Table 3H.7-1 Results of DGFOT Concrete Design

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1,8)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Loads (11) Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	Longitudinal Reinforcement Design Loads – In-Plane Shear Loads – Loads (11) Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Forces – Load Combination	Horizontal Section – Transverse Shear Force (kips / ft)	Horizontal Section – Corresponding Axial Force (kips / ft)	Vertical Section – Transverse Shear Force (kips / ft)	Vertical Section – Corresponding Axial Force (kips / ft)	Transverse Shear (7) Reinforcement Provided (in²/ft²)	Remarks
Tunnel Walls	2	Near Side	Horizontal	3H.7-11	1-H-L	Max Tension w/ corresponding moment	951	D + L + H' +E' (WP)	130	-28	D + L + H' +E' (WP)	26	4.68	-				-	-	
						Max Compression w/ corresponding moment	932	D + L + H' +E' (WP)	-66	-1										
						Max Moment with axial tension	952	D + L + H' +E' (WP)	48	-32										
						Max Moment with axial compression	953	D + L + H' +E' (WP)	-1	-28										
					2-H-L	Max Tension w/ corresponding moment	153	D + L + H' +E' (WP)	89	-11	D + L + H' +E' (WP)	21	3.12	-				-	-	
						Max Compression w/ corresponding moment	854	D + L + H' +E' (WP)	-77	-1										
						Max Moment with axial tension	265	D + L + H' +E' (WP)	62	-17										
						Max Moment with axial compression	706	D + L + H' +E' (WP)	-8	-16										
					3-H-L	Max Tension w/ corresponding moment	149	D + L + H' +E' (WP)	108	-28	D + L + H' +E' (WP)	26	4.68	-				-	-	
						Max Compression w/ corresponding moment	149	D + L + H' +E' (WP)	-123	-6										
						Max Moment with axial tension	149	D + L + H' +E' (WP)	104	-28										
						Max Moment with axial compression	141	D + L + H' +E' (WP)	-9	-28										
		Far Side	Horizontal	3H.7-12	1-H-L	Max Tension w/ corresponding moment	284	D + L + H +Wt	109	0	D + L + H' +E' (WP)	26	3.12	-				-	-	
						Max Compression w/ corresponding moment	149	D + L + H' +E' (WP)	-129	25										
						Max Moment with axial tension	634	D + L + H' +E' (WP)	4	28										
						Max Moment with axial compression	277	D + L + H' +E' (WP)	-72	30										
		Near Side	Vertical	3H.7-13	1-V-L	Max Tension w/ corresponding moment	953	D + L + H' +E'	35	-6	D + L + H + Wt	59	3.12	-				-	-	
						Max Compression w/ corresponding moment	918	D + L + H +Wt	-96	-16										
						Max Moment with axial tension	902	D + L + H' +E' (WP)	14	-86										
						Max Moment with axial compression	902	D + L + H' +E' (WP)	-10	-86										
		Far Side	Vertical	3H.7-14	1-V-L	-	-	D + L + H +Wt	-	17	D + L + H + Wt	59	3.12	-				-	-	
				3H.7-14A	1-T	-	-	-	-	-	-	-	-	D + F + L + H' + E'	26	3	10	146	0.44	
Access Region Walls	2	Near Side	Horizontal	3H.7-9	1-H-L	-	-	D + L + H + Wt	See Note (9)		D + L + H' +E' (WP)	34	3.12	-				-	-	
		Far Side	Horizontal	3H.7-9	1-H-L	-	-	D + L + H + Wt			D + L + H' +E' (WP)	34	3.12	-				-	-	
		Near Side	Vertical	3H.7-10	1-V-L	-	-	D + L + H + Wt			D + L + H + Wt	182	3.12	-				-	-	
		Far Side	Vertical	3H.7-10	1-V-L	-	-	D + L + H + Wt			D + L + H + Wt	182	3.12	-				-	-	
				3H.7-10A	1-T	-	-	-	-	-	-	-	-	D + F + L + H + Wt	-6	-102	28	86	0.44	

Table 3H.7-1 Results of DGFOT Concrete Design (Continued)

Location	Thickness (ft)	Face	Direction	orcement Layout ing Number (1,8)	ment Zone Number (2)	imum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Loads (11) Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Loads (11) Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Forces: Load Combination	Horizontal Section		Vertical Section		Transverse Shear (7) Reinforcement Provided (in^2/ft^2)	Remarks
Basemat	2	Near Side	Horizontal	3H.7-15	1-H-L	-	-	D + L + H + Wt	See Note (10)		D + L + H' +E' (WP)	27	3.12	-				-	-	
		Far Side	Horizontal	3H.7-15	1-H-L	Max Tension w/ corresponding moment	2584	D + L + H' +E' (WP)	95	8	D + L + H' +E' (WP)	27	3.12	-				-	-	
						Max Compression w/ corresponding moment	309	D + L + H' +E' (WP)	-117	12										
						Max Moment with axial tension	2351	D + L + H' +E' (WP)	12	21										
						Max Moment with axial compression	2316	D + L + H +Wt	-13	32										
		Near Side	Vertical	3H.7-16	1-V-L	Max Tension w/ corresponding moment	2425	D + L + H' +E' (WP)	20	-60	D + L + H' +E' (WP)	47	3.12	-				-	-	
						Max Compression w/ corresponding moment	301	D + L + H' +E' (WP)	-23	0										
						Max Moment with axial tension	2433	D + L + H' +E' (WP)	16	-74										
						Max Moment with axial compression	2554	D + L + H' +E' (WP)	-2	-72										
		Far Side	Vertical	3H.7-16	1-V-L	Max Tension w/ corresponding moment	2315	D + L + H +Wt	13	2	D + L + H' +E' (WP)	47	3.12	-				-	-	
						Max Compression w/ corresponding moment	309	D + L + H' +E' (WP)	-35	79										
						Max Moment with axial tension	2438	D + L + H' +E' (WP)	1	56										
						Max Moment with axial compression	2496	D + L + H' +E' (WP)	-29	87										
				3H.7-17	1-T	-	-	-	-	-	-	-	-	1.4D + 1.4F + 1.7L + 1.7H + 1.7W	52	12	12	1	0.44	
Roof of Tunnel	2	Near Side	Horizontal	3H.7-18	1-H-L	Max Tension w/ corresponding moment	174	D + L + H + Wt	124	-11	D + L + H' +E' (WP)	34	3.12	-				-	-	
						Max Compression w/ corresponding moment	1703	D + L + H' +E' (WP)	-117	-4										
						Max Moment with axial tension	1688	D + L + H + Wt	53	-38										
						Max Moment with axial compression	1694	D + L + H' +E' (WP)	-9	-30										
		Far Side	Horizontal	3H.7-18	1-H-L	Max Tension w/ corresponding moment	1710	D + L + H' +E' (WP)	118	7	D + L + H' +E' (WP)	34	3.12	-				-	-	
						Max Compression w/ corresponding moment	1703	D + L + H' +E' (WP)	-117	12										
						Max Moment with corresponding axial tension	1695	D + L + H + Wt	10	41										
						Max Moment with corresponding axial compression	1840	D + L + H + Wt	-10	53										
		Near Side	Vertical	3H.7-19	1-V-L	Max Tension w/ corresponding moment	1694	D + L + H + Wt	17	-20	D + L + H' +E' (WP)	53	3.12	-				-	-	
						Max Compression w/ corresponding moment	1694	D + L + H' +E' (WP)	-28	-45										
						Max Moment with corresponding axial tension	1710	D + L + H' +E' (WP)	0	-65										
						Max Moment with corresponding axial compression	174	D + L + H' +E' (WP)	-14	-70										
		Far Side	Vertical	3H.7-19	1-V-L	Max Tension w/ corresponding moment	1694	D + L + H + Wt	16	9	D + L + H' +E' (WP)	53	3.12	-				-	-	
						Max Compression w/ corresponding moment	1839	D + L + H' +E' (WP)	-23	6										
						Max Moment with corresponding axial tension	209	D + L + H' +E' (WP)	2	54										
						Max Moment with corresponding axial compression	209	D + L + H' +E' (WP)	-5	54										
				3H.7-19A	1-T	-	-	-	-	-	-	-	-	D + F + L + H + Wt	-7	21	33	22	0.44	

Notes:

(1) The reinforcement layout drawings show the various zones used to define the minimum reinforcement that will be provided based on finite element analysis results. Actual provided reinforcement based on final rebar layout and including development length may exceed the reported provided reinforcement and the zones with higher reinforcement may be extended beyond their reported boundaries. The dimensions in the reinforcement drawings are based on the dimensions of the 2D SAP2000 shell elements, which are modeled at the centerline of the walls and slabs.

(2) Each reinforcement layout drawing is divided into reinforcement zones. The reinforcement zone naming convention is as follows: "H" = horizontal, "V" = vertical, "L" = longitudinal reinforcement, "T" = transverse reinforcement. For slabs, vertical corresponds to Y-axis and horizontal corresponds to X-axis as shown on Figure 3H.7-1.

(3) The maximum tension and compression axial forces are provided with the corresponding moment from the same load combination. The maximum moment that has a corresponding tension in the same load combination and the maximum moment that has a corresponding compression in the same load combination are also provided.

(4) Negative axial load is compression and positive axial load is tension. Negative moment applies tension to the top face of the shell element and positive moment applies tension to the bottom face of the shell element. For walls or slabs where the same reinforcement is provided on both faces, the moment is shown as absolute value.

(5) The reported in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.

(6) Not used.

(7) In areas where horizontal and vertical transverse shear zones overlap, the total transverse shear reinforcement to be supplied in the overlapping area is the sum of the transverse reinforcement required from the horizontal and vertical zones.

(8) Openings in the Access Regions have not been included in the Reinforcement Layout Drawings.

(9) The Access Region is governed by the tornado load combination. The outside layer of transverse torsional reinforcement (all 4 near sides horizontal) in conjunction with the near side vertical longitudinal reinforcement are utilized to resist a torsional moment of 1438 kip*ft due to an eccentric tornado missile load. The far side horizontal reinforcement is utilized to resist an axial force of 805 kip due to a concentric tornado missile load as well as a tornado wind pressure of 294 psf. The remaining capacity of the near side vertical longitudinal reinforcement in conjunction with the far side vertical longitudinal reinforcement are utilized to resist a moment of 10076 kip*ft due to the tornado load combination.

(10) The basemat near side horizontal reinforcement is governed by the tornado load combination. The outside layer of transverse torsional reinforcement is composed of near side vertical reinforcement (tunnel walls in Z-direction and roof and basemat in Y-direction) in conjunction with the near side horizontal reinforcement (2 tunnel walls, roof, and basemat in X-direction) are utilized to resist a torsional moment of 8085 kip*ft due to tornado load combination.

(11) The "E ' (WP)" designation in the load combination column indicates seismic SSE loading including wave propagation effects.

Table 3H.7-2 Factors of Safety against Sliding, Overturning and Flotation for DGFOT

Load Combination	Calculated Safety Factor			Notes
	Overturning	Sliding	Flotation	
D + F_b	--	--	1.70	
D + H + W	1.58	3.47	--	2, 3 (Sliding Only)
D + H + W_t	1.10	1.10	--	2, 4
D + H’ + E’	1.30	1.28	--	2, 3, 5
D + H + W_{th}	1.10	1.10	--	2, 6

Notes:

(1) Loads D, H, H’, W, W_t, and E’ are defined in Section 3H.7.4.3.4. F_b is the buoyant force corresponding to the design basis flood. Load W_{th} is defined in Subsection 3H.11.1.

(2) Coefficients of friction for sliding resistance are 0.58 for static conditions and 0.39 for dynamic conditions for the Diesel Generator Fuel Oil Tunnel.

(3) The calculated safety factors consider the full passive pressure.

(4) The minimum calculated safety factor against sliding and overturning for tornado wind is 2.32. For tornado wind in conjunction with tornado missile, subsequent detailed design of the restraints for the Access Regions will provide sliding and overturning safety factors greater than 1.10.

(5) The seismic sliding forces and overturning moments from SSI and SSSI analyses are less than the seismic sliding forces and overturning moments used in the stability evaluations.

(6) The minimum calculated safety factor against sliding and overturning for hurricane wind is 1.21. For hurricane wind in conjunction with hurricane missile, subsequent detailed design of the restraints for the Access Regions will provide sliding and overturning safety factors greater than 1.10.

Table 3H.7-3 Tornado Missile Impact Evaluation for Diesel Generator Fuel Oil Tunnel

Local Check	**DGFOT and Access Regions**	Minimum required thickness to prevent penetration, perforation, and scabbing = 15.14” Minimum provided thickness = 24”
Overall Check of Impacted Element	**Walls and Slabs of DGFOT and Access Regions**	Flexure controls. Maximum impact load including Dynamic Load Factor (DLF) = 899 kips for Access Regions and 862 kips for DGFOT Ductility demand = 1.4 for shell missile and 1.0 for automobile missile < Ductility limit = 10
Global Check		Equivalent static impact forces due to missile impact are considered in the local and global design of the DGFOT. The analysis results presented in Table 3H.7-1 provide a summary of the results for all load combinations including those affected by the tornado missile impact.

Table 3H.9-1 Extreme Environmental Design Parameters for Seismic Analysis, Design, Stability Evaluation and Seismic Category II/I Design

Structure	Seismic Analysis				
	SSI			SSSI	
	Input Motion	Soil Type	Structural Damping for Generation of ISRS	Input Motion	Soil Type
Diesel Generator Fuel Oil Tunnels (DGFOT)	Envelope of Amplified[(1)] Site-Specific SSE & 0.3g RG 1.60	DCD & Site-Specific	4% for all SSI analysis cases	Site-Specific SSE	Site-Specific
UHS/RSW Pump House	Site-Specific SSE	Site-Specific	4% for all SSI analysis cases	Site-Specific SSE	Site-Specific
RSW Piping Tunnels	Amplified[(1)] Site-Specific SSE	Site-Specific	4% for all SSI analysis cases Except 7% for Cracked Case	Site-Specific SSE	Site-Specific
Diesel Generator Fuel Oil Storage Vault (DGFOSV)	Envelope of Amplified[(1)] Site-Specific SSE & 0.3g RG 1.60	Site-Specific	4% for all SSI analysis cases	Site-Specific SSE	Site-Specific
Radwaste Building (RWB)	NA	NA	NA	Site-Specific SSE	Site-Specific
Control Bldg. Annex (CBA)	NA	NA	NA	NA	NA
Turbine Building (TB)	NA	NA	NA	NA	NA
Service Building (SB)	NA	NA	NA	NA	NA

Table 3H.9-1 Extreme Environmental Design Parameters for Seismic Analysis, Design, Stability Evaluation and Seismic Category II/I Design (Continued)

Structure	Design Structure			
	Seismic	Tornado(5)	Tornado Missiles(5)	Flood
Diesel Generator Fuel Oil Tunnels (DGFOT)	Envelope of Amplified(1) Site-Specific SSE & 0.3g RG 1.60 (See Note 4)	DCD Tornado Wind Parameters (As described in Table 5.0 of DCD/Tier 1)	DCD Missile Spectrum 1 as defined in Table 5.0 of DCD/Tier 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)
UHS/RSW Pump House	Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)
RSW Piping Tunnels	Amplified(1) Site-Specific SSE (See Note 4)	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)
Diesel Generator Fuel Oil Storage Vault (DGFOSV)	Envelope of Amplified(1) Site-Specific SSE & 0.3g RG 1.60	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)
Radwaste Building (RWB)	1/2 of 0.3g RG 1.60 SSE for RW-IIa Classification, 4% Damping	Per Table 2 of RG 1.143 Rev. 2 for RW-IIa Classification	Per Table 2 of RG 1.143 Rev. 2 for RW-IIa Classification	Flood El. 33' MSL RW-IIa Classification
Control Bldg. Annex (CBA)	IBC 2006	NA	NA	NA
Turbine Building (TB)	IBC 2006	NA	NA	NA
Service Building (SB)	IBC 2006	NA	NA	NA

Table 3H.9-1 Extreme Environmental Design Parameters for Seismic Analysis, Design, Stability Evaluation and Seismic Category II/I Design (Continued)

Structure	Design Stability				
	Seismic	Tornado(5)	Tornado Missiles(5)	Flotation	Coeff. Of Friction for Water-proofing Membrane
Diesel Generator Fuel Oil Tunnels (DGFOT)	Amplified(1) Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1 (Note 2)	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific
UHS/RSW Pump House	Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific
RSW Piping Tunnels	Amplified(1) Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific
Diesel Generator Fuel Oil Storage Vault (DGFOSV)	Amplified(1) Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific
Radwaste Building (RWB)	Amplified(1) Site-Specific SSE, 7% Damping	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific
Control Bldg. Annex (CBA)	Amplified(1) Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific
Turbine Building (TB)	Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific
Service Building (SB)	Amplified(1) Site-Specific SSE	Site-Specific Tornado Wind Parameters (Region II, RG 1.76 Rev. 1)	Site-Specific Tornado Missile Spectrum for Region II as shown in Table 2 of RG 1.76 Rev. 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade)	Site-Specific

Table 3H.9-1 Extreme Environmental Design Parameters for Seismic Analysis, Design, Stability Evaluation and Seismic Category II/I Design (Continued)

Structure	Design for II/I (applicable to the design of lateral load resisting system)			
	Seismic	Tornado[(5)]	Tornado Missiles[(5)]	Flood
Diesel Generator Fuel Oil Tunnels (DGFOT)	NA	NA	NA	NA
UHS/RSW Pump House	NA	NA	NA	NA
RSW Piping Tunnels	NA	NA	NA	NA
Diesel Generator Fuel Oil Storage Vault (DGFOSV)	NA	NA	NA	NA
Radwaste Building (RWB)	Envelope of Amplified[(1)] Site-Specific SSE & 0.3g RG 1.60, 7% Damping	DCD Tornado Wind Parameters (As described in Table 5.0 of DCD/Tier 1)	DCD Missile Spectrum 1 as defined in Table 5.0 of DCD/Tier 1[(6)]	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)
Control Bldg. Annex (CBA)	Envelope of Amplified[(1)] Site-Specific SSE & 0.3g RG 1.60	DCD Tornado Wind Parameters (As described in Table 5.0 of DCD/Tier 1)	DCD Missile Spectrum 1 as defined in Table 5.0 of DCD/Tier 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)
Turbine Building (TB)	0.3g RG 1.60 SSE	DCD Tornado Wind Parameters (As described in Table 5.0 of DCD/Tier 1)	DCD Missile Spectrum 1 as defined in Table 5.0 of DCD/Tier 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)
Service Building (SB)	Envelope of Amplified[(1)] Site-Specific SSE & 0.3g RG 1.60	DCD Tornado Wind Parameters (As described in Table 5.0 of DCD/Tier 1)	DCD Missile Spectrum 1 as defined in Table 5.0 of DCD/Tier 1	Flood El. 40' MSL, Water Density 63.85 lb/ft^3 (above grade) + Drag Effect 44 psf (above grade) + Impact of Floating Debris per COLA Section 3.4.2 + Wind Generated Wave Action per COLA Figure 3.4-1 (only hydrodynamic portion)

Table 3H.9-1 Extreme Environmental Design Parameters for Seismic Analysis, Design, Stability Evaluation and Seismic Category II/I Design (Continued)

Notes:

(1) Amplified Site-Specific SSE accounts for the influence of nearby heavy Reactor Building, Control Building, and/or UHS/RSW Pump House.

(2) For stability under tornado loading with tornado missile, restraints are required at top of DGFOT access regions.

(3) NA: Not Applicable

(4) Seismic wave propagation for DGFOT and RSW Piping Tunnels is based on site-specific SSE because their layouts are site-specific.

(5) See Section 3H.11 for site-specific hurricane wind and hurricane missiles.

(6) The exterior doors of the Radwaste Building are normally closed.

Table 3H.11-1 Hurricane Missile Impact Evaluations for UHS/RSW Pump House

Local Check	**UHS / RSW Pump House Walls and Roof**		Minimum Required Thickness to Prevent Penetration, Perforation, and Scabbing = 15.4"
			Minimum Provided Thickness = 18"
Overall Check of Impacted Element (See Note 1)	**RSW Pump House**	**Roof**	Shear Controls. Maximum impact load including Dynamic Load Factor (DLF) of 1.0 = 161 Kips Minimum capacity = 188 Kips
		Walls	Shear Controls. Maximum impact load including Dynamic Load Factor (DLF) of 1.53 = 1566 Kips Minimum capacity = 1731 Kips
	UHS	**Fan Enclosure Walls**	Flexure Controls. Ductility demand = 2.1 Ductility limit = 10
		Basin Walls	Shear Controls. Maximum impact load including Dynamic Load Factor (DLF) of 1.0 = 1024 Kips Minimum capacity = 1130 Kips

Notes:

(1) The reported impact loads for the subject wall(s) are the resulting loads due to a horizontal automobile missile impact with a minimum impact load of 1024 kips (the peak of a triangular impulse load for a horizontal impact). The reported impact loads for the subject slab(s) are the resulting loads due to a vertical automobile missile impact with a minimum impact load of 445 kips (the peak of a triangular impulse load for a vertical impact).

Table 3H.11-2 Hurricane Missile Impact Evaluation for Diesel Generator Fuel Oil Storage Vault

Local Check	**DGFOS Vault Walls and Roof**	Minimum Required Thickness to Prevent Penetration, Perforation, and Scabbing = 15.4"
		Minimum Provided Thickness = 18"
Overall Check of Impacted Element (See Note 2)	**Roof**	Impacts where Shear Controls. Maximum impact load including Dynamic Load Factor of 1.0 = 445 Kips Minimum capacity = 613 Kips
		Impacts where Flexure Controls. Ductility demand < 1.0 Ductility limit = 10
	Protection Hood	Shear Controls. Maximum impact load including Dynamic Load Factor of 1.0 = 227 Kips Minimum capacity = 534 Kips The minimum capacity is based on the inclusion of the following shear reinforcement: - #3 bars spaced at 6" o.c. in both directions
	Walls (Excluding Walls 9, 10, & 16)	Shear Controls. Maximum impact load including Dynamic Load Factor of 1.1 = 1126 Kips Minimum capacity = 1202 Kips Maximum impact load and minimum capacity based on largest ratio of impact load to capacity.

Table 3H.11-2 Hurricane Missile Impact Evaluation for Diesel Generator Fuel Oil Storage Vault (Continued)

Overall Check of Impacted Element (See Note 2)	**Short Access Room Walls** (Walls 9 & 10)	Shear Controls. <u>For Vertical Beam Shear:</u> Maximum impact load including Dynamic Load Factor of 1.0 = 415 Kips Minimum capacity = 487 Kips <u>For Horizontal Beam Shear:</u> Maximum impact load including Dynamic Load Factor of 1.0 = 385 Kips Minimum capacity = 620 Kips Shear ties are required to withstand a missile strike near the top panel support. See Table 3H.6-11 and Figures 3H.6-176B and 3H.6-180B for reinforcement size and location.
	Entry Way Wall (Wall 16)	Shear Controls. <u>For Vertical Beam Shear:</u> Maximum impact load including Dynamic Load Factor of 1.0 = 507 Kips Minimum capacity = 625 Kips <u>For Horizontal Beam Shear:</u> Maximum impact load including Dynamic Load Factor of 1.0 = 457 Kips Minimum capacity = 620 Kips Shear ties are required to withstand a missile strike near the top and bottom panel supports. See Table 3H.6-11 and Figure 3H.6-208 for reinforcement size and location.

Notes:

(1) See Figure 3H.6-141 for location of Walls 9, 10, and 16.

(2) The reported impact loads for the subject wall(s) are the resulting loads due to a horizontal automobile missile impact with a minimum impact load of 1024 kips (the peak of a triangular impulse load for a horizontal impact). The reported impact loads for the subject slab(s) are the resulting loads due to a vertical automobile missile impact with a minimum impact load of 445 kips (the peak of a triangular impulse load for a vertical impact).

Table 3H.11-3 Hurricane Missile Impact Evaluation for Diesel Generator Fuel Oil Tunnel

Local Check	**DGFOT and Access Regions Walls and Roof**	Minimum Required Thickness to Prevent Penetration, Perforation, and Scabbing = 15.4"
		Minimum Provided Thickness = 24"
Overall Check of Impacted Element (See Note 1)	**DGFOT Roof**	Shear Controls. Maximum impact load including Dynamic Load Factor (DLF) of 1.0 = 302 Kips Minimum capacity = 1058 Kips
	Access Region Walls	Shear Controls. Maximum impact load including Dynamic Load Factor (DLF) of 1.0 = 420 Kips Minimum capacity = 821 Kips
		The minimum capacity is based on the inclusion of the following shear reinforcement: - #3 bars spaced at 6" o.c. in both directions

Note (1): The reported impact loads for the subject wall(s) are the resulting loads due to a horizontal automobile missile impact with a minimum impact load of 1024 kips (the peak of a triangular impulse load for a horizontal impact). The reported impact loads for the subject slab(s) are the resulting loads due to a vertical automobile missile impact with a minimum impact load of 445 kips (the peak of a triangular impulse load for a vertical impact).

Table 3H.11-4 Hurricane Missile Impact Evaluation for Reactor Building

Local Check	**Reactor Building Walls**	Minimum Required Thickness to Prevent Penetration, Perforation, and Scabbing = 15.4"
		Minimum Provided Thickness = 16.7"
	Reactor Building Roof	Minimum Required Thickness to Prevent Penetration, Perforation, and Scabbing = 11.4"
		Minimum Provided Thickness = 13.2"
Overall Check of Impacted Element (See Note 1)	**Roof and Walls above elevation 64'-0"**	Based on the DCD design for tornado missiles per DCD Tier 1 Table 5.0, the Reactor Building roof and exterior walls above elevation 64'-0" are adequate for hurricane missiles.
	Walls between grade (elevation 34'-0") and elevation 64'-0"	Shear Controls. Maximum impact load including Dynamic Load Factor of 1.0 = 1024 Kips Minimum capacity = 1310 Kips

Notes:

(1) The reported impact loads for the subject wall(s) are the resulting loads due to a horizontal automobile missile impact with a minimum impact load of 1024 kips (the peak of a triangular impulse load for a horizontal impact).

Table 3H.11-5 Hurricane Missile Impact Evaluation for Control Building

Local Check	**Control Building Walls**	Minimum Required Thickness to Prevent Penetration, Perforation, and Scabbing = 15.4"
		Minimum Provided Thickness = 23.6"
	Control Building Roof	Minimum Required Thickness to Prevent Penetration, Perforation, and Scabbing = 11.4"
		Minimum Provided Thickness = 15.75"
Overall Check of Impacted Element (See Note 1)	**Roof and Walls above elevation 64’-0”**	Based on the DCD design for tornado missiles per DCD Tier 1 Table 5.0, the Control Building roof and exterior walls above elevation 64’-0” are adequate for hurricane missiles.
	Walls between grade (elevation 34’-0”) and elevation 64’-0”	Impacts where Shear Controls. Maximum impact load including Dynamic Load Factor of 1.0 = 1024 Kips Minimum capacity = 1056 Kips
		Impacts where Flexure Controls. Ductility demand < 1.0 Ductility limit = 10

Notes:

(1) The reported impact loads for the subject wall(s) are the resulting loads due to a horizontal automobile missile impact with a minimum impact load of 1024 kips (the peak of a triangular impulse load for a horizontal impact).

Table 3H.11-6 Comparison of RG 1.221 and Tornado Requirements for DCD Structures

Wind type	RG Guide	Wind speed (mph)	Horizontal Missile Velocity (m/s)			Vertical Missile Velocity (m/s)		
			Auto	Pipe	Sphere	Auto	Pipe	Sphere
Hurricane	1.221	210	59.7	46.5	41.1	26	26	26
Tornado	DCD	300	47	47	47	32.9	32.9	32.9

Table 3H.11-7 Comparison of RG 1.221 and RG 1.76 Tornado Requirements for Site-Specific Structures

Wind type	RG Guide	Wind speed (mph)	Horizontal Missile Velocity (m/s)			Vertical Missile Velocity (m/s)		
			Auto	Pipe	Sphere	Auto	Pipe	Sphere
Hurricane	1.221	210	59.7	46.5	41.1	26	26	26
Tornado	1.76 Rev. 1	200	34	34	7	22.8	22.8	4.7

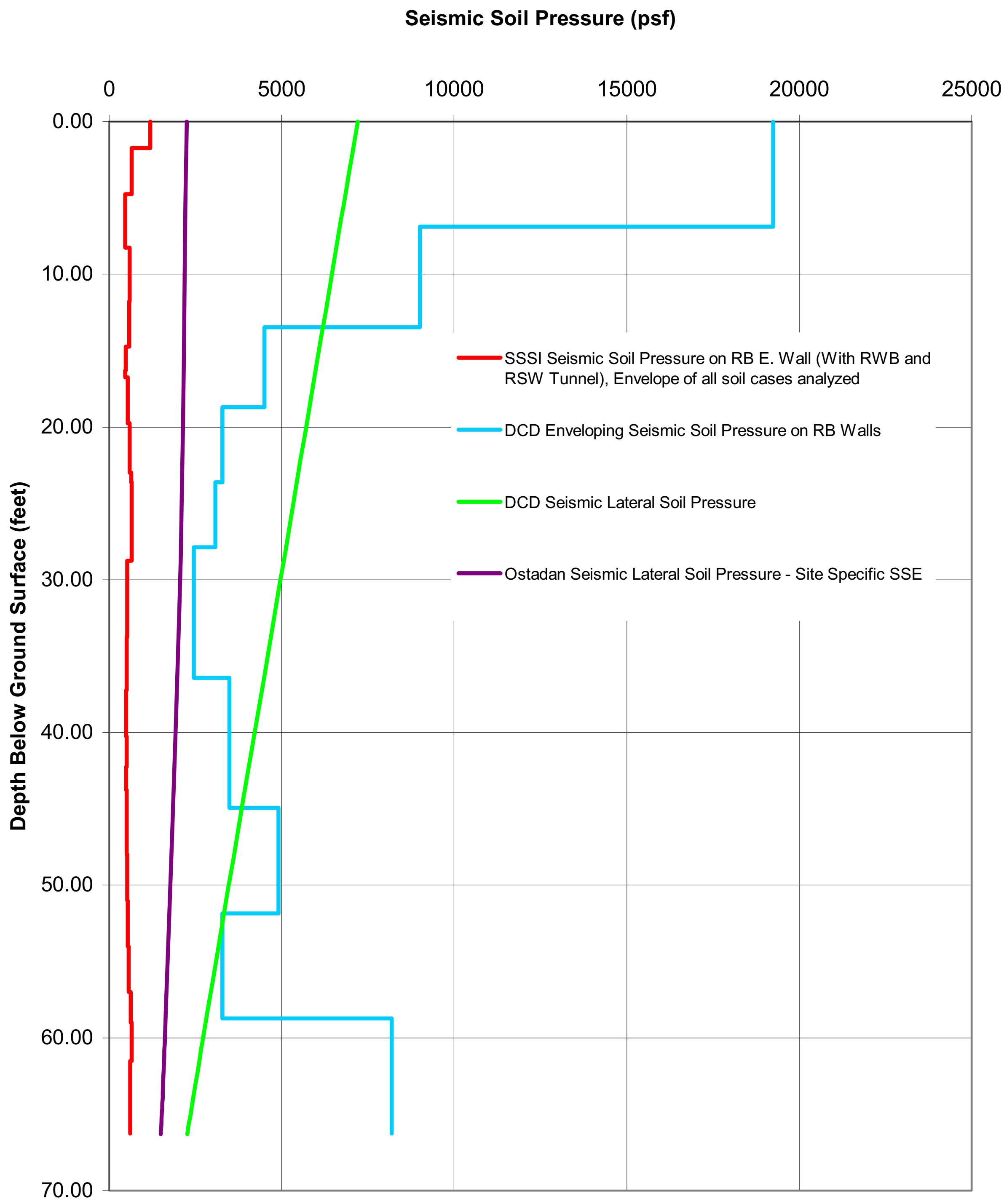


Figure 3H.1-1 Lateral Seismic Soil Pressure Comparison for RB East Wall (Considering RSW Tunnel & Radwaste Building)

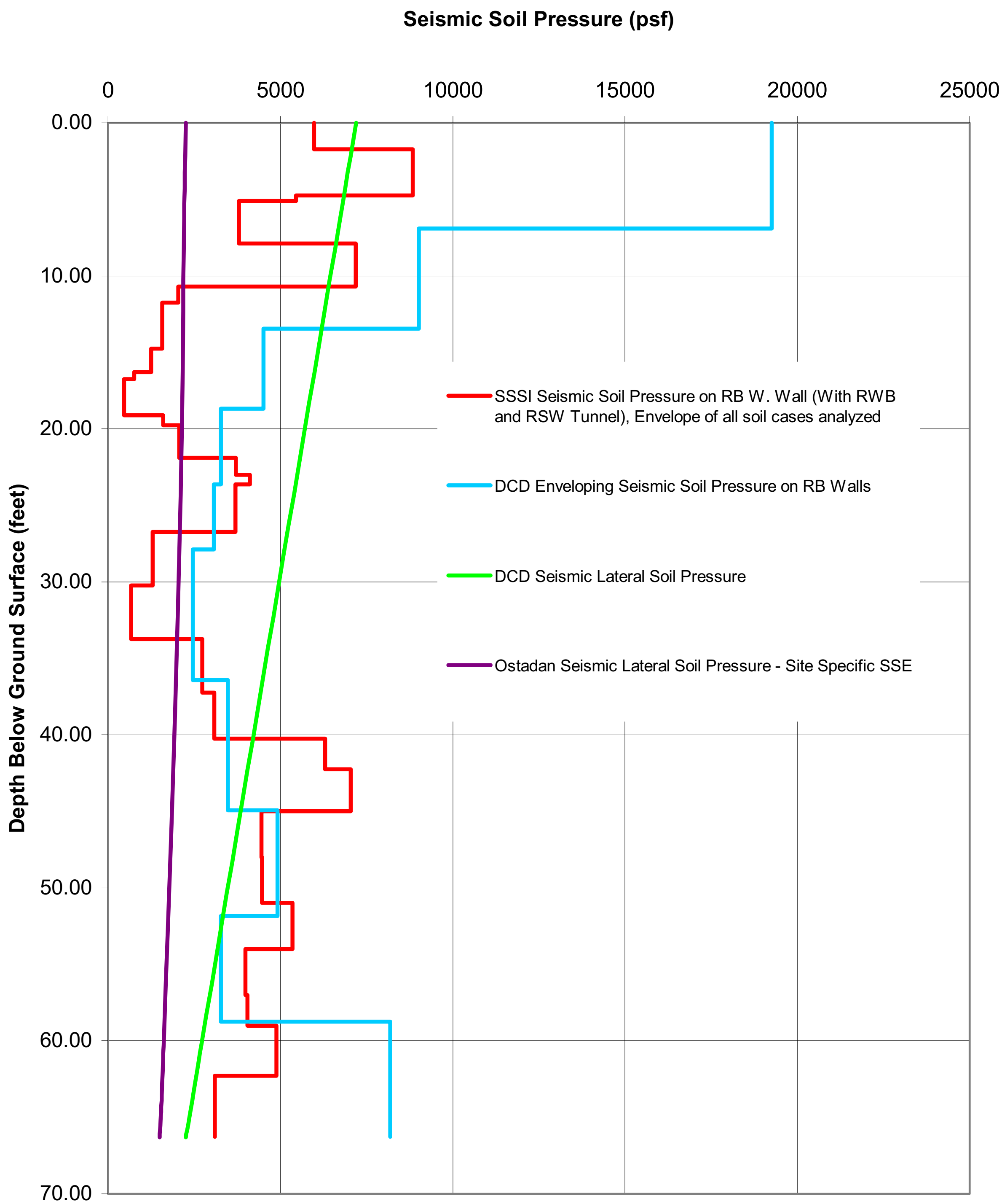


Figure 3H.1-2 Lateral Seismic Soil Pressure Comparison for RB West Wall (Considering RSW Tunnel & Radwaste Building)

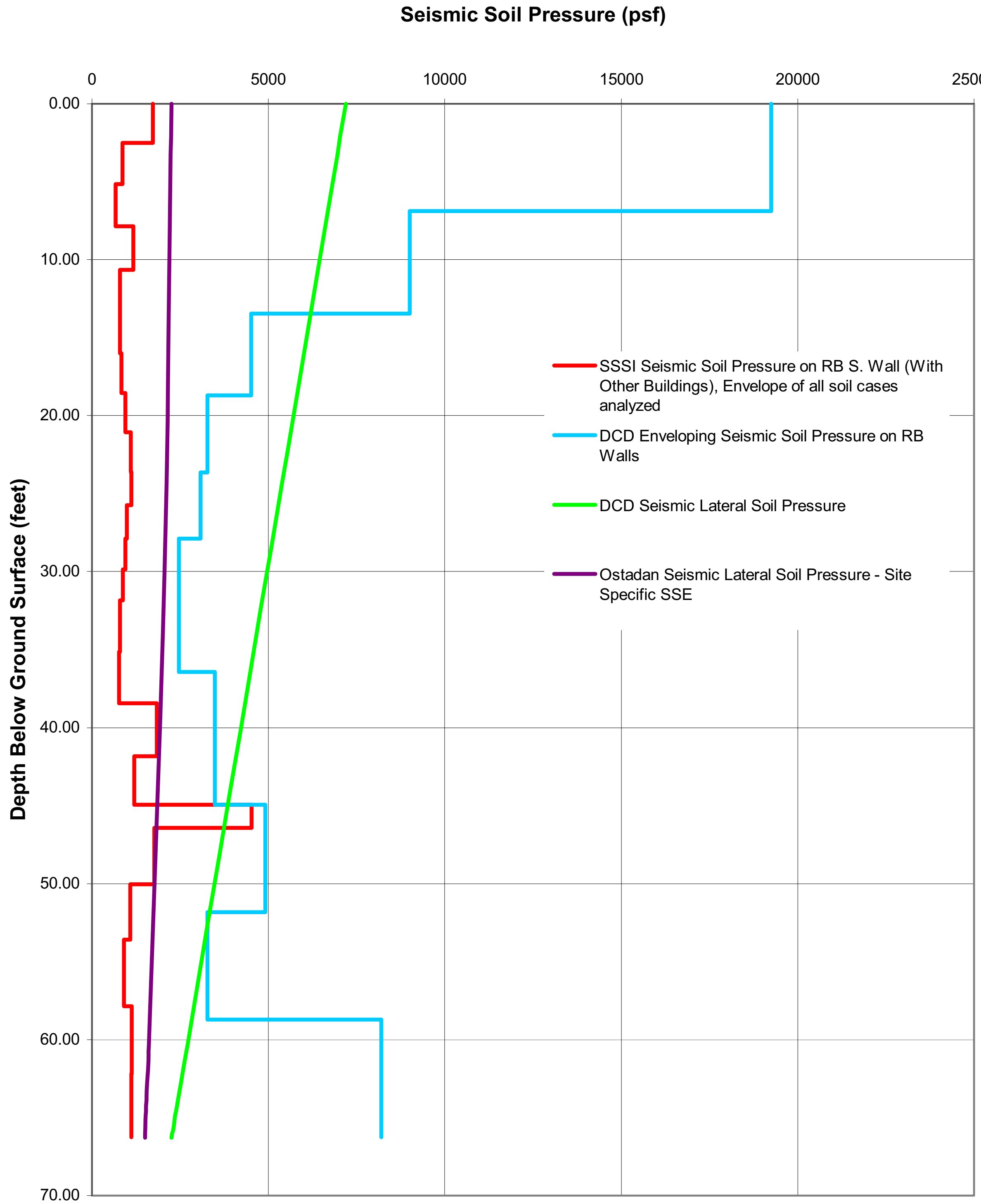


Figure 3H.1-3 Lateral Seismic Soil Pressure Comparison for RB South Wall (Considering DGFOSVS, RSW Tunnel & UHS/RSW Pump House Building)

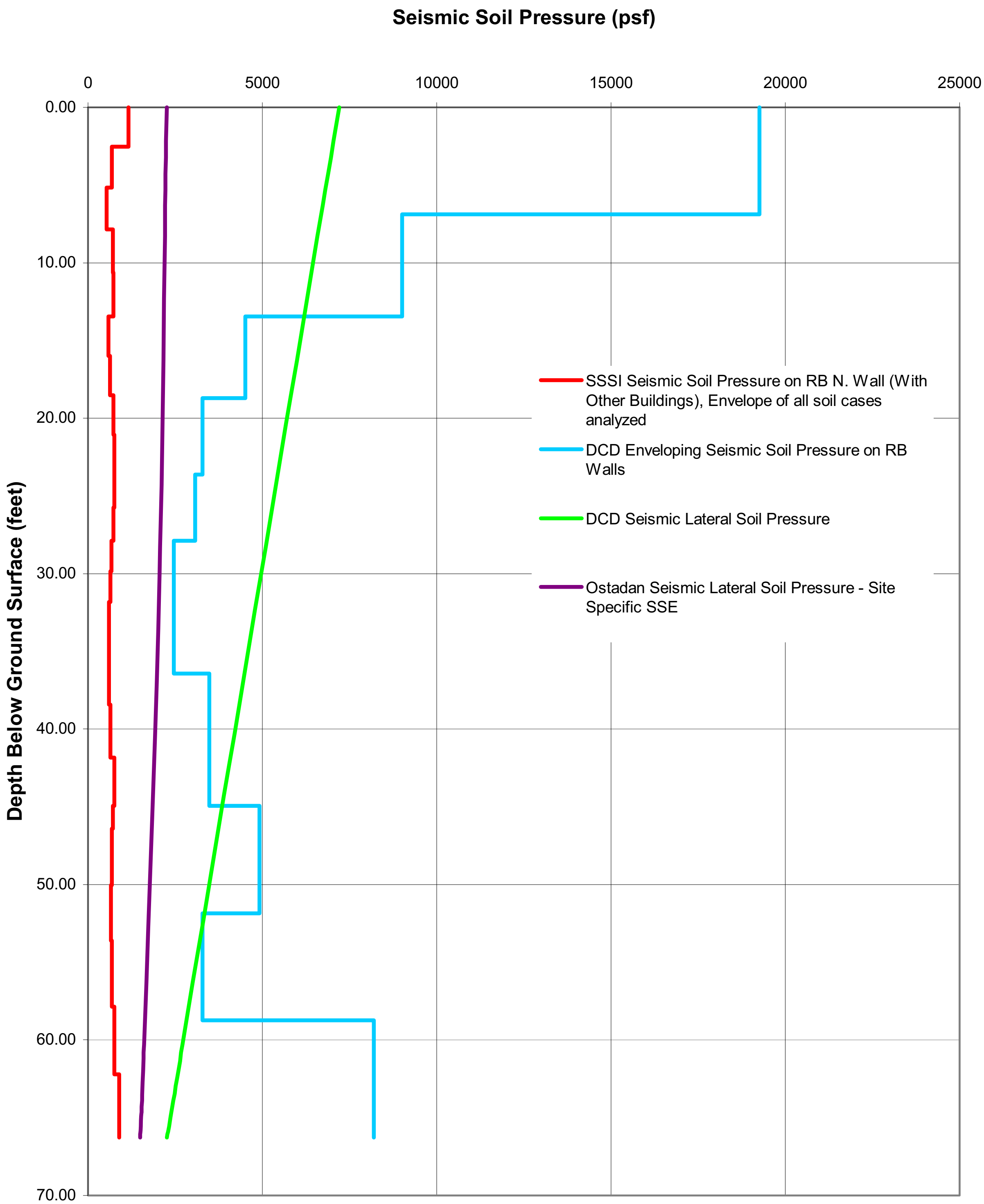


Figure 3H.1-4 Lateral Seismic Soil Pressure Comparison for RB North Wall (Considering DGFOSVS, RSW Tunnel & UHS/RSW Pump House Building)

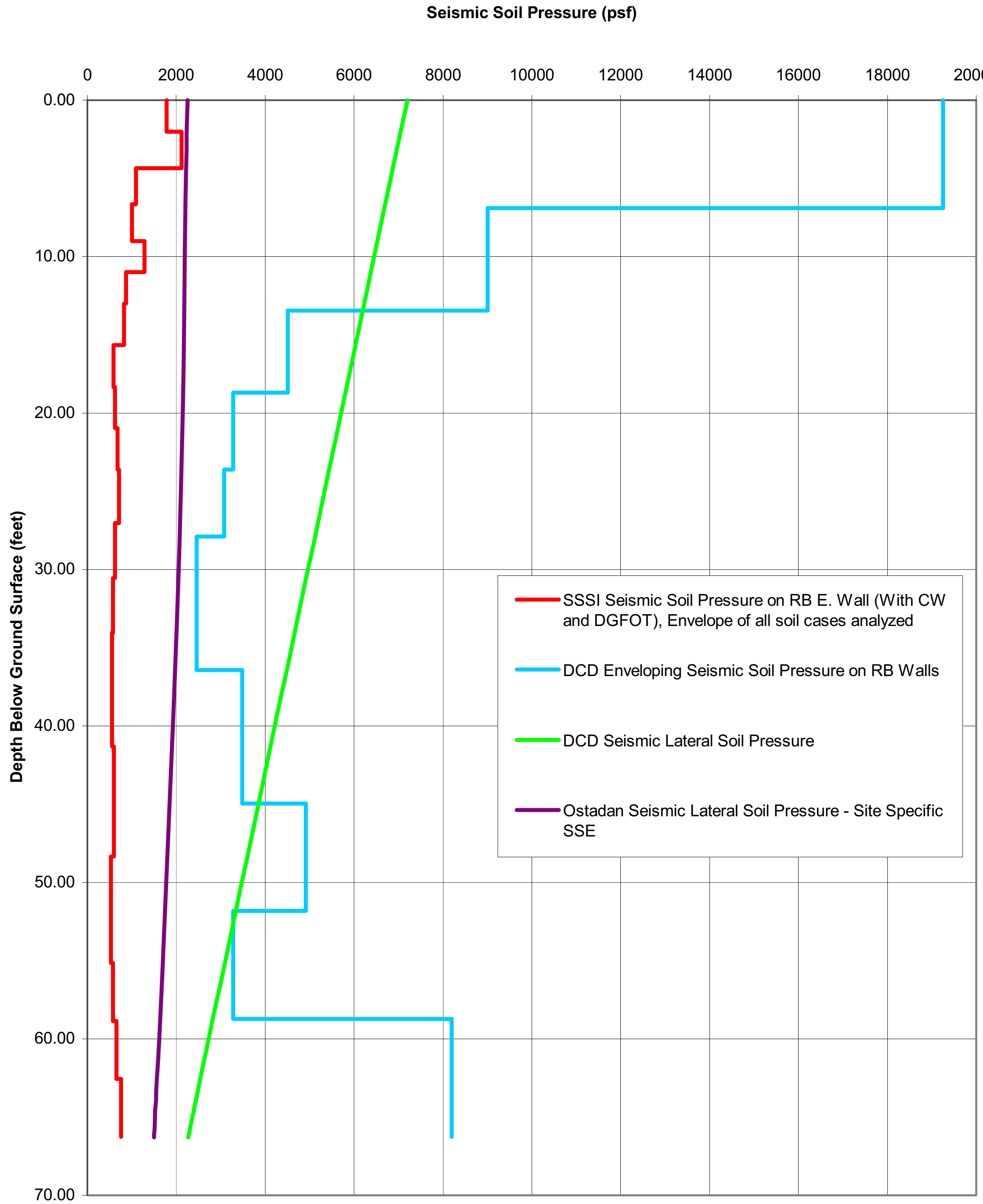


Figure 3H.1-5 Lateral Seismic Soil Pressure Comparison for RB East Wall (Considering DGFOT & Crane Wall)

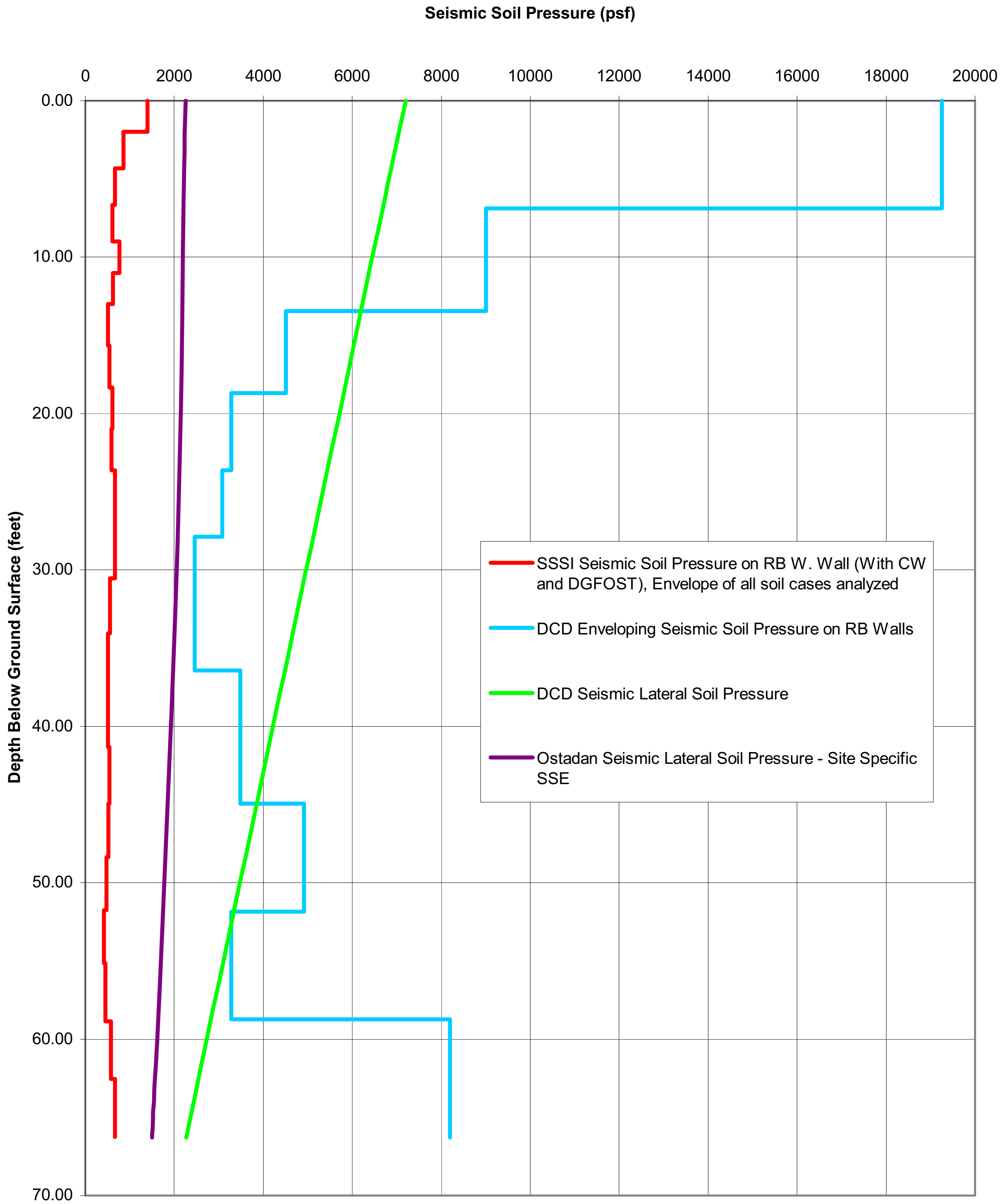


Figure 3H.1-6 Lateral Seismic Soil Pressure Comparison for RB West Wall (Considering DGFOT & Crane Wall)

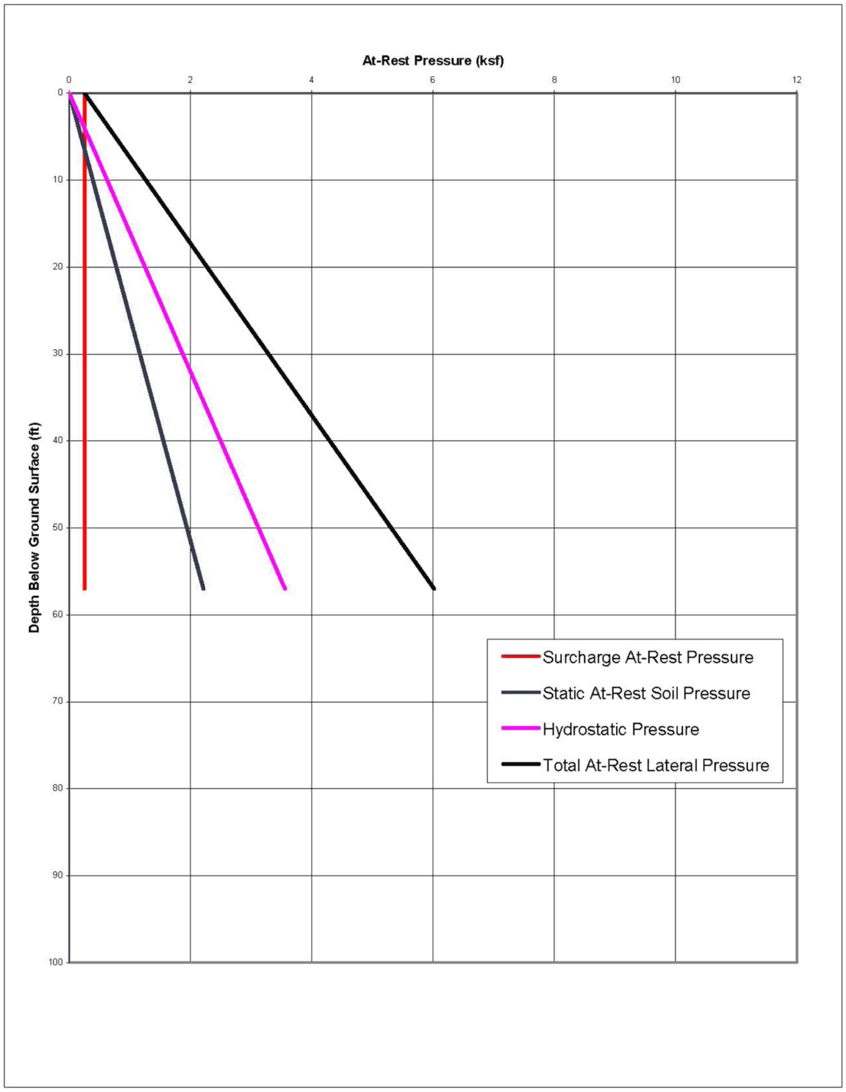


Figure 3H.3-1 At-Rest Lateral Earth Pressure on the RWB Walls

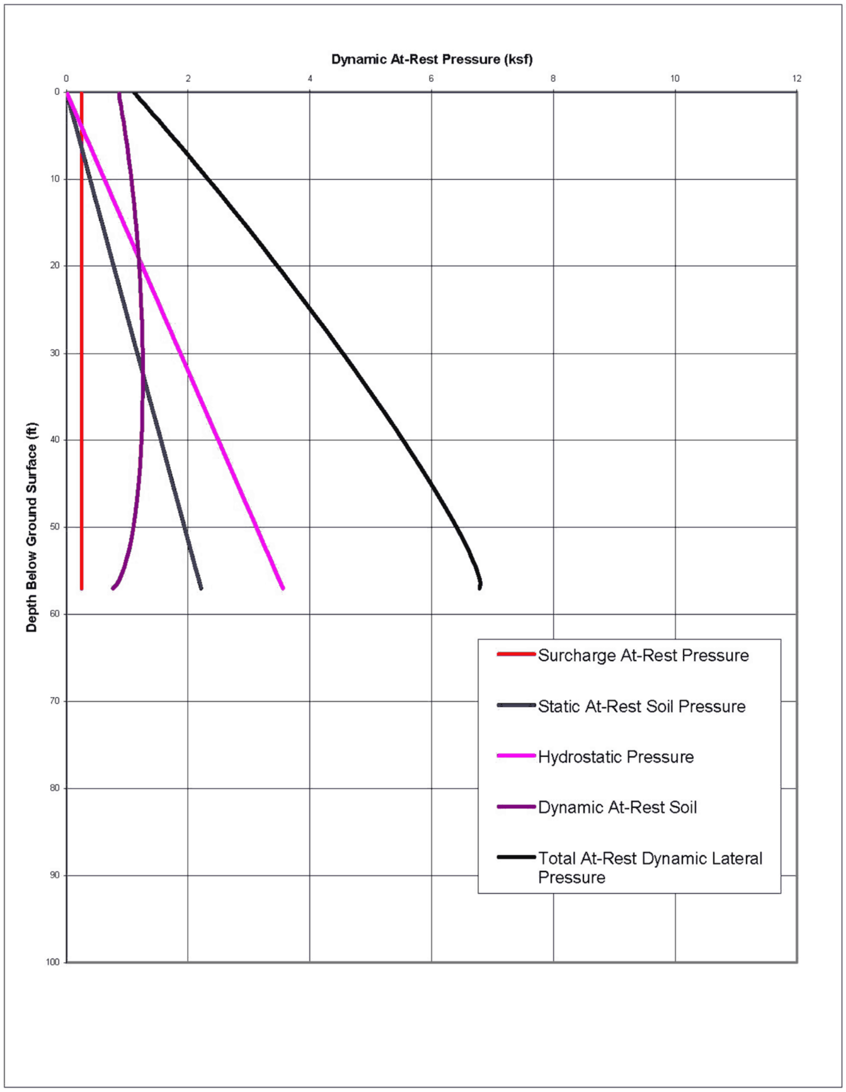


Figure 3H.3-2 Dynamic At-Rest Lateral Earth Pressure on the RWB Walls

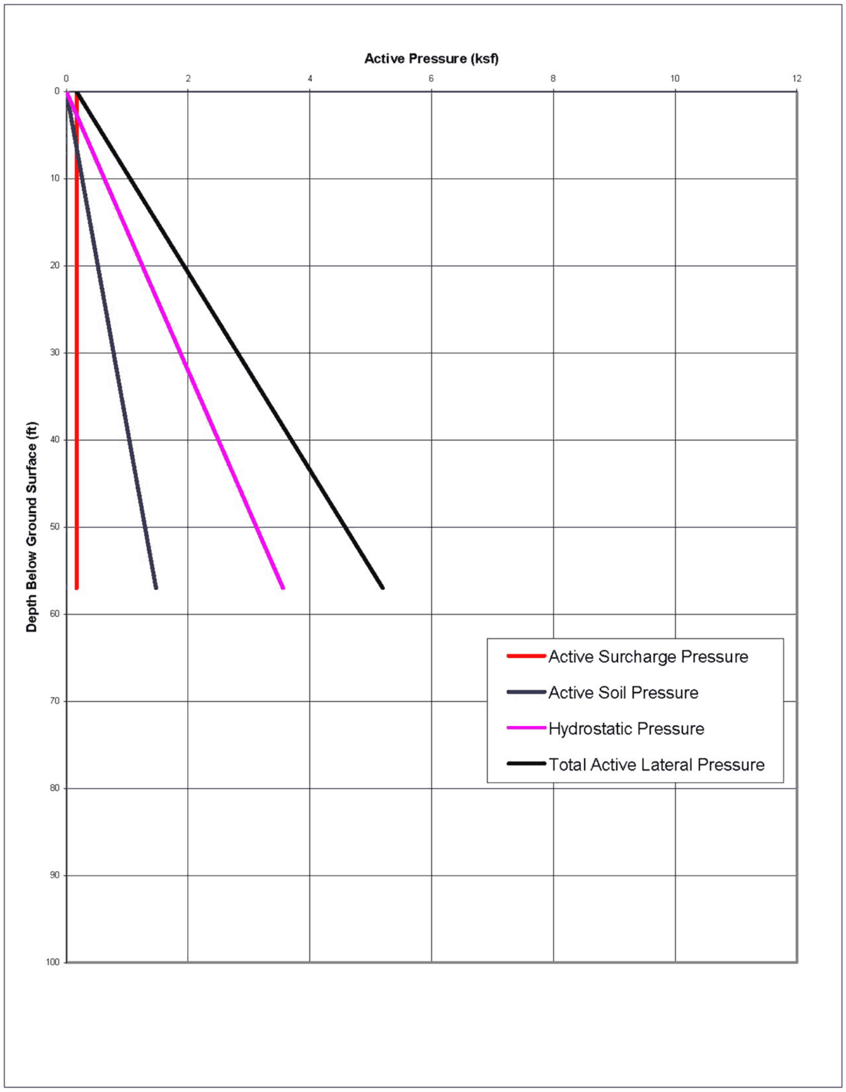


Figure 3H.3-3 Active Lateral Earth Pressure on the RWB Walls

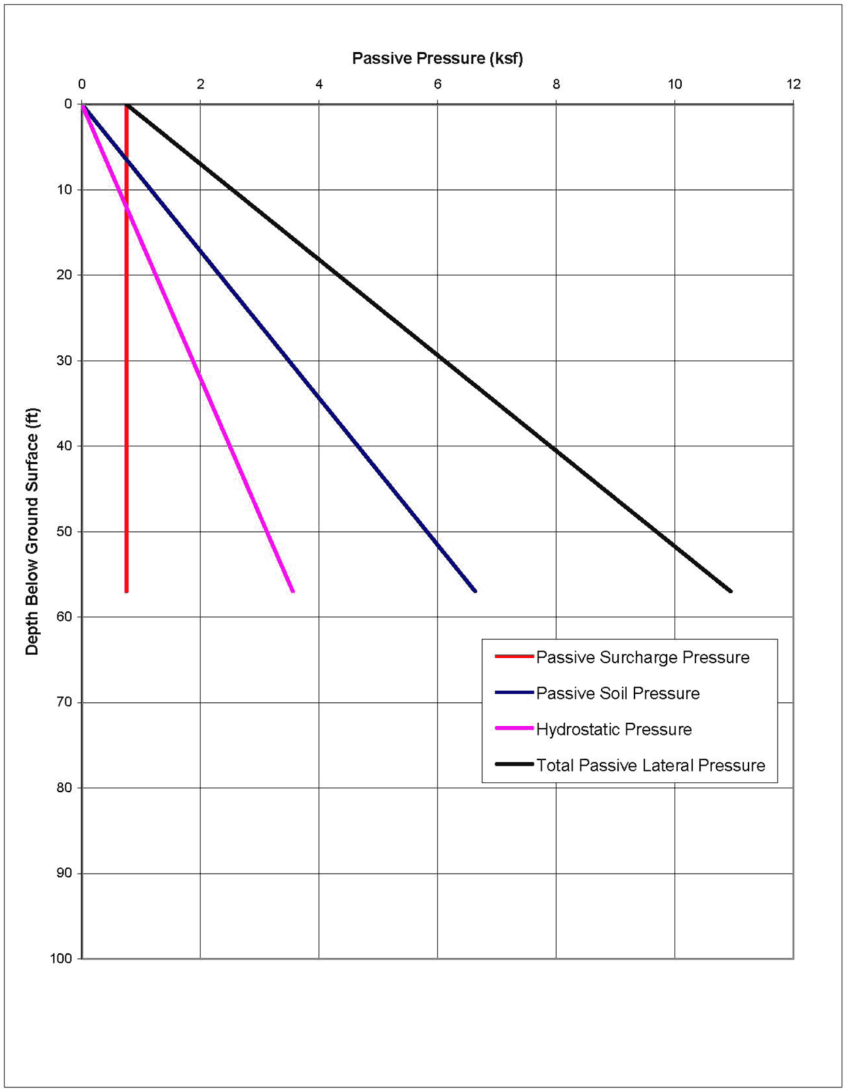


Figure 3H.3-4 Passive Lateral Earth Pressure on the RWB Walls

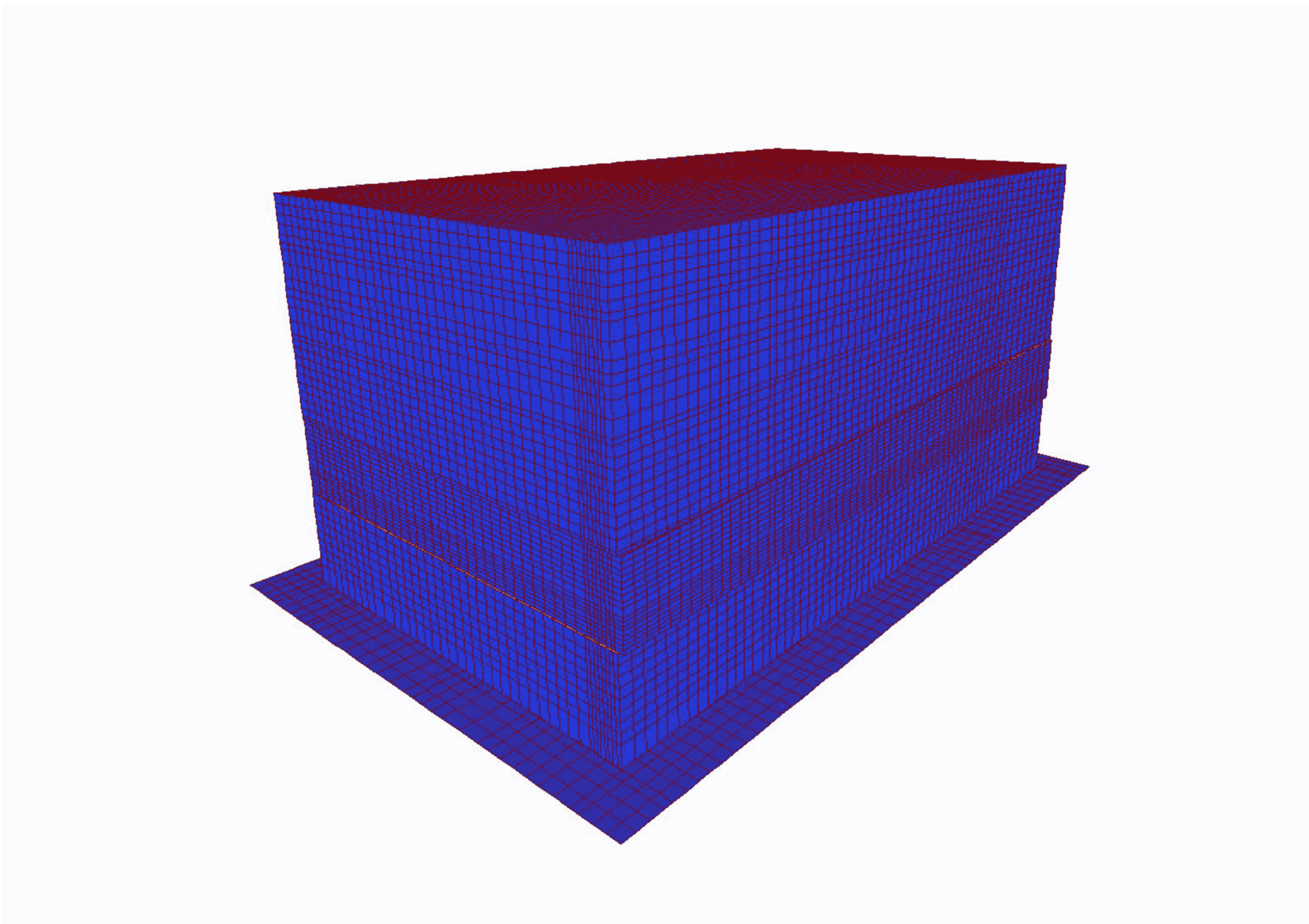


Figure 3H.3-5 Radwaste Building SAP2000 Model (Looking from Southwest Corner)

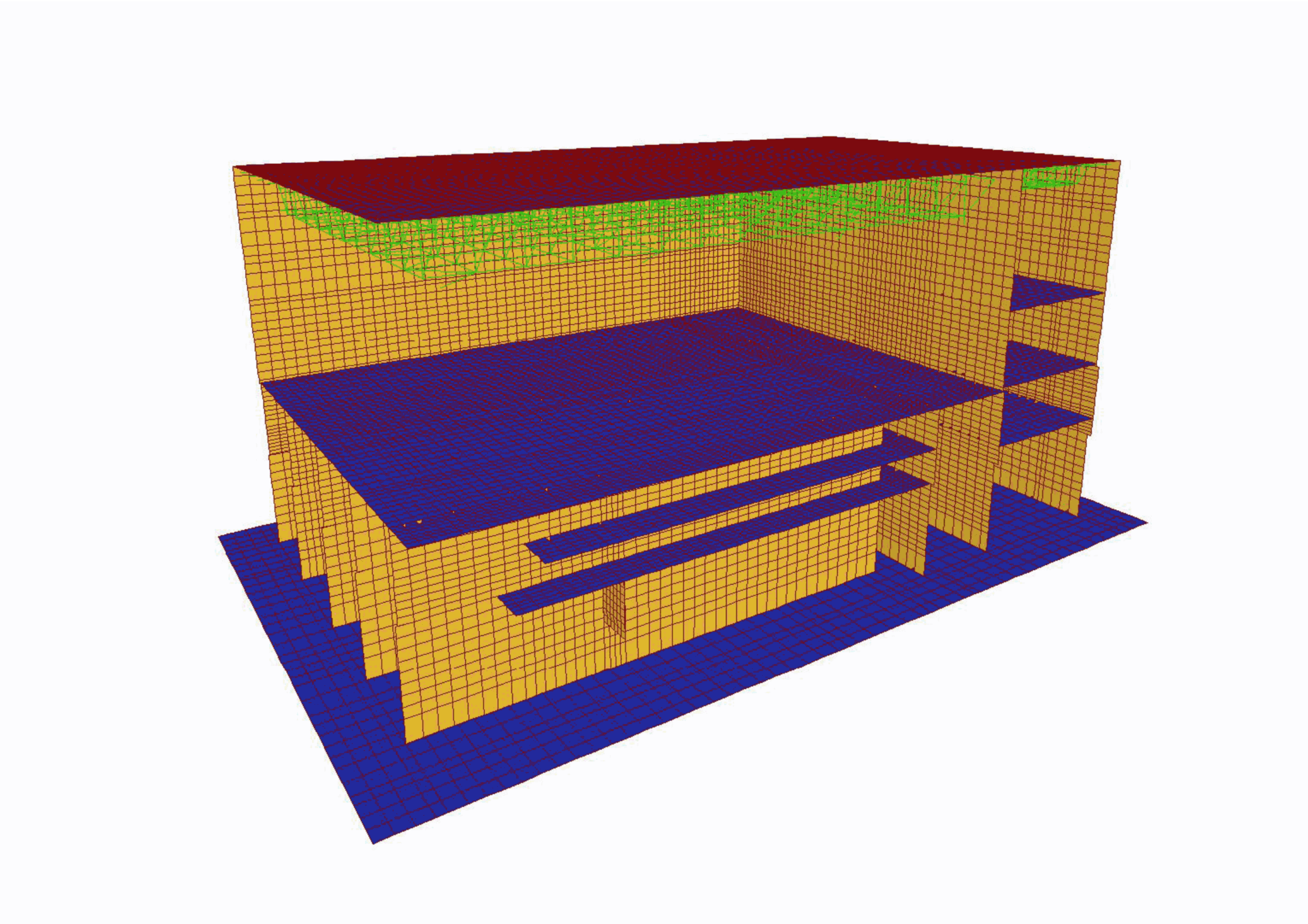


Figure 3H.3-6 Radwaste Building SAP2000 Model (South and West Walls Removed)

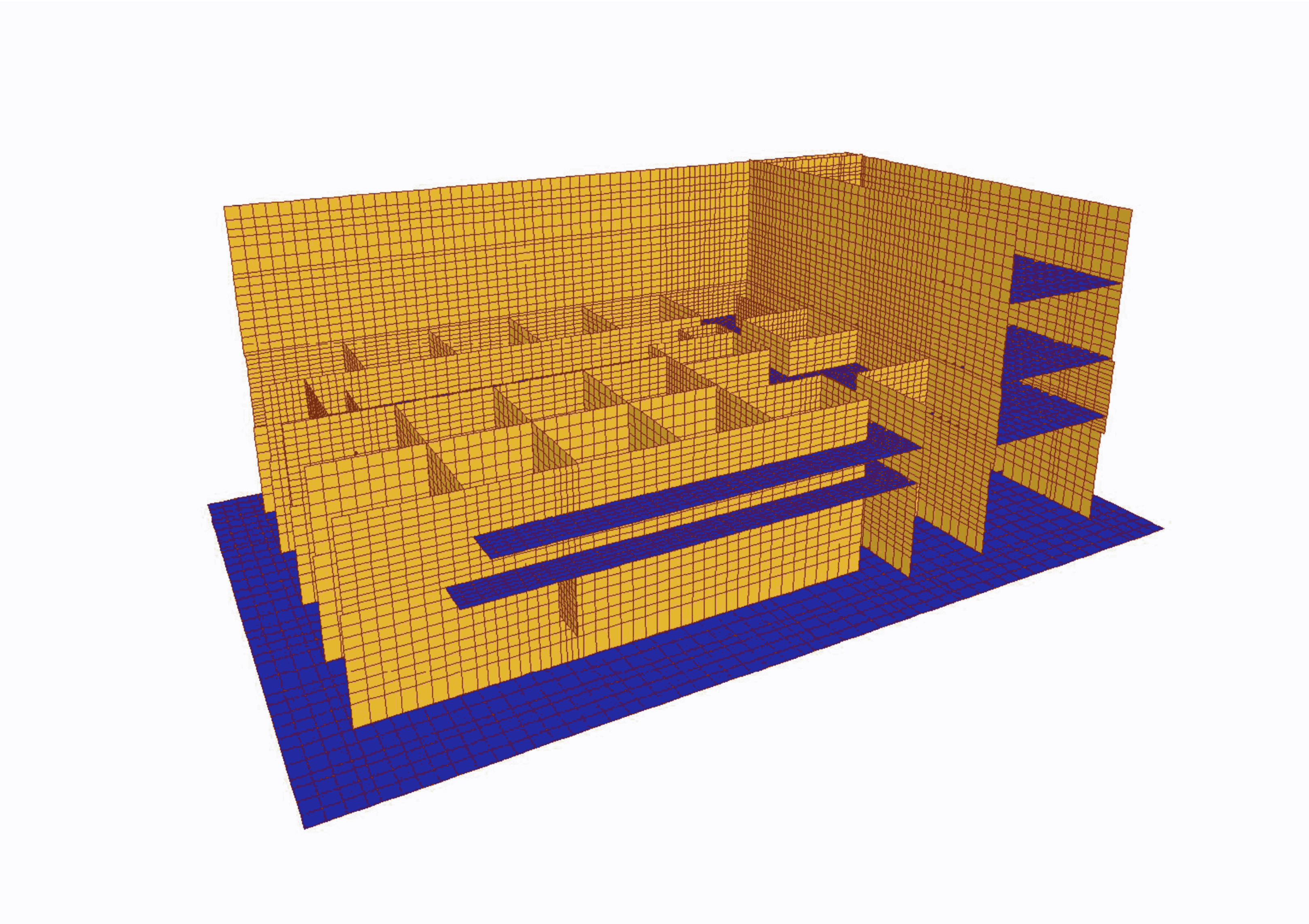


Figure 3H.3-7 Radwaste Building SAP2000 Model (South Wall, West Wall, Roof and El. 35'-0" Slab Removed)

