

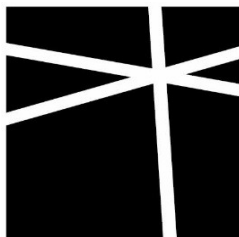
SUPPLEMENTAL STRUCTURAL CALCULATIONS FOR:

6423 E MERCER WAY

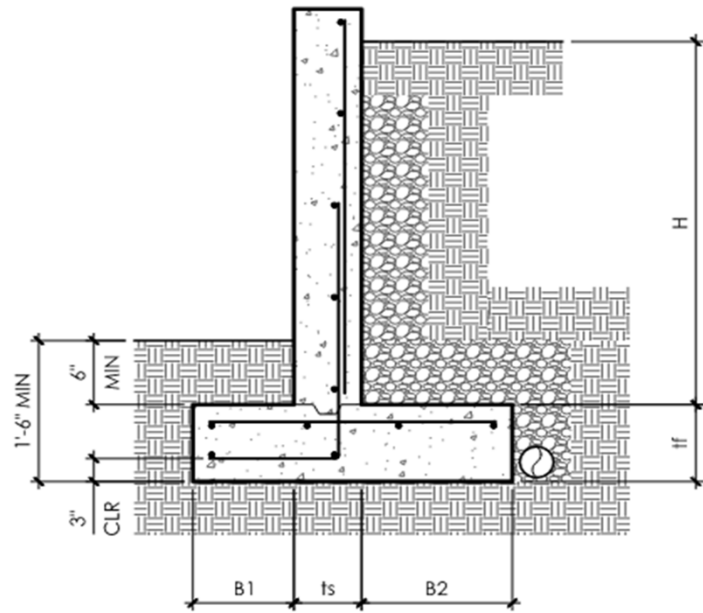
MERCER ISLAND, WA

ARCHITECT: CITIZEN DESIGN

JANUARY 23, 2026



**MALSAM
TSANG**
STRUCTURAL
ENGINEERING

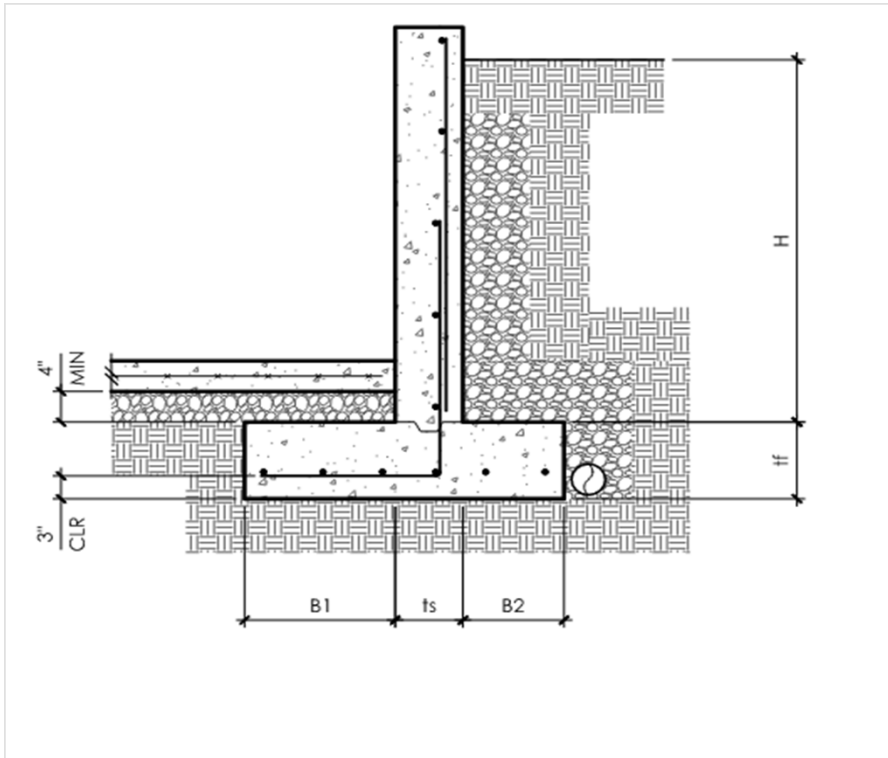


Retaining Wall Type	C02-X00	
Bearing (q_{all})	2	ksf
Bearing w/ Seismic (q_{eq})	2.66	ksf
Active Pressure (K_a)	0.035	kcf
Ultimate Passive (K_p)	0.1	kcf
Ultimate Coef Frict (μ)	0.4	
Seismic Surcharge (K_{eq})	9	H
Soil Weight (ρ_{soil})	0.12	kcf
Frost Depth	18	in
Slab Resist Sliding	No	
Concr Strength (f'_c)	2.5	ksi
Steel Strength (f_y)	60	ksi
Conc density (ρ_{conc})	0.15	kcf
Ignore Passive	1	ft

