

## ETABS Shear Wall Design

### ACI 318-14 Pier Design

#### Pier Details

Story ID	Pier ID	Centroid X (m)	Centroid Y (m)	Length (m)	Thickness (m)	LLRF
Cielo P1	PFel-A20-2	27,77885	29,44554	1,05	0,26	1

#### Material Properties

E_c (tonf/m²)	f'_c (tonf/m²)	Lt.Wt Factor (Unitless)	f_y (tonf/m²)	f_y's (tonf/m²)
2194996,45	2109,21	1	42184,18	42184,18

#### Design Code Parameters

Φ_T	Φ_C	Φ_v	Φ_v (Seismic)	IP <sub>MAX</sub>	IP <sub>MIN</sub>	P <sub>MAX</sub>
0,9	0,65	0,75	0,6	0,04	0,0025	0,8

#### Pier Leg Location, Length and Thickness

Station Location	ID	Left X <sub>1</sub> m	Left Y <sub>1</sub> m	Right X <sub>2</sub> m	Right Y <sub>2</sub> m	Length m	Thickness m
Top	Leg 1	27,67868	28,93019	27,87902	29,9609	1,05	0,26
Bottom	Leg 1	27,67868	28,93019	27,87902	29,9609	1,05	0,26

#### Flexural Design for P, M<sub>3</sub> and M<sub>2</sub>

Station	D/C	Flexural	P <sub>u</sub> tonf	M <sub>u2</sub> tonf-m	M <sub>u3</sub> tonf-m
Top	1,245	1.4Y+1.2D+1.0L	-23,5369	0,3902	-15,0505
Bottom	0,848	-1.4Y+1.2D+1.0L	1,9755	-0,537	-18,9669

**Design Inadequacy Message: Pier fails in flexure or P-M-M interaction !!**

#### Shear Design

Station Location	ID	Rebar m <sup>2</sup> /m	Shear Combo	P <sub>u</sub> tonf	M <sub>u</sub> tonf-m	V <sub>u</sub> tonf	ΦV <sub>c</sub> tonf	ΦV <sub>n</sub> tonf
Top	Leg 1	0,00065	-1.4Y+1.2D+1.0L	43,1873	23,0996	22,1076	12,6155	29,8899
Bottom	Leg 1	0,00065	-1.4Y+1.2D+1.0L	1,9755	-18,9669	21,9836	12,6155	29,8899

#### Boundary Element Check (ACI 18.10.6.3, 18.10.6.4)

Station Location	ID	Edge Length (m)	Governing Combo	P <sub>u</sub> tonf	M <sub>u</sub> tonf-m	Stress Comp tonf/m <sup>2</sup>	Stress Limit tonf/m <sup>2</sup>	C Depth m	C Limit m
Top-Left	Leg 1	Not Required	-1.4Y+1.2D+1.0L	43,1873	23,0996	-325,31	421,84	0,17501	0,23333
Top-Right	Leg 1	Not Calculated	-1.4Y+1.2D+1.0L	43,1873	23,0996	641,7	421,84	0,17501	0,23333
Bottom-Left	Leg 1	0,04258	-1.4Y+1.2D+1.0L	1,9755	-18,9669	404,24	421,84	0,08517	0,23333
Botttom-Right	Leg 1	0,05495	1.4Y+1.2D+1.0L	15,2985	15,9988	390,92	421,84	0,1099	0,23333