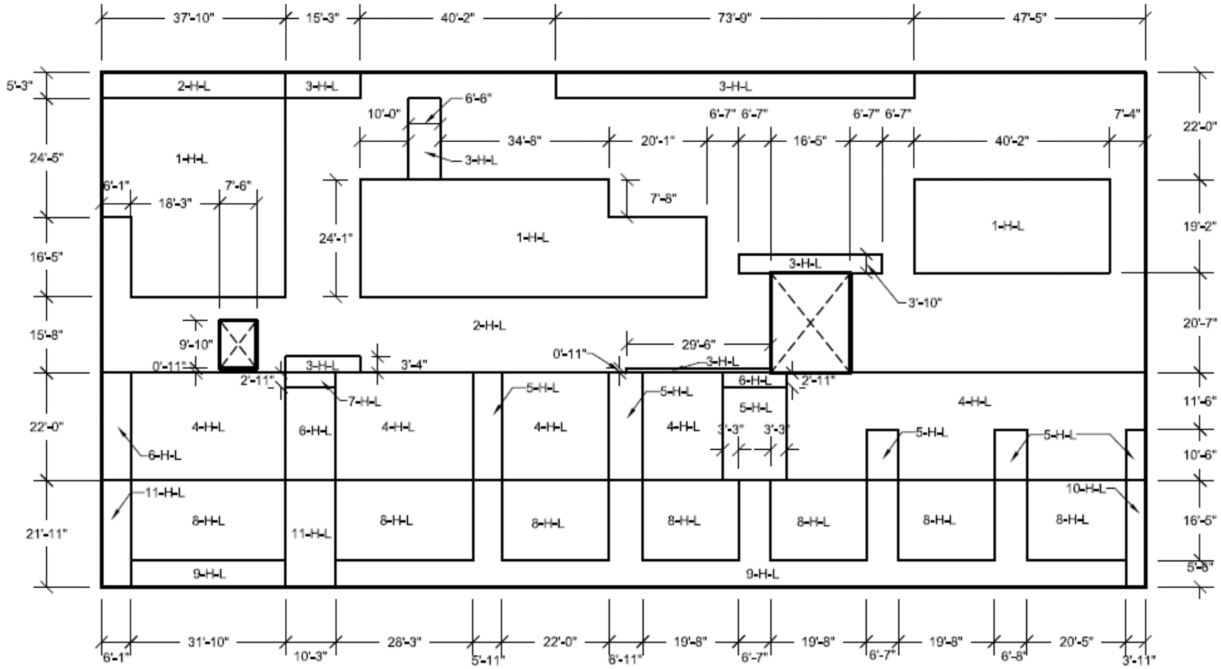


Figure 3H.3-8 RWB North Wall Looking South Horizontal Reinforcement Zones Near Side Face

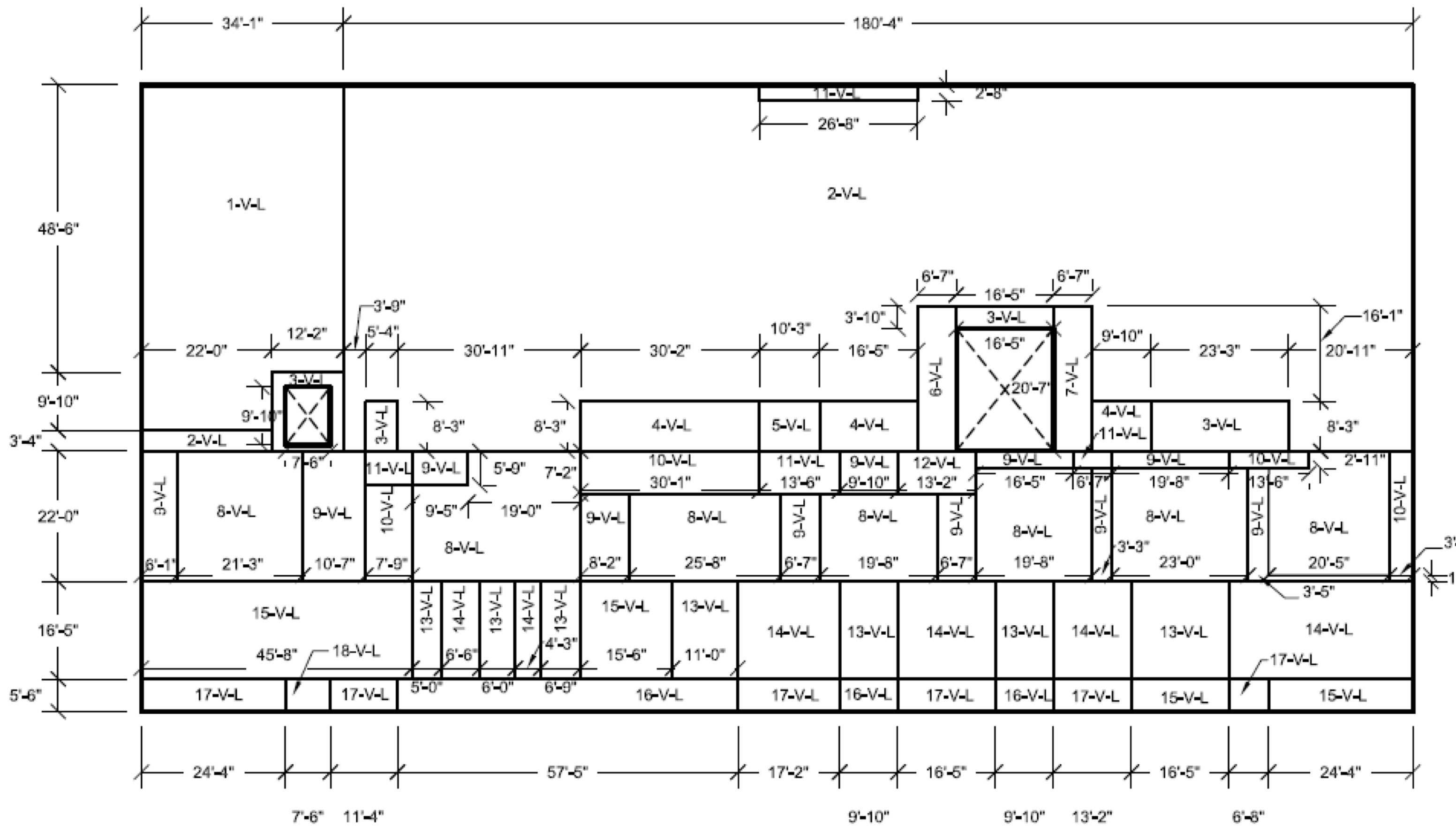


Figure 3H.3-9 RWB North Wall Looking South Vertical Reinforcement Zones Near Side Face

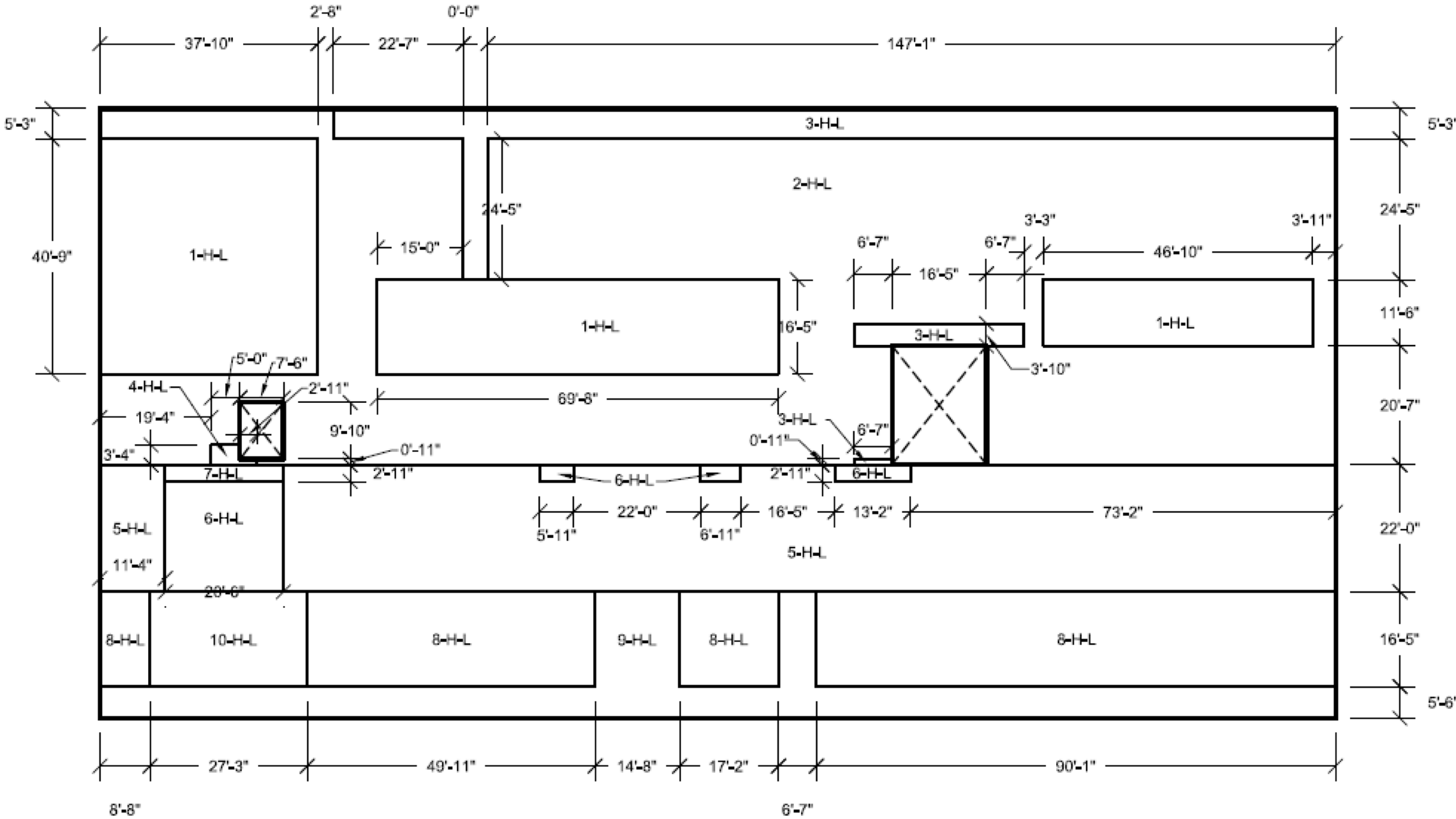


Figure 3H.3-10 RWB North Wall Looking South
Horizontal Reinforcement Zones
Far Side Face

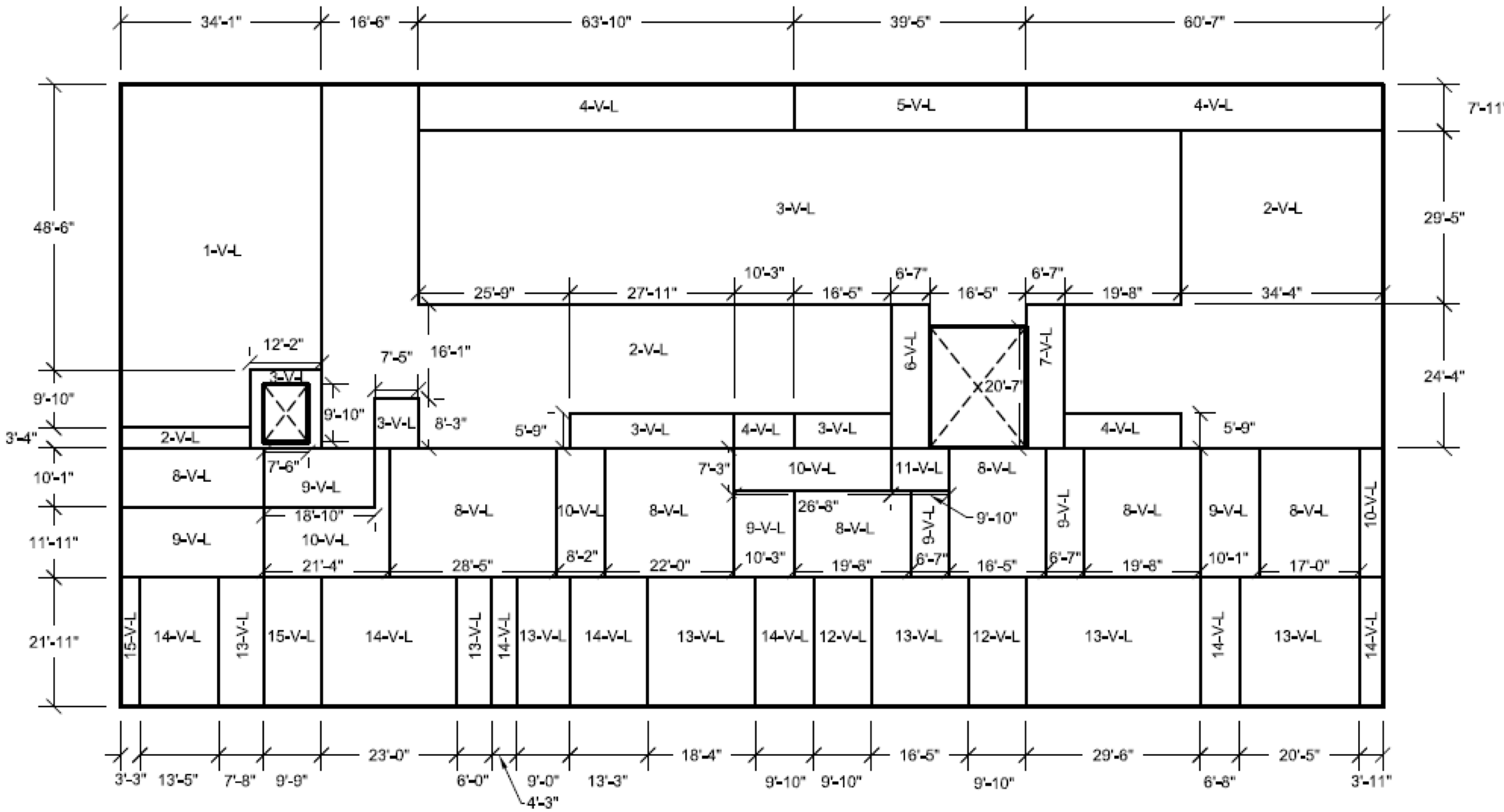


Figure 3H.3-11 RWB North Wall Looking South Vertical Reinforcement Zones Far Side Face

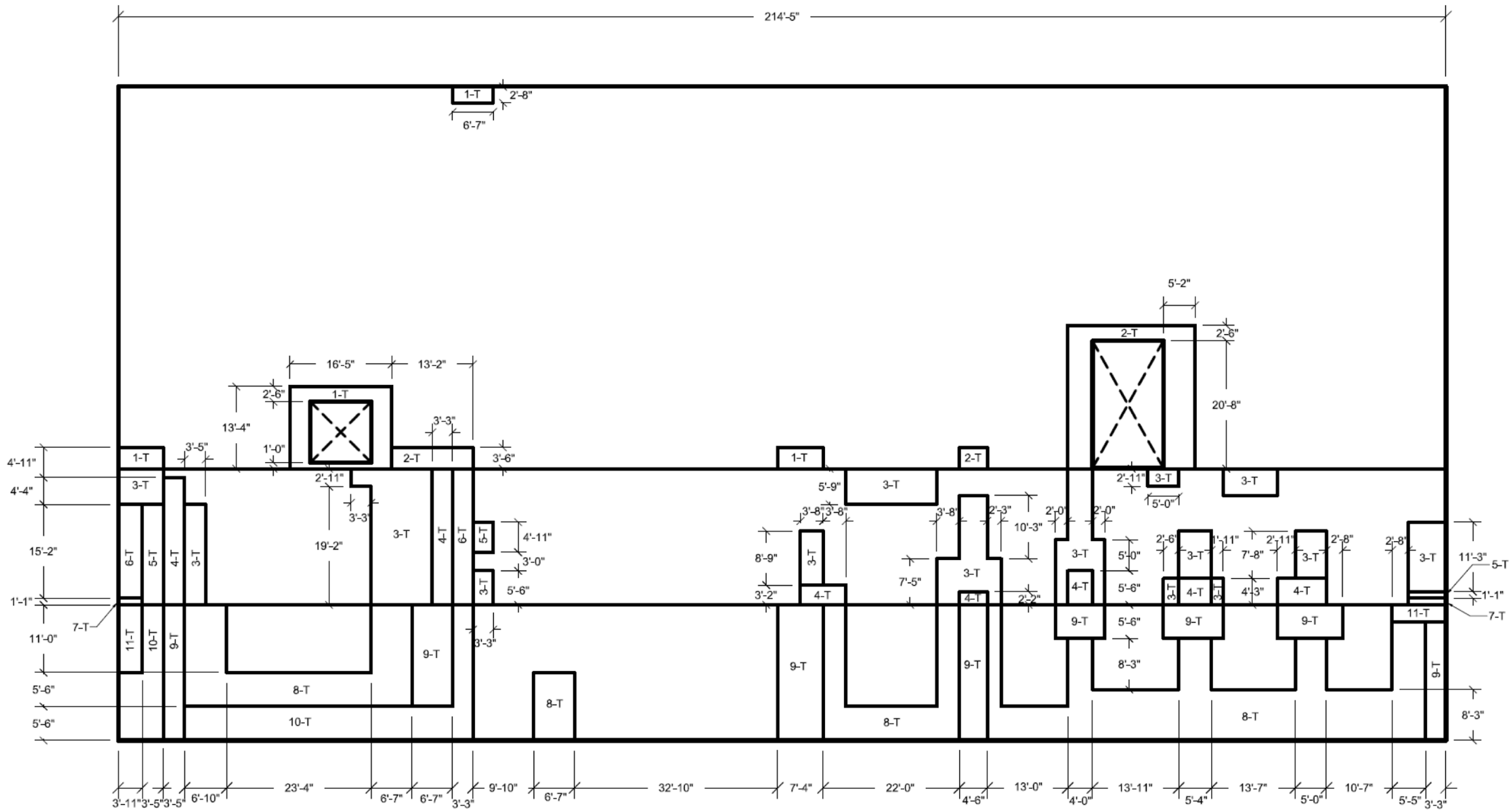


Figure 3H.3-12 RWB North Wall Looking South Transverse Reinforcement Zones

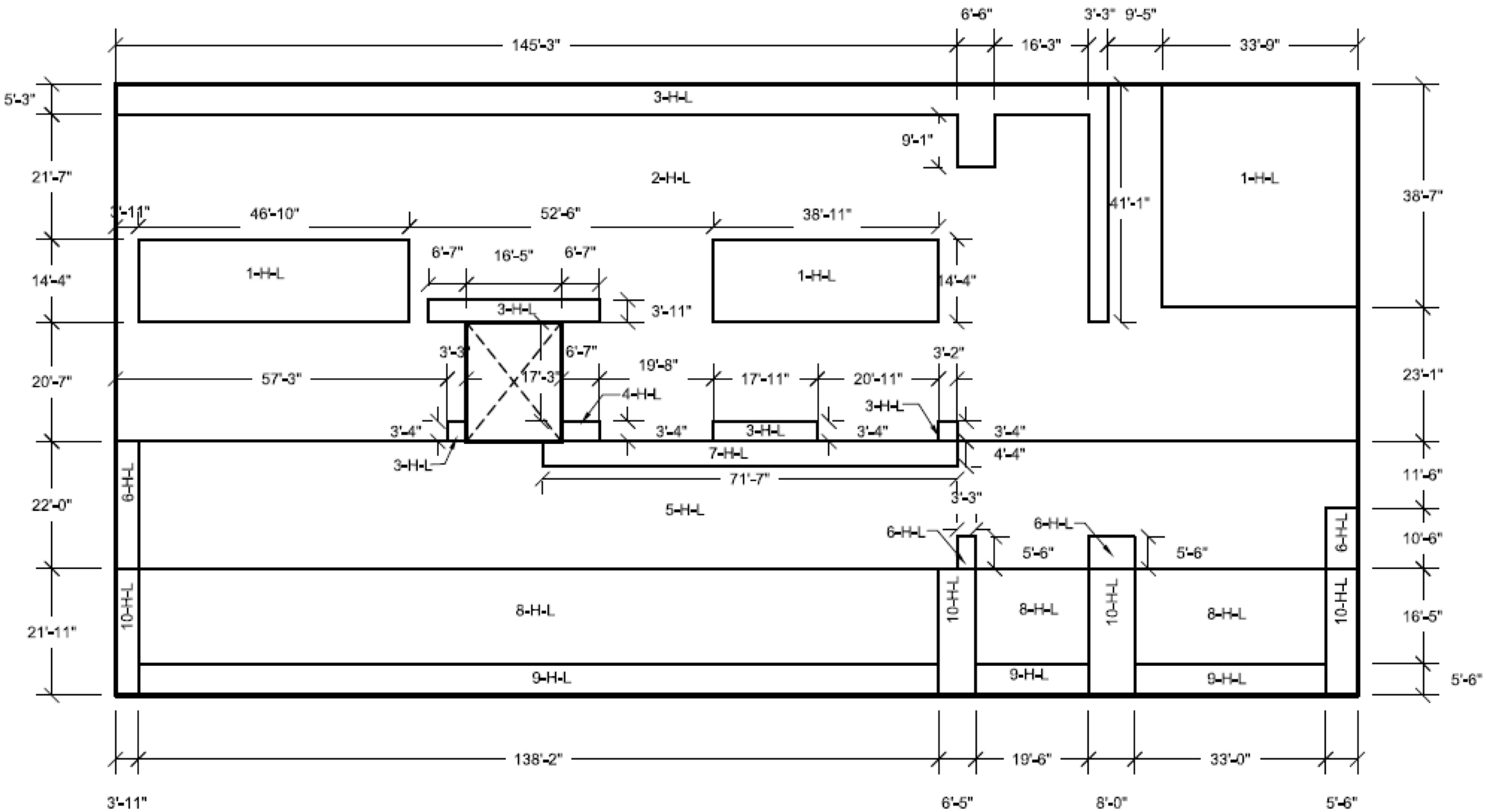


Figure 3H.3-13 RWB South Wall Looking North
Horizontal Reinforcement Zones
Near Side Face

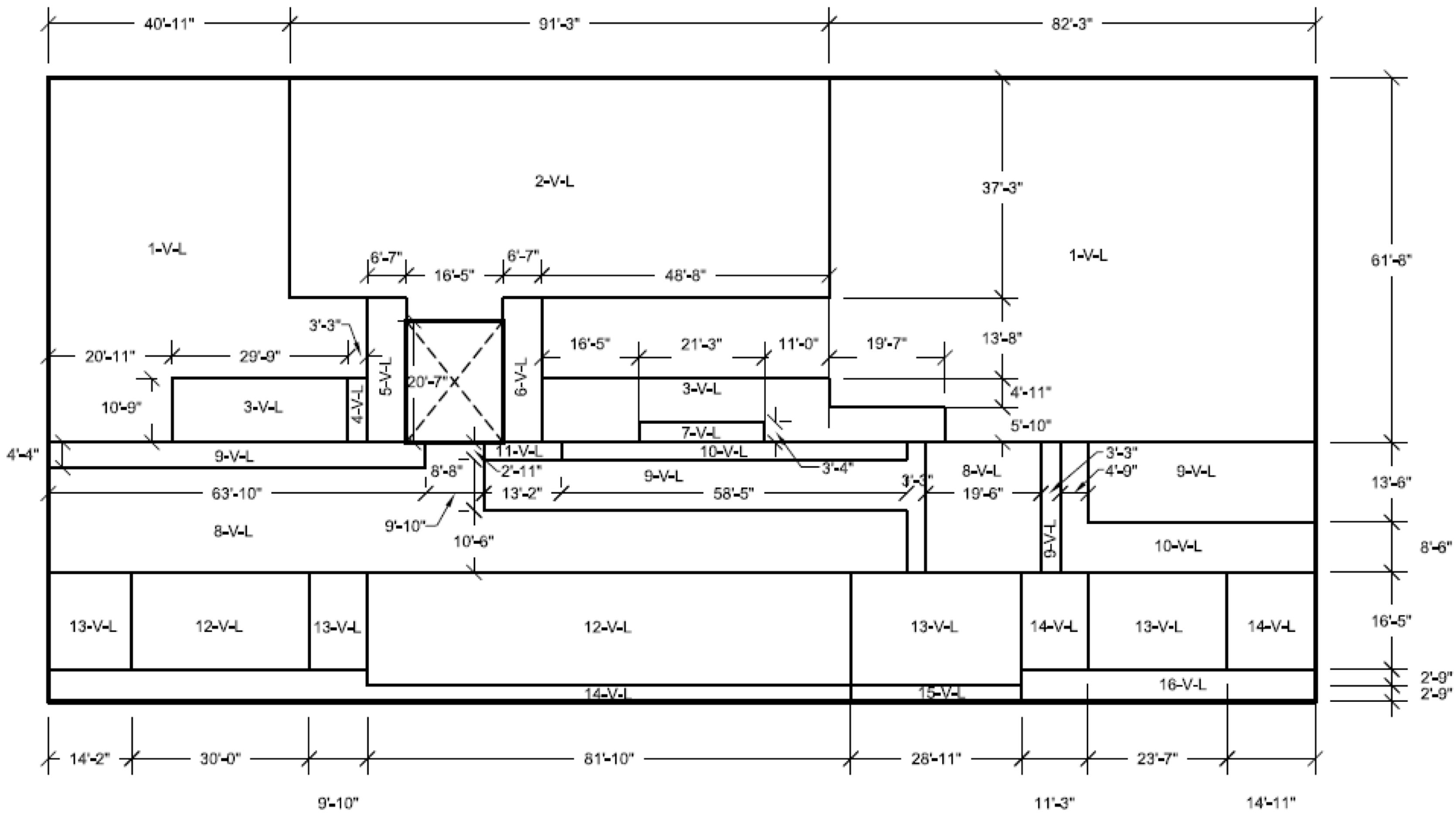


Figure 3H.3-14 RWB South Wall Looking North
Vertical Reinforcement Zones
Near Side Face

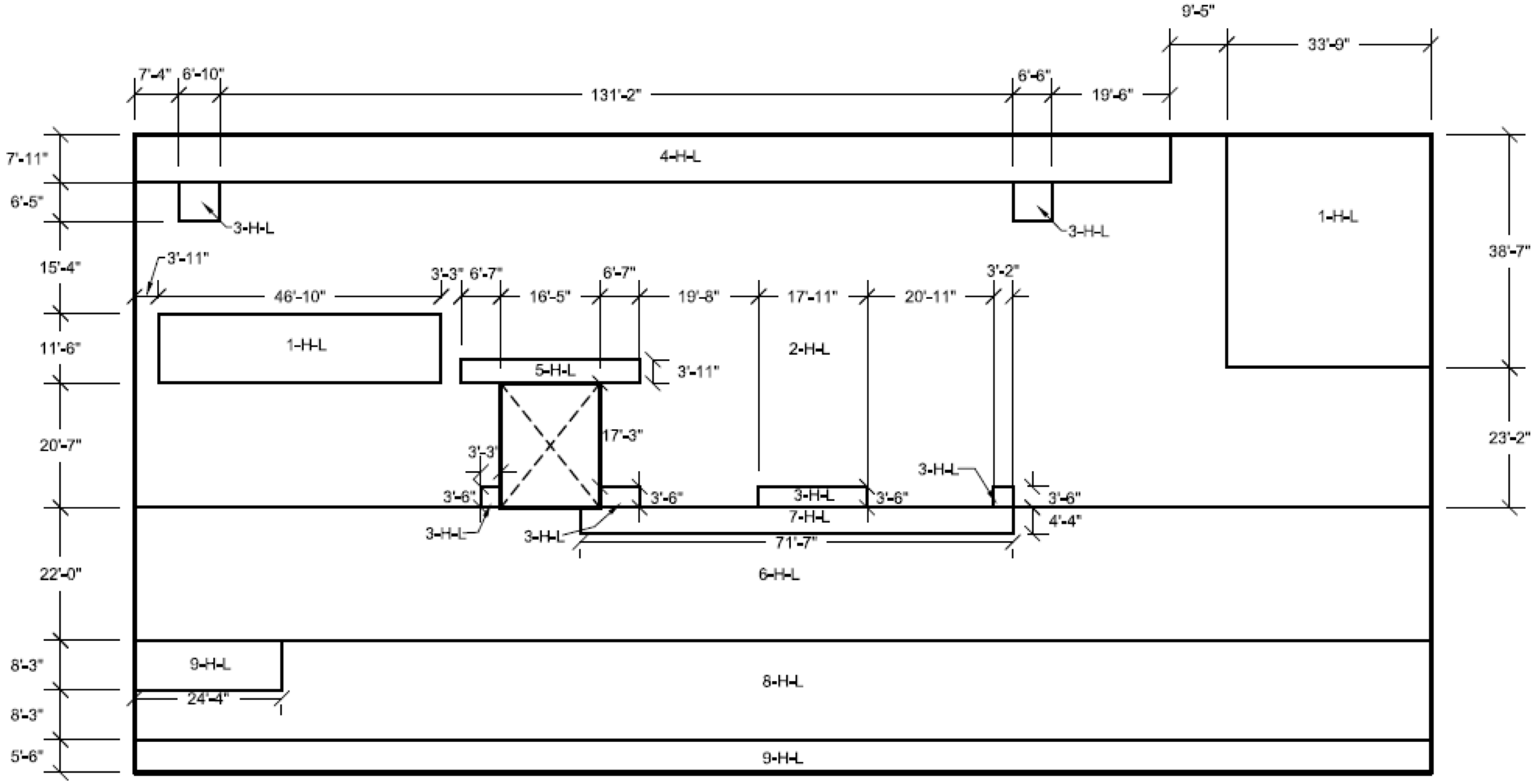


**Figure 3H.3-15 RWB South Wall Looking North
Horizontal Reinforcement Zones
Far Side Face**

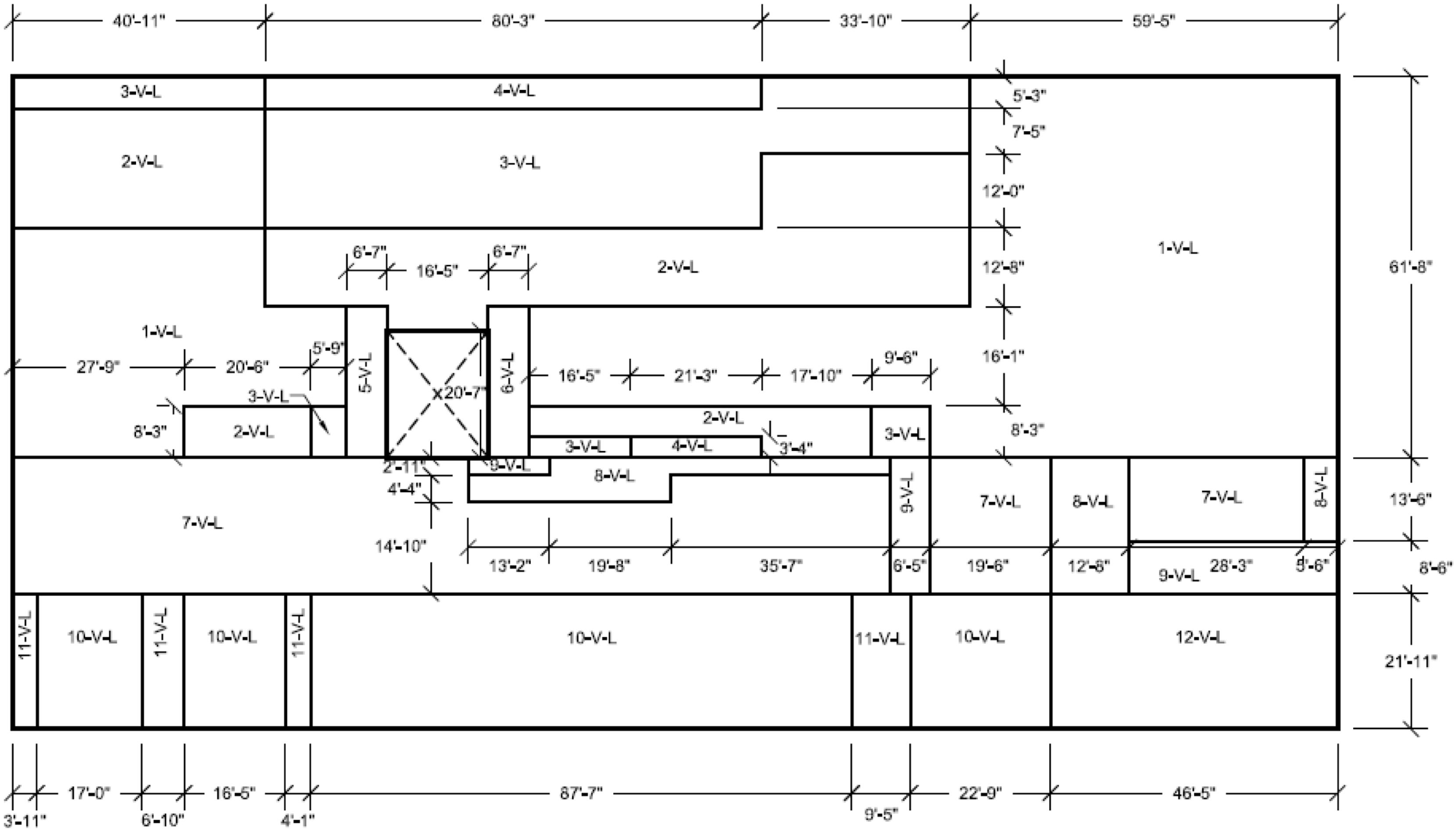


Figure 3H.3-16 RWB South Wall Looking North
Vertical Reinforcement Zones
Far Side Face

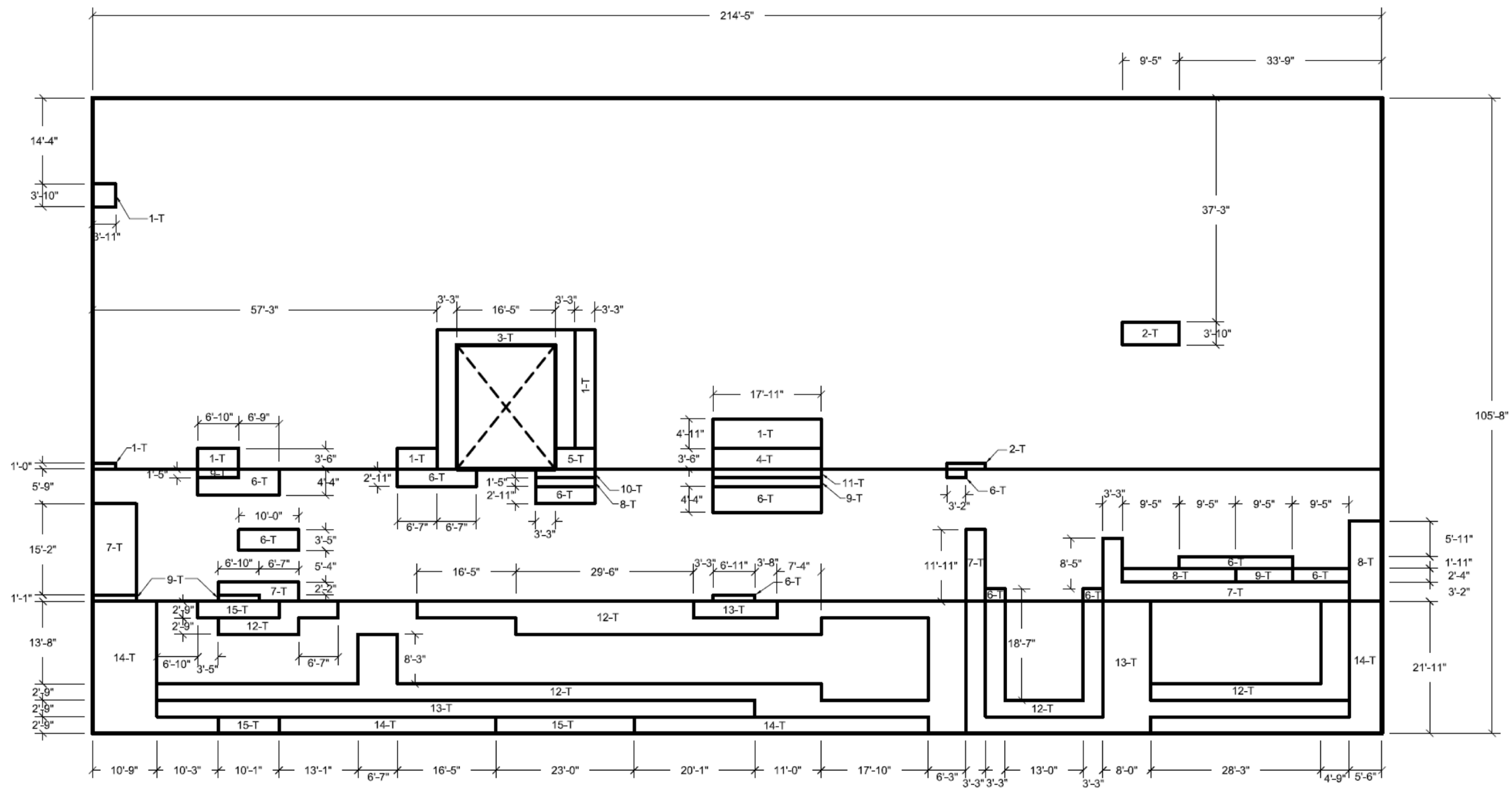


Figure 3H.3-17 RWB South Wall Looking North Transverse Reinforcement Zones

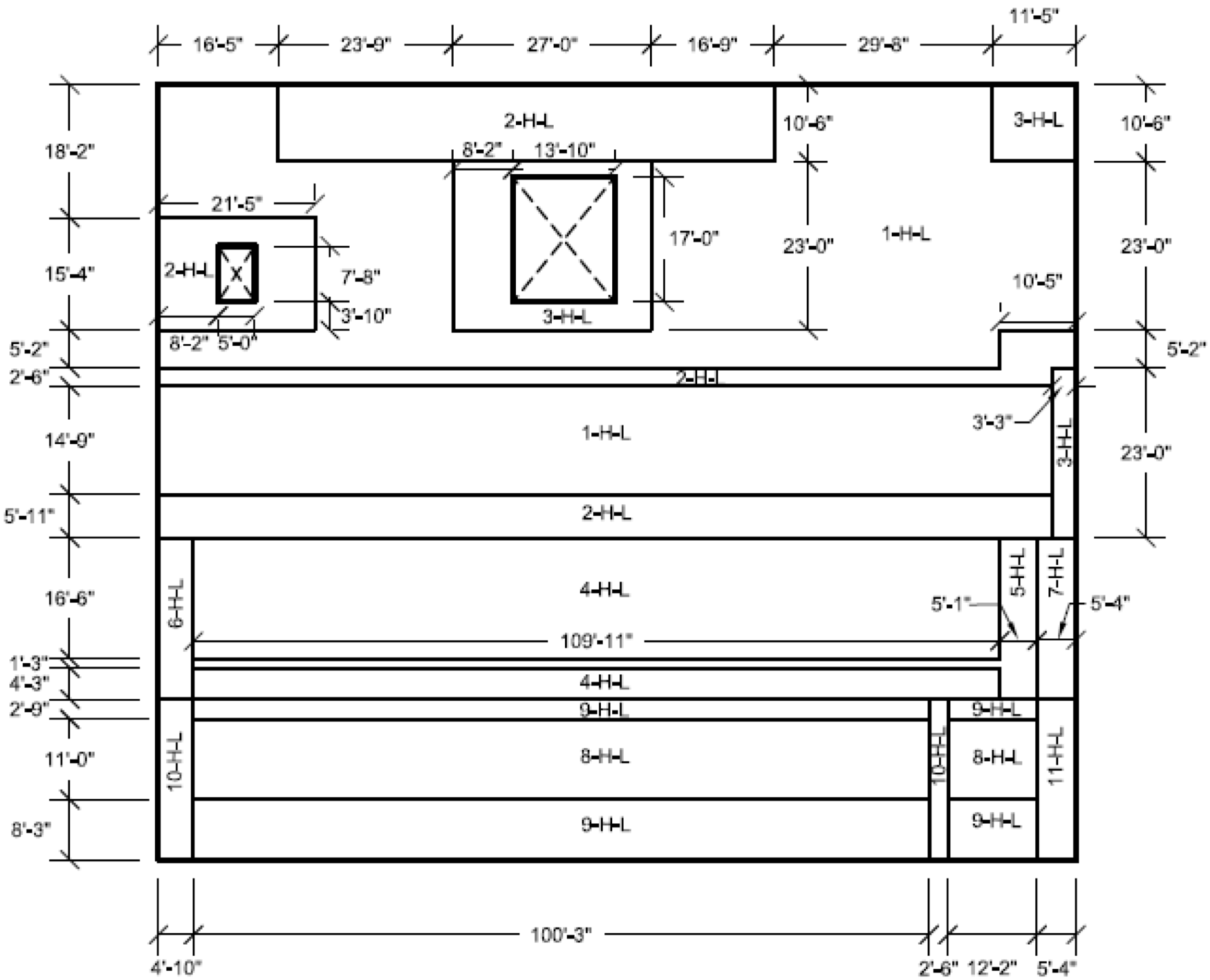


Figure 3H.3-18 RWB East Wall Looking West Horizontal Reinforcement Zones Near Side Face

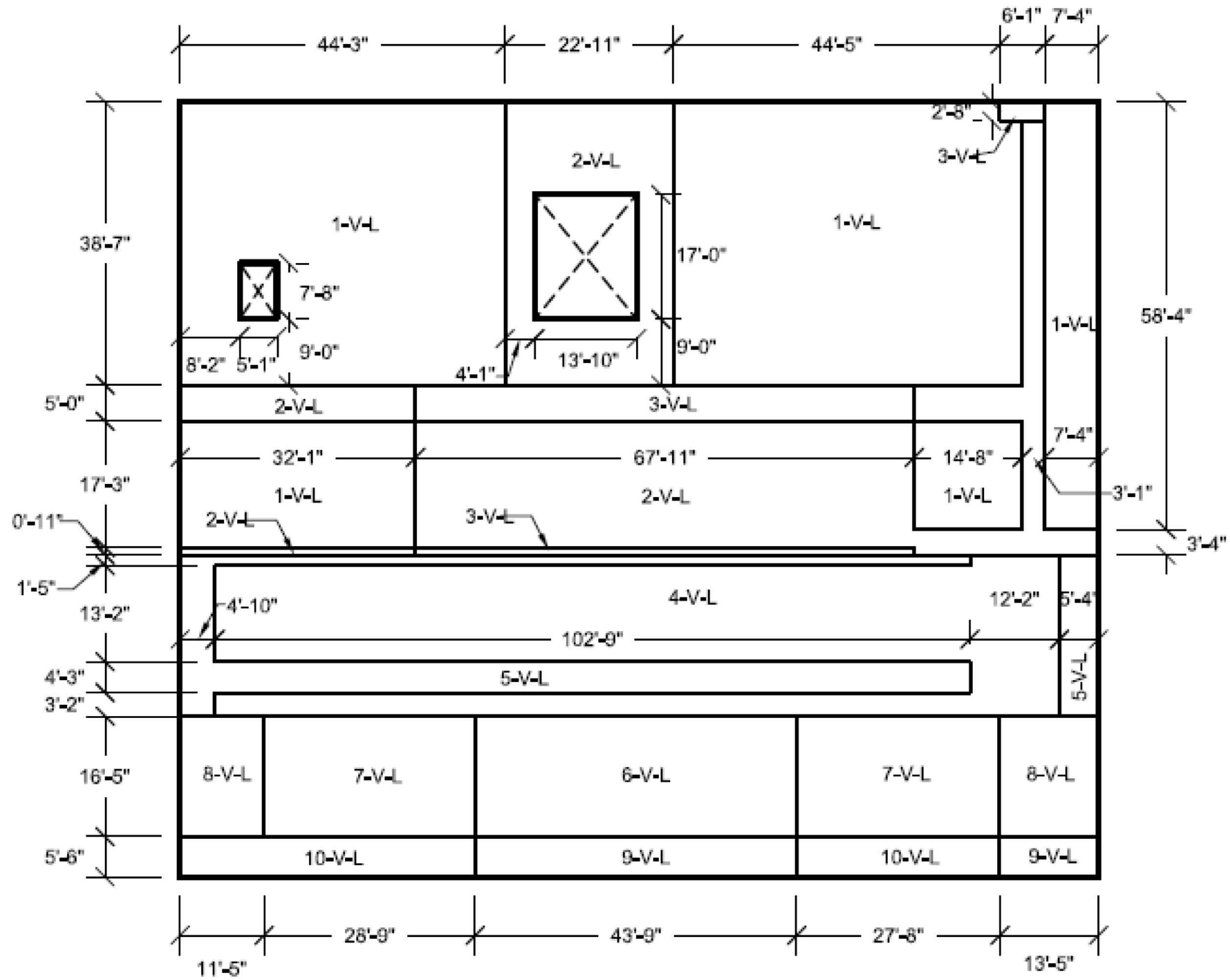


Figure 3H.3-19 RWB East Wall Looking West
Vertical Reinforcement Zones
Near Side Face

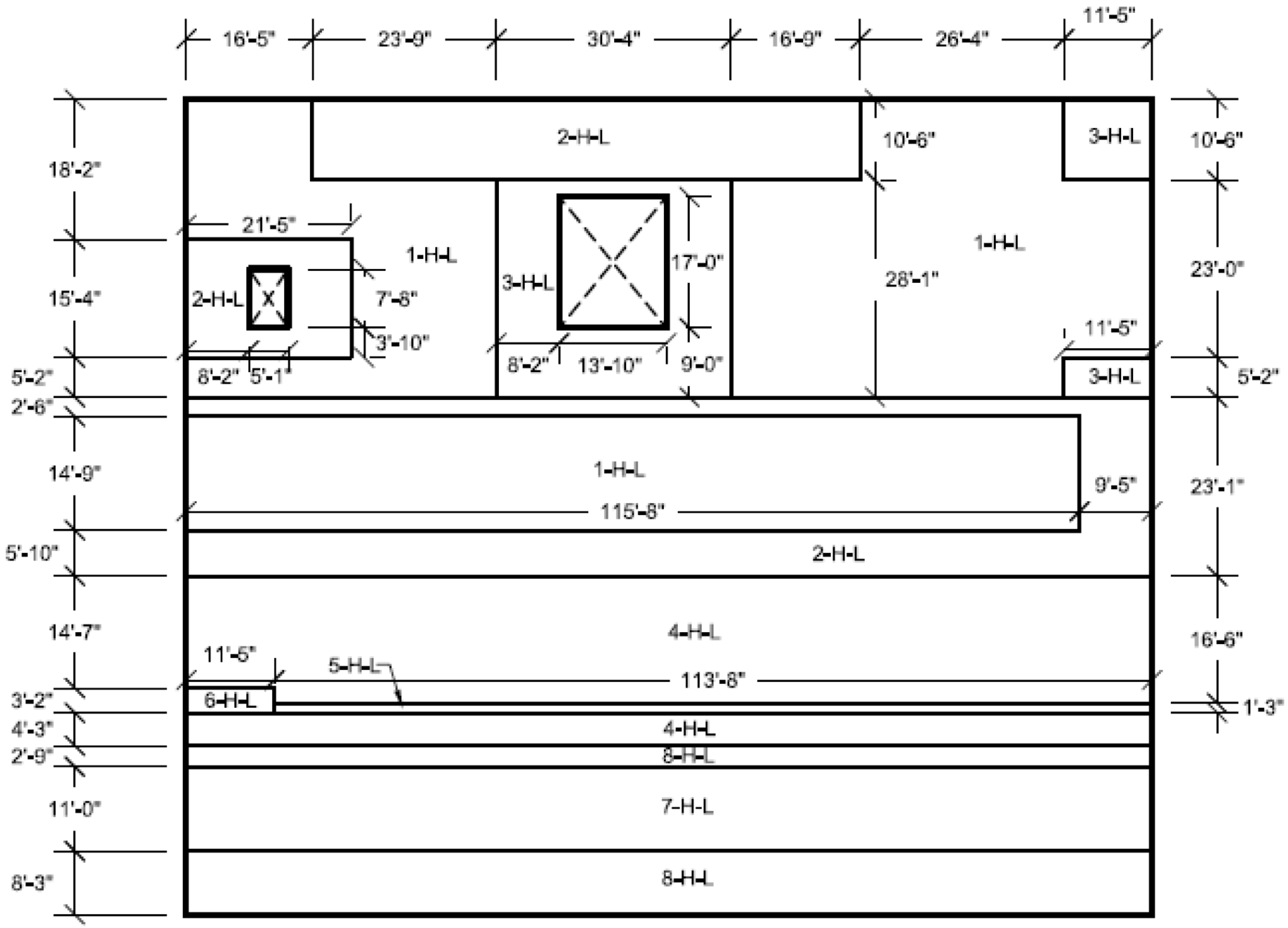


Figure 3H.3-20 RWB East Wall Looking West
Horizontal Reinforcement Zones
Far Side Face

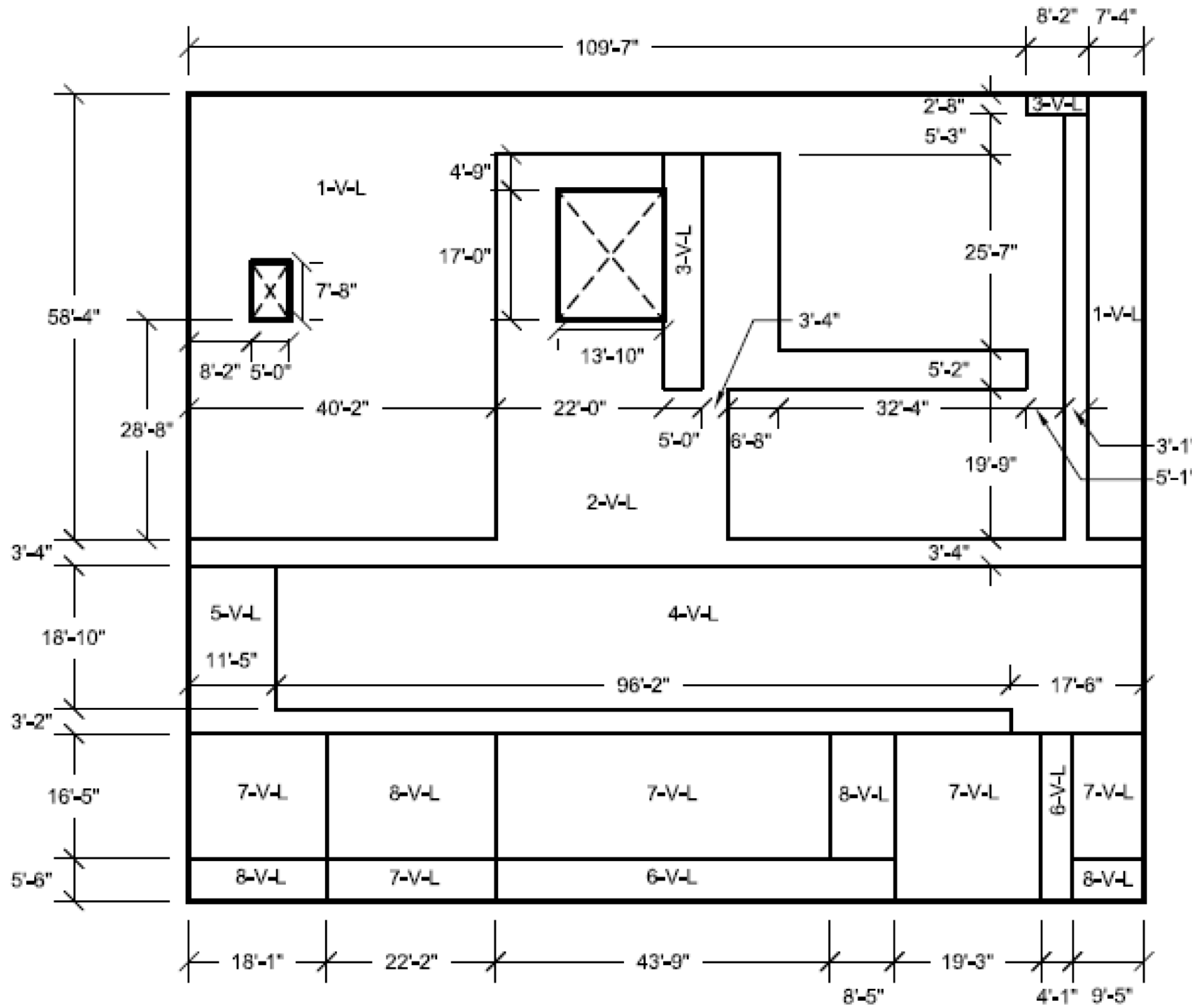


Figure 3H.3-21 RWB East Wall Looking West
Vertical Reinforcement Zones
Far Side Face

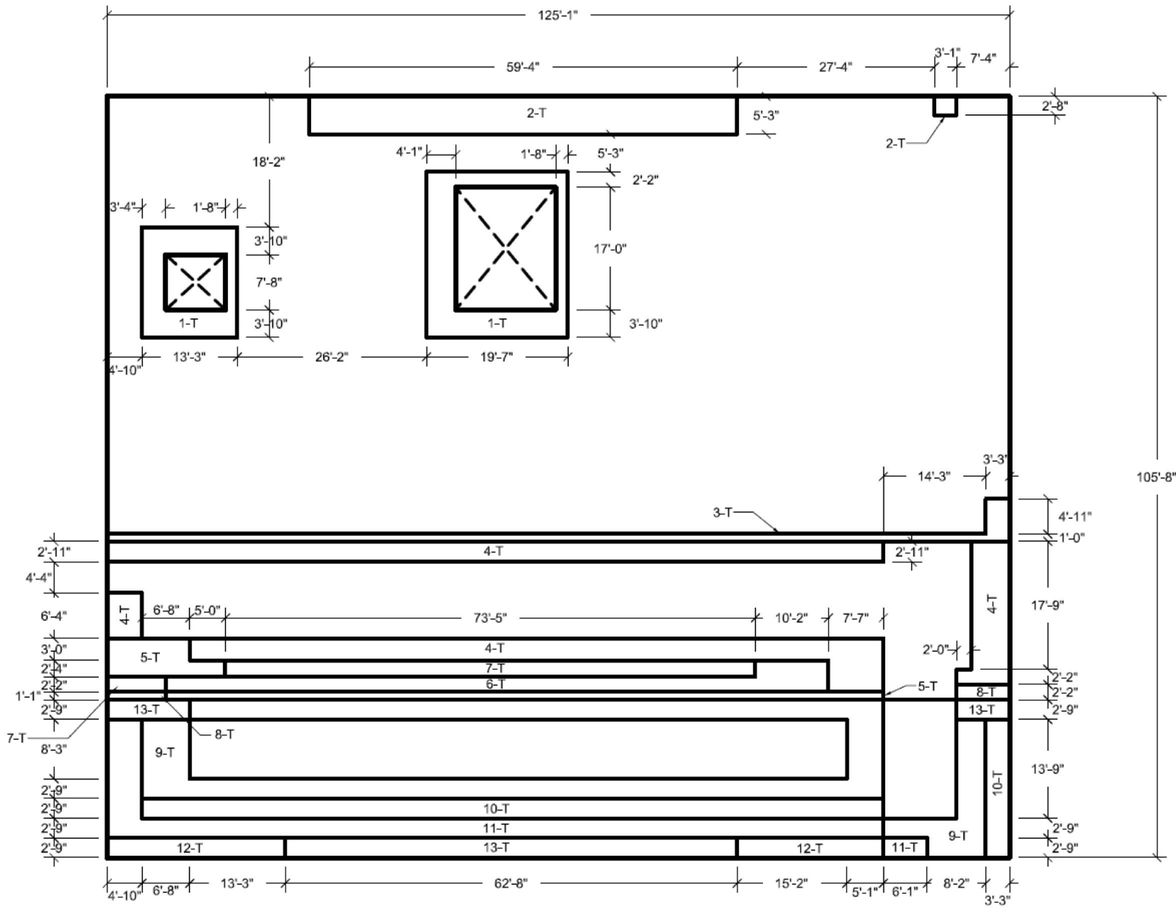


Figure 3H.3-22 RWB East Wall Looking West Transverse Reinforcement Zones

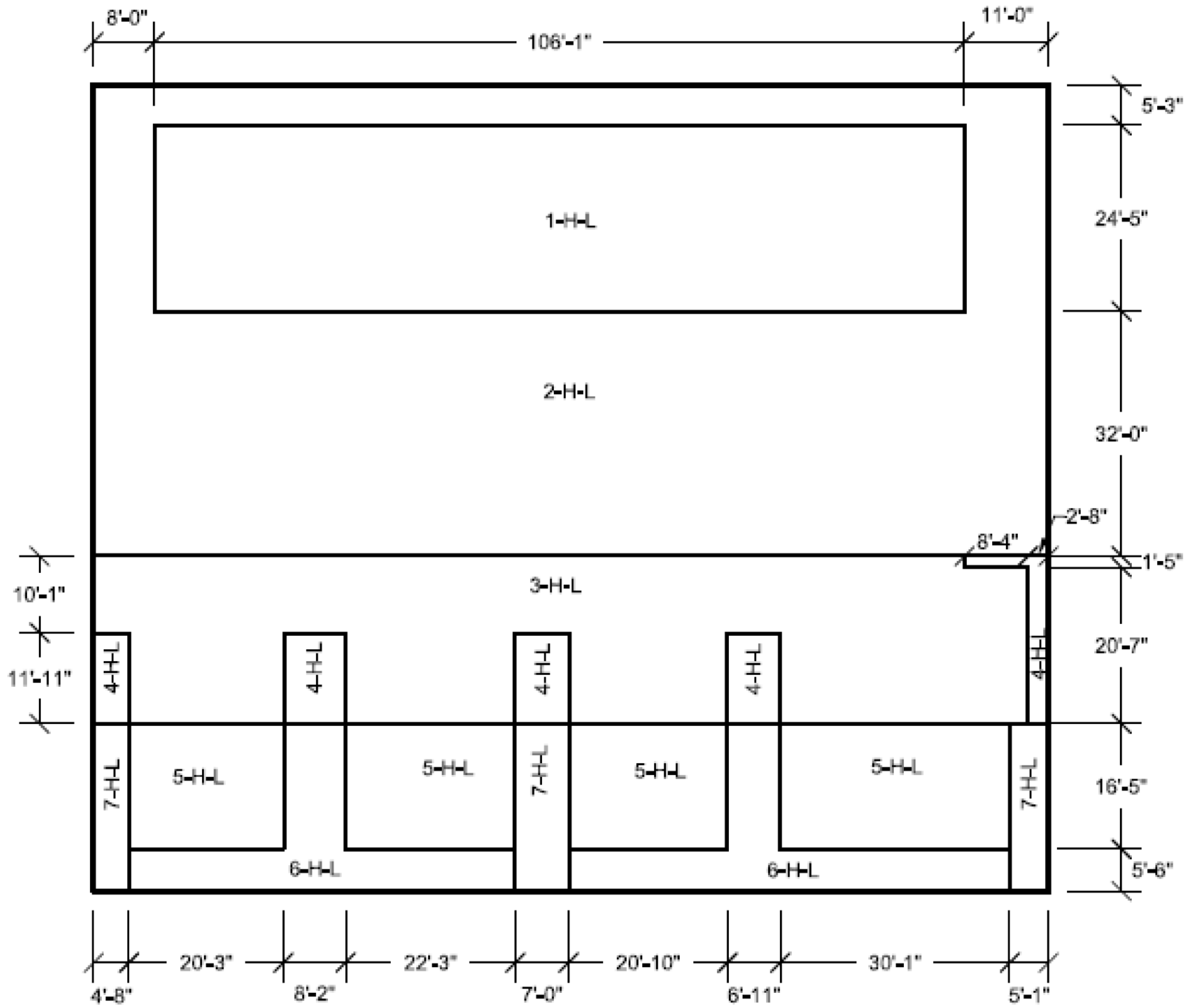


Figure 3H.3-23 RWB West Wall Looking East
Horizontal Reinforcement Zones
Near Side Face

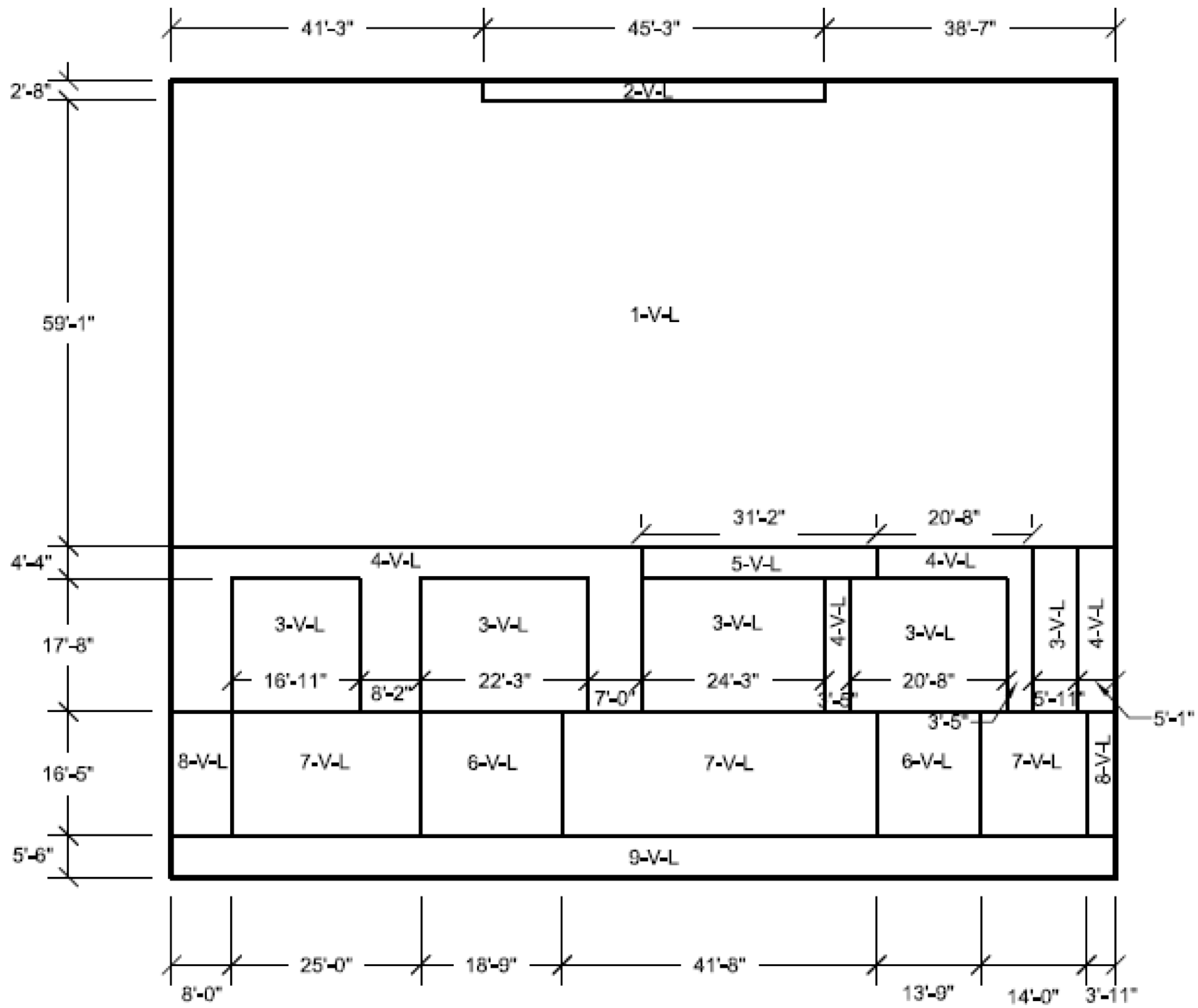


Figure 3H.3-24 RWB West Wall Looking East Vertical Reinforcement Zones Near Side Face

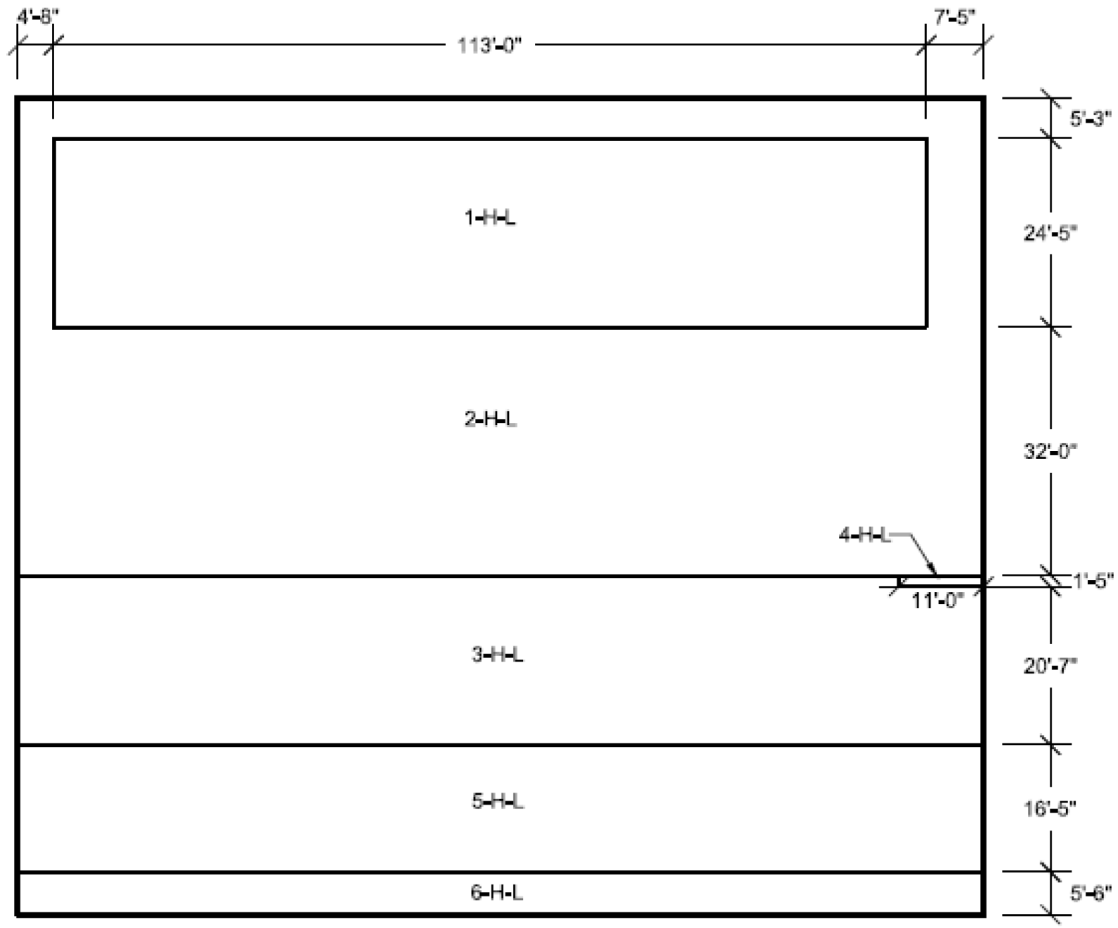


Figure 3H.3-25 RWB West Wall Looking East Horizontal Reinforcement Zones Far Side Face

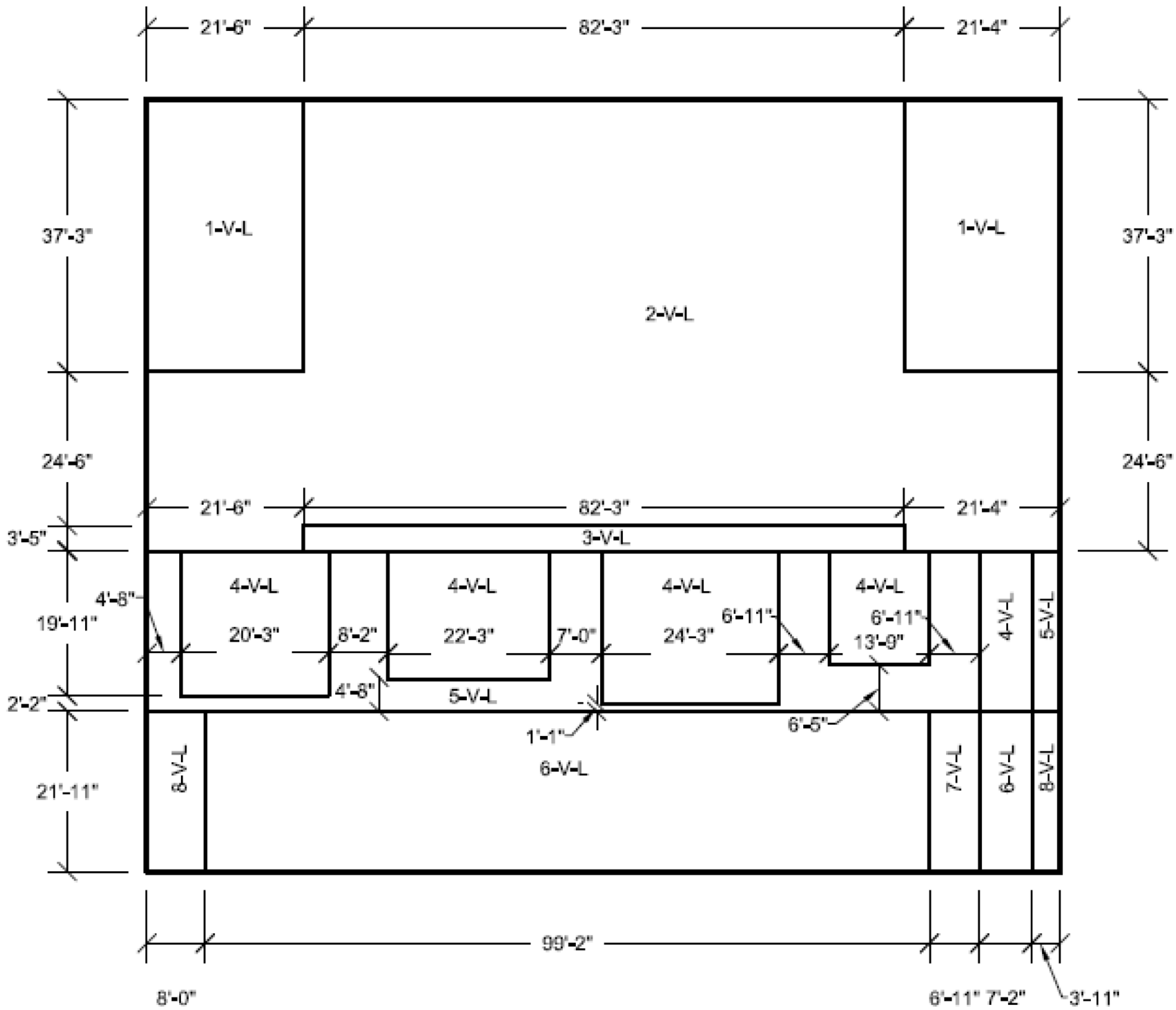


**Figure 3H.3-26 RWB West Wall Looking East
Vertical Reinforcement Zones
Far Side Face**

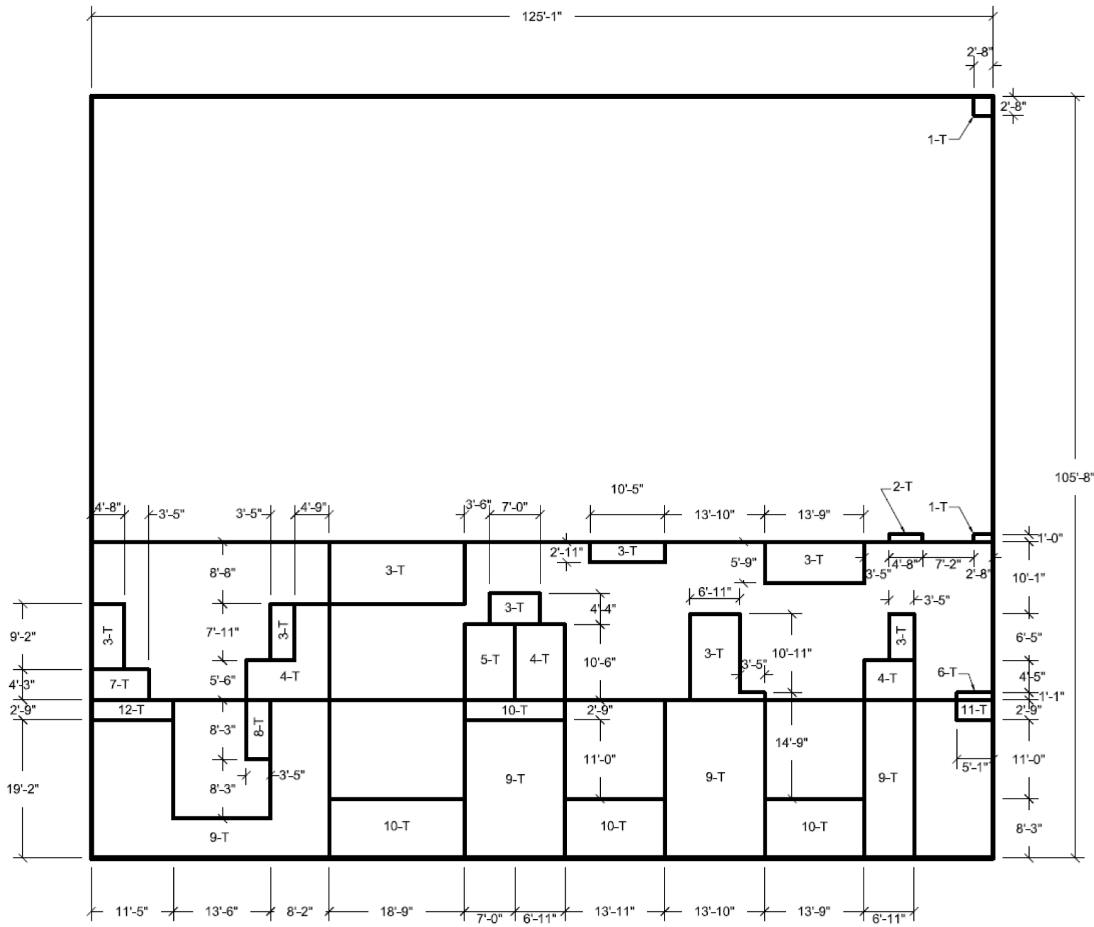


Figure 3H.3-27 RWB West Wall Looking East Transverse Reinforcement Zones

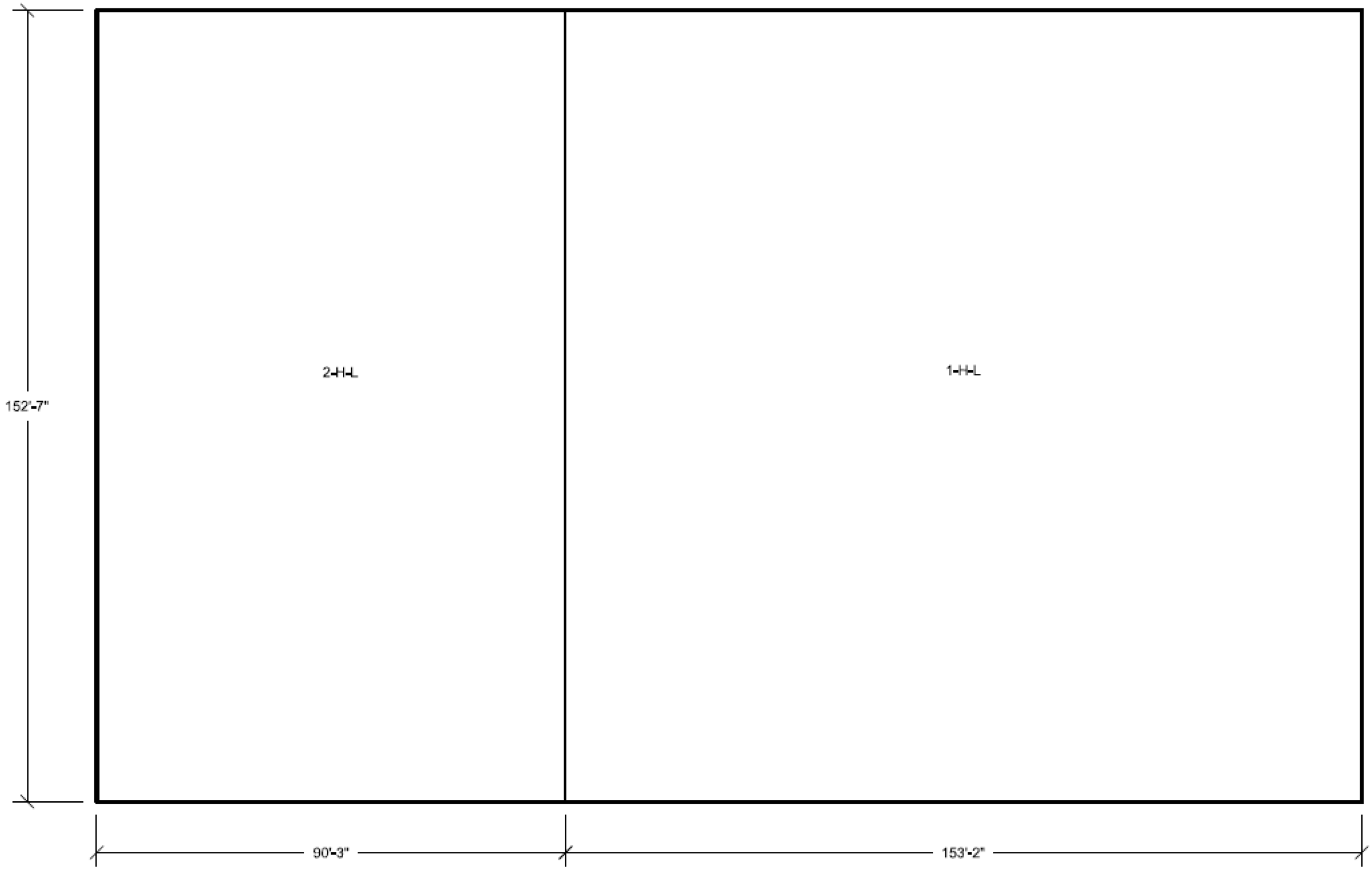


Figure 3H.3-28 RWB Basemat Looking Down East-West Reinforcement Zones Near Side Face

