.1432	8.03	0.31	0.95	9.28	6.77	6.58	1.00	6.58
			116	13.4	-2.30	0.42	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.4	2.30	0.42	3.61	1.14	1.1432	7.87	2.02	0.37	10.25	5.48	7.55	1.00	7.55
			117	17.0	2.84	0.39	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	32.0	2.84	0.39	3.61	1.14	1.1432	8.87	2.48	0.34	11.69	6.05	8.99	1.00	8.99
			118	14.0	0.08	0.98	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.0	0.08	0.98	3.61	1.14	1.1432	8.05	0.07	0.86	8.98	7.11	6.28	1.00	6.28
			119	13.5	0.21	0.14	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.5	0.21	0.14	3.61	1.14	1.1432	7.90	0.18	0.12	8.20	7.59	5.50	1.00	5.50
			120	13.0	-0.89	0.34	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.0	0.89	0.34	3.61	1.14	1.1432	7.76	0.78	0.30	8.84	6.68	6.14	1.00	6.14
			121	14.2	1.11	0.42	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.2	1.11	0.42	3.61	1.14	1.1432	8.10	0.97	0.37	9.44	6.76	6.74	1.00	6.74
			122	14.9	0.15	1.85	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.9	0.15	1.85	3.61	1.14	1.1432	8.29	0.13	1.61	10.04	6.54	7.34	1.00	7.34
			123	12.4	0.32	-1.12	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	27.5	0.32	1.12	3.61	1.14	1.1432	7.61	0.28	0.98	8.87	6.34	6.17	1.00	6.17
			124	11.9	-2.33	0.38	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.9	2.33	0.38	3.61	1.14	1.1432	7.44	2.04	0.33	9.81	5.07	7.11	1.00	7.11
			125	15.5	2.81	0.35	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.5	2.81	0.35	3.61	1.14	1.1432	8.45	2.46	0.30	11.21	5.69	8.51	1.00	8.51
	F1	37	101	10.4	0.20	-0.36	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.4	0.20	0.36	3.61	1.14	1.1432	7.05	0.17	0.31	7.53	6.56	4.83	1.00	4.83
			102	10.3	0.20	-0.15	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.3	0.20	0.15	3.61	1.14	1.1432	7.00	0.17	0.13	7.31	6.70	4.61	1.25	3.69
			103	10.7	0.16	-0.79	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.7	0.16	0.79	3.61	1.14	1.1432	7.11	0.14	0.69	7.94	6.28	5.24	1.25	4.20
			104	8.3	-1.55	-0.38	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	23.4	1.55	0.38	3.61	1.14	1.1432	6.47	1.36	0.34	8.17	4.78	5.47	1.25	4.37
			105	12.1	1.57	-0.37	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	27.1	1.57	0.37	3.61	1.14	1.1432	7.51	1.38	0.32	9.20	5.81	6.50	1.25	5.20
			106	9.9	0.22	-0.17	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.0	0.22	0.17	3.61	1.14	1.1432	6.91	0.19	0.15	7.25	6.57	4.55	1.00	4.55
			107	10.4	0.18	-0.81	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.4	0.18	0.81	3.61	1.14	1.1432	7.03	0.16	0.71	7.89	6.16	5.19	1.00	5.19
			108	8.0	-1.53	-0.40	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	23.0	1.53	0.40	3.61	1.14	1.1432	6.38	1.34	0.35	8.07	4.70	5.37	1.00	5.37
			109	11.8	1.60	-0.38	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.8	1.60	0.38	3.61	1.14	1.1432	7.42	1.40	0.33	9.15	5.69	6.45	1.00	6.45
			110	9.2	0.21	1.05	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	24.3	0.21	1.05	3.61	1.14	1.1432	6.72	0.18	0.92	7.82	5.62	5.12	1.25	4.09
			111	11.6	0.18	-1.76	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.6	0.18	1.76	3.61	1.14	1.1432	7.37	0.16	1.54	9.07	5.68	6.37	1.25	5.10
			112	4.8	-3.36	-0.37	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	19.8	3.36	0.37	3.61	1.14	1.1432	5.49	2.94	0.32	8.76	2.23	6.06	1.25	4.84
			113	16.0	3.75	-0.34	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.1	3.75	0.34	3.61	1.14	1.1432	8.60	3.28	0.30	12.18	5.02	9.48	1.25	7.59
			114	8.9	0.23	1.03	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	23.9	0.23	1.03	3.61	1.14	1.1432	6.63	0.20	0.90	7.74	5.52	5.04	1.00	5.04
			115	11.3	0.21	-1.77	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.3	0.21	1.77	3.61	1.14	1.1432	7.28	0.18	1.55	9.02	5.55	6.32	1.00	6.32
			116	4.5	-3.34	-0.38	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	19.5	3.34	0.38	3.61	1.14	1.1432	5.40	2.92	0.33	8.66	2.15	5.96	1.00	5.96
			117	15.7	3.78	-0.36	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.7	3.78	0.36	3.61	1.14	1.1432	8.51	3.31	0.31	12.13	4.90	9.43	1.00	9.43
			118	8.9	0.20	-0.13	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	23.9	0.20	0.13	3.61	1.14	1.1432	6.63	0.17	0.11	6.92	6.35	4.22	1.00	4.22
			119	9.3	0.16	-0.77	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	24.4	0.16	0.77	3.61	1.14	1.1432	6.75	0.14	0.68	7.56	5.93	4.86	1.00	4.86
			120	7.0	-1.55	-0.36	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	22.0	1.55	0.36	3.61	1.14	1.1432	6.10	1.36	0.32	7.78	4.43	5.08	1.00	5.08
			121	10.8	1.58	-0.34	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.8	1.58	0.34	3.61	1.14	1.1432	7.14	1.38	0.30	8.82	5.46	6.12	1.00	6.12
			122	7.9	0.21	1.07	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	22.9	0.21	1.07	3.61	1.14	1.1432	6.35	0.18	0.94	7.47	5.23	4.77	1.00	4.77
			123	10.3	0.19	-1.74	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.3	0.19	1.74	3.61	1.14	1.1432	7.00	0.16	1.52	8.68	5.33	5.98	1.00	5.98

		124	3.5	-3.36	-0.35	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	18.5	3.36	0.35	3.61	1.14	1.1432	5.12	2.94	0.30	8.37	1.88	5.67	1.00	5.67
		125	14.7	3.76	-0.32	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.7	3.76	0.32	3.61	1.14	1.1432	8.23	3.29	0.28	11.80	4.67	9.10	1.00	9.10
F1	64	101	14.7	-0.66	-0.16	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.7	0.66	0.16	3.61	1.14	1.1432	8.23	0.58	0.14	8.95	7.52	6.25	1.00	6.25
		102	14.5	-0.81	0.19	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.5	0.81	0.19	3.61	1.14	1.1432	8.18	0.71	0.17	9.06	7.31	6.36	1.25	5.09
		103	15.0	-0.71	-0.56	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.0	0.71	0.56	3.61	1.14	1.1432	8.32	0.62	0.49	9.43	7.21	6.73	1.25	5.38
		104	15.3	-1.81	-0.11	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	30.3	1.81	0.11	3.61	1.14	1.1432	8.39	1.59	0.10	10.07	6.70	7.37	1.25	5.90
		105	14.3	0.24	-0.22	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.3	0.24	0.22	3.61	1.14	1.1432	8.13	0.21	0.20	8.54	7.72	5.84	1.25	4.67
		106	13.2	-0.82	0.21	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.2	0.82	0.21	3.61	1.14	1.1432	7.81	0.71	0.18	8.70	6.92	6.00	1.00	6.00
		107	13.7	-0.72	-0.55	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.7	0.72	0.55	3.61	1.14	1.1432	7.94	0.63	0.48	9.05	6.84	6.35	1.00	6.35
		108	13.9	-1.82	-0.10	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.9	1.82	0.10	3.61	1.14	1.1432	8.01	1.59	0.09	9.69	6.33	6.99	1.00	6.99
		109	13.0	0.24	-0.21	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.0	0.24	0.21	3.61	1.14	1.1432	7.75	0.21	0.18	8.14	7.36	5.44	1.00	5.44
		110	13.2	-0.68	1.61	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.2	0.68	1.61	3.61	1.14	1.1432	7.81	0.59	1.41	9.82	5.81	7.12	1.25	5.69
		111	16.2	-0.65	-1.93	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.2	0.65	1.93	3.61	1.14	1.1432	8.65	0.57	1.68	10.91	6.40	8.21	1.25	6.57
		112	16.3	-3.29	-0.14	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	31.3	3.29	0.14	3.61	1.14	1.1432	8.67	2.87	0.12	11.67	5.68	8.97	1.25	7.17
		113	13.1	1.96	-0.18	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.1	1.96	0.18	3.61	1.14	1.1432	7.80	1.71	0.15	9.66	5.93	6.96	1.25	5.57
		114	11.8	-0.68	1.63	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.8	0.68	1.63	3.61	1.14	1.1432	7.44	0.60	1.42	9.46	5.42	6.76	1.00	6.76
		115	14.9	-0.66	-1.91	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.9	0.66	1.91	3.61	1.14	1.1432	8.28	0.58	1.67	10.53	6.03	7.83	1.00	7.83
		116	14.9	-3.29	-0.12	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	29.9	3.29	0.12	3.61	1.14	1.1432	8.30	2.88	0.11	11.28	5.31	8.58	1.00	8.58
		117	11.8	1.95	-0.16	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.8	1.95	0.16	3.61	1.14	1.1432	7.42	1.71	0.14	9.27	5.57	6.57	1.00	6.57
		118	11.8	-0.75	0.22	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.9	0.75	0.22	3.61	1.14	1.1432	7.44	0.65	0.19	8.28	6.59	5.58	1.00	5.58
		119	12.3	-0.65	-0.53	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	27.3	0.65	0.53	3.61	1.14	1.1432	7.57	0.57	0.47	8.60	6.54	5.90	1.00	5.90
		120	12.6	-1.75	-0.09	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	27.6	1.75	0.09	3.61	1.14	1.1432	7.64	1.53	0.08	9.25	6.03	6.55	1.00	6.55
		121	11.6	0.30	-0.20	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	26.7	0.30	0.20	3.61	1.14	1.1432	7.38	0.27	0.17	7.82	6.95	5.12	1.00	5.12
		122	10.5	-0.62	1.64	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.5	0.62	1.64	3.61	1.14	1.1432	7.07	0.54	1.44	9.04	5.09	6.34	1.00	6.34
		123	13.5	-0.59	-1.90	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.6	0.59	1.90	3.61	1.14	1.1432	7.91	0.52	1.66	10.09	5.73	7.39	1.00	7.39
		124	13.6	-3.23	-0.11	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	28.6	3.23	0.11	3.61	1.14	1.1432	7.93	2.82	0.10	10.84	5.01	8.14	1.00	8.14
		125	10.4	2.02	-0.15	0.23	0.45	0.3	1.9	1.9	2.7075	12.3078	25.5	2.02	0.15	3.61	1.14	1.1432	7.05	1.76	0.13	8.94	5.16	6.24	1.00	6.24

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	

5.2.2 Checking of footings for max basepressure combination FOR F2

NET SBC = 10 t/m2 Density Of Soil= 1.8 t/m3 DIST b/W FNL & FGL/FFL= 0.75 m(over burden soil wt)

GROSS SBC = 12.7 t/m2 SBC for WL/EQ= 15.2 t/m2 Depth of found fromFGL 1.5 m

Footing marked	Column Node	L/C	Fy	Mx	Mz	Column Size		Footing Size			self weight	overburden soil wt	P	Mx	My	A	Zx	Zy	P/A	MX/ZX	MY/Zy	Pmax	Pmin	Pmax net	SBC factor	final SBC
						ZD	YD	Th of foting	Along X	Along Z																
F2	10	101	26.3	-1.12	-0.60	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	46.5	1.12	0.60	4.84	1.77	1.7747	9.61	0.63	0.34	10.58	8.64	7.88	1.00	7.88
		102	26.1	-1.02	-0.10	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	46.3	1.02	0.10	4.84	1.77	1.7747	9.57	0.58	0.06	10.20	8.94	7.50	1.25	6.00
		103	26.5	-1.08	-1.08	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	46.7	1.08	1.08	4.84	1.77	1.7747	9.66	0.61	0.61	10.87	8.44	8.17	1.25	6.54
		104	25.4	-2.62	-0.58	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	45.6	2.62	0.58	4.84	1.77	1.7747	9.42	1.48	0.33	11.23	7.62	8.53	1.25	6.82
		105	27.5	0.68	-0.65	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	47.8	0.68	0.65	4.84	1.77	1.7747	9.87	0.38	0.37	10.62	9.12	7.92	1.25	6.34
		106	23.9	-1.06	-0.11	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	44.2	1.06	0.11	4.84	1.77	1.7747	9.13	0.60	0.06	9.79	8.46	7.09	1.00	7.09
		107	24.3	-1.12	-1.10	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	44.6	1.12	1.10	4.84	1.77	1.7747	9.21	0.63	0.62	10.46	7.97	7.76	1.00	7.76
		108	23.2	-2.66	-0.60	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	43.5	2.66	0.60	4.84	1.77	1.7747	8.98	1.50	0.34	10.81	7.15	8.11	1.00	8.11
		109	25.4	0.64	-0.67	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	45.6	0.64	0.67	4.84	1.77	1.7747	9.43	0.36	0.38	10.16	8.69	7.46	1.00	7.46
		110	25.1	-1.14	1.29	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	45.4	1.14	1.29	4.84	1.77	1.7747	9.37	0.64	0.73	10.74	8.00	8.04	1.25	6.43
		111	27.4	-1.10	-2.49	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	47.7	1.10	2.49	4.84	1.77	1.7747	9.85	0.62	1.40	11.87	7.83	9.17	1.25	7.33
		112	25.2	-3.75	-0.61	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	45.5	3.75	0.61	4.84	1.77	1.7747	9.40	2.11	0.34	11.85	6.94	9.15	1.25	7.32
		113	27.3	1.51	-0.59	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	47.5	1.51	0.59	4.84	1.77	1.7747	9.82	0.85	0.33	11.00	8.64	8.30	1.25	6.64
		114	23.0	-1.18	1.27	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	43.2	1.18	1.27	4.84	1.77	1.7747	8.93	0.67	0.72	10.31	7.55	7.61	1.00	7.61
		115	25.3	-1.14	-2.50	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	45.5	1.14	2.50	4.84	1.77	1.7747	9.40	0.64	1.41	11.45	7.35	8.75	1.00	8.75
		116	23.1	-3.79	-0.62	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	43.3	3.79	0.62	4.84	1.77	1.7747	8.95	2.13	0.35	11.44	6.47	8.74	1.00	8.74
		117	25.1	1.47	-0.61	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	45.4	1.47	0.61	4.84	1.77	1.7747	9.38	0.83	0.34	10.55	8.21	7.85	1.00	7.85
		118	21.5	-0.94	-0.05	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	41.8	0.94	0.05	4.84	1.77	1.7747	8.63	0.53	0.03	9.19	8.07	6.49	1.00	6.49
		119	21.9	-1.00	-1.03	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	42.2	1.00	1.03	4.84	1.77	1.7747	8.71	0.56	0.58	9.86	7.57	7.16	1.00	7.16
		120	20.8	-2.54	-0.53	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	41.0	2.54	0.53	4.84	1.77	1.7747	8.48	1.43	0.30	10.21	6.75	7.51	1.00	7.51
		121	23.0	0.76	-0.61	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	43.2	0.76	0.61	4.84	1.77	1.7747	8.93	0.43	0.34	9.70	8.16	7.00	1.00	7.00
		122	20.6	-1.07	1.33	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.8	1.07	1.33	4.84	1.77	1.7747	8.43	0.60	0.75	9.78	7.08	7.08	1.00	7.08
		123	22.8	-1.02	-2.44	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	43.1	1.02	2.44	4.84	1.77	1.7747	8.91	0.57	1.38	10.86	6.96	8.16	1.00	8.16
		124	20.7	-3.67	-0.56	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.9	3.67	0.56	4.84	1.77	1.7747	8.46	2.07	0.32	10.84	6.07	8.14	1.00	8.14
		125	22.7	1.59	-0.55	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	43.0	1.59	0.55	4.84	1.77	1.7747	8.88	0.89	0.31	10.08	7.68	7.38	1.00	7.38

