CÁLCULO DE PILARES (EDIFÍCIO ACALANTO)

Característica do concreto

f_{ck} = 30 MPa

f_{cd} = 21.43 MPa

f_{yd} = 43.48 kN/cm²

E_{cs} = 2852 kN/cm²

$e_{ax}=e_{ay}$ = 0.0 cm Excentricidade acidental

d'= 3.0 cm

PILAR INTERMEDIÁRIO (Compressão centrada)

DIREÇÃO X

PILAR	Resistência		Seção do pilar (cm)		Altura (cm)	Esbeltez	e_{2x} (cm)	P_{ex} (kN)	$e_{fluência}$ l_x>50 (cm)	$e_{1x,\ min}$ (cm)	$e_{x,\ total}$ (cm)	Md (kN.cm)	DIMENSIONAMENTO			A_s (cm²)	$A_{smín}$ (cm²)	Barras 10 mm	Barras 12.5 mm	Barras 16 mm	Barras 20 mm
	F_k (kN)	F_d (kN)	h_x	h_y		< 90 ok							n	m	w						
P07	550.0	770	20	50	282	48.84	1.89	11786	0.00	2.1	3.99	3075	0.4	0.08	0.05	2.09	1.50	3	2	1	1
P08	440.0	616	20	50	282	48.84	2.12	11786	0.00	2.10	4.22	2596	0.3	0.07	0.05	2.09	1.50	3	2	1	1
P09	550.0	770	20	50	282	48.84	1.89	11786	0.00	2.10	3.99	3075	0.4	0.08	0.05	2.09	1.50	3	2	1	1
P13	330.0	462	15	45	282	65.13	2.68	4475	0.00	1.95	4.63	2139	0.4	0.12	0.05	1.41	1.01	2	1	1	0
P24	330.0	462	15	45	282	65.13	2.68	4475	0.00	1.95	4.63	2139	0.4	0.12	0.05	1.41	1.01	2	1	1	0
P28	550.0	770	20	50	282	48.84	1.89	11786	0.00	2.10	3.99	3075	0.4	0.08	0.05	2.09	1.50	3	2	1	1
P29	450.0	630	20	50	282	48.84	2.09	11786	0.00	2.1	4.19	2641	0.3	0.07	0.05	2.09	1.50	3	2	1	1
P30	570.0	798	20	50	282	48.84	1.86	11786	0.00	2.10	3.96	3159	0.4	0.09	0.05	2.09	1.50	3	2	1	1

PILAR INTERMEDIÁRIO (Compressão centrada)

DIREÇÃO Y

PILAR	Resistência		Seção do pilar (cm)		Altura (cm)	Esbeltez	e_{2x} (cm)	P_{ex} (kN)	$e_{fluência}$ l_x>50 (cm)	$e_{1x,\ min}$ (cm)	$e_{x,\ total}$ (cm)	Md (kN.cm)	DIMENSIONAMENTO			A_s (cm²)	$A_{smín}$ (cm²)	Barras 10 mm	Barras 12.5 mm	Barras 16 mm	Barras 20 mm
	F_k (kN)	F_d (kN)	h_x	h_y		< 90 ok							n	m	w						
P07	550.0	770	50	20	282	19.54	0.76	73661	0.00	3.00	3.76	2893	0.4	0.03	0.05	2.09	1.50	3	2	1	1
P08	440.0	616	50	20	282	19.54	0.85	73661	0.00	3.00	3.85	2369	0.3	0.03	0.05	2.09	1.50	3	2	1	1
P09	550.0	770	50	20	282	19.54	0.76	73661	0.00	3.00	3.76	2893	0.4	0.03	0.05	2.09	1.50	3	2	1	1
P13	330.0	462	45	15	282	21.71	0.89	40274	0.00	2.85	3.74	1730	0.4	0.03	0.05	1.41	1.01	2	1	1	0
P24	330.0	462	45	15	282	21.71	0.89	40274	0.00	2.85	3.74	1730	0.4	0.03	0.05	1.41	1.01	2	1	1	0
P28	550.0	770	50	20	282	19.54	0.76	73661	0.00	3.00	3.76	2893	0.4	0.03	0.05	2.09	1.50	3	2	1	1
P29	450.0	630	50	20	282	19.54	0.84	73661	0.00	3.00	3.84	2417	0.3	0.03	0.05	2.09	1.50	3	2	1	1
P30	570.0	798	50	20	282	19.54	0.74	73661	0.00	3.00	3.74	2987	0.4	0.03	0.05	2.09	1.50	3	2	1	1