**Figure 3H.3-29 RWB Basemat Looking Down
North-South Reinforcement Zones
Near Side Face**

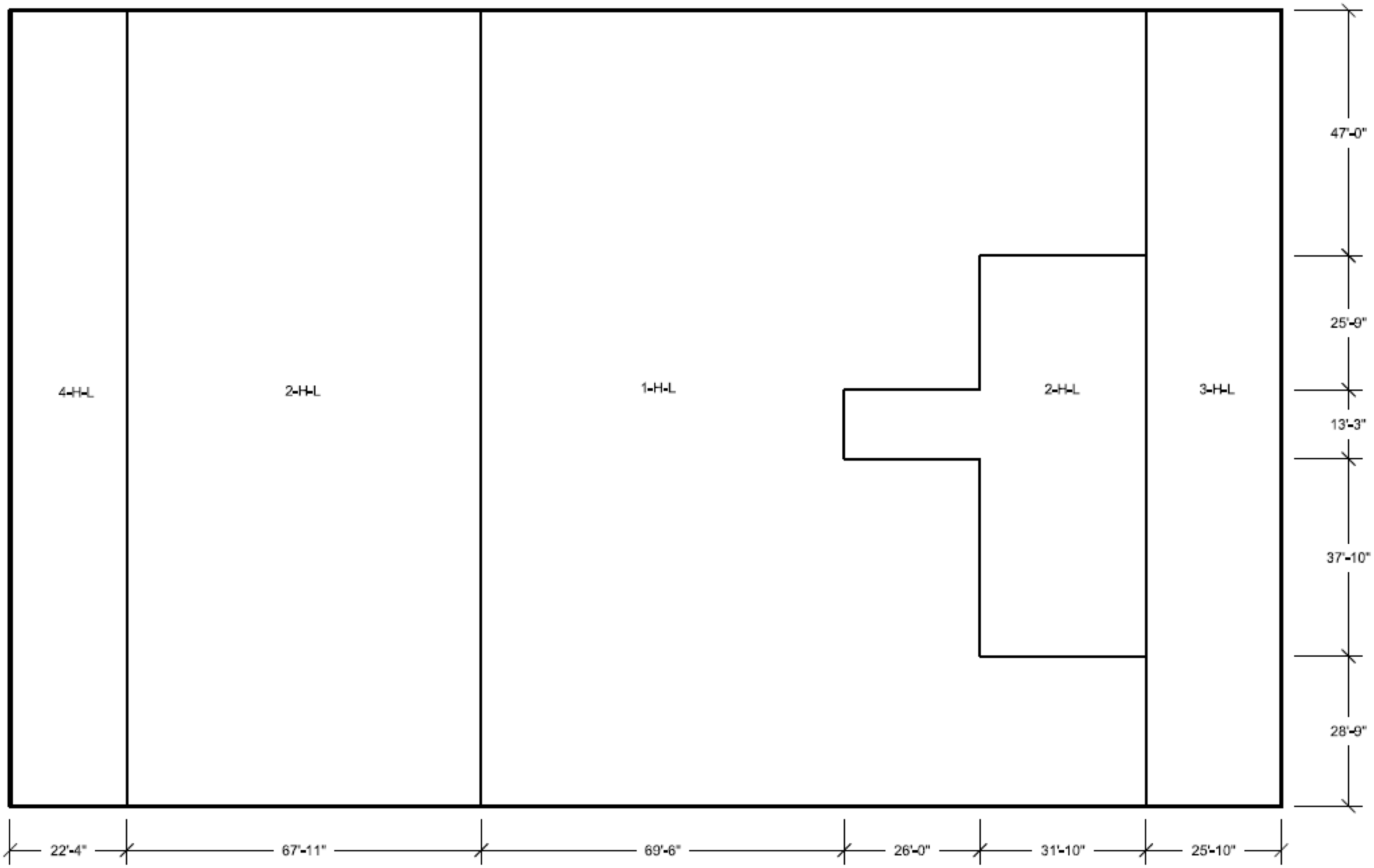


Figure 3H.3-30 RWB Basemat Looking Down East-West Reinforcement Zones Far Side Face

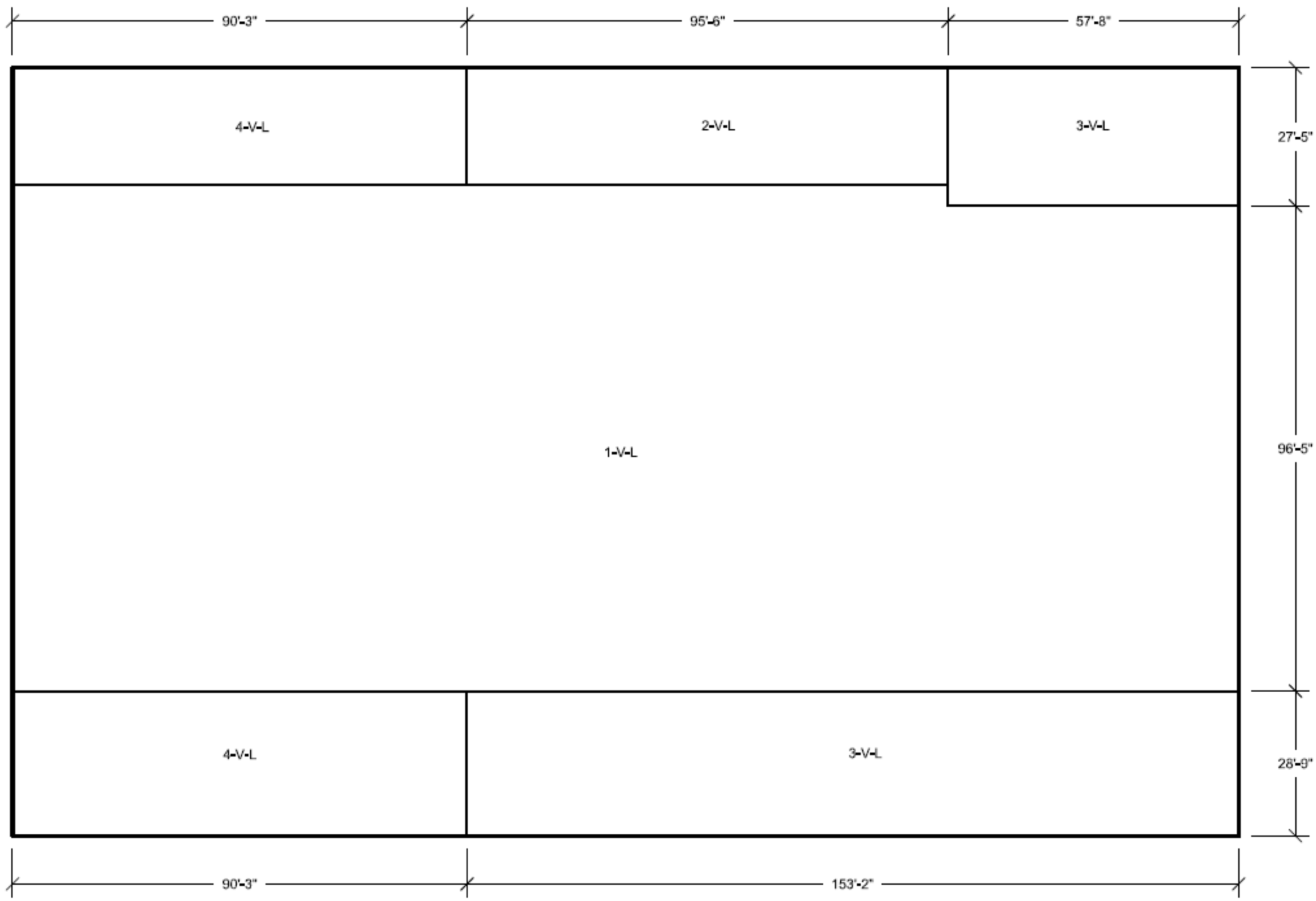


Figure 3H.3-31 RWB Basemat Looking Down North-South Reinforcement Zones Far Side Face

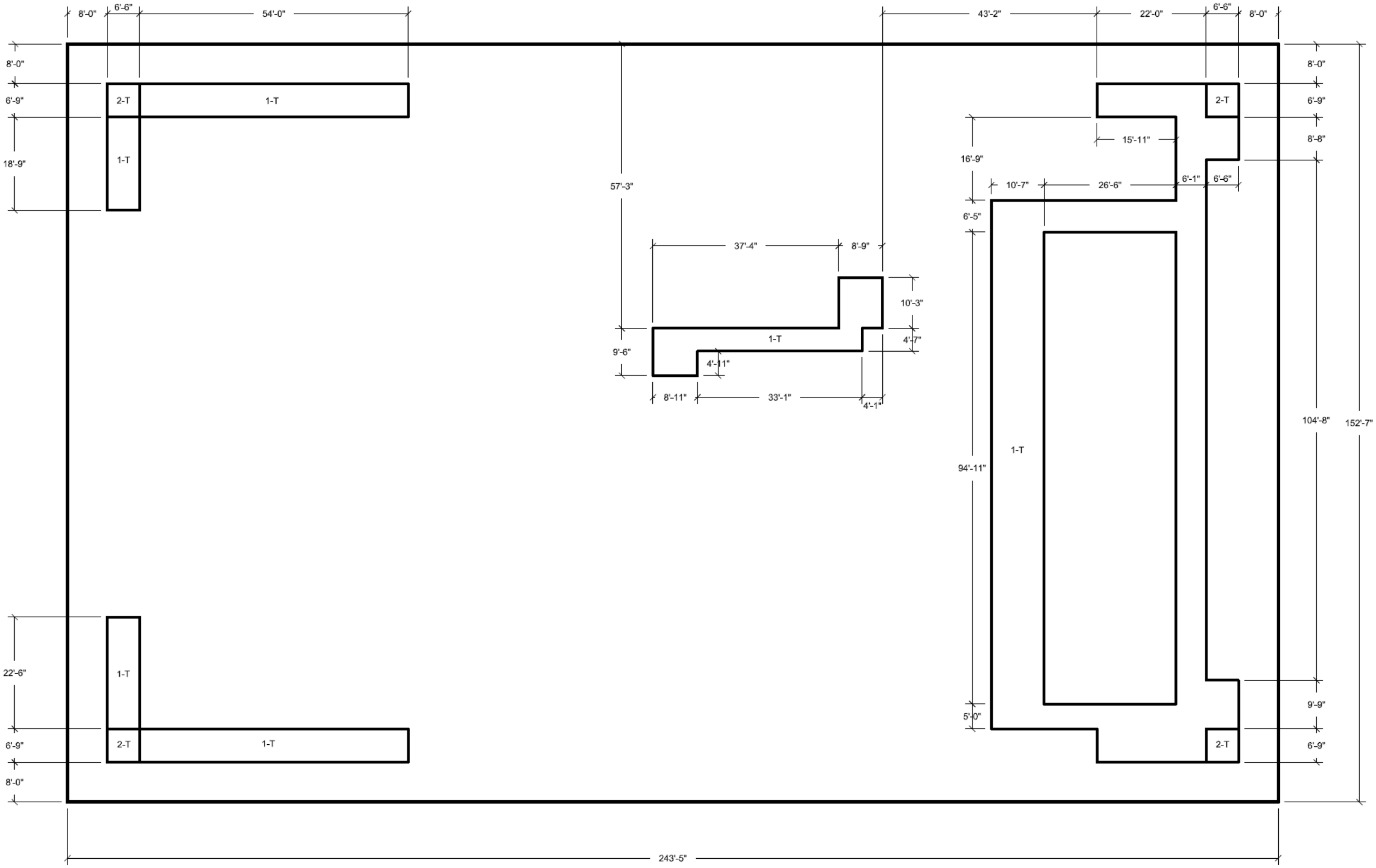


Figure 3H.3-32 RWB Basemat Looking Down Transverse Reinforcement Zones

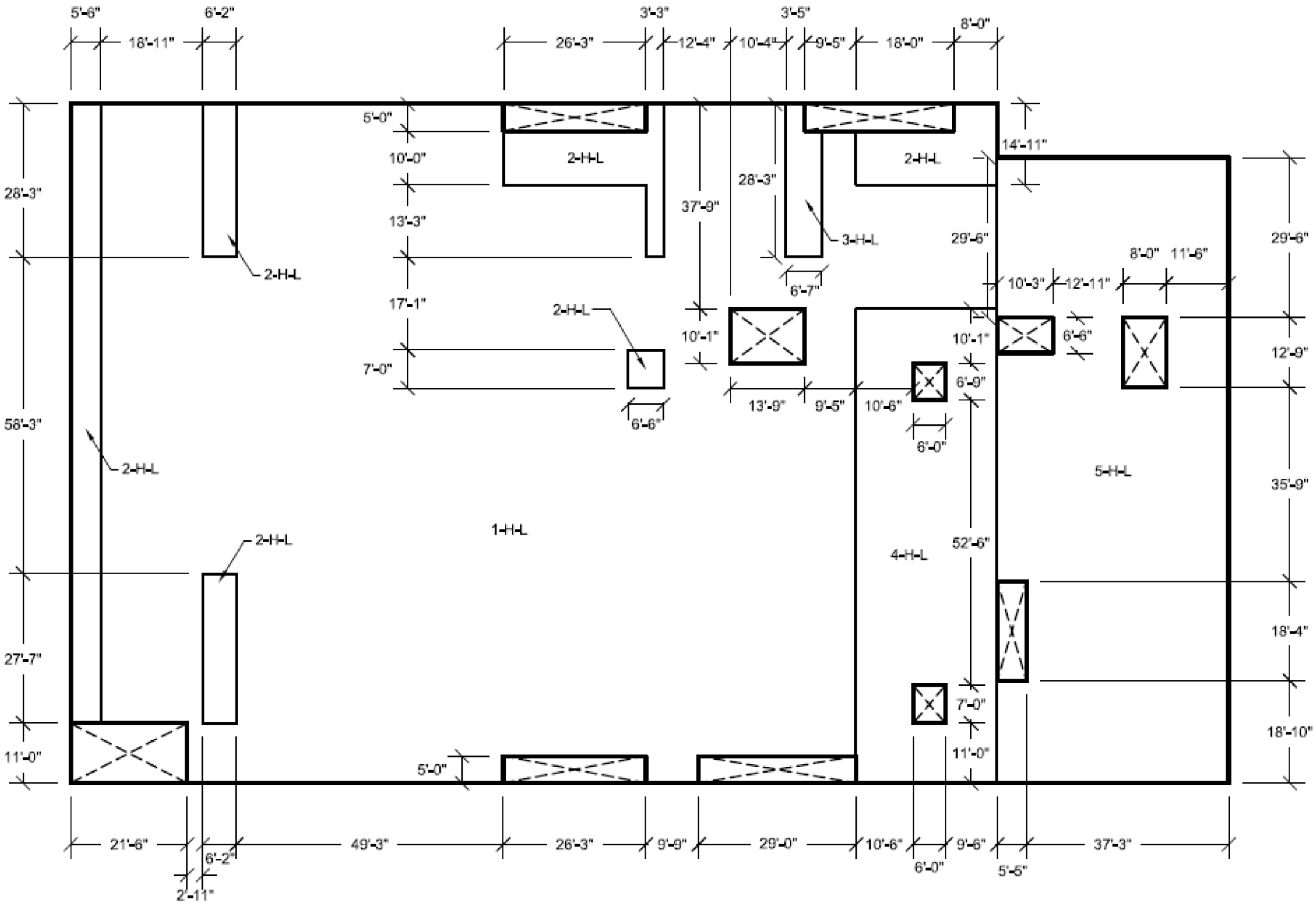


Figure 3H.3-33 RWB Elevation 35 Looking Down East-West Reinforcement Zones Near Side Face

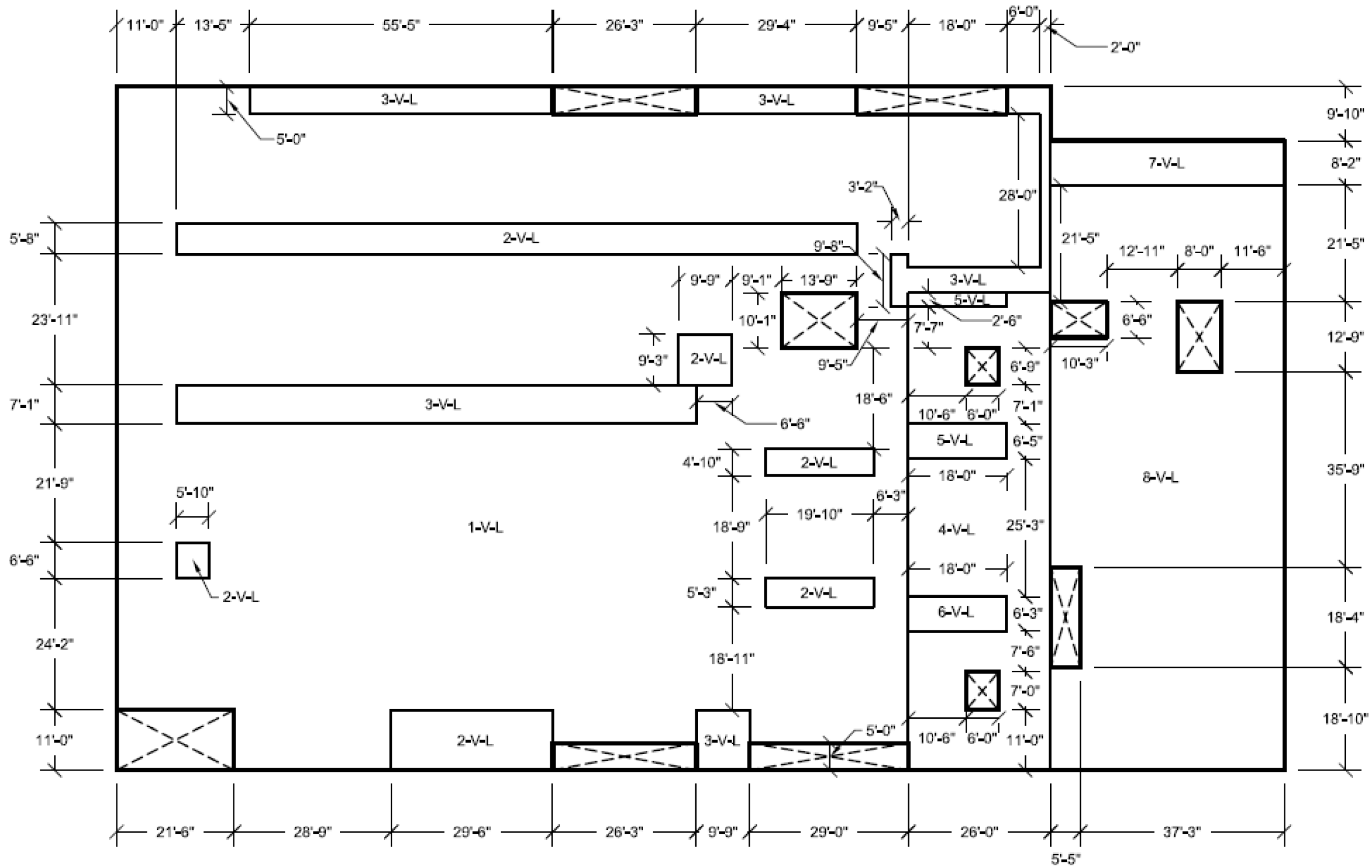


Figure 3H.3-34 RWB Elevation 35 Looking Down North-South Reinforcement Zones Near Side Face

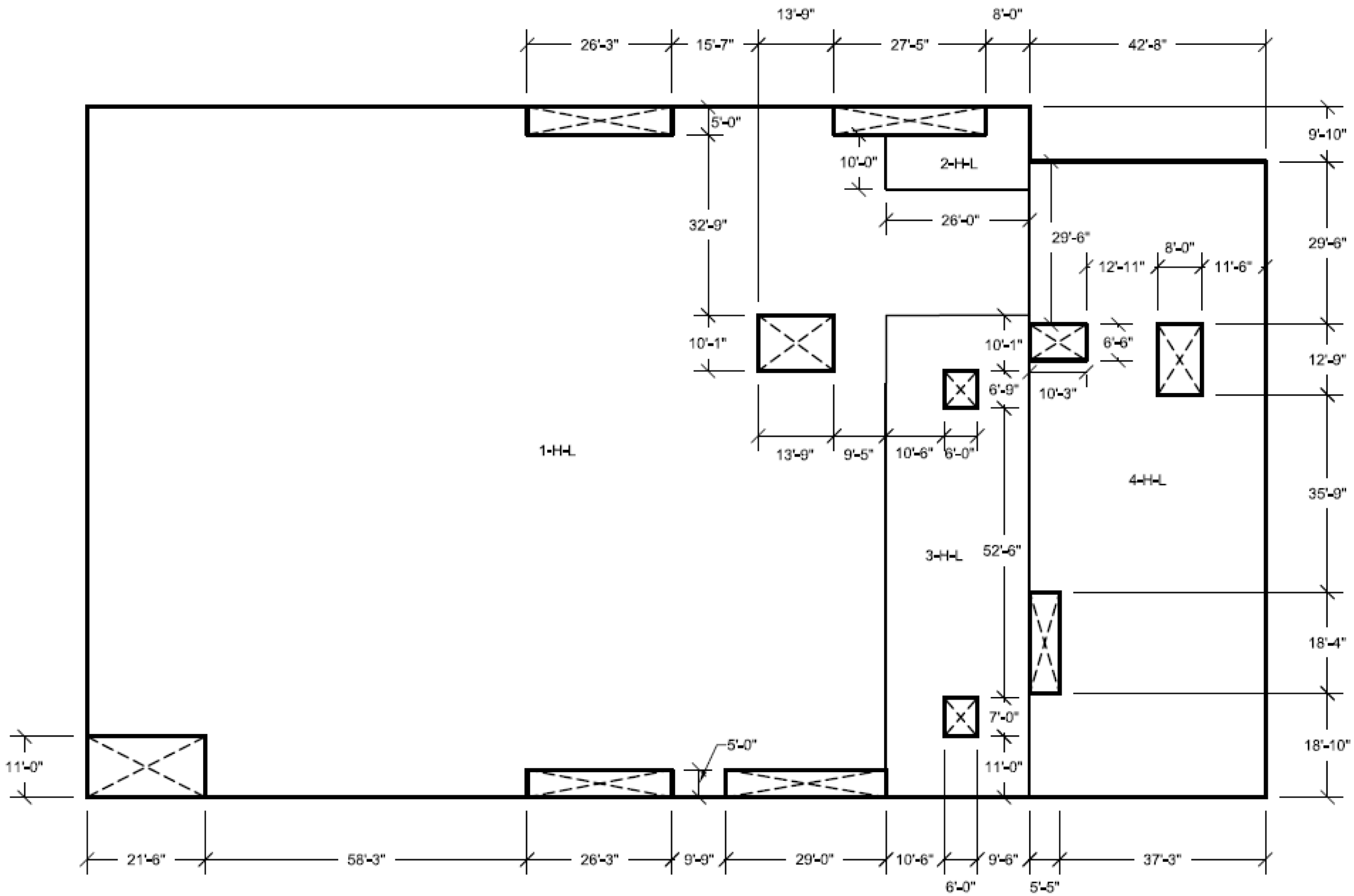


Figure 3H.3-35 RWB Elevation 35 Looking Down
East-West Reinforcement Zones
Far Side Face

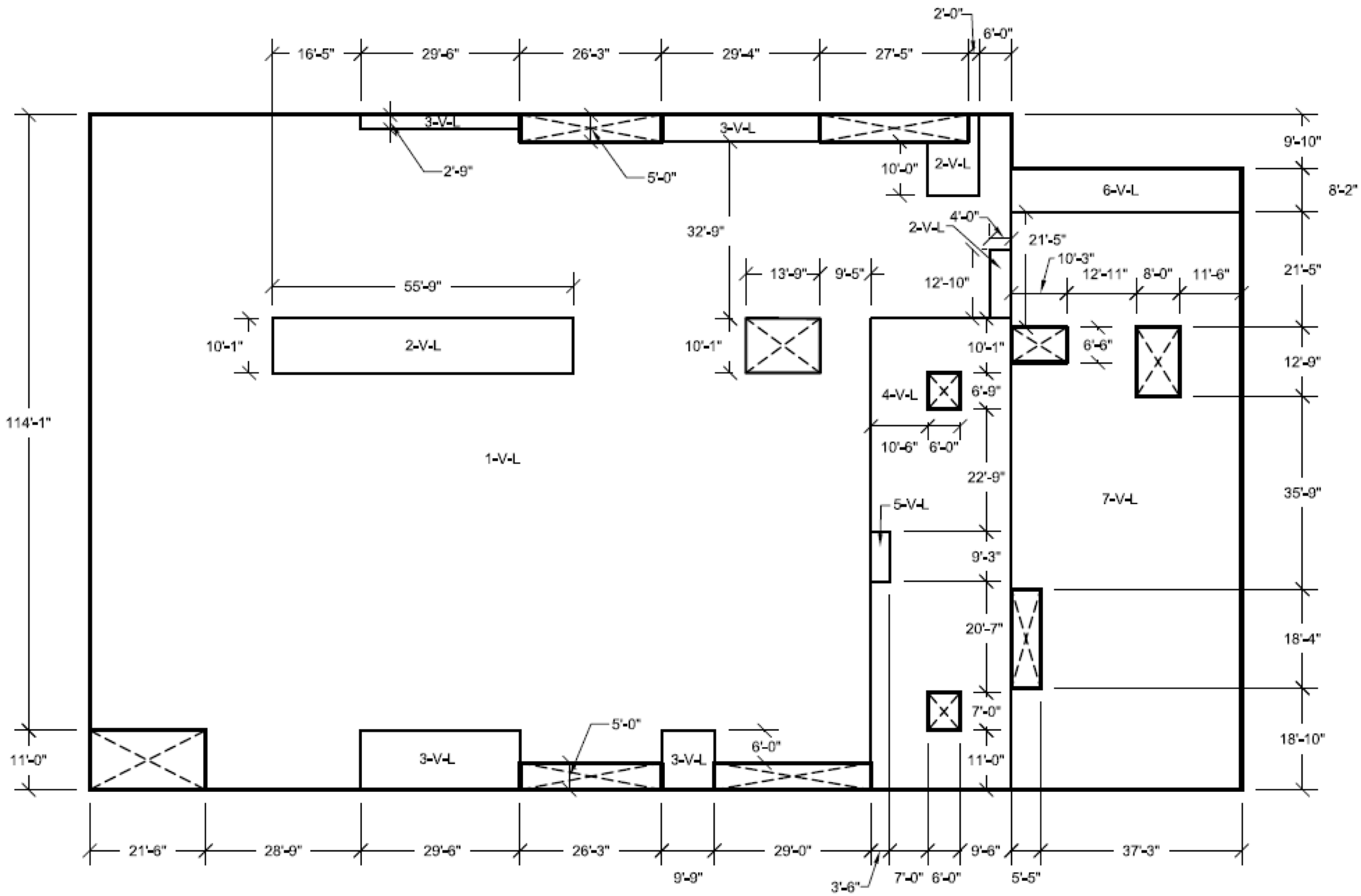


Figure 3H.3-36 RWB Elevation 35 Looking Down North-South Reinforcement Zones Far Side Face

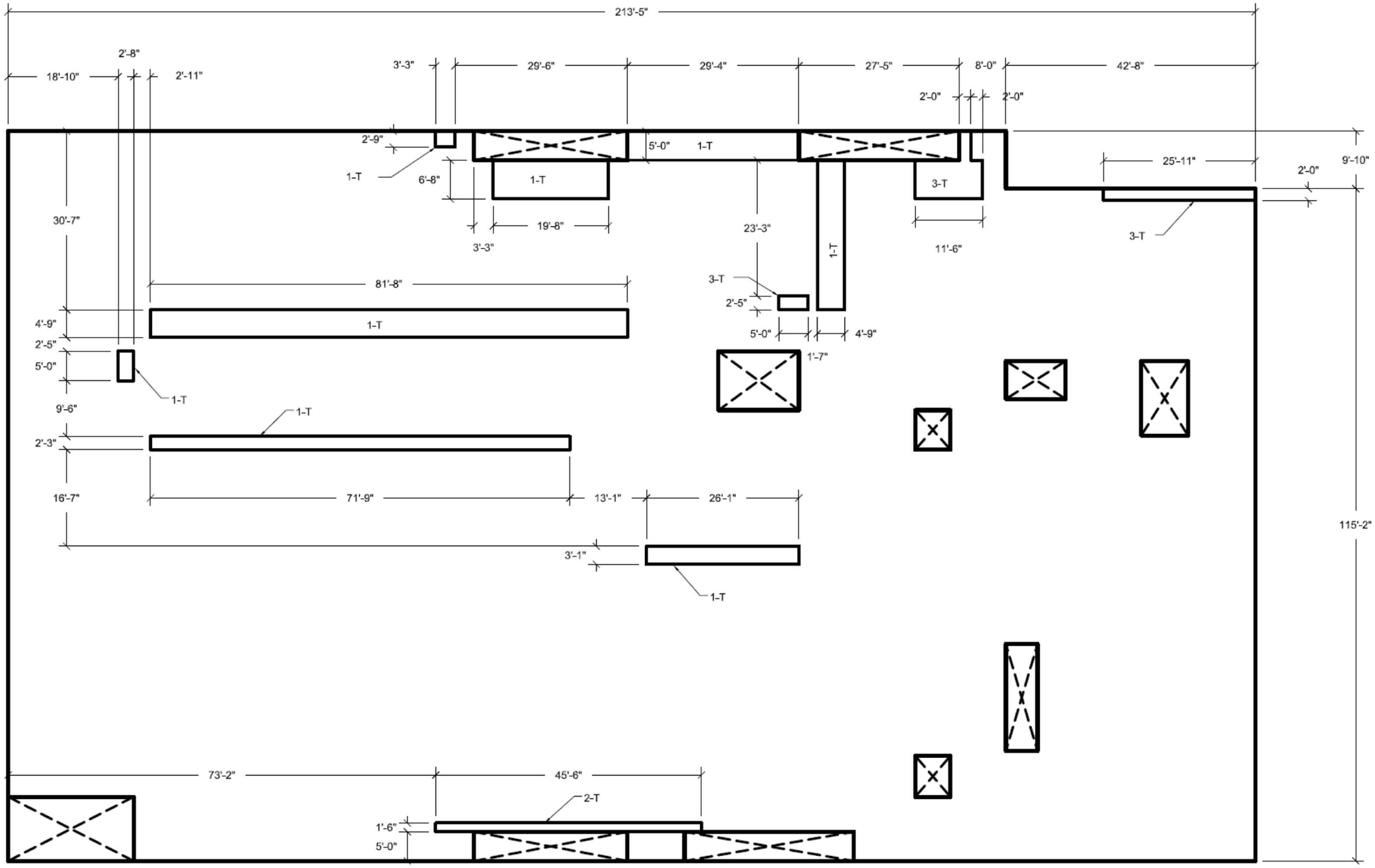


Figure 3H.3-37a RWB Elevation 35 Looking Down Transverse Reinforcement Zones

Figure 3H.3-37b Not Used

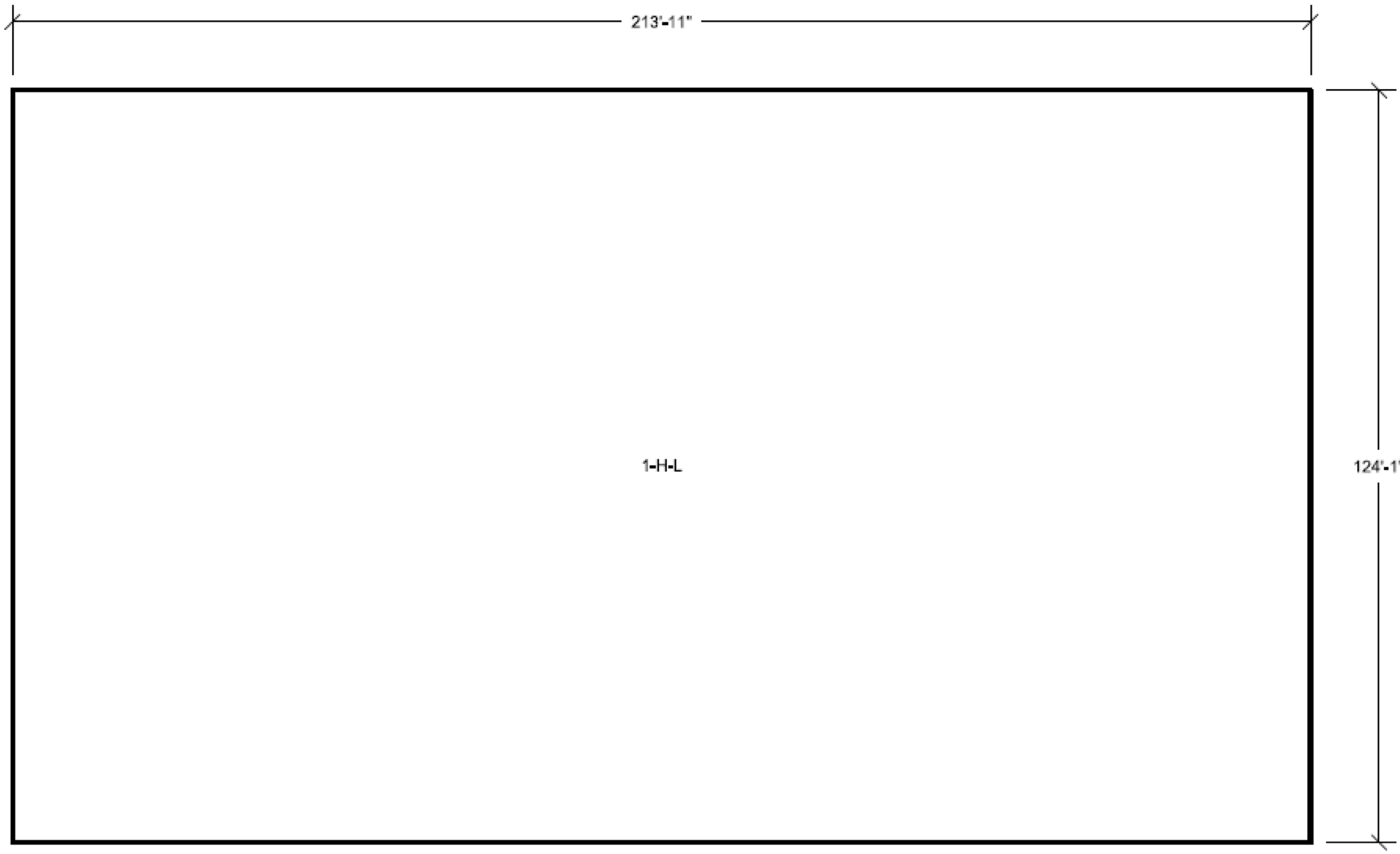


Figure 3H.3-38 RWB Elevation 95 Looking Down East-West Reinforcement Zones Near Side Face

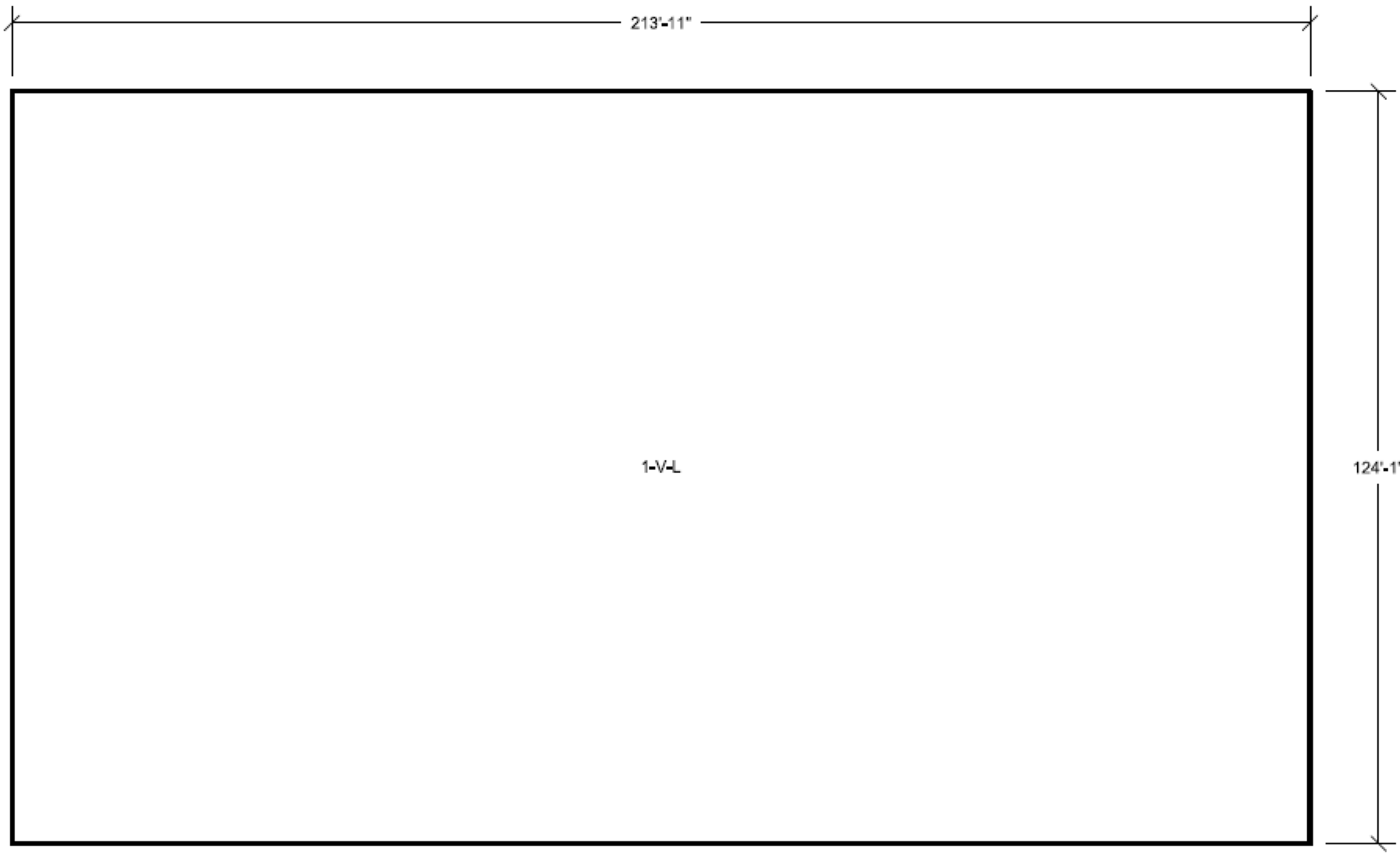


Figure 3H.3-39 RWB Elevation 95 Looking Down
North-South Reinforcement Zones
Near Side Face

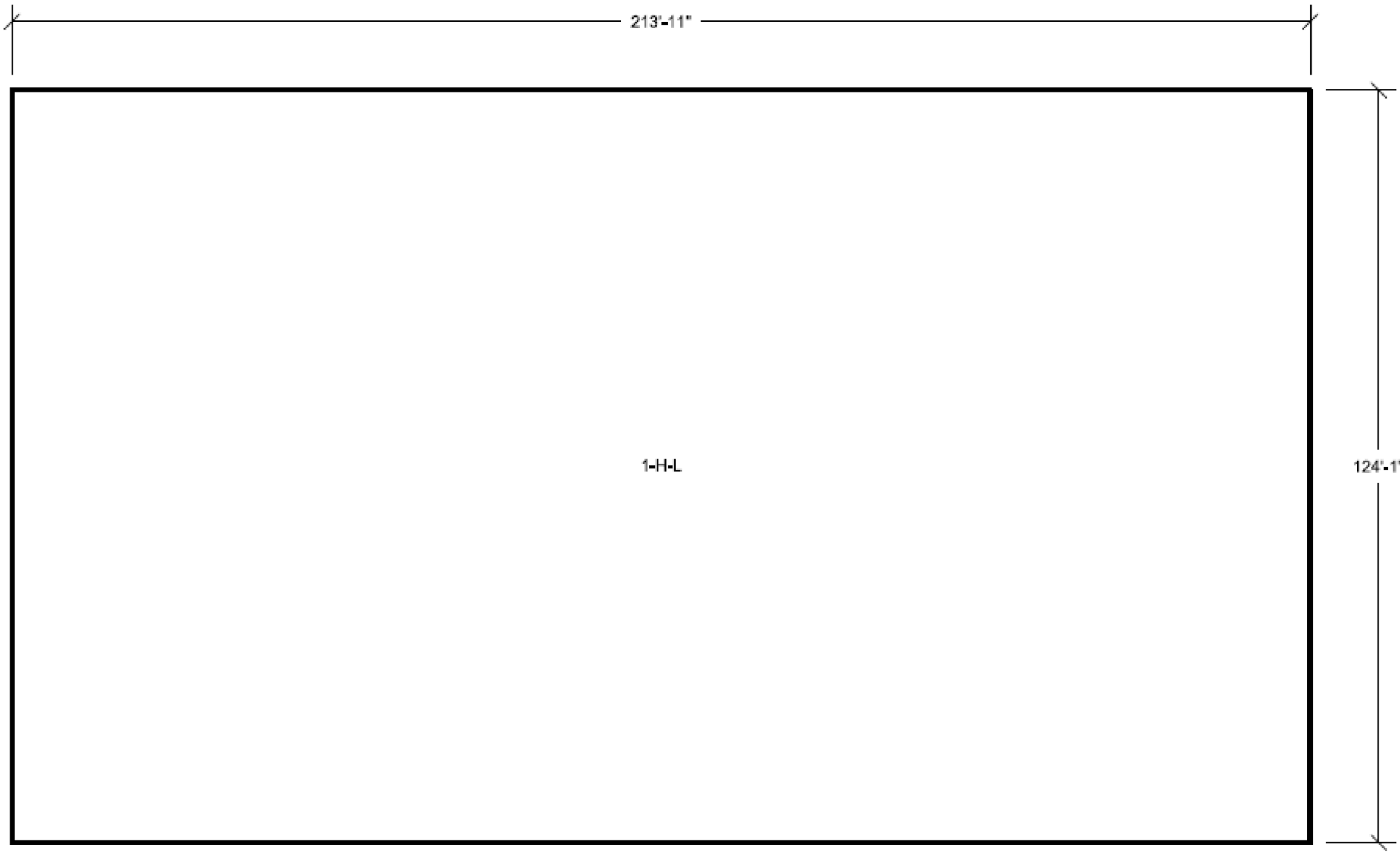


Figure 3H.3-40 RWB Elevation 95 Looking Down East-West Reinforcement Zones Far Side Face

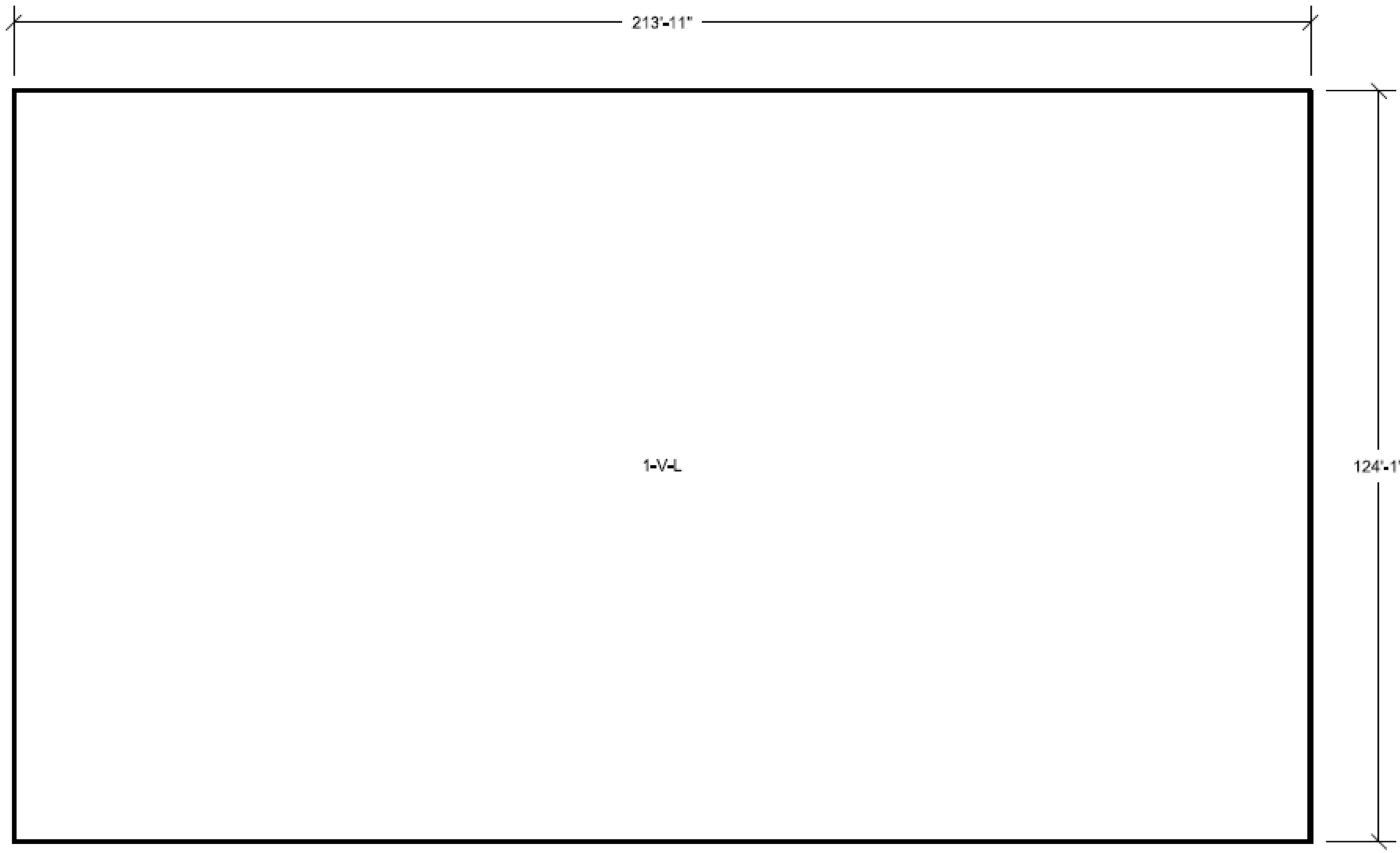


**Figure 3H.3-41 RWB Elevation 95 Looking Down
North-South Reinforcement Zones
Far Side Face**

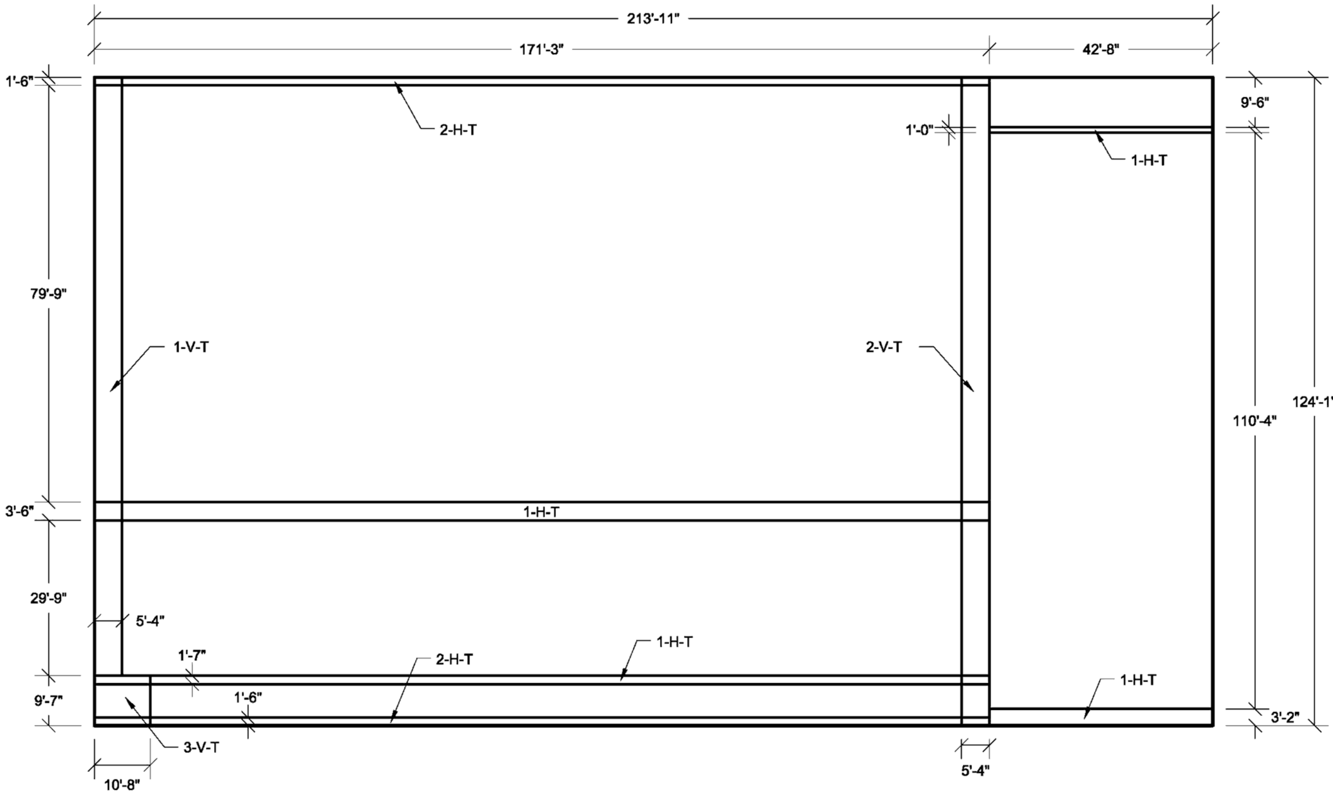


Figure 3H.3-42 RWB Elevation 95 Looking Down Transverse Reinforcement Zones

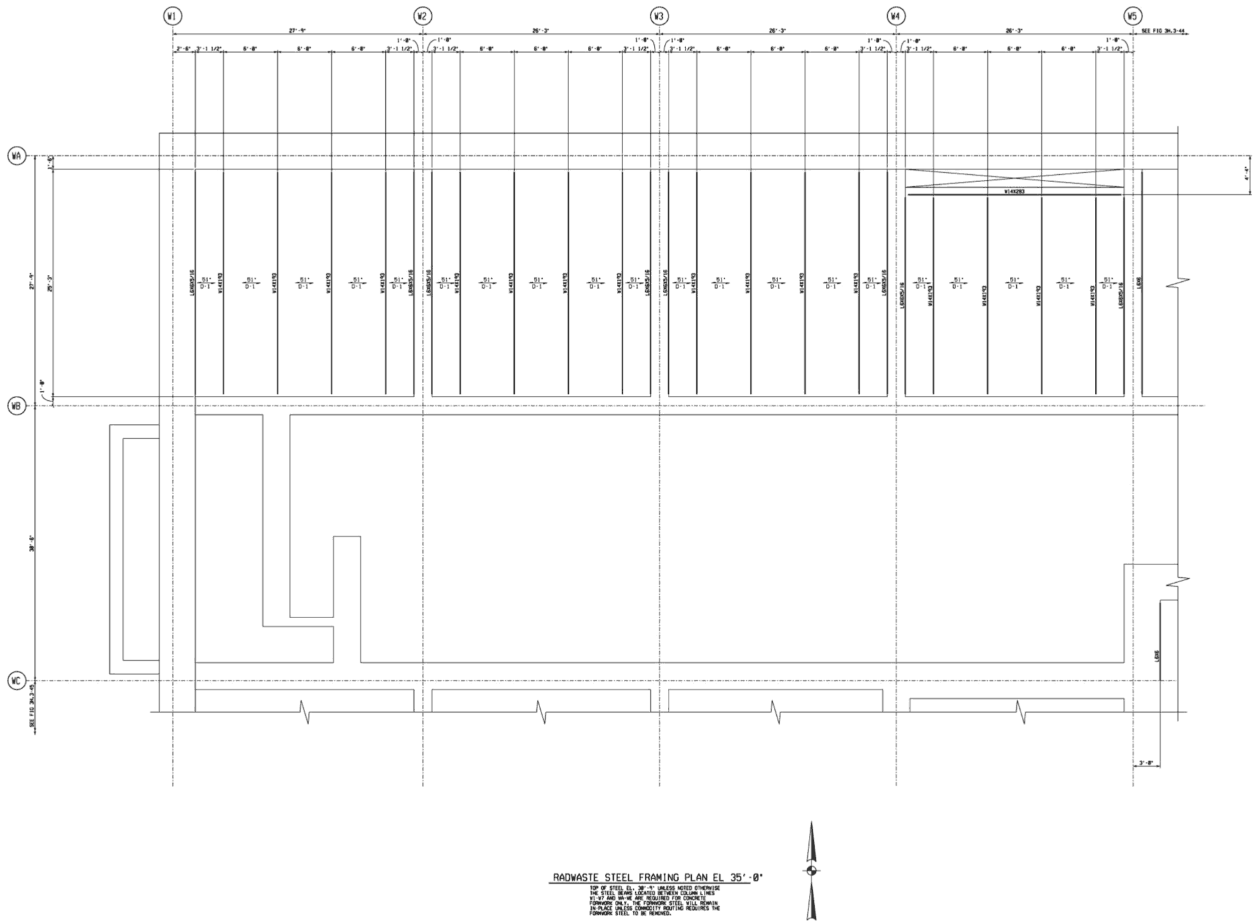


Figure 3H.3-43 RWB El 35’-0” Steel Layout Between Column Lines W1-W5 and WA-WC

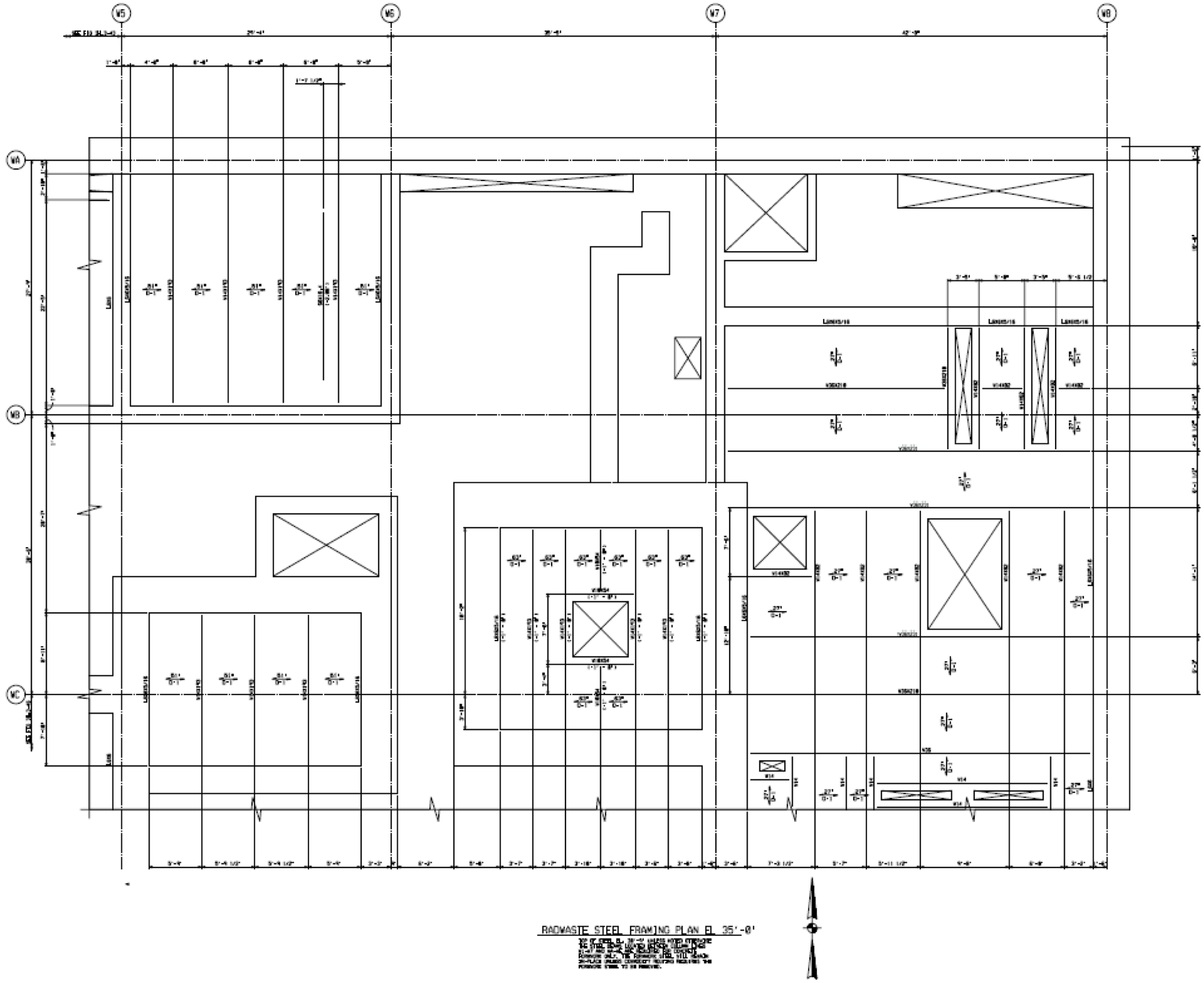


Figure 3H.3-44 RWB El 35’-0” Steel Layout Between Column Lines W5-W8 and WA-WC

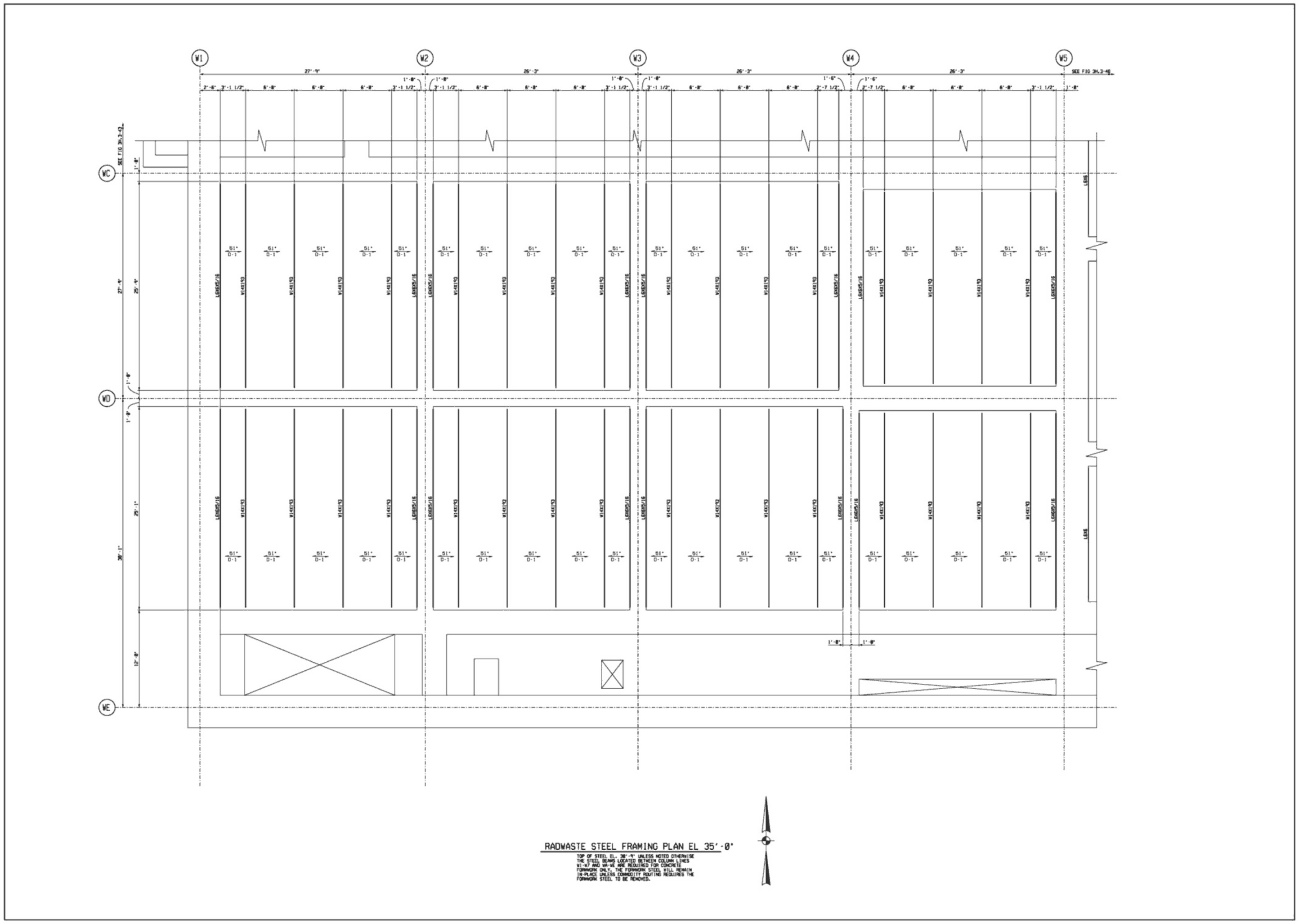


Figure 3H.3-45 RWB El 35’-0” Steel Layout Between Column Lines W1-W5 and WC-WE

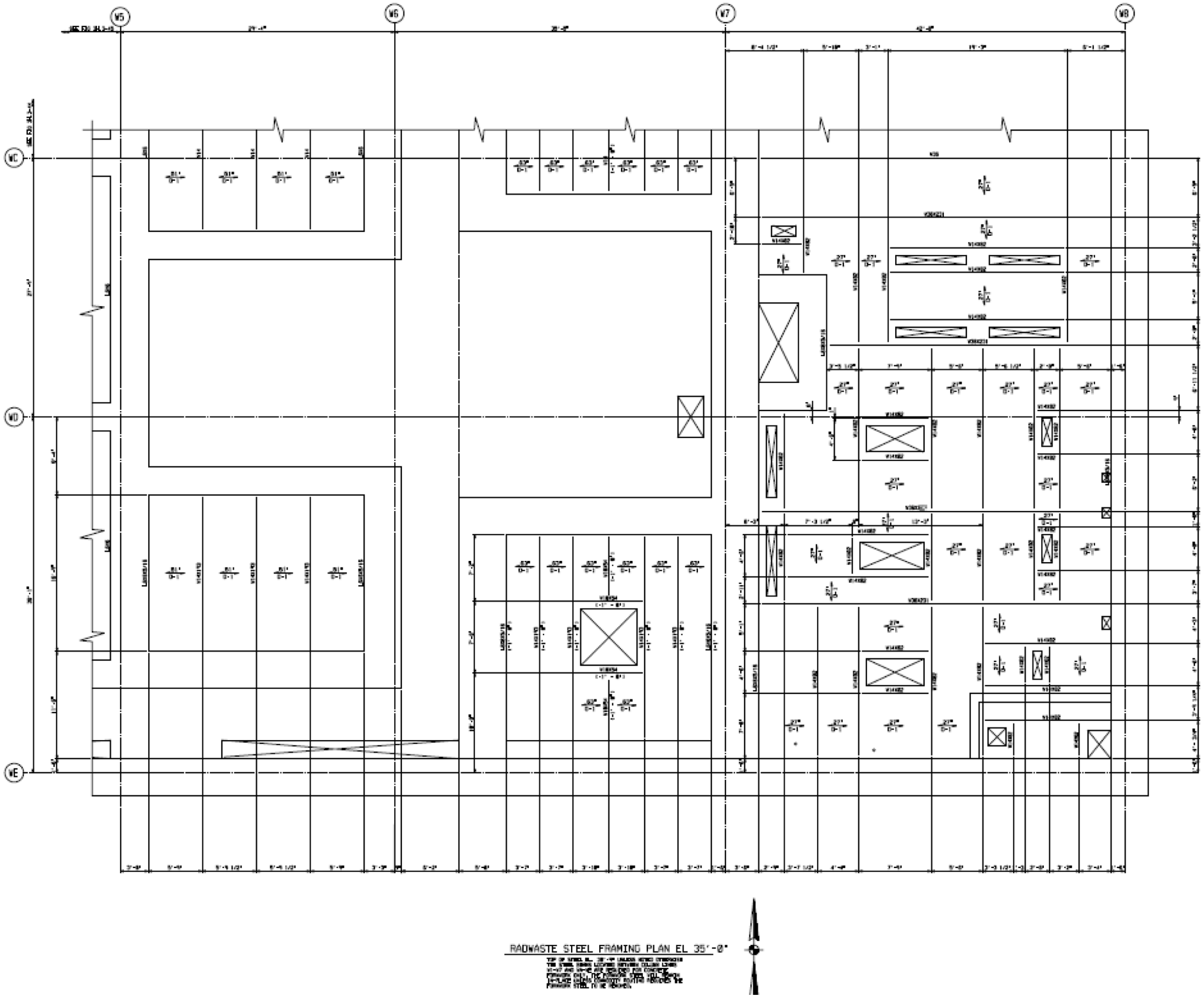


Figure 3H.3-46 RWB El 35'-0" Steel Layout Between Column Lines W5-W8 and WC-WE

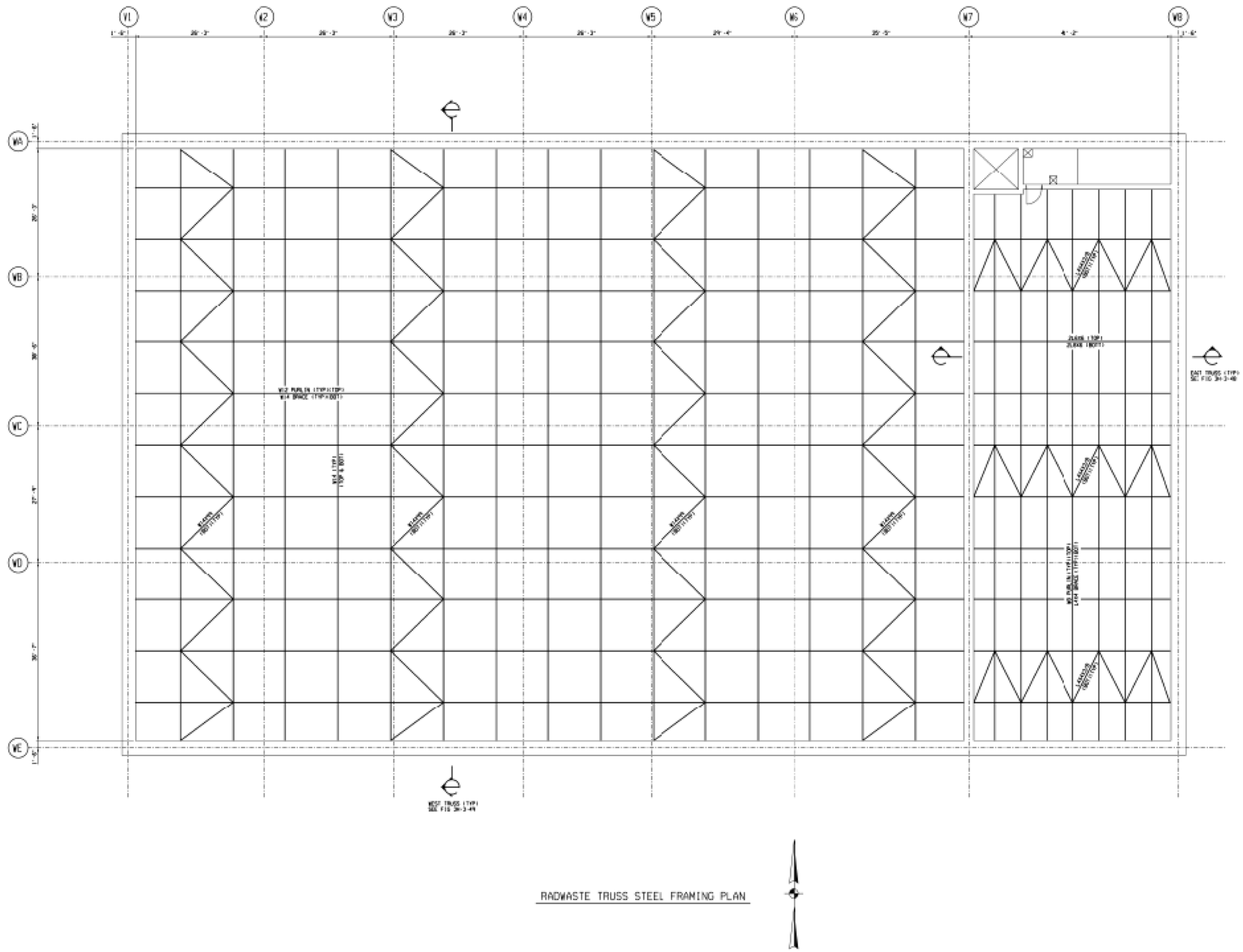


Figure 3H.3-47 RWB Roof Truss. Purlin and Horizontal Bracing Layout (Plan View)

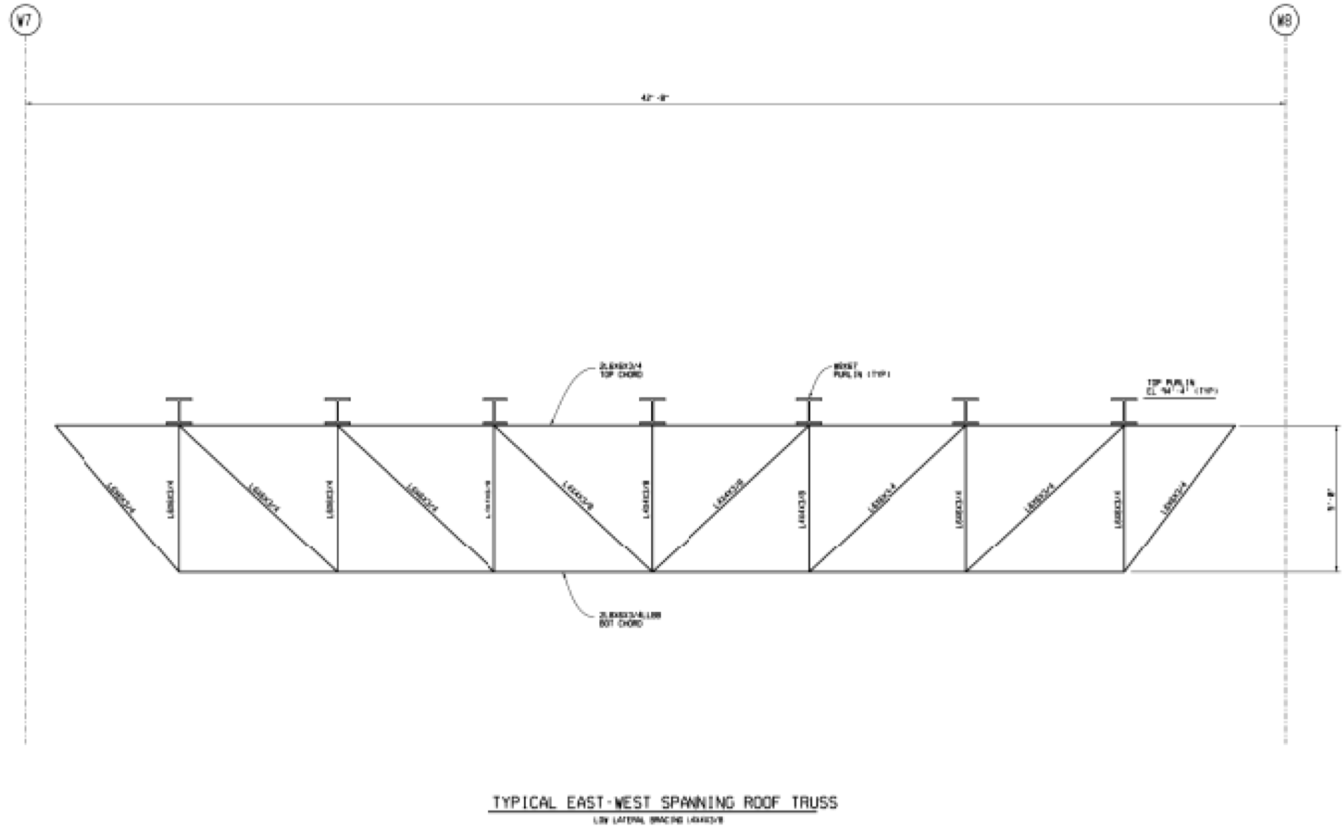


Figure 3H.3-48 RWB Typical East-West Spanning Roof Truss Between Column Lines W7-W8 (Elevation View)

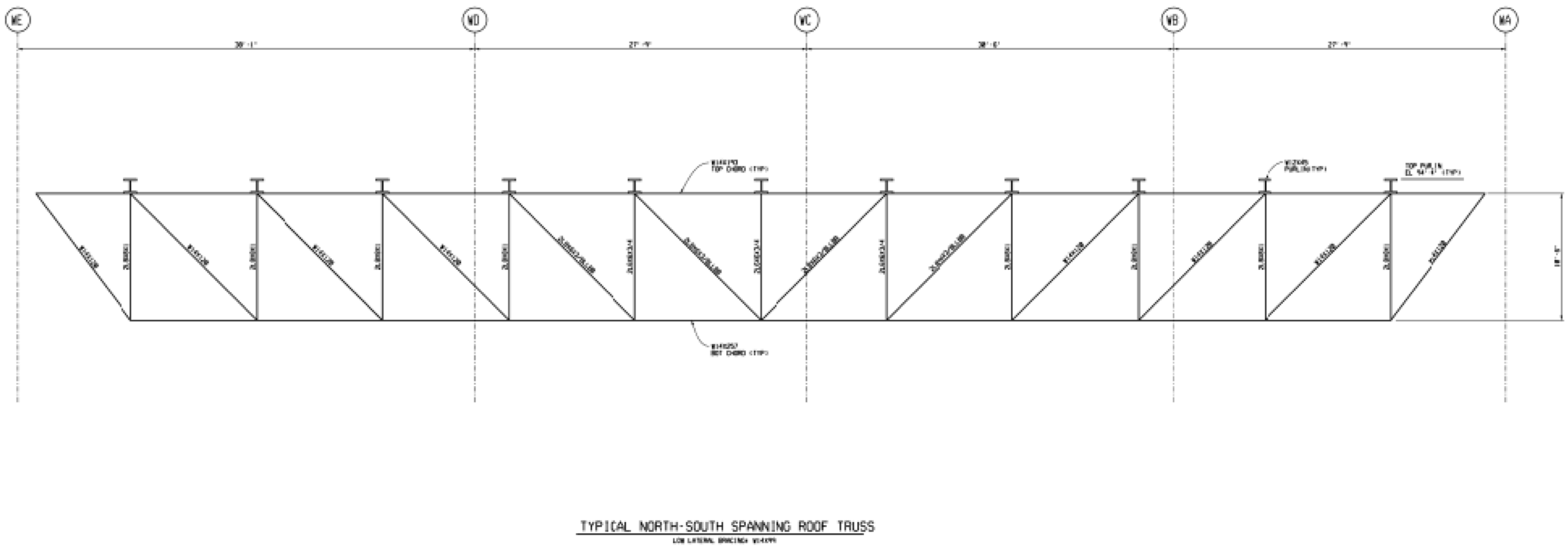


Figure 3H.3-49 RWB Typical North-South Spanning Truss Between Column Lines WA-WE (Elevation View)

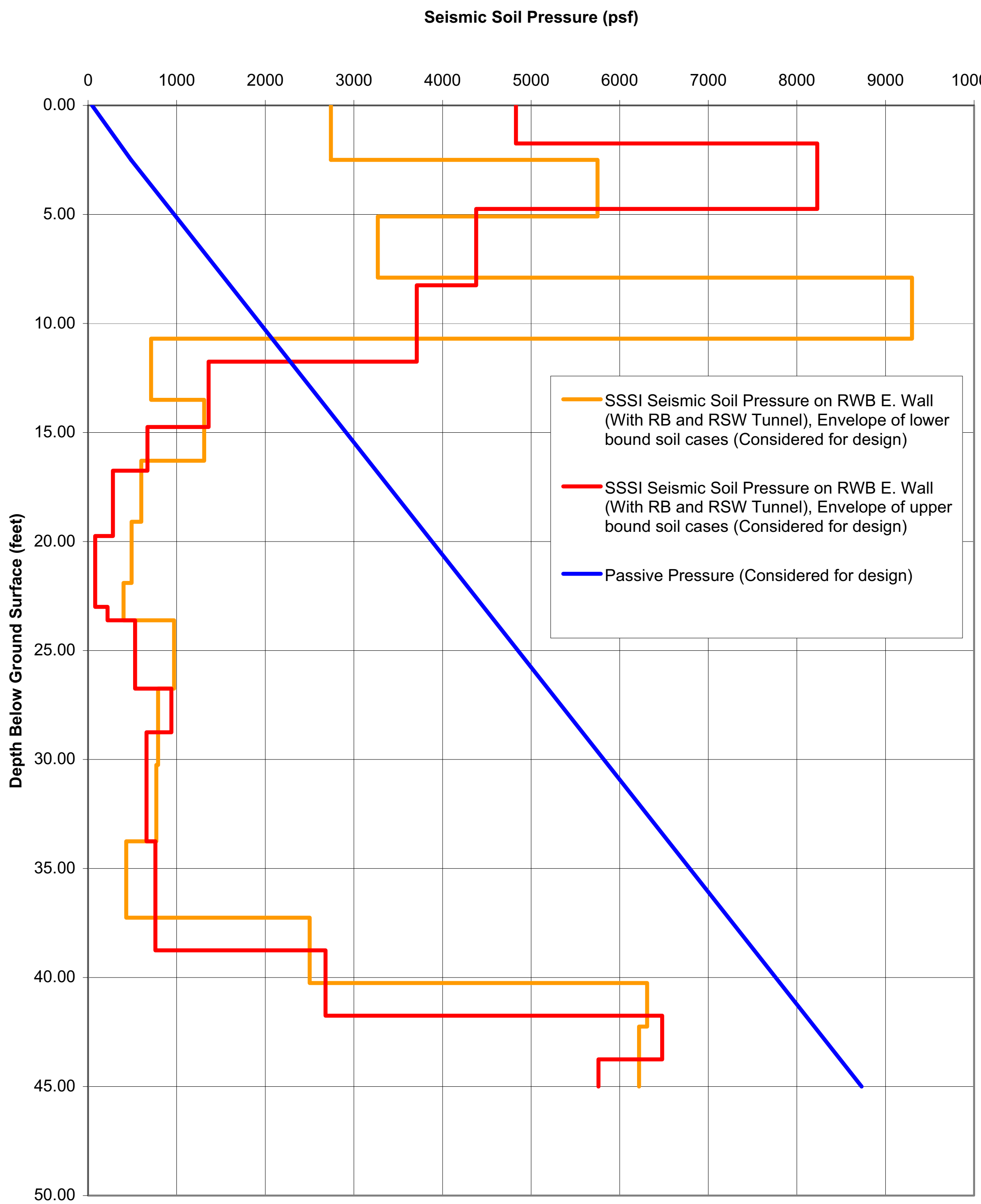


Figure 3H.3-50 SSSI Lateral Seismic Soil Pressures (psf) on Radwaste Building East Wall

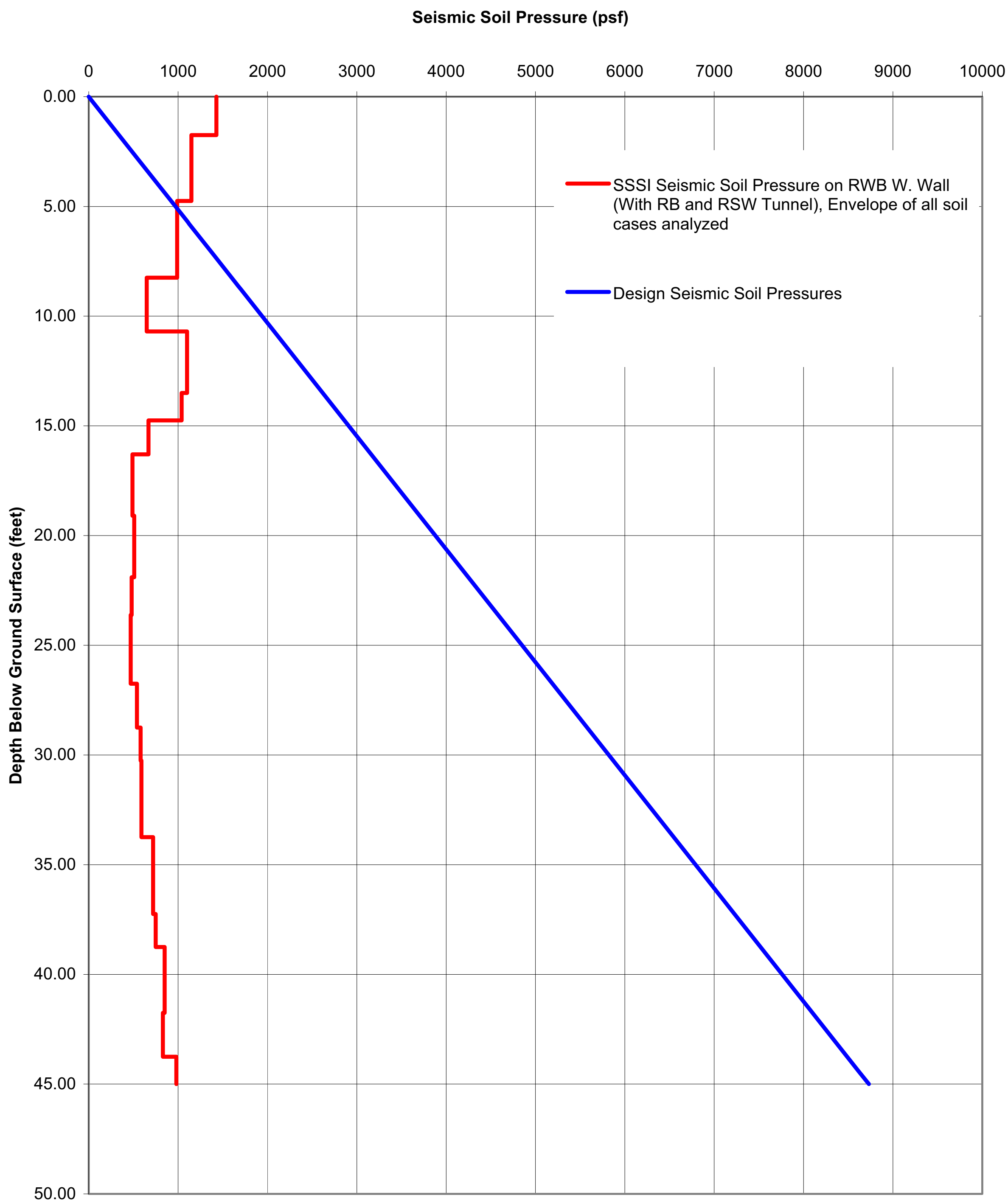
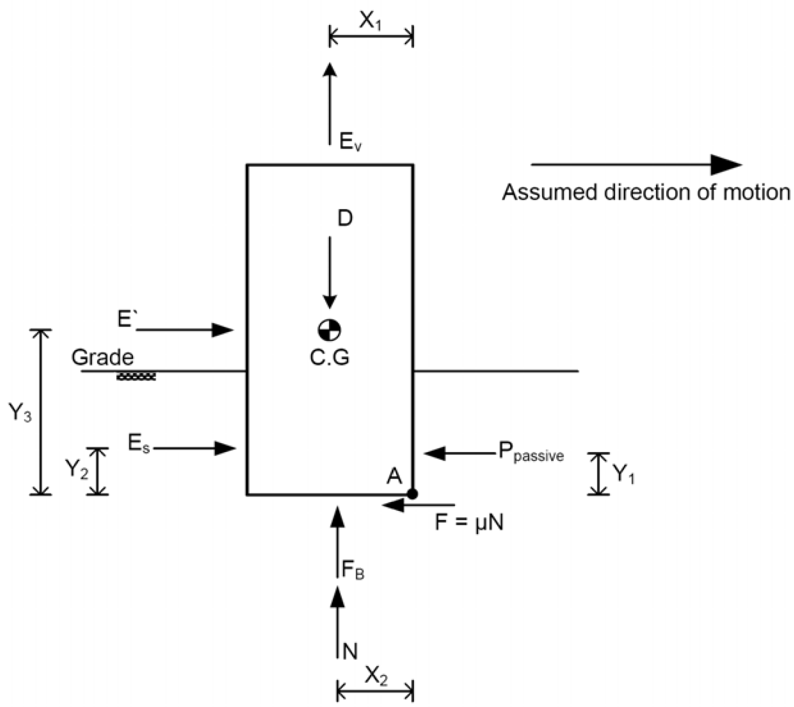


Figure 3H.3-51 SSSI Lateral Seismic Soil Pressures (psf) on Radwaste Building West Wall



Factors of Safety against Sliding and Overturning about point A are calculated as follows:

$$SF_{sliding} = \frac{P_{passive} + F}{E_s + E`}$$

$$SF_{OT\_A} = \frac{(P_{passive})(Y_1) + (D)(X_1) - (F_B)(X_2)}{(E_s)(Y_2) + (E`)(Y_3) + (E_v)(X_1)}$$

Where:

$SF_{sliding}$ = Safety factor against sliding

SF_{OT_A} = Safety factor against overturning about "A"

D = Dead load

$P_{passive}$ = Total passive soil pressure

$F = \mu N$ = friction force and μ is the coefficient of friction

E_s = Static and dynamic soil pressure (active condition)

E` = Self weight excitation in the horizontal direction

E_v = Self weight excitation in the vertical direction

F_B = Buoyancy force

N = Vertical reaction $= D - F_B - E_v$

Notes:

(1) E' represents the inertia of the structure and it is either determined from equivalent static method or response spectrum analysis.