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK																									
F2	24	101	21.1	1.36	0.55	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	41.3	1.36	0.55	4.84	1.77	1.7747	8.54	0.77	0.31	9.61	7.46	6.91	1.00	6.91
		102	21.3	1.44	0.76	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	41.6	1.44	0.76	4.84	1.77	1.7747	8.59	0.81	0.43	9.83	7.36	7.13	1.25	5.70
		103	20.7	1.39	0.10	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.9	1.39	0.10	4.84	1.77	1.7747	8.46	0.78	0.06	9.30	7.62	6.60	1.25	5.28
		104	20.5	0.28	0.52	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.8	0.28	0.52	4.84	1.77	1.7747	8.43	0.16	0.29	8.88	7.98	6.18	1.25	4.94
		105	21.5	2.34	0.54	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	41.8	2.34	0.54	4.84	1.77	1.7747	8.63	1.32	0.30	10.25	7.01	7.55	1.25	6.04
		106	20.2	1.50	0.77	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.5	1.50	0.77	4.84	1.77	1.7747	8.36	0.84	0.43	9.64	7.09	6.94	1.00	6.94
		107	19.6	1.45	0.11	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.8	1.45	0.11	4.84	1.77	1.7747	8.23	0.82	0.06	9.11	7.35	6.41	1.00	6.41
		108	19.4	0.34	0.53	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.7	0.34	0.53	4.84	1.77	1.7747	8.20	0.19	0.30	8.69	7.71	5.99	1.00	5.99
		109	20.4	2.40	0.55	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.6	2.40	0.55	4.84	1.77	1.7747	8.40	1.35	0.31	10.06	6.74	7.36	1.00	7.36
		110	22.9	1.57	1.98	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	43.1	1.57	1.98	4.84	1.77	1.7747	8.91	0.89	1.12	10.91	6.90	8.21	1.25	6.57
		111	19.3	1.15	-0.88	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.5	1.15	0.88	4.84	1.77	1.7747	8.17	0.65	0.50	9.31	7.02	6.61	1.25	5.29
		112	19.4	-1.48	0.54	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.7	1.48	0.54	4.84	1.77	1.7747	8.20	0.83	0.30	9.34	7.06	6.64	1.25	5.31
		113	22.7	4.20	0.56	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	42.9	4.20	0.56	4.84	1.77	1.7747	8.87	2.37	0.32	11.56	6.19	8.86	1.25	7.09
		114	21.7	1.64	1.99	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	42.0	1.64	1.99	4.84	1.77	1.7747	8.68	0.92	1.12	10.72	6.63	8.02	1.00	8.02
		115	18.1	1.21	-0.87	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.4	1.21	0.87	4.84	1.77	1.7747	7.93	0.68	0.49	9.11	6.76	6.41	1.00	6.41
		116	18.3	-1.42	0.55	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.6	1.42	0.55	4.84	1.77	1.7747	7.97	0.80	0.31	9.08	6.86	6.38	1.00	6.38
		117	21.6	4.26	0.57	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	41.8	4.26	0.57	4.84	1.77	1.7747	8.64	2.40	0.32	11.36	5.92	8.66	1.00	8.66
		118	18.2	1.35	0.71	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.5	1.35	0.71	4.84	1.77	1.7747	7.95	0.76	0.40	9.11	6.79	6.41	1.00	6.41
		119	17.6	1.31	0.06	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	37.8	1.31	0.06	4.84	1.77	1.7747	7.82	0.74	0.03	8.58	7.05	5.88	1.00	5.88
		120	17.4	0.20	0.48	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	37.7	0.20	0.48	4.84	1.77	1.7747	7.79	0.11	0.27	8.16	7.41	5.46	1.00	5.46
		121	18.4	2.26	0.49	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.7	2.26	0.49	4.84	1.77	1.7747	7.99	1.27	0.28	9.53	6.44	6.83	1.00	6.83
		122	19.7	1.49	1.93	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.0	1.49	1.93	4.84	1.77	1.7747	8.26	0.84	1.09	10.19	6.33	7.49	1.00	7.49
		123	16.2	1.07	-0.93	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	36.4	1.07	0.93	4.84	1.77	1.7747	7.52	0.60	0.52	8.65	6.40	5.95	1.00	5.95
		124	16.3	-1.56	0.49	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	36.6	1.56	0.49	4.84	1.77	1.7747	7.56	0.88	0.28	8.71	6.40	6.01	1.00	6.01
		125	19.6	4.12	0.52	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.8	4.12	0.52	4.84	1.77	1.7747	8.23	2.32	0.29	10.84	5.62	8.14	1.00	8.14
F2	27	101	18.8	-1.23	0.19	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.1	1.23	0.19	4.84	1.77	1.7747	8.08	0.69	0.11	8.88	7.28	6.18	1.00	6.18
		102	19.3	-1.17	0.71	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.6	1.17	0.71	4.84	1.77	1.7747	8.18	0.66	0.40	9.24	7.12	6.54	1.25	5.23
		103	18.3	-1.18	-0.32	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.6	1.18	0.32	4.84	1.77	1.7747	7.97	0.67	0.18	8.81	7.12	6.11	1.25	4.89
		104	19.4	-2.29	0.22	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.6	2.29	0.22	4.84	1.77	1.7747	8.19	1.29	0.12	9.60	6.77	6.90	1.25	5.52
		105	18.3	-0.25	0.14	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.6	0.25	0.14	4.84	1.77	1.7747	7.97	0.14	0.08	8.19	7.75	5.49	1.25	4.39
		106	18.1	-1.22	0.71	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.3	1.22	0.71	4.84	1.77	1.7747	7.92	0.68	0.40	9.00	6.83	6.30	1.00	6.30
		107	17.0	-1.23	-0.32	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	37.3	1.23	0.32	4.84	1.77	1.7747	7.70	0.69	0.18	8.58	6.82	5.88	1.00	5.88
		108	18.1	-2.34	0.22	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.3	2.34	0.22	4.84	1.77	1.7747	7.92	1.32	0.12	9.36	6.48	6.66	1.00	6.66
		109	17.0	-0.30	0.14	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	37.3	0.30	0.14	4.84	1.77	1.7747	7.70	0.17	0.08	7.95	7.45	5.25	1.00	5.25
		110	21.6	-1.10	2.23	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	41.8	1.10	2.23	4.84	1.77	1.7747	8.64	0.62	1.26	10.52	6.76	7.82	1.25	6.25
		111	16.1	-1.35	-1.85	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	36.4	1.35	1.85	4.84	1.77	1.7747	7.52	0.76	1.04	9.32	5.72	6.62	1.25	5.30
		112	20.3	-4.04	0.19	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.6	4.04	0.19	4.84	1.77	1.7747	8.38	2.28	0.10	10.76	6.00	8.06	1.25	6.45
		113	17.4	1.59	0.20	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	37.6	1.59	0.20	4.84	1.77	1.7747	7.77	0.89	0.11	8.78	6.77	6.08	1.25	4.87
		114	20.3	-1.15	2.23	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	40.5	1.15	2.23	4.84	1.77	1.7747	8.37	0.65	1.26	10.28	6.47	7.58	1.00	7.58

Project		STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK																							
		115	14.8	-1.40	-1.85	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	35.1	1.40	1.85	4.84	1.77	1.7747	7.25	0.79	1.04	9.08	5.42	6.38	1.00	6.38
		116	19.0	-4.09	0.19	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	39.3	4.09	0.19	4.84	1.77	1.7747	8.12	2.30	0.10	10.53	5.71	7.83	1.00	7.83
		117	16.1	1.54	0.20	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	36.3	1.54	0.20	4.84	1.77	1.7747	7.51	0.87	0.11	8.49	6.53	5.79	1.00	5.79
		118	16.3	-1.09	0.69	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	36.6	1.09	0.69	4.84	1.77	1.7747	7.55	0.61	0.39	8.56	6.55	5.86	1.00	5.86
		119	15.3	-1.10	-0.34	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	35.5	1.10	0.34	4.84	1.77	1.7747	7.34	0.62	0.19	8.15	6.52	5.45	1.00	5.45
		120	16.3	-2.21	0.20	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	36.6	2.21	0.20	4.84	1.77	1.7747	7.56	1.25	0.11	8.91	6.20	6.21	1.00	6.21
		121	15.3	-0.17	0.12	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	35.5	0.17	0.12	4.84	1.77	1.7747	7.34	0.10	0.07	7.50	7.17	4.80	1.00	4.80
		122	18.5	-1.02	2.21	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	38.8	1.02	2.21	4.84	1.77	1.7747	8.01	0.57	1.25	9.83	6.19	7.13	1.00	7.13
		123	13.1	-1.27	-1.87	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	33.3	1.27	1.87	4.84	1.77	1.7747	6.89	0.72	1.05	8.66	5.12	5.96	1.00	5.96
		124	17.3	-3.96	0.17	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	37.5	3.96	0.17	4.84	1.77	1.7747	7.76	2.23	0.09	10.08	5.43	7.38	1.00	7.38
		125	14.3	1.67	0.18	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	34.6	1.67	0.18	4.84	1.77	1.7747	7.15	0.94	0.10	8.19	6.10	5.49	1.00	5.49
F2	69	101	33.7	-0.55	0.33	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	53.9	0.55	0.33	4.84	1.77	1.7747	11.14	0.31	0.19	11.63	10.64	8.93	1.00	8.93
		102	33.3	-0.54	0.88	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	53.6	0.54	0.88	4.84	1.77	1.7747	11.07	0.30	0.50	11.87	10.27	9.17	1.25	7.34
		103	34.0	-0.50	-0.21	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	54.2	0.50	0.21	4.84	1.77	1.7747	11.21	0.28	0.12	11.61	10.80	8.91	1.25	7.13
		104	33.8	-1.63	0.36	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	54.1	1.63	0.36	4.84	1.77	1.7747	11.17	0.92	0.20	12.29	10.06	9.59	1.25	7.67
		105	33.5	0.73	0.28	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	53.8	0.73	0.28	4.84	1.77	1.7747	11.12	0.41	0.16	11.68	10.55	8.98	1.25	7.18
		106	29.8	-0.49	0.88	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	50.0	0.49	0.88	4.84	1.77	1.7747	10.33	0.28	0.50	11.11	9.56	8.41	1.00	8.41
		107	30.4	-0.45	-0.21	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	50.7	0.45	0.21	4.84	1.77	1.7747	10.47	0.25	0.12	10.84	10.10	8.14	1.00	8.14
		108	30.3	-1.57	0.36	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	50.5	1.57	0.36	4.84	1.77	1.7747	10.44	0.89	0.20	11.52	9.35	8.82	1.00	8.82
		109	30.0	0.78	0.28	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	50.2	0.78	0.28	4.84	1.77	1.7747	10.38	0.44	0.16	10.97	9.79	8.27	1.00	8.27
		110	31.9	-0.58	2.53	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	52.2	0.58	2.53	4.84	1.77	1.7747	10.78	0.32	1.42	12.53	9.03	9.83	1.25	7.86
		111	35.4	-0.52	-1.86	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	55.7	0.52	1.86	4.84	1.77	1.7747	11.50	0.29	1.05	12.84	10.16	10.14	1.25	8.11
		112	34.3	-3.45	0.32	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	54.6	3.45	0.32	4.84	1.77	1.7747	11.27	1.94	0.18	13.40	9.15	10.70	1.25	8.56
		113	33.0	2.36	0.34	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	53.3	2.36	0.34	4.84	1.77	1.7747	11.00	1.33	0.19	12.53	9.48	9.83	1.25	7.86
		114	28.4	-0.52	2.53	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	48.6	0.52	2.53	4.84	1.77	1.7747	10.04	0.30	1.42	11.76	8.33	9.06	1.00	9.06
		115	31.8	-0.47	-1.86	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	52.1	0.47	1.86	4.84	1.77	1.7747	10.76	0.26	1.05	12.07	9.45	9.37	1.00	9.37
		116	30.7	-3.40	0.33	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	51.0	3.40	0.33	4.84	1.77	1.7747	10.54	1.92	0.18	12.64	8.44	9.94	1.00	9.94
		117	29.4	2.41	0.34	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	49.7	2.41	0.34	4.84	1.77	1.7747	10.27	1.36	0.19	11.82	8.72	9.12	1.00	9.12
		118	26.8	-0.44	0.85	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	47.0	0.44	0.85	4.84	1.77	1.7747	9.71	0.25	0.48	10.44	8.99	7.74	1.00	7.74
		119	27.4	-0.40	-0.25	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	47.7	0.40	0.25	4.84	1.77	1.7747	9.85	0.23	0.14	10.21	9.48	7.51	1.00	7.51
		120	27.3	-1.53	0.32	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	47.5	1.53	0.32	4.84	1.77	1.7747	9.82	0.86	0.18	10.86	8.77	8.16	1.00	8.16
		121	27.0	0.83	0.24	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	47.2	0.83	0.24	4.84	1.77	1.7747	9.76	0.47	0.14	10.36	9.16	7.66	1.00	7.66
		122	25.3	-0.48	2.49	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	45.6	0.48	2.49	4.84	1.77	1.7747	9.42	0.27	1.40	11.09	7.75	8.39	1.00	8.39
		123	28.8	-0.42	-1.89	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	49.1	0.42	1.89	4.84	1.77	1.7747	10.14	0.23	1.07	11.44	8.84	8.74	1.00	8.74
		124	27.7	-3.35	0.29	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	48.0	3.35	0.29	4.84	1.77	1.7747	9.92	1.89	0.16	11.97	7.86	9.27	1.00	9.27
		125	26.4	2.46	0.31	0.23	0.45	0.3	2.2	2.2	3.63	16.6251	46.7	2.46	0.31	4.84	1.77	1.7747	9.65	1.39	0.17	11.21	8.09	8.51	1.00	8.51

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	

5.2.3 Checking of footings for max basepressure combination FOR F3

NET SBC = 10 t/m2 Density Of Soil= 1.8 t/m3 DIST b/W FNL & FGL/FFL= 0.75 m(over burden soil wt)

GROSS SBC = 12.7 t/m2 SBC for WL/EQ= 15.2 t/m2 Depth of found fromFGL 1.5 m

Footing marked	Column Node	L/C	Fy	Mx	Mz	Column Size		Footing Size			self weight	overburden soil wt	P	Mx	My	A	Zx	Zy	P/A	MX/ZX	MY/Zy	Pmax	Pmin	Pmax net	SBC factor	final SBC
						ZD	YD	Th of foting	Along X	Along Z																
F3	66	101	26.5	0.03	-0.06	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	44.6	0.03	0.06	4.335	1.23	1.8424	10.30	0.02	0.03	10.35	10.24	7.65	1.00	7.65
		102	26.7	0.03	0.82	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	44.8	0.03	0.82	4.335	1.23	1.8424	10.35	0.02	0.44	10.81	9.88	8.11	1.25	6.49
		103	26.3	0.01	-1.21	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	44.4	0.01	1.21	4.335	1.23	1.8424	10.25	0.01	0.66	10.92	9.58	8.22	1.25	6.57
		104	28.4	-0.56	0.03	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	46.5	0.56	0.03	4.335	1.23	1.8424	10.73	0.46	0.01	11.21	10.26	8.51	1.25	6.80
		105	25.1	0.49	-0.23	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	43.2	0.49	0.23	4.335	1.23	1.8424	9.96	0.40	0.12	10.48	9.44	7.78	1.25	6.22
		106	24.4	0.03	0.82	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	42.5	0.03	0.82	4.335	1.23	1.8424	9.80	0.03	0.45	10.27	9.33	7.57	1.00	7.57
		107	24.0	0.02	-1.21	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	42.1	0.02	1.21	4.335	1.23	1.8424	9.70	0.01	0.66	10.37	9.03	7.67	1.00	7.67
		108	26.1	-0.56	0.03	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	44.2	0.56	0.03	4.335	1.23	1.8424	10.19	0.45	0.02	10.66	9.72	7.96	1.00	7.96
		109	22.7	0.50	-0.22	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	40.8	0.50	0.22	4.335	1.23	1.8424	9.41	0.40	0.12	9.94	8.89	7.24	1.00	7.24
		110	27.9	0.04	4.83	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	46.0	0.04	4.83	4.335	1.23	1.8424	10.60	0.03	2.62	13.25	7.96	10.55	1.25	8.44
		111	25.2	0.02	-4.95	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	43.3	0.02	4.95	4.335	1.23	1.8424	9.99	0.01	2.69	12.69	7.29	9.99	1.25	8.00
		112	31.5	-1.22	0.01	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	49.6	1.22	0.01	4.335	1.23	1.8424	11.44	0.99	0.00	12.43	10.44	9.73	1.25	7.79
		113	21.6	1.27	-0.13	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	39.7	1.27	0.13	4.335	1.23	1.8424	9.16	1.03	0.07	10.26	8.06	7.56	1.25	6.05
		114	25.5	0.04	4.83	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	43.6	0.04	4.83	4.335	1.23	1.8424	10.06	0.03	2.62	12.72	7.40	10.02	1.00	10.02
		115	22.9	0.02	-4.95	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	41.0	0.02	4.95	4.335	1.23	1.8424	9.45	0.02	2.69	12.15	6.74	9.45	1.00	9.45
		116	29.1	-1.21	0.01	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	47.2	1.21	0.01	4.335	1.23	1.8424	10.89	0.99	0.01	11.89	9.90	9.19	1.00	9.19
		117	19.2	1.27	-0.13	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	37.3	1.27	0.13	4.335	1.23	1.8424	8.61	1.04	0.07	9.72	7.51	7.02	1.00	7.02
		118	22.0	0.03	0.83	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	40.1	0.03	0.83	4.335	1.23	1.8424	9.24	0.03	0.45	9.72	8.77	7.02	1.00	7.02
		119	21.5	0.02	-1.20	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	39.7	0.02	1.20	4.335	1.23	1.8424	9.15	0.01	0.65	9.81	8.48	7.11	1.00	7.11
		120	23.6	-0.56	0.04	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	41.7	0.56	0.04	4.335	1.23	1.8424	9.63	0.46	0.02	10.10	9.16	7.40	1.00	7.40
		121	20.3	0.49	-0.22	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	38.4	0.49	0.22	4.335	1.23	1.8424	8.86	0.40	0.12	9.38	8.34	6.68	1.00	6.68
		122	23.1	0.04	4.84	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	41.2	0.04	4.84	4.335	1.23	1.8424	9.50	0.03	2.63	12.16	6.84	9.46	1.00	9.46
		123	20.4	0.02	-4.94	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	38.5	0.02	4.94	4.335	1.23	1.8424	8.89	0.02	2.68	11.59	6.19	8.89	1.00	8.89
		124	26.7	-1.21	0.02	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	44.8	1.21	0.02	4.335	1.23	1.8424	10.34	0.99	0.01	11.33	9.34	8.63	1.00	8.63
		125	16.8	1.27	-0.12	0.23	0.45	0.3	2.55	1.7	3.2513	14.8526	34.9	1.27	0.12	4.335	1.23	1.8424	8.06	1.03	0.07	9.16	6.95	6.46	1.00	6.46

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	

5.2.4 Checking of footings for max basepressure combination FOR F3

NET SBC = 10 t/m2 Density Of Soil= 1.8 t/m3 DIST b/W FNL & FGL/FFL= 0.75 m(over burden soil wt)

