

Shoring Wall Calculations for the MI Treehouse

Job: 18-025

Site 5637 East Mercer Way

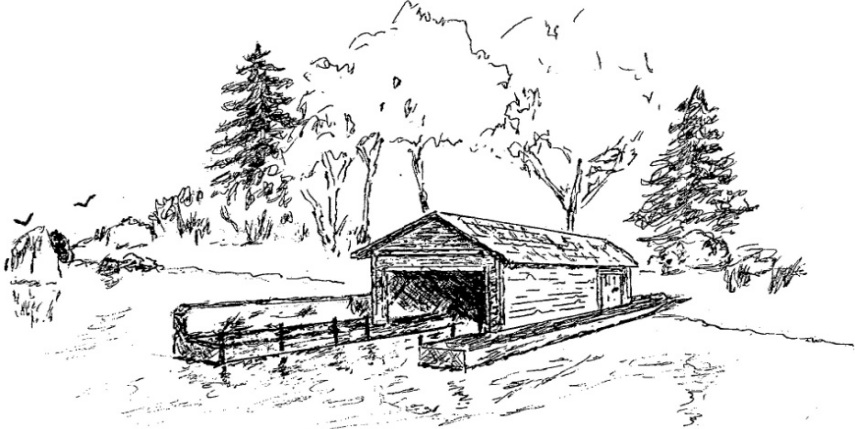
Address : Mercer Island, WA 98040

Date: March 27, 2023

**Shoring Wall
Calculations**



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Sheet: 2 Shoring Wall Calculations