(2) E_S represents the static and dynamic loads from soil which includes seismic loads from soil and hydrodynamic pressure from groundwater. These loads are computed in accordance with Selection 2.5S4.10.5.

Figure 3H.3-52 Formulations Used for Calculations of Factors of Stability Against Sliding and Overturning for Seismic II/I Considerations

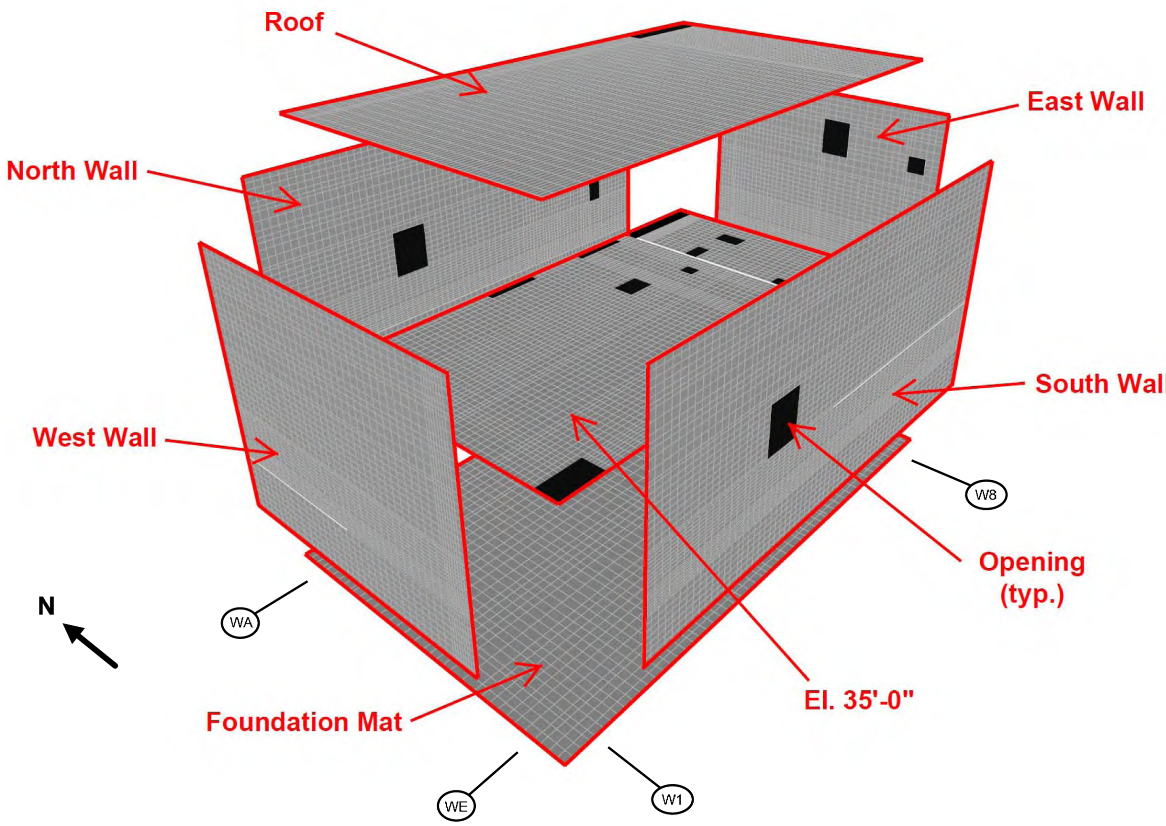


Figure 3H.3-53 RWB Wall and Slab Labeling Convention

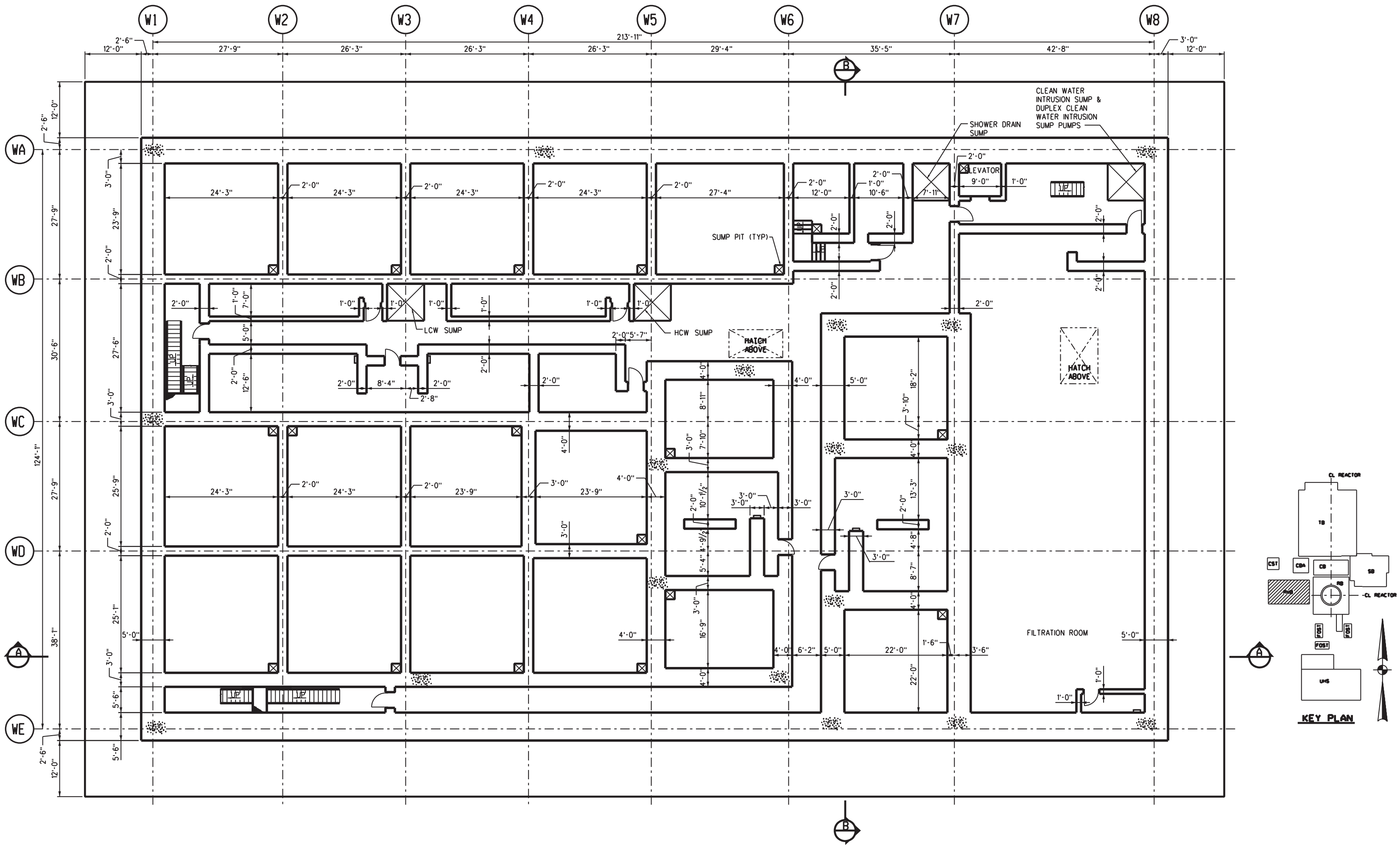


Figure 3H.3-54 Radwaste Building Floor Plan at Elevation -11'-0"

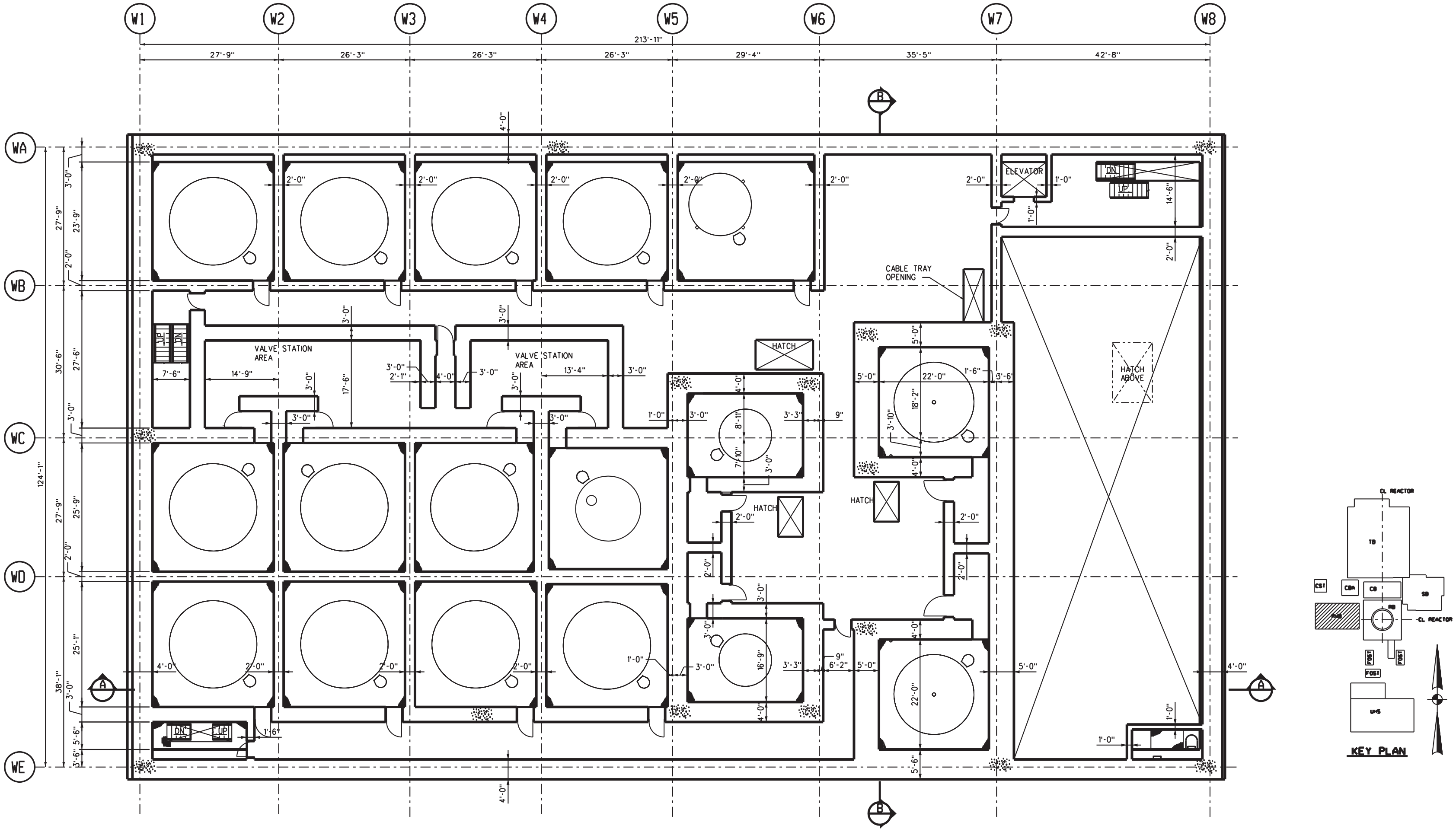


Figure 3H.3-55 Radwaste Building Floor Plan at Elevation 12’-0”

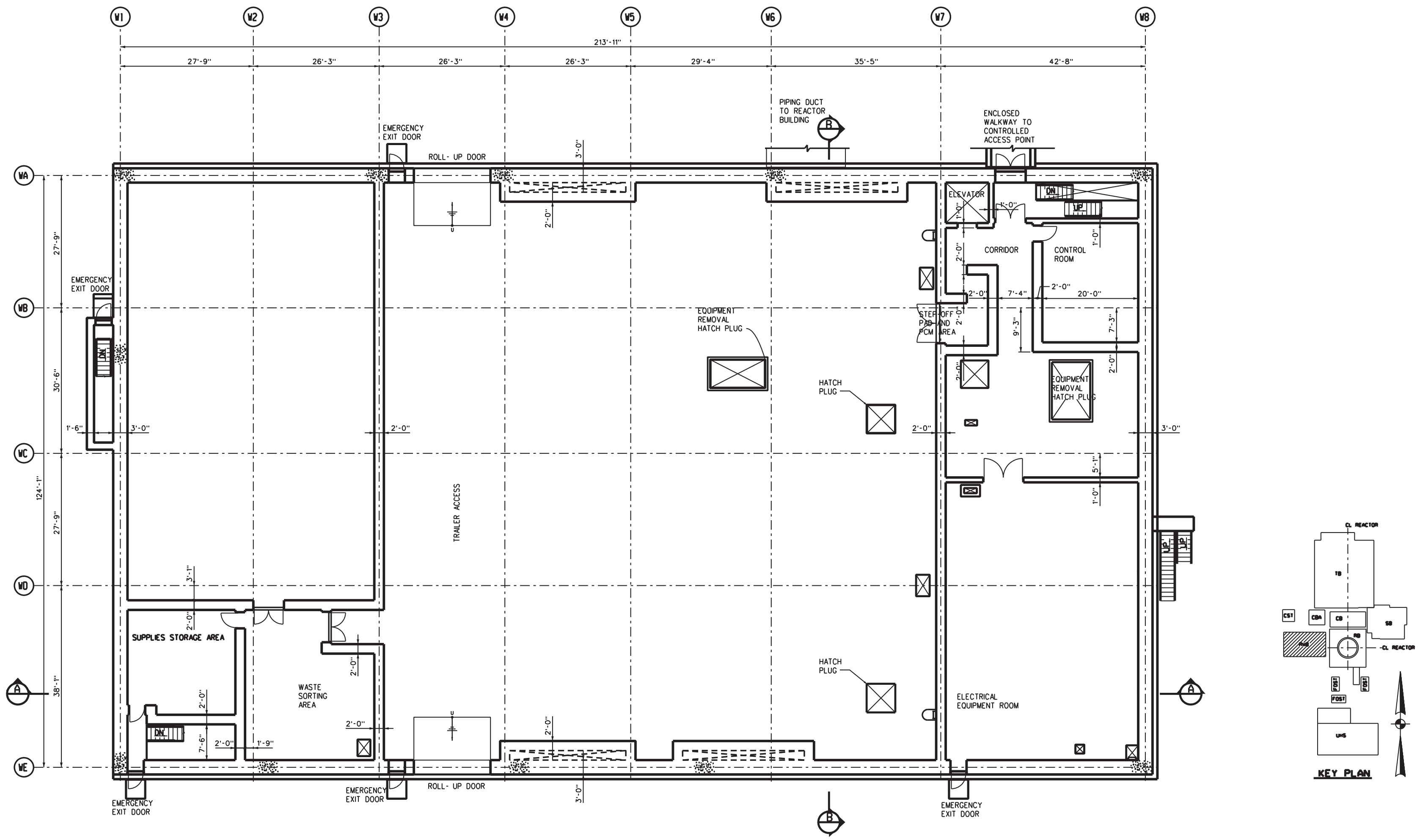


Figure 3H.3-56 Radwaste Building Floor Plan at Elevation 35'-0"

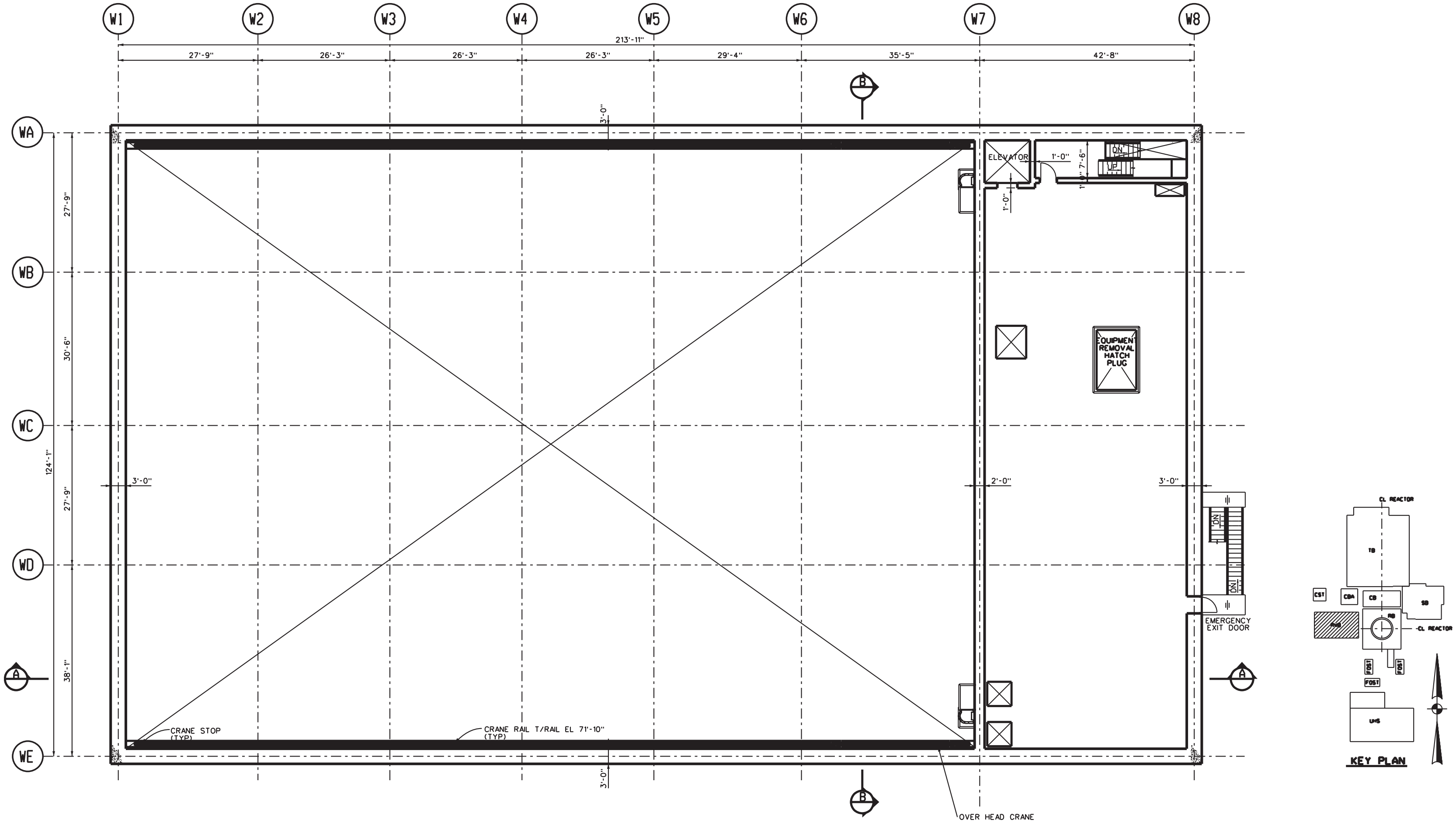


Figure 3H.3-57 Radwaste Building Floor Plan at Elevation 57'-2"

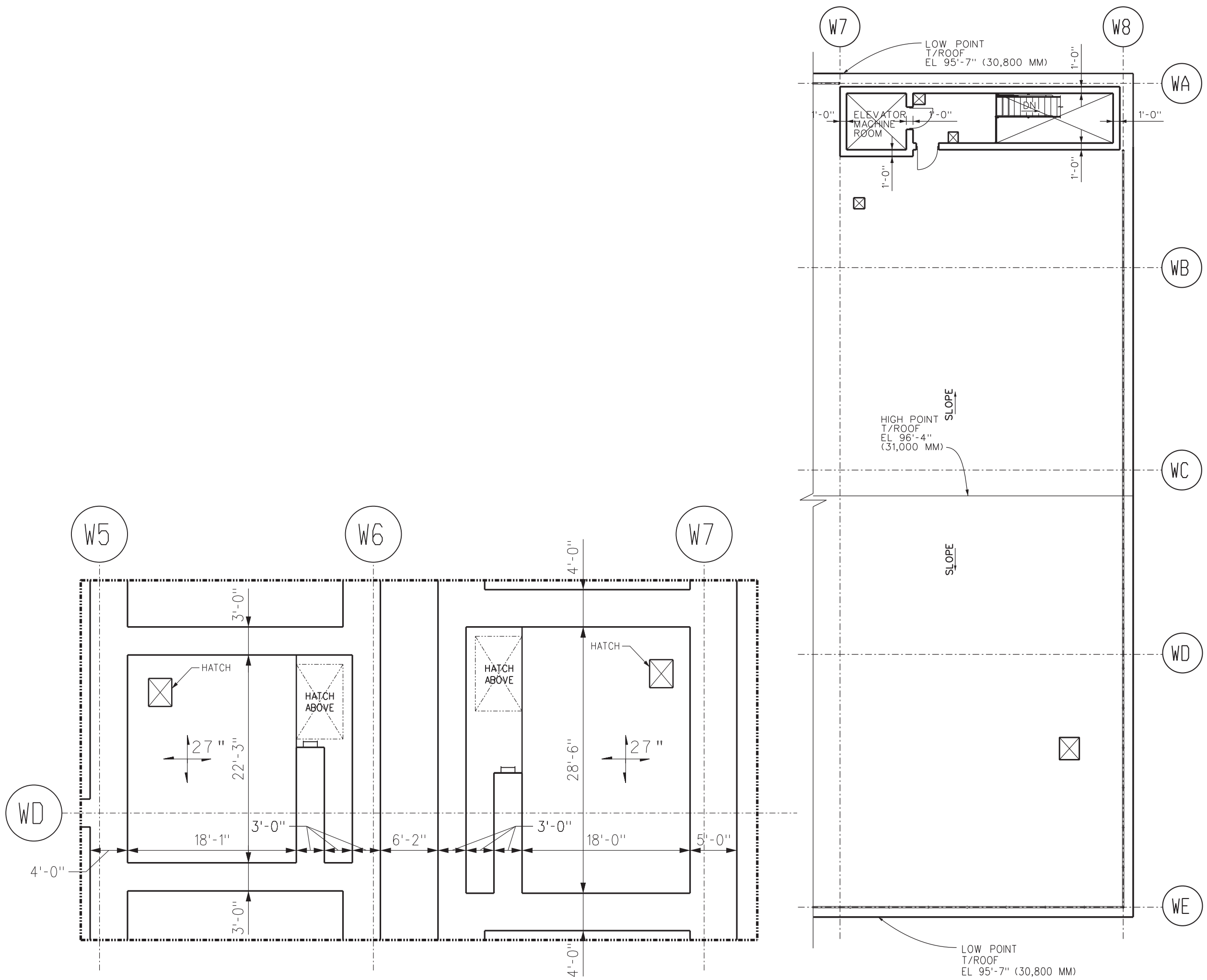


Figure 3H.3-58 Radwaste Building Partial Floor Plans at Elevation 0'-6" and Roof

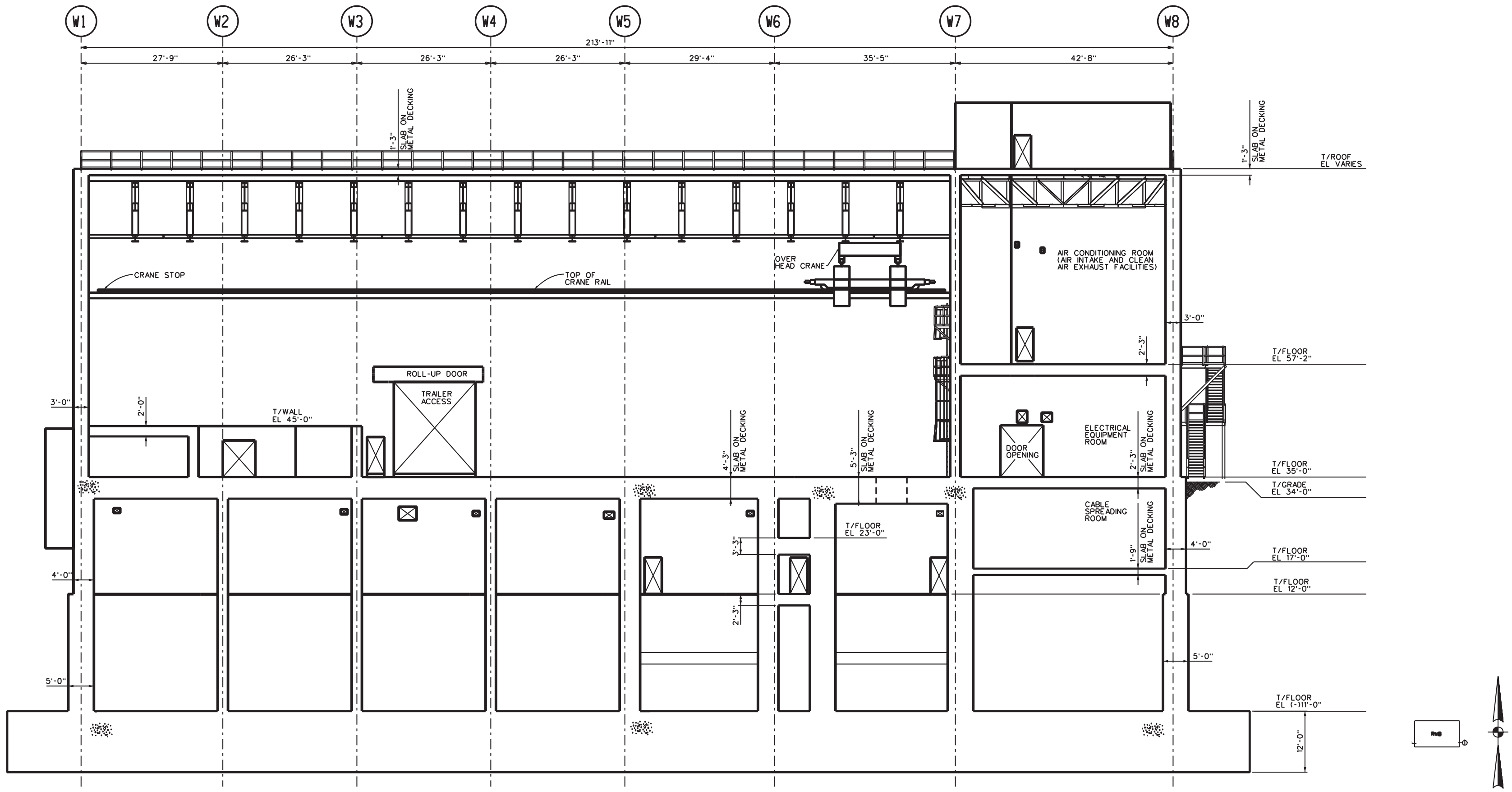
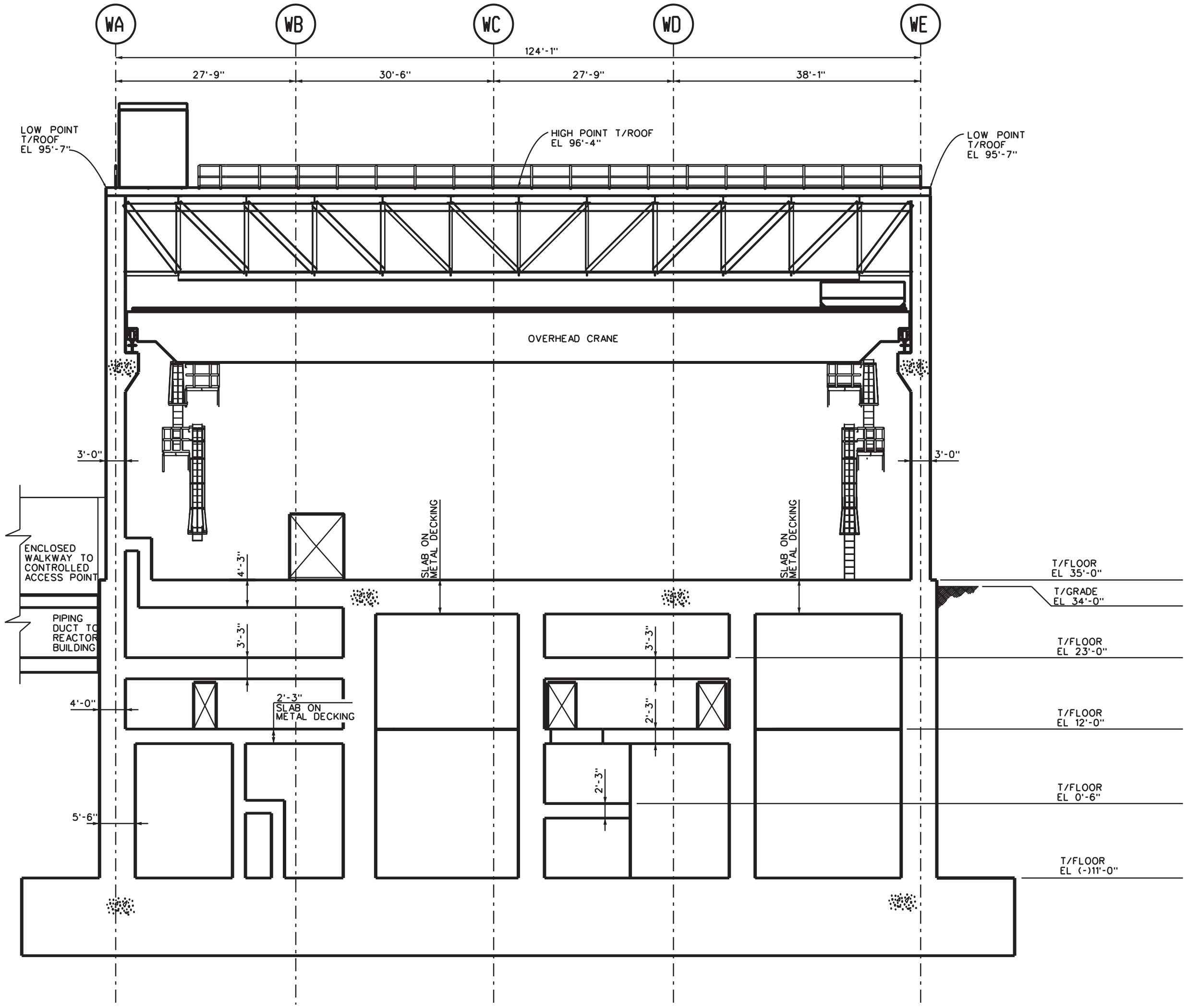


Figure 3H.3-59 Radwaste Building, Section A-A



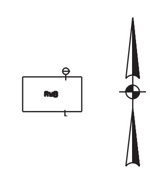
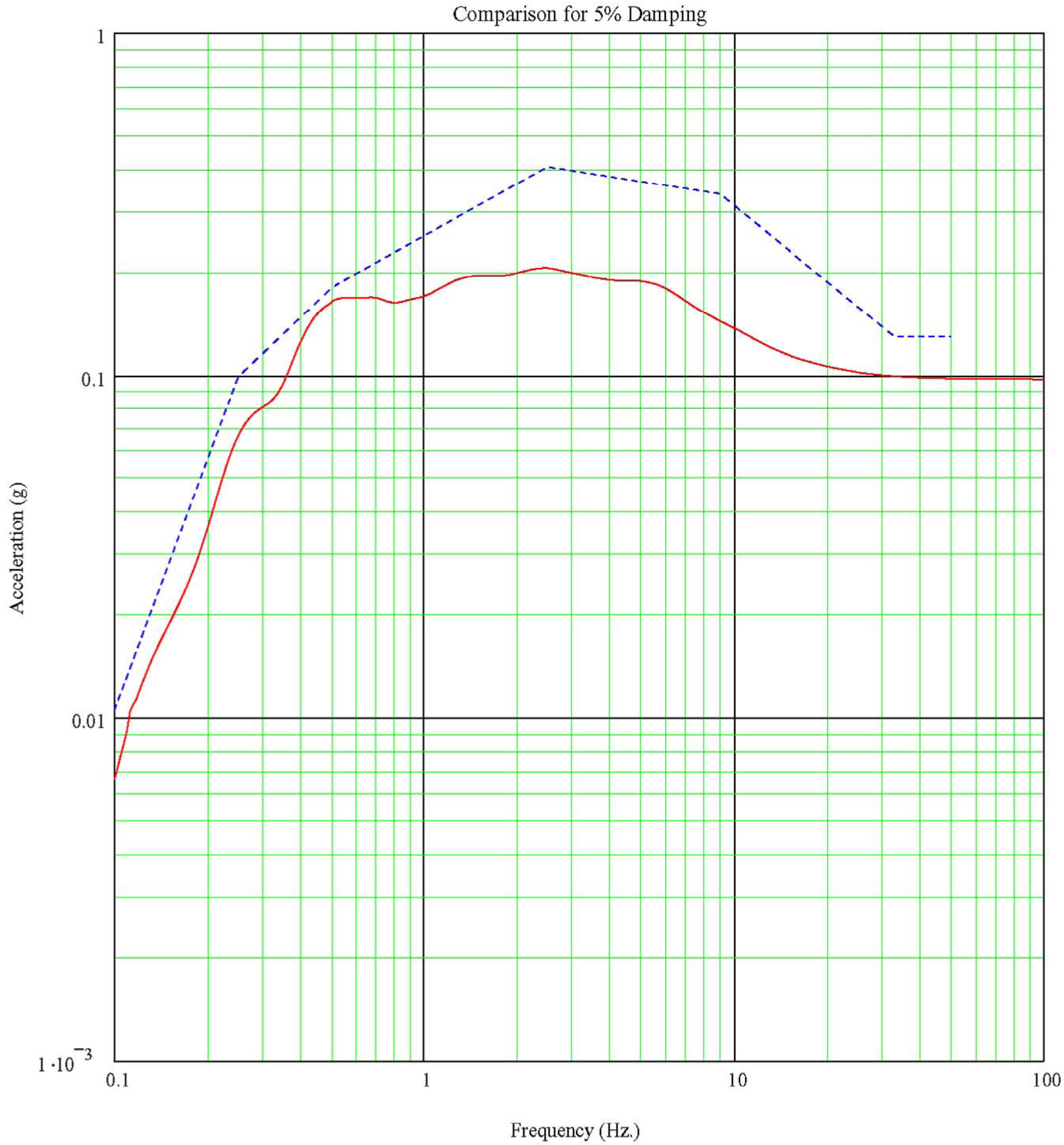


Figure 3H.3-60 Radwaste Building, Section B-B



___ (Red): GMRS in the horizontal direction
...... (Blue): Input Spectrum in the horizontal direction

Figure 3H.6-1 Comparison of GMRS with the Input Spectrum (Horizontal)

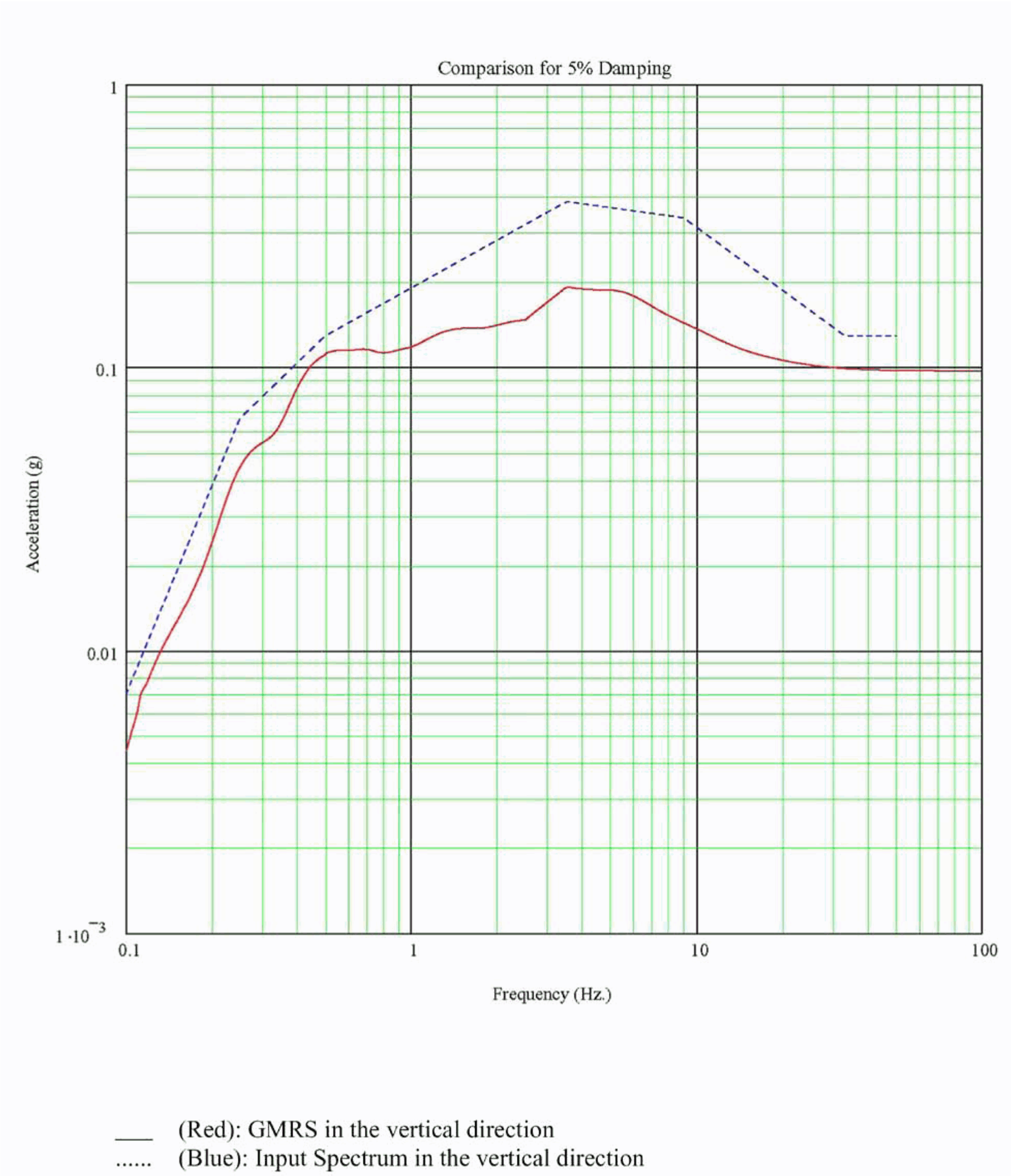
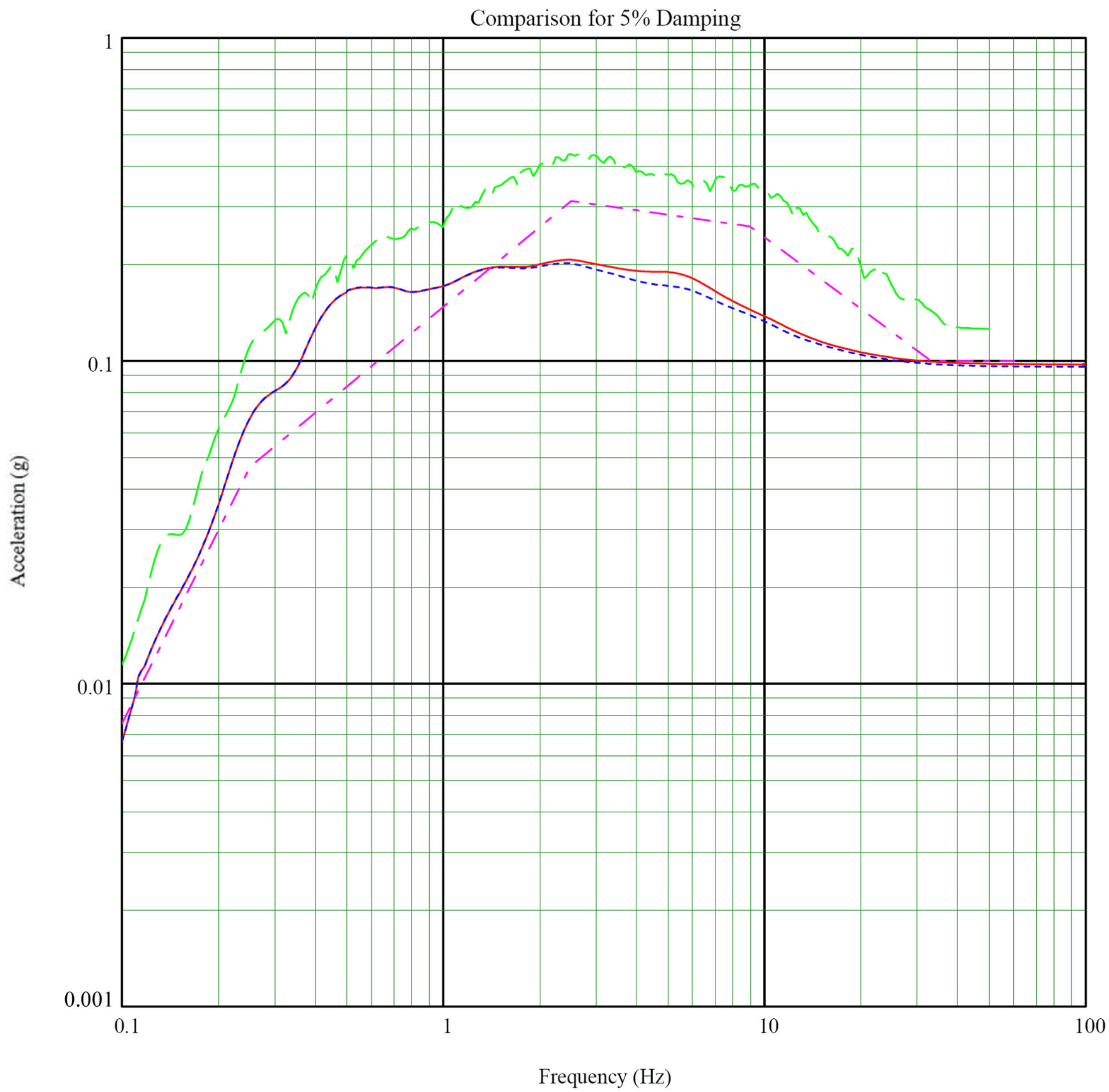


Figure 3H.6-2 Comparison of GMRS with the Input Spectrum (Vertical)

Figure 3H.6-3 Not Used



___ (Red): GMRS
...... (Blue): FIRS at 32 ft below ground surface
___ (Green): Outcrop spectrum at 32 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-3a Comparison of Spectra at Foundation of UHS Basin (Mean Soil Properties, E-W Direction)

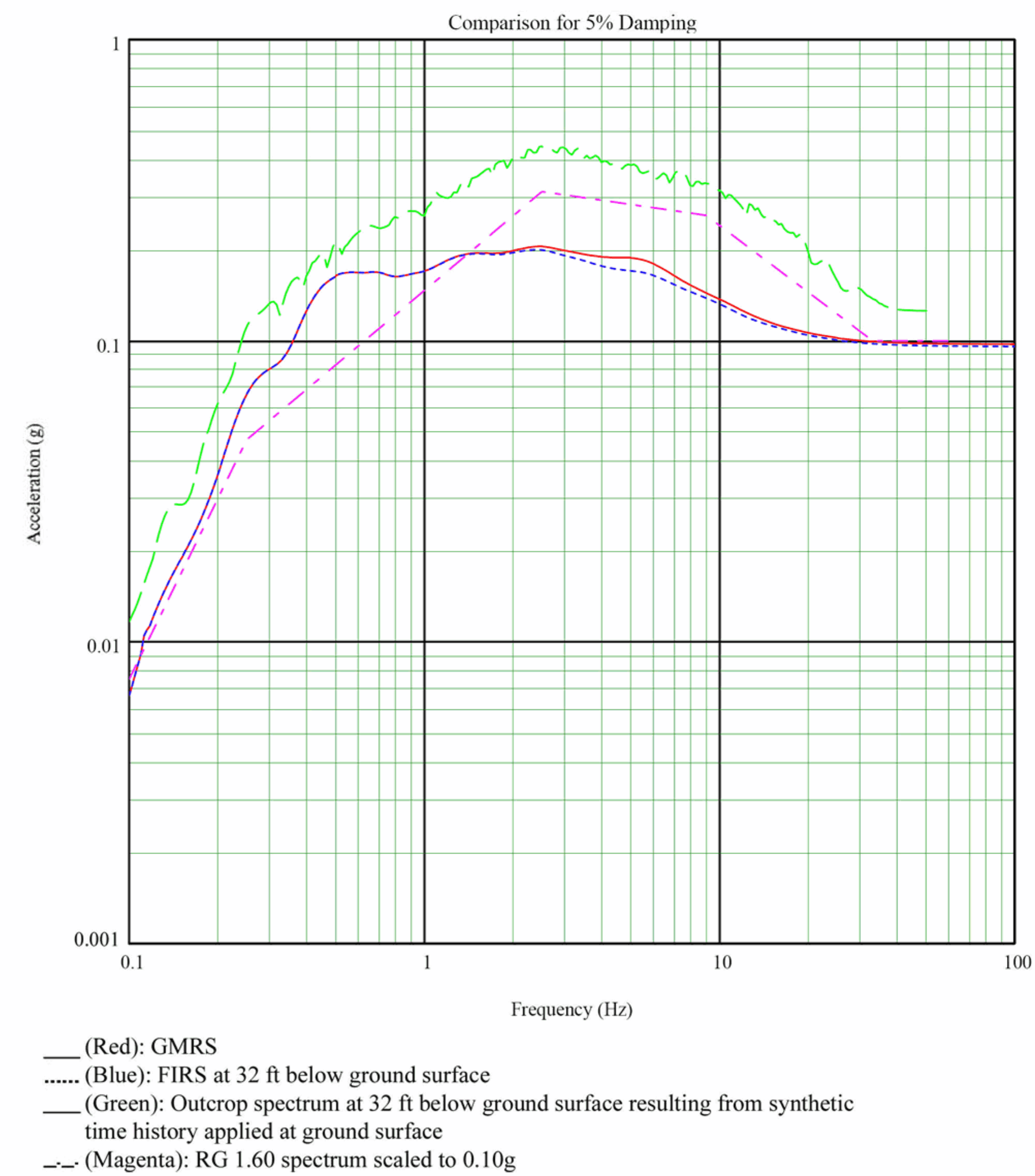
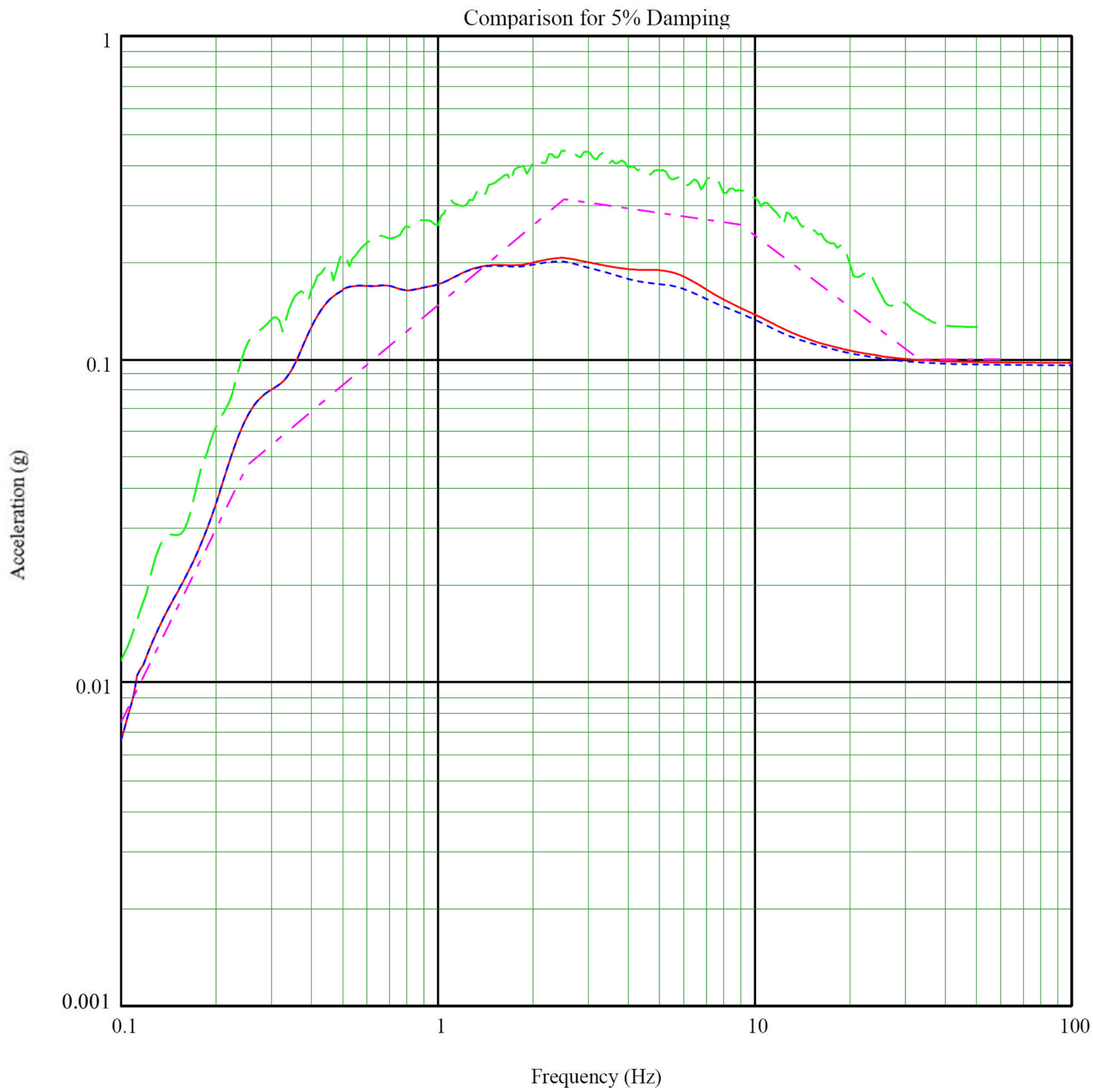


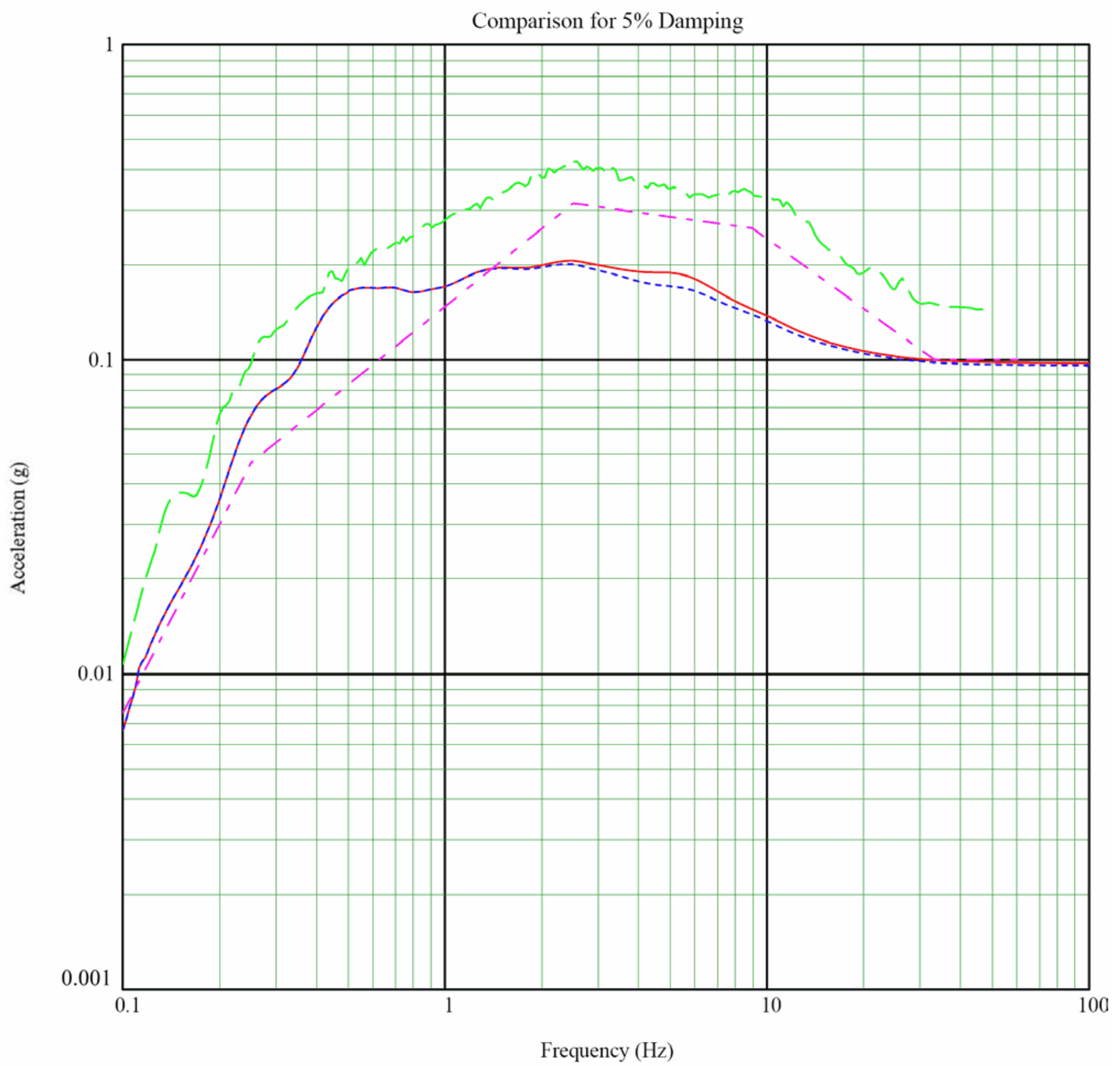
Figure 3H.6-3b Comparison of Spectra at Foundation of UHS Basin (Upper Bound Soil Properties, E-W Direction)



___ (Red): GMRS
...... (Blue): FIRS at 32 ft below ground surface
___ (Green): Outcrop spectrum at 32 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

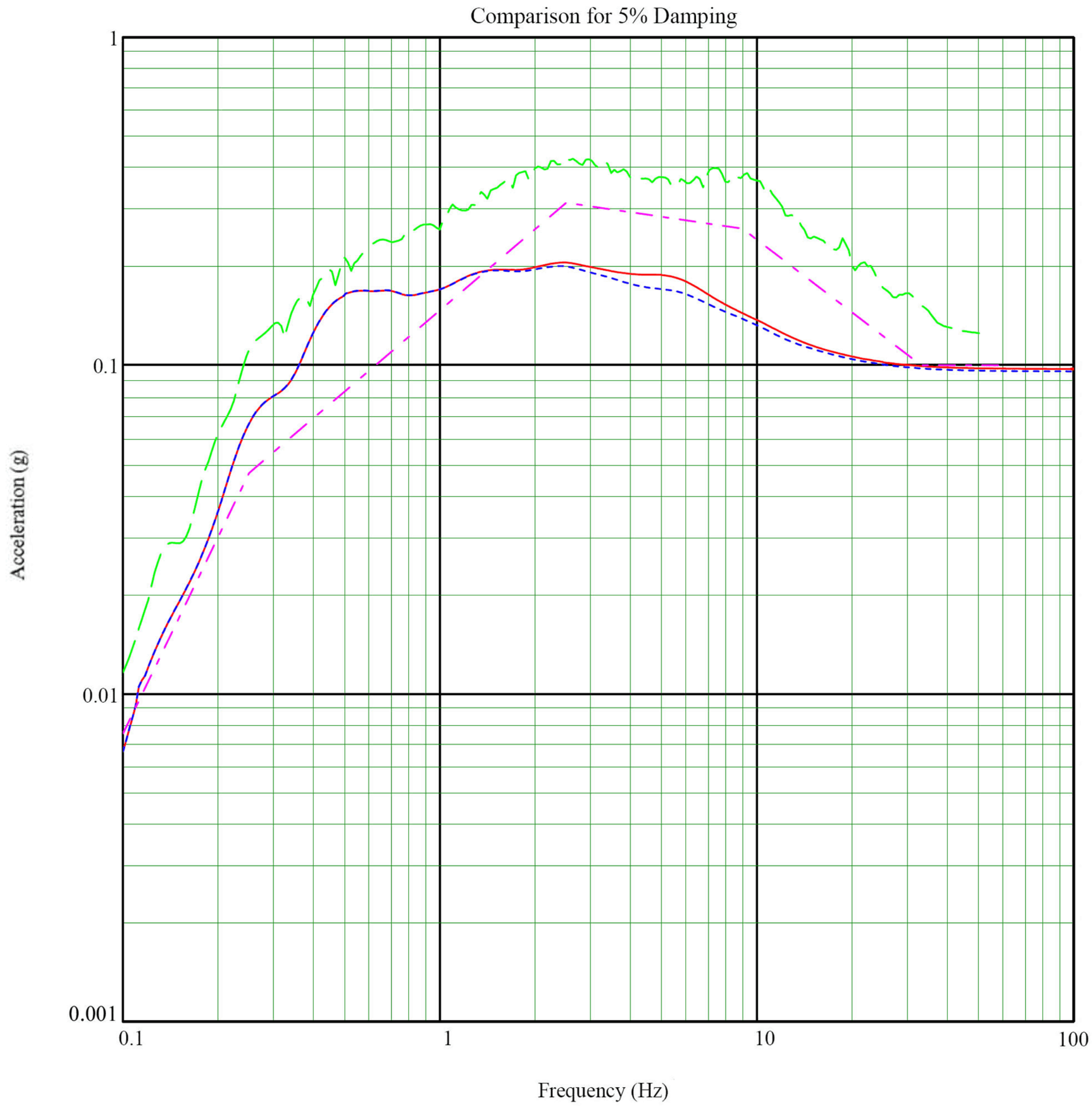
Figure 3H.6-3c Comparison of Spectra at Foundation of UHS Basin (Lower Bound Soil Properties, E-W Direction)

Figure 3H.6-4 Not Used



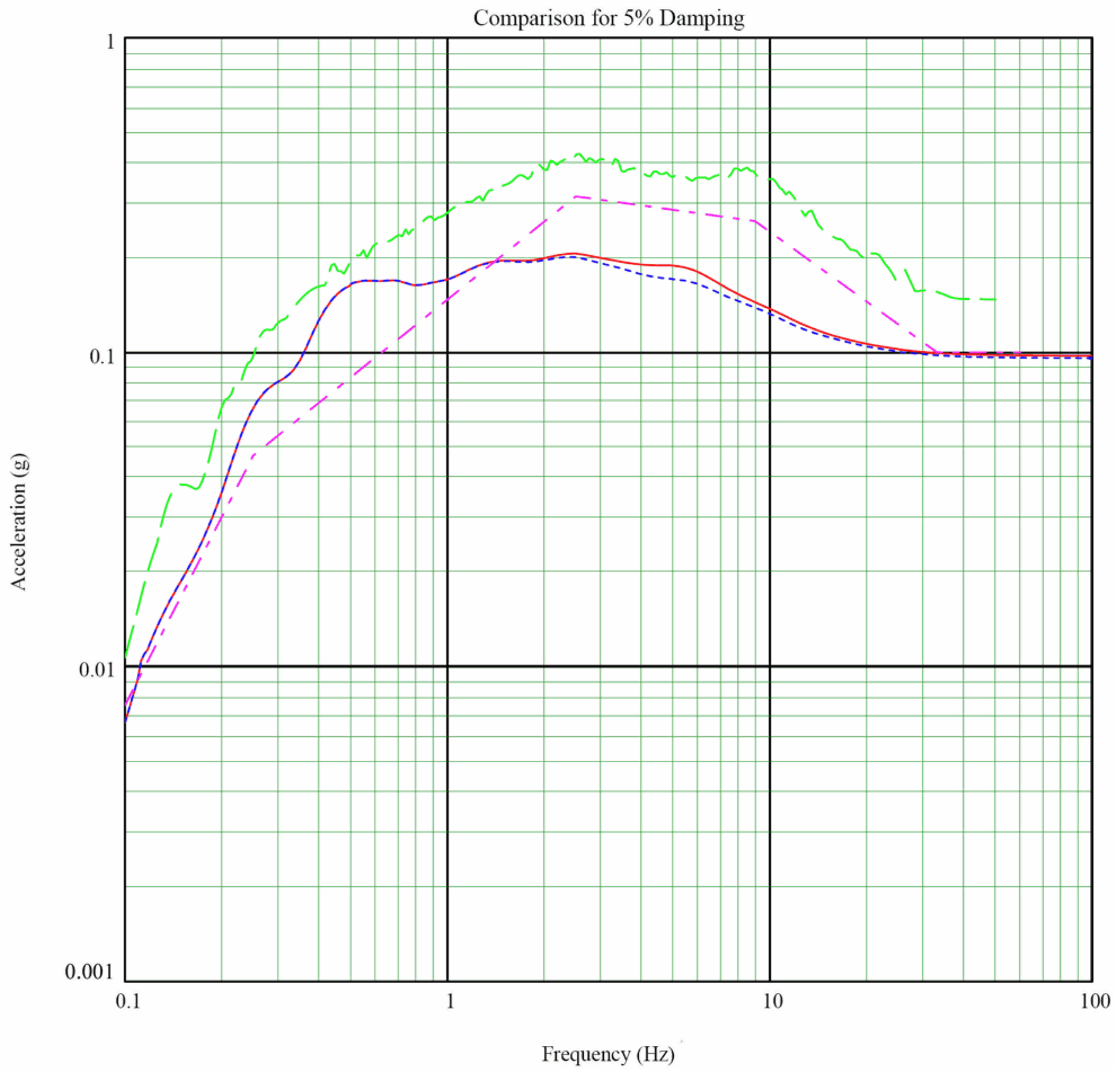
___ (Red): GMRS
...... (Blue): FIRS at 32 ft below ground surface
___ (Green): Outcrop spectrum at 32 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-4a Comparison of Spectra at Foundation of UHS Basin (Mean Soil Properties, N-S Direction)



___ (Red): GMRS
...... (Blue): FIRS at 32 ft below ground surface
___ (Green): Outcrop spectrum at 32 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-4b Comparison of Spectra at Foundation of UHS Basin (Upper Bound Soil Properties, N-S Direction)



___ (Red): GMRS
...... (Blue): FIRS at 32 ft below ground surface
___ (Green): Outcrop spectrum at 32 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-4c Comparison of Spectra at Foundation of UHS Basin (Lower Bound Soil Properties, N-S Direction)

Figure 3H.6-5 Not Used

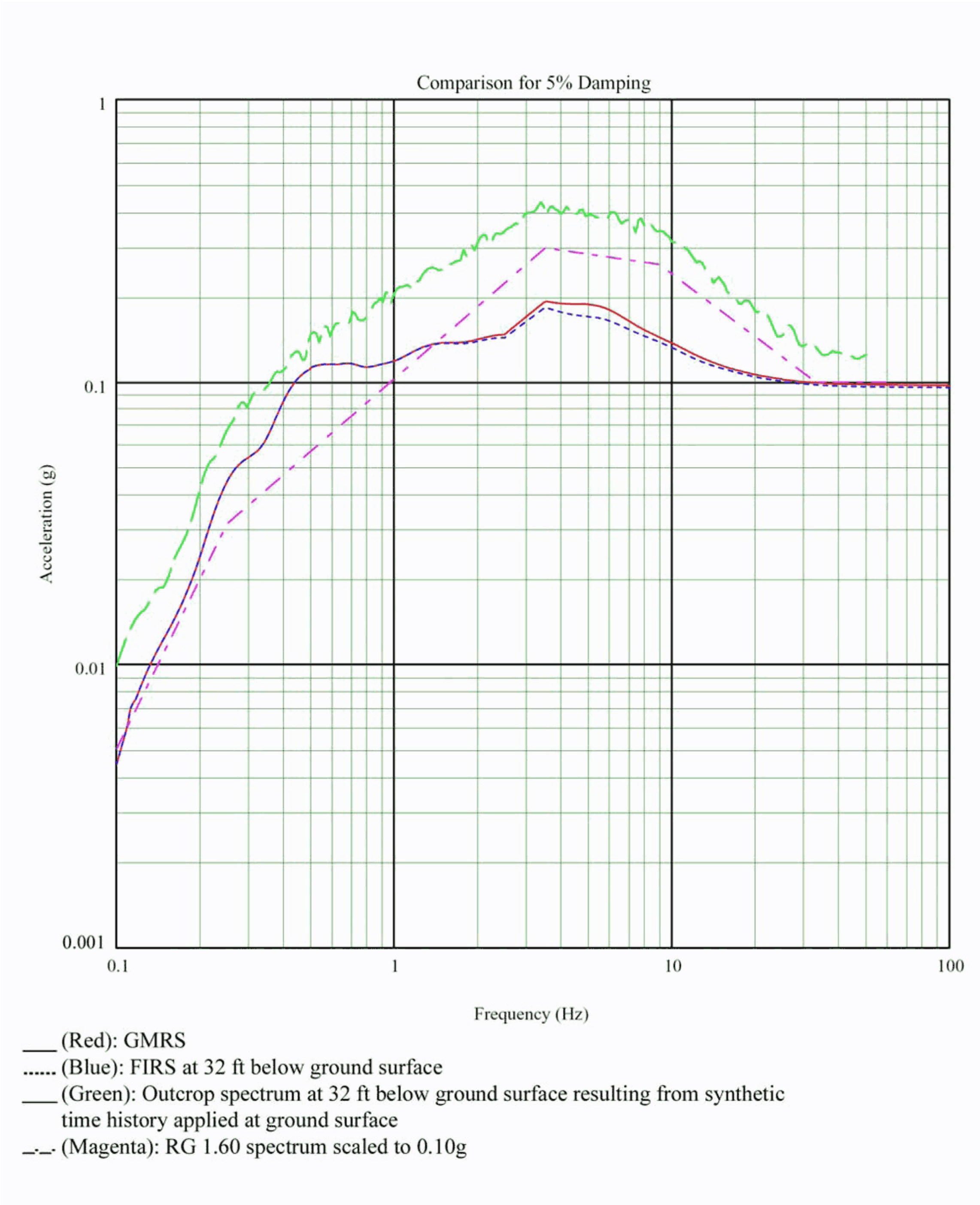


Figure 3H.6-5a Comparison of Spectra at Foundation of UHS Basin (Mean Soil Properties, Vertical Direction)