GROSS SBC = 12.7 t/m2 SBC for WL/EQ= 15.2 t/m2 Depth of found fromFGL 1.5 m

Footing marked	Column Node	L/C	Fy	Mx	Mz	Column Size		Footing Size			self weight	overburden soil wt	P	Mx	My	A	Zx	Zy	P/A	MX/ZX	MY/Zy	Pmax	Pmin	Pmax net	SBC factor	final SBC
						ZD	YD	Th of foting	Along X	Along Z																
F4	11	101	47.7	-0.54	0.27	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	73.9	0.54	0.27	6.25	2.6	2.6042	11.83	0.21	0.10	12.14	11.52	9.44	1.00	9.44
		102	47.9	-0.59	0.81	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	74.2	0.59	0.81	6.25	2.6	2.6042	11.87	0.23	0.31	12.40	11.33	9.70	1.25	7.76
		103	47.5	-0.56	-0.26	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	73.7	0.56	0.26	6.25	2.6	2.6042	11.80	0.22	0.10	12.11	11.48	9.41	1.25	7.53
		104	47.4	-2.31	0.29	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	73.7	2.31	0.29	6.25	2.6	2.6042	11.79	0.89	0.11	12.78	10.79	10.08	1.25	8.07
		105	49.0	2.16	0.21	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	75.3	2.16	0.21	6.25	2.6	2.6042	12.04	0.83	0.08	12.95	11.13	10.25	1.25	8.20
		106	43.0	-0.61	0.82	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	69.2	0.61	0.82	6.25	2.6	2.6042	11.08	0.23	0.32	11.63	10.53	8.93	1.00	8.93
		107	42.5	-0.58	-0.25	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	68.8	0.58	0.25	6.25	2.6	2.6042	11.01	0.22	0.09	11.33	10.69	8.63	1.00	8.63
		108	42.5	-2.33	0.30	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	68.7	2.33	0.30	6.25	2.6	2.6042	11.00	0.89	0.12	12.01	9.99	9.31	1.00	9.31
		109	44.1	2.13	0.23	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	70.3	2.13	0.23	6.25	2.6	2.6042	11.25	0.82	0.09	12.16	10.35	9.46	1.00	9.46
		110	48.9	-0.69	2.39	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	75.1	0.69	2.39	6.25	2.6	2.6042	12.02	0.26	0.92	13.21	10.84	10.51	1.25	8.41
		111	46.5	-0.40	-1.86	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	72.8	0.40	1.86	6.25	2.6	2.6042	11.64	0.15	0.71	12.51	10.77	9.81	1.25	7.85
		112	48.5	-3.67	0.26	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	74.7	3.67	0.26	6.25	2.6	2.6042	11.96	1.41	0.10	13.47	10.45	10.77	1.25	8.61
		113	46.9	2.58	0.27	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	73.2	2.58	0.27	6.25	2.6	2.6042	11.70	0.99	0.10	12.80	10.61	10.10	1.25	8.08
		114	43.9	-0.71	2.41	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	70.2	0.71	2.41	6.25	2.6	2.6042	11.23	0.27	0.92	12.43	10.04	9.73	1.00	9.73
		115	41.5	-0.42	-1.85	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	67.8	0.42	1.85	6.25	2.6	2.6042	10.85	0.16	0.71	11.72	9.98	9.02	1.00	9.02
		116	43.5	-3.69	0.27	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	69.8	3.69	0.27	6.25	2.6	2.6042	11.17	1.42	0.11	12.69	9.65	9.99	1.00	9.99
		117	42.0	2.56	0.29	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	68.2	2.56	0.29	6.25	2.6	2.6042	10.91	0.98	0.11	12.01	9.82	9.31	1.00	9.31
		118	38.7	-0.55	0.80	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	65.0	0.55	0.80	6.25	2.6	2.6042	10.39	0.21	0.31	10.91	9.88	8.21	1.00	8.21
		119	38.3	-0.53	-0.28	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	64.5	0.53	0.28	6.25	2.6	2.6042	10.32	0.20	0.11	10.63	10.02	7.93	1.00	7.93
		120	38.2	-2.27	0.28	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	64.5	2.27	0.28	6.25	2.6	2.6042	10.31	0.87	0.11	11.29	9.33	8.59	1.00	8.59
		121	39.8	2.19	0.20	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	66.0	2.19	0.20	6.25	2.6	2.6042	10.57	0.84	0.08	11.48	9.65	8.78	1.00	8.78
		122	39.7	-0.66	2.38	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	65.9	0.66	2.38	6.25	2.6	2.6042	10.55	0.25	0.91	11.71	9.38	9.01	1.00	9.01
		123	37.3	-0.36	-1.87	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	63.5	0.36	1.87	6.25	2.6	2.6042	10.17	0.14	0.72	11.02	9.31	8.32	1.00	8.32
		124	39.3	-3.64	0.25	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	65.5	3.64	0.25	6.25	2.6	2.6042	10.48	1.40	0.09	11.98	8.99	9.28	1.00	9.28
		125	37.7	2.62	0.26	0.23	0.45	0.3	2.5	2.5	4.6875	21.5742	63.9	2.62	0.26	6.25	2.6	2.6042	10.23	1.00	0.10	11.33	9.13	8.63	1.00	8.63

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	

5.2.5 Checking of footings for max basepressure combination FOR F5

NET SBC = 10 t/m2 Density Of Soil= 1.8 t/m3 DIST b/W FNL & FGL/FFL= 0 m(over burden soil wt)

GROSS SBC = 12.7 t/m2 SBC for WL/EQ= 15.2 t/m2 Depth of found fromFGL 1.5 m

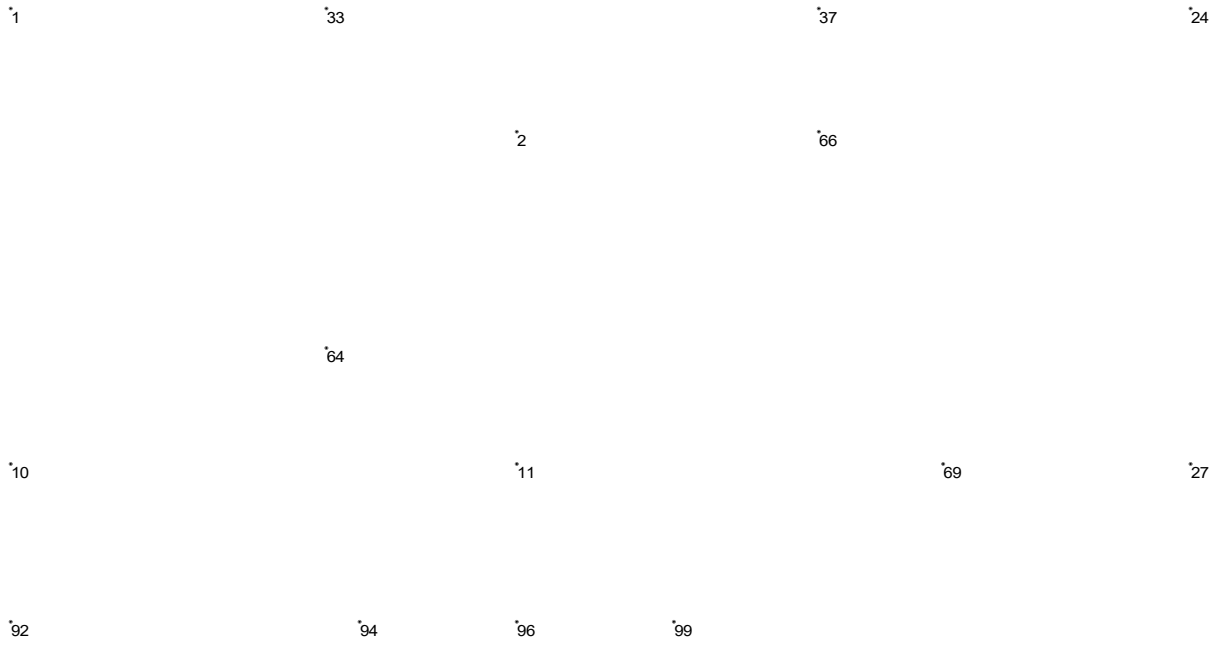
Footing marked	Column Node	L/C	Fy	Mx	Mz	Column Size		Footing Size			self weight	overburden soil wt	P	Mx	My	A	Zx	Zy	P/A	MX/ZX	MY/Zy	Pmax	Pmin	Pmax net	SBC factor	final SBC
						ZD	YD	Th of foting	Along X	Along Z																
F5	92	101	4.4	-0.01	-0.02	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.5	0.01	0.02	1.44	0.29	0.288	5.89	0.05	0.07	6.01	5.76	3.31	1.00	3.31
		102	4.3	0.02	0.24	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.3	0.02	0.24	1.44	0.29	0.288	5.77	0.06	0.82	6.64	4.90	3.94	1.25	3.15
		103	4.5	0.00	-0.28	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.6	0.00	0.28	1.44	0.29	0.288	5.95	0.00	0.95	6.91	4.99	4.21	1.25	3.37
		104	5.9	-0.51	-0.06	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	10.0	0.51	0.06	1.44	0.29	0.288	6.93	1.75	0.20	8.89	4.98	6.19	1.25	4.95
		105	2.5	0.58	0.07	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.5	0.58	0.07	1.44	0.29	0.288	4.51	2.00	0.24	6.75	2.26	4.05	1.25	3.24
		106	4.1	0.02	0.23	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.1	0.02	0.23	1.44	0.29	0.288	5.63	0.06	0.80	6.49	4.77	3.79	1.00	3.79
		107	4.3	0.00	-0.28	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.4	0.00	0.28	1.44	0.29	0.288	5.81	0.00	0.97	6.79	4.84	4.09	1.00	4.09
		108	5.7	-0.50	-0.06	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	9.8	0.50	0.06	1.44	0.29	0.288	6.80	1.75	0.22	8.76	4.83	6.06	1.00	6.06
		109	2.3	0.58	0.06	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.3	0.58	0.06	1.44	0.29	0.288	4.37	2.00	0.22	6.59	2.14	3.89	1.00	3.89
		110	3.8	-0.02	0.95	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.8	0.02	0.95	1.44	0.29	0.288	5.44	0.07	3.28	8.78	2.09	6.08	1.25	4.87
		111	5.1	-0.01	-0.99	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	9.1	0.01	0.99	1.44	0.29	0.288	6.34	0.03	3.43	9.79	2.88	7.09	1.25	5.67
		112	6.6	-0.84	-0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	10.6	0.84	0.05	1.44	0.29	0.288	7.36	2.92	0.17	10.45	4.27	7.75	1.25	6.20
		113	2.3	0.81	0.01	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.4	0.81	0.01	1.44	0.29	0.288	4.41	2.83	0.02	7.26	1.56	4.56	1.25	3.65
		114	3.6	-0.02	0.94	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.02	0.94	1.44	0.29	0.288	5.30	0.06	3.26	8.62	1.97	5.92	1.00	5.92
		115	4.9	-0.01	-0.99	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.9	0.01	0.99	1.44	0.29	0.288	6.20	0.02	3.45	9.67	2.73	6.97	1.00	6.97
		116	6.4	-0.84	-0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	10.4	0.84	0.05	1.44	0.29	0.288	7.22	2.92	0.18	10.32	4.12	7.62	1.00	7.62
		117	2.1	0.82	0.00	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.2	0.82	0.00	1.44	0.29	0.288	4.27	2.83	0.00	7.11	1.43	4.41	1.00	4.41
		118	3.6	0.02	0.23	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.7	0.02	0.23	1.44	0.29	0.288	5.34	0.07	0.81	6.21	4.46	3.51	1.00	3.51
		119	3.9	0.00	-0.28	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.9	0.00	0.28	1.44	0.29	0.288	5.52	0.01	0.96	6.49	4.55	3.79	1.00	3.79
		120	5.3	-0.50	-0.06	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	9.4	0.50	0.06	1.44	0.29	0.288	6.50	1.74	0.21	8.45	4.55	5.75	1.00	5.75
		121	1.8	0.58	0.07	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.9	0.58	0.07	1.44	0.29	0.288	4.07	2.01	0.23	6.32	1.83	3.62	1.00	3.62
		122	3.2	-0.02	0.94	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.2	0.02	0.94	1.44	0.29	0.288	5.00	0.06	3.27	8.34	1.67	5.64	1.00	5.64
		123	4.5	-0.01	-0.99	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.5	0.01	0.99	1.44	0.29	0.288	5.90	0.02	3.44	9.36	2.45	6.66	1.00	6.66
		124	5.9	-0.84	-0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	10.0	0.84	0.05	1.44	0.29	0.288	6.93	2.91	0.18	10.02	3.84	7.32	1.00	7.32
		125	1.7	0.82	0.00	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.7	0.82	0.00	1.44	0.29	0.288	3.98	2.84	0.01	6.82	1.13	4.12	1.00	4.12

Project	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK																									
F5	94	101	3.8	-0.01	0.11	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.8	0.01	0.11	1.44	0.29	0.288	5.44	0.04	0.39	5.86	5.01	3.16	1.00	3.16
		102	3.6	-0.01	0.41	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.01	0.41	1.44	0.29	0.288	5.29	0.02	1.43	6.74	3.84	4.04	1.25	3.23
		103	4.0	-0.02	-0.19	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.0	0.02	0.19	1.44	0.29	0.288	5.58	0.06	0.65	6.29	4.88	3.59	1.25	2.87
		104	3.9	-0.28	0.07	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.0	0.28	0.07	1.44	0.29	0.288	5.52	0.97	0.23	6.72	4.33	4.02	1.25	3.21
		105	3.6	0.75	0.22	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.75	0.22	1.44	0.29	0.288	5.28	2.60	0.78	8.66	1.90	5.96	1.25	4.77
		106	3.6	-0.01	0.41	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.01	0.41	1.44	0.29	0.288	5.30	0.02	1.43	6.74	3.85	4.04	1.00	4.04
		107	4.0	-0.02	-0.19	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.0	0.02	0.19	1.44	0.29	0.288	5.59	0.06	0.65	6.30	4.88	3.60	1.00	3.60
		108	3.9	-0.28	0.06	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.0	0.28	0.06	1.44	0.29	0.288	5.53	0.97	0.22	6.72	4.34	4.02	1.00	4.02
		109	3.6	0.75	0.22	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.75	0.22	1.44	0.29	0.288	5.29	2.60	0.77	8.66	1.91	5.96	1.00	5.96
		110	2.6	-0.03	1.29	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.6	0.03	1.29	1.44	0.29	0.288	4.61	0.10	4.48	9.19	0.03	6.49	1.25	5.19
		111	5.0	0.00	-1.07	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	9.0	0.00	1.07	1.44	0.29	0.288	6.26	0.01	3.70	9.98	2.54	7.28	1.25	5.83
		112	3.9	-0.55	0.08	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.0	0.55	0.08	1.44	0.29	0.288	5.52	1.92	0.26	7.71	3.33	5.01	1.25	4.01
		113	3.7	0.53	0.15	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.7	0.53	0.15	1.44	0.29	0.288	5.35	1.84	0.51	7.71	3.00	5.01	1.25	4.00
		114	2.6	-0.03	1.29	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.6	0.03	1.29	1.44	0.29	0.288	4.62	0.09	4.48	9.19	0.05	6.49	1.00	6.49
		115	5.0	0.00	-1.07	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	9.0	0.00	1.07	1.44	0.29	0.288	6.27	0.01	3.71	9.99	2.55	7.29	1.00	7.29
		116	3.9	-0.55	0.07	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.0	0.55	0.07	1.44	0.29	0.288	5.53	1.92	0.26	7.71	3.35	5.01	1.00	5.01
		117	3.7	0.53	0.15	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.7	0.53	0.15	1.44	0.29	0.288	5.36	1.84	0.51	7.71	3.01	5.01	1.00	5.01
		118	3.2	0.00	0.40	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.2	0.00	0.40	1.44	0.29	0.288	5.03	0.01	1.39	6.44	3.63	3.74	1.00	3.74
		119	3.6	-0.02	-0.20	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.7	0.02	0.20	1.44	0.29	0.288	5.32	0.06	0.69	6.07	4.58	3.37	1.00	3.37
		120	3.5	-0.28	0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.28	0.05	1.44	0.29	0.288	5.26	0.97	0.18	6.41	4.12	3.71	1.00	3.71
		121	3.2	0.75	0.21	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.2	0.75	0.21	1.44	0.29	0.288	5.02	2.61	0.74	8.37	1.67	5.67	1.00	5.67
		122	2.2	-0.03	1.28	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.3	0.03	1.28	1.44	0.29	0.288	4.35	0.09	4.44	8.88	-0.17	6.18	1.00	6.18
		123	4.6	0.01	-1.08	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.6	0.01	1.08	1.44	0.29	0.288	6.01	0.02	3.75	9.77	2.24	7.07	1.00	7.07
		124	3.5	-0.55	0.06	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.55	0.06	1.44	0.29	0.288	5.27	1.92	0.22	7.41	3.13	4.71	1.00	4.71
		125	3.3	0.53	0.14	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.3	0.53	0.14	1.44	0.29	0.288	5.09	1.85	0.47	7.41	2.78	4.71	1.00	4.71
F5	96	101	3.0	-0.05	0.08	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.0	0.05	0.08	1.44	0.29	0.288	4.88	0.18	0.29	5.35	4.41	2.65	1.00	2.65
		102	2.9	-0.06	0.40	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.0	0.06	0.40	1.44	0.29	0.288	4.84	0.19	1.38	6.40	3.27	3.70	1.25	2.96
		103	3.1	-0.07	-0.22	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.1	0.07	0.22	1.44	0.29	0.288	4.93	0.24	0.78	5.95	3.91	3.25	1.25	2.60
		104	3.9	-0.23	0.04	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.9	0.23	0.04	1.44	0.29	0.288	5.50	0.80	0.13	6.42	4.57	3.72	1.25	2.98
		105	1.3	-0.16	0.20	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.4	0.16	0.20	1.44	0.29	0.288	3.72	0.56	0.69	4.97	2.47	2.27	1.25	1.82
		106	2.9	-0.05	0.39	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.9	0.05	0.39	1.44	0.29	0.288	4.81	0.17	1.37	6.34	3.27	3.64	1.00	3.64
		107	3.0	-0.06	-0.23	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.1	0.06	0.23	1.44	0.29	0.288	4.90	0.22	0.78	5.90	3.90	3.20	1.00	3.20
		108	3.8	-0.22	0.03	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.9	0.22	0.03	1.44	0.29	0.288	5.47	0.77	0.12	6.36	4.57	3.66	1.00	3.66
		109	1.3	-0.15	0.20	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.3	0.15	0.20	1.44	0.29	0.288	3.69	0.53	0.69	4.91	2.47	2.21	1.00	2.21
		110	2.8	-0.03	1.32	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.9	0.03	1.32	1.44	0.29	0.288	4.77	0.11	4.58	9.46	0.07	6.76	1.25	5.41
		111	3.1	-0.07	-1.15	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.2	0.07	1.15	1.44	0.29	0.288	4.99	0.25	4.00	9.23	0.75	6.53	1.25	5.23
		112	4.2	-0.93	0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.2	0.93	0.05	1.44	0.29	0.288	5.71	3.23	0.17	9.10	2.31	6.40	1.25	5.12
		113	1.8	0.83	0.12	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.8	0.83	0.12	1.44	0.29	0.288	4.05	2.88	0.42	7.34	0.76	4.64	1.25	3.71
		114	2.8	-0.02	1.32	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.8	0.02	1.32	1.44	0.29	0.288	4.73	0.08	4.58	9.39	0.08	6.69	1.00	6.69