Soldier Pile Wall Design

#	Soil								Pile											Timber Lagging																						
	Safety Factor		Pressures						Geometry					Depths/Moments						Steel		Lower Third			Middle Third			Upper Third														
	Typ.	Seis. & Debris	Act. P _{Act}		Sur. P _{Sur}	Seis. Sur. P _{Seis}	Debris Flow P _{DF}	Passive Pressure		Shape	Grade	Back Fill H _{BF}	Debris Flow. H _{DF}	Spac. Sp.	Pile Dia. D	Arch. Factor A	Typ.			Seis.			Act. f' _b	Allw. F' _b	Timber	Grade	Loads		Stresses		Timber	Grade	Loads		Stresses		Timber	Grade	Loads		Stresses	
			AG	BG				P _p	h _n								Zero Shear d _{Typ.}	Pile Depth E _{Typ.}	Max. Mom. Typ. M _{max}	Zero Shear d _{Seis.}	Pile Depth E _{Seis.}	Max. Mom. Seis. M _{max}					Max. Mom. M _{max}	Act. f' _b	All. F' _b	Max. Mom. M _{max}			Act. f' _b	All. F' _b	Max. Mom. M _{max}	Act. f' _b			All. F' _b	Max. Mom. M _{max}	Act. f' _b	All. F' _b
			(pcf)	(pcf)	(psf)	(psf)	(pcf)	(pcf)	(pcf)	(ft)	(ft)	(ft)	(in)	(ft)	(ft)	(kip-ft)	(ft)	(ft)	(kip-ft)	(ksi)	(ksi)	Arch =	0.50	(lb-ft)	(psi)	(psi)	Arch =	0.50	(lb-ft)	(psi)	(psi)	Arch =	0.50	lb-ft	(psi)	(psi)						
1-4	1.5	1.2	35	35	80.0			225	2.5	W6x20	A572	4.00		7.50	18.0	2.00	3.81	7.13	29.72	3.22	6.15	21.40	26.6	33.0	4x8	DF#2	492	399	1015	4x8	DF#2	328	266	1015	4x8	DF#2	164	133	1015			
5-8	1.5	1.2	35	35	80.0			225	2.5	W6x20	A572	3.30		7.50	18.0	2.00	3.32	6.20	19.39	2.81	5.34	13.93	17.4	33.0	4x8	DF#2	406	329	1015	4x8	DF#2	271	219	1015	4x8	DF#2	135	110	1015			
9-11	1.5	1.2	35	35	80.0			225	2.5	W6x20	A572	2.00		7.50	18.0	2.00	2.39	4.41	6.76	2.02	3.78	4.82	6.1	33.0	4x8	DF#1	246	200	1508	4x8	DF#2	164	133	1015	4x8	DF#2	82	67	1015			
12	1.5	1.2	60	60				225		W8x35	A572	6.50	6.00	6.00	18.0	2.00	5.48	10.08	70.78	4.44	8.35	49.09	27.2	33.0	4x8	DF#1	878	711	1508	4x8	DF#2	585	474	1015	4x8	DF#2	293	237	1015			
13	1.5	1.2	60	60				225		W10x68	A572	8.50		7.50	24.0	2.00	6.98	12.84	194.95	5.65	10.63	135.25	30.9	33.0	4x8	DF#1	1793	1454	1508	4x8	DF#2	1195	969	1015	4x8	DF#2	598	485	1015			
14	1.5	1.2	60	60				225		W12x72	A572	10.00		6.00	24.0	2.00	7.50	13.84	241.88	6.05	11.44	167.91	29.8	33.0	4x8	DF#1	1350	1094	1508	4x8	DF#2	900	730	1015	4x8	DF#2	450	365	1015			
15	1.5	1.2	60	60			100	225		W12x72	A572	10.00	2.00	6.00	24.0	2.00	7.50	13.84	241.88	6.22	11.88	192.11	29.8	33.0	4x8	DF#1	1350	1094	1508	4x8	DF#2	900	730	1015	4x8	DF#2	450	365	1015			
16	1.5	1.2	60	60			100	225		W14x68	A572	10.50	3.33	6.00	24.0	2.00	7.87	14.53	280.00	6.78	13.13	266.95	32.6	33.0	4x8	DF#1	1418	1149	1508	4x8	DF#2	945	766	1015	4x8	DF#2	473	383	1015			
17	1.5	1.2	60	60			100	225		W14x99	A572	11.50	4.67	6.00	24.0	2.00	8.62	15.91	367.86	7.71	15.10	415.52	31.8	33.0	4x8	DF#1	1553	1259	1508	4x8	DF#2	1035	839	1015	4x8	DF#2	518	420	1015			
18	1.5	1.2	60	60			100	225		W14x145	A572	12.50	6.00	6.00	24.0	2.00	9.37	17.30	472.41	8.68	17.16	621.30	32.1	33.0	4x8	DF#1	1688	1368	1508	4x8	DF#2	1125	912	1015	4x8	DF#2	563	456	1015			
19-28	1.5	1.2	60	60			100	225		W14x145	A572	12.50	6.00	6.21	24.0	2.00	9.51	17.53	492.50	8.81	17.40	647.09	33.5	33.0	4x8	DF#1	1808	1465	1508	4x8	DF#2	1205	977	1015	4x8	DF#2	603	488	1015			
29	1.5	1.2	60	60				225		W12x72	A572	10.00		6.00	24.0	2.00	7.50	13.84	241.88	6.05	11.44	167.91	29.8	33.0	4x8	DF#1	1350	1094	1508	4x8	DF#1	900	730	1508	4x8	DF#1	450	365	1508			
30	1.5	1.2	60	60				225		W12x50	A572	9.00		6.00	24.0	2.00	6.75	12.45	176.33	5.45	10.30	122.41	33.0	33.0	4x8	DF#1	1215	985	1508	4x8	DF#1	810	657	1508	4x8	DF#1	405	328	1508			
31	1.5	1.2	60	60				225		W12x35	A572	8.00		6.00	24.0	2.00	6.00	11.07	123.84	4.84	9.15	85.97	32.6	33.0	4x8	DF#1	1080	876	1508	4x8	DF#1	720	584	1508	4x8	DF#1	360	292	1508			
32	1.5	1.2	60	60				225		W10x39	A572	7.50		6.00	24.0	2.00	5.63	10.38	102.04	4.54	8.58	70.84	29.1	33.0	4x8	DF#1	1013	821	1508	4x8	DF#1	675	547	1508	4x8	DF#1	338	274	1508			
33	1.5	1.2	60	60				225		W10x30	A572	7.00		6.00	24.0	2.00	5.25	9.69	82.96	4.24	8.01	57.59	30.7	33.0	4x8	DF#2	945	766	1015	4x8	DF#2	630	511	1015	4x8	DF#2	315	255	1015			