FOS not included
FOS not included

6" Min

Retaining Wall Schedule and Summary																											
Retain Height	Toe Width	Stem Width	Heel Width	Ftg Depth	Key Depth	Stem Reinf				Footing Reinf					Key Reinf			Slide FOS		OT FOS		Bearing w/o Eq	Bearing w/ Eq	Resultant in Middle Third	Max Force on Stem		
						Vert	Horiz	Top Heel	Bot Toe	Long	Vert	Long	w/o Seismic	w/ Seismic	w/o Seismic	w/ Seismic											
H	B1	ts	B2	ff	D	bar	in	bar	in	bar	in	bar	in	#	bar	bar	in	#	bar					ksf	ksf		
Formula																											
ft	ft	in	ft	in	in	bar	in	bar	in	bar	in	bar	in	#	bar	bar	in	#	bar					ksf	ksf		kip
4	0.5	6	1.75	9	0	#4	18	#4	16					3	#4					1.67	1.23	3.58	2.19	0.90	1.22	Yes	
4	0.5	8	1.5	9	0	#4	18	#4	12					3	#4					1.64	1.20	3.40	2.08	0.93	1.30	Yes	
5	0.5	6	2.5	10	0	#4	18	#4	16					4	#4					1.69	1.22	3.83	2.32	1.08	1.46	Yes	
5	0.5	8	2.5	10	0	#4	12	#4	12					4	#4					1.78	1.29	4.22	2.56	1.06	1.39	Yes	
6	0.75	6	3.25	10	0	#4	11	#4	16	#4	11			5	#4					1.75	1.25	4.55	2.73	1.08	1.45	Yes	
6	0.75	8	3	10	0	#4	12	#4	12	#4	11			5	#4					1.73	1.24	4.40	2.64	1.11	1.49	Yes	
7	1.25	8	3.5	10	0	#4	10	#4	12	#4	11			6	#4					1.70	1.21	4.92	2.92	1.02	1.43	Yes	
8	1.25	8	4.25	12	0	#5	11	#4	12	#5	14			6	#5					1.70	1.21	4.86	2.90	1.23	1.70	Yes	
9	1.5	8	5	12	0	#5	8	#4	12	#5	14			6	#5					1.74	1.23	5.27	3.13	1.25	1.78	Yes	
10	1.75	8	5.5	15	0	#6	8	#4	12	#5	11			9	#5					1.71	1.21	5.07	3.03	1.40	1.99	Yes	
11	2	10	6	15	0	#6	8	#4	10	#5	11			10	#5					1.73	1.22	5.31	3.15	1.46	2.10	Yes	
12	2.25	12	6.5	15	0	#6	8	#5	12	#5	10			11	#5					1.74	1.23	5.52	3.26	1.52	2.21	Yes	



Retaining Wall Type	C02-X10
Bearing (q_{all})	2 ksf
Bearing w/ Seismic (q_{eq})	2.66 ksf
Active Pressure (K_a)	0.035 kcf
Ultimate Passive (K_p)	0.1 kcf
Ultimate Coef Frict (μ)	0.4
Seismic Surcharge (K_{eq})	9 H
Soil Weight (ρ_{soil})	0.12 kcf
Frost Depth	18 in
Slab Resist Sliding	Yes
Concr Strength (f'_c)	2.5 ksi
Steel Strength (f_y)	60 ksi
Conc density (ρ_{conc})	0.15 kcf
Ignore Passive	1 ft

FOS not included
FOS not included

6" Min

Retaining Wall Schedule and Summary

Retain Height	Toe Width	Stem Width	Heel Width	Ftg Depth	Key Depth	Stem Reinf				Footing Reinf					Key Reinf		Slide FOS		OT FOS		Bearing w/o Eq	Bearing w/ Eq	Resultant in Middle Third	Max Force on Stem			
						Vert	Horiz	Top Heel	Bot Toe	Long	Vert	Long	w/o Seismic	w/ Seismic	w/o Seismic	w/ Seismic											
H	B1	ts	B2	ff	D	bar	in	bar	in	bar	in	bar	in	#	bar	bar	in	#	bar								
ft	ft	in	ft	in	in	bar	in	bar	in	bar	in	bar	in	#	bar	bar	in	#	bar					ksf	ksf		kip
4	1	6	0.75	9	0	#4	18	#4	16					3	#4					-	-	2.21	1.35	0.89	1.87	Yes	
4	1.25	8	0.42	9	0	#4	18	#4	12					3	#4					-	-	2.30	1.41	0.78	1.52	Yes	
5	1.75	6	0.75	10	0	#4	11	#4	16					4	#4					-	-	2.26	1.37	0.81	1.69	Yes	
5	1.5	8	0.75	10	0	#4	11	#4	12					4	#4					-	-	2.32	1.41	0.89	1.77	Yes	
6	2.25	6	0.75	10	0	#4	11	#4	16					4	#4					-	-	2.03	1.22	0.90	2.54	Yes	
6	2	8	0.75	10	0	#4	11	#4	12					4	#4					-	-	2.11	1.27	0.96	2.40	Yes	
7	2.75	8	0.75	10	0	#4	9	#4	12					5	#4					-	-	2.12	1.26	0.91	2.34	Yes	
8	3.25	8	1	12	0	#5	11	#4	12					5	#5					-	-	2.17	1.29	0.95	2.30	Yes	
9	3.75	8	1.25	12	0	#5	8	#4	12					5	#5					-	-	2.28	1.35	0.95	2.12	Yes	
10	4.25	8	1.5	15	0	#6	8	#4	12					7	#5					-	-	2.31	1.38	1.07	2.30	Yes	
11	4.75	10	1.5	15	0	#6	8	#4	10					8	#5					-	-	2.33	1.38	1.10	2.37	Yes	
12	5.25	12	1.5	15	0	#6	8	#5	12					9	#5					-	-	2.35	1.39	1.12	2.44	Yes	