		115	3.1	-0.06	-1.15	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.1	0.06	1.15	1.44	0.29	0.288	4.96	0.22	4.00	9.19	0.74	6.49	1.00	6.49
		116	4.1	-0.92	0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	8.2	0.92	0.05	1.44	0.29	0.288	5.68	3.20	0.16	9.04	2.31	6.34	1.00	6.34
		117	1.7	0.84	0.12	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.8	0.84	0.12	1.44	0.29	0.288	4.02	2.90	0.41	7.33	0.71	4.63	1.00	4.63
		118	2.6	-0.04	0.39	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.6	0.04	0.39	1.44	0.29	0.288	4.60	0.15	1.34	6.10	3.11	3.40	1.00	3.40
		119	2.7	-0.06	-0.23	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.8	0.06	0.23	1.44	0.29	0.288	4.69	0.20	0.81	5.71	3.68	3.01	1.00	3.01
		120	3.5	-0.22	0.03	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.22	0.03	1.44	0.29	0.288	5.26	0.76	0.09	6.11	4.41	3.41	1.00	3.41
		121	1.0	-0.15	0.19	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.0	0.15	0.19	1.44	0.29	0.288	3.49	0.51	0.66	4.66	2.31	1.96	1.00	1.96
		122	2.5	-0.02	1.31	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.5	0.02	1.31	1.44	0.29	0.288	4.53	0.07	4.55	9.15	-0.08	6.45	1.00	6.45
		123	2.8	-0.06	-1.16	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.9	0.06	1.16	1.44	0.29	0.288	4.76	0.21	4.03	9.00	0.51	6.30	1.00	6.30
		124	3.8	-0.92	0.04	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.9	0.92	0.04	1.44	0.29	0.288	5.47	3.19	0.13	8.79	2.15	6.09	1.00	6.09
		125	1.5	0.84	0.11	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.5	0.84	0.11	1.44	0.29	0.288	3.82	2.92	0.38	7.12	0.52	4.42	1.00	4.42
F5	99	101	1.7	0.03	0.08	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.7	0.03	0.08	1.44	0.29	0.288	3.99	0.11	0.28	4.37	3.60	1.67	1.00	1.67
		102	2.1	0.01	0.36	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.1	0.01	0.36	1.44	0.29	0.288	4.26	0.04	1.24	5.54	2.97	2.84	1.25	2.27
		103	1.3	0.04	-0.20	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.4	0.04	0.20	1.44	0.29	0.288	3.72	0.12	0.68	4.52	2.92	1.82	1.25	1.45
		104	1.6	-0.27	0.04	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.7	0.27	0.04	1.44	0.29	0.288	3.94	0.94	0.14	5.02	2.85	2.32	1.25	1.86
		105	1.9	0.85	0.18	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.9	0.85	0.18	1.44	0.29	0.288	4.10	2.97	0.61	7.67	0.53	4.97	1.25	3.98
		106	2.1	0.01	0.36	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	6.1	0.01	0.36	1.44	0.29	0.288	4.24	0.02	1.24	5.50	2.98	2.80	1.00	2.80
		107	1.3	0.03	-0.20	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.3	0.03	0.20	1.44	0.29	0.288	3.70	0.10	0.68	4.49	2.92	1.79	1.00	1.79
		108	1.6	-0.28	0.04	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.6	0.28	0.04	1.44	0.29	0.288	3.92	0.96	0.14	5.02	2.82	2.32	1.00	2.32
		109	1.8	0.85	0.17	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.9	0.85	0.17	1.44	0.29	0.288	4.08	2.95	0.60	7.63	0.53	4.93	1.00	4.93
		110	3.7	0.00	1.16	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.8	0.00	1.16	1.44	0.29	0.288	5.40	0.01	4.03	9.43	1.36	6.73	1.25	5.38
		111	-0.3	0.07	-1.00	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	3.7	0.07	1.00	1.44	0.29	0.288	2.58	0.23	3.47	6.28	-1.13	3.58	1.25	2.86
		112	1.7	-0.55	0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.7	0.55	0.05	1.44	0.29	0.288	3.97	1.92	0.18	6.07	1.86	3.37	1.25	2.70
		113	1.7	0.62	0.11	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.8	0.62	0.11	1.44	0.29	0.288	4.00	2.15	0.38	6.52	1.48	3.82	1.25	3.06
		114	3.7	-0.01	1.16	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.7	0.01	1.16	1.44	0.29	0.288	5.38	0.03	4.02	9.43	1.33	6.73	1.00	6.73
		115	-0.4	0.06	-1.00	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	3.7	0.06	1.00	1.44	0.29	0.288	2.56	0.21	3.48	6.25	-1.13	3.55	1.00	3.55
		116	1.7	-0.56	0.05	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.7	0.56	0.05	1.44	0.29	0.288	3.95	1.94	0.17	6.07	1.84	3.37	1.00	3.37
		117	1.7	0.61	0.11	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.7	0.61	0.11	1.44	0.29	0.288	3.99	2.13	0.37	6.48	1.49	3.78	1.00	3.78
		118	1.9	0.00	0.35	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.9	0.00	0.35	1.44	0.29	0.288	4.13	0.01	1.21	5.35	2.90	2.65	1.00	2.65
		119	1.1	0.03	-0.20	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.2	0.03	0.20	1.44	0.29	0.288	3.59	0.09	0.71	4.38	2.79	1.68	1.00	1.68
		120	1.4	-0.28	0.03	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.5	0.28	0.03	1.44	0.29	0.288	3.81	0.97	0.11	4.89	2.72	2.19	1.00	2.19
		121	1.7	0.85	0.17	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.7	0.85	0.17	1.44	0.29	0.288	3.97	2.94	0.57	7.48	0.46	4.78	1.00	4.78
		122	3.5	-0.01	1.15	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	7.6	0.01	1.15	1.44	0.29	0.288	5.26	0.03	4.00	9.30	1.23	6.60	1.00	6.60
		123	-0.5	0.06	-1.01	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	3.5	0.06	1.01	1.44	0.29	0.288	2.44	0.20	3.50	6.15	-1.26	3.45	1.00	3.45
		124	1.5	-0.56	0.04	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.5	0.56	0.04	1.44	0.29	0.288	3.84	1.95	0.15	5.94	1.74	3.24	1.00	3.24
		125	1.5	0.61	0.10	0.23	0.3	0.3	1.2	1.2	1.08	2.96136	5.6	0.61	0.10	1.44	0.29	0.288	3.87	2.12	0.34	6.33	1.41	3.63	1.00	3.63

5.2.6. FOOTING SCHEDULE

SNO	Grid Mkd	Footing Node-no	Footing Size Details in mm				Footing Reinforcement		No of columns	FOOTING MKD
			L	B	C	D	Ast1	Ast2		
1	A1 A2 A4 B3 C2	1 33 37 2 64	1900	1900		300	Y12-200	Y12-200	5	**F1**
2	D1 A6 D6 D5	10 24 27 69	2200	2200		300	Y12-150	Y12-150	3	**F2**
3	B4	66	2550	1700		300	Y12-150	Y12-150	1	**F3**
4	D3	11	2500	2500		350	Y12-125	Y12-125	1	**F4**
5	E grid		1200	1200		350	Y12-200	Y12-200	4	**F5**



PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F1

5.2.7 Design of Footing F1

Node Nos From Stadd: 1 33 37 2 64

Configuration of Column & Footing

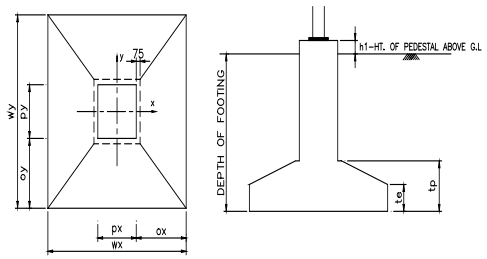
Width of column Along X axis	0.23	m
Width of column along Y axis	0.45	m
Ht above FGL & FFL	0.75	m
Depth of Foundation	1.50	m
Thickness of footing at edge	0.30	m
Thickness of footing at face of Ped.	0.30	m
Width of footing along X axis	1.90	m
Width of footing along Y axis	1.90	m
Total height	1.95	m

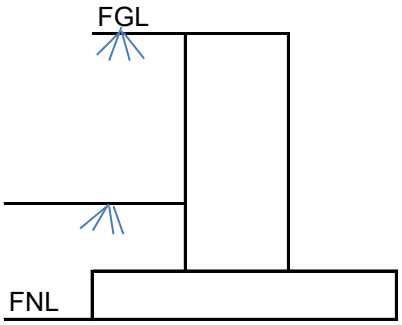
Design Specifications

Grade of Concrete	M	25
Grade of Steel	Fe	500
Cover to Reinf.(pedes) in mm		40
Cover to Reinf.(foot) in mm		50

Refer Enclosed Sketch for Configuration of Pedestal & footing

Self weight of footing	2.71	t
Soil weight betweenFGL&O.G.L	4.73	t
Soil weight above footing	7.57	t





LOAD COMBINATIONS	COMBINATIONS	Pmax	Net SBC	Pmin	BEARING CAPACITY
DL+LL	101	10.01	7.31	8.19	10
DL+WL/SL	106 to 109 114 to 1117 118 to 125	12.66	9.96	5.51	10
DL+LL+WL/SL	102 to 105 110 to 113	12.99	10.29	6.15	12.5

Load Combination For Design

	Load combination	P* (in t)	For Footing Design My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
101	DL+LL	32.85	0.095	0.944	10.01	7.31	8.19204	10	1.5	No Ten
102	DL+LL+WL(X)	32.69	0.398	0.934	10.22	7.52	7.8892	12.5	1.2	No Ten
103	DL+LL+WL(-X)	33.05	-0.294	0.893	10.19	7.49	8.11576	12.5	1.2	No Ten
104	DL+LL+WL(Z)	32.34	0.127	-0.647	9.634	6.93	8.28036	12.5	1.2	No Ten
105	DL+LL+WL(-Z)	33.17	0.039	3.276	12.09	9.39	6.28972	12.5	1.2	No Ten
106	DL+WL(X)	31.62	0.412	0.878	9.887	7.19	7.63009	12.5	1.5	No Ten
107	DL+WL(-X)	31.98	-0.28	0.836	9.835	7.13	7.8823	12.5	1.5	No Ten
108	DL+WL(Z)	31.27	0.141	-0.704	9.401	6.70	7.92269	12.5	1.5	No Ten
109	DL+WL(-Z)	32.11	0.052	3.22	11.76	9.06	6.03177	12.5	1.5	No Ten
110	DL+LL+EQ(X)	31.78	1.804	0.983	11.24	8.54	6.36406	10	1.2	No Ten
111	DL+LL+EQ(-X)	33.93	-1.614	0.905	11.6	8.90	7.19656	10	1.2	No Ten
112	DL+LL+EQ(Z)	31.17	0.125	-1.958	10.46	7.76	6.8123	10	1.2	No Ten
113	DL+LL+EQ(-Z)	34.54	0.064	3.846	12.99	10.29	6.14735	10	1.2	No Ten
114	DL+EQ(X)	30.71	1.817	0.927	10.91	8.21	6.10583	10	1.5	No Ten
115	DL+EQ(-X)	32.87	-1.6	0.848	11.25	8.55	6.9631	10	1.5	No Ten

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F1

	Load combination	P* (in t)	For Footing Design: My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
116	DL+EQ(Z)	30.10	0.139	-2.015	10.22	7.52	6.45463	10	1.5	No Ten
117	DL+EQ(-Z)	33.47	0.078	3.79	12.66	9.96	5.88853	10	1.5	No Ten
118	DL+WL(X)	29.94	0.401	0.789	9.335	6.63	7.25303	10	1.5	No Ten
119	DL+WL(-X)	30.30	-0.291	0.747	9.302	6.60	7.48571	10	1.5	No Ten
120	DL+WL(Z)	29.59	0.13	-0.792	9.004	6.30	7.39079	10	1.5	No Ten
121	DL+WL(-Z)	30.43	0.042	3.131	11.21	8.51	5.65383	10	1.5	No Ten
122	DL+EQ(X)	29.03	1.806	0.838	10.35	7.65	5.72876	10	1.5	No Ten
123	DL+EQ(-X)	31.19	-1.611	0.759	10.71	8.01	6.56679	10	1.5	No Ten
124	DL+EQ(Z)	28.43	0.128	-2.104	9.827	7.13	5.92185	10	1.5	No Ten
125	DL+EQ(-Z)	31.79	0.067	3.701	12.1	9.40	5.51118	10	1.5	No Ten

P* Vertical load from super structure + footing wt. +soil wt. + Pedestal wt.

Increase 25% under wind load and seismic load condition

Critical Design Forces and Moments at bottom of footing

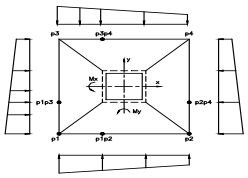
		Loads	Load factors
P	33.47-2.71-7.57-4.73	**18.46** t	
Mx	ABS(+ 3.79)	**3.79** tm	**1.5**
My	ABS(+ .078)	**0.08** tm	

P = Load from Super structure

le Load comb 117 DL+EQ(+Z) is Critical for design

Designed Vertical load	=	28.11	t
Moment with respect to X-axis	=	5.69	tm
Moment with respect to Y-axis	=	0.12	tm

18.46* 1.5+ 1.5*((2.71/2.5-1.90*1.90*0.30)*(2.5-1.8)+(1.50-0.30)*0.23*0.45*(2.5-1.8)+0.23*0.45*0.75*2.5)



Flexural Design of Footing

Ox	=	0.835	m
Oy	=	0.73	m

Calculation of net base pressures

				* p1/p2/p3/p4 +(x) t	x=	
p1	=	12.86	t/sqm	12.86 t/sqm		0
p2	=	12.66	t/sqm	12.66 t/sqm	*	
p3	=	2.92	t/sqm	2.92 t/sqm		
p4	=	2.71	t/sqm	2.71 t/sqm		

If p4 comes to -ve Value then a dummy pressure (x t/sqm) added from bottom and added from bottom and top to counteract the negative effect

p1p2	=	12.77	t/sqm
p2p4	=	8.86	t/sqm
p3p4	=	2.83	t/sqm
p1p3	=	9.07	t/sqm

BASE PRESSURES @ VARIOUS POINTS

$$p1 = \frac{P}{Wx*Wy} + \frac{Mx * 6}{Wy^2*Wx} + \frac{My * 6}{Wx^2*Wy}$$

$$p2 = \frac{P}{Wx*Wy} + \frac{Mx * 6}{Wy^2*Wx} - \frac{My * 6}{Wx^2*Wy}$$

$$p3 = \frac{P}{Wx*Wy} - \frac{Mx * 6}{Wy^2*Wx} + \frac{My * 6}{Wx^2*Wy}$$

$$p4 = \frac{P}{Wx*Wy} - \frac{Mx * 6}{Wy^2*Wx} - \frac{My * 6}{Wx^2*Wy}$$

$$p1p2 = p2+(p1-p2)\frac{(Wx-Ox)}{Wx}$$

$$p2p4 = p4+(p2-p4)\frac{(Wy-Oy)}{Wy}$$

$$p3p4 = p4+(p3-p4)\frac{(Wx-Ox)}{Wx}$$

$$p1p3 = p3+(p1-p3)\frac{(Wx-Oy)}{Wy}$$

Max. BM with respect to X-Axis (at face of pedestal)

BMx	=	5.74	tm		
bx	=	1.90	m		
M/bd2	=	0.52			
pt	=	**0.12**			
Ast	=	563.85	sqmm		
Ast per metre width	=	296.76	sqmm		
Provide **Y12-200**	=	**565.00**	sqmm	minimum Ast = **360**	sqmm
pt	=	0.24			

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F1

Max. BM with respect to Y-axis(at face of pedestal)

Bmy		=	5.20	tm				
by		=	1.90	m				
M/bd2		=	0.48					
pt		=	**0.11**					
Ast		=	510.23	sqmm				
Ast per metre width		=	268.54	sqmm				
Provide	**Y12-200**	=	**565.00**	sqmm	minimum Ast =	**360**		sqmm
pt		=	0.24					

Shear Design : tpeff. = 0.24

(A) Check for Two Way shear (ie Punching shear)

Desiged P =	28.11*(1.90*1.90-(0.23+0.24)*(0.45+0.24))/(1.90*1.90)	=	25.58	t	
a1 =	0.23+0.30-0.06	=	0.470	m	
a =	0.45+0.30-0.06	=	0.690	m	
t1 =	0.30+(0.30-0.30)*(.835-0.5*0.24)/(.835)	=	0.300	m	
t2 =	0.30+(0.30-0.30)*(0.73-0.5*0.24)/(0.73)	=	0.300	m	

Therefore Tv = **0.459** N/sqmm < Allowable Stress

1.25 n/sqmm

(B) Check for One way Shear

Calculation for Net base pressures at various points

p1'p2'	=	12.80	t/sqm				
p1'p3'	=	10.32	t/sqm				
p2'p4'	=	10.12	t/sqm				
p3'p4'	=	2.85	t/sqm				
a1	=	1.900	m				
a2	=	1.900	m				
t1	=	0.300	m	t1eff.	=	0.240	m
t2	=	0.300	m	t2eff	=	0.240	m

Tv with respect to X-Axis = ((12.86+12.66+10.32+10.12)/4- 0)*1.90*(0.73-0.24)/(100*(1.900*0.240+(0.240+(0.30-0.06))*(1.90-1.900)*0.5))

= **0.23** N/sqmm < Tc Hence ok

pt at this section = 0.24

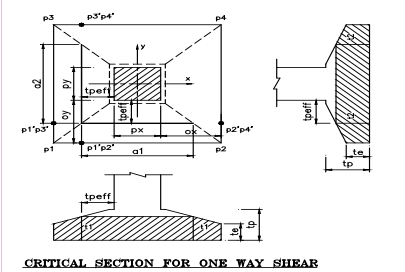
Tc from SP:16-1980 (clause 4.1) = **0.36** N/sqmm > Tv

Tv with respect to Y-Axis = ((12.86+2.92+12.80+2.85)/4- 0)*(1.90*(.835-0.24)/(100*(1.900*0.240+(0.240+(0.30-0.06))*(1.90-1.900)*0.5)))

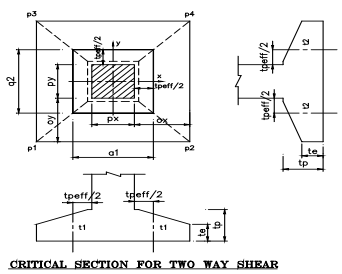
= **0.19** N/sqmm < Tc Hence ok

pt at this section = 0.24

Tc from SP:16-1980 (clause 4.1) = **0.36** N/sqmm > Tv



CRITICAL SECTION FOR ONE WAY SHEAR



CRITICAL SECTION FOR TWO WAY SHEAR

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F2

5.2.8 Design of Footing F2

Node Nos From Stadd: 10 24 27 69

Configuration of Column & Footing

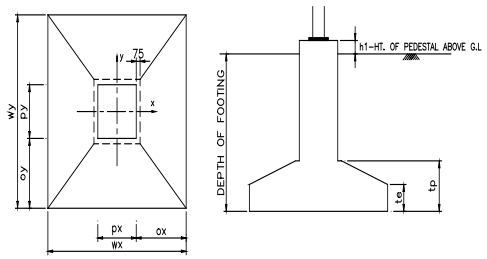
Width of column Along X axis	0.23	m
Width of column along Y axis	0.45	m
Ht above FGL & FFL	0.75	m
Depth of Foundation	1.50	m
Thickness of footing at edge	0.30	m
Thickness of footing at face of Ped.	0.30	m
Width of footing along X axis	2.20	m
Width of footing along Y axis	2.20	m
Total height	1.95	m

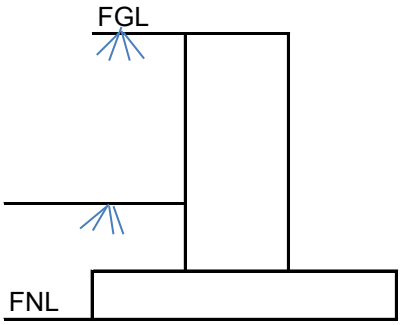
Design Specifications

Grade of Concrete	M	25
Grade of Steel	Fe	500
Cover to Reinf.(pedes) in mm		40
Cover to Reinf.(foot) in mm		50

Refer Enclosed Sketch for Configuration of Pedestal & footing

Self weight of footing	3.63 t
Soil weight betweenFGL&O.G.L	6.39 t
Soil weight above footing	10.23 t





LOAD COMBINATIONS	COMBINATIONS	Pmax	Net SBC	Pmin	BEARING CAPACITY
DL+LL	101	11.63	8.93	10.64	10
DL+WL/SL	106 to 109 114 to 1117 118 to 125	12.64	9.94	7.75	10
DL+LL+WL/SL	102 to 105 110 to 113	13.40	10.70	9.03	12.5

Load Combination For Design

	Load combination	P* (in t)	For Footing Design My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
101	DL+LL	53.92	0.332	-0.546	11.63	8.93	10.645	10	1.5	No Ten
102	DL+LL+WL(X)	53.58	0.883	-0.54	11.87	9.17	10.2688	12.5	1.2	No Ten
103	DL+LL+WL(-X)	54.24	-0.212	-0.502	11.61	8.91	10.8049	12.5	1.2	No Ten
104	DL+LL+WL(Z)	54.08	0.356	-1.625	12.29	9.59	10.0571	12.5	1.2	No Ten
105	DL+LL+WL(-Z)	53.80	0.276	0.726	11.68	8.98	10.5515	12.5	1.2	No Ten
106	DL+WL(X)	50.02	0.884	-0.489	11.11	8.41	9.56045	12.5	1.5	No Ten
107	DL+WL(-X)	50.68	-0.212	-0.451	10.84	8.14	10.0973	12.5	1.5	No Ten
108	DL+WL(Z)	50.51	0.356	-1.574	11.52	8.82	9.34927	12.5	1.5	No Ten
109	DL+WL(-Z)	50.24	0.276	0.777	10.97	8.27	9.78642	12.5	1.5	No Ten
110	DL+LL+EQ(X)	52.18	2.526	-0.575	12.53	9.83	9.03323	10	1.2	No Ten
111	DL+LL+EQ(-X)	55.65	-1.861	-0.516	12.84	10.14	10.1594	10	1.2	No Ten
112	DL+LL+EQ(Z)	54.57	0.324	-3.45	13.4	10.70	9.14781	10	1.2	No Ten
113	DL+LL+EQ(-Z)	53.26	0.34	2.359	12.53	9.83	9.48413	10	1.2	No Ten
114	DL+EQ(X)	48.61	2.526	-0.524	11.76	9.06	8.32561	10	1.5	No Ten
115	DL+EQ(-X)	52.09	-1.861	-0.465	12.07	9.37	9.45155	10	1.5	No Ten

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F2

	Load combination	P* (in t)	For Footing Design: My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
116	DL+EQ(Z)	51.00	0.325	-3.399	12.64	9.94	8.43941	10	1.5	No Ten
117	DL+EQ(-Z)	49.70	0.34	2.41	11.82	9.12	8.71903	10	1.5	No Ten
118	DL+WL(X)	47.01	0.85	-0.44	10.44	7.74	8.98532	10	1.5	No Ten
119	DL+WL(-X)	47.67	-0.245	-0.401	10.21	7.51	9.48498	10	1.5	No Ten
120	DL+WL(Z)	47.51	0.323	-1.525	10.86	8.16	8.77378	10	1.5	No Ten
121	DL+WL(-Z)	47.23	0.243	0.826	10.36	7.66	9.15551	10	1.5	No Ten
122	DL+EQ(X)	45.60	2.493	-0.475	11.09	8.39	7.74991	10	1.5	No Ten
123	DL+EQ(-X)	49.08	-1.894	-0.416	11.44	8.74	8.83866	10	1.5	No Ten
124	DL+EQ(Z)	47.99	0.292	-3.35	11.97	9.27	7.86372	10	1.5	No Ten
125	DL+EQ(-Z)	46.69	0.307	2.459	11.21	8.51	8.08812	10	1.5	No Ten

P* Vertical load from super structure + footing wt. +soil wt. + Pedestal wt.

Increase 25% under wind load and seismic load condition

Critical Design Forces and Moments at bottom of footing

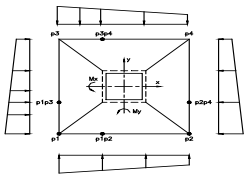
		Loads	Load factors
P	51.00-3.63-10.23-6.39	**30.75** t	
Mx	ABS(+-3.399)	**3.40** tm	**1.5**
My	ABS(+ .325)	**0.33** tm	

P = Load from Super structure

le Load comb 116 DL+EQ(+Z) is Critical for design

Designed Vertical load	=	46.54	t
Moment with respect to X-axis	=	5.10	tm
Moment with respect to Y-axis	=	0.49	tm

30.75* 1.5+ 1.5*((3.63/2.5-2.20*2.20*0.30)*(2.5-1.8)+(1.50-0.30)*0.23*0.45*(2.5-1.8)+0.23*0.45*0.75*2.5)



Flexural Design of Footing

Ox	=	0.985	m
Oy	=	0.88	m

Calculation of net base pressures

				* p1/p2/p3/p4 +(x) t	x=	
p1	=	12.76	t/sqm	12.76 t/sqm		0
p2	=	12.21	t/sqm	12.21 t/sqm	*	
p3	=	7.02	t/sqm	7.02 t/sqm		
p4	=	6.47	t/sqm	6.47 t/sqm		

If p4 comes to -ve Value then a dummy pressure (x t/sqm) added from bottom and added from bottom and top to counteract the negative effect

p1p2	=	12.52	t/sqm
p2p4	=	9.93	t/sqm
p3p4	=	6.77	t/sqm
p1p3	=	10.48	t/sqm

BASE PRESSURES @ VARIOUS POINTS

$$p1 = \frac{P}{Wx*Wy} + \frac{Mx * 6}{Wy^2*Wx} + \frac{My * 6}{Wx^2*Wy}$$

$$p2 = \frac{P}{Wx*Wy} + \frac{Mx * 6}{Wy^2*Wx} - \frac{My * 6}{Wx^2*Wy}$$

$$p3 = \frac{P}{Wx*Wy} - \frac{Mx * 6}{Wy^2*Wx} + \frac{My * 6}{Wx^2*Wy}$$

$$p4 = \frac{P}{Wx*Wy} - \frac{Mx * 6}{Wy^2*Wx} - \frac{My * 6}{Wx^2*Wy}$$

$$p1p2 = p2+(p1-p2)\frac{(Wx-Ox)}{Wx}$$

$$p2p4 = p4+(p2-p4)\frac{(Wy-Oy)}{Wy}$$

$$p3p4 = p4+(p3-p4)\frac{(Wx-Ox)}{Wx}$$

$$p1p3 = p3+(p1-p3)\frac{(Wx-Oy)}{Wy}$$

Max. BM with respect to X-Axis (at face of pedestal)

BMx	=	9.88	tm		
bx	=	2.20	m		
M/bd2	=	0.78			
pt	=	**0.19**			
Ast	=	983.01	sqmm		
Ast per metre width	=	446.82	sqmm		
Provide **Y12-150**	=	**753.33**	sqmm	minimum Ast = **360**	sqmm
pt	=	0.31			

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F2

Max. BM with respect to Y-axis(at face of pedestal)

Bmy	=	10.47	tm				
by	=	2.20	m				
M/bd2	=	0.83					
pt	=	**0.20**					
Ast	=	1044.57	sqmm				
Ast per metre width	=	474.81	sqmm				
Provide **Y12-150**	=	**753.33**	sqmm	minimum Ast =	**360**		sqmm
pt	=	0.31					

Shear Design : tpeff. = 0.24

(A) Check for Two Way shear (ie Punching shear)

Desiged P =	46.54*(2.20*2.20-(0.23+0.24)*(0.45+0.24))/(2.20*2.20)	=	43.42	t	
a1 =	0.23+0.30-0.06	=	0.470	m	
a =	0.45+0.30-0.06	=	0.690	m	
t1 =	0.30+(0.30-0.30)*(.985-0.5*0.24)/(.985)	=	0.300	m	
t2 =	0.30+(0.30-0.30)*(0.88-0.5*0.24)/(0.88)	=	0.300	m	

Therefore Tv = **0.780** N/sqmm < Allowable Stress

1.25 n/sqmm

(B) Check for One way Shear

Calculation for Net base pressures at various points

p1'p2'	=	12.58	t/sqm				
p1'p3'	=	11.11	t/sqm				
p2'p4'	=	10.56	t/sqm				
p3'p4'	=	6.83	t/sqm				
a1	=	2.200	m				
a2	=	2.200	m				
t1	=	0.300	m	t1eff.	=	0.240	m
t2	=	0.300	m	t2eff	=	0.240	m

Tv with respect to X-Axis = ((12.76+12.21+11.11+10.56)/4- 0)*2.20*(0.88-0.24)/(100*(2.200*0.240+(0.240+(0.30-0.06))*(2.20-2.200)*0.5))

= **0.31** N/sqmm < Tc Hence ok

pt at this section = 0.31

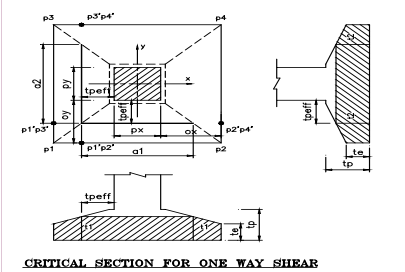
Tc from SP:16-1980 (clause 4.1) = **0.40** N/sqmm > Tv

Tv with respect to Y-Axis = ((12.76+7.02+12.58+6.83)/4- 0)*(2.20*(.985-0.24)/(100*(2.200*0.240+(0.240+(0.30-0.06))*(2.20-2.200)*0.5)))

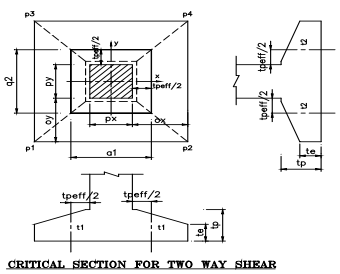
= **0.30** N/sqmm < Tc Hence ok

pt at this section = 0.31

Tc from SP:16-1980 (clause 4.1) = **0.40** N/sqmm > Tv



CRITICAL SECTION FOR ONE WAY SHEAR



CRITICAL SECTION FOR TWO WAY SHEAR

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F3

5.2.9 Design of Footing F3

Node Nos From Stadd

66

Configuration of Column & Footing

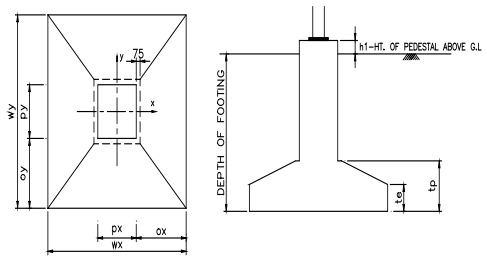
Width of column Along X axis	0.45	m
Width of column along Y axis	0.23	m
Ht above FGL & FFL	0.75	m
Depth of Foundation	1.50	m
Thickness of footing at edge	0.30	m
Thickness of footing at face of Ped.	0.30	m
Width of footing along X axis	2.55	m
Width of footing along Y axis	1.70	m
Total height	1.95	m

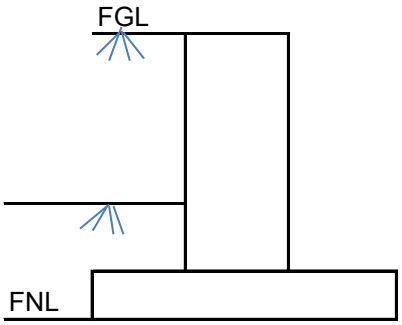
Design Specifications

Grade of Concrete	M	25
Grade of Steel	Fe	500
Cover to Reinf.(pedes) in mm		40
Cover to Reinf.(foot) in mm		50

Refer Enclosed Sketch for Configuration of Pedestal & footing

Self weight of footing	3.25	t
Soil weight betweenFGL&O.G.L	5.71	t
Soil weight above footing	9.14	t





LOAD COMBINATIONS	COMBINATIONS	Pmax	Net SBC	Pmin	BEARING CAPACITY
DL+LL	101	10.35	7.65	10.24	10
DL+WL/SL	106 to 109 114 to 1117 118 to 125	12.72	10.02	6.19	10
DL+LL+WL/SL	102 to 105 110 to 113	13.25	10.55	7.29	12.5

Load Combination For Design

	Load combination	P* (in t)	For Footing Design My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
101	DL+LL	44.65	-0.063	0.025	10.35	7.65	10.2448	10	1.5	No Ten
102	DL+LL+WL(X)	44.85	0.816	0.027	10.81	8.11	9.88063	12.5	1.2	No Ten
103	DL+LL+WL(-X)	44.43	-1.212	0.011	10.92	8.22	9.58344	12.5	1.2	No Ten
104	DL+LL+WL(Z)	46.53	0.025	-0.562	11.21	8.51	10.2629	12.5	1.2	No Ten
105	DL+LL+WL(-Z)	43.17	-0.227	0.489	10.48	7.78	9.43825	12.5	1.2	No Ten
106	DL+WL(X)	42.48	0.821	0.034	10.27	7.57	9.32619	12.5	1.5	No Ten
107	DL+WL(-X)	42.07	-1.207	0.018	10.37	7.67	9.03444	12.5	1.5	No Ten
108	DL+WL(Z)	44.17	0.029	-0.555	10.66	7.96	9.72059	12.5	1.5	No Ten
109	DL+WL(-Z)	40.81	-0.223	0.496	9.939	7.24	8.88893	12.5	1.5	No Ten
110	DL+LL+EQ(X)	45.97	4.827	0.035	13.25	10.55	7.95632	10	1.2	No Ten
111	DL+LL+EQ(-X)	43.32	-4.952	0.016	12.69	9.99	7.2931	10	1.2	No Ten
112	DL+LL+EQ(Z)	49.59	0.007	-1.217	12.43	9.73	10.445	10	1.2	No Ten
113	DL+LL+EQ(-Z)	39.70	-0.133	1.267	10.26	7.56	8.05516	10	1.2	No Ten
114	DL+EQ(X)	43.60	4.831	0.042	12.72	10.02	7.40243	10	1.5	No Ten
115	DL+EQ(-X)	40.96	-4.947	0.022	12.15	9.45	6.74491	10	1.5	No Ten

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F3

	Load combination	P* (in t)	For Footing Design: My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
116	DL+EQ(Z)	47.22	0.012	-1.21	11.89	9.19	9.90219	10	1.5	No Ten
117	DL+EQ(-Z)	37.34	-0.128	1.274	9.72	7.02	7.50638	10	1.5	No Ten
118	DL+WL(X)	40.06	0.827	0.031	9.716	7.02	8.76782	10	1.5	No Ten
119	DL+WL(-X)	39.65	-1.201	0.015	9.811	7.11	8.48258	10	1.5	No Ten
120	DL+WL(Z)	41.75	0.035	-0.559	10.1	7.40	9.15629	10	1.5	No Ten
121	DL+WL(-Z)	38.39	-0.217	0.493	9.375	6.68	8.33685	10	1.5	No Ten
122	DL+EQ(X)	41.19	4.837	0.039	12.16	9.46	6.84406	10	1.5	No Ten
123	DL+EQ(-X)	38.54	-4.942	0.019	11.59	8.89	6.19251	10	1.5	No Ten
124	DL+EQ(Z)	44.81	0.018	-1.213	11.33	8.63	9.3387	10	1.5	No Ten
125	DL+EQ(-Z)	34.92	-0.122	1.271	9.156	6.46	6.9543	10	1.5	No Ten

P* Vertical load from super structure + footing wt. +soil wt. + Pedestal wt.