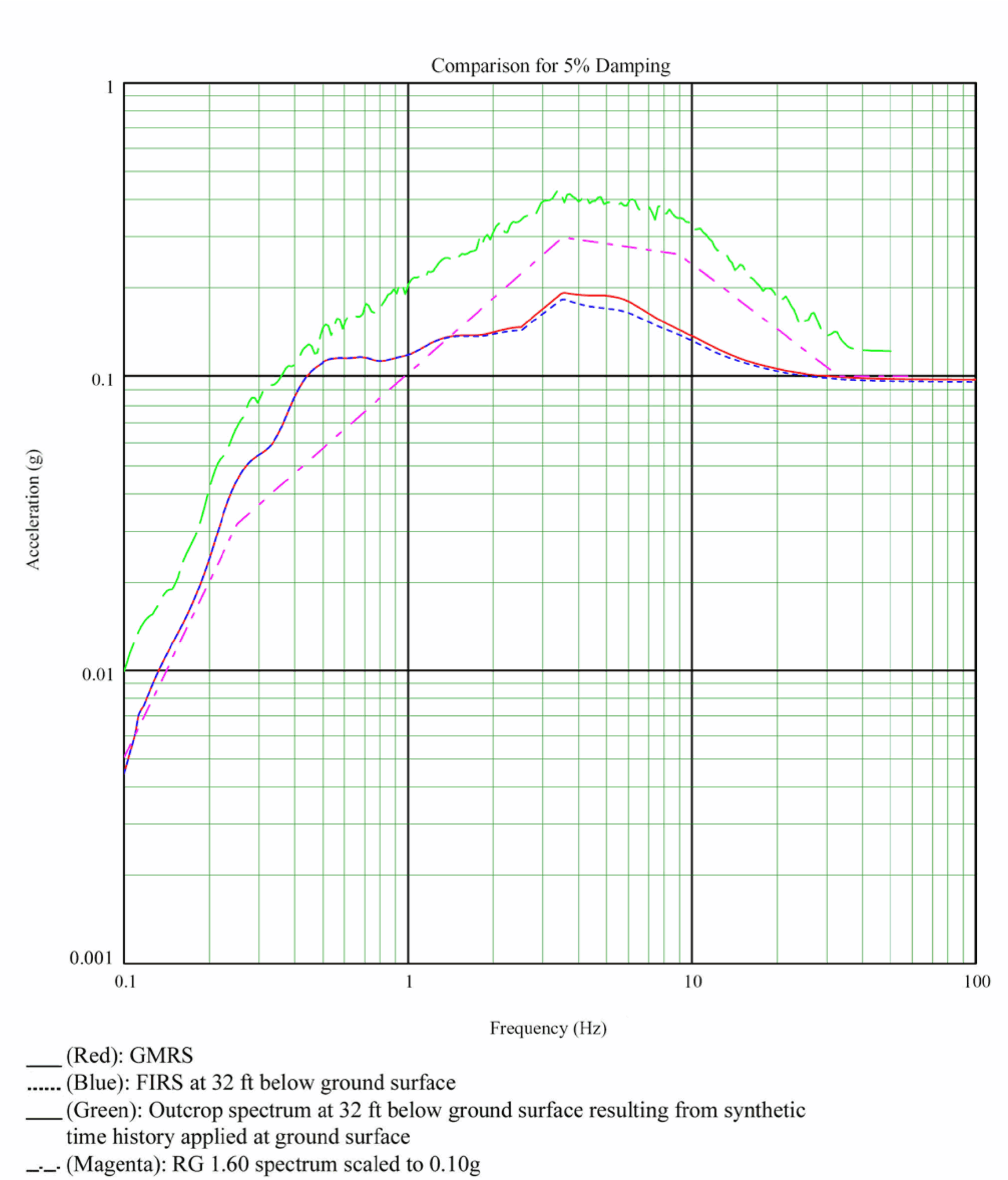


Figure 3H.6-5b Comparison of Spectra at Foundation of UHS Basin (Upper Bound Soil Properties, Vertical Direction)

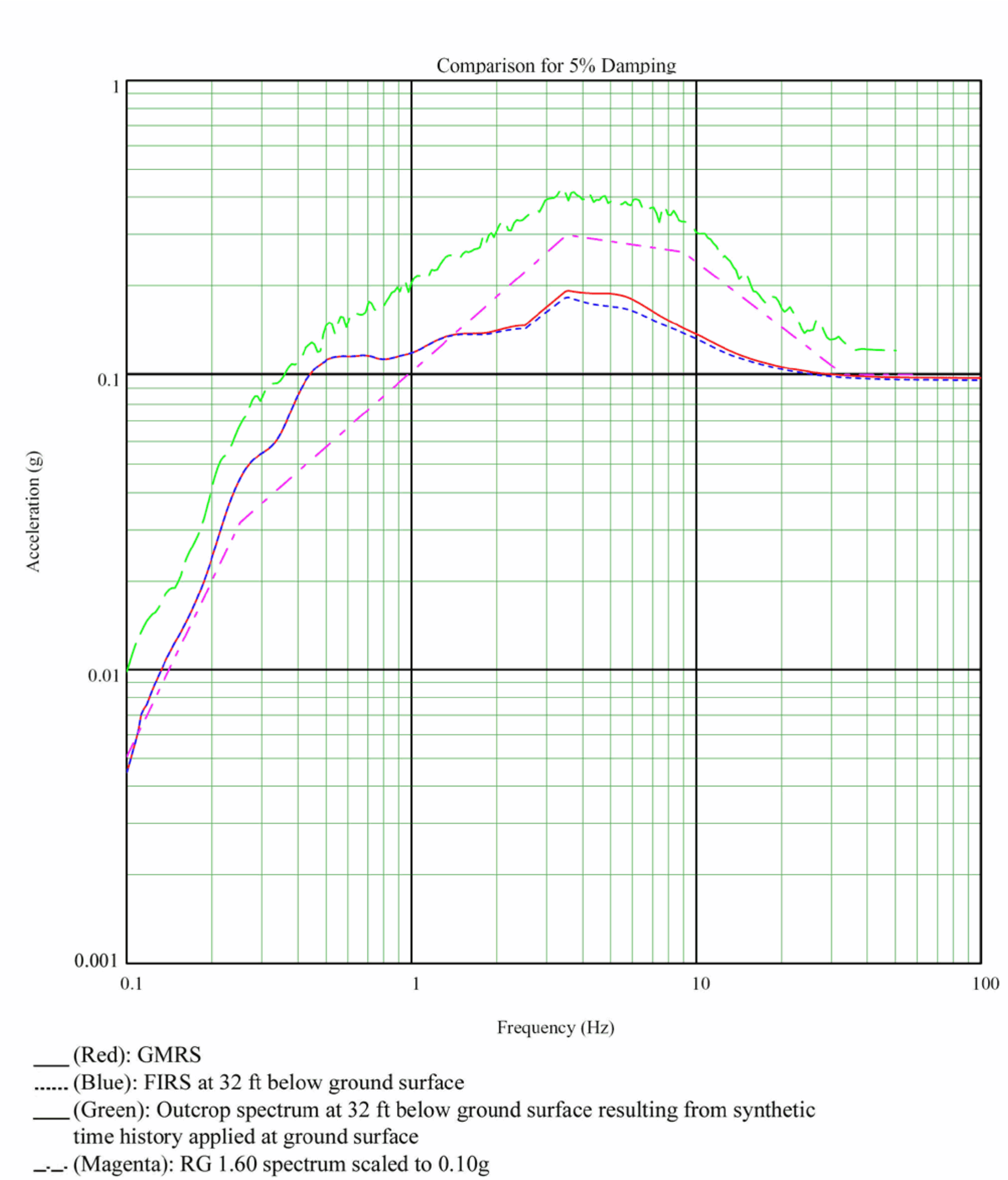


Figure 3H.6-5c Comparison of Spectra at Foundation of UHS Basin (Lower Bound Soil Properties, Vertical Direction)

Figure 3H.6-6 Not Used

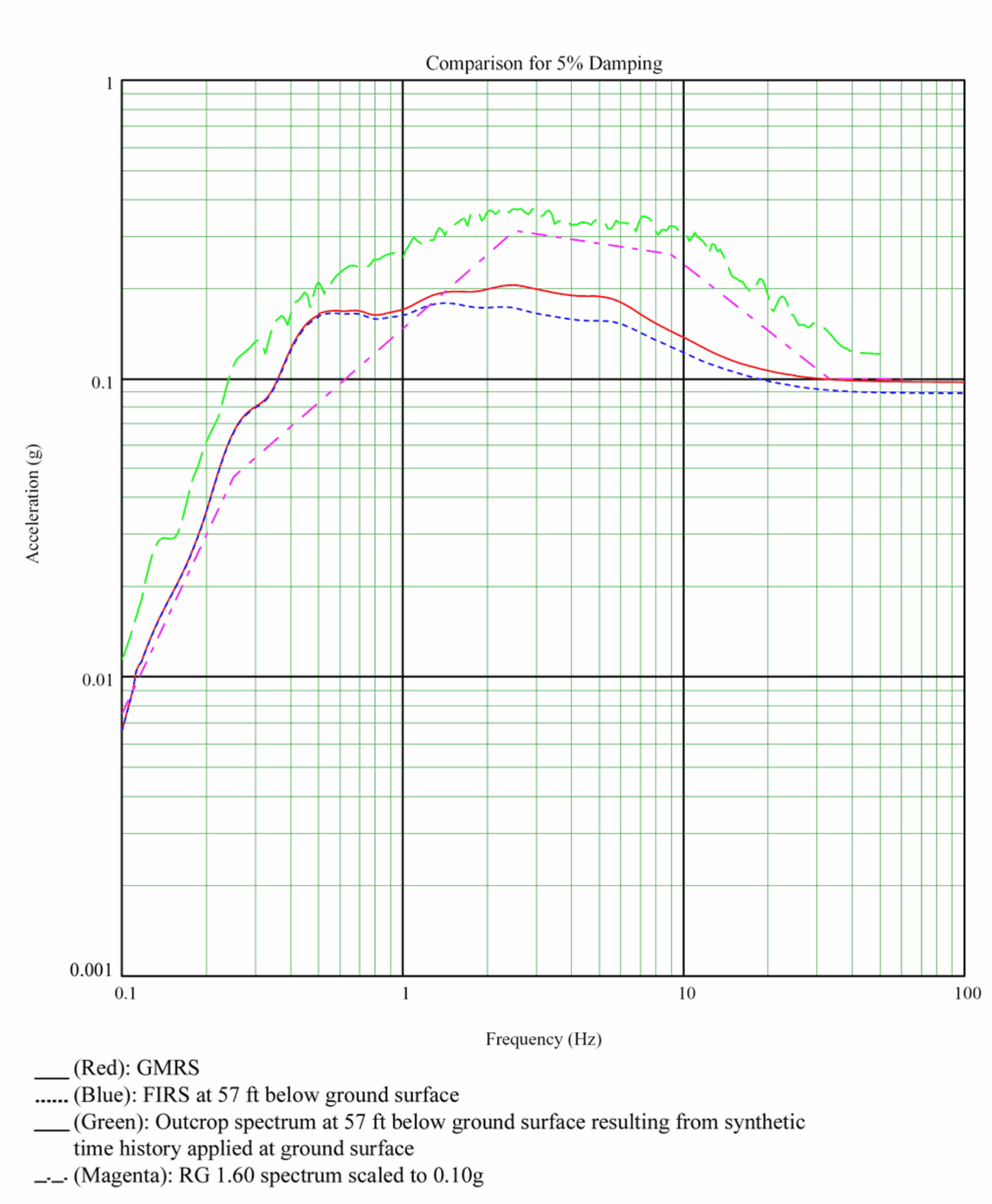


Figure 3H.6-6a Comparison of Spectra at Foundation of RSW Piping Tunnel (Mean Soil Properties, E-W Direction)

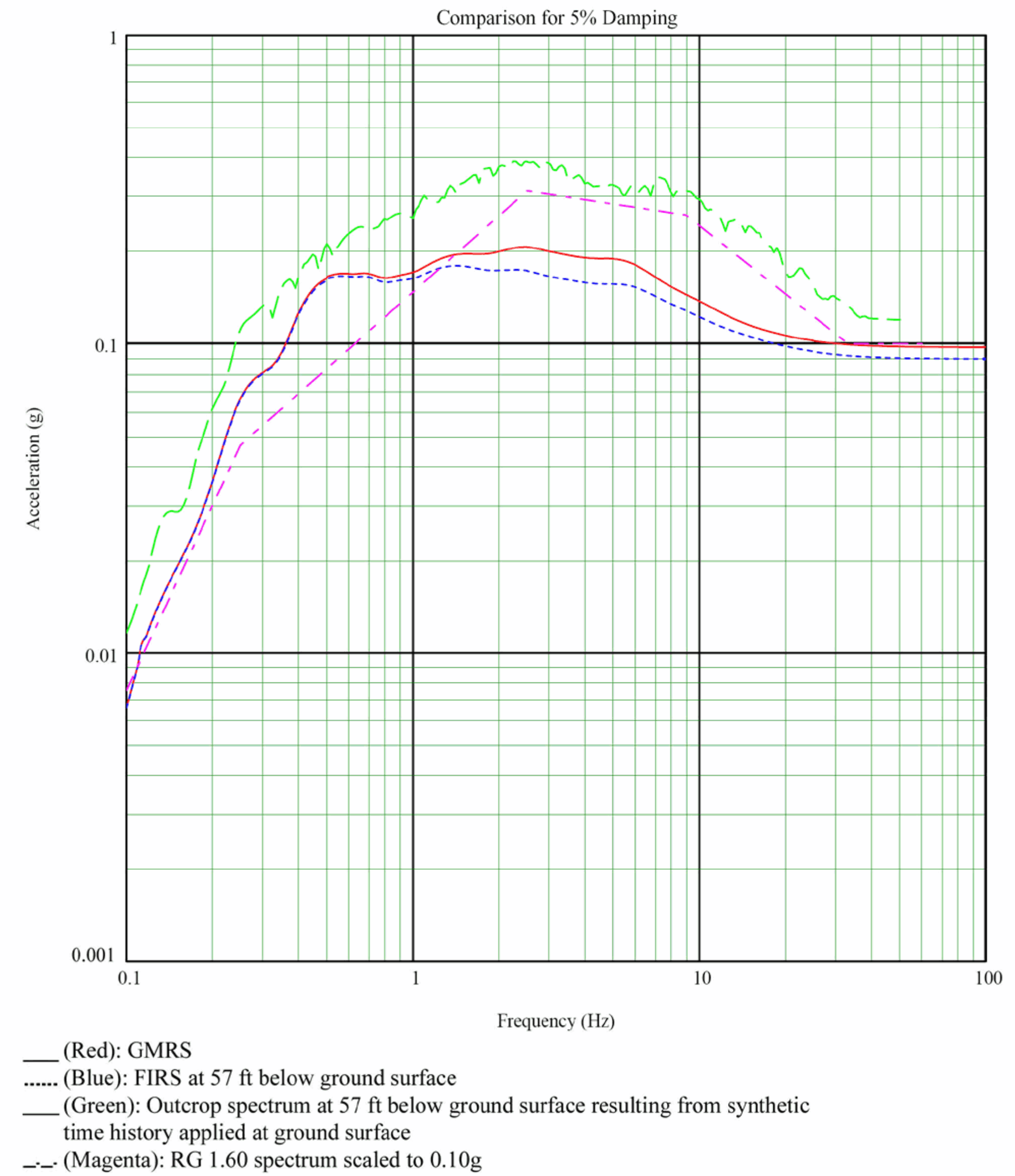
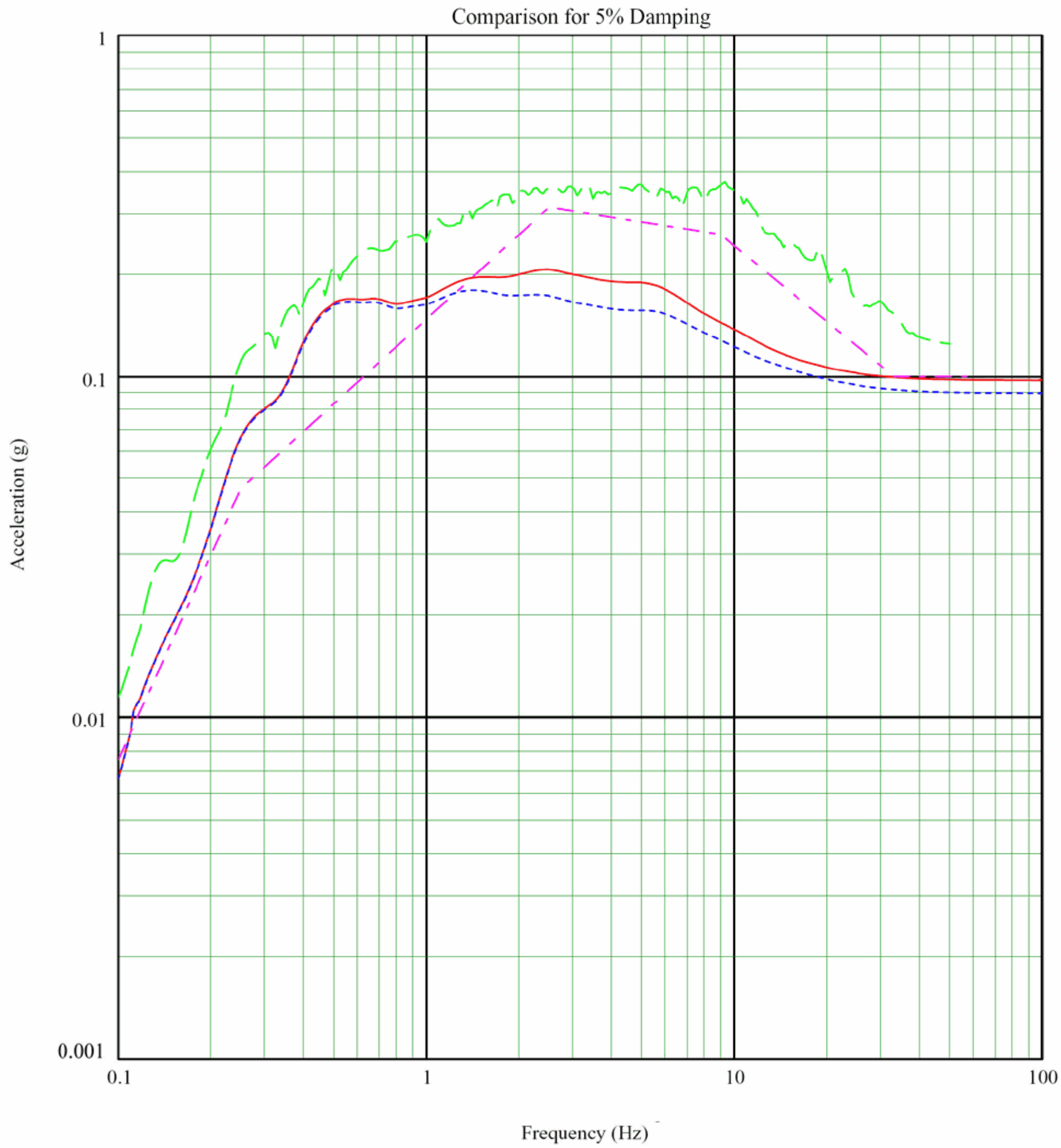


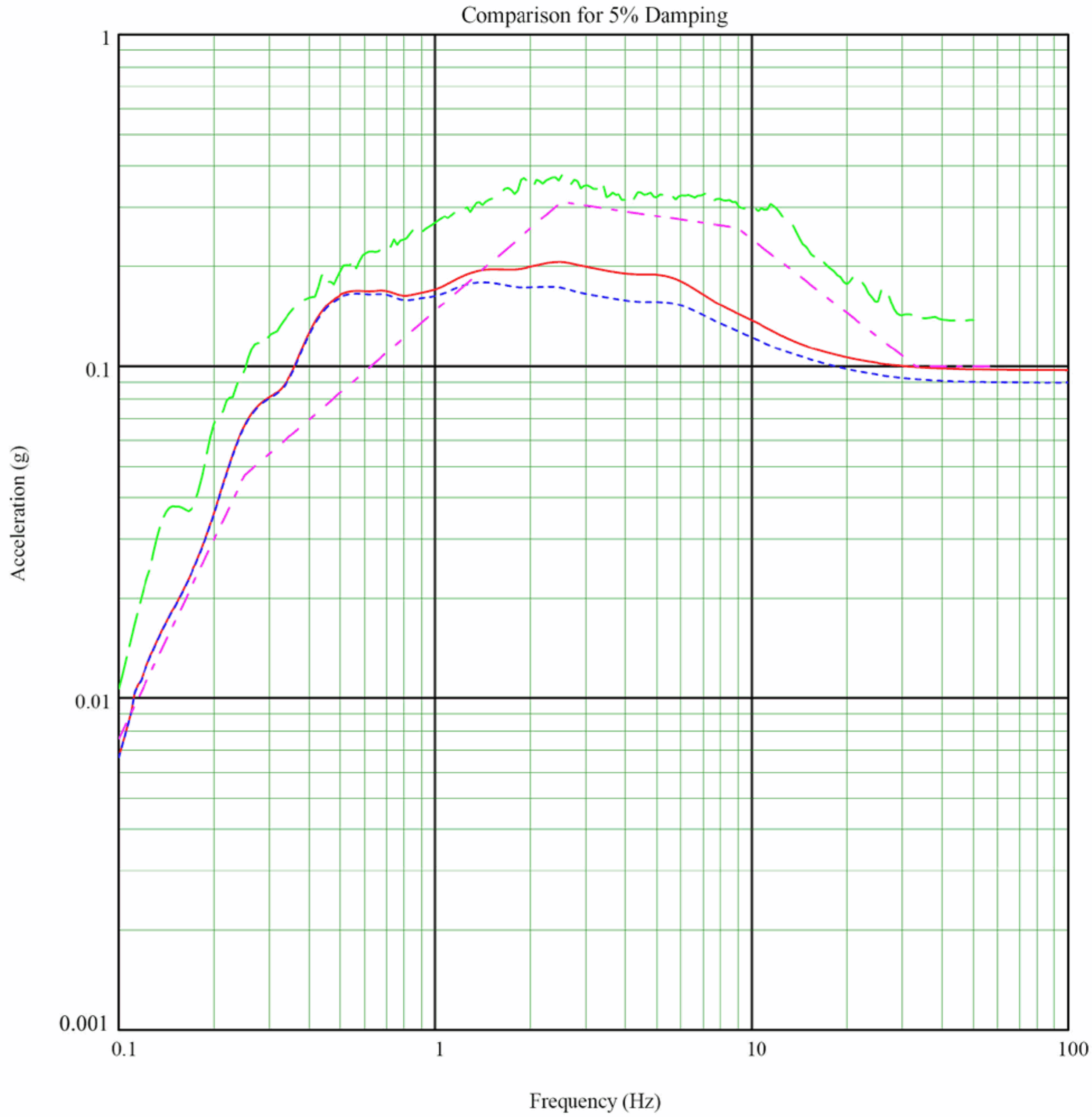
Figure 3H.6-6b Comparison of Spectra at Foundation of RSW Piping Tunnel (Upper Bound Soil Properties, E-W Direction)



___ (Red): GMRS
...... (Blue): FIRS at 57 ft below ground surface
___ (Green): Outcrop spectrum at 57 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-6c Comparison of Spectra at Foundation of RSW Piping Tunnel (Lower Bound Soil Properties, E-W Direction)

Figure 3H.6-7 Not Used



___ (Red): GMRS
...... (Blue): FIRS at 57 ft below ground surface
___ (Green): Outcrop spectrum at 57 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-7a Comparison of Spectra at Foundation of RSW Piping Tunnel (Mean Soil Properties, N-S Direction)

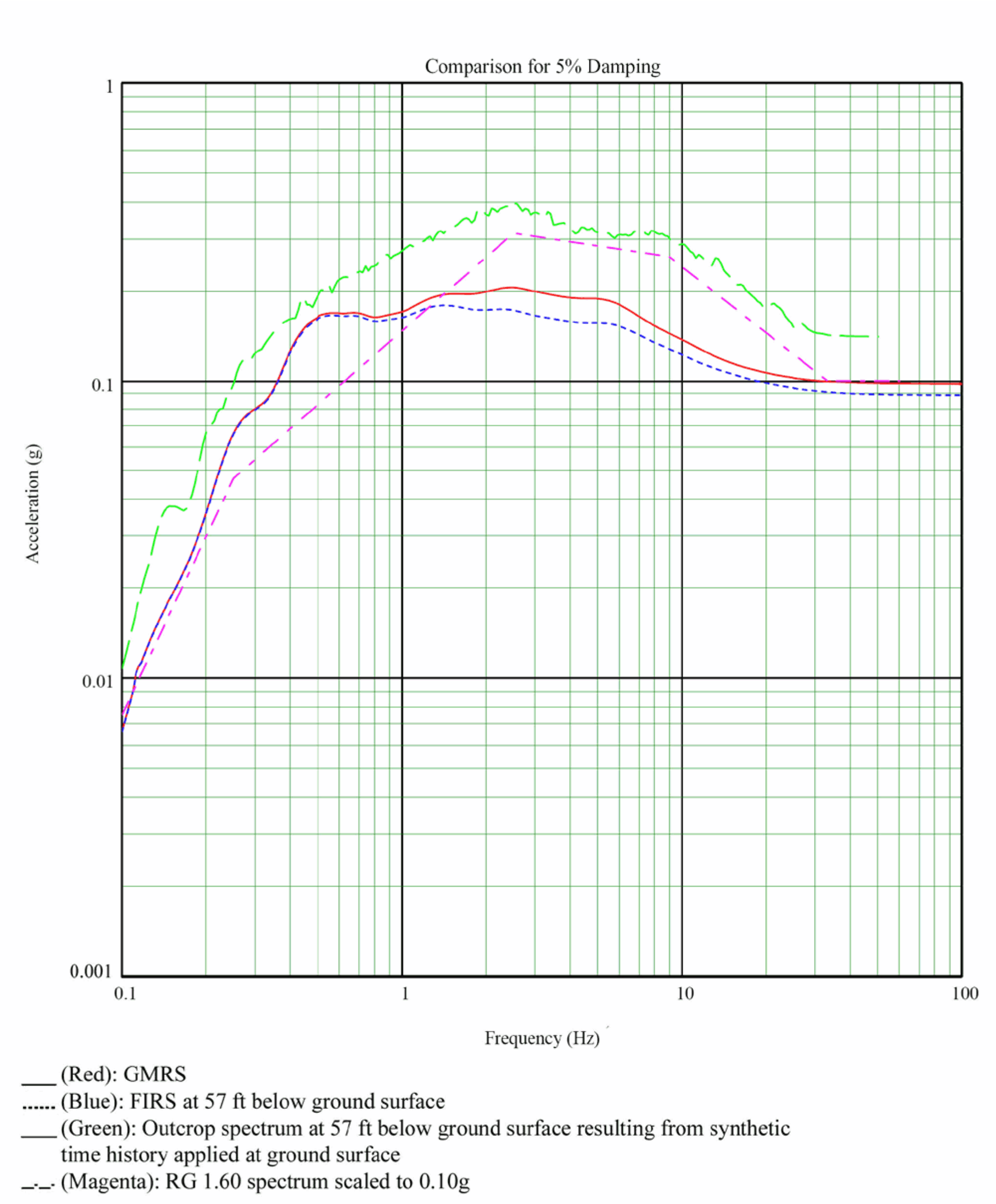
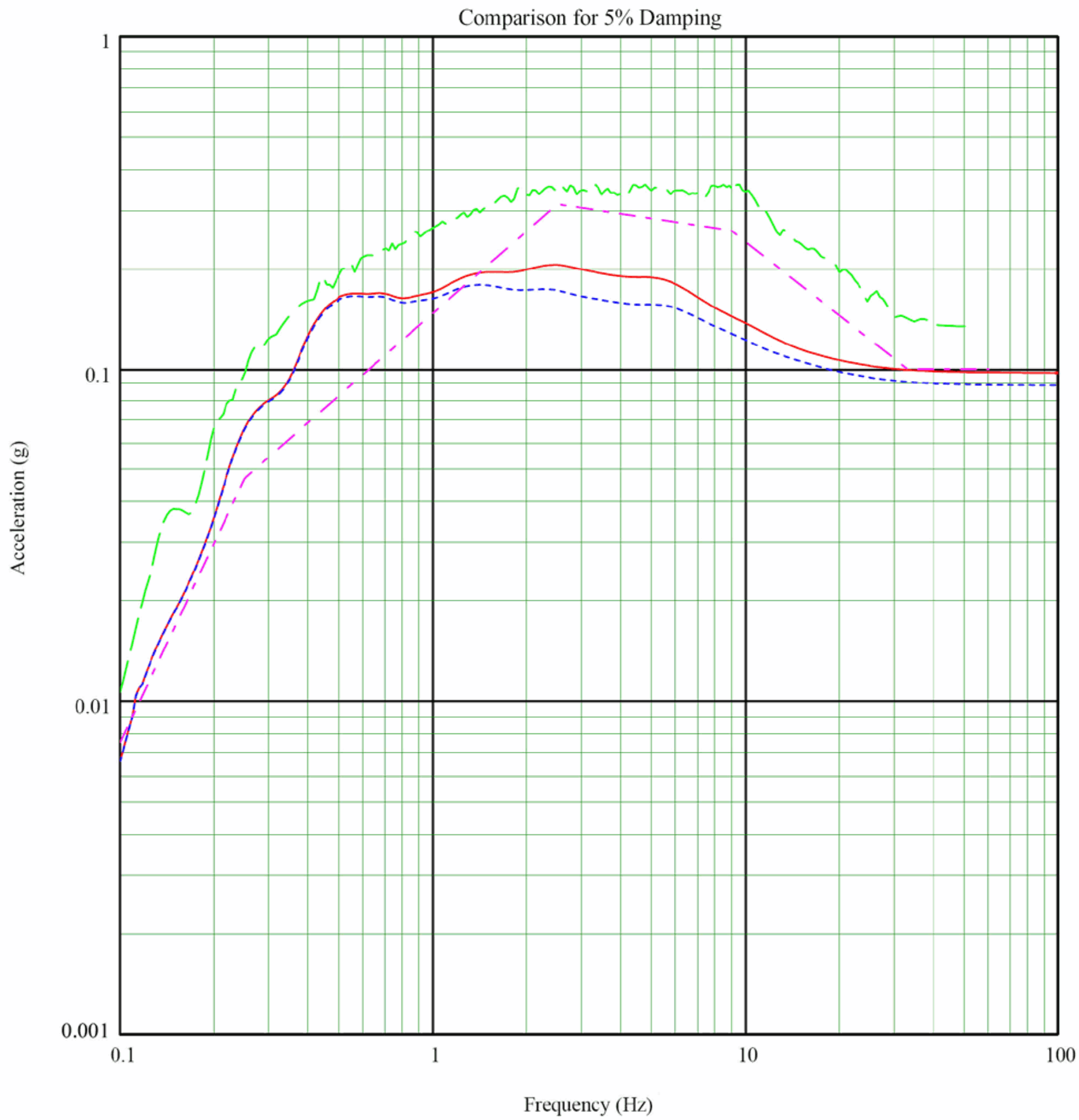


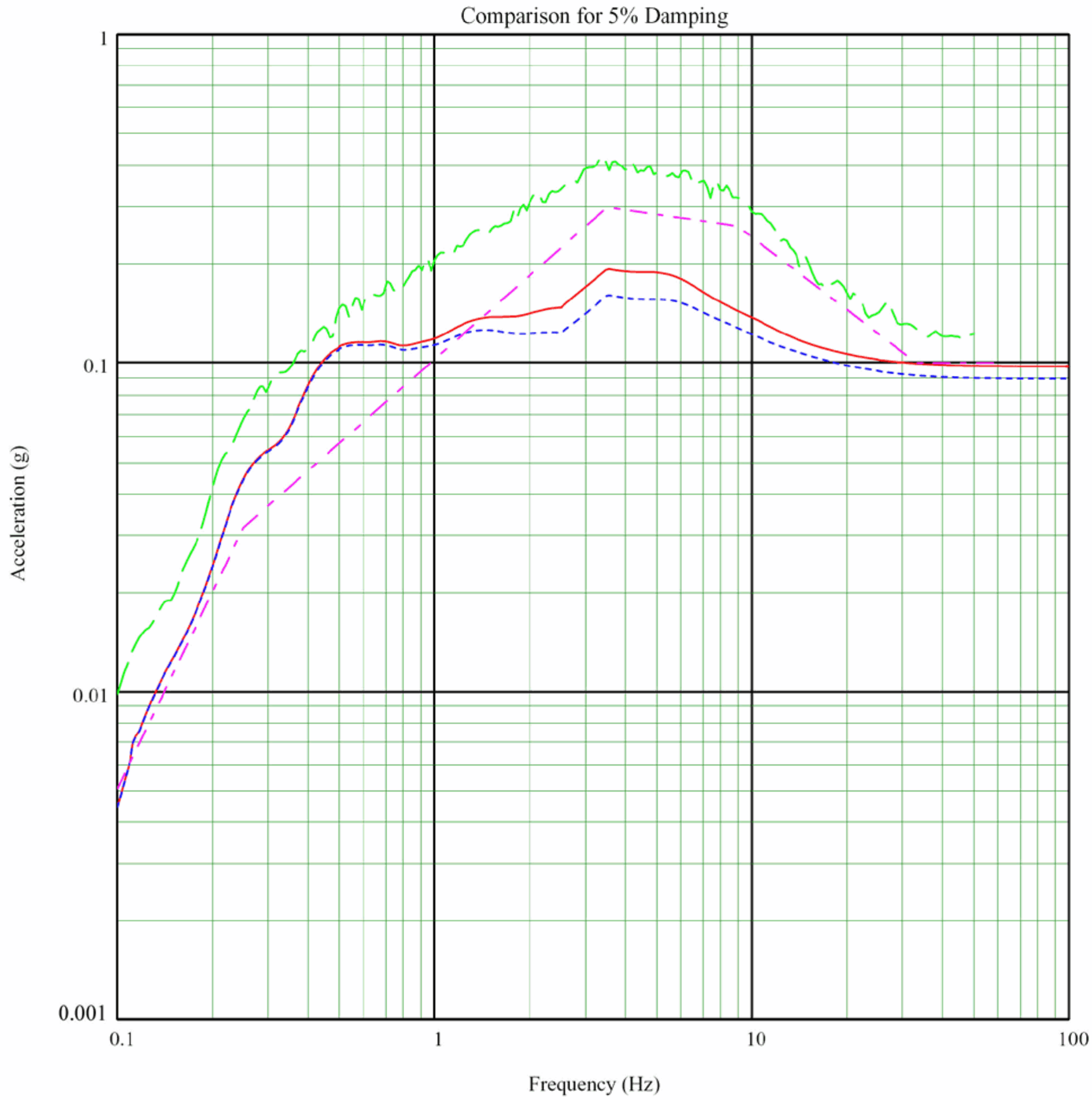
Figure 3H.6-7b Comparison of Spectra at Foundation of RSW Piping Tunnel (Upper Bound Soil Properties, N-S Direction)



___ (Red): GMRS
...... (Blue): FIRS at 57 ft below ground surface
___ (Green): Outcrop spectrum at 57 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

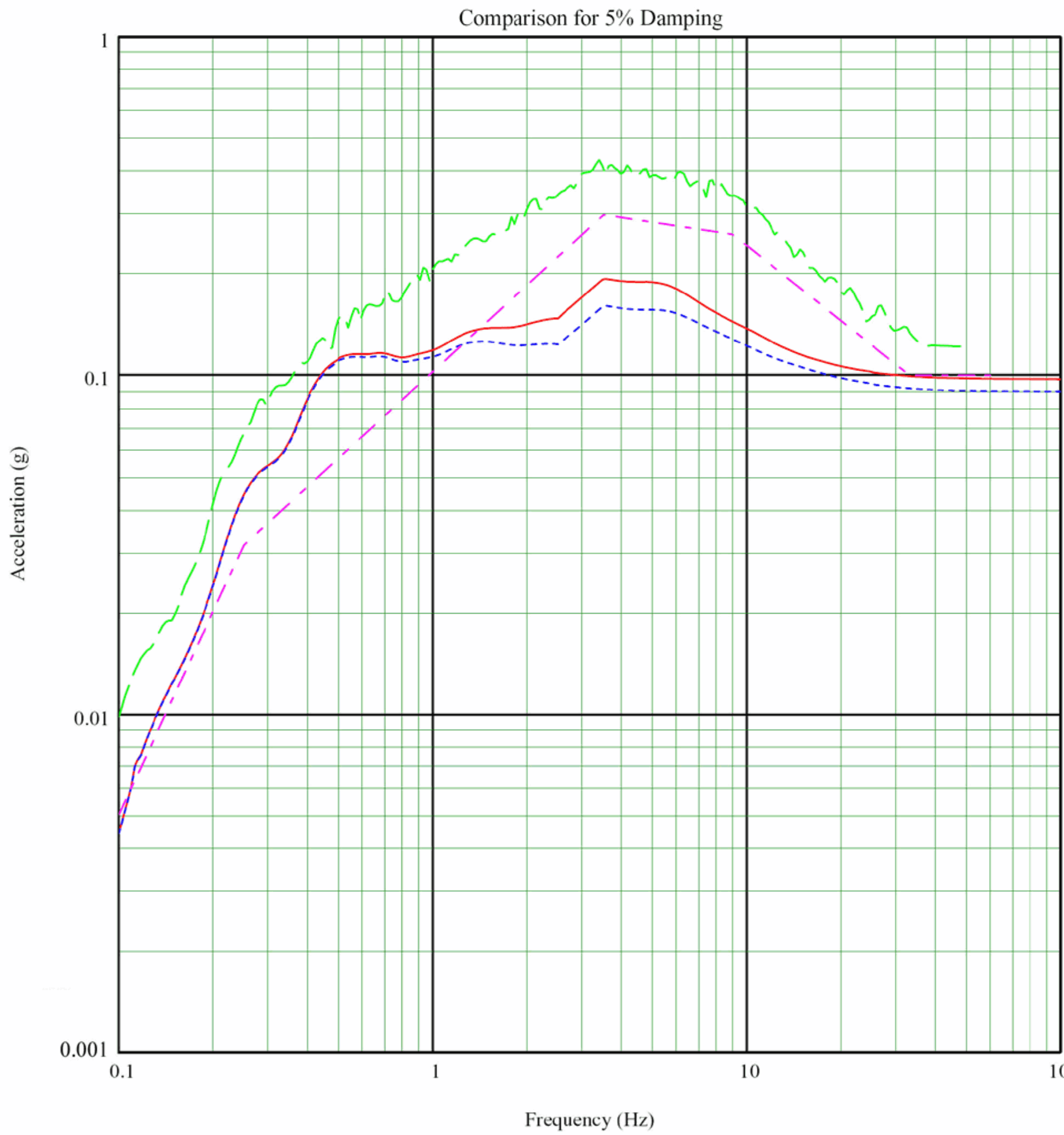
Figure 3H.6-7c Comparison of Spectra at Foundation of RSW Piping Tunnel (Lower Bound Soil Properties, N-S Direction)

Figure 3H.6-8 Not Used



___ (Red): GMRS
...... (Blue): FIRS at 57 ft below ground surface
___ (Green): Outcrop spectrum at 57 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-8a Comparison of Spectra at Foundation of RSW Piping Tunnel (Mean Soil Properties, Vertical Direction)



___ (Red): GMRS
...... (Blue): FIRS at 57 ft below ground surface
___ (Green): Outcrop spectrum at 57 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-8b Comparison of Spectra at Foundation of RSW Piping Tunnel (Upper Bound Soil Properties, Vertical Direction)

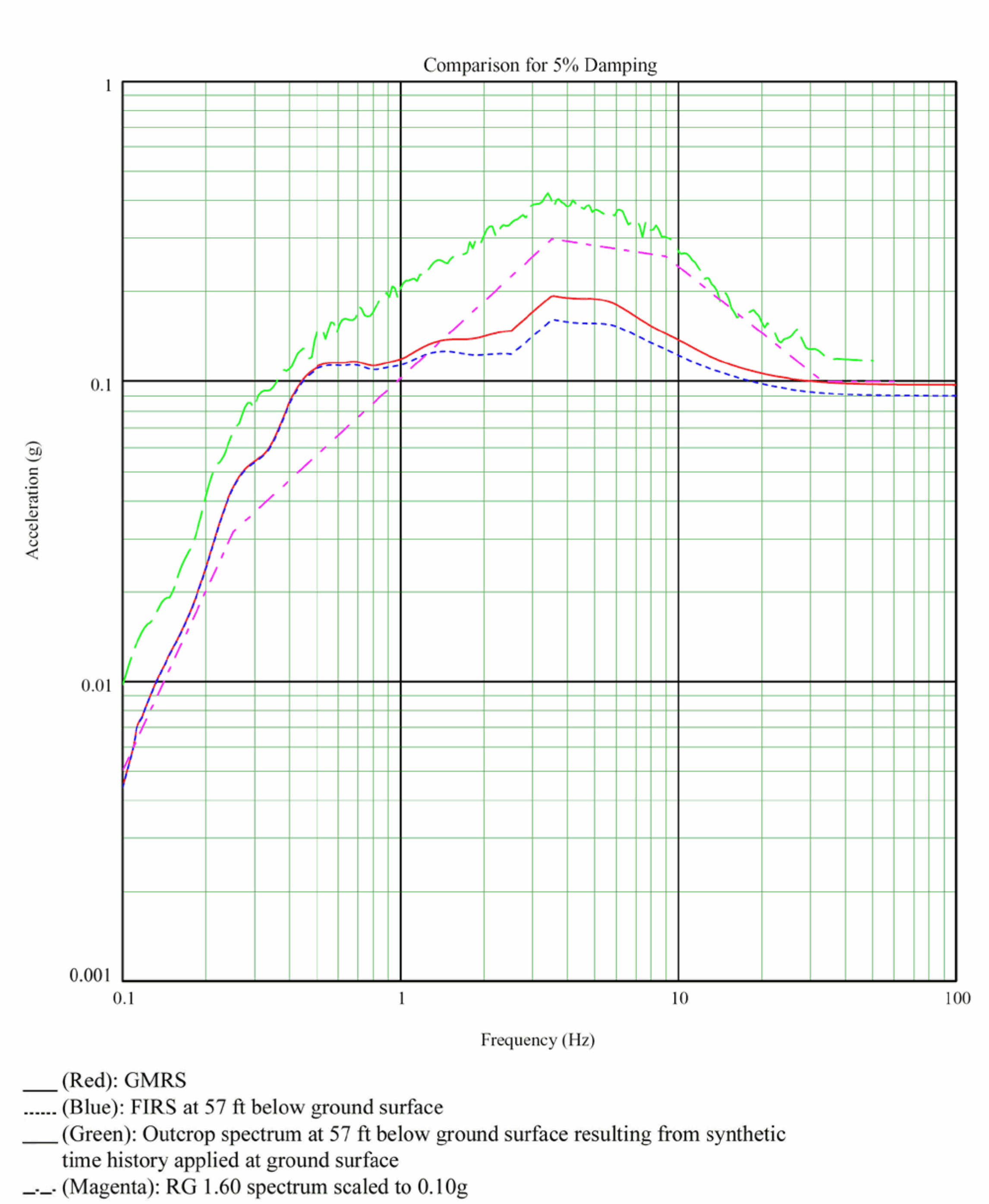
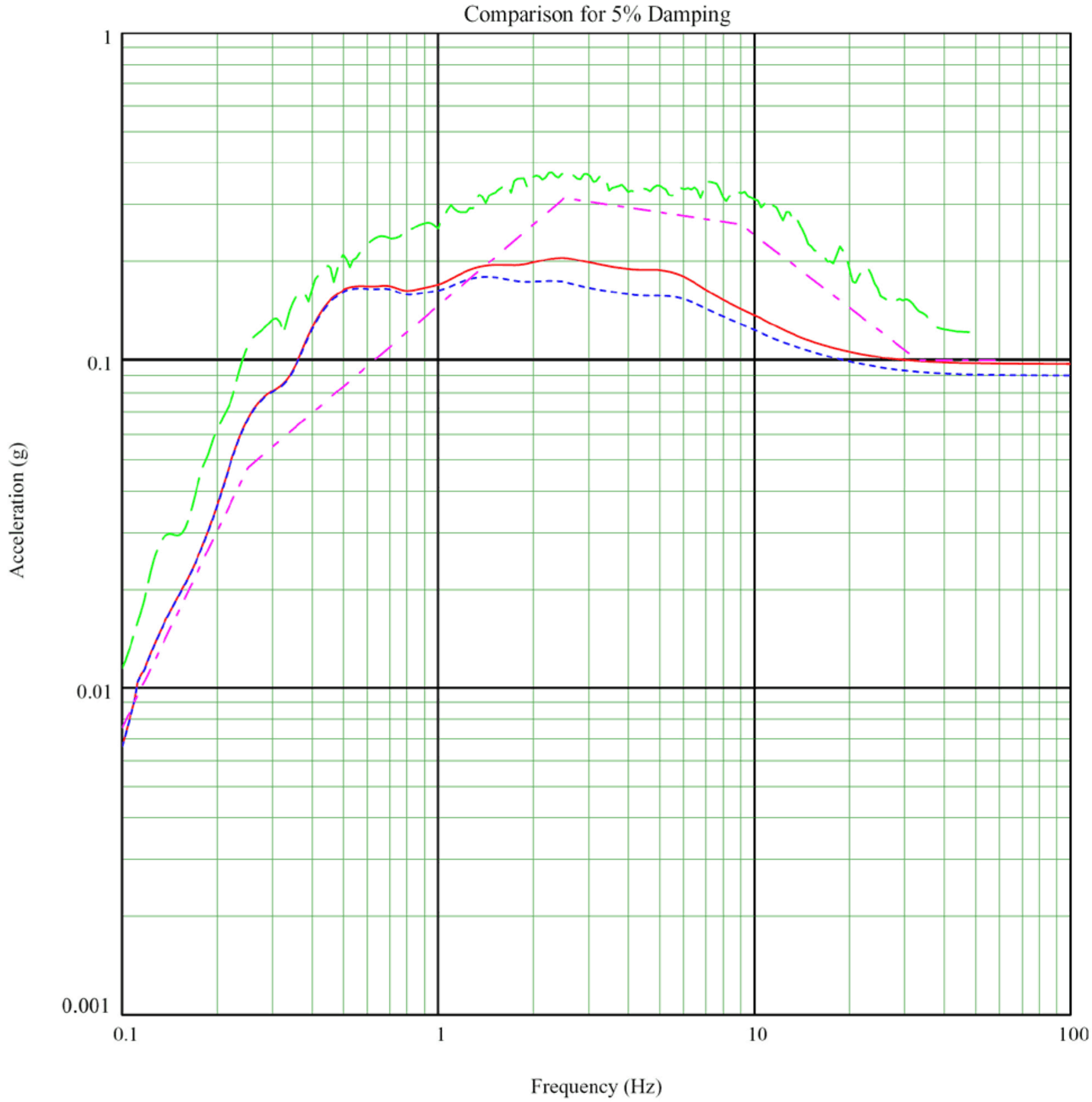


Figure 3H.6-8c Comparison of Spectra at Foundation of RSW Piping Tunnel (Lower Bound Soil Properties, Vertical Direction)

Figure 3H.6-9 Not Used



___ (Red): GMRS
...... (Blue): FIRS at 68 ft below ground surface
___ (Green): Outcrop spectrum at 68 ft below ground surface resulting from synthetic time history applied at ground surface
_._ (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-9a Comparison of Spectra at Foundation of RSW Pump House (Mean Soil Properties, E-W Direction)

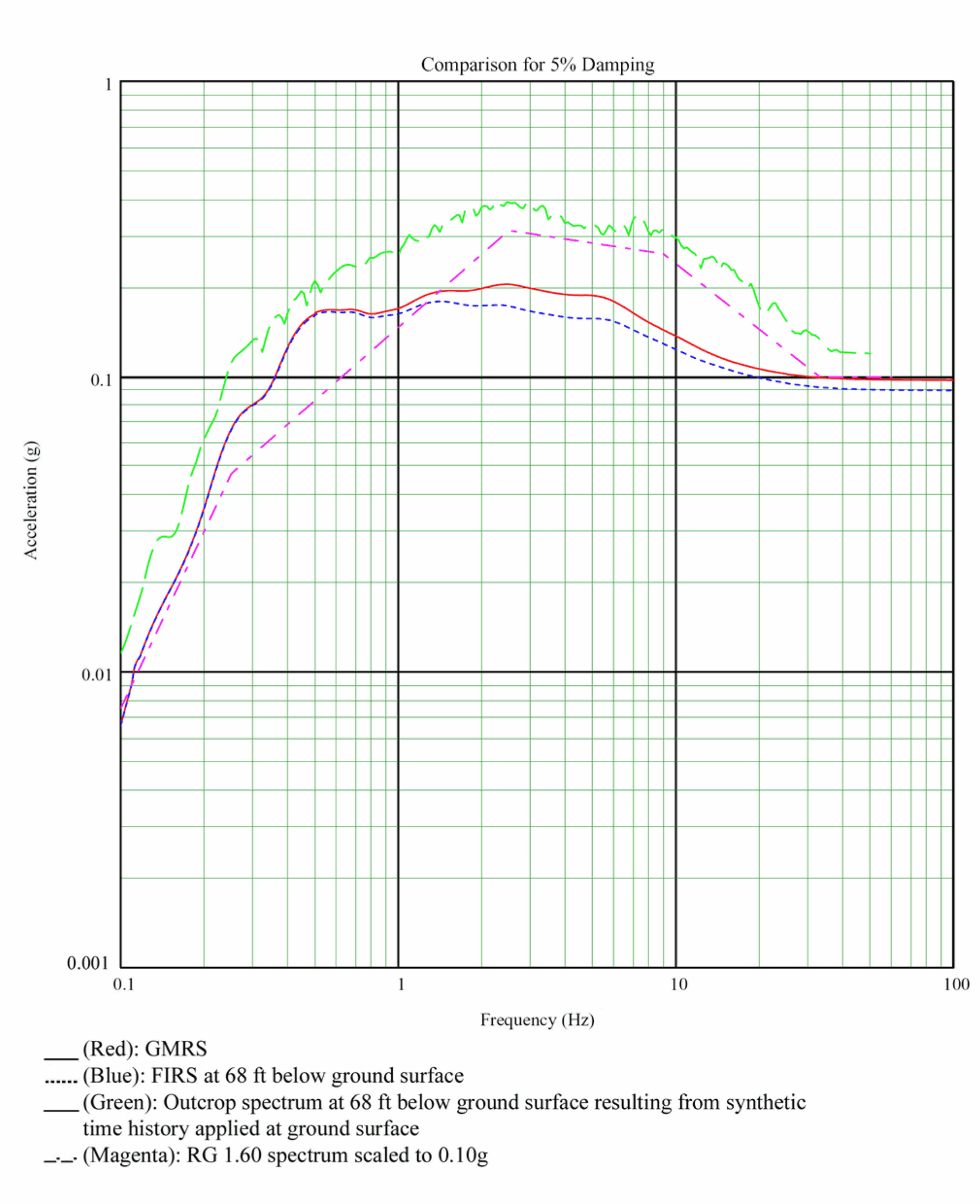
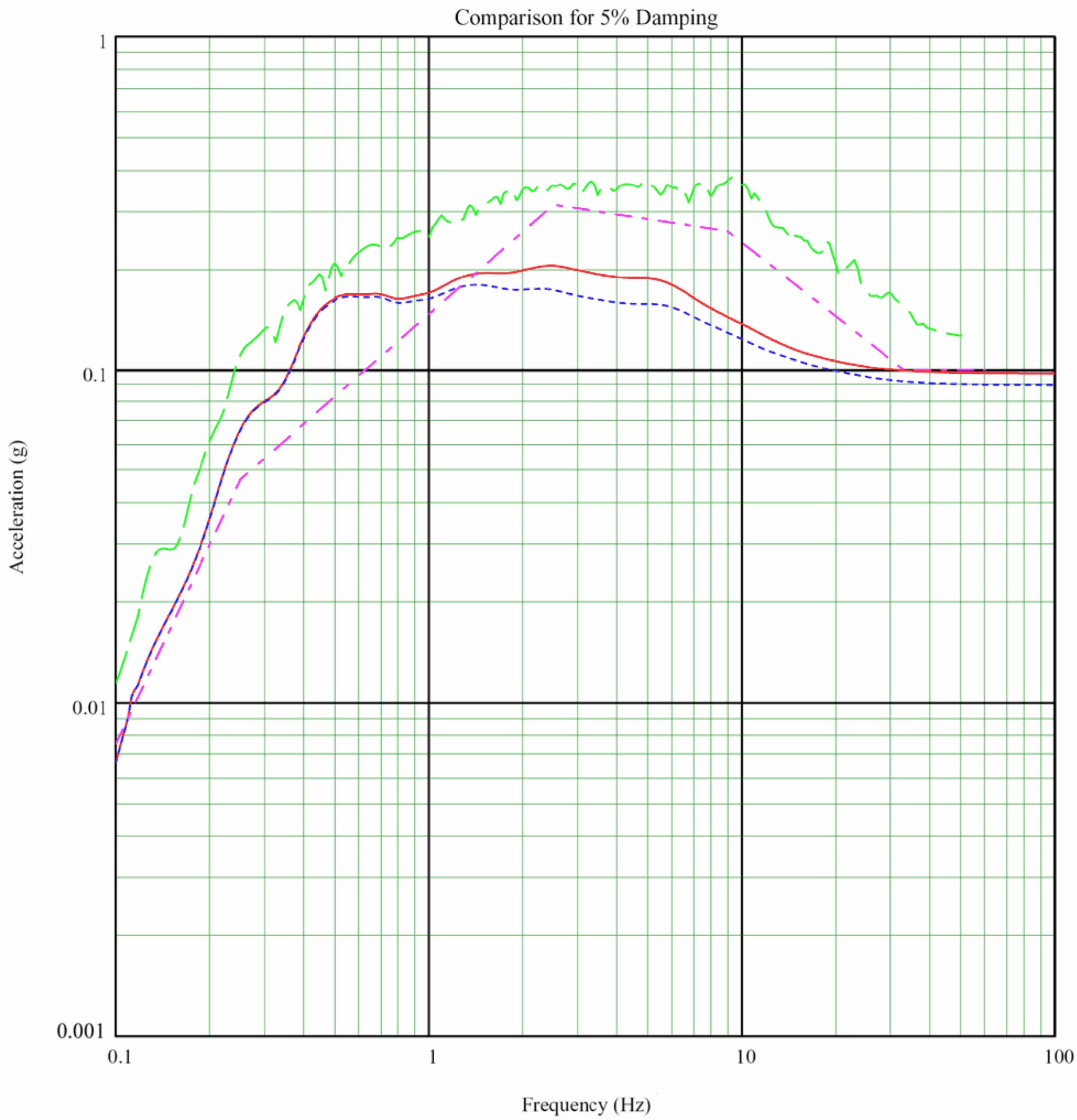


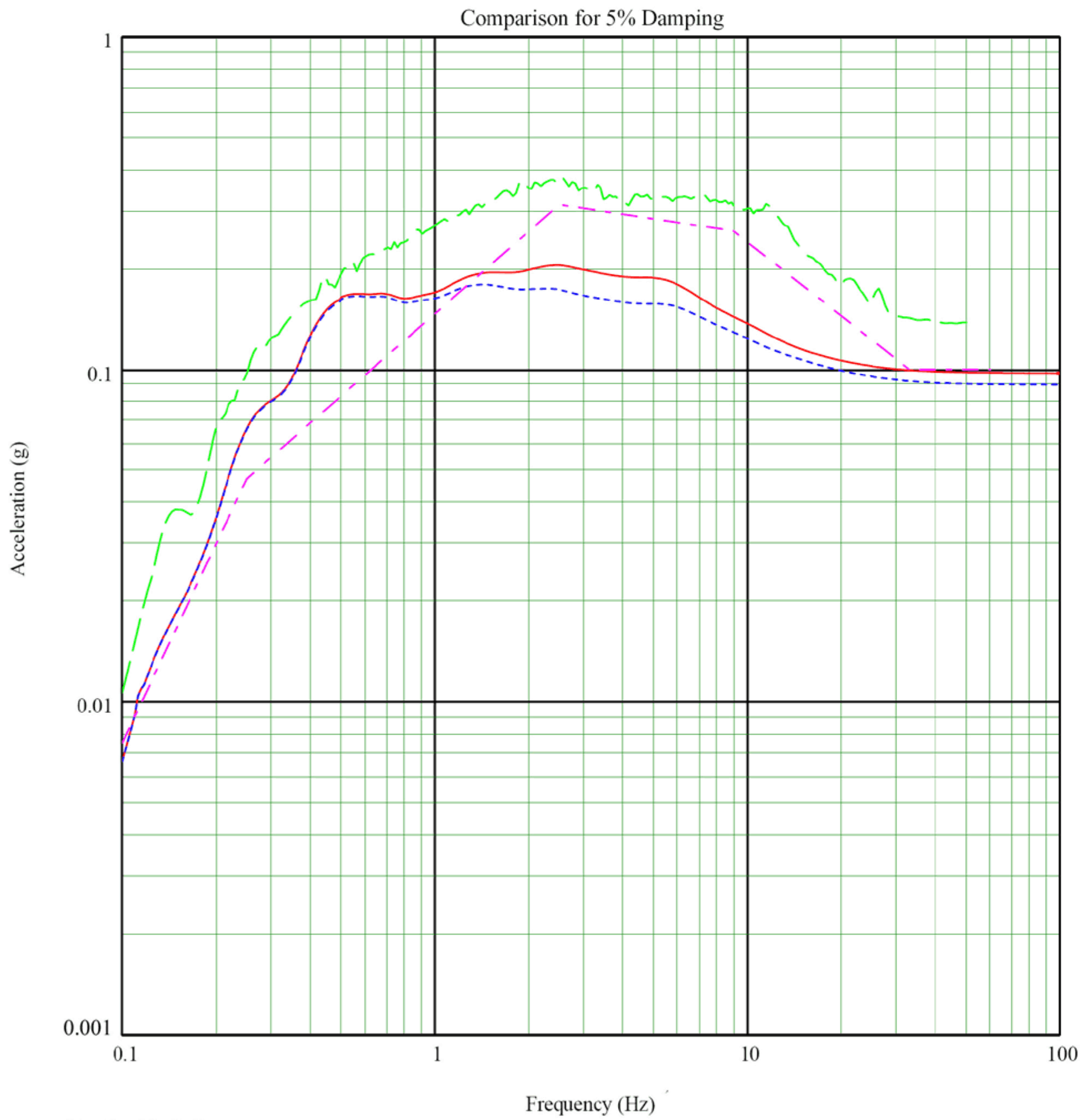
Figure 3H.6-9b Comparison of Spectra at Foundation of RSW Pump House (Upper Bound Soil Properties, E-W Direction)



___ (Red): GMRS
...... (Blue): FIRS at 68 ft below ground surface
___ (Green): Outcrop spectrum at 68 ft below ground surface resulting from synthetic time history applied at ground surface
_._. (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-9c Comparison of Spectra at Foundation of RSW Pump House (Lower Bound Soil Properties, E-W Direction

Figure 3H.6-10 Not Used



___ (Red): GMRS
...... (Blue): FIRS at 68 ft below ground surface
___ (Green): Outcrop spectrum at 68 ft below ground surface resulting from synthetic time history applied at ground surface
_._ (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-10a Comparison of Spectra at Foundation of RSW Pump House (Mean Soil Properties, N-S Direction)

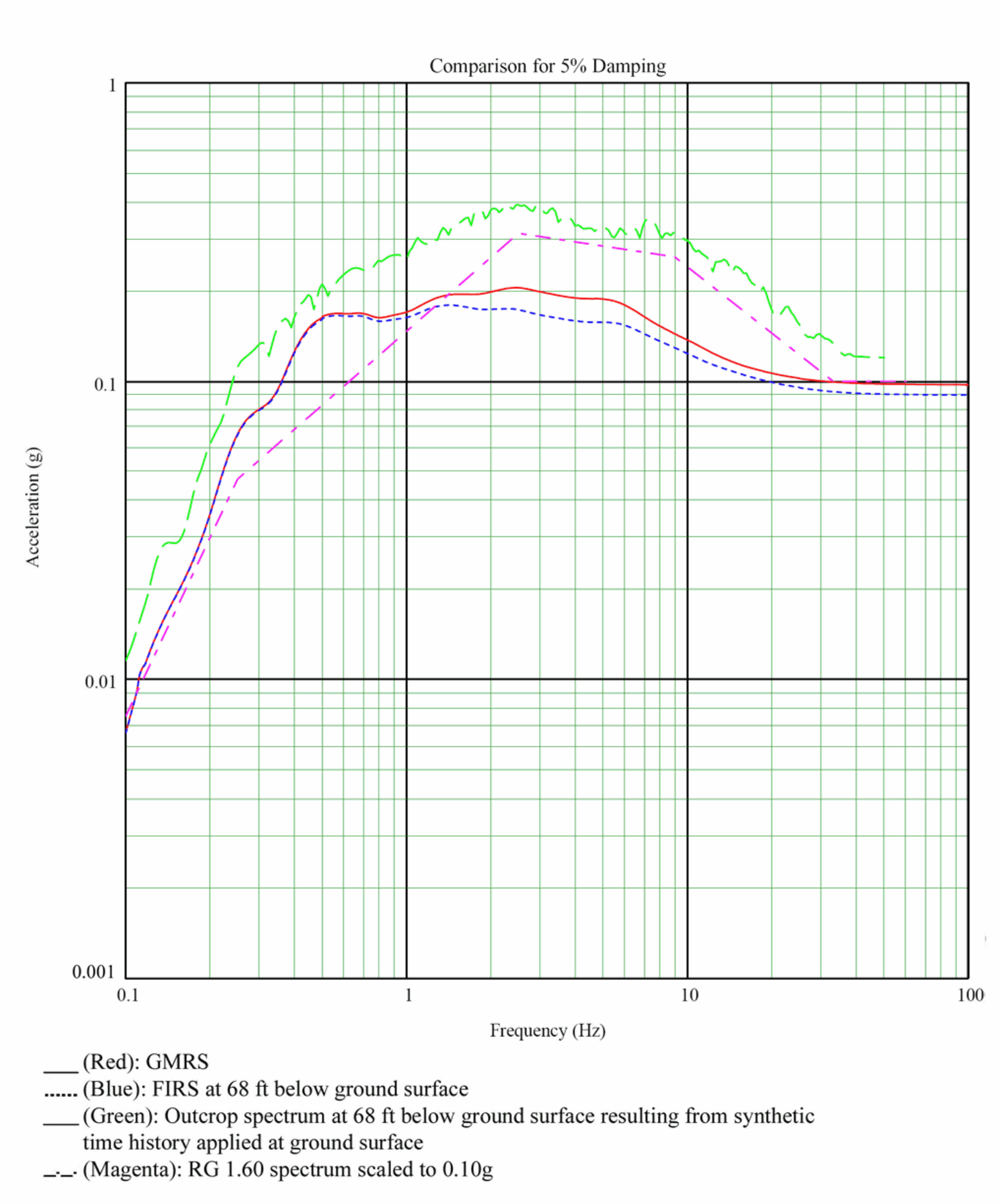


Figure 3H.6-10b Comparison of Spectra at Foundation of RSW Pump House (Upper Bound Soil Properties, N-S Direction)

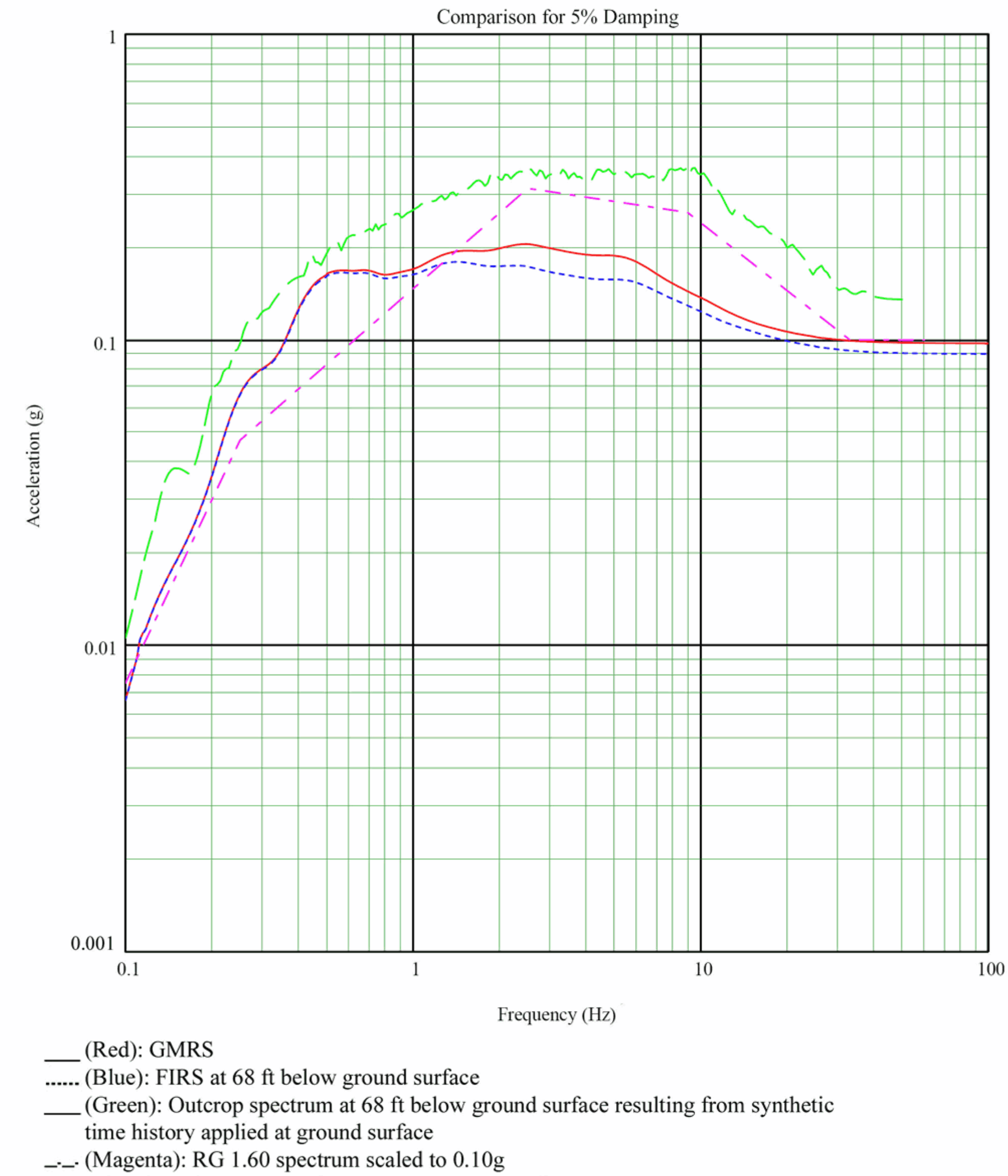


Figure 3H.6-10c Comparison of Spectra at Foundation of RSW Pump House (Lower Bound Soil Properties, N-S Direction)

Figure 3H.6-11 Not Used

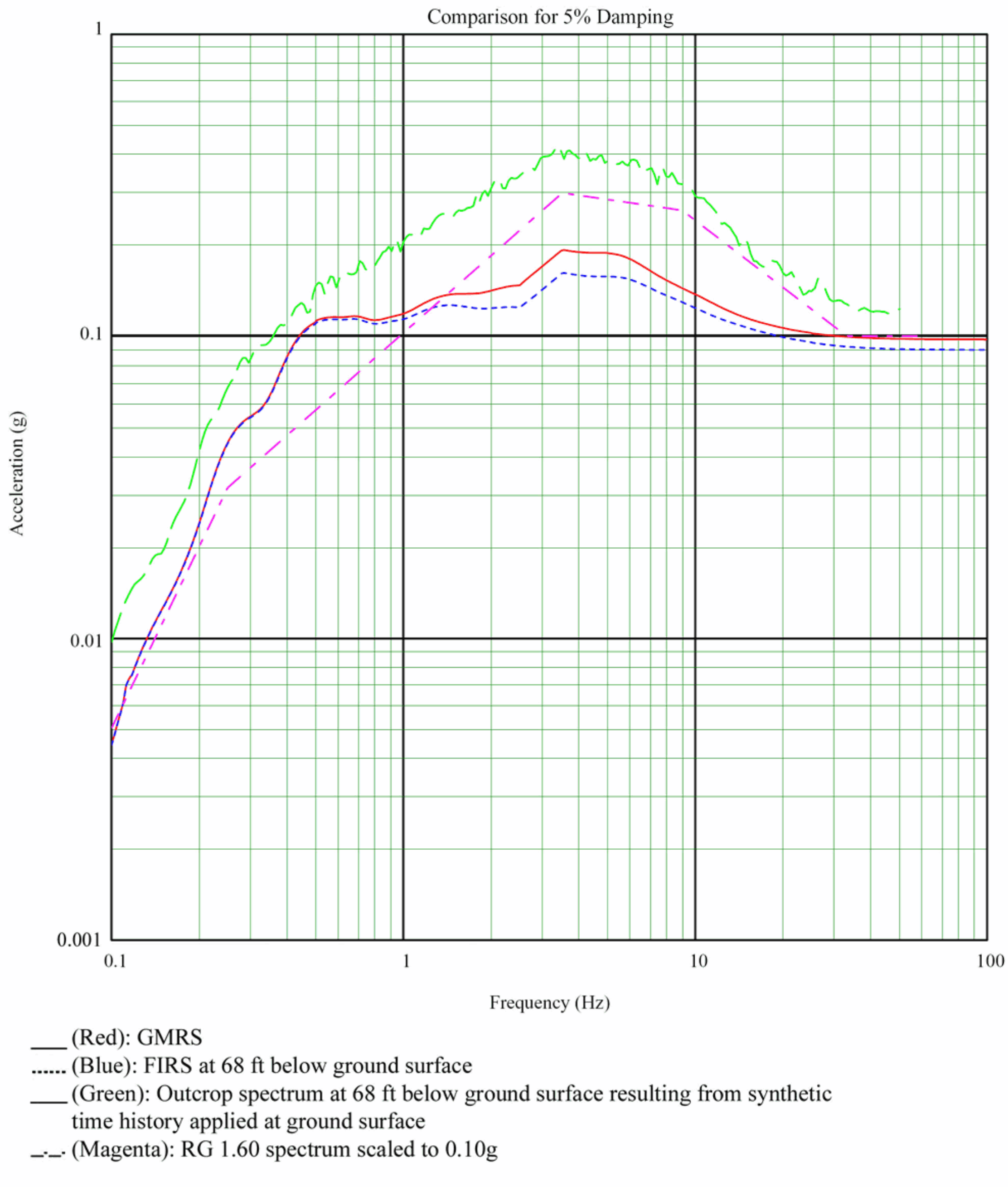
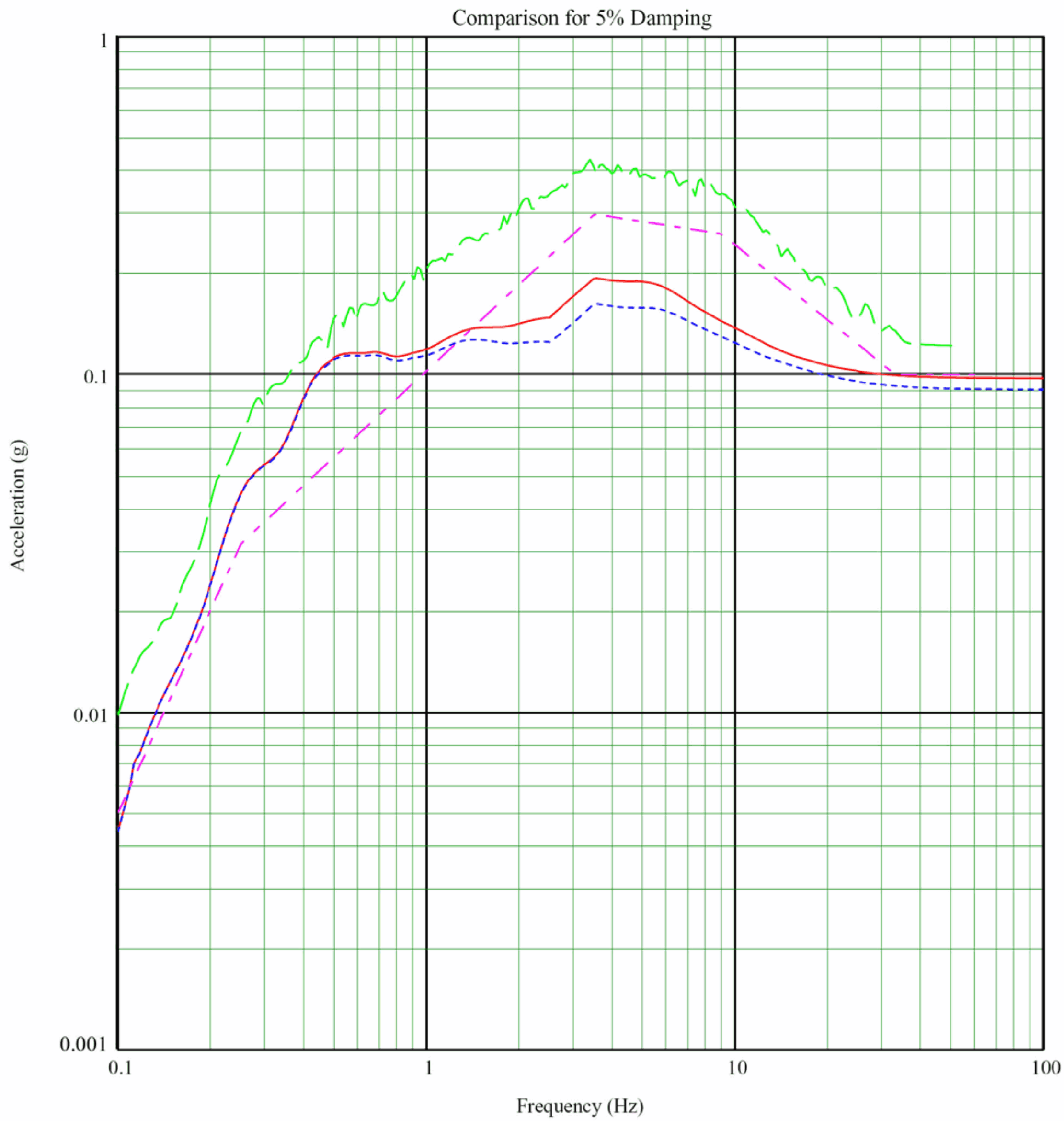


Figure 3H.6-11a Comparison of Spectra at Foundation of RSW Pump House (Mean Soil Properties, Vertical Direction)



___ (Red): GMRS
...... (Blue): FIRS at 68 ft below ground surface
___ (Green): Outcrop spectrum at 68 ft below ground surface resulting from synthetic time history applied at ground surface
_._ (Magenta): RG 1.60 spectrum scaled to 0.10g

Figure 3H.6-11b Comparison of Spectra at Foundation of RSW Pump House (Upper Bound Soil Properties, Vertical Direction)

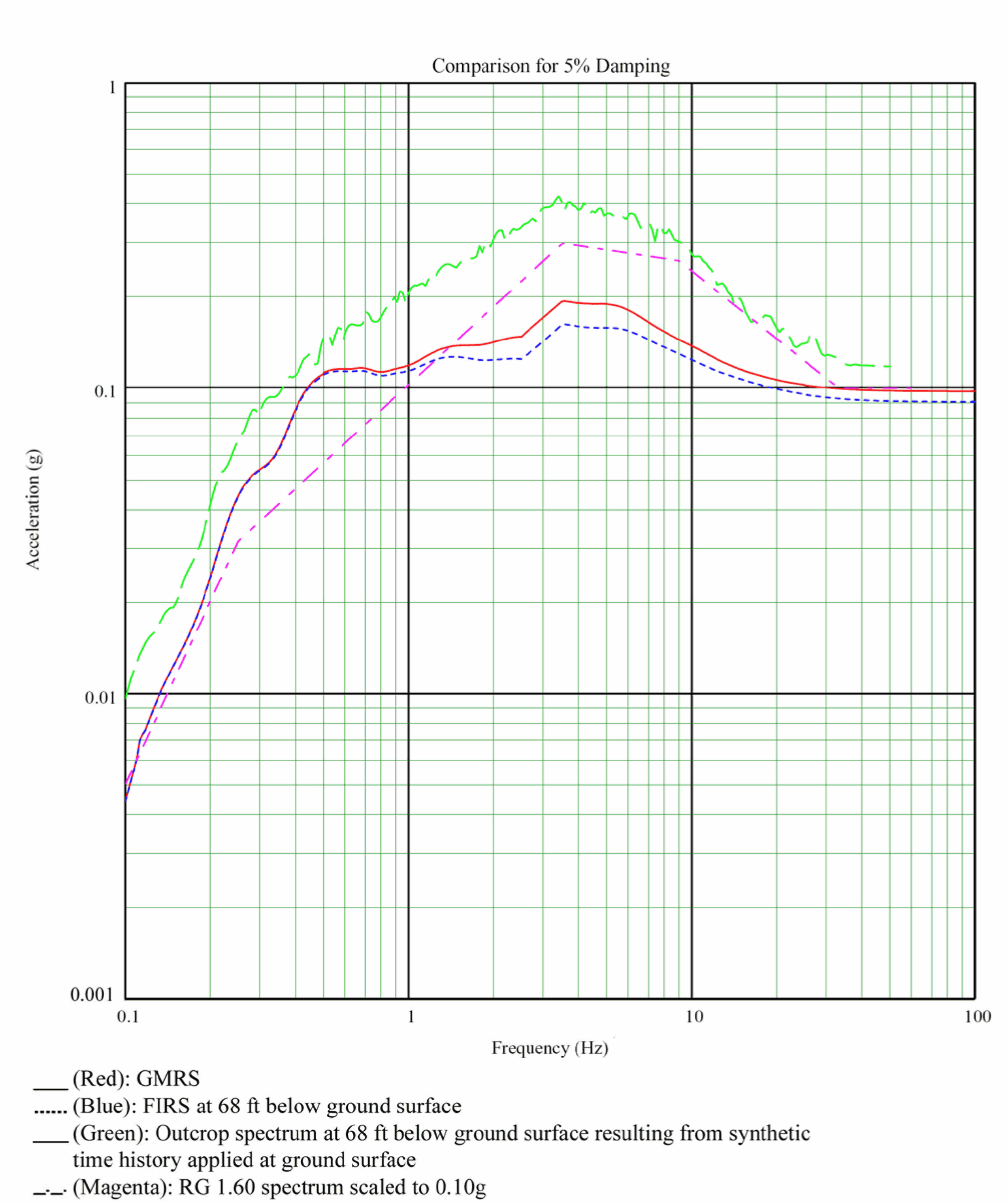


Figure 3H.6-11c Comparison of Spectra at Foundation of RSW Pump House (Lower Bound Soil Properties, Vertical Direction)

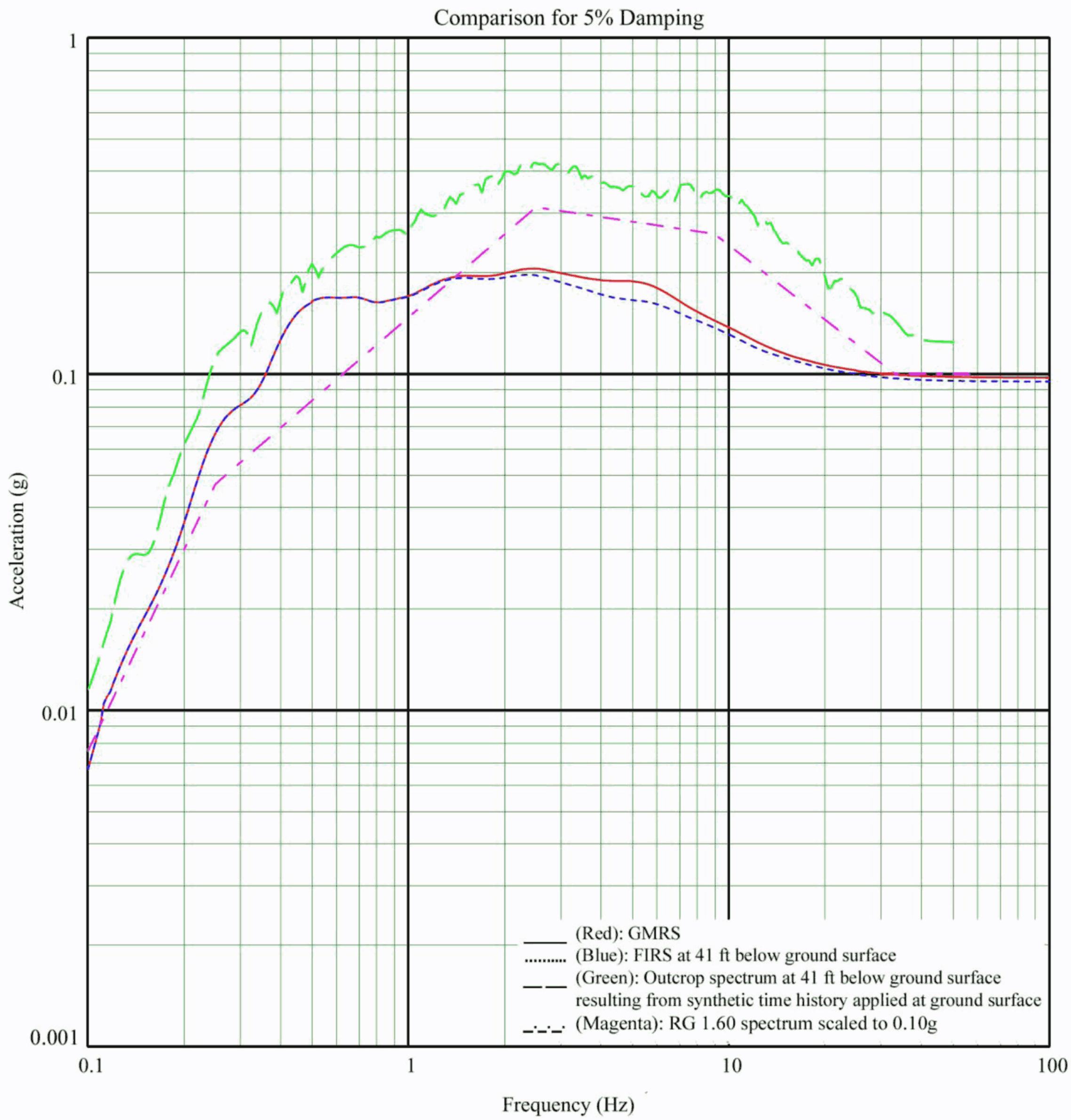


Figure 3H.6-11d Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Mean Soil Properties, E-W Direction

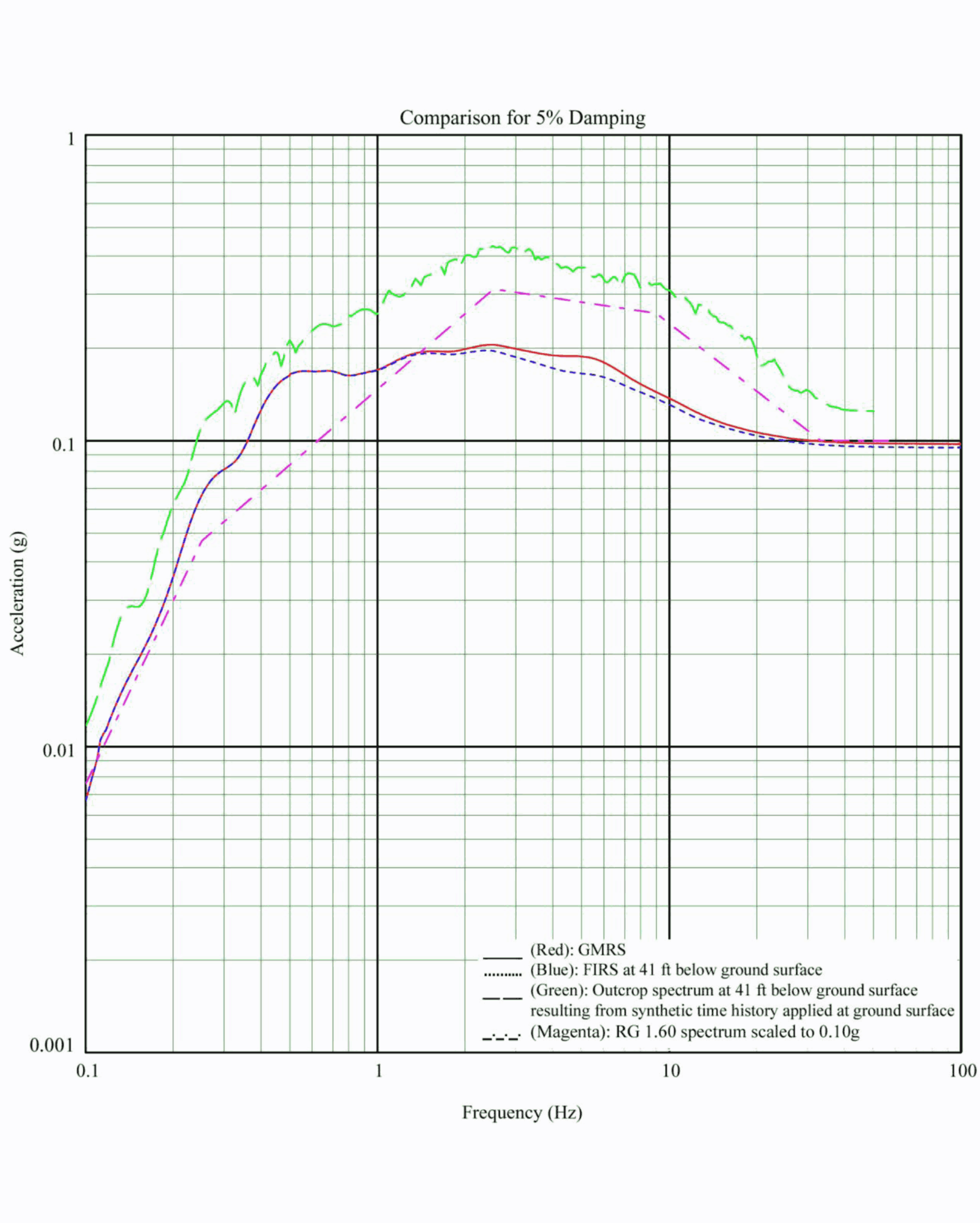


Figure 3H.6-11e Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Upper Bound Soil Properties, E-W Direction

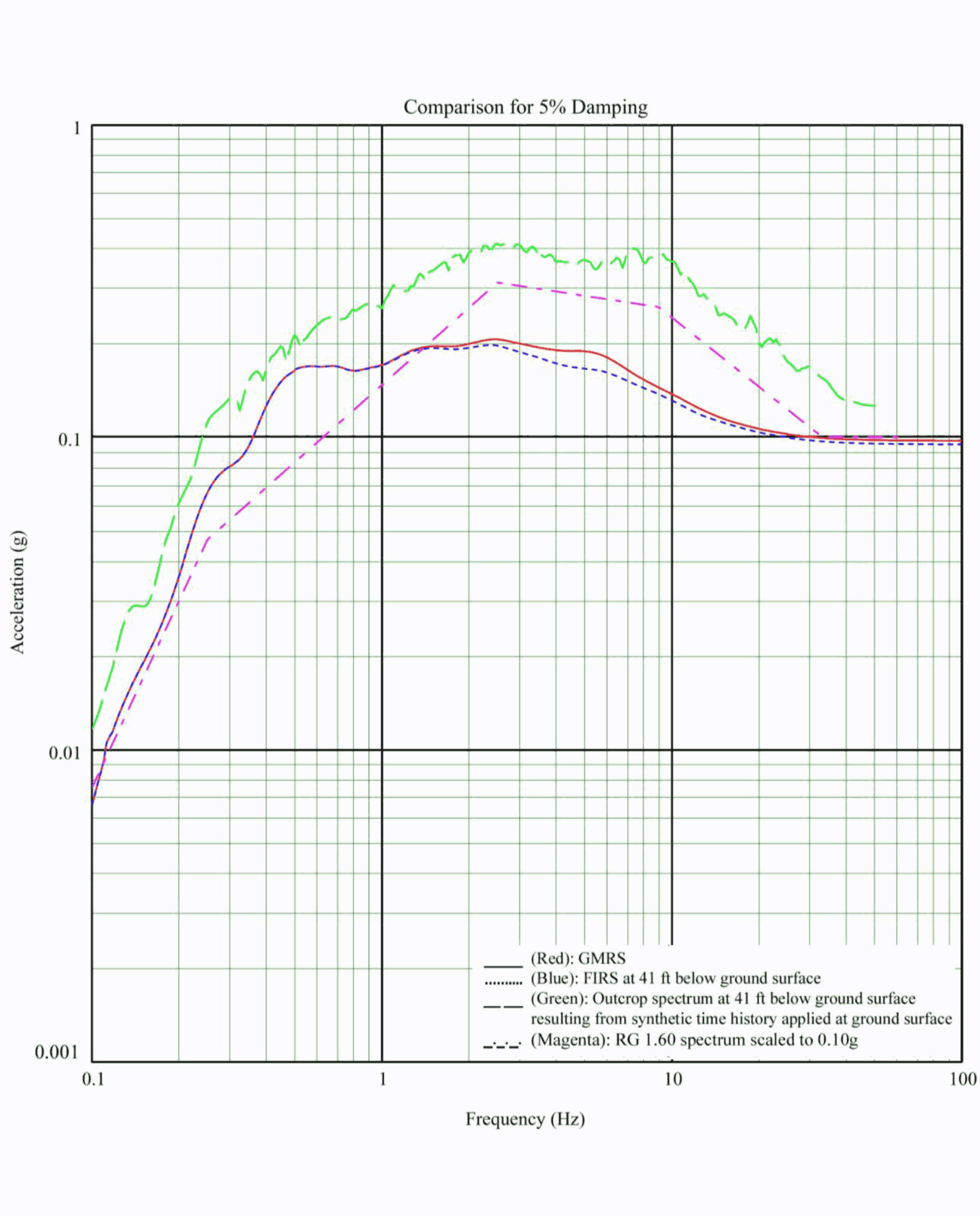


Figure 3H.6-11f Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Lower Bound Soil Properties, E-W Direction

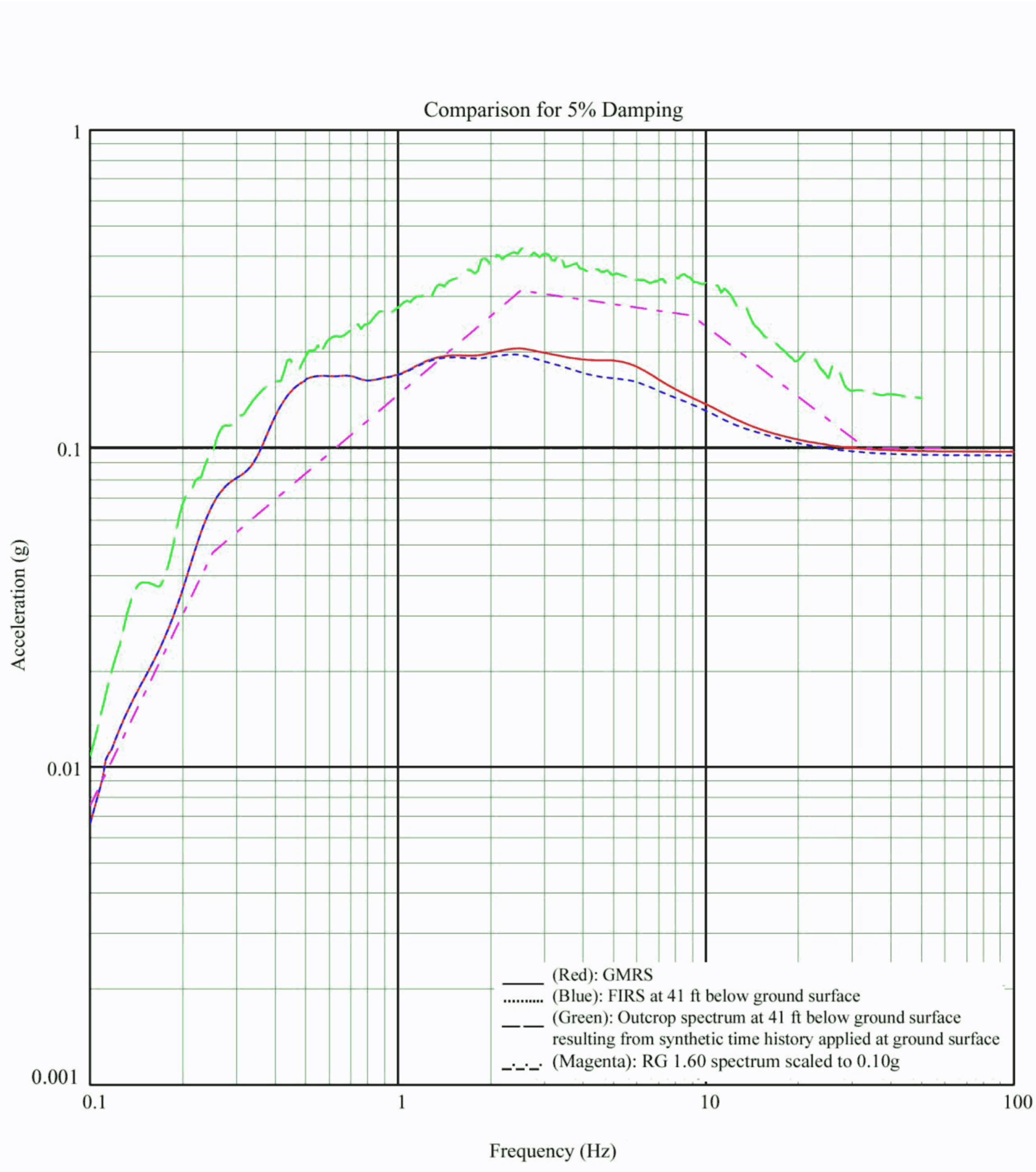


Figure 3H.6-11g Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Mean Soil Properties, N-S Direction

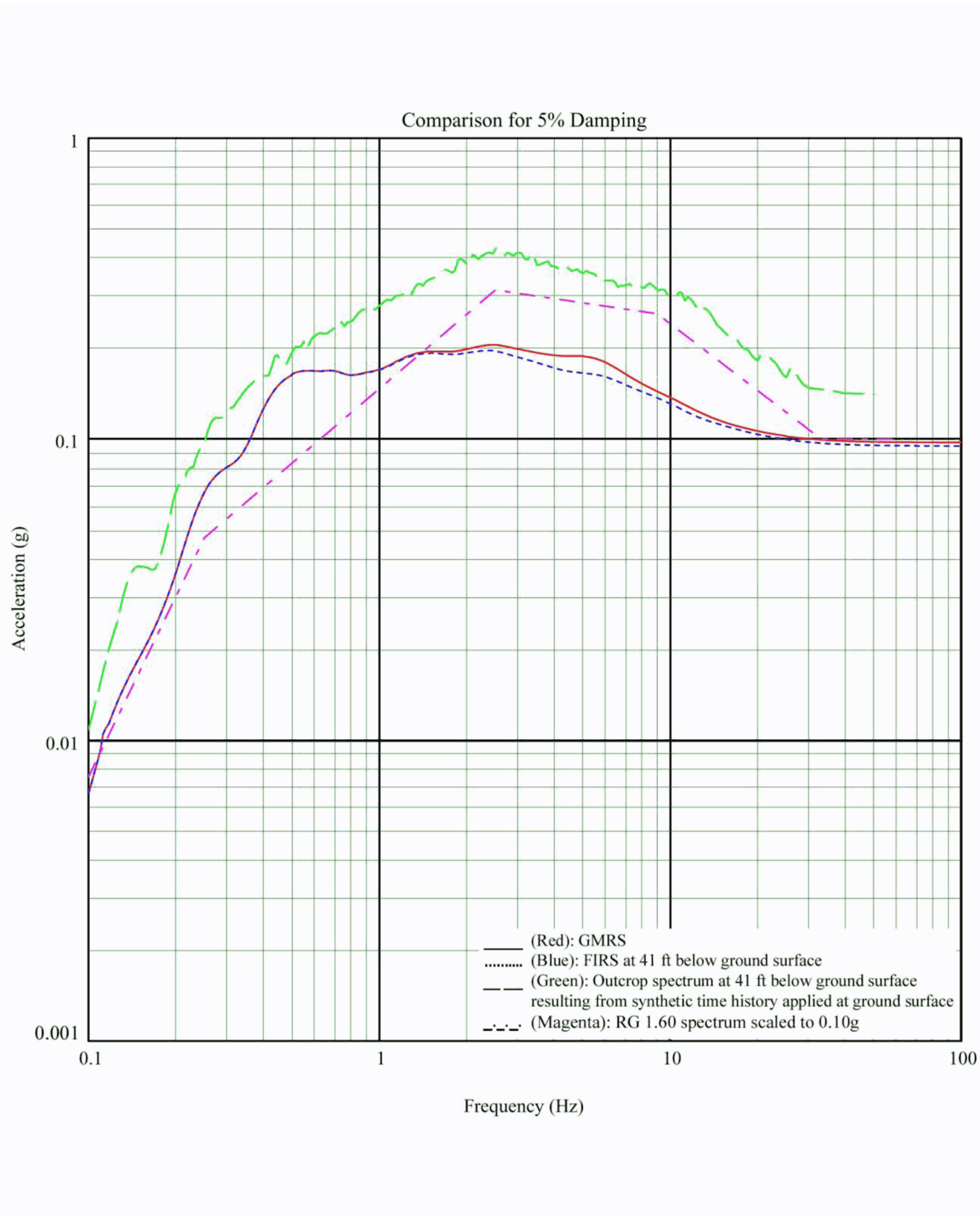


Figure 3H.6-11h Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Upper Bound Soil Properties, N-S Direction

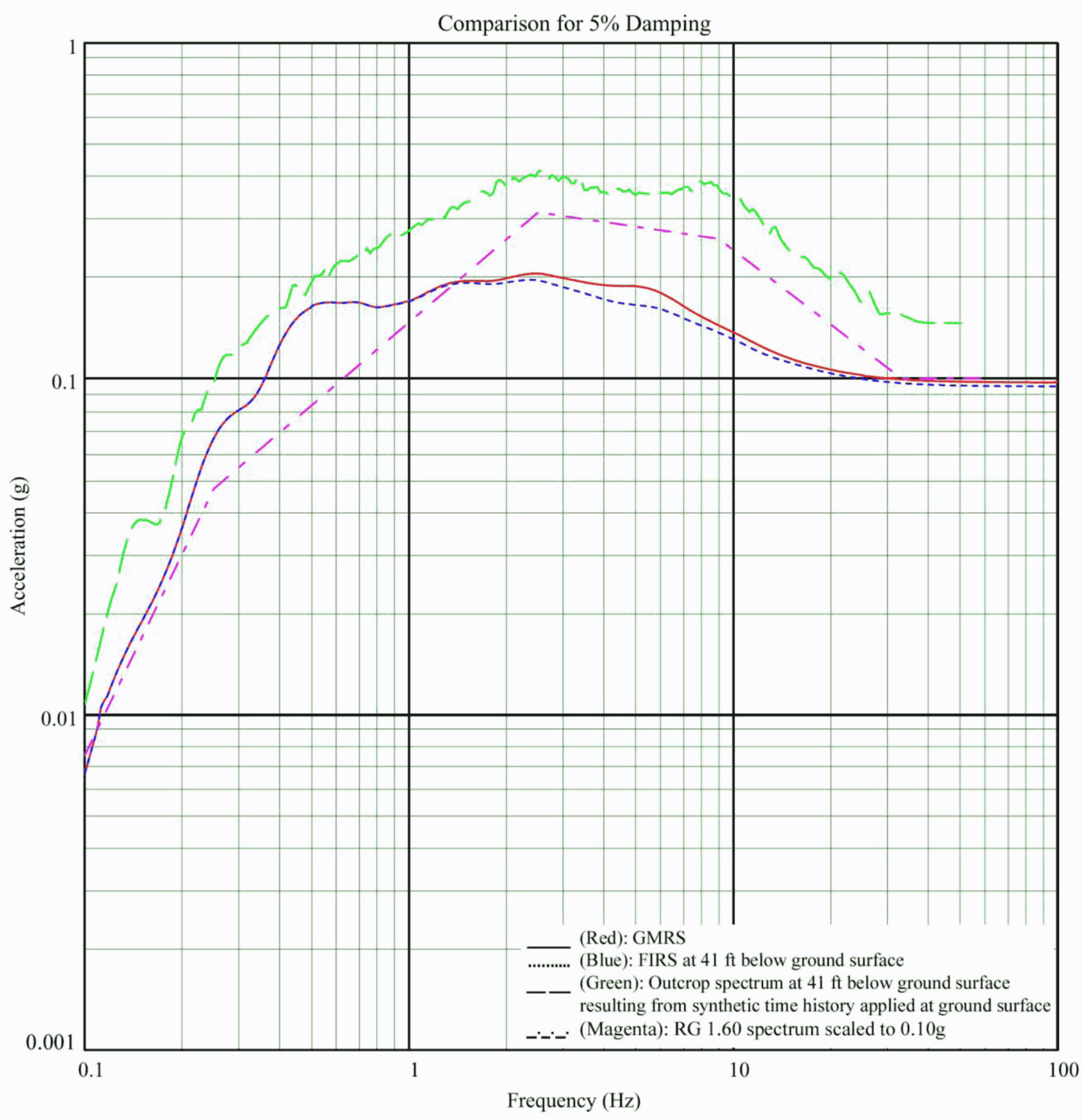


Figure 3H.6-11i Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Lower Bound Soil Properties, N-S Direction

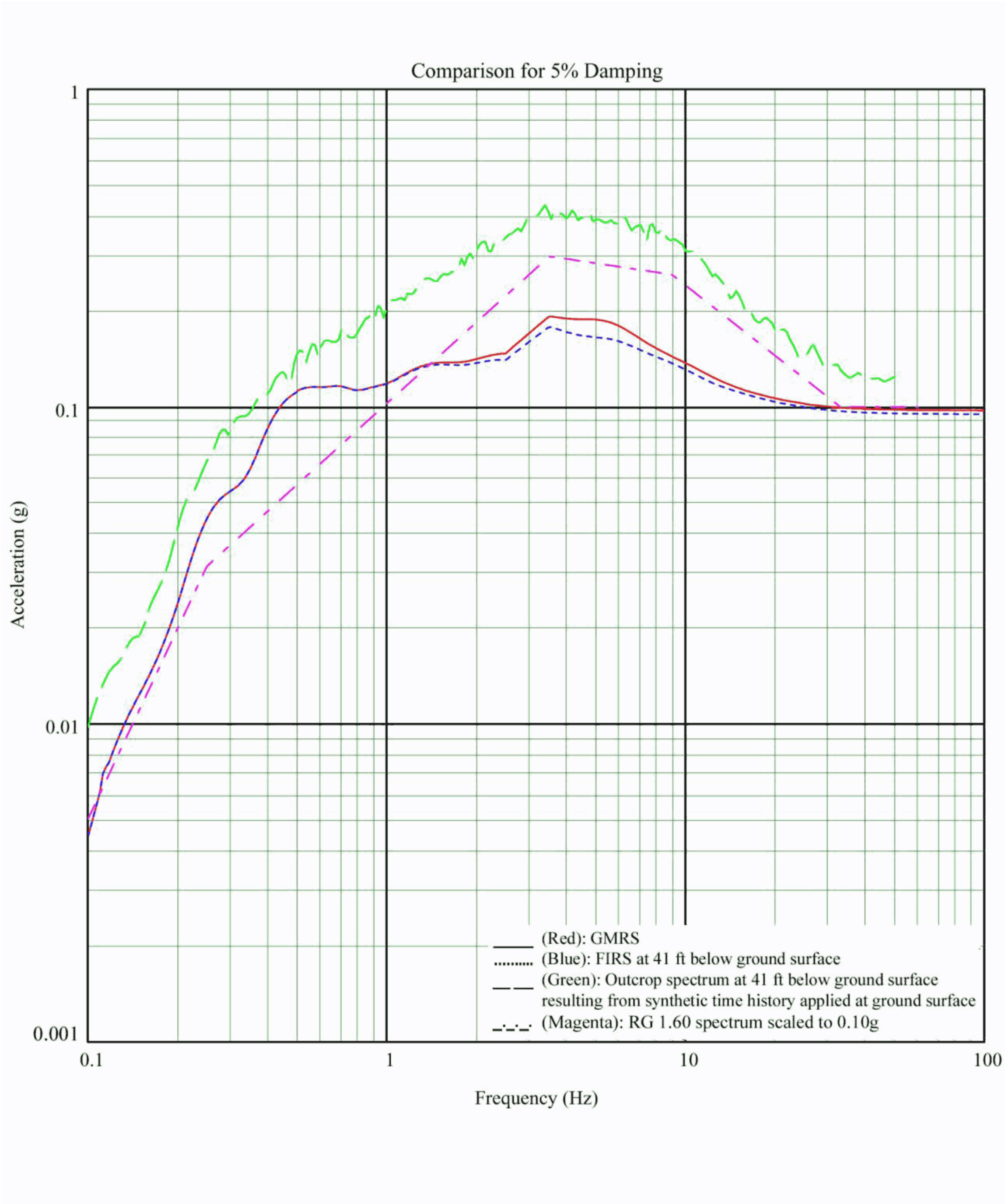


Figure 3H.6-11j Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Mean Soil Properties, Vertical Direction

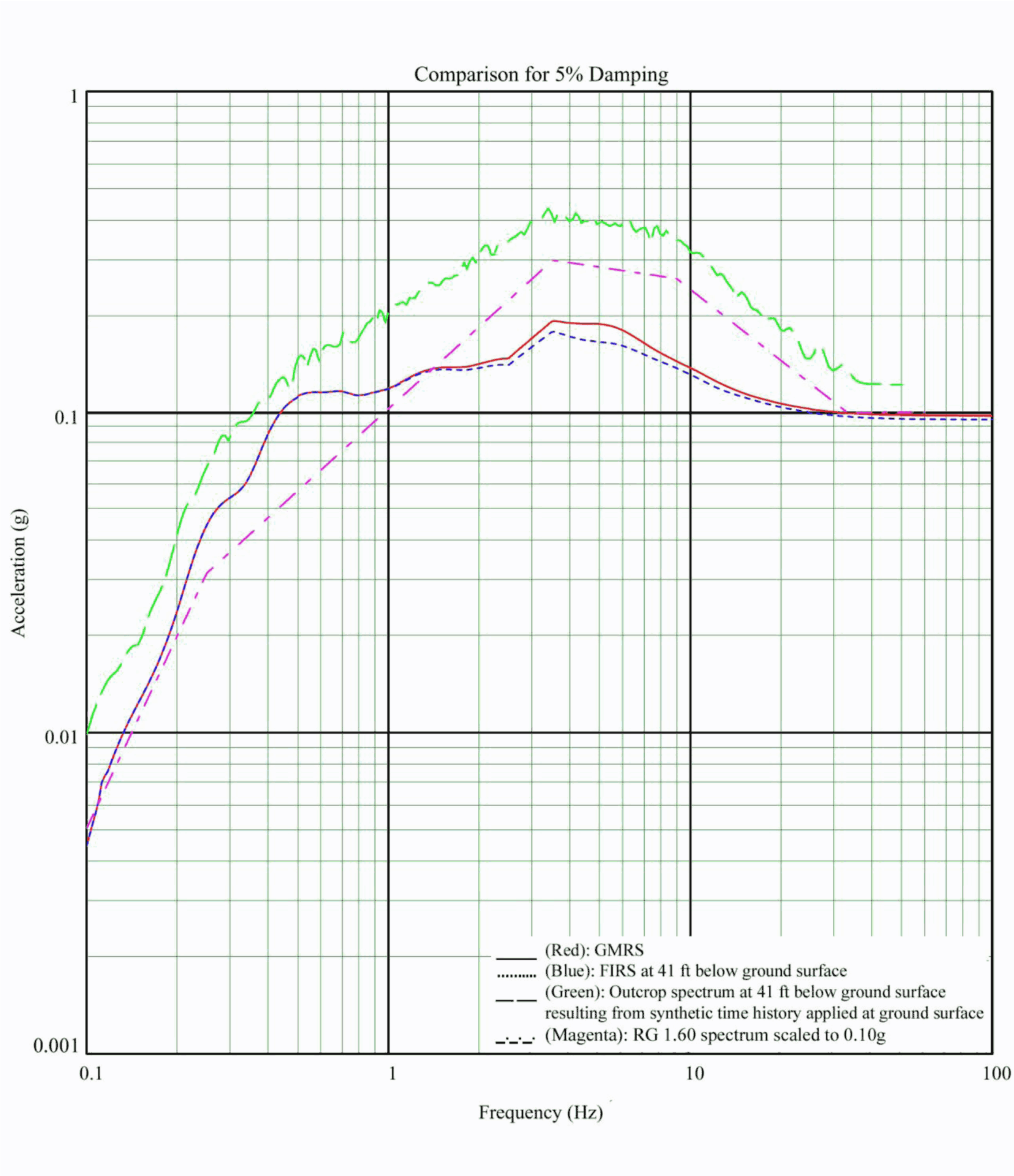


Figure 3H.6-11k Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Upper Bound Soil Properties, Vertical Direction

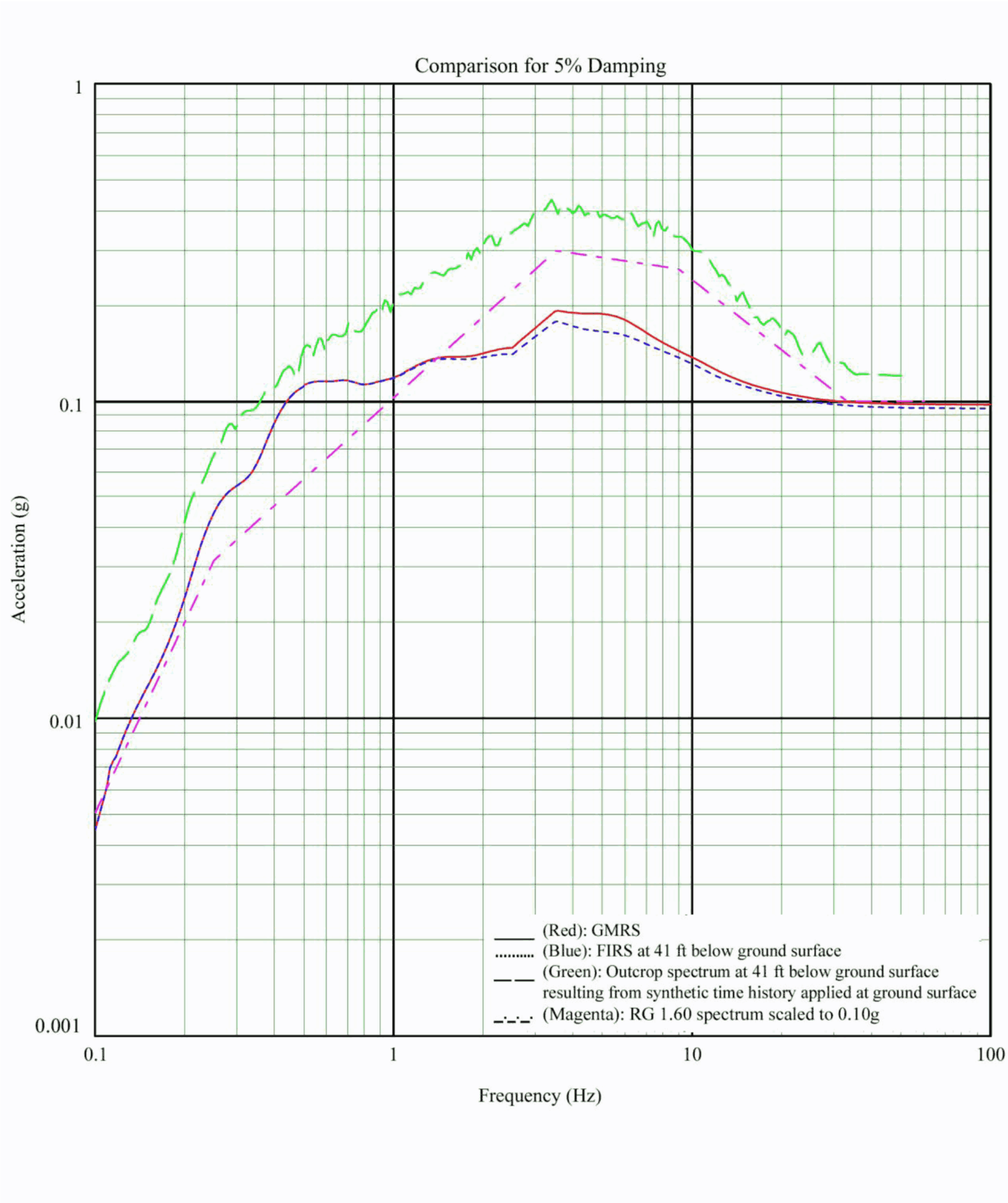


Figure 3H.6-11L Comparison of Spectra at Foundation of Emergency Diesel Generator Fuel Storage Vault – Lower Bound Soil Properties, Vertical Direction

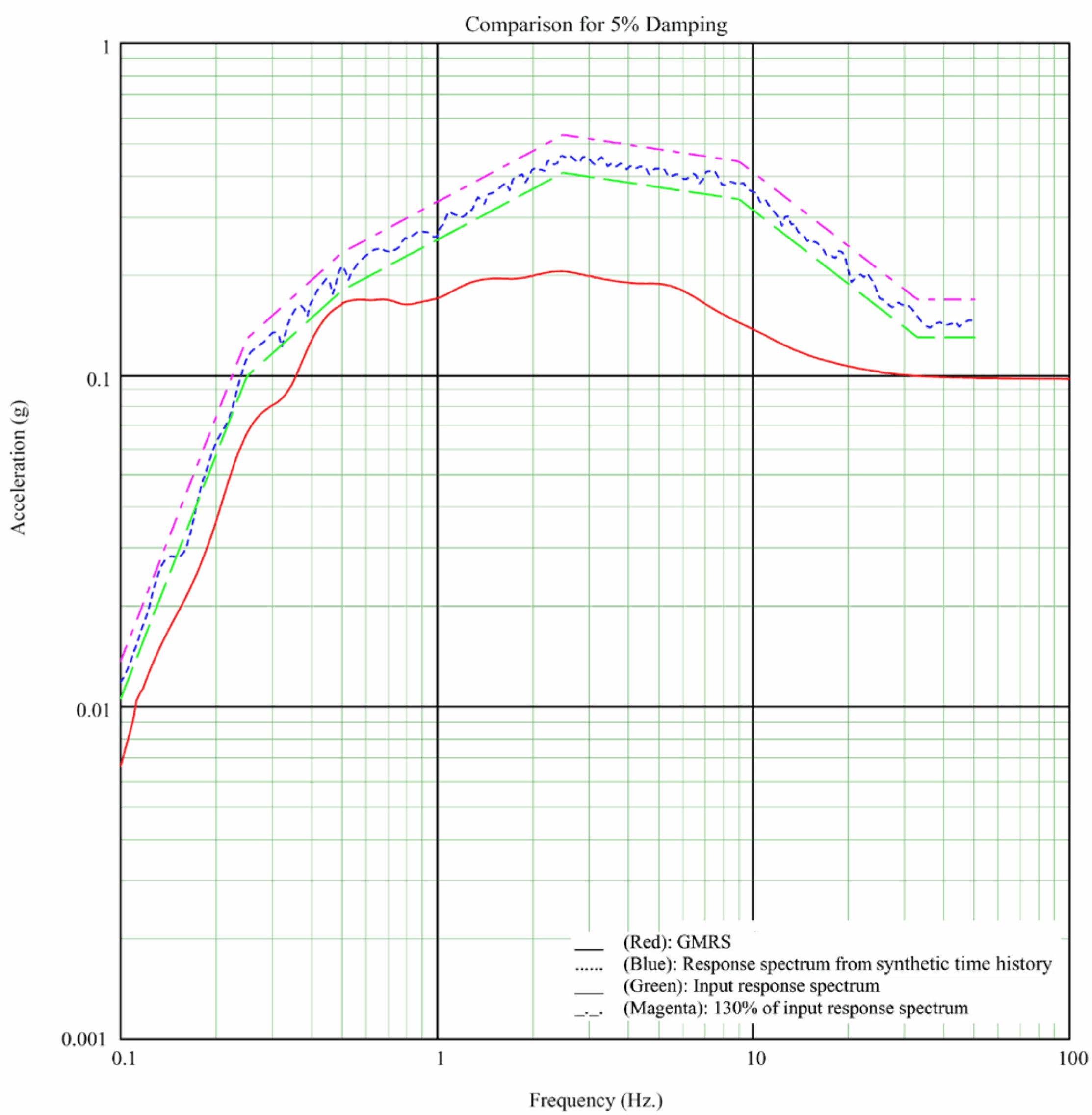


Figure 3H.6-12 Comparison of Spectrum from Synthetic Time History, Input Spectrum, 130% of Input Spectrum, and GMRS (E-W Direction)

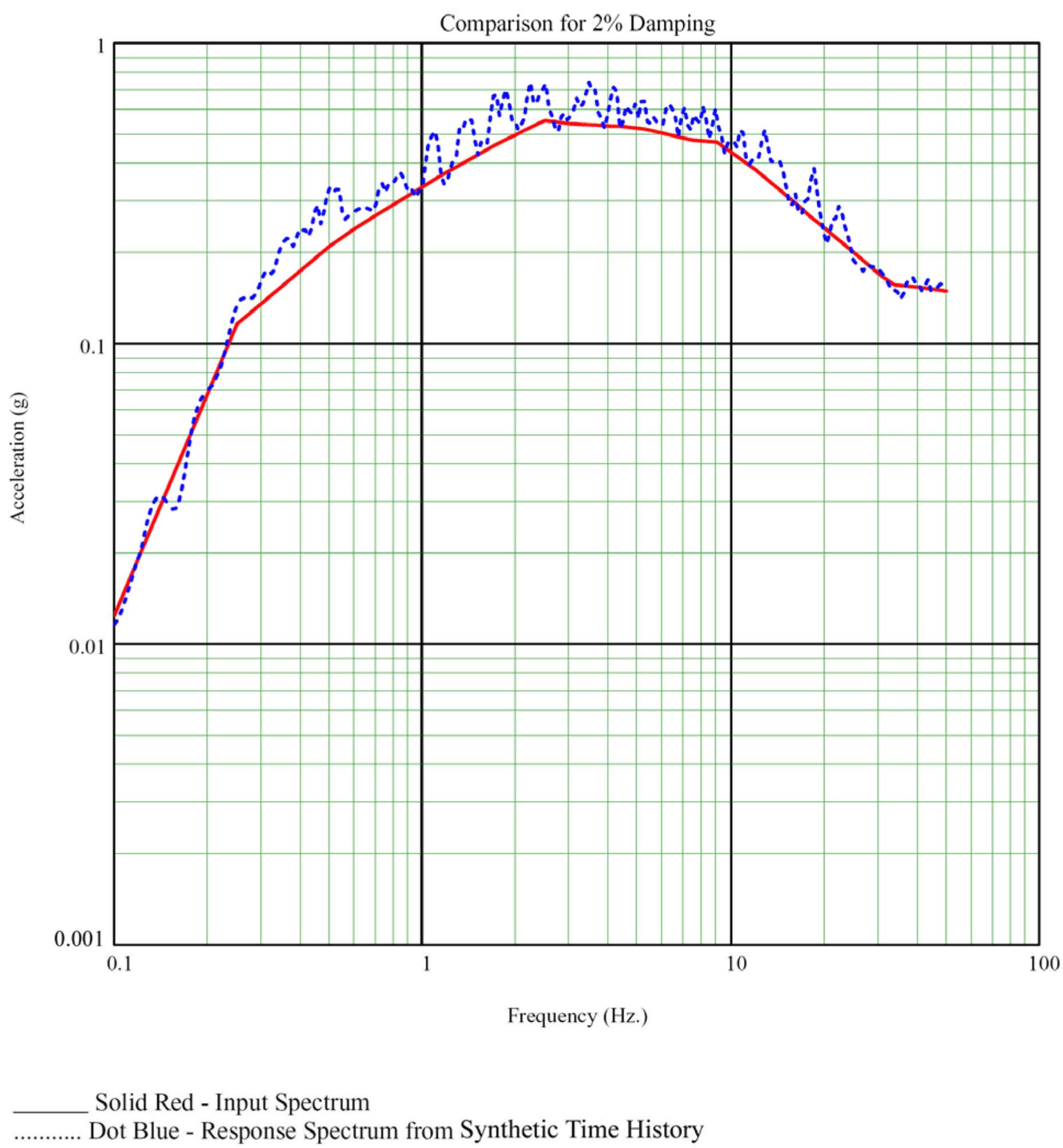
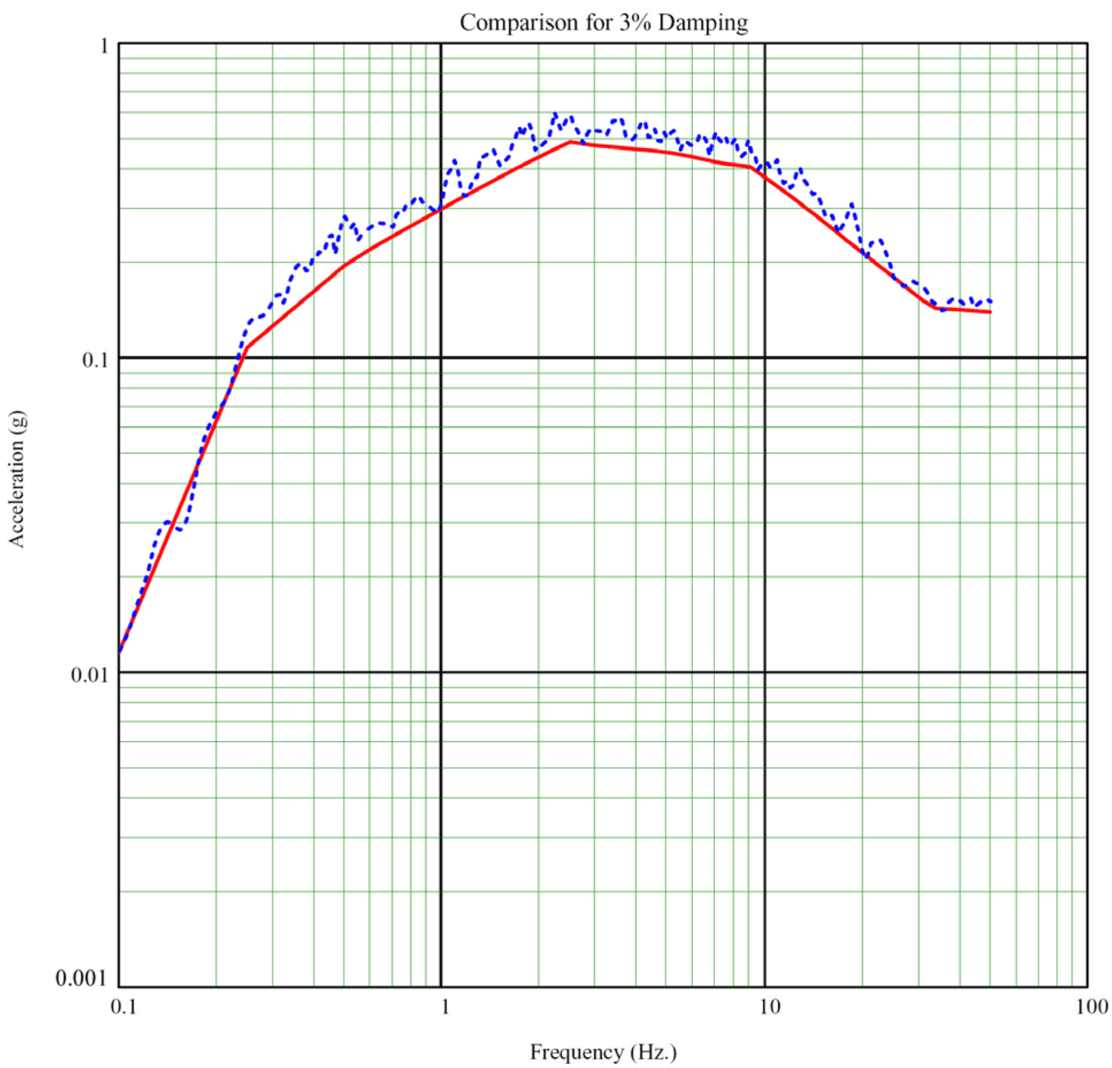
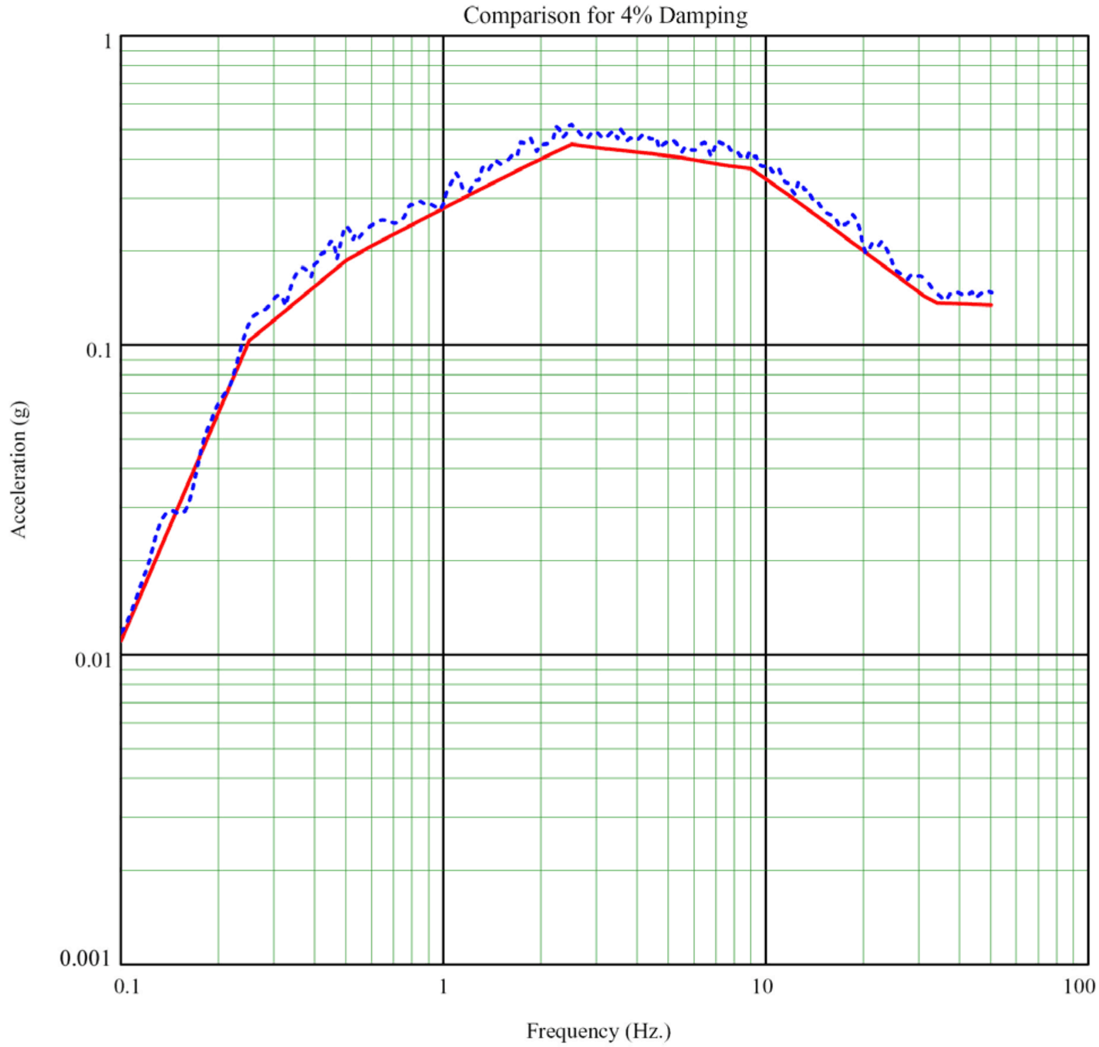


Figure 3H.6-12a Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (E-W) – 2% Damping



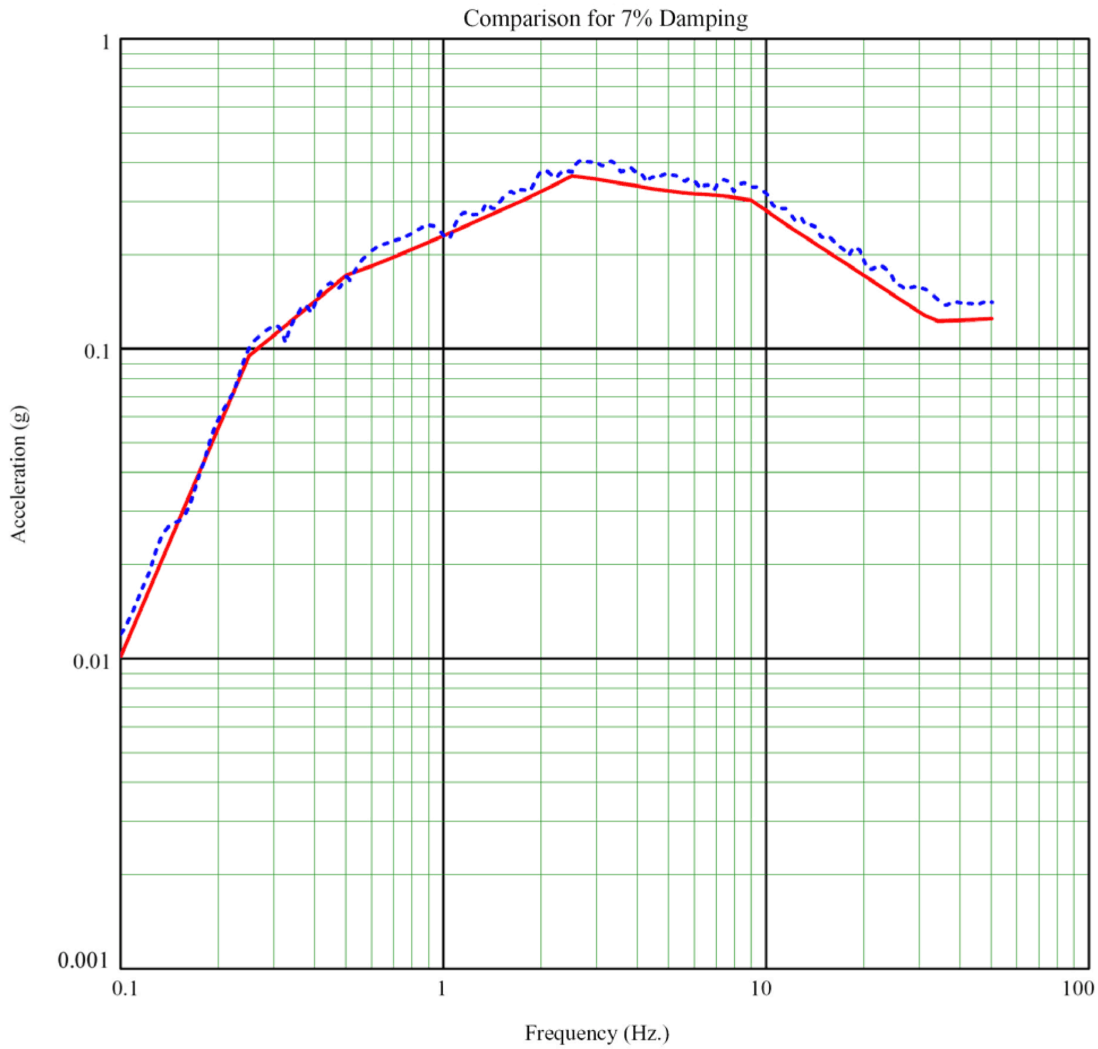
______ Solid Red - Input Spectrum
.... Dot Blue - Response Spectrum from Synthetic Time History

Figure 3H.6-12b Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (E-W) – 3% Damping



_______ Solid Red - Input Spectrum
.... Dot Blue - Response Spectrum from Synthetic Time History

Figure 3H.6-12c Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (E-W) – 4% Damping



_______ Solid Red - Input Spectrum
.... Dot Blue - Response Spectrum from Synthetic Time History

Figure 3H.6-12d Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (E-W) – 7% Damping

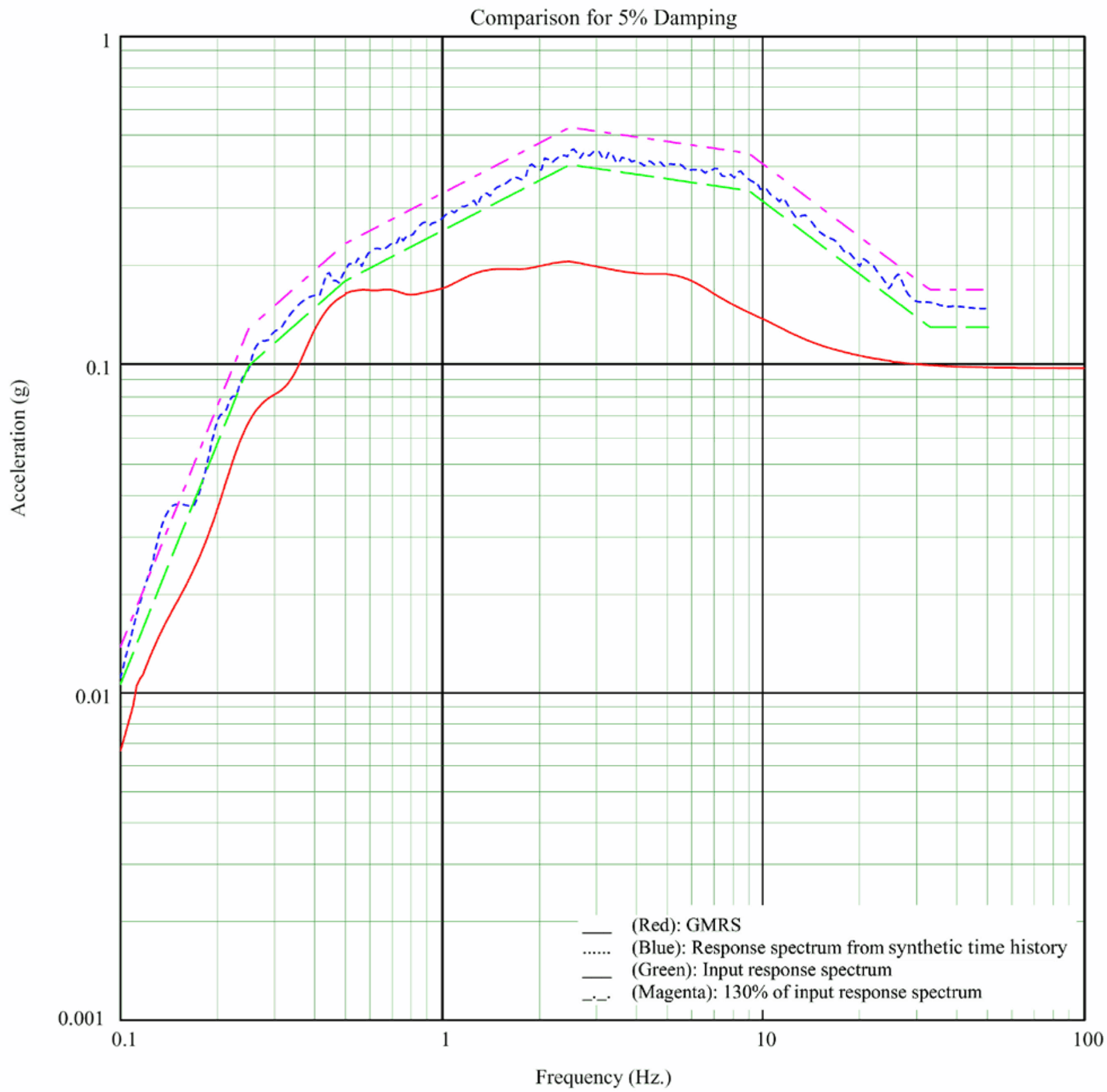


Figure 3H.6-13 Comparison of Spectrum from Synthetic Time History, Input Spectrum, 130% of Input Spectrum, and GMRS (N-S Direction)

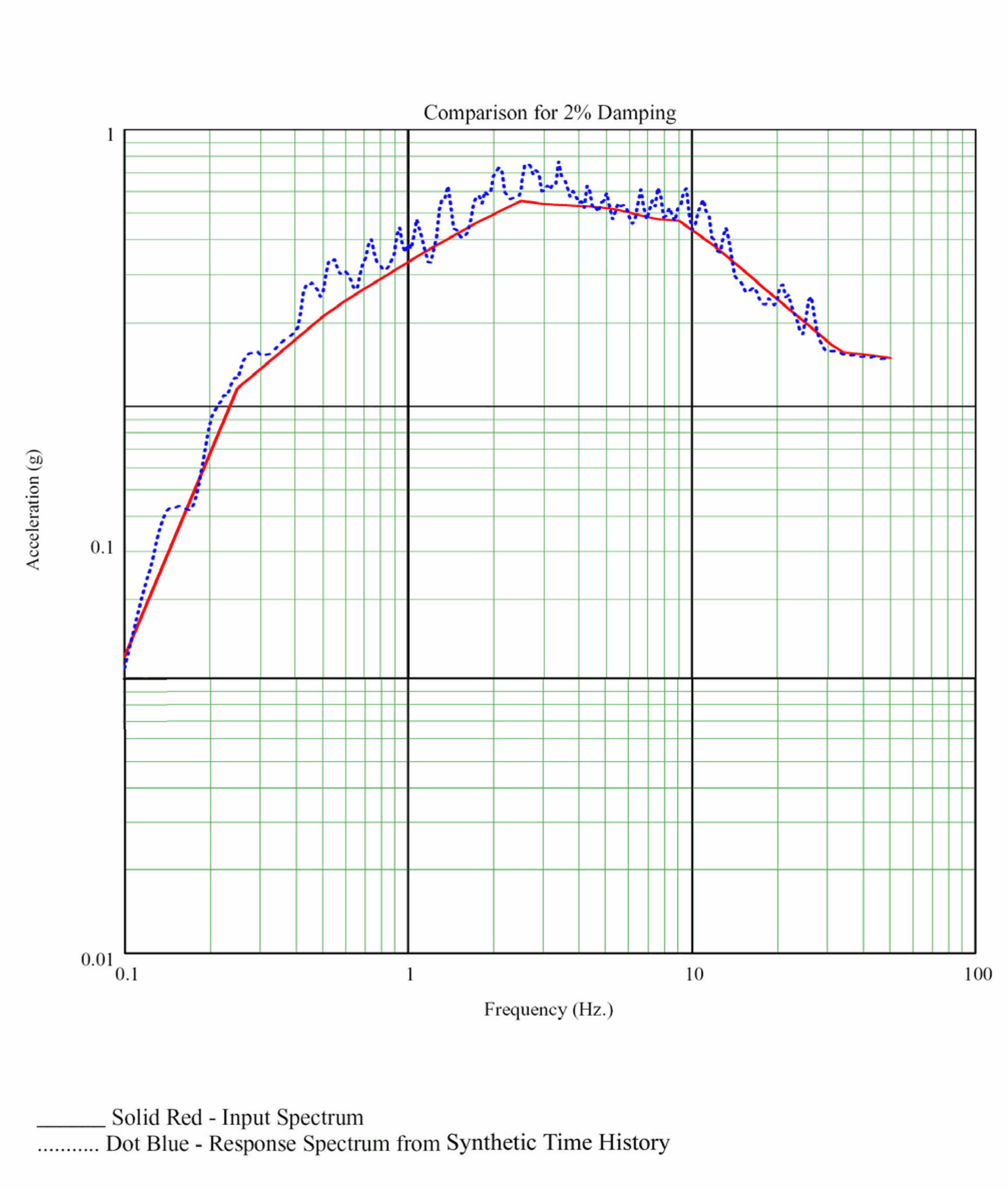


Figure 3H.6-13a Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (N-S) – 2% Damping

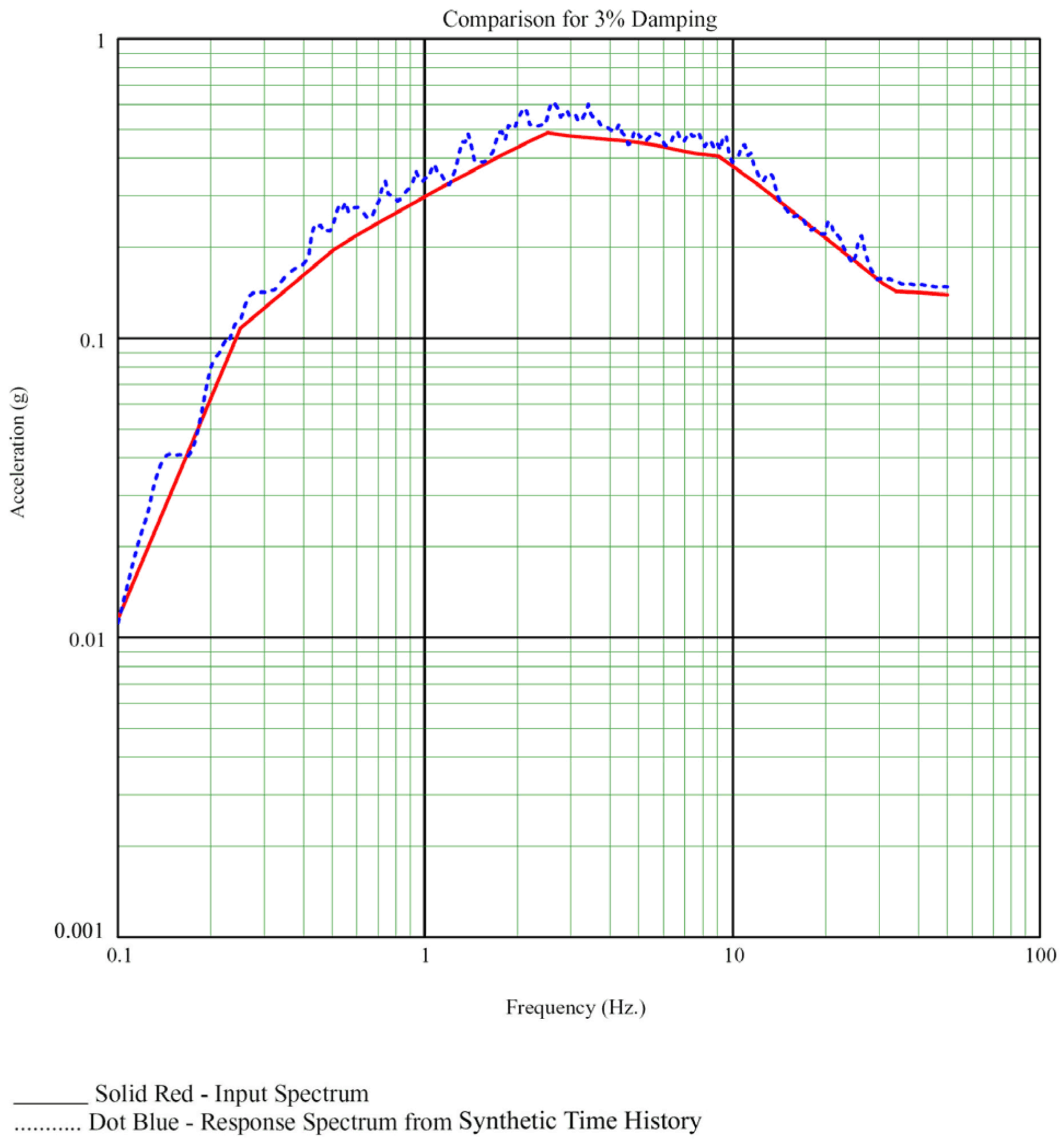


Figure 3H.6-13b Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (N-S) – 3% Damping

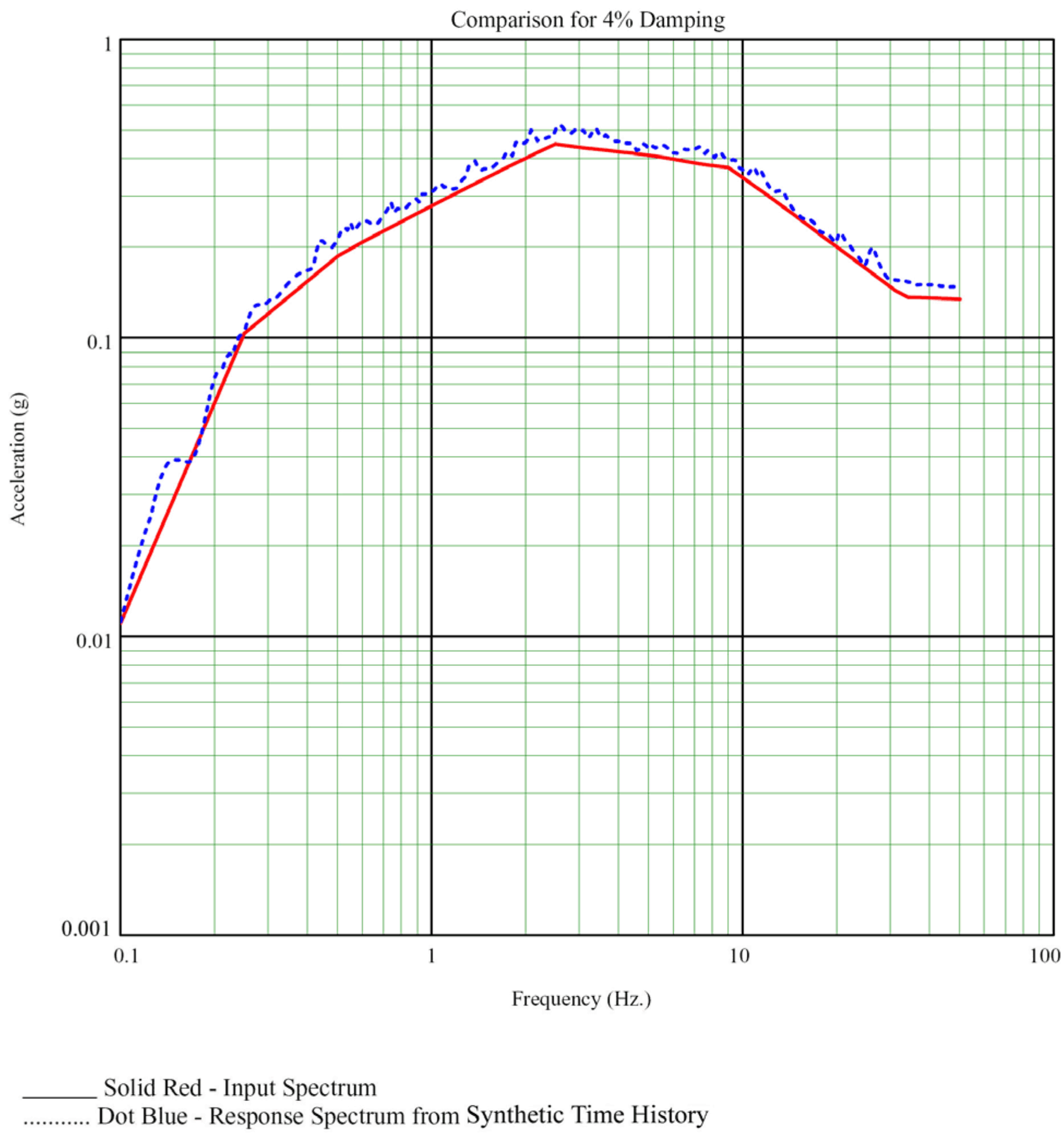
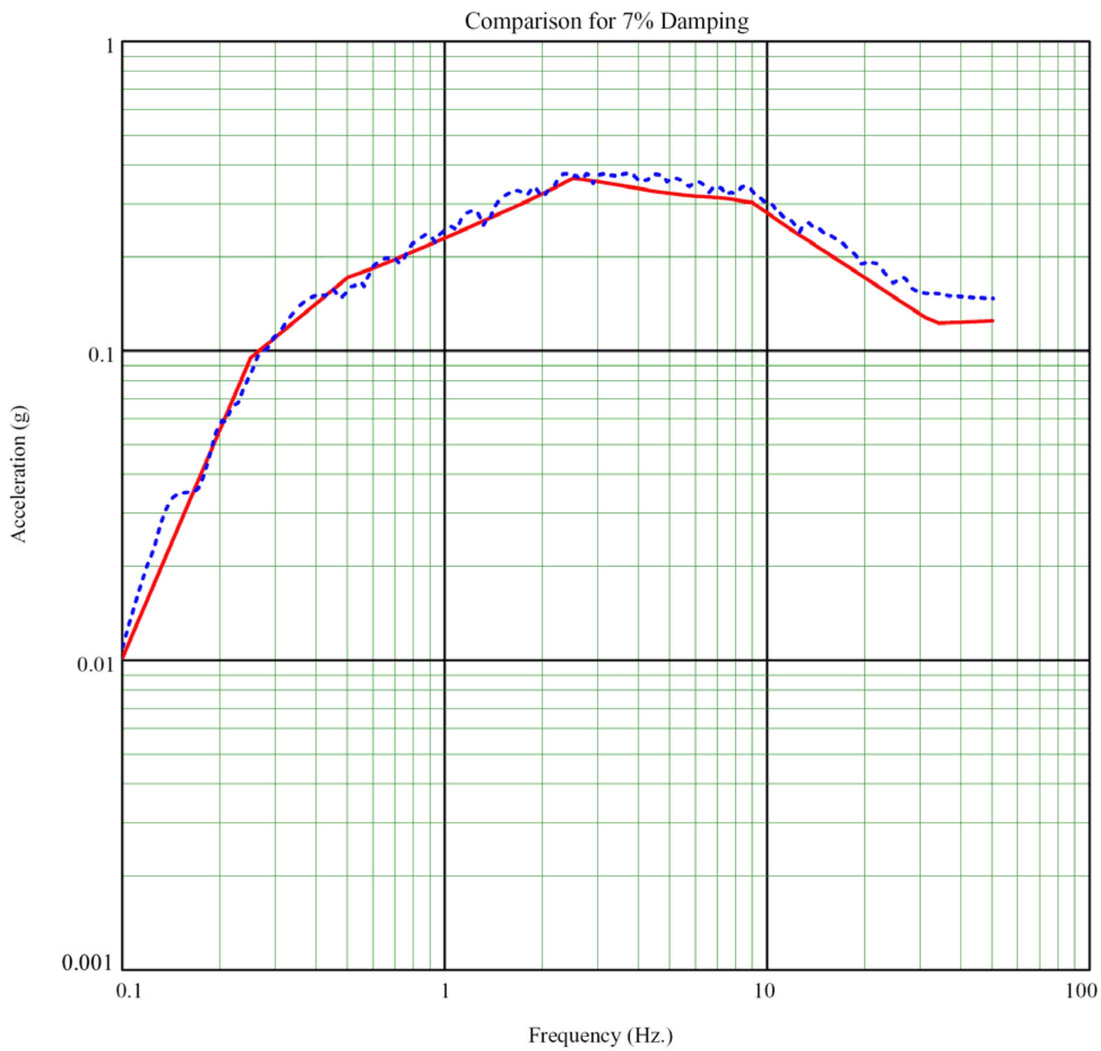