CÁLCULO DE PILARES (EDIFÍCIO ACALANTO)

Característica do concreto

f_{ck} =	30	MPa	
f_{cd} =	21.43	MPa	
f_{yd} =	43.48	kN/cm²	
E_{cs}=	2852	kN/cm²	
e_{ax}=e_{ay} =	1.0	cm	Excentricidade acidental
d'=	3.0	cm	

PILAR EXTREMIDADE (COMPRESSÃO NORMAL)

DIREÇÃO X

PILAR	Resistência		Seção do pilar (cm)		Altura (cm)	Esbeltez	e_{2x} (cm)	P_{ex} (kN)	$e_{fluência}$ l_x>50 (cm)	$e_{1x,\ min}$ (cm)	$e_{x,\ total}$ (cm)	Md (kN.cm)	DIMENSIONAMENTO			A_s (cm²)	$A_{smín}$ (cm²)	Barras 8 mm	Barras 10 mm	Barras 12.5 mm	Barras 16 mm	Barras 20 mm	
	F_k (kN)	F_d (kN)	h_x	h_y		< 90 ok							n	m	w								
P05	290.0	406	15	40	282	65.13	2.70	3978	0.22	1.95	4.86	1974	0.4	0.12	0.10	2.51	0.90	5	3	2	1	1	
P06	350.0	490	15	40	282	65.13	2.45	3978	0.27	1.95	4.67	2288	0.4	0.14	0.10	2.51	0.90	5	3	2	1	1	
P10	350.0	490	15	40	282	65.13	2.45	3978	0.27	1.95	4.67	2288	0.4	0.14	0.10	2.51	0.90	5	3	2	1	1	
P12	390.0	546	15	45	282	65.13	2.46	4475	0.27	1.95	4.68	2555	0.4	0.14	0.10	2.83	1.01	6	4	2	1	1	
P14	340.0	476	15	45	282	65.13	2.64	4475	0.23	1.95	4.82	2294	0.4	0.12	0.08	2.26	1.01	5	3	2	1	1	
P17	570.0	798	50	20	282	19.54	0.74	73661	0.02	3.00	3.76	3003	0.4	0.03	0.08	3.35	1.50	7	4	3	2	1	
P20	550.0	770	50	20	282	19.54	0.76	73661	0.02	3.00	3.78	2908	0.4	0.03	0.08	3.35	1.50	7	4	3	2	1	
P23	360.0	504	15	45	282	65.13	2.57	4475	0.24	1.95	4.76	2399	0.4	0.13	0.10	2.83	1.01	6	4	2	1	1	8diametros de12,5
P25	350.0	490	15	45	282	65.13	2.60	4475	0.24	1.95	4.79	2347	0.4	0.13	0.10	2.83	1.01	6	4	2	1	1	
P27	350.0	490	15	40	282	65.13	2.45	3978	0.27	1.95	4.67	2288	0.4	0.14	0.10	2.51	0.90	5	3	2	1	1	
P31	340.0	476	15	40	282	65.13	2.49	3978	0.26	1.95	4.70	2236	0.4	0.14	0.10	2.51	0.90	5	3	2	1	1	
P32	280.0	392	15	40	282	65.13	2.74	3978	0.21	1.95	4.90	1921	0.4	0.12	0.08	2.01	0.90	4	3	2	1	1	Pilar de seção circular

PILAR EXTREMIDADE (COMPRESSÃO NORMAL)