Increase 25% under wind load and seismic load condition

Critical Design Forces and Moments at bottom of footing

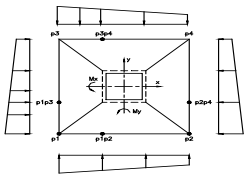
		Loads	Load factors
P	43.60-3.25-9.14-5.71	**25.50** t	
Mx	ABS(+ .042)	**0.04** tm	**1.5**
My	ABS(+ 4.831)	**4.83** tm	

P = Load from Super structure

le Load comb 114 DL+EQ(+X) is Critical for design

Designed Vertical load	=	38.67	t
Moment with respect to X-axis	=	0.06	tm
Moment with respect to Y-axis	=	7.25	tm

25.50* 1.5+ 1.5*((3.25/2.5-2.55*1.70*0.30)*(2.5-1.8)+(1.50-0.30)*0.45*0.23*(2.5-1.8)+0.45*0.23*0.75*2.5)



Flexural Design of Footing

Ox	=	1.05	m
Oy	=	0.74	m

Calculation of net base pressures

			* p1/p2/p3/p4 +(x) t	x=	
p1	=	12.91 t/sqm	12.91 t/sqm		0
p2	=	5.04 t/sqm	5.04 t/sqm	*	
p3	=	12.80 t/sqm	12.80 t/sqm		
p4	=	4.94 t/sqm	4.94 t/sqm		

If p4 comes to -ve Value then a dummy pressure (x t/sqm) added from bottom and added from bottom and top to counteract the negative effect

p1p2	=	9.67 t/sqm
p2p4	=	4.99 t/sqm
p3p4	=	9.56 t/sqm
p1p3	=	12.86 t/sqm

BASE PRESSURES @ VARIOUS POINTS

$$p1 = \frac{P}{WxWy} + \frac{Mx * 6}{Wy^2Wx} + \frac{My * 6}{Wx^2Wy}$$

$$p2 = \frac{P}{WxWy} + \frac{Mx * 6}{Wy^2Wx} - \frac{My * 6}{Wx^2Wy}$$

$$p3 = \frac{P}{WxWy} - \frac{Mx * 6}{Wy^2Wx} + \frac{My * 6}{Wx^2Wy}$$

$$p4 = \frac{P}{WxWy} - \frac{Mx * 6}{Wy^2Wx} - \frac{My * 6}{Wx^2Wy}$$

$$p1p2 = p2+(p1-p2)\frac{(Wx-Ox)}{Wx}$$

$$p2p4 = p4+(p2-p4)\frac{(Wy-Oy)}{Wy}$$

$$p3p4 = p4+(p3-p4)\frac{(Wx-Ox)}{Wx}$$

$$p1p3 = p3+(p1-p3)\frac{(Wx-Oy)}{Wy}$$

Max. BM with respect to X-Axis (at face of pedestal)

BMx	=	6.17	tm	
bx	=	2.55	m	
M/bd2	=	0.42		
pt	=	**0.10**		
Ast	=	603.17	sqmm	
Ast per metre width	=	236.54	sqmm	
Provide **Y12-150**	=	**753.33**	sqmm	minimum Ast = **360** sqmm
pt	=	0.31		

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F3

Max. BM with respect to Y-axis(at face of pedestal)

Bmy		=	11.03	tm				
by		=	1.70	m				
M/bd2		=	1.13					
pt		=	**0.27**					
Ast		=	1118.60	sqmm				
Ast per metre width		=	658.00	sqmm				
Provide	Y12-150	=	**753.33**	sqmm	minimum Ast =	**360**		sqmm
pt		=	0.31					

Shear Design :

tpeff. = 0.24

(A) Check for Two Way shear (ie Punching shear)

Desiged P =	38.67*(2.55*1.70-(0.45+0.24)*(0.23+0.24))/(2.55*1.70)	=	35.78	t	
a1 =	0.45+0.30-0.06	=	0.690	m	
a =	0.23+0.30-0.06	=	0.470	m	
t1 =	0.30+(0.30-0.30)*(1.05-0.5*0.24)/(1.05)	=	0.300	m	
t2 =	0.30+(0.30-0.30)*(0.74-0.5*0.24)/(0.74)	=	0.300	m	

Therefore Tv = **0.643** N/sqmm < Allowable Stress

1.25 n/sqmm

(B) Check for One way Shear

Calculation for Net base pressures at various points

p1'p2'	=	10.41	t/sqm				
p1'p3'	=	12.88	t/sqm				
p2'p4'	=	5.01	t/sqm				
p3'p4'	=	10.30	t/sqm				
a1	=	2.550	m				
a2	=	1.700	m				
t1	=	0.300	m	t1eff.	=	0.240	m
t2	=	0.300	m	t2eff	=	0.240	m

Tv with respect to X-Axis = ((12.91+5.04+12.88+5.01)/4- 0)*2.55*(0.74-0.24)/(100*(2.550*0.240+(0.240+(0.30-0.06))*(2.55-2.550)*0.5))

= **0.18** N/sqmm < Tc — Hence ok

pt at this section = 0.31

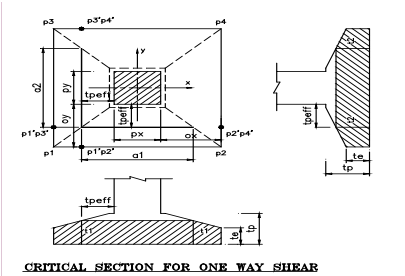
Tc from SP:16-1980 (clause 4.1) = **0.40** N/sqmm > Tv

Tv with respect to Y-Axis = ((12.91+12.80+10.41+10.30)/4- 0)*(1.70*(1.05-0.24)/(100*(1.700*0.240+(0.240+(0.30-0.06))*(1.70-1.700)*0.5)))

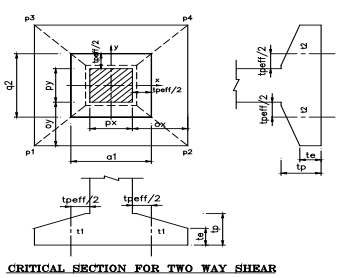
= **0.39** N/sqmm < Tc — Hence ok

pt at this section = 0.31

Tc from SP:16-1980 (clause 4.1) = **0.40** N/sqmm > Tv



CRITICAL SECTION FOR ONE WAY SHEAR



CRITICAL SECTION FOR TWO WAY SHEAR

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F4

5.2.10 Design of Footing F4

Node Nos From Stadd

Configuration of Column & Footing

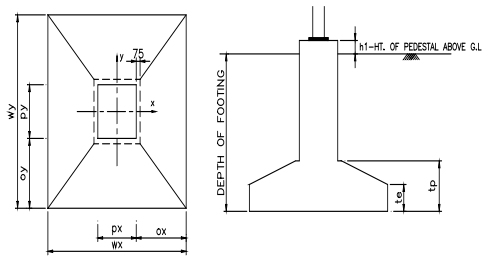
Width of column Along X axis	0.45	m
Width of column along Y axis	0.23	m
Ht above FGL & FFL	0.75	m
Depth of Foundation	1.50	m
Thickness of footing at edge	0.35	m
Thickness of footing at face of Ped.	0.35	m
Width of footing along X axis	2.50	m
Width of footing along Y axis	2.50	m
Total height	1.90	m

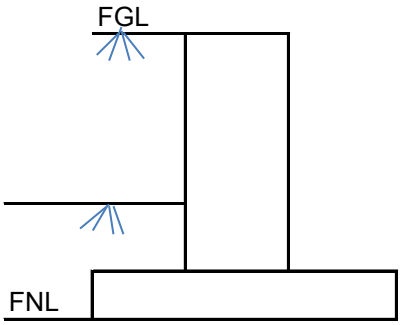
Design Specifications

		11
Grade of Concrete	M	25
Grade of Steel	Fe	500
Cover to Reinf.(pedes) in mm		40
Cover to Reinf.(foot) in mm		50

Refer Enclosed Sketch for Configuration of Pedestal & footing

Self weight of footing	**5.47** t
Soil weight betweenFGL&O.G.L	**8.30** t
Soil weight above footing	**12.72** t





LOAD COMBINATIONS	COMBINATIONS	Pmax	Net SBC	Pmin	BEARING CAPACITY
DL+LL	101	12.18	9.48	11.56	10
DL+WL/SL	106 to 109 114 to 1117 118 to 125	12.73	10.03	9.03	10
DL+LL+WL/SL	102 to 105 110 to 113	13.50	10.80	10.49	12.5

Load Combination For Design

	Load combination	P* (in t)	For Footing Design My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
101	DL+LL	74.18	0.266	-0.544	12.18	9.48	11.5572	10	1.5	No Ten
102	DL+LL+WL(X)	74.40	0.809	-0.587	12.44	9.74	11.3677	12.5	1.2	No Ten
103	DL+LL+WL(-X)	73.97	-0.261	-0.561	12.15	9.45	11.52	12.5	1.2	No Ten
104	DL+LL+WL(Z)	73.89	0.289	-2.308	12.82	10.12	10.8259	12.5	1.2	No Ten
105	DL+LL+WL(-Z)	75.49	0.212	2.155	12.99	10.29	11.1693	12.5	1.2	No Ten
106	DL+WL(X)	69.46	0.823	-0.609	11.66	8.96	10.5635	12.5	1.5	No Ten
107	DL+WL(-X)	69.03	-0.247	-0.584	11.36	8.66	10.7261	12.5	1.5	No Ten
108	DL+WL(Z)	68.95	0.303	-2.33	12.04	9.34	10.0217	12.5	1.5	No Ten
109	DL+WL(-Z)	70.55	0.227	2.133	12.19	9.49	10.3816	12.5	1.5	No Ten
110	DL+LL+EQ(X)	75.38	2.391	-0.69	13.24	10.54	10.877	10	1.2	No Ten
111	DL+LL+EQ(-X)	72.98	-1.86	-0.397	12.54	9.84	10.8099	10	1.2	No Ten
112	DL+LL+EQ(Z)	74.97	0.259	-3.67	13.5	10.80	10.4869	10	1.2	No Ten
113	DL+LL+EQ(-Z)	73.38	0.272	2.583	12.84	10.14	10.6448	10	1.2	No Ten
114	DL+EQ(X)	70.44	2.406	-0.713	12.47	9.77	10.072	10	1.5	No Ten
115	DL+EQ(-X)	68.04	-1.845	-0.42	11.76	9.06	10.0164	10	1.5	No Ten

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F4

	Load combination	P* (in t)	For Footing Design: My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
116	DL+EQ(Z)	70.03	0.274	-3.693	12.73	10.03	9.68192	10	1.5	No Ten
117	DL+EQ(-Z)	68.44	0.287	2.56	12.04	9.34	9.85744	10	1.5	No Ten
118	DL+WL(X)	65.18	0.795	-0.553	10.95	8.25	9.91177	10	1.5	No Ten
119	DL+WL(-X)	64.76	-0.275	-0.528	10.67	7.97	10.0529	10	1.5	No Ten
120	DL+WL(Z)	64.68	0.275	-2.274	11.33	8.63	9.37011	10	1.5	No Ten
121	DL+WL(-Z)	66.27	0.199	2.189	11.52	8.82	9.68697	10	1.5	No Ten
122	DL+EQ(X)	66.16	2.377	-0.656	11.75	9.05	9.42105	10	1.5	No Ten
123	DL+EQ(-X)	63.76	-1.873	-0.363	11.06	8.36	9.34374	10	1.5	No Ten
124	DL+EQ(Z)	65.76	0.246	-3.636	12.01	9.31	9.03056	10	1.5	No Ten
125	DL+EQ(-Z)	64.17	0.259	2.617	11.37	8.67	9.1623	10	1.5	No Ten

P* Vertical load from super structure + footing wt. +soil wt. + Pedestal wt.

Increase 25% under wind load and seismic load condition

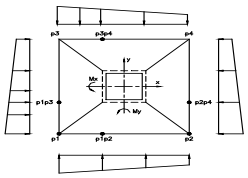
Critical Design Forces and Moments at bottom of footing

		Loads	Load factors
P	70.03-5.47-12.72-8.30	**43.54** t	
Mx	ABS(+-3.693)	**3.69** tm	**1.5**
My	ABS(+ .274)	**0.27** tm	

P = Load from Super structure

le Load comb 116DL+EQ(+Z) is Critical for design

Designed Vertical load	=	65.73 t	43.54* 1.5+ 1.5*((5.47/2.5-2.50*2.50*0.35)*(2.5-1.8)+(1.50-0.35)*0.45*0.23*(2.5-1.8)+0.45*0.23*0.75*2.5)
Moment with respect to X-axis	=	5.54 tm	
Moment with respect to Y-axis	=	0.41 tm	



Flexural Design of Footing

Ox	=	1.025 m	
Oy	=	1.14 m	

Calculation of net base pressures

			* p1/p2/p3/p4 +(x) t	x=	
p1	=	12.80 t/sqm	12.80 t/sqm		0
p2	=	12.49 t/sqm	12.49 t/sqm	*	
p3	=	8.55 t/sqm	8.55 t/sqm		
p4	=	8.23 t/sqm	8.23 t/sqm		
p1p2	=	12.67 t/sqm			
p2p4	=	10.55 t/sqm			
p3p4	=	8.42 t/sqm			
p1p3	=	10.87 t/sqm			

If p4 comes to -ve Value then a dummy pressure (x t/sqm) added from bottom and added from bottom and top to counteract the negative effect

BASE PRESSURES @ VARIOUS POINTS

$$p1 = \frac{P}{Wx*Wy} + \frac{Mx*6}{Wy^2*Wx} + \frac{My*6}{Wx^2*Wy}$$

$$p2 = \frac{P}{Wx*Wy} + \frac{Mx*6}{Wy^2*Wx} - \frac{My*6}{Wx^2*Wy}$$

$$p3 = \frac{P}{Wx*Wy} - \frac{Mx*6}{Wy^2*Wx} + \frac{My*6}{Wx^2*Wy}$$

$$p4 = \frac{P}{Wx*Wy} - \frac{Mx*6}{Wy^2*Wx} - \frac{My*6}{Wx^2*Wy}$$

$$p1p2 = p2+(p1-p2)\frac{(Wx-Ox)}{Wx}$$

$$p2p4 = p4+(p2-p4)\frac{(Wy-Oy)}{Wy}$$

$$p3p4 = p4+(p3-p4)\frac{(Wx-Ox)}{Wx}$$

$$p1p3 = p3+(p1-p3)\frac{(Wx-Oy)}{Wy}$$

Max. BM with respect to X-Axis (at face of pedestal)

BMx	=	19.32 tm		
bx	=	2.50 m		
M/bd2	=	0.92		
pt	=	**0.22**		
Ast	=	1603.32 sqmm		
Ast per metre width	=	641.33 sqmm		
Provide **Y12-125**	=	**904.00** sqmm	minimum Ast = **420**	sqmm
pt	=	0.31		

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F4

Max. BM with respect to Y-axis(at face of pedestal)

Bmy	=	13.96	tm				
by	=	2.50	m				
M/bd2	=	0.66					
pt	=	**0.16**					
Ast	=	1143.41	sqmm				
Ast per metre width	=	457.36	sqmm				
Provide **Y12-125**	=	**904.00**	sqmm	minimum Ast =	**420**		sqmm
pt	=	0.31					

Shear Design : tpeff. = 0.29

(A) Check for Two Way shear (ie Punching shear)

Desiged P =	65.73*(2.50*2.50-(0.45+0.29)*(0.23+0.29))/(2.50*2.50)	=	61.68	t	
a1 =	0.45+0.35-0.06	=	0.740	m	
a =	0.23+0.35-0.06	=	0.520	m	
t1 =	0.35+(0.35-0.35)*(1.025-0.5*0.29)/(1.025)	=	0.350	m	
t2 =	0.35+(0.35-0.35)*(1.14-0.5*0.29)/(1.14)	=	0.350	m	

Therefore Tv = **0.844** N/sqmm < Allowable Stress

1.25 n/sqmm

(B) Check for One way Shear

Calculation for Net base pressures at various points

p1'p2'	=	12.71	t/sqm				
p1'p3'	=	11.36	t/sqm				
p2'p4'	=	11.05	t/sqm				
p3'p4'	=	8.45	t/sqm				
a1	=	2.500	m				
a2	=	2.500	m				
t1	=	0.350	m	t1eff.	=	0.290	m
t2	=	0.350	m	t2eff	=	0.290	m

Tv with respect to X-Axis = ((12.80+12.49+11.36+11.05)/4- 0)*2.50*(1.14-0.29)/(100*(2.500*0.290+(0.290+(0.35-0.06))*(2.50-2.500)*0.5))

= **0.35** N/sqmm < Tc Hence ok

pt at this section = 0.31

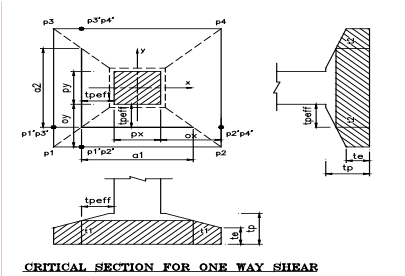
Tc from SP:16-1980 (clause 4.1) = **0.40** N/sqmm > Tv

Tv with respect to Y-Axis = ((12.80+8.55+12.71+8.45)/4- 0)*(2.50*(1.025-0.29)/(100*(2.500*0.290+(0.290+(0.35-0.06))*(2.50-2.500)*0.5)))

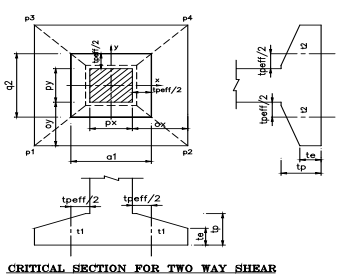
= **0.27** N/sqmm < Tc Hence ok

pt at this section = 0.31

Tc from SP:16-1980 (clause 4.1) = **0.40** N/sqmm > Tv



CRITICAL SECTION FOR ONE WAY SHEAR



CRITICAL SECTION FOR TWO WAY SHEAR

PROJECT	STRUCTURAL DESIGN REPORT FOR PROPOSED TOILET BLOCK	Details	F5

5.2.10 Design of Footing F5

Node Nos From Stadd: 11

Configuration of Column & Footing

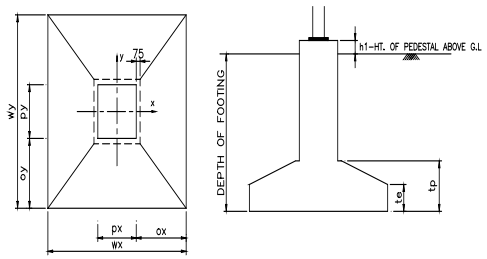
Width of column Along X axis	0.30	m
Width of column along Y axis	0.23	m
Ht above FGL & FFL	0.00	m
Depth of Foundation	1.50	m
Thickness of footing at edge	0.30	m
Thickness of footing at face of Ped.	0.30	m
Width of footing along X axis	1.20	m
Width of footing along Y axis	1.20	m
Total height	1.20	m

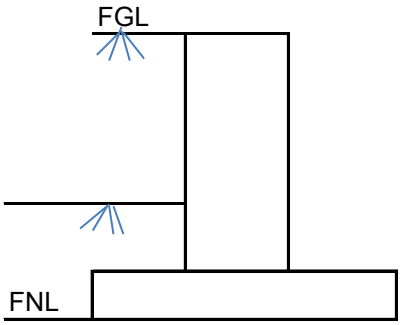
Design Specifications

Grade of Concrete	M	25
Grade of Steel	Fe	500
Cover to Reinf.(pedes) in mm		40
Cover to Reinf.(foot) in mm		50

Refer Enclosed Sketch for Configuration of Pedestal & footing

Self weight of footing	1.08	t
Soil weight betweenFGL&O.G.L	0.00	t
Soil weight above footing	2.96	t





LOAD COMBINATIONS	COMBINATIONS	Pmax	Net SBC	Pmin	BEARING CAPACITY
DL+LL	101	6.01	3.31	5.76	10
DL+WL/SL	106 to 109 114 to 1117 118 to 125	10.32	7.62	1.13	10
DL+LL+WL/SL	102 to 105 110 to 113	10.45	7.75	1.56	12.5

Load Combination For Design

	Load combination	P* (in t)	For Footing Design My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
101	DL+LL	8.48	-0.021	-0.014	6.008	3.31	5.76483	10	1.5	No Ten
102	DL+LL+WL(X)	8.31	0.235	0.016	6.641	3.94	4.89817	12.5	1.2	No Ten
103	DL+LL+WL(-X)	8.57	-0.275	-0.001	6.91	4.21	4.99331	12.5	1.2	No Ten
104	DL+LL+WL(Z)	9.99	-0.057	-0.505	8.886	6.19	4.98358	12.5	1.2	No Ten
105	DL+LL+WL(-Z)	6.49	0.07	0.576	6.751	4.05	2.26483	12.5	1.2	No Ten
106	DL+WL(X)	8.11	0.23	0.018	6.492	3.79	4.76969	12.5	1.5	No Ten
107	DL+WL(-X)	8.37	-0.28	0.001	6.788	4.09	4.83706	12.5	1.5	No Ten
108	DL+WL(Z)	9.79	-0.063	-0.503	8.761	6.06	4.83081	12.5	1.5	No Ten
109	DL+WL(-Z)	6.29	0.064	0.577	6.595	3.89	2.14331	12.5	1.5	No Ten
110	DL+LL+EQ(X)	7.83	0.945	-0.019	8.784	6.08	2.08983	10	1.2	No Ten
111	DL+LL+EQ(-X)	9.12	-0.987	-0.008	9.791	7.09	2.8815	10	1.2	No Ten
112	DL+LL+EQ(Z)	10.60	-0.048	-0.842	10.45	7.75	4.27247	10	1.2	No Ten
113	DL+LL+EQ(-Z)	6.35	0.006	0.814	7.258	4.56	1.56344	10	1.2	No Ten
114	DL+EQ(X)	7.63	0.94	-0.018	8.625	5.92	1.97178	10	1.5	No Ten
115	DL+EQ(-X)	8.92	-0.993	-0.007	9.67	6.97	2.72525	10	1.5	No Ten

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	Load combination	P* (in t)	My (wrt Y axis)	Mx (wrt X axis)	Pmax (t/sqm)	Net SBC (t/sqm)	Pmin	Allowable B.C	Load Factor	Remarks
			For Footing Design							
116	DL+EQ(Z)	10.40	-0.053	-0.84	10.32	7.62	4.12317	10	1.5	No Ten
117	DL+EQ(-Z)	6.15	0.001	0.816	7.109	4.41	1.43497	10	1.5	No Ten
118	DL+WL(X)	7.68	0.233	0.019	6.211	3.51	4.46136	10	1.5	No Ten
119	DL+WL(-X)	7.95	-0.277	0.002	6.487	3.79	4.54956	10	1.5	No Ten
120	DL+WL(Z)	9.36	-0.06	-0.502	8.454	5.75	4.55094	10	1.5	No Ten
121	DL+WL(-Z)	5.87	0.067	0.579	6.318	3.62	1.8315	10	1.5	No Ten
122	DL+EQ(X)	7.21	0.943	-0.017	8.337	5.64	1.67039	10	1.5	No Ten
123	DL+EQ(-X)	8.50	-0.99	-0.005	9.358	6.66	2.44817	10	1.5	No Ten
124	DL+EQ(Z)	9.98	-0.051	-0.839	10.02	7.32	3.83983	10	1.5	No Ten
125	DL+EQ(-Z)	5.73	0.003	0.817	6.825	4.12	1.13011	10	1.5	No Ten

P* Vertical load from super structure + footing wt. +soil wt. + Pedestal wt.