Figure 3H.6-13c Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (N-S) – 4% Damping



_______ Solid Red - Input Spectrum
.... Dot Blue - Response Spectrum from Synthetic Time History

Figure 3H.6-13d Comparison of Input Spectrum and Spectrum from Synthetic Time History, Horizontal (N-S) – 7% Damping

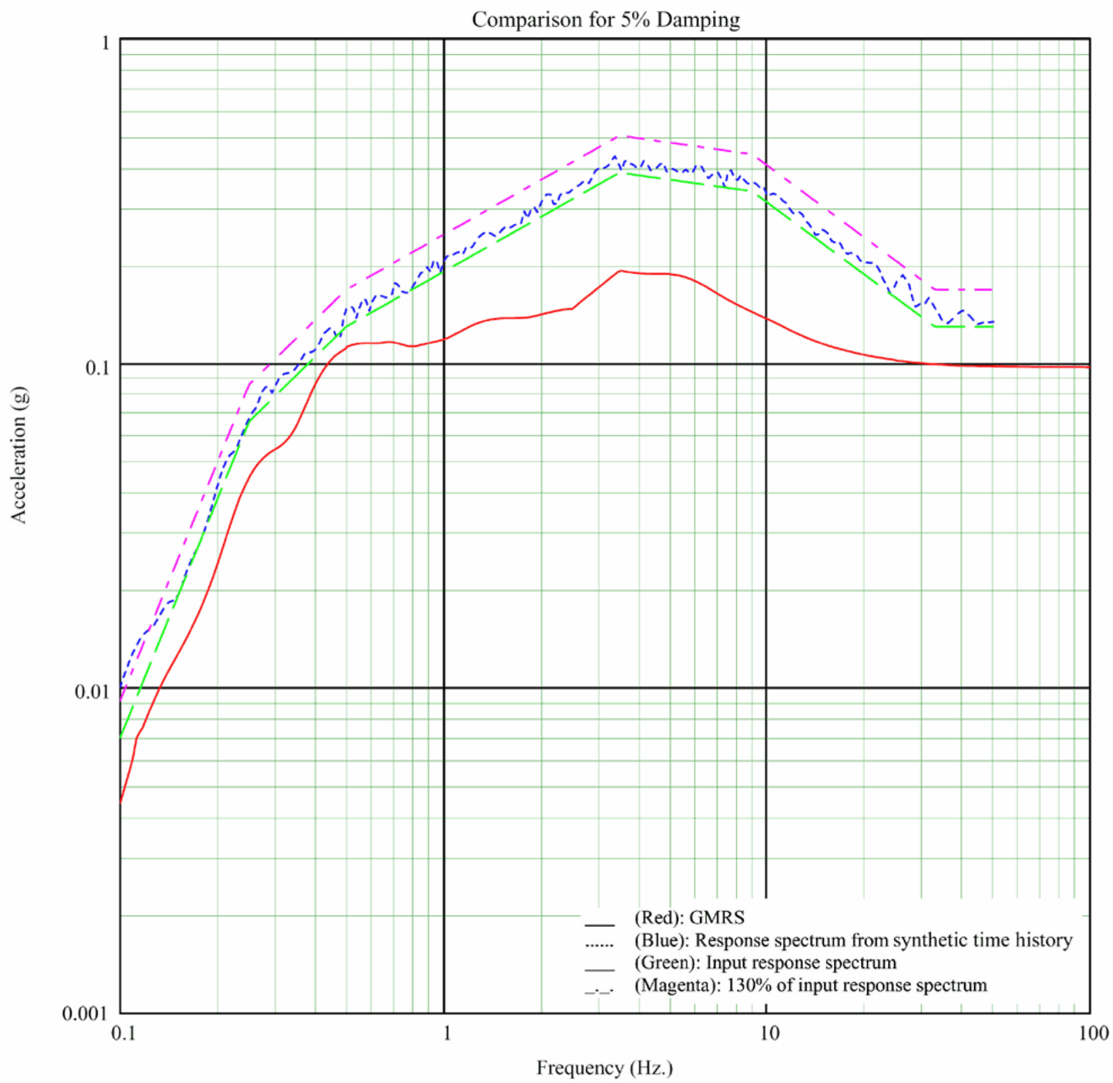


Figure 3H.6-14 Comparison of Spectrum from Artificial Time History, Input Spectrum, 130% of Input Spectrum, and GMRS (Vertical Direction)

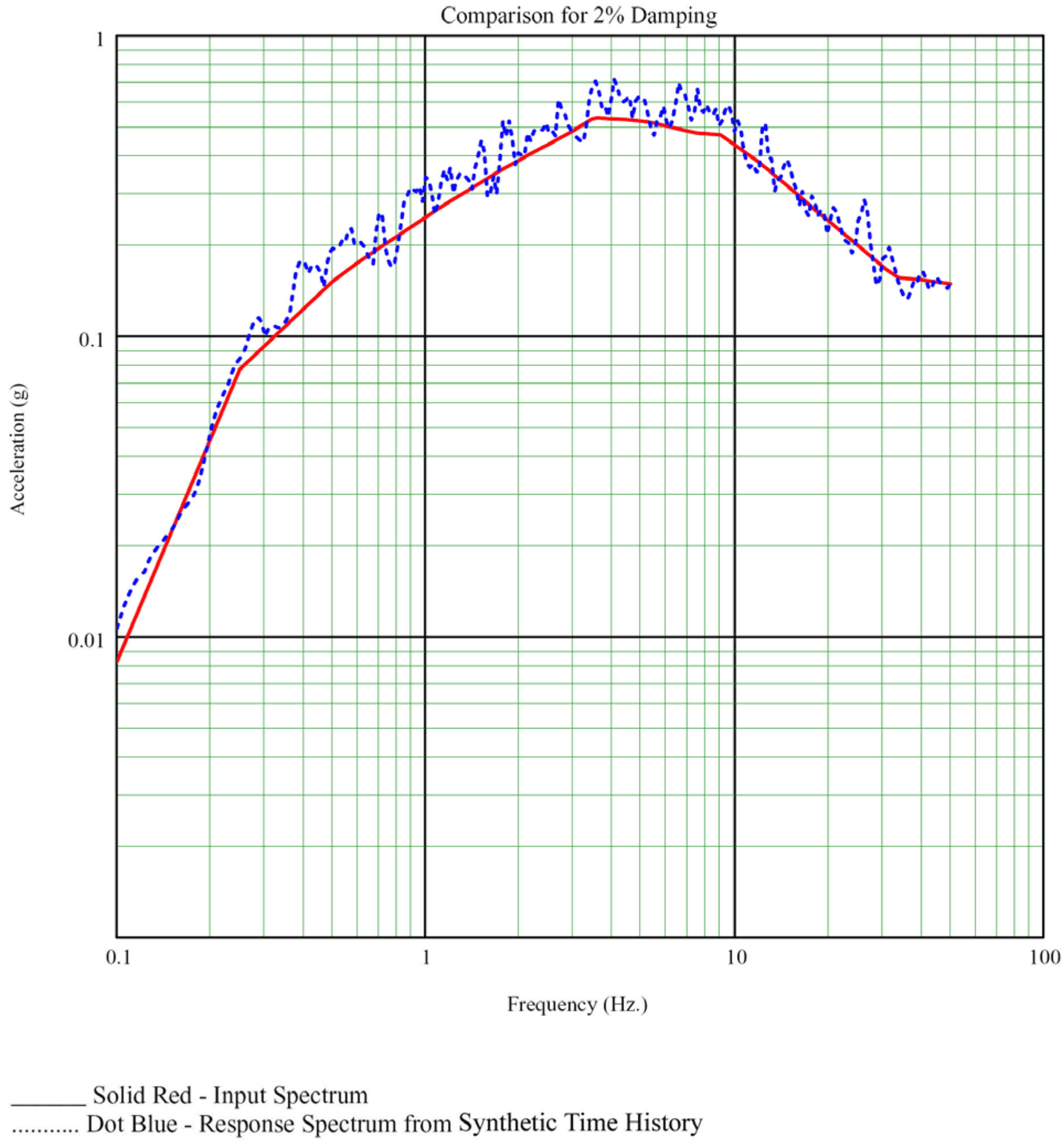


Figure 3H.6-14a Comparison of Input Spectrum and Spectrum from Synthetic Time History, Vertical – 2% Damping

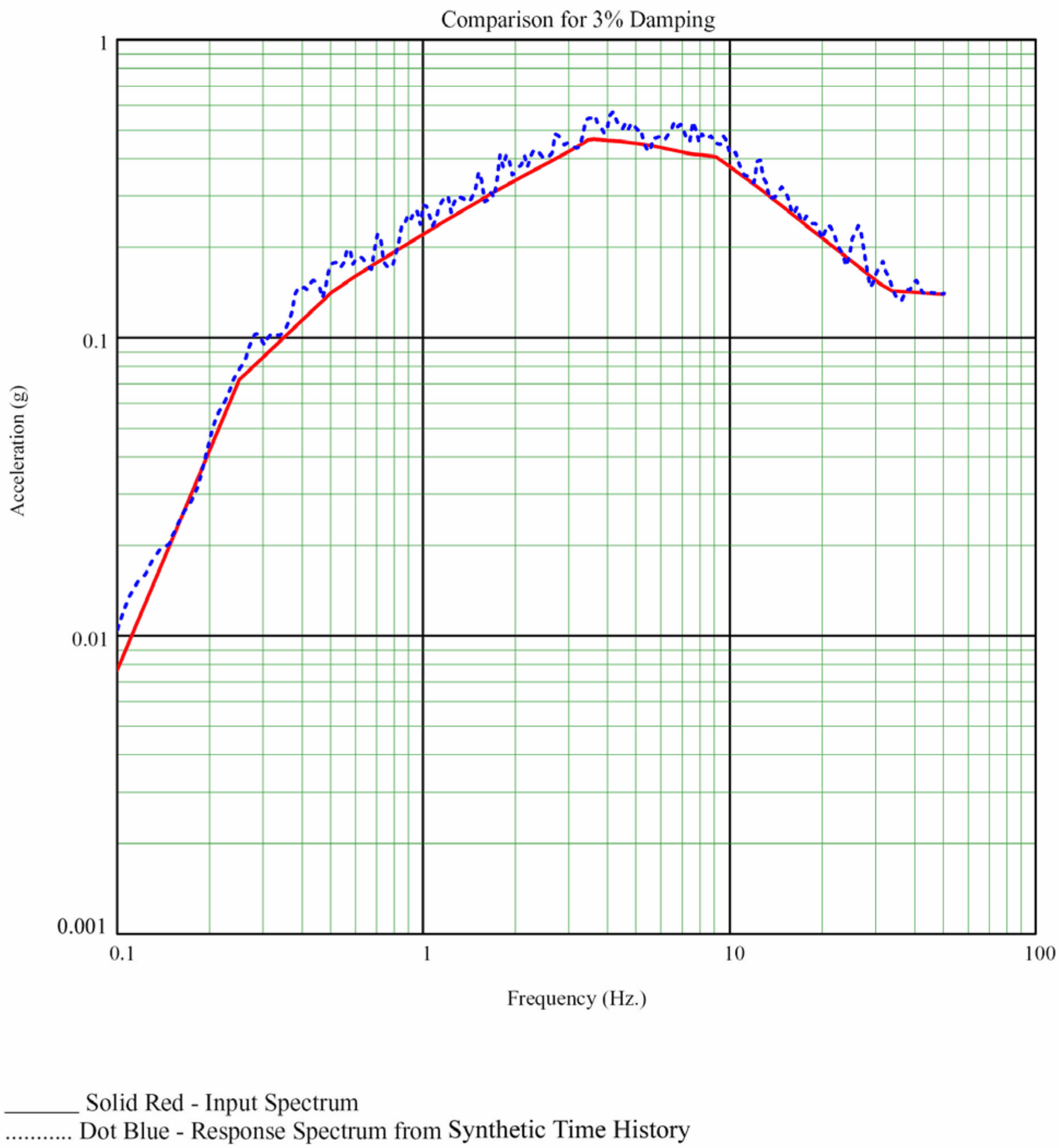


Figure 3H.6-14b Comparison of Input Spectrum and Spectrum from Synthetic Time History, Vertical – 3% Damping

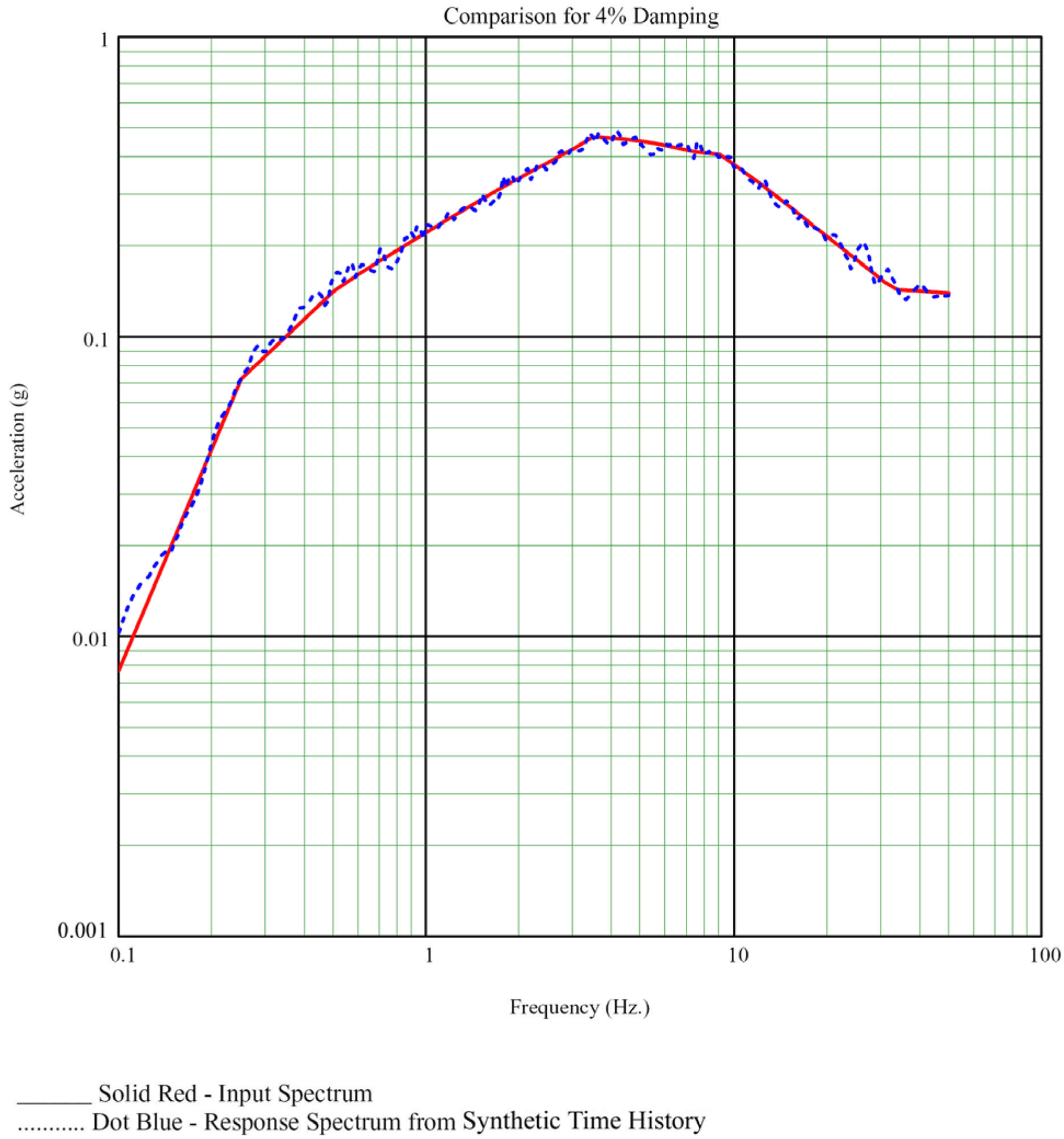


Figure 3H.6-14c Comparison of Input Spectrum and Spectrum from Synthetic Time History, Vertical – 4% Damping

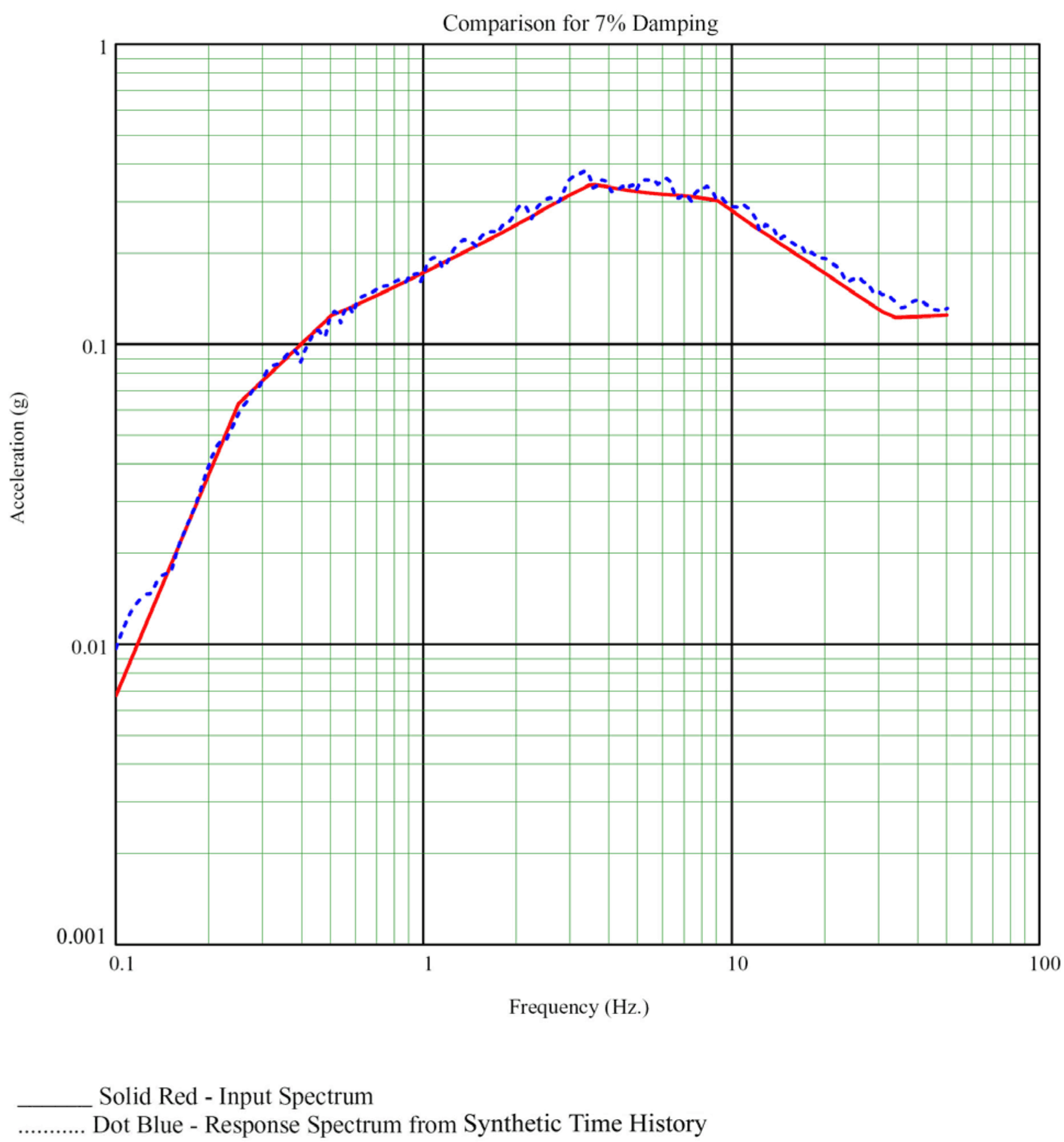


Figure 3H.6-14d Comparison of Input Spectrum and Spectrum from Synthetic Time History, Vertical – 7% Damping

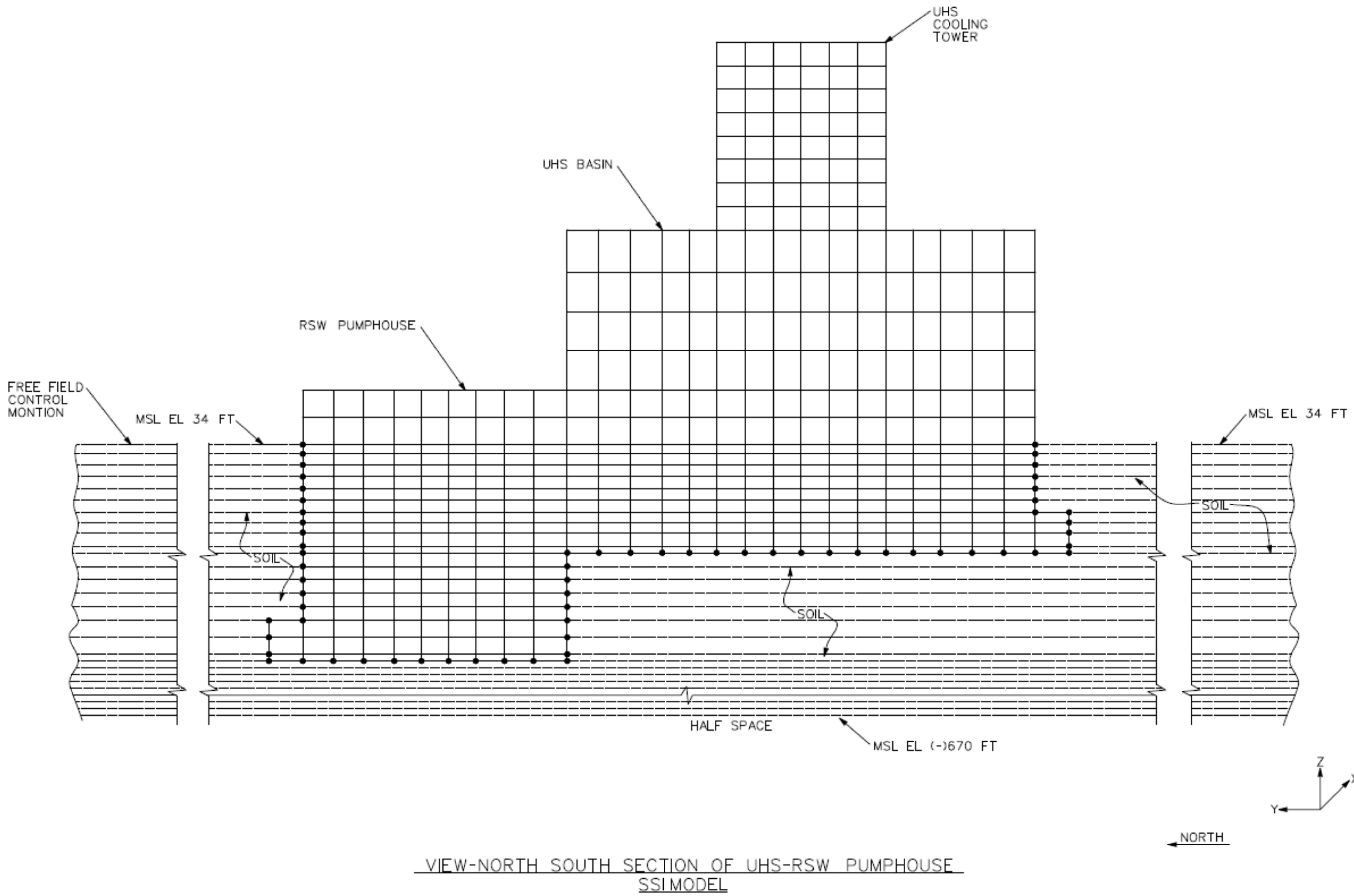


Figure 3H.6-15 SASSI2000 Model of UHS and RSW Pump House

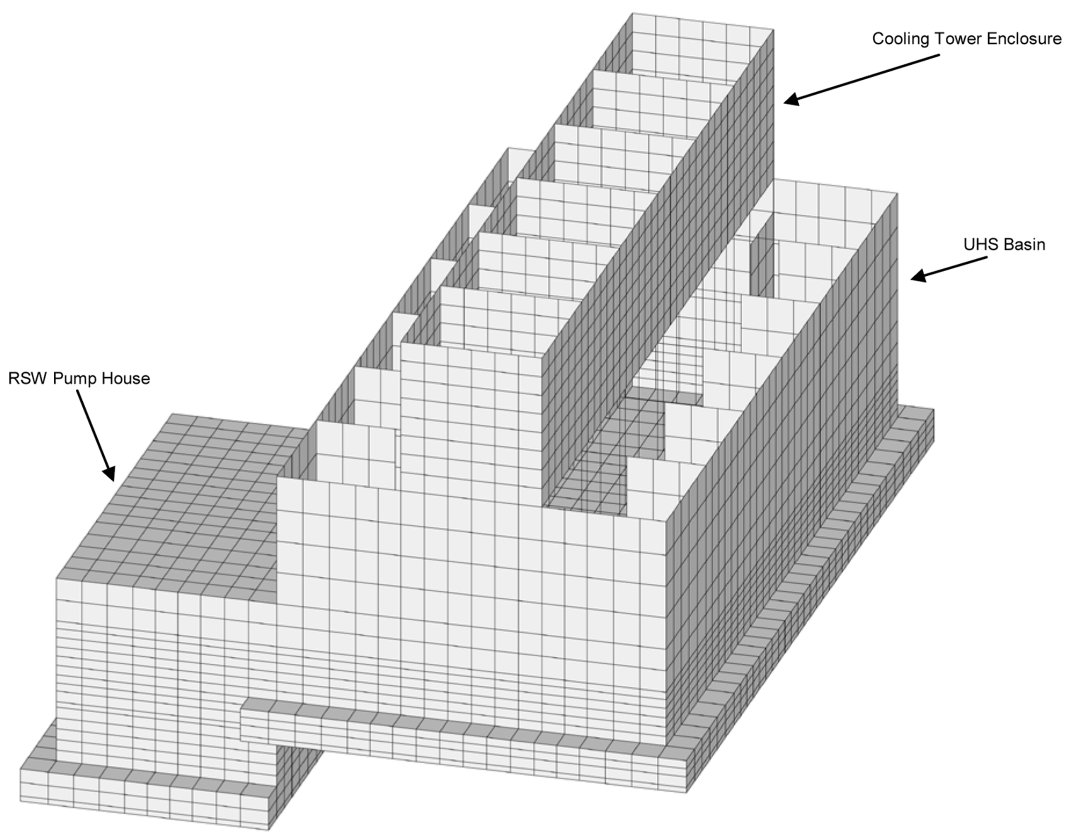
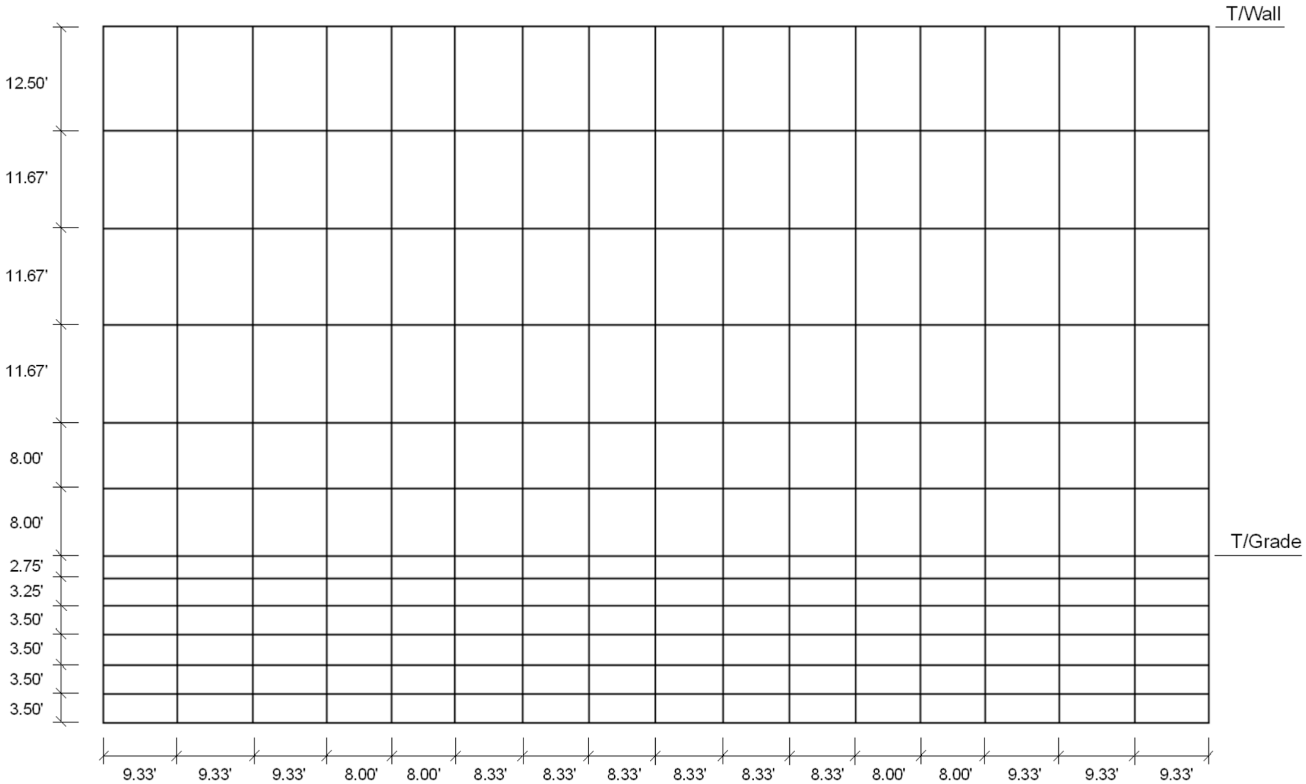
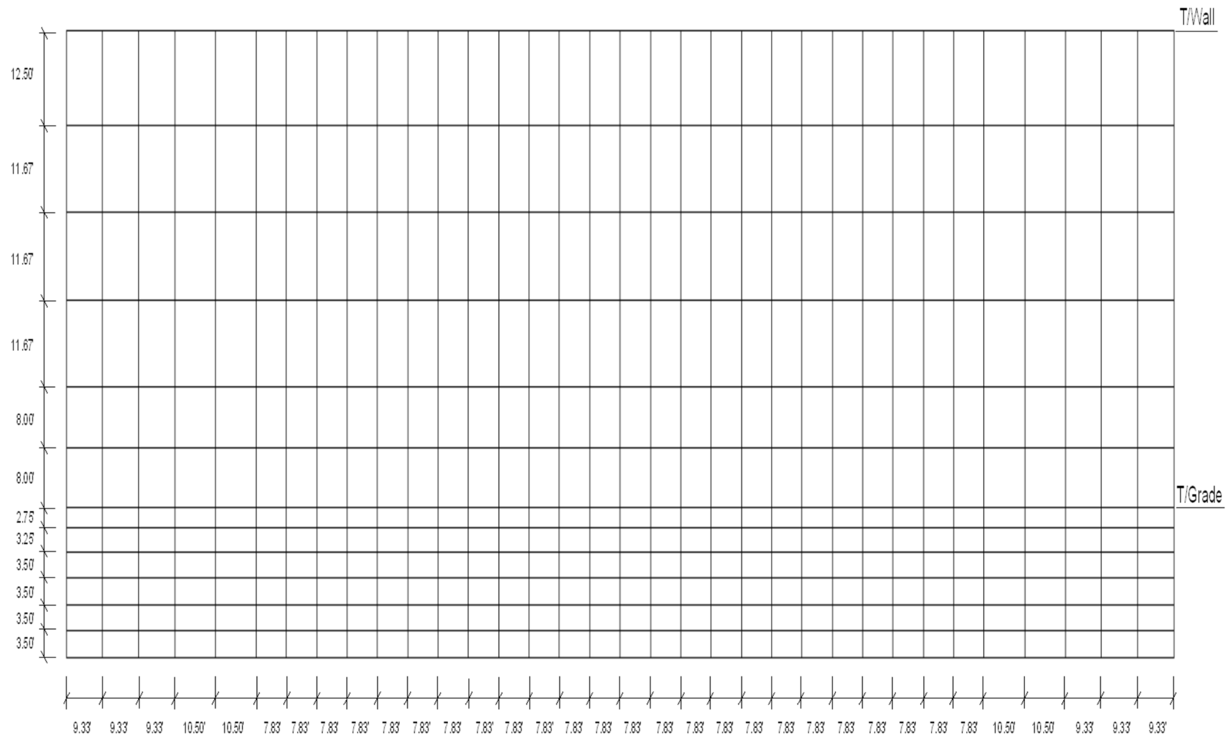


Figure 3H.6-15a SSI Model (structure only)



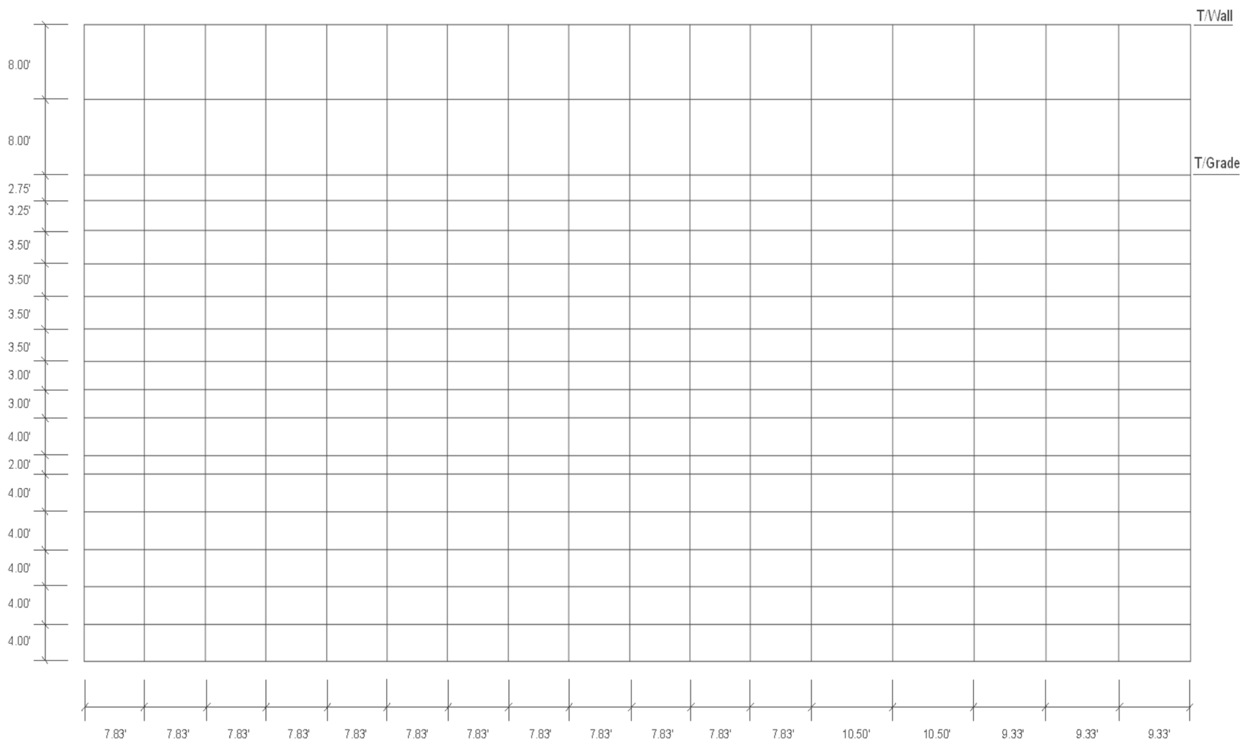
Note: Basin East and West Walls have the same mesh. The mesh is symmetrical about the vertical axis such that the view is the same whether looking at the wall from the inside or outside of the basin.

Figure 3H.6-15b UHS Basin East and West Wall – SSI Model



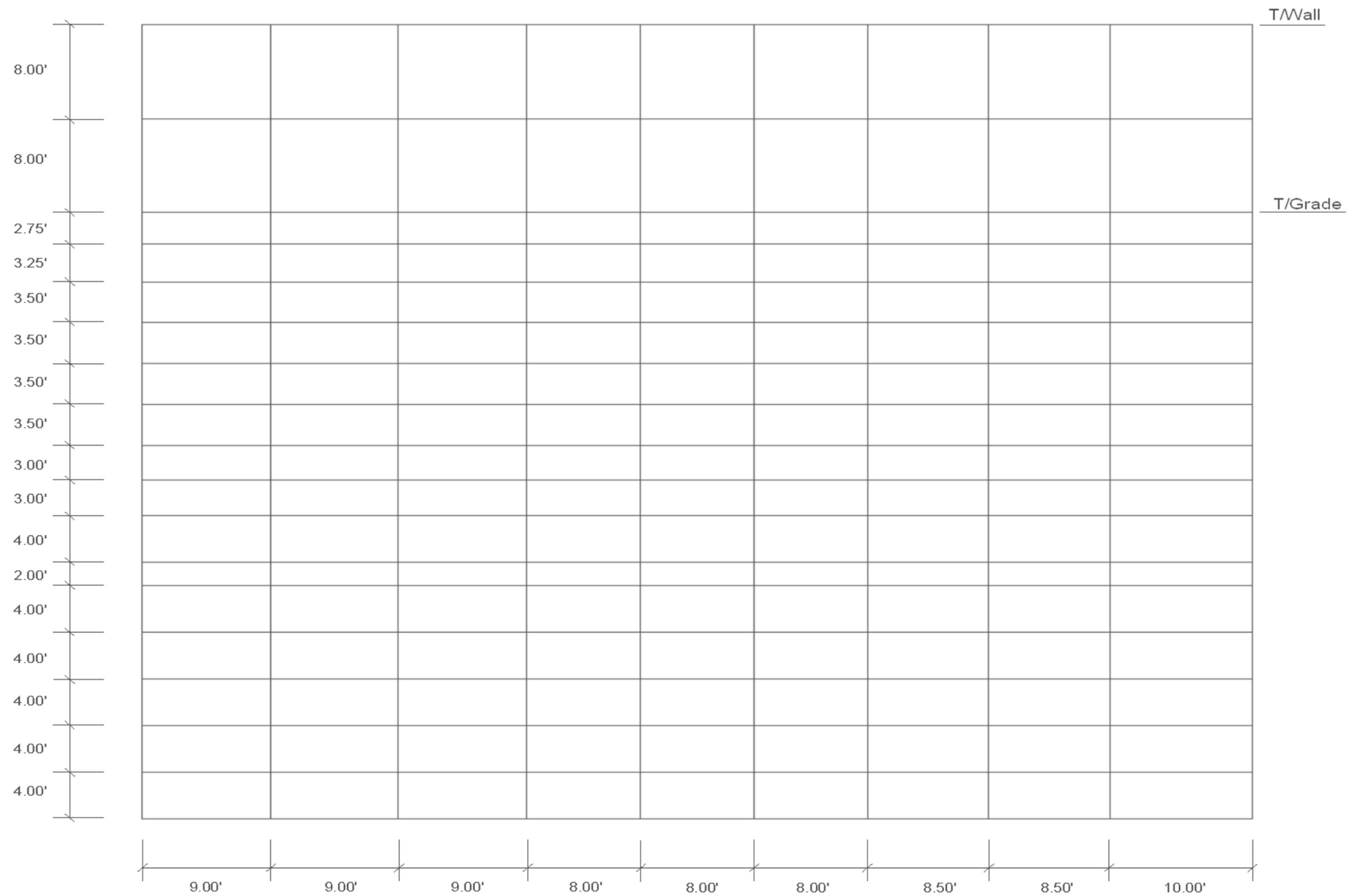
Note: Basin North and South Walls have the same mesh. The mesh is symmetrical about the vertical axis such that the view is the same whether looking at the wall from the inside or outside of the basin.

Figure 3H.6-15c UHS Basin North and South Wall – SSI Model



Note: The view is looking south at the outside face of the RSW pump house north wall.

Figure 3H.6-15d RSW Pump House North Wall – SSI Model



Note: The view above is looking east at the outside face of the RSW pump house west wall. The RSW pump house east wall mesh is the mirror image of the RSW pump house west wall mesh with the same dimensions

Figure 3H.6-15e RSW Pump House East and West Wall – SSI Model

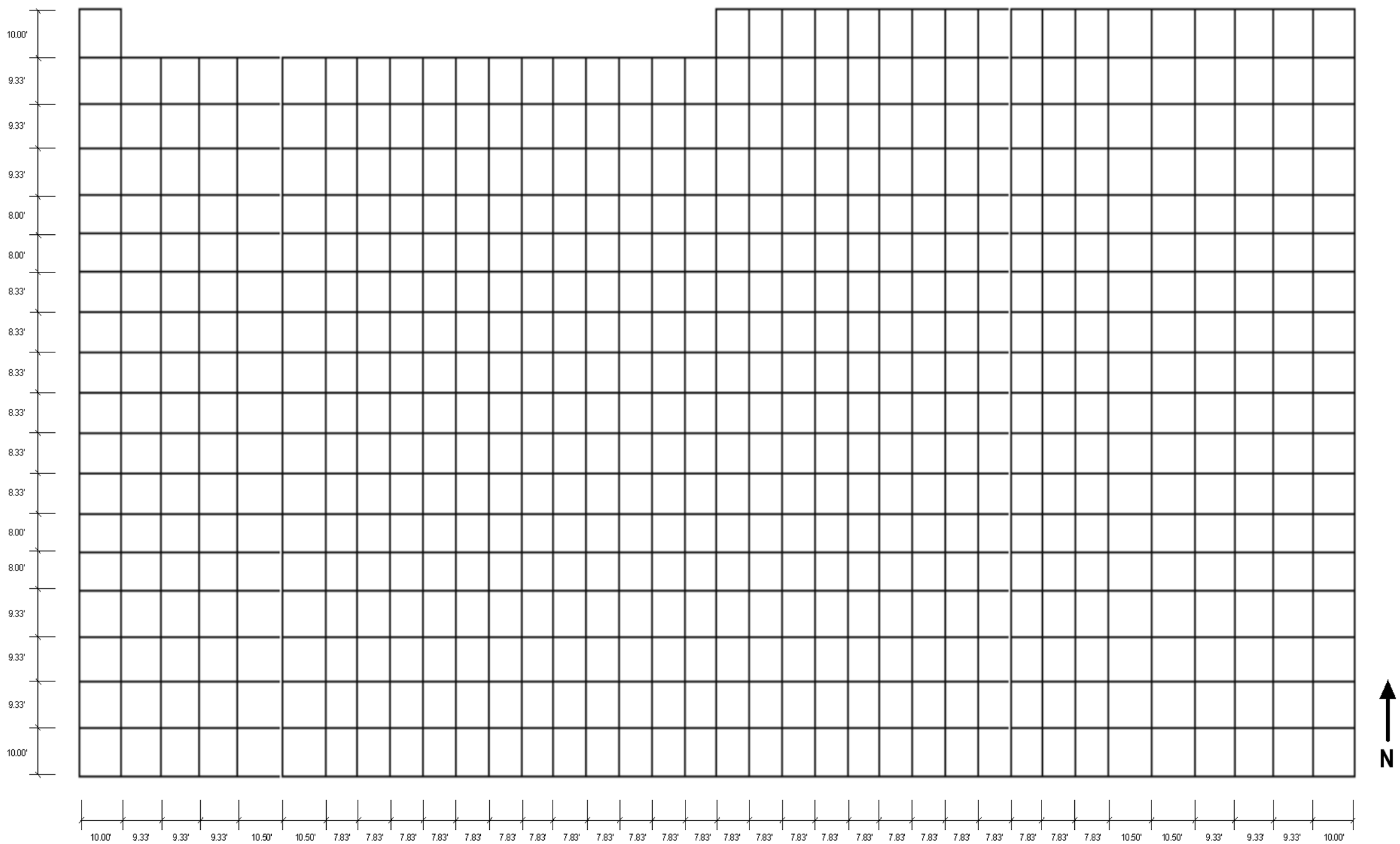


Figure 3H.6-15f UHS Basin Basemat – SSI Model

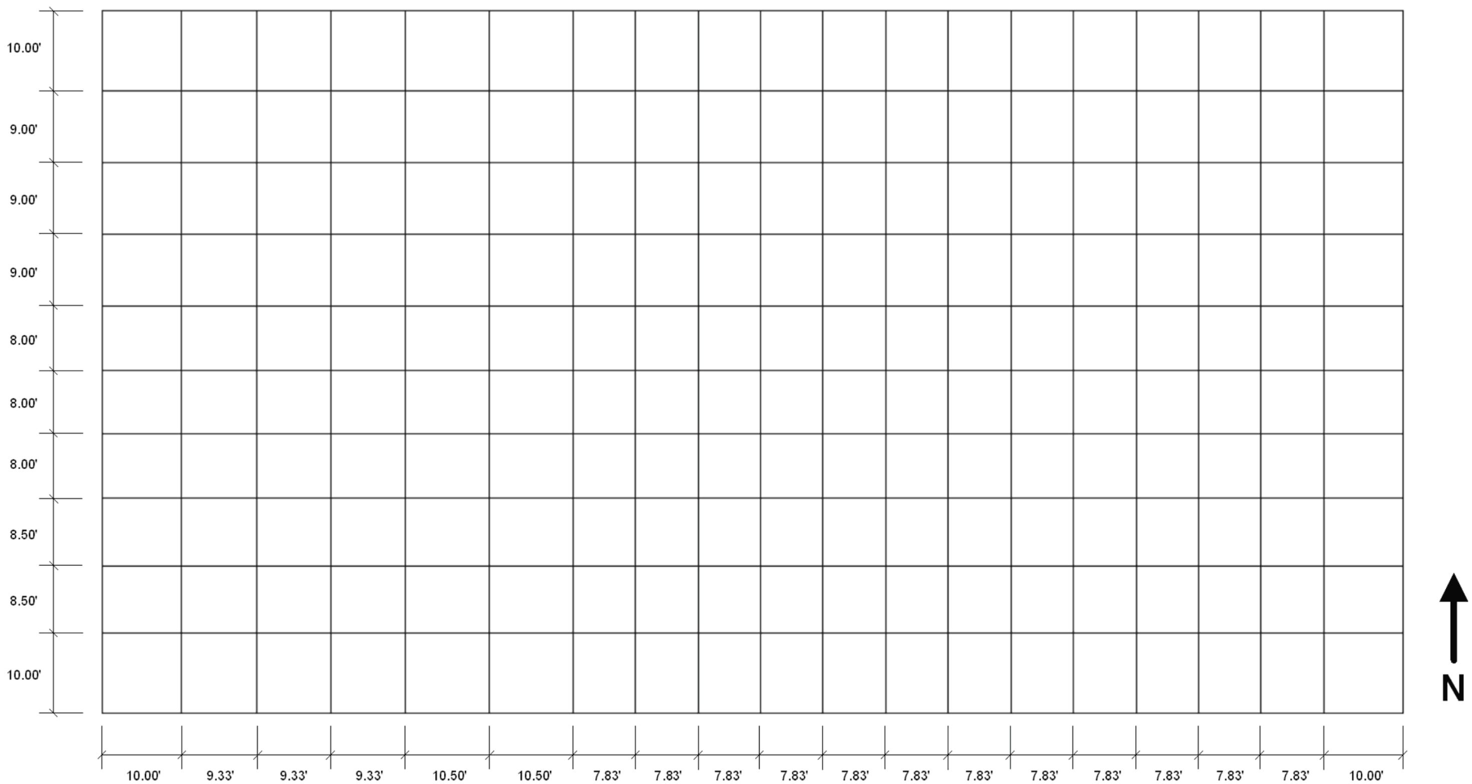


Figure 3H.6-15g RSW Pump House Basemat – SSI Model

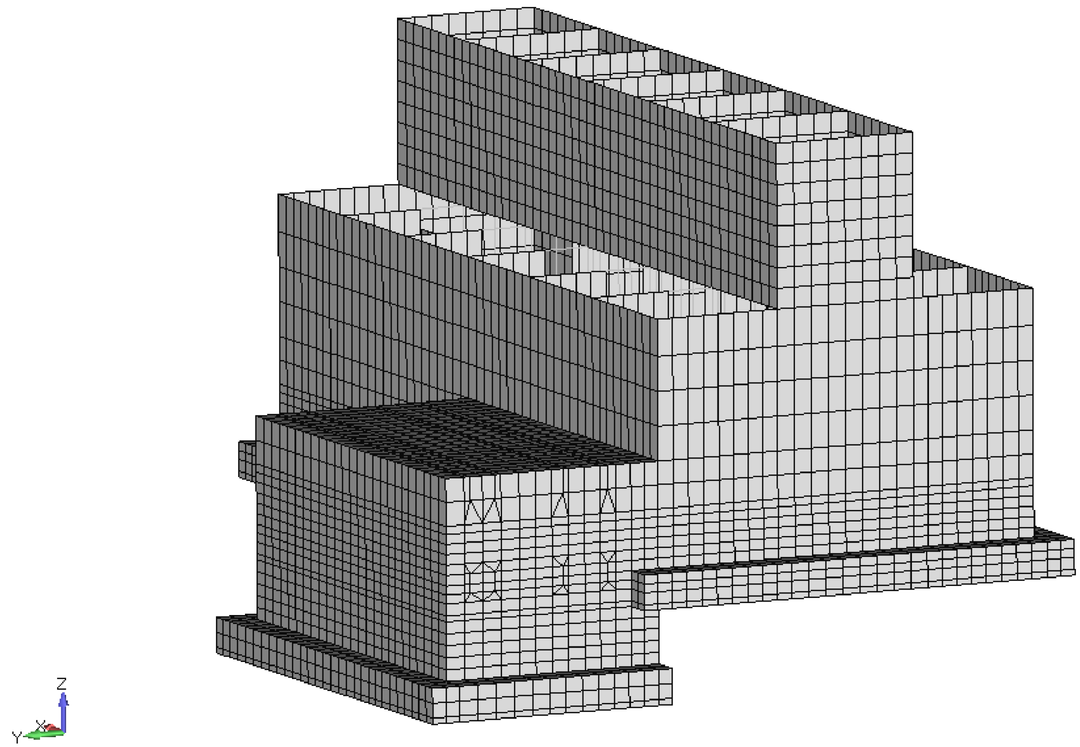


Figure 3H.6-15h SSI Refined Mesh Model of UHS/RSW Pump House

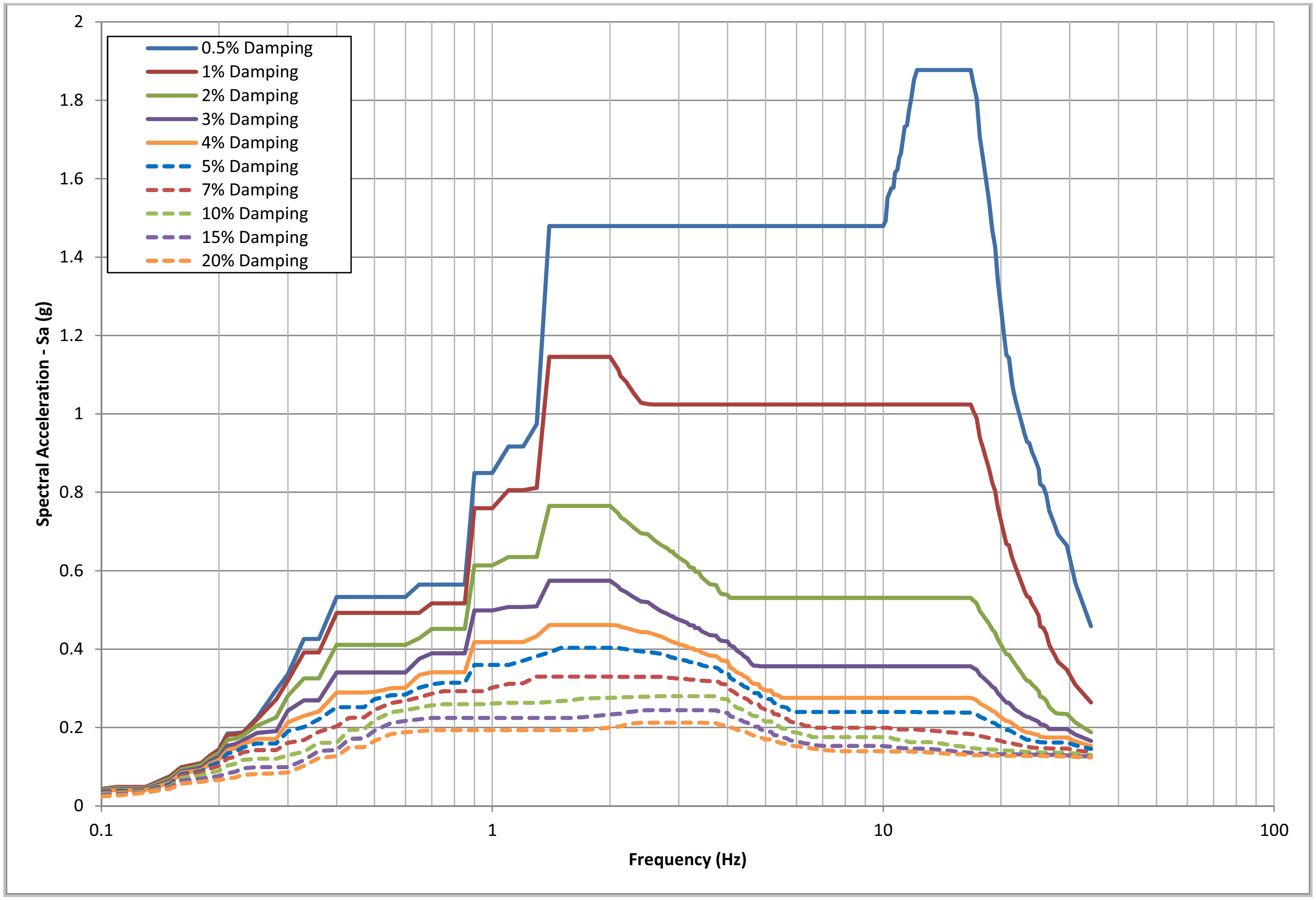


Figure 3H.6-16 Broadened FRS in E-W (X) Direction at the Top of RSW Pump House Mat (Elevation -18 ft MSL)

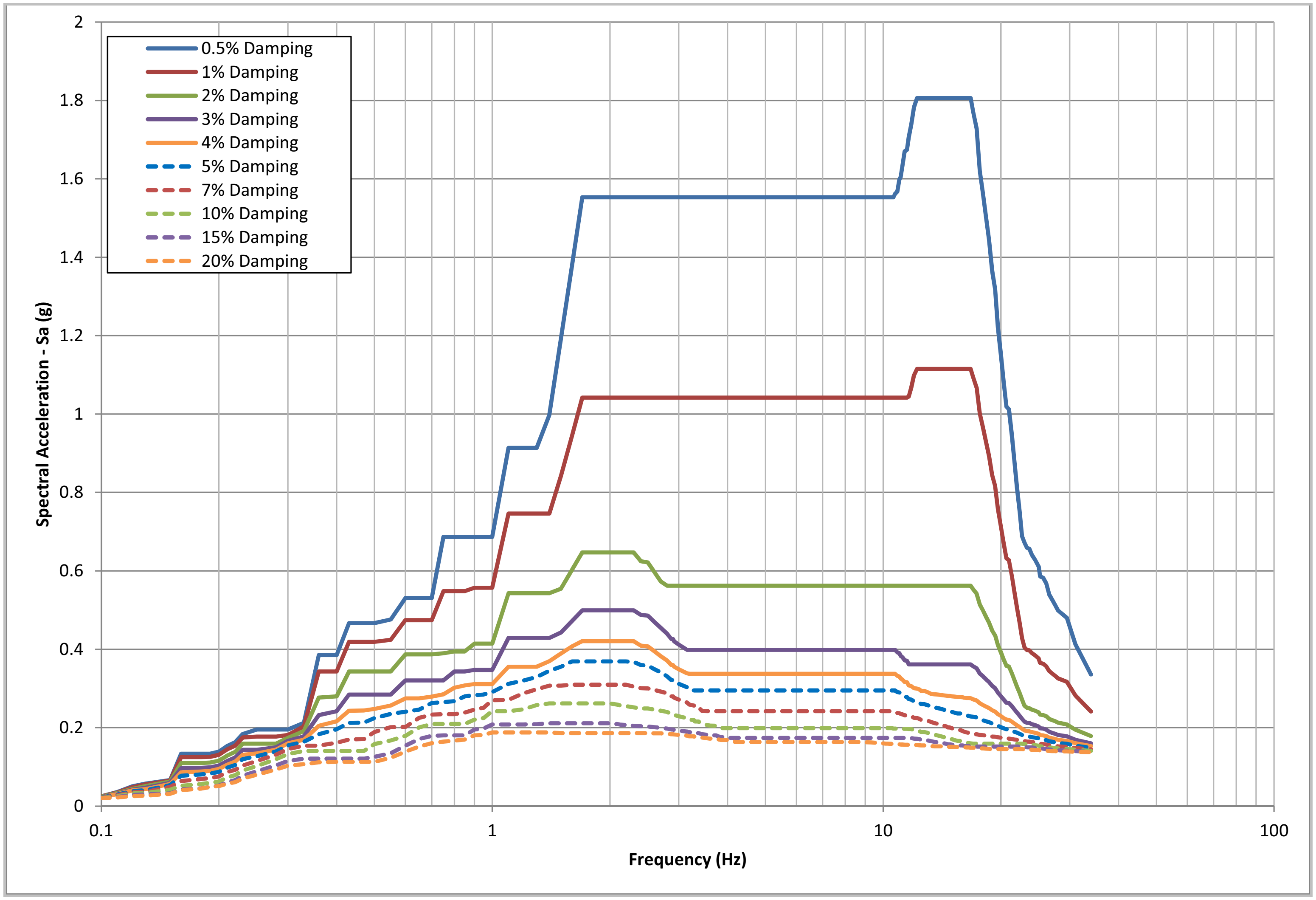


Figure 3H.6-17 Broadened FRS in N-S (Y) Direction at the Top of RSW Pump House Mat (Elevation -18 ft MSL)

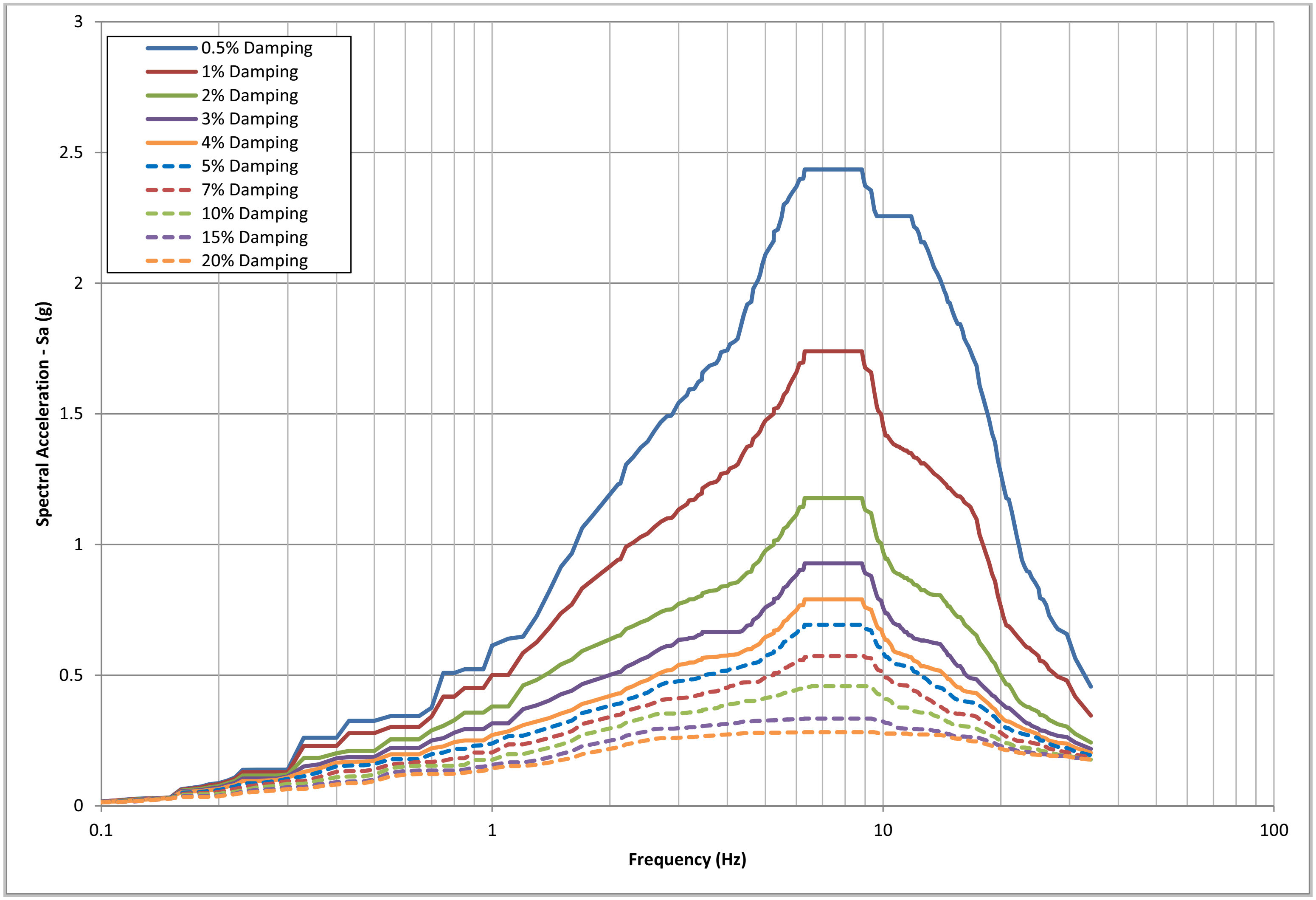


Figure 3H.6-18 Broadened FRS in Vertical (Z) Direction at the Top of RSW Pump House Mat (Elevation -18 ft MSL)

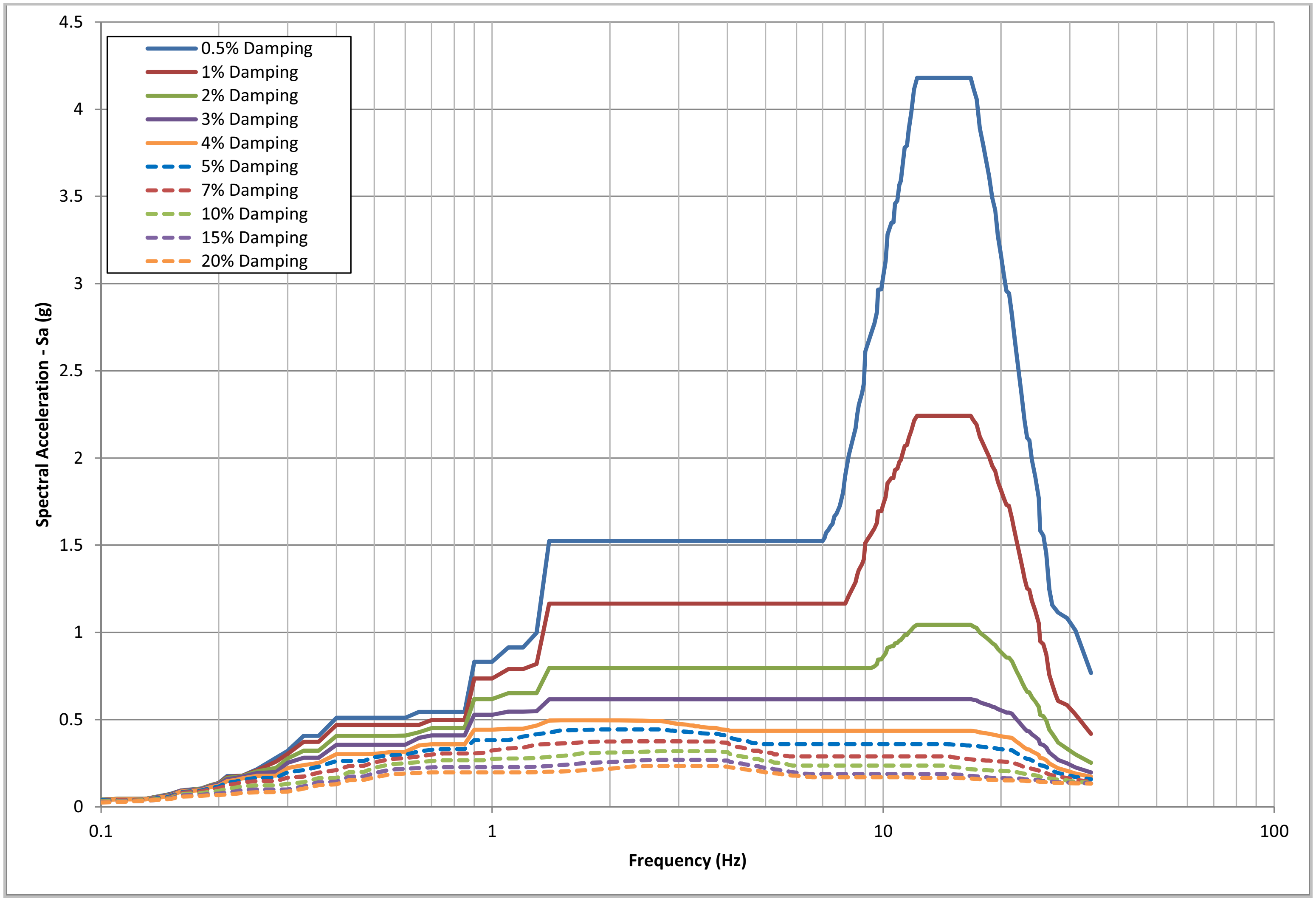


Figure 3H.6-19 Broadened FRS in E-W (X) Direction at the RSW Pump House Operating Floor (Elevation 14 ft MSL)

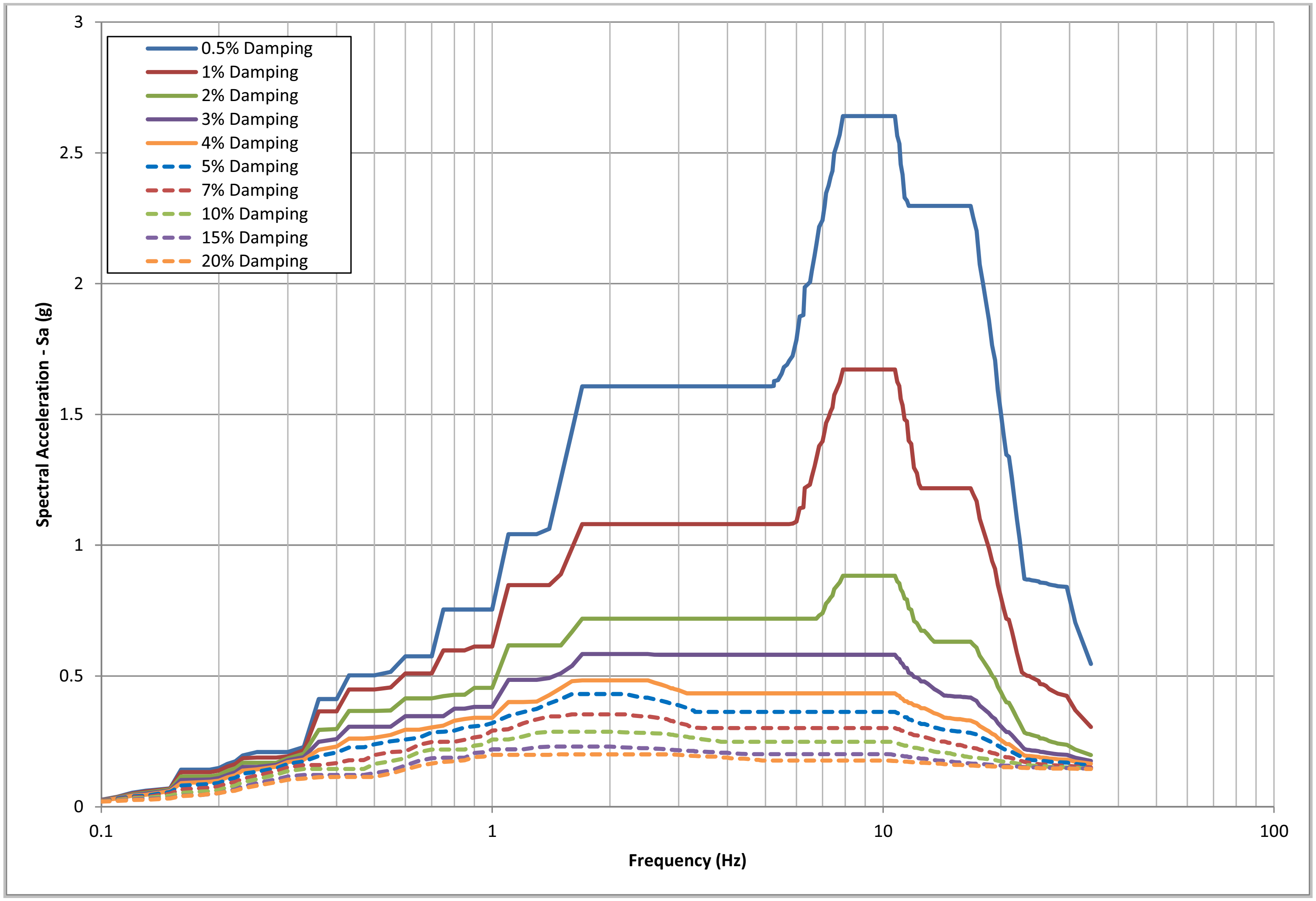


Figure 3H.6-20 Broadened FRS in N-S (Y) Direction at the RSW Pump House Operating Floor (Elevation 14 ft MSL)

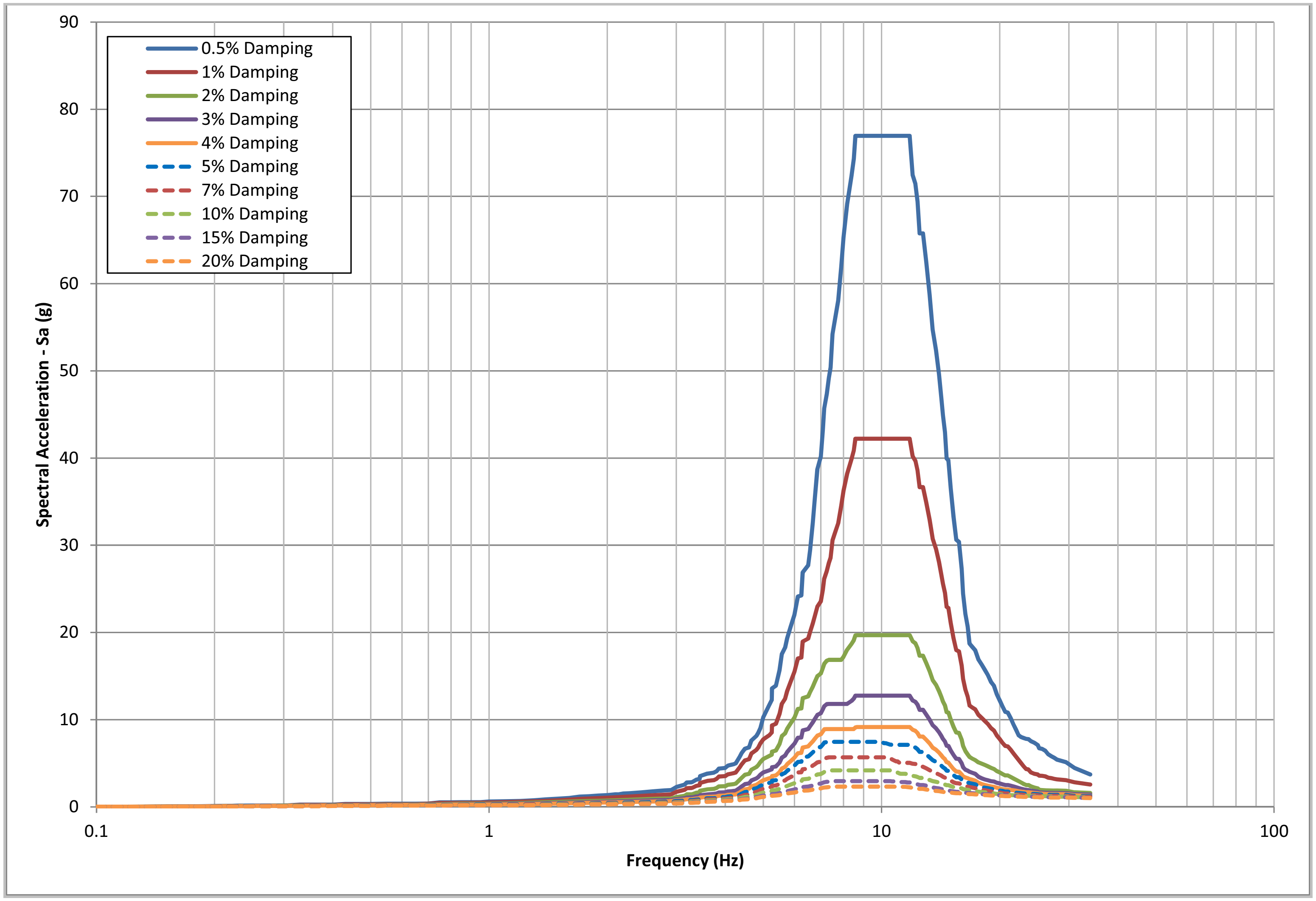


Figure 3H.6-21 Broadened FRS in Vertical (Z) Direction at the RSW Pump House Operating Floor (Elevation 14 ft MSL)

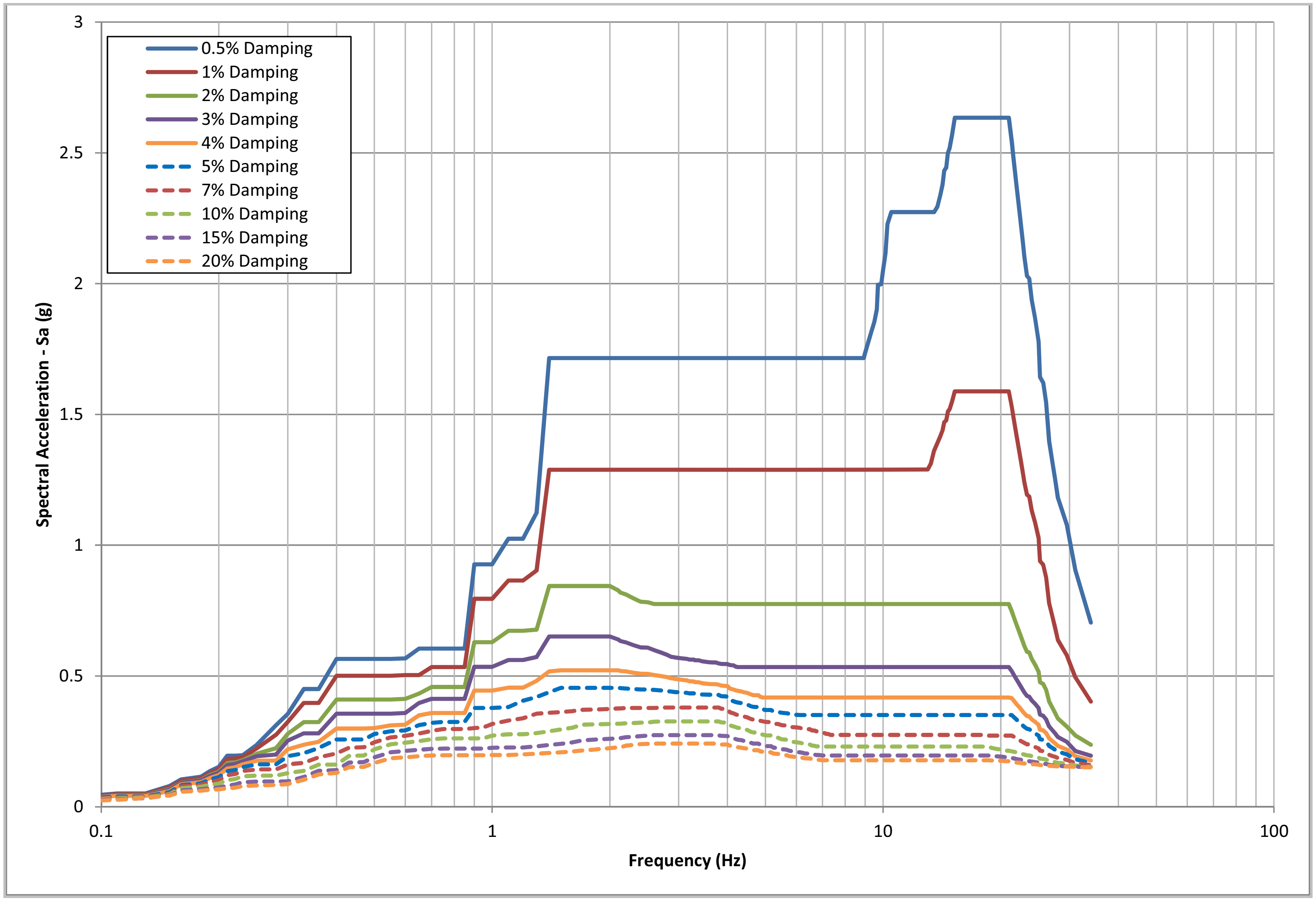


Figure 3H.6-22 Broadened FRS in E-W (X) Direction at the RSW Pump House Roof (Elevation 50 ft MSL)

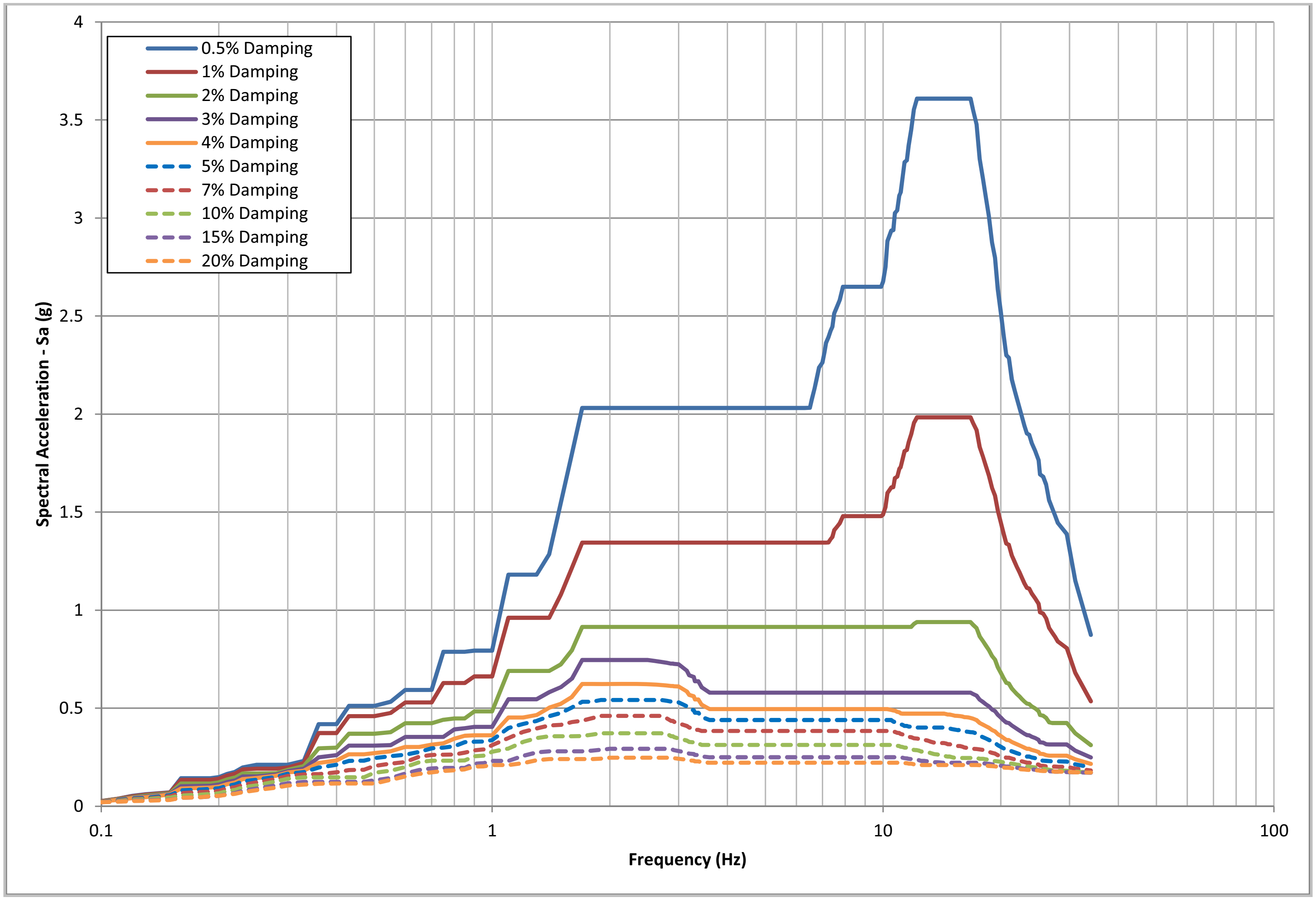


Figure 3H.6-23 Broadened FRS in N-S (Y) Direction at the RSW Pump House Roof (Elevation 50 ft MSL)

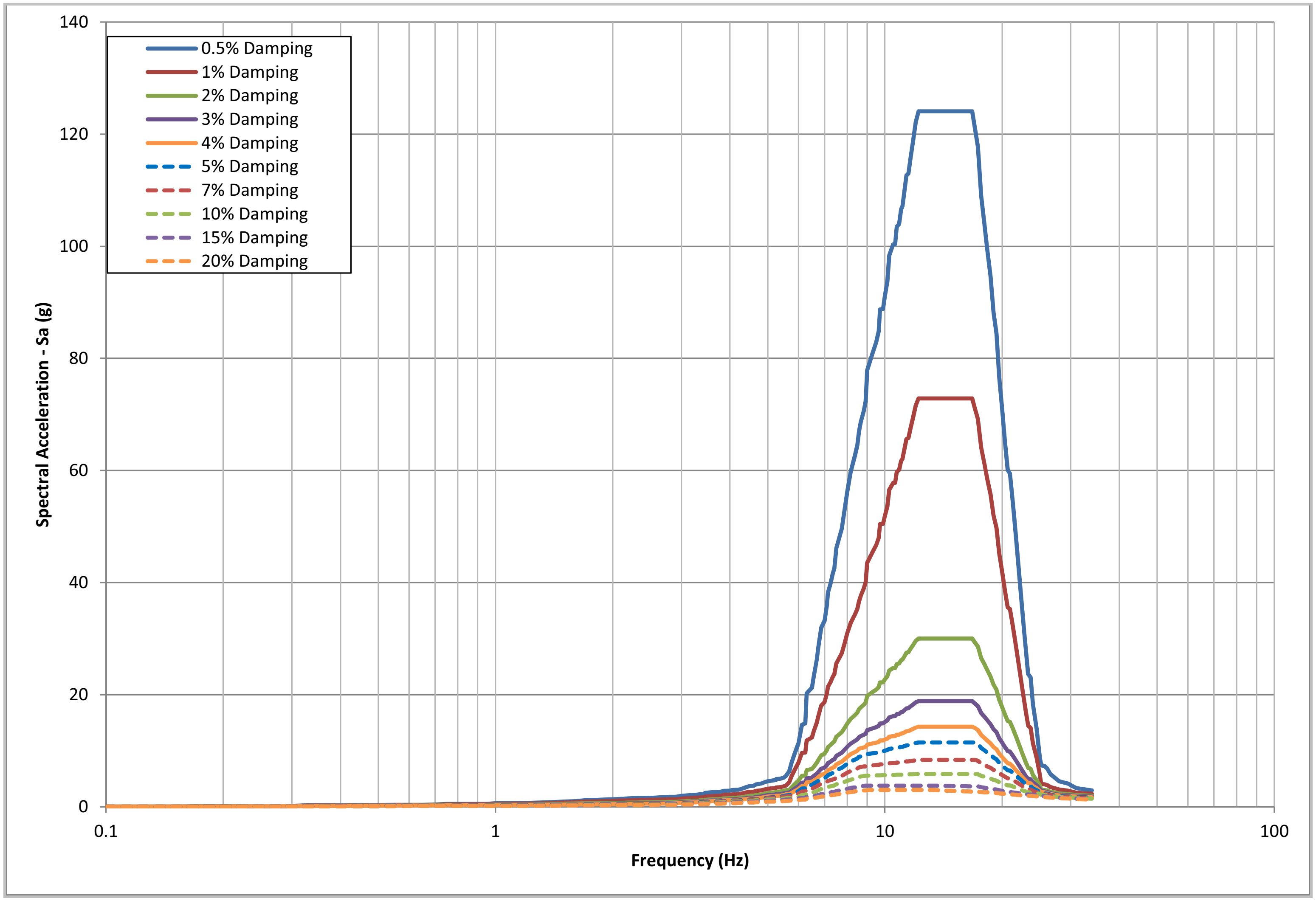


Figure 3H.6-24 Broadened FRS in Vertical (Z) Direction at the RSW Pump House Roof (Elevation 50 ft MSL)

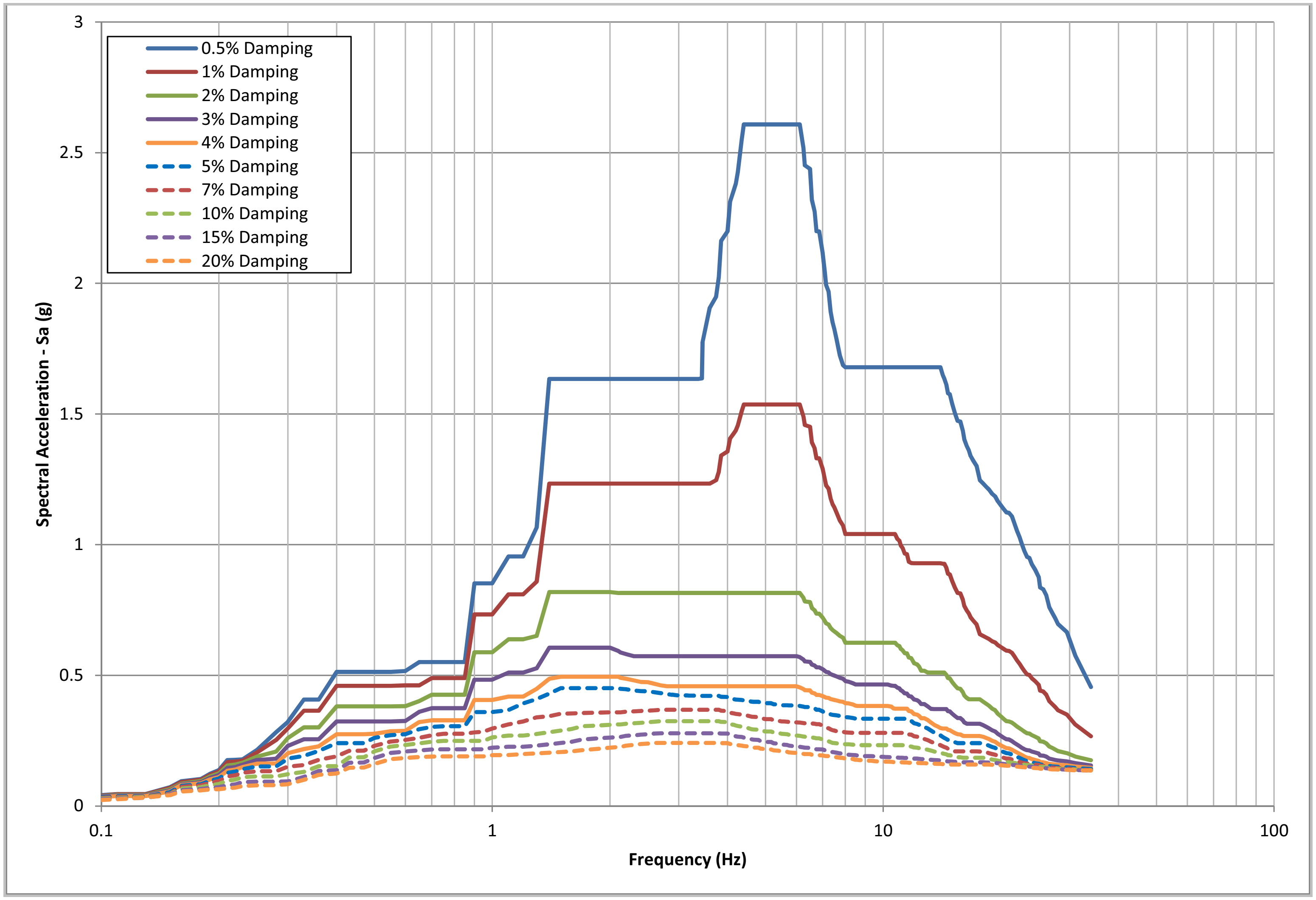


Figure 3H.6-25 Broadened FRS in E-W (X) Direction at the Top of UHS Basin Mat (Elevation 14 ft MSL)

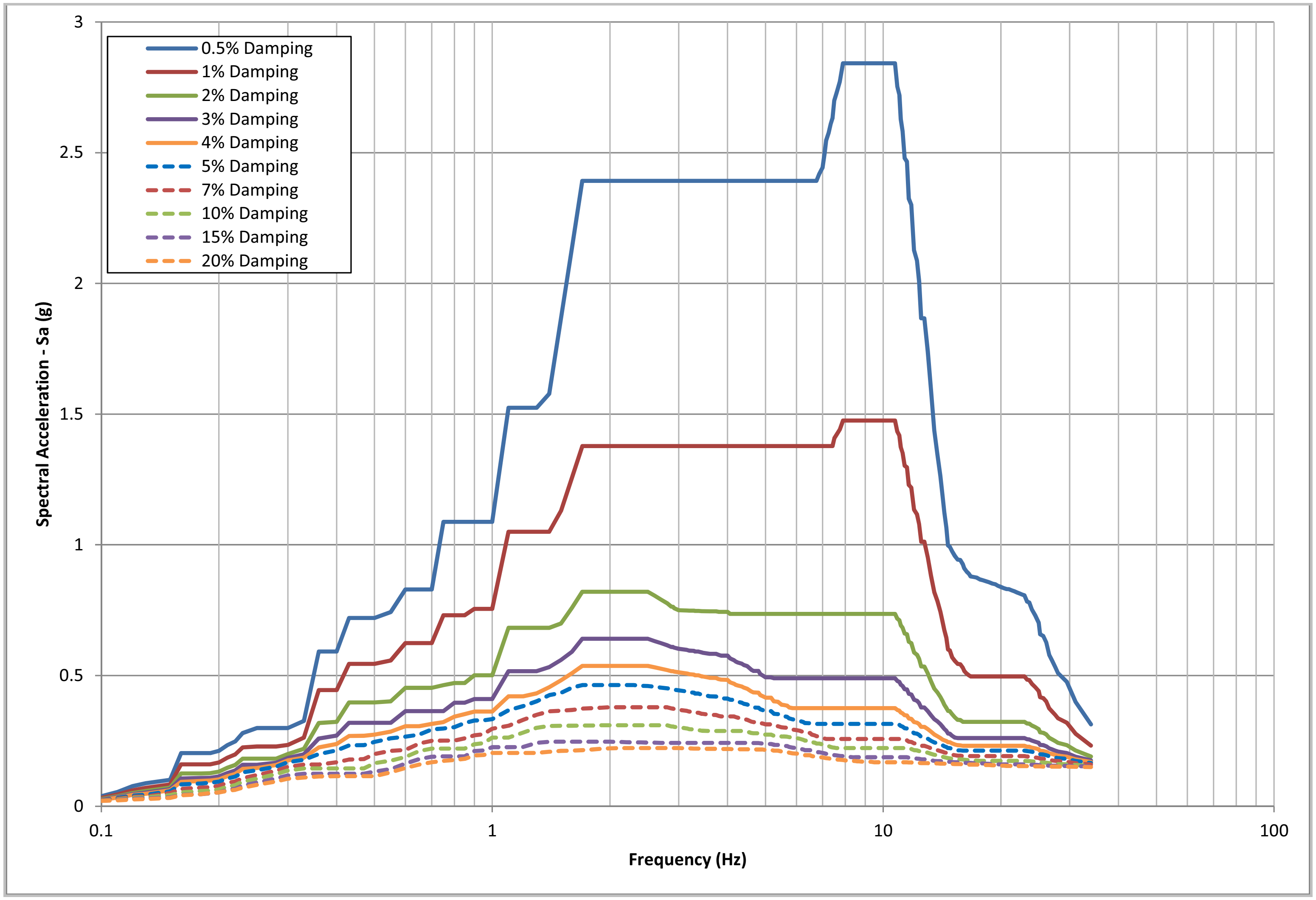


Figure 3H.6-26 Broadened FRS in N-S (Y) Direction at the Top of UHS Basin Mat (Elevation 14 ft MSL)

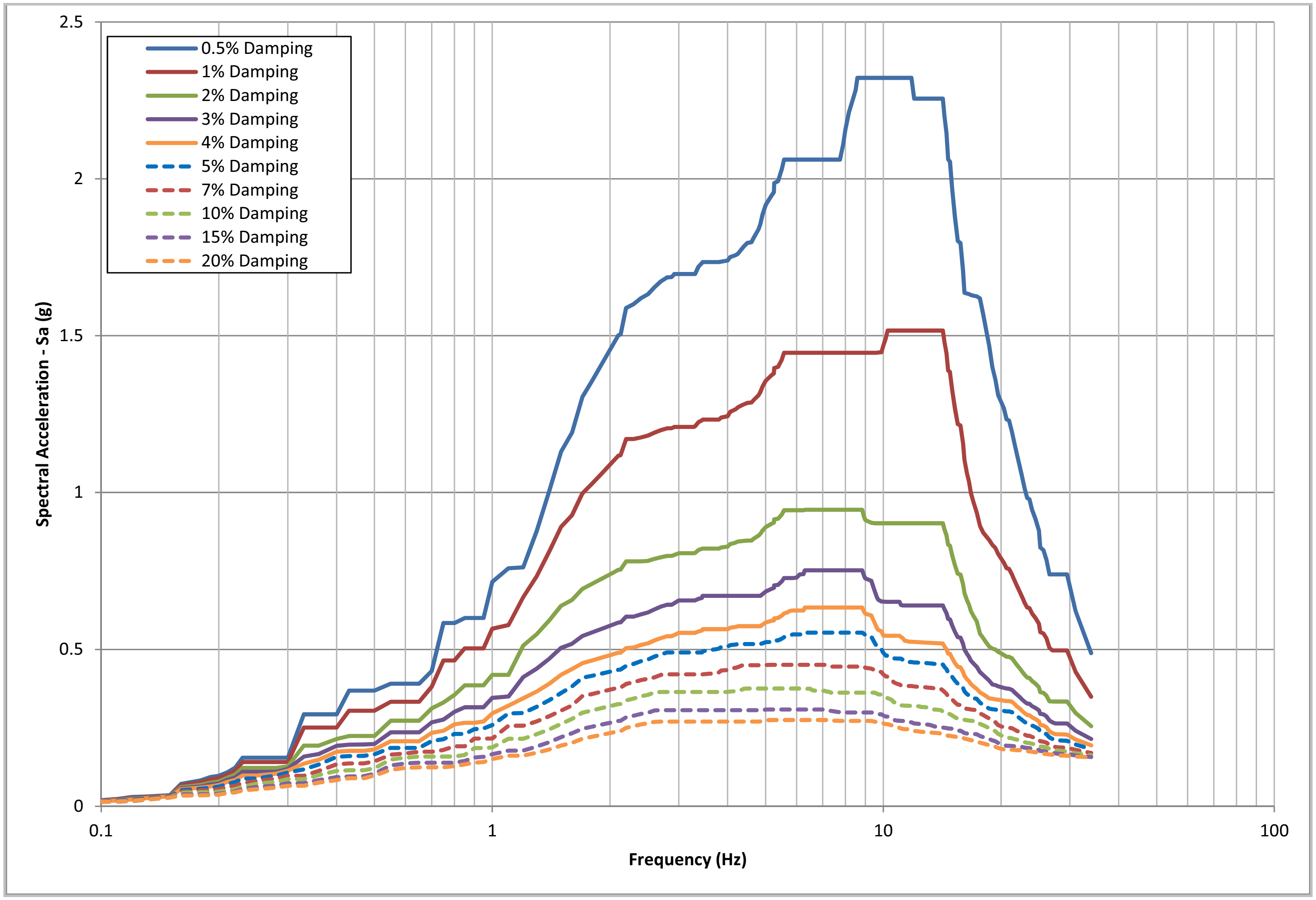


Figure 3H.6-27 Broadened FRS in Vertical (Z) Direction at the Top of UHS Basin Mat (Elevation 14 ft MSL)

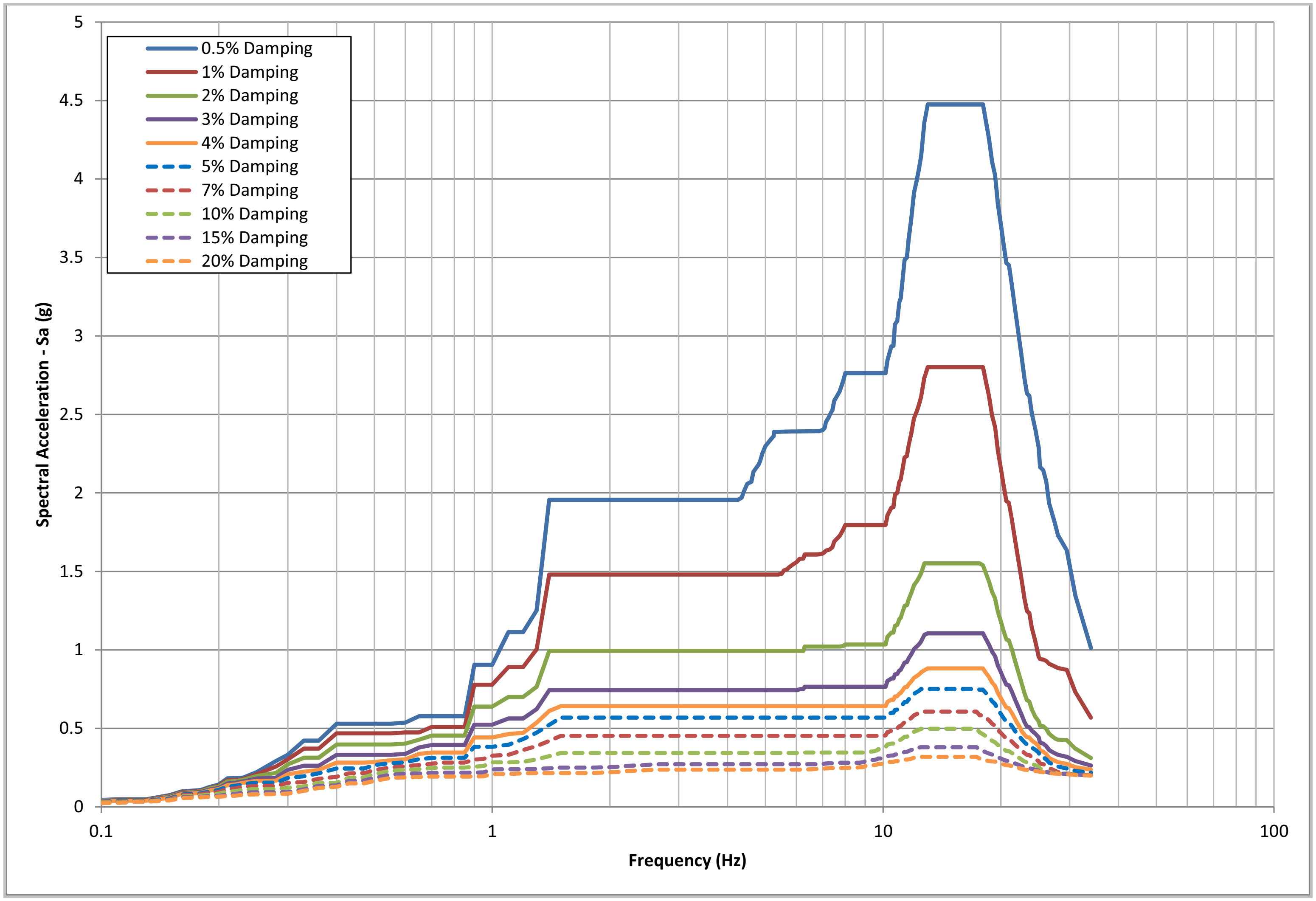


Figure 3H.6-28 Broadened FRS in E-W (X) Direction at the Top of the UHS Basin Walls (Elevation 97.5 ft MSL)

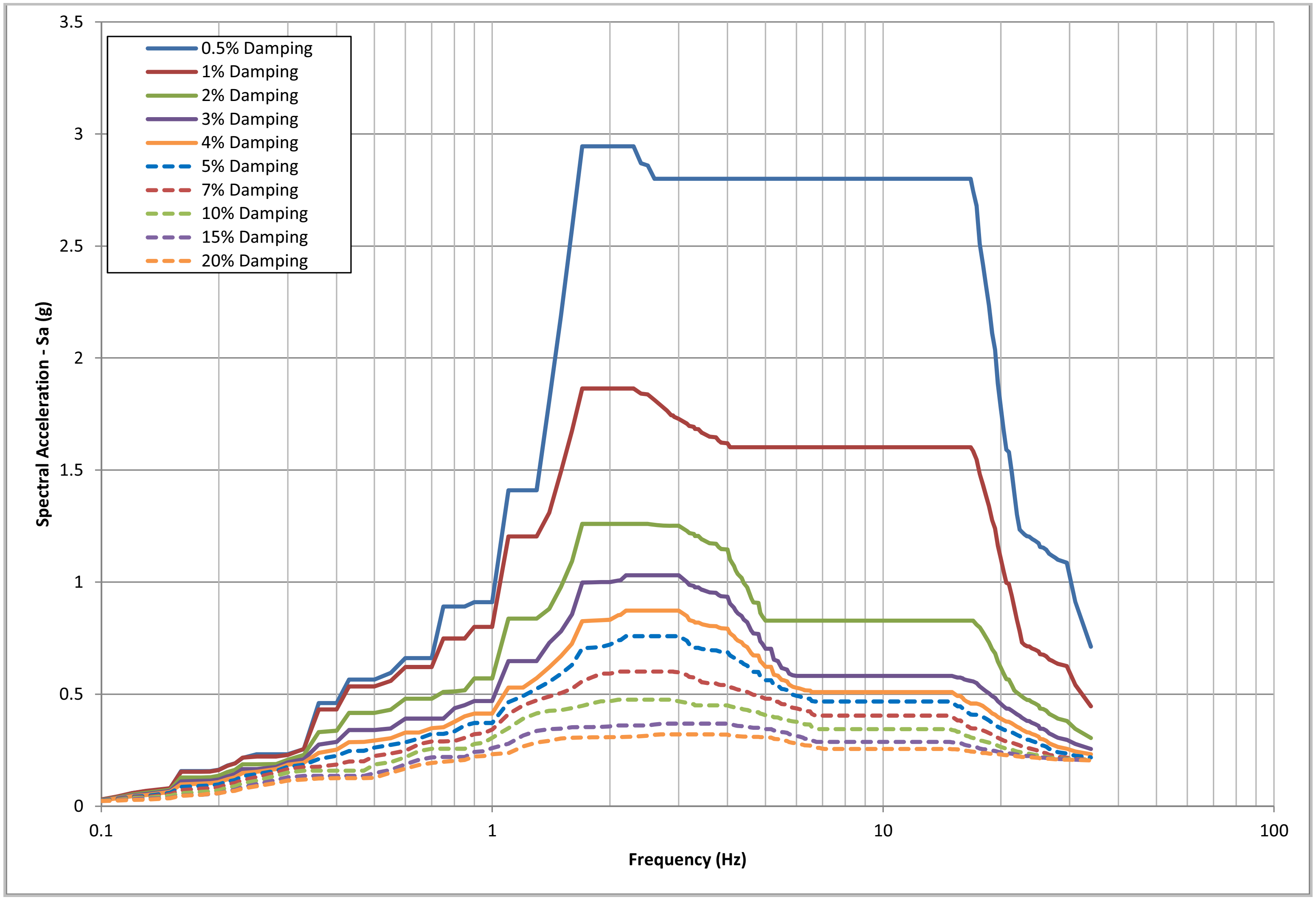


Figure 3H.6-29 Broadened FRS in N-S (Y) Direction at the Top of the UHS Basin Walls (Elevation 97.5 ft MSL)

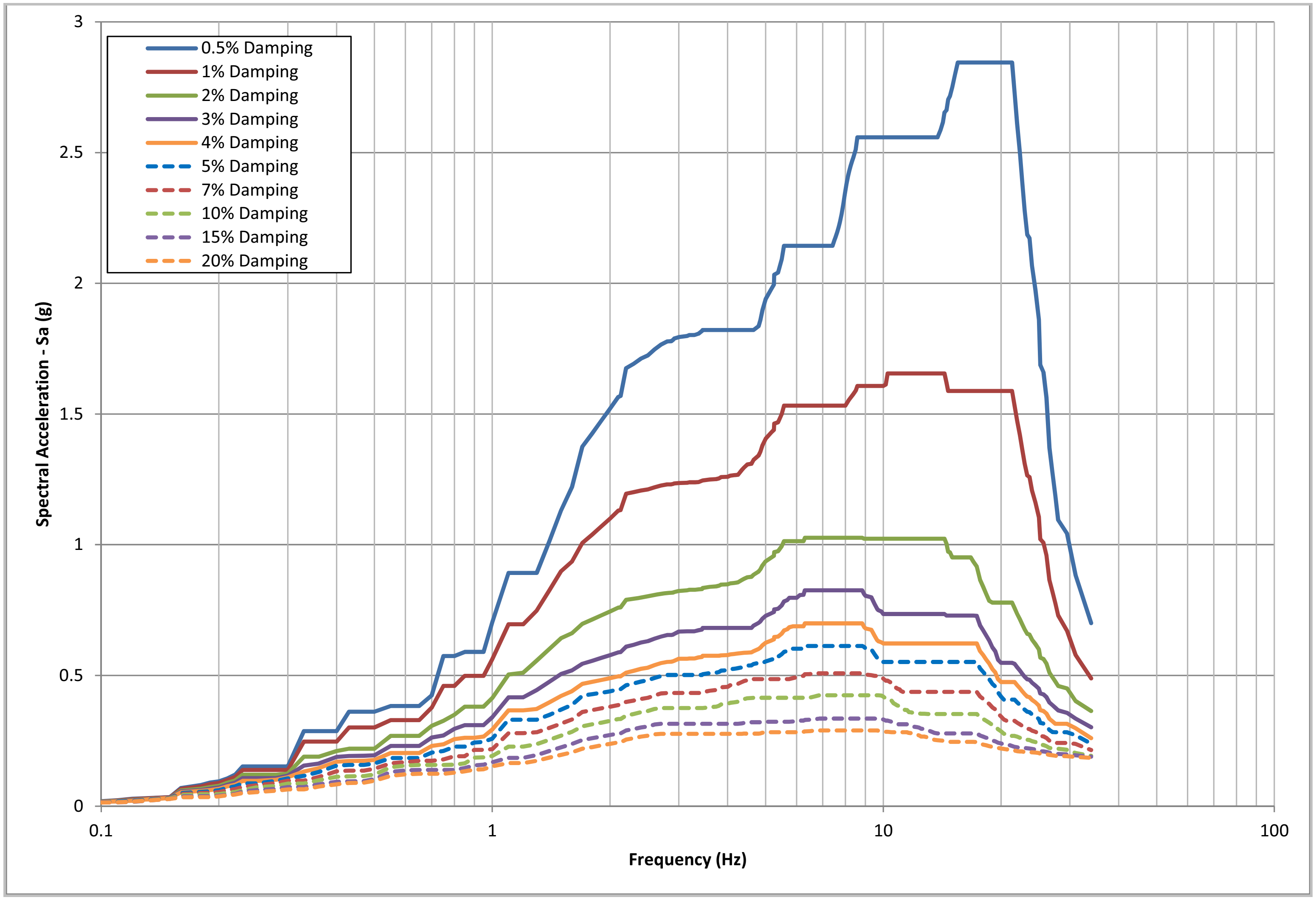


Figure 3H.6-30 Broadened FRS in Vertical (Z) Direction at the Top of the UHS Basin Walls (Elevation 97.5 ft MSL)

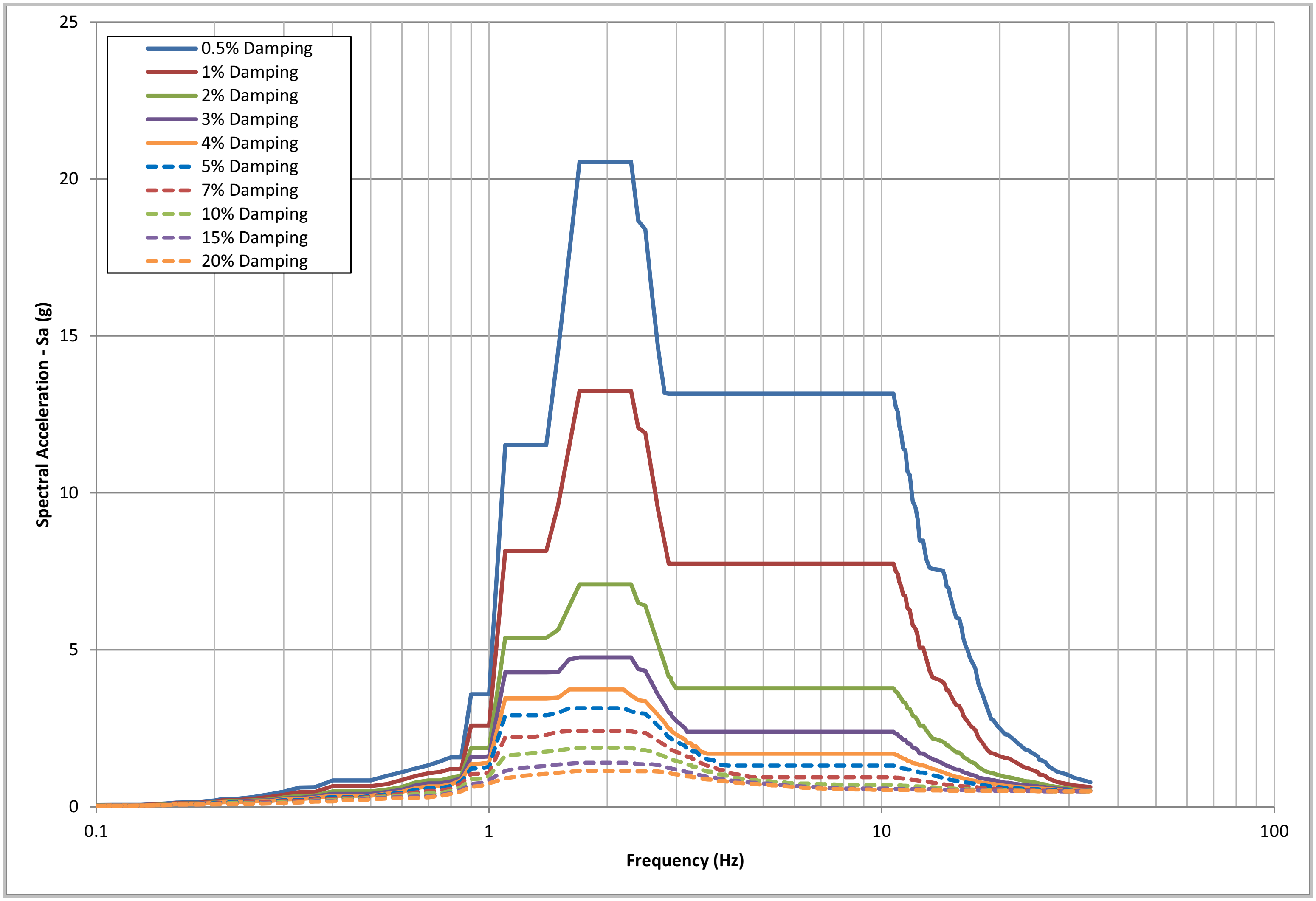


Figure 3H.6-31 Broadened FRS in E-W (X) Direction at the Bottom of Cooling Towers (Elevation 97.5 ft MSL)

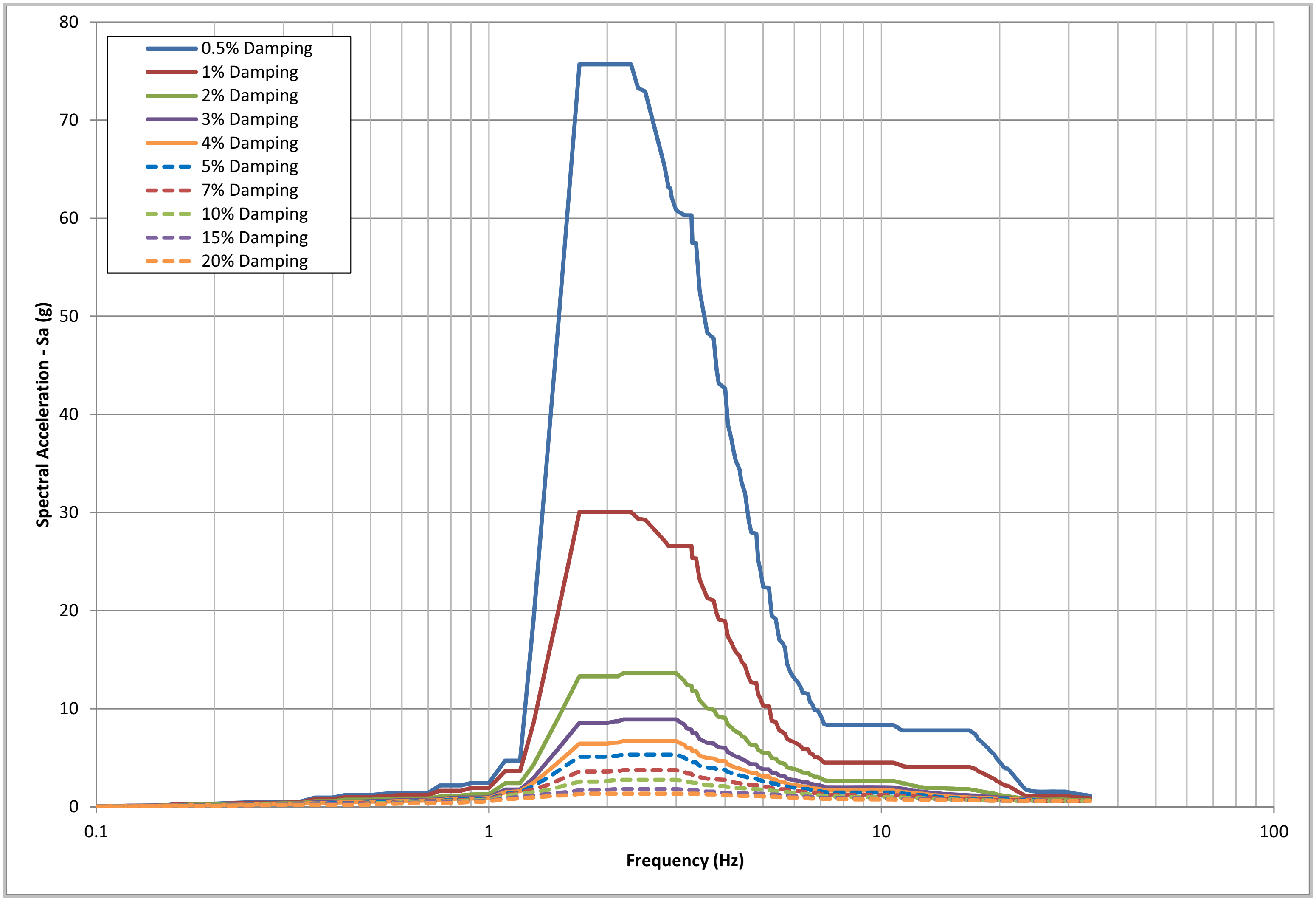


Figure 3H.6-32 Broadened FRS in N-S (Y) Direction at the Bottom of Cooling Towers (Elevation 97.5 ft MSL)

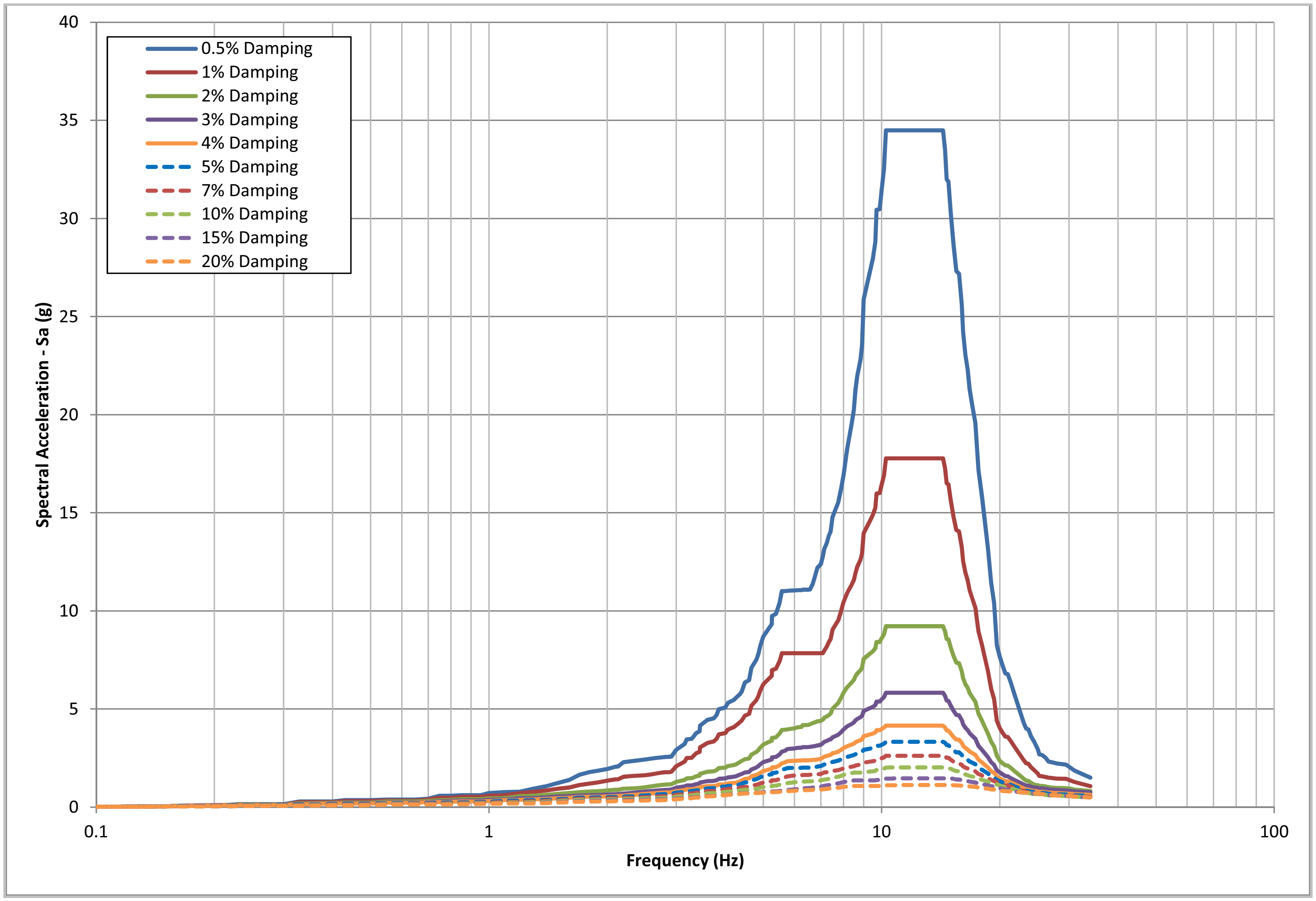


Figure 3H.6-33 Broadened FRS in Vertical (Z) Direction at the Bottom of Cooling Towers (Elevation 97.5 ft MSL)

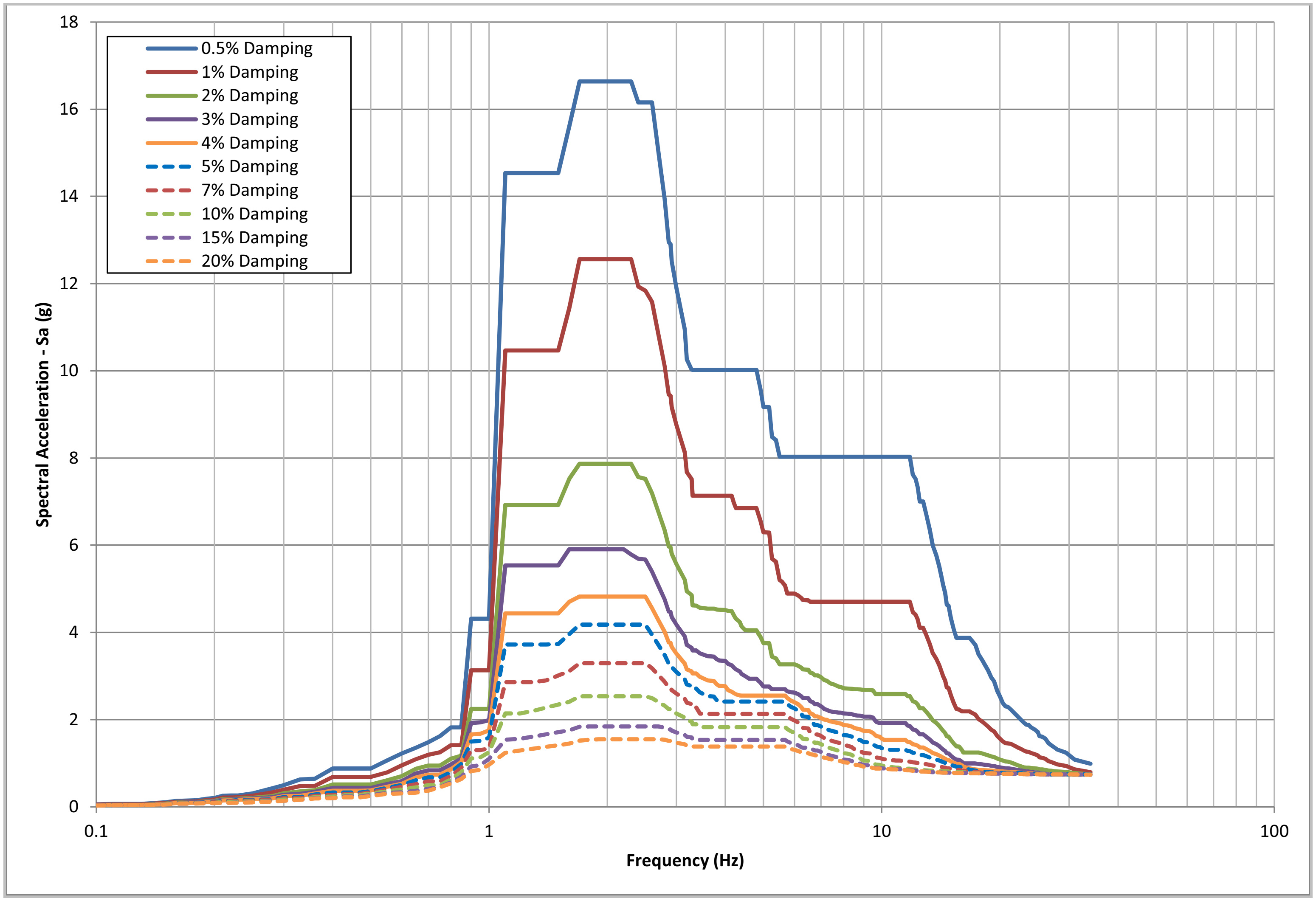


Figure 3H.6-34 Broadened FRS in E-W (X) Direction at the Mid-Level of Cooling Towers (Elevation 125.25 ft MSL)

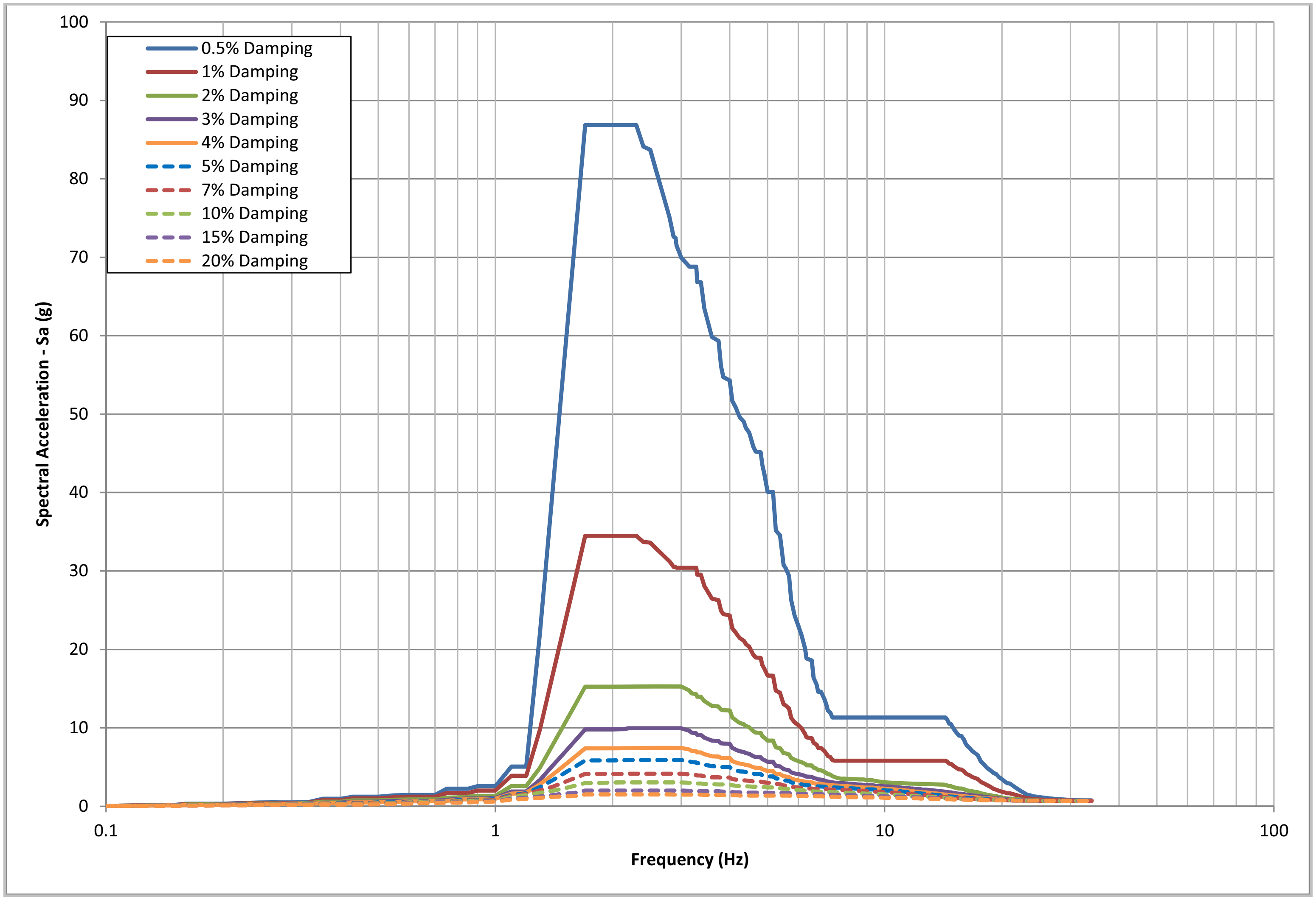


Figure 3H.6-35 Broadened FRS in N-S (Y) Direction at the Mid-Level of Cooling Towers (Elevation 125.25 ft MSL)

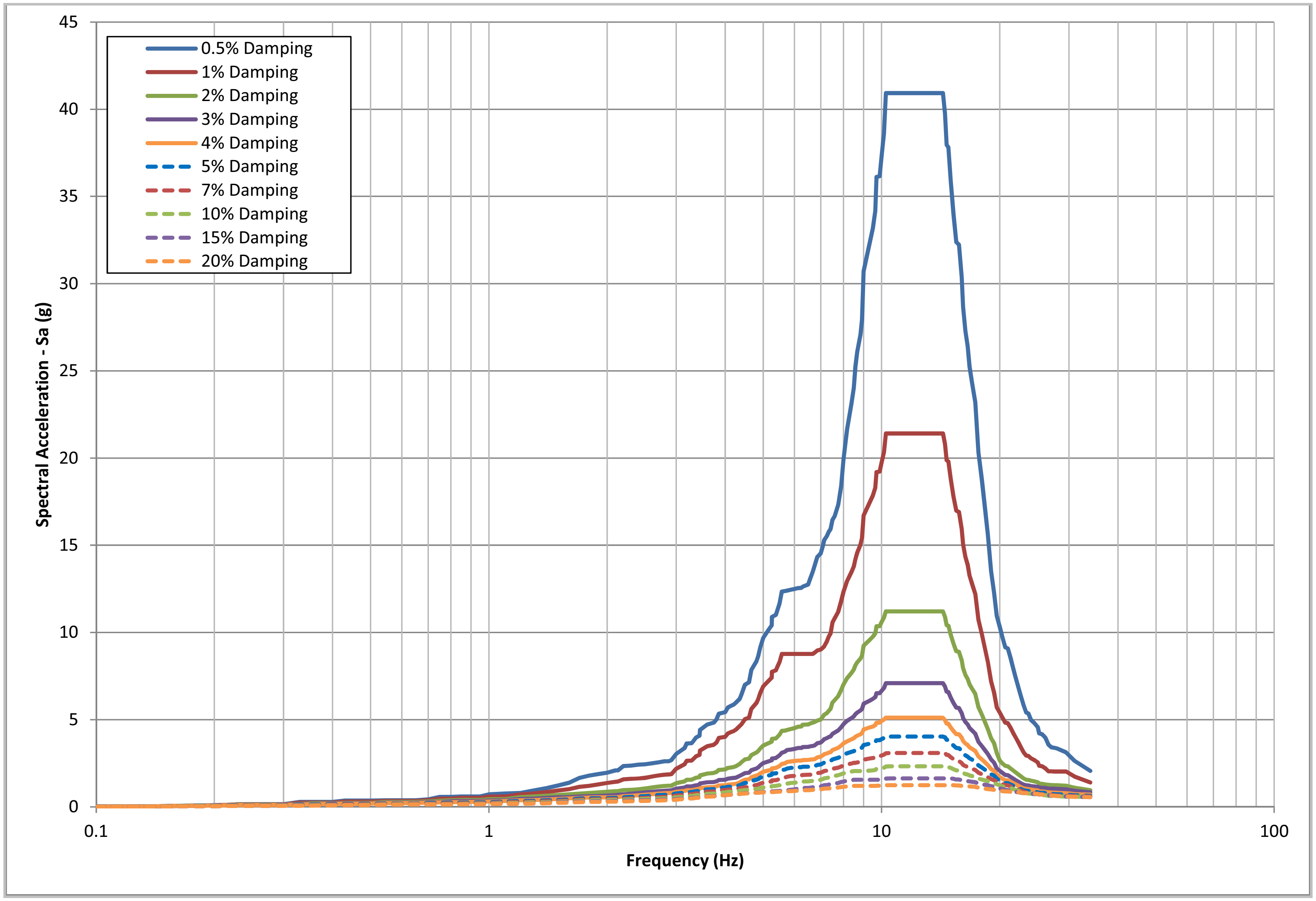


Figure 3H.6-36 Broadened FRS in Vertical (Z) Direction at the Mid-Level of Cooling Towers (Elevation 125.25 ft MSL)

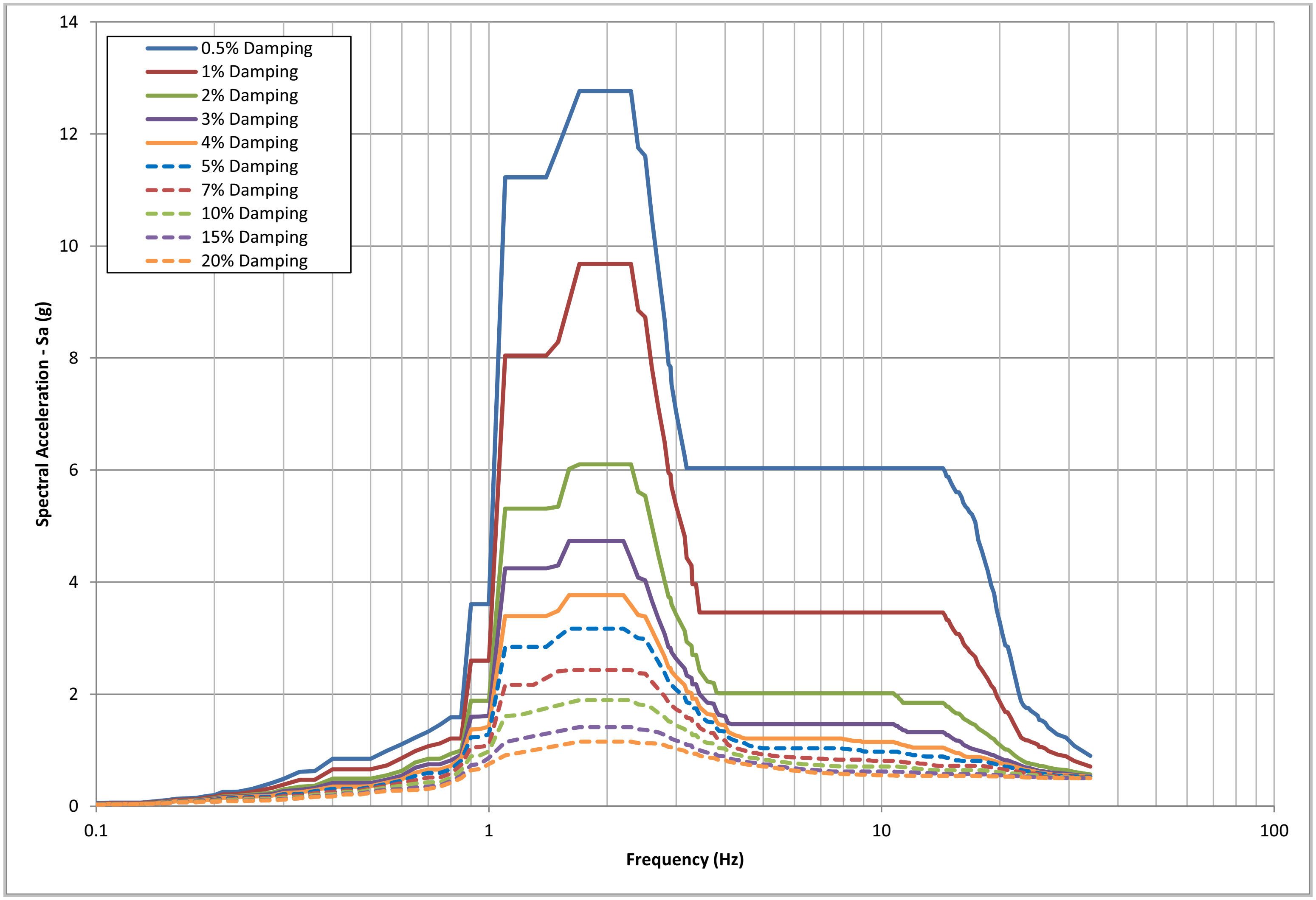


Figure 3H.6-37 Broadened FRS in E-W (X) Direction at the Top of Cooling Towers (Elevation 153 ft MSL)

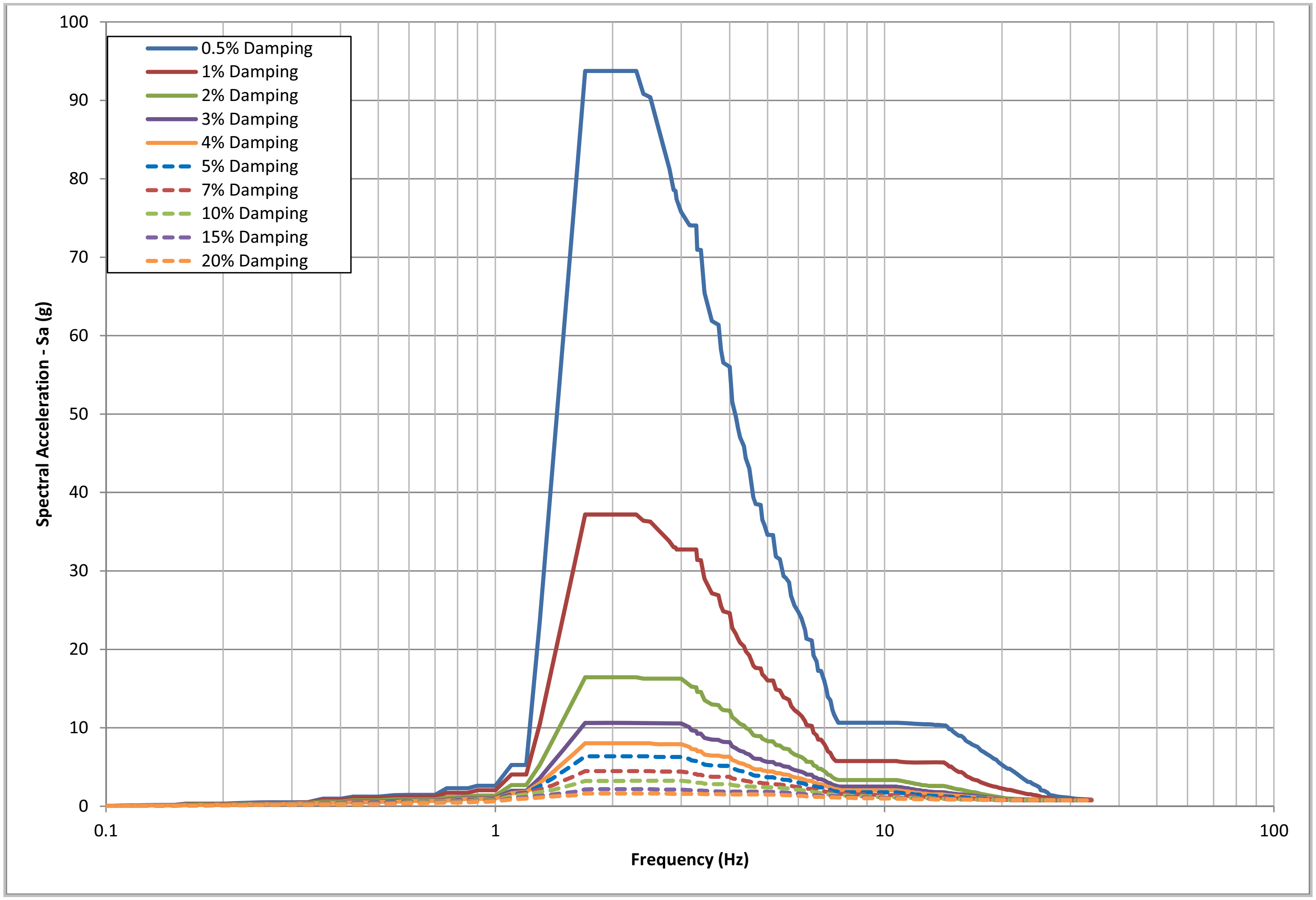


Figure 3H.6-38 Broadened FRS in N-S (Y) Direction at the Top of Cooling Towers (Elevation 153 ft MSL)

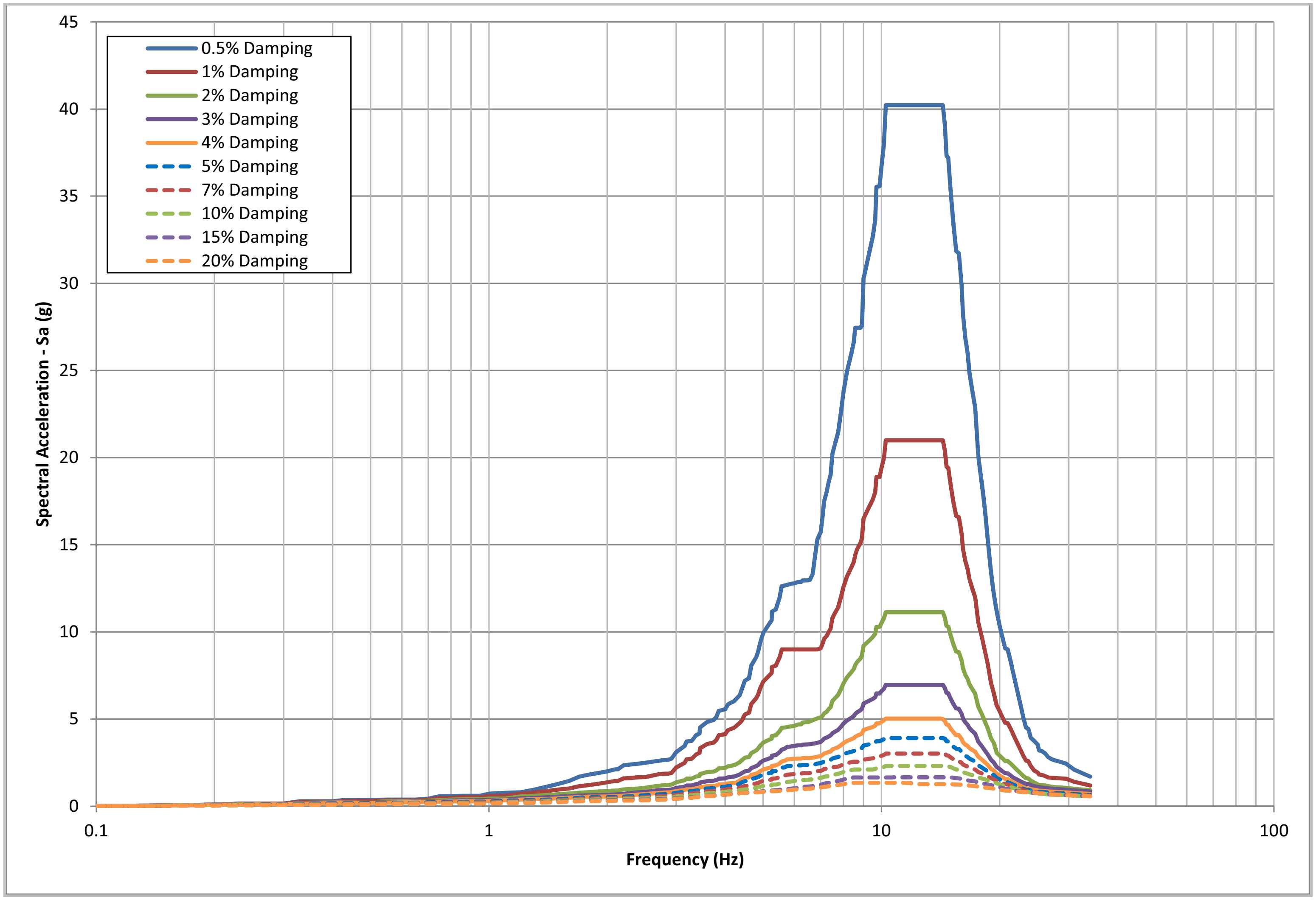


Figure 3H.6-39 Broadened FRS in Vertical (Z) Direction at the Top of Cooling Towers (Elevation 153 ft MSL)

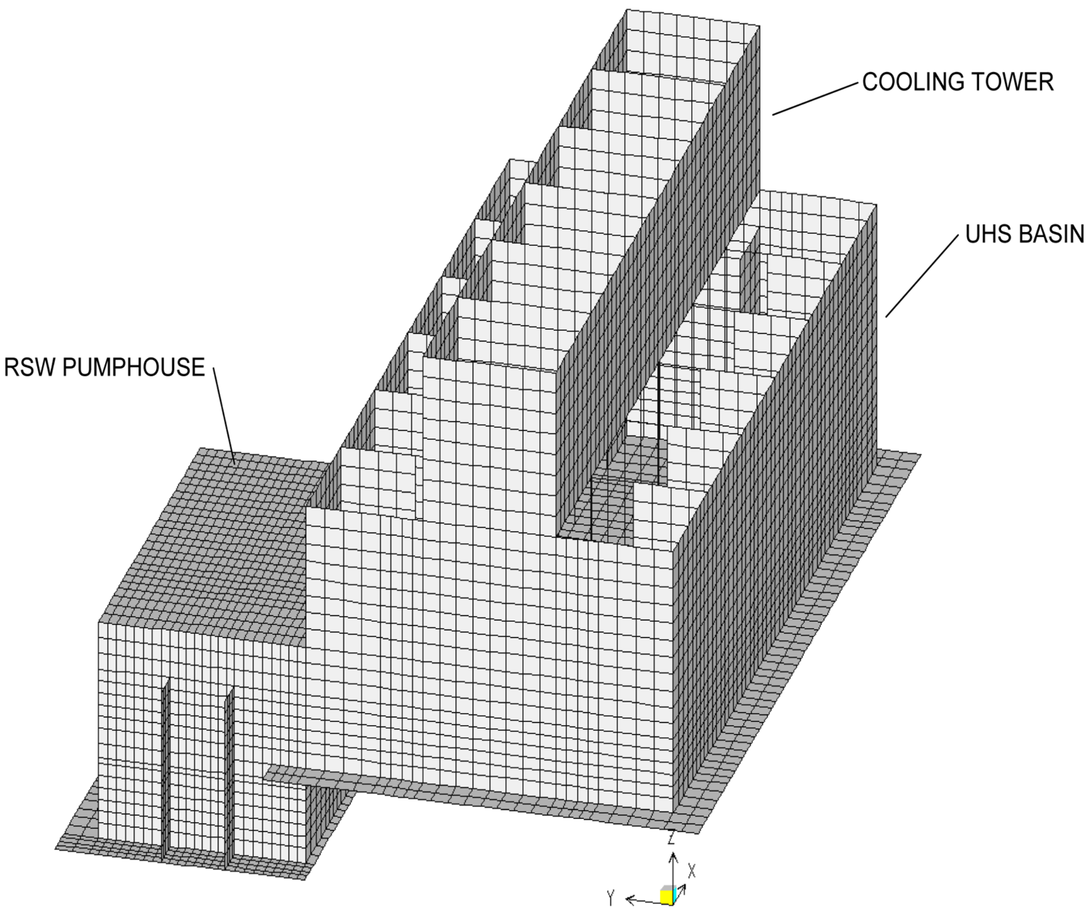


Figure 3H.6-40 SAP Finite Element Model for UHS and RSW Pump House Design

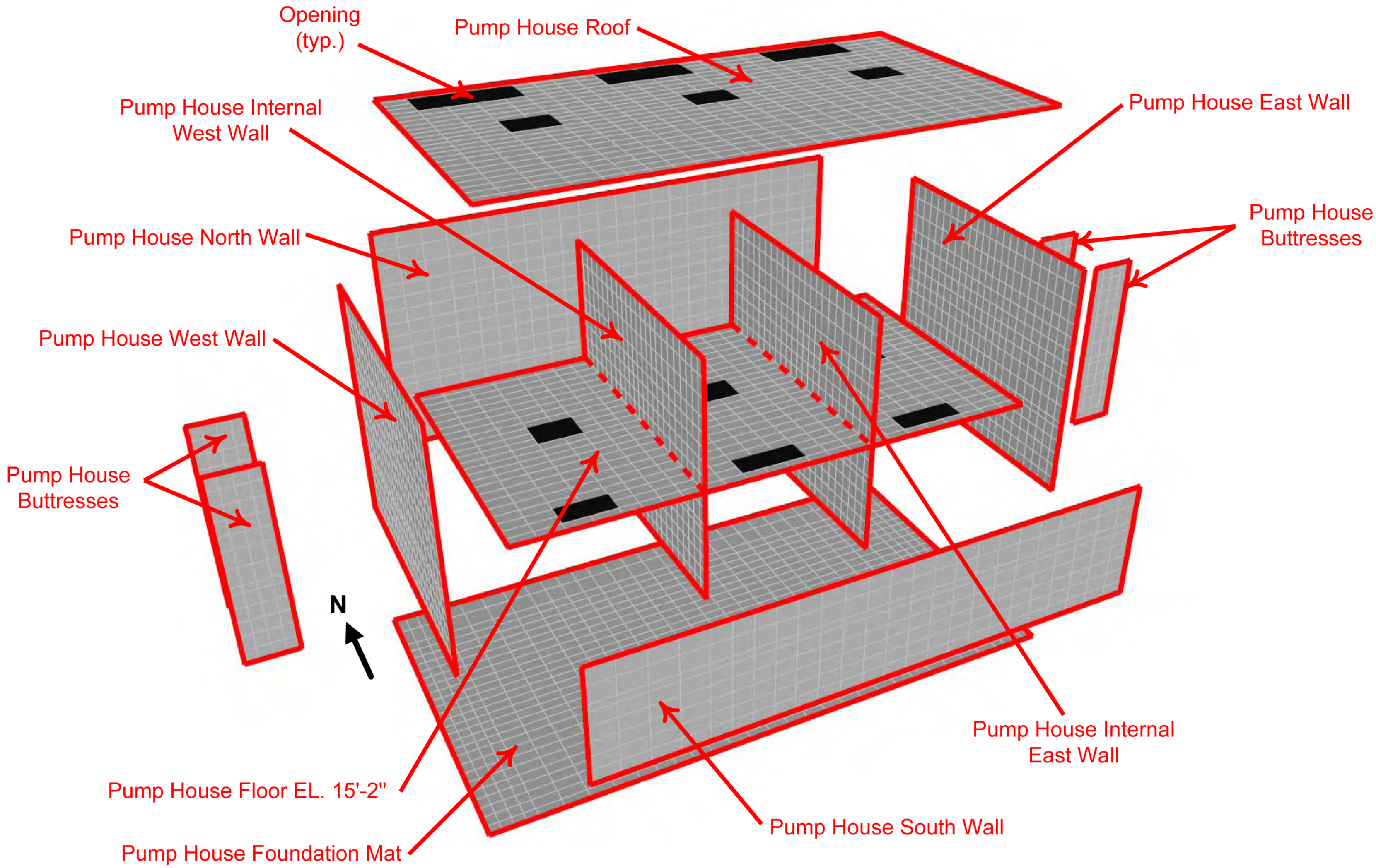


Figure 3H.6-40A RSW Pump House Wall and Slab Labeling Convention