DIREÇÃO Y

PILAR	Resistência		Seção do pilar (cm)		Altura (cm)	Esbeltez	e_{2x} (cm)	P_{ex} (kN)	$e_{fluência}$ l_x>50 (cm)	$e_{1x,\ min}$ (cm)	$e_{x,\ total}$ (cm)	Md (kN.cm)	DIMENSIONAMENTO			A_s (cm²)	$A_{smín}$ (cm²)	Barras 8 mm	Barras 10 mm	Barras 12.5 mm	Barras 16 mm	Barras 20 mm
	F_k (kN)	F_d (kN)	h_x	h_y		< 90 ok							n	m	w							
P05	290.0	406	40	15	282	24.42	1.01	28286	0.03	2.7	3.74	1517	0.4	0.03	0.06	1.51	0.90	3	2	1	1	0
P06	350.0	490	40	15	282	24.42	0.92	28286	0.03	2.7	3.65	1788	0.4	0.04	0.06	1.51	0.90	3	2	1	1	0
P10	350.0	490	40	15	282	24.42	0.92	28286	0.03	2.7	3.65	1788	0.4	0.04	0.06	1.51	0.90	3	2	1	1	0
P12	390.0	546	45	15	282	21.71	0.82	40274	0.02	2.85	3.69	2017	0.4	0.04	0.06	1.70	1.01	3	2	1	1	1
P14	340.0	476	45	15	282	21.71	0.88	40274	0.02	2.85	3.75	1786	0.4	0.03	0.06	1.70	1.01	3	2	1	1	1
P17	570.0	798	20	50	282	48.84	1.86	11786	0.14	2.1	4.09	3267	0.4	0.09	0.06	2.51	1.50	5	3	2	1	1
P20	550.0	770	20	50	282	48.84	1.89	11786	0.13	2.1	4.12	3175	0.4	0.09	0.06	2.51	1.50	5	3	2	1	1
P23	360.0	504	45	15	282	21.71	0.86	40274	0.02	2.85	3.73	1879	0.4	0.03	0.06	1.70	1.01	3	2	1	1	1
P25	350.0	490	45	15	282	21.71	0.87	40274	0.02	2.85	3.74	1832	0.4	0.03	0.06	1.70	1.01	3	2	1	1	1
P27	350.0	490	40	15	282	24.42	0.92	28286	0.03	2.7	3.65	1788	0.4	0.04	0.06	1.51	0.90	3	2	1	1	0
P31	340.0	476	40	15	282	24.42	0.93	28286	0.03	2.7	3.66	1743	0.4	0.04	0.06	1.51	0.90	3	2	1	1	0
P32	280.0	392	40	15	282	24.42	1.03	28286	0.03	2.7	3.75	1471	0.4	0.03	0.06	1.51	0.90	3	2	1	1	0

CÁLCULO DE PILARES (EDIFÍCIO ACALANTO)

Característica do concreto

f_{ck} = 30 MPa

f_{cd} = 21.43 MPa

f_{yd} = 43.48 kN/cm²

E_{cs} = 2852 kN/cm²

$e_{ax}=e_{ay}$ = 0.0 cm Excentricidade acidental

d'= 3.0 cm

PILAR CANTO (FLEXO-COMPRESÃO OBLÍQUA)

DIREÇÃO X

PILAR	Resistência		Seção do pilar (cm)		Altura (cm)	Esbeltez	e_{2x} (cm)	P_{ex} (kN)	$e_{fluência}$ l_x>50 (cm)	$e_{1x,\ min}$ (cm)	$e_{x,\ total}$ (cm)	Md (kN.cm)	DIMENSIONAMENTO			A_s (cm²)	$A_{smín}$ (cm²)	Barras 8 mm	Barras 10 mm	Barras 12.5 mm	Barras 16 mm	Barras 20 mm
	F_k (kN)	F_d (kN)	h_x	h_y		< 90 ok							n	m	w							
P01	170.0	238	15	40	282	65.13	3.38	3978	0.00	1.95	5.33	1269	0.2	0.08		0.00	0.90	0	0	0	0	0
P02	280.0	392	15	40	282	65.13	2.74	3978	0.00	1.95	4.69	1839	0.4	0.11		0.00	0.90	0	0	0	0	0
P03	280.0	392	15	40	282	65.13	2.74	3978	0.00	1.95	4.69	1839	0.4	0.11		0.00	0.90	0	0	0	0	0
P04	170.0	238	15	40	282	65.13	3.38	3978	0.00	1.95	5.33	1269	0.2	0.08		0.00	0.90	0	0	0	0	0
P11	210.0	294	15	40	282	65.13	3.12	3978	0.00	1.95	5.07	1490	0.3	0.09		0.00	0.90	0	0	0	0	0
P15	210.0	294	15	40	282	65.13	3.12	3978	0.00	1.95	5.07	1490	0.3	0.09		0.00	0.90	0	0	0	0	0
P16	250.0	350	50	20	282	19.54	1.06	73661	0.00	3.00	4.06	1421	0.2	0.02		0.00	1.50	0	0	0	0	0
P18	370.0	518	50	20	282	19.54	0.91	73661	0.00	3.00	3.91	2027	0.3	0.02		0.00	1.50	0	0	0	0	0
P19	230.0	322	50	20	282	19.54	1.09	73661	0.00	3.00	4.09	1317	0.2	0.01		0.00	1.50	0	0	0	0	0
P21	350.0	490	50	20	282	19.54	0.94	73661	0.00	3.00	3.94	1928	0.3	0.02		0.00	1.50	0	0	0	0	0
P22	210.0	294	15	40	282	65.13	3.12	3978	0.00	1.95	5.07	1490	0.3	0.09		0.00	0.90	0	0	0	0	0
P26	210.0	294	15	40	282	65.13	3.12	3978	0.00	1.95	5.07	1490	0.3	0.09		0.00	0.90	0	0	0	0	0
P33	170.0	238	15	40	282	65.13	3.38	3978	0.00	1.95	5.33	1269	0.2	0.08		0.00	0.90	0	0	0	0	0
P34	280.0	392	15	40	282	65.13	2.74	3978	0.00	1.95	4.69	1839	0.4	0.11		0.00	0.90	0	0	0	0	0
P35	290.0	406	15	40	282	65.13	2.70	3978	0.00	1.95	4.65	1886	0.4	0.12		0.00	0.90	0	0	0	0	0
P36	170.0	238	15	40	282	65.13	3.38	3978	0.00	1.95	5.33	1269	0.2	0.08		0.00	0.90	0	0	0	0	0