Increase 25% under wind load and seismic load condition

Critical Design Forces and Moments at bottom of footing

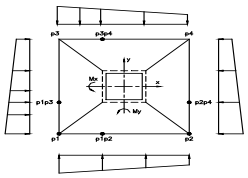
		Loads	Load factors
P	10.40-1.08-2.96-0.00	**6.36** t	
Mx	ABS(+-.84)	**0.84** tm	**1.5**
My	ABS(+-.053)	**0.05** tm	

P = Load from Super structure

le Load comb 116DL+EQ(+Z) is Critical for design

Designed Vertical load	=	9.63	t
Moment with respect to X-axis	=	1.26	tm
Moment with respect to Y-axis	=	0.08	tm

6.36* 1.5+ 1.5*((1.08/2.5-1.20*1.20*0.30)*(2.5-1.8)+(1.50-0.30)*0.30*0.23*(2.5-1.8)+0.30*0.23*0.00*2.5)



Flexural Design of Footing

Ox	=	0.45	m
Oy	=	0.49	m

Calculation of net base pressures

				* p1/p2/p3/p4 +(x) t	x=	0
p1	=	11.34	t/sqm	11.34 t/sqm		
p2	=	10.79	t/sqm	10.79 t/sqm	*	If p4 comes to -ve Value then a dummy pressure (x t/sqm) added from bottom and added from bottom and top to counteract the negative effect
p3	=	2.59	t/sqm	2.59 t/sqm		
p4	=	2.04	t/sqm	2.04 t/sqm		

p1p2	=	11.13	t/sqm
p2p4	=	7.25	t/sqm
p3p4	=	2.38	t/sqm
p1p3	=	7.80	t/sqm

BASE PRESSURES @ VARIOUS POINTS

$$p1 = \frac{P}{WxWy} + \frac{Mx * 6}{Wy^2Wx} + \frac{My * 6}{Wx^2Wy}$$

$$p2 = \frac{P}{WxWy} + \frac{Mx * 6}{Wy^2Wx} - \frac{My * 6}{Wx^2Wy}$$

$$p3 = \frac{P}{WxWy} - \frac{Mx * 6}{Wy^2Wx} + \frac{My * 6}{Wx^2Wy}$$

$$p4 = \frac{P}{WxWy} - \frac{Mx * 6}{Wy^2Wx} - \frac{My * 6}{Wx^2Wy}$$

$$p1p2 = p2+(p1-p2)\frac{(Wx-Ox)}{Wx}$$

$$p2p4 = p4+(p2-p4)\frac{(Wy-Oy)}{Wy}$$

$$p3p4 = p4+(p3-p4)\frac{(Wx-Ox)}{Wx}$$

$$p1p3 = p3+(p1-p3)\frac{(Wx-Oy)}{Wy}$$

Max. BM with respect to X-Axis (at face of pedestal)

BMx	=	1.39	tm		
bx	=	1.20	m		
M/bd2	=	0.20			
pt	=	**0.05**			
Ast	=	134.90	sqmm		
Ast per metre width	=	112.42	sqmm		
Provide **Y12-200**	=	**565.00**	sqmm	minimum Ast = **360**	sqmm
pt	=	0.24			

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Max. BM with respect to Y-axis(at face of pedestal)

Bmy		=	0.84	tm				
by		=	1.20	m				
M/bd2		=	0.12					
pt		=	**0.03**					
Ast		=	80.72	sqmm				
Ast per metre width		=	67.26	sqmm				
Provide	**Y12-200**	=	**565.00**	sqmm	minimum Ast =	**360**		sqmm
pt		=	0.24					

Shear Design : tpeff. = 0.24

(A) Check for Two Way shear (ie Punching shear)

Desiged P =	9.63*(1.20*1.20-(0.30+0.24)*(0.23+0.24))/(1.20*1.20)	=	7.93	t
a1 =	0.30+0.30-0.06	=	0.540	m
a =	0.23+0.30-0.06	=	0.470	m
t1 =	0.30+(0.30-0.30)*(.45-0.5*0.24)/(.45)	=	0.300	m
t2 =	0.30+(0.30-0.30)*(0.49-0.5*0.24)/(0.49)	=	0.300	m

Therefore Tv = **0.164** N/sqmm < Allowable Stress

1.25 n/sqmm

(B) Check for One way Shear

Calculation for Net base pressures at various points

p1'p2'	=	11.24	t/sqm				
p1'p3'	=	9.55	t/sqm				
p2'p4'	=	9.00	t/sqm				
p3'p4'	=	2.49	t/sqm				
a1	=	1.200	m				
a2	=	1.200	m				
t1	=	0.300	m	t1eff.	=	0.240	m
t2	=	0.300	m	t2eff	=	0.240	m

Tv with respect to X-Axis = ((11.34+10.79+9.55+9.00)/4- 0)*1.20*(0.49-0.24)/(100*(1.200*0.240+(0.240+(0.30-0.06))*(1.20-1.200)*0.5))

= **0.10** N/sqmm < Tc Hence ok

pt at this section = 0.24

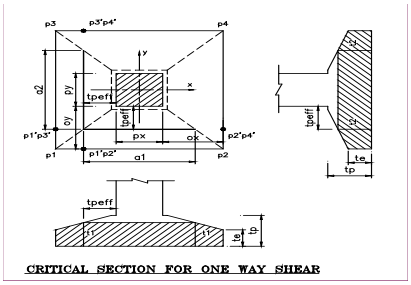
Tc from SP:16-1980 (clause 4.1) = **0.36** N/sqmm > Tv

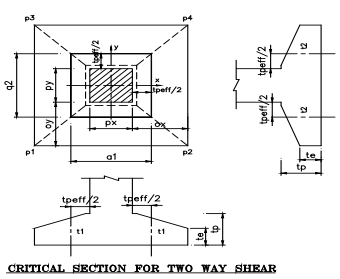
Tv with respect to Y-Axis = ((11.34+2.59+11.24+2.49)/4- 0)*(1.20*(.45-0.24)/(100*(1.200*0.240+(0.240+(0.30-0.06))*(1.20-1.200)*0.5)))

= **0.06** N/sqmm < Tc Hence ok

pt at this section = 0.24

Tc from SP:16-1980 (clause 4.1) = **0.36** N/sqmm > Tv





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5.3.1 Roof slab S1 Remarl

one long edge Dis Continuous:

Basic dimensions of slab		=	Lx	Ly	
			4.55	6.8	
Basic Ly/Lx ratio		=	1.495	<2	
			Hence designed as two way slab		
Clear cover to reinforcement	d'	=	30	mm	
Provided overall depth	D	=	125.00	mm	
Effective depth	d	=	91.00	mm	
Diameter of bar	f	=	8	mm	
Select Grade of Concrete	fck	=	30	N/mm²	
Select Grade of Steel	fy	=	500	N/mm²	

Load calculation :

Dead load of the slab	DL	=	3.125	kN/m²
Floor finish(Roof finish)	FF	=	1.5	kN/m²
Live load	LL	=	1.5	kN/m²
Total load	TL	=	6.125	kN/m²

Moment and Area of Steel calculations:

Span	Moment Coefficient		Mu kN.m	Mu/bd² N/mm²	Pt %	Ast reqd mm²	Min Ast mm²	Dia of bar mm	Spacing mm	Ast pro mm²	
shorter	$a_{x\ neg}$	0.067	12.74	1.54	0.38	348.84	109.2	8	100	502.65	safe
	$a_{x\ pos}$	0.051	9.70	1.17	0.29	260.04	109.2	8	100	502.65	safe
longer	$a_{y\ neg}$	0.037	7.04	0.85	0.20	185.43	109.2	8	200	251.33	safe
	$a_{y\ pos}$	0.028	5.33	0.64	0.15	138.84	109.2	8	200	251.33	safe

Check for Deflection

The effective depth provided		=	91.000	mm
From figure 3 of I.S 456:1978 modification factor is				
Modification factor		=	1.90	
Required depth under deflection consideration		=	92.11	mm
				UNSAFE

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5.3.2 Roof slab S2 Remarl

one long edge Dis Continuous:

Basic dimensions of slab		=	Lx	Ly	
			3.45	4.9	
Basic Ly/Lx ratio		=	1.420	<2	
			Hence designed as two way slab		
Clear cover to reinforcement	d'	=	30	mm	
Provided overall depth	D	=	125.00	mm	
Effective depth	d	=	91.00	mm	
Diameter of bar	f	=	8	mm	
Select Grade of Concrete	fck	=	30	N/mm²	
Select Grade of Steel	fy	=	500	N/mm²	

Load calculation :

Dead load of the slab	DL	=	3.125	kN/m²
Floor finish(Roof finish)	FF	=	1.5	kN/m²
Live load	LL	=	1.5	kN/m²
Total load	TL	=	6.125	kN/m²

Moment and Area of Steel calculations:

Span	Moment Coefficient		Mu kN.m	Mu/bd² N/mm²	Pt %	Ast reqd mm²	Min Ast mm²	Dia of bar mm	Spacing mm	Ast pro mm²	
shorter	$a_{x\ neg}$	0.067	7.33	0.88	0.21	193.40	109.2	8	200	251.33	safe
	$a_{x\ pos}$	0.051	5.58	0.67	0.16	145.62	109.2	8	200	251.33	safe
longer	$a_{y\ neg}$	0.037	4.05	0.49	0.12	104.67	109.2	8	200	251.33	safe
	$a_{y\ pos}$	0.028	3.06	0.37	0.09	78.75	109.2	8	200	251.33	safe

Check for Deflection

The effective depth provided		=	91.000	mm
From figure 3 of I.S 456:1978 modification factor is				
Modification factor		=	2.00	
Required depth under deflection consideration		=	66.35	mm
				HENCE SAFE

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PLINTH BEAMS

Refer staad analysis and design

Grade of steel Fe 500

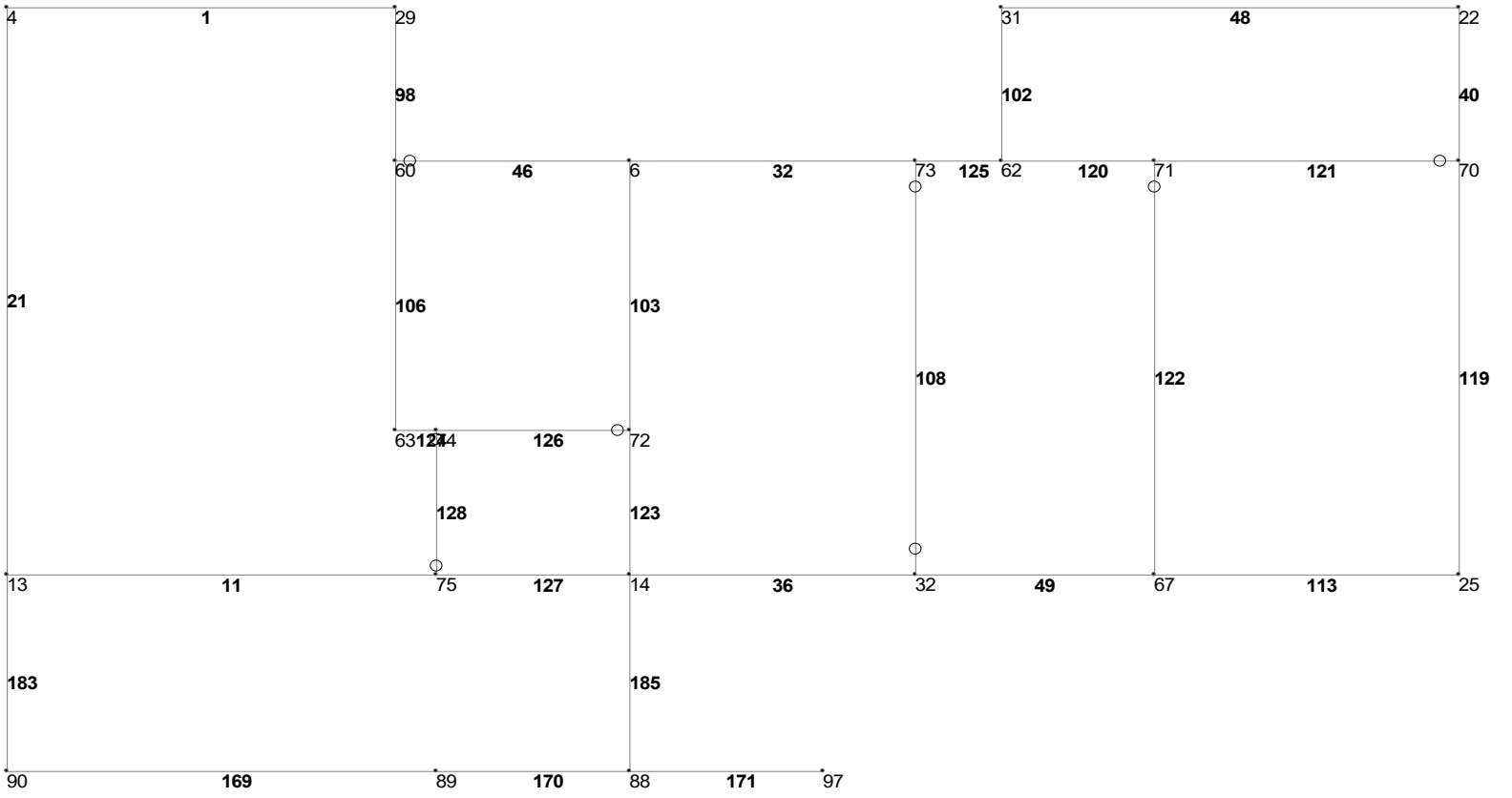
5.4.

Grade of	M25

PLINTH BEAMS SCHEDULE (REFER STAAD)

SNO	Beam	Beam No	Size Details in		Reinforcement		Reinforcement		Shear Reinf	Shear Reinf
			b	d	Top	Bot	Top	Bot	@support	@span
1	PB1	1	230	450	400	200	2-Y12(st)+2-Y12(X)	2-Y12(st)+1-Y12(X)	Y8-125	Y8-200
2	PB2	48	230	450	430	260	2-Y12(st)+2-Y12(X)	2-Y12(st)+1-Y12(X)	Y8-125	Y8-200
3	PB3	46 32 125 120 121	230	450	430/774	250	2-Y16(st)/1-Y12(x) @B3 2Y16(X) @ B4	2-Y12(st)+1-Y12(X) mid span	Y8-125	Y8-200
4	PB4	124 126	230	450	330	250	3-Y12(st)	3-Y12(st)	Y8-125	Y8-200
5	PB5	11 127 36 49 113	230	525	520/930, 510/300	520/430/420	2-Y16(st)/2-Y12(x) @D1 D5, 3-Y16(X) D3	2-Y16(st)+2-Y12(X) @ bot Span	Y8-125	Y8-150
6	PB6	169 170 171	230	300	min	min	3-Y12(st)	3-Y12(st)	Y8-125	Y8-125
7	PB7	21 & 41 /119	230	525	830	370	2-Y16(st)+3-Y16(X)	2-Y16(st)	Y8-125	Y8-200
8	PB8	106/98	230	450	525	270	2-Y12(st)+2-Y16(x)	3-Y12(st)	Y8-125	Y8-200
9	PB9	123/103	230	450	470	240	2-Y16(st)+1-Y12(X)	3-Y12(st)	Y8-125	Y8-200
10	PB10	108	230	450	160	270	2-Y12(st)	3-Y12(st)	Y8-125	Y8-200
11	PB11	122	230	450	477	300	2-Y16(st)+2-Y12(x)	3-Y16(st)	Y8-125	Y8-200
12	PB12	128	230	450	200	200	2-Y12(st)	2-Y12(st)	Y8-125	Y8-200
13	PB13	183 185	230	300	260	200	3-Y12(st)	3-Y12(st)	Y8-125	Y8-125

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ROOF BEAMS

Refer staad analysis and design

Grade of steel Fe 500

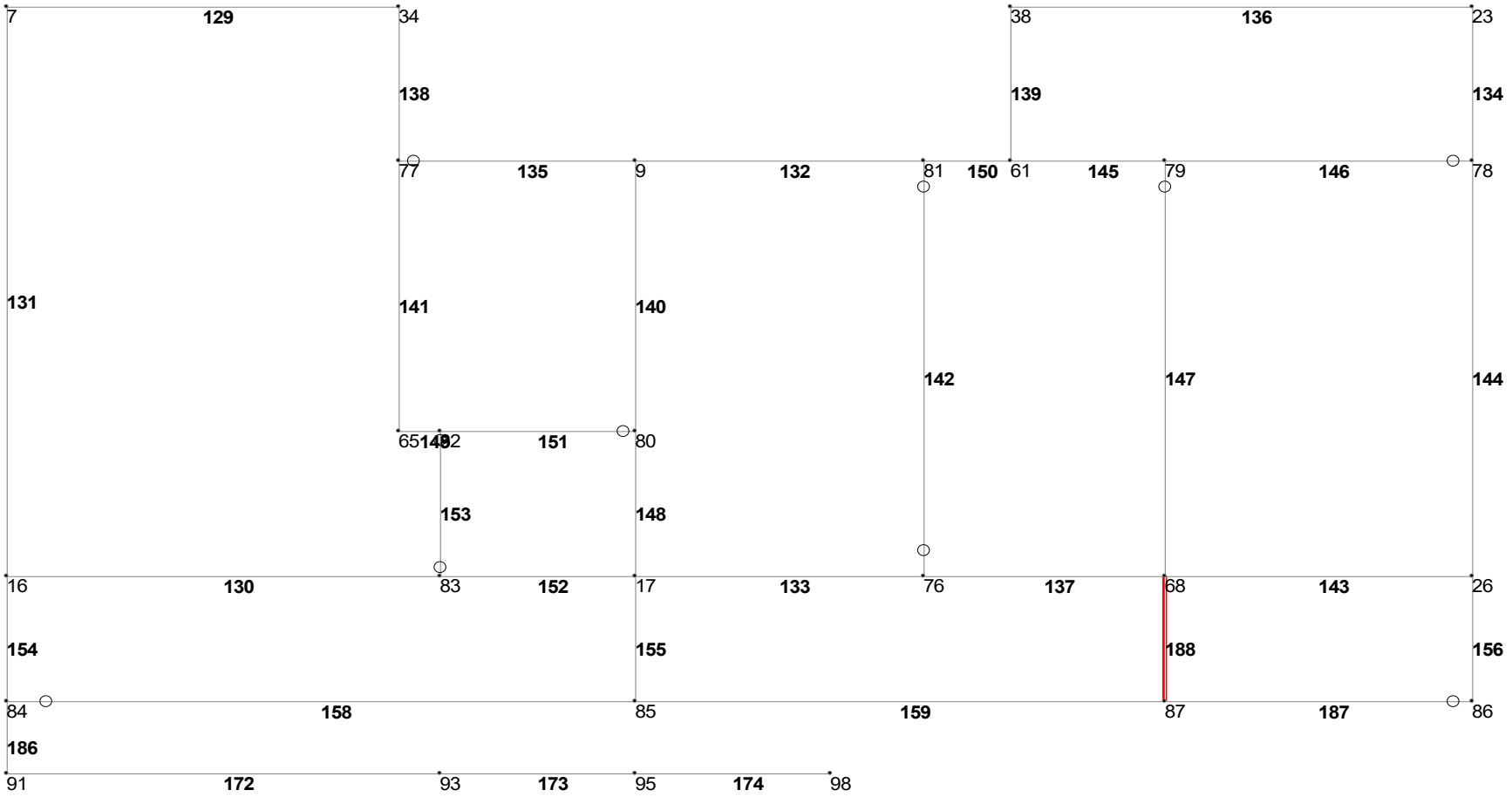
5.5.

Grade of concrete	M25

ROOF BEAMS SCHEDULE (REFER STAAD)

SNO	Beam	Beam No	Size Details in mm		Reinforcement Required as per Staad		Reinforcement		Shear Reinf	Shear Reinf
			b	d	Top	Bot	Top	Bot	@support	@span
1	RB1	129	230	425	280	333	2-Y12(st)+1-Y12(X)	2-Y12(st)+1-Y12(X)	Y8-125	Y8-200
2	RB2	136	230	425	280	240	2-Y12(st)+1-Y12(X)	2-Y12(st)+1-Y12(X)	Y8-125	Y8-200
3	RB3	135 132 150 145 146	230	425	300/800	300	2-Y16(st)/2-Y16(x) @B4	2-Y12(st)+2-Y12(X) third Span	Y8-125	Y8-200
4	RB4	149 151	230	425	min	min	2-Y12(st)	2-Y12(st)	Y8-125	Y8-200
5	RB5	130/152 133/137 143	230	500	400/900,430/200	520/430/420	2-Y16(st)/1-Y12(x) @D1 D6, 3-Y16(X) D3,2-Y12(x) @D5	2-Y16(st)+2-Y12(X)	Y8-125	Y8-150
6	RB6	158 159 187	230	350	800/300	700	2-Y16(st)+2-Y16(X)/2-Y12(X) mid supp	2-Y16(st)+2-Y16*X)	Y8-125	Y8-125
7	RB7	154 131 134 144	230	500	530/750	350	2-Y16(st)/2-Y12(x) /2-Y16(X)	2-Y16(st)+2-Y12(x)	Y8-125	Y8-200
8	RB8	138/141	230	425	380	260	2-Y12(st)+2-Y12(x)	2-Y12(st)+2-Y12(x)	Y8-125	Y8-200
9	RB9	155/148/140	230	500	1225	230	3-Y16(st)) /3-Y16(X)	2-Y16(st)	Y8-125	Y8-200
10	RB10	142	230	425	200	508	2-Y12(st)	2-Y12(st)+2-Y16(x)	Y8-125	Y8-200
11	RB11	188/147	230	425	920	317	2-Y16(st)+3-Y16(x)	2-Y16(st)	Y8-125	Y8-200
12	RB12	153	230	425	200	200	2-Y12(st)	2-Y12(st)	Y8-125	Y8-200

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5.6 Remarks

5.6.1 **Design Of Sunshade**

Span	=	0.6	m
THk assumed	=	0.075	m
SW of sunshade	=	0.25	T/m2 (plastering added)
LL on sunshade	=	0.075	T/m2
Total Load	=	0.325	T/m2
M	=	0.0585	T.m
Mu/bd2	=	0.433	
Pt	=	0.102	
Ast	=	45.78	mm2

Provide min Y8-125c/c Main Reinf 75mm th

Provide min Y8-150c/c as distribution

5.6.2 **Design Of lintel**

Span	=	1.8	m (max Size)
span of opening	=	1.8	m
Wall above the lintel	=	0.325	m
Size of the beam	=	0.23	0.15
Sw of beam	=	0.08625	T/m
DL of wall	=	0.1495	T/m
Load from sunshade	=	0.195	t/m
Sf due to Beam load	=	0.13455	T
Sf due to sunshade	=	0.1755	T
Mt	=	0.0585	
M	=	0.17	t.m
Meq	=	0.23	
Mu/bd2	=	0.94	
pt	=	0.227	
Ast	=	57.31	mm2
Vu	=	0.70	T
Vt	=	0.61	T
Ve	=	1.31	T
Tc (n/sq.mm)	=	0.23	
Vus/d (kN/cm)	=	0.61	

So provide min Top & Bottom 2-Y12 , Y8-100 (Stirrups)

5.6.3 **For Inside Lintels** (for 115mm thk walls)

Span	=	1.2	
41/2" Wall Above	=	0.207	t/m
Size of lintel	=	0.115	0.15
SW of lintel	=	0.043125	t/m
Total load	=	0.250125	t/m
M	=	0.045023	T.m
Mu/bd2	=	0.485331	
Pt	=	0.114	
Ast	=	14.45	mm2

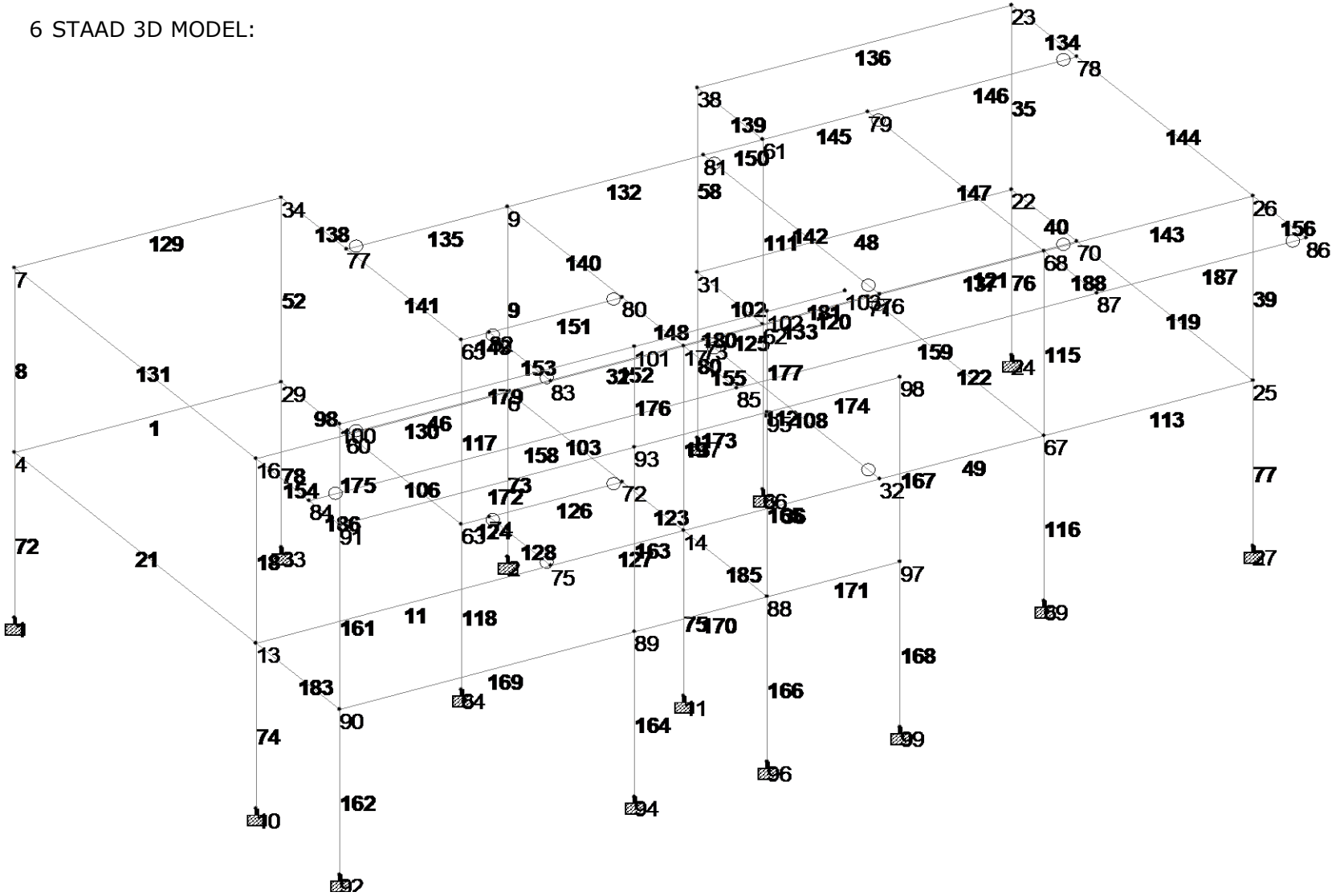
Provide min 2 Nos -10mm Dia

Strirrups Y8-100mm

So provide min Steel

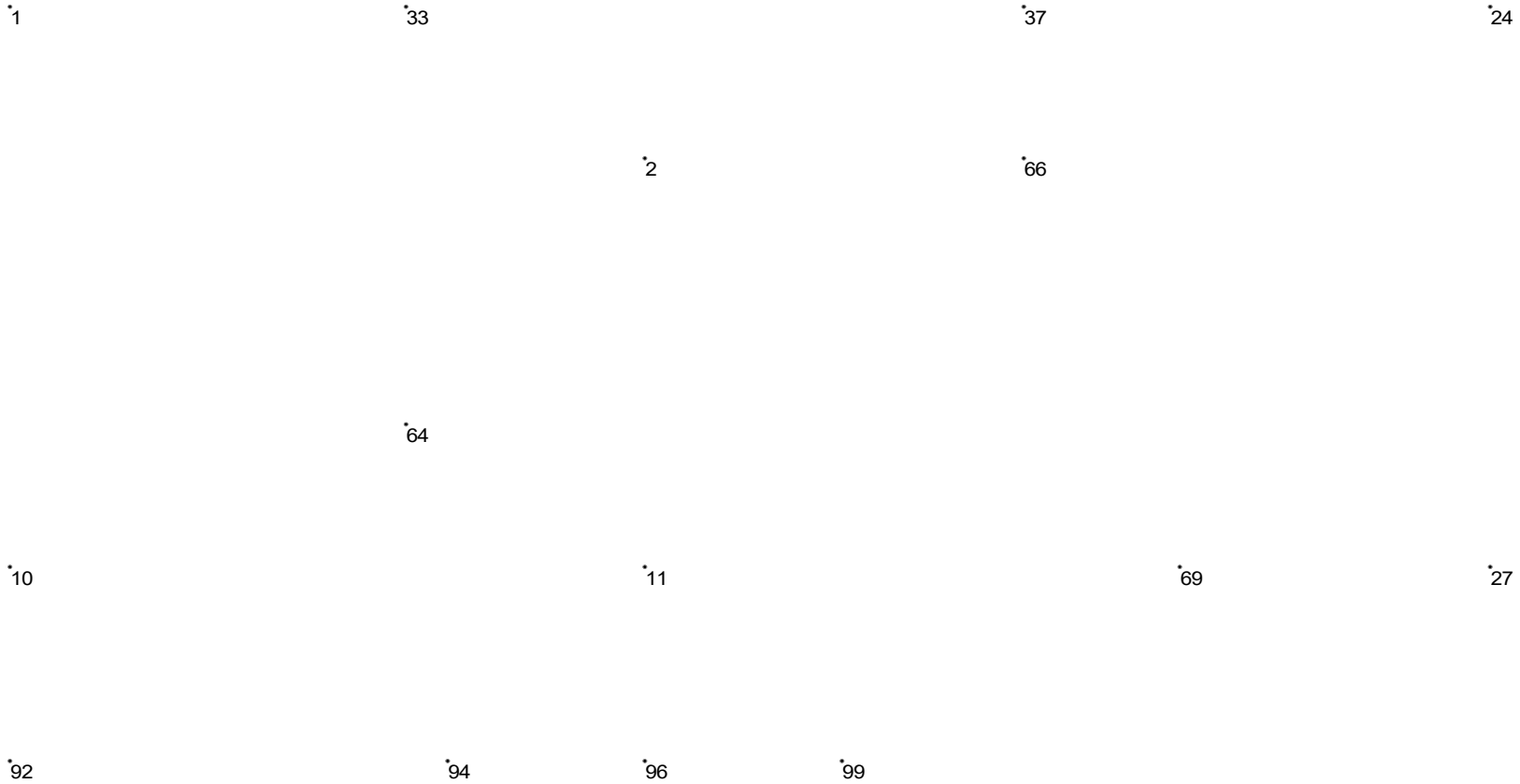
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6 STAAD 3D MODEL:

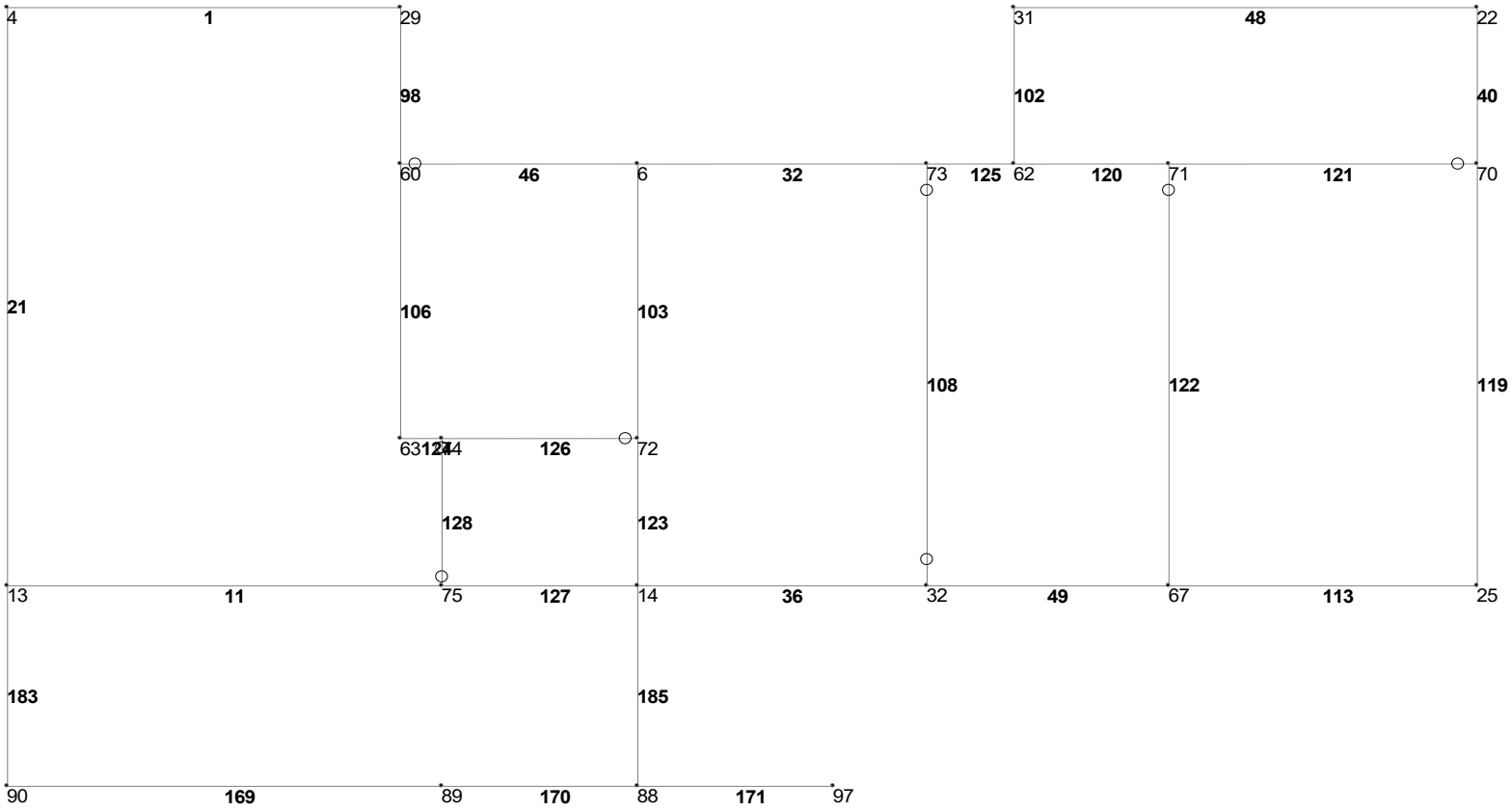


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FOOTING NODES



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ROOF BEAMS