PILAR CANTO (FLEXO-COMPRESÃO OBLÍQUA)

DIREÇÃO Y

PILAR	Resistência		Seção do pilar (cm)		Altura (cm)	Esbeltez	e_{2x} (cm)	P_{ex} (kN)	$e_{fluência}$ l_x>50 (cm)	$e_{1x,\ min}$ (cm)	$e_{x,\ total}$ (cm)	Md (kN.cm)	DIMENSIONAMENTO			A_s (cm²)	$A_{smín}$ (cm²)	Barras 8 mm	Barras 10 mm	Barras 12.5 mm	Barras 16 mm	Barras 20 mm
	F_k (kN)	F_d (kN)	h_x	h_y		< 90 ok							n	m	w							
P01	170.0	238	40	15	282	24.42	1.27	28286	0.00	2.7	3.97	945	0.2	0.02		0.00	0.90	0	0	0	0	0
P02	280.0	392	40	15	282	24.42	1.03	28286	0.00	2.7	3.73	1462	0.4	0.03		0.00	0.90	0	0	0	0	0
P03	280.0	392	40	15	282	24.42	1.03	28286	0.00	2.7	3.73	1462	0.4	0.03		0.00	0.90	0	0	0	0	0
P04	170.0	238	40	15	282	24.42	1.27	28286	0.00	2.7	3.97	945	0.2	0.02		0.00	0.90	0	0	0	0	0
P11	210.0	294	40	15	282	24.42	1.17	28286	0.00	2.7	3.87	1138	0.3	0.03		0.00	0.90	0	0	0	0	0
P15	210.0	294	40	15	282	24.42	1.17	28286	0.00	2.7	3.87	1138	0.3	0.03		0.00	0.90	0	0	0	0	0
P16	250.0	350	20	50	282	48.84	2.65	11786	0.00	2.1	4.75	1663	0.2	0.05		0.00	1.50	0	0	0	0	0
P18	370.0	518	20	50	282	48.84	2.29	11786	0.00	2.1	4.39	2272	0.3	0.06		0.00	1.50	0	0	0	0	0
P19	230.0	322	20	50	282	48.84	2.72	11786	0.00	2.1	4.82	1553	0.2	0.04		0.00	1.50	0	0	0	0	0
P21	350.0	490	20	50	282	48.84	2.34	11786	0.00	2.1	4.44	2175	0.3	0.06		0.00	1.50	0	0	0	0	0
P22	210.0	294	40	15	282	24.42	1.17	28286	0.00	2.7	3.87	1138	0.3	0.03		0.00	0.90	0	0	0	0	0
P26	210.0	294	40	15	282	24.42	1.17	28286	0.00	2.7	3.87	1138	0.3	0.03		0.00	0.90	0	0	0	0	0
P33	170.0	238	40	15	282	24.42	1.27	28286	0.00	2.7	3.97	945	0.2	0.02		0.00	0.90	0	0	0	0	0
P34	280.0	392	40	15	282	24.42	1.03	28286	0.00	2.7	3.73	1462	0.4	0.03		0.00	0.90	0	0	0	0	0
P35	290.0	406	40	15	282	24.42	1.01	28286	0.00	2.7	3.71	1507	0.4	0.03		0.00	0.90	0	0	0	0	0
P36	170.0	238	40	15	282	24.42	1.27	28286	0.00	2.7	3.97	945	0.2	0.02		0.00	0.90	0	0	0	0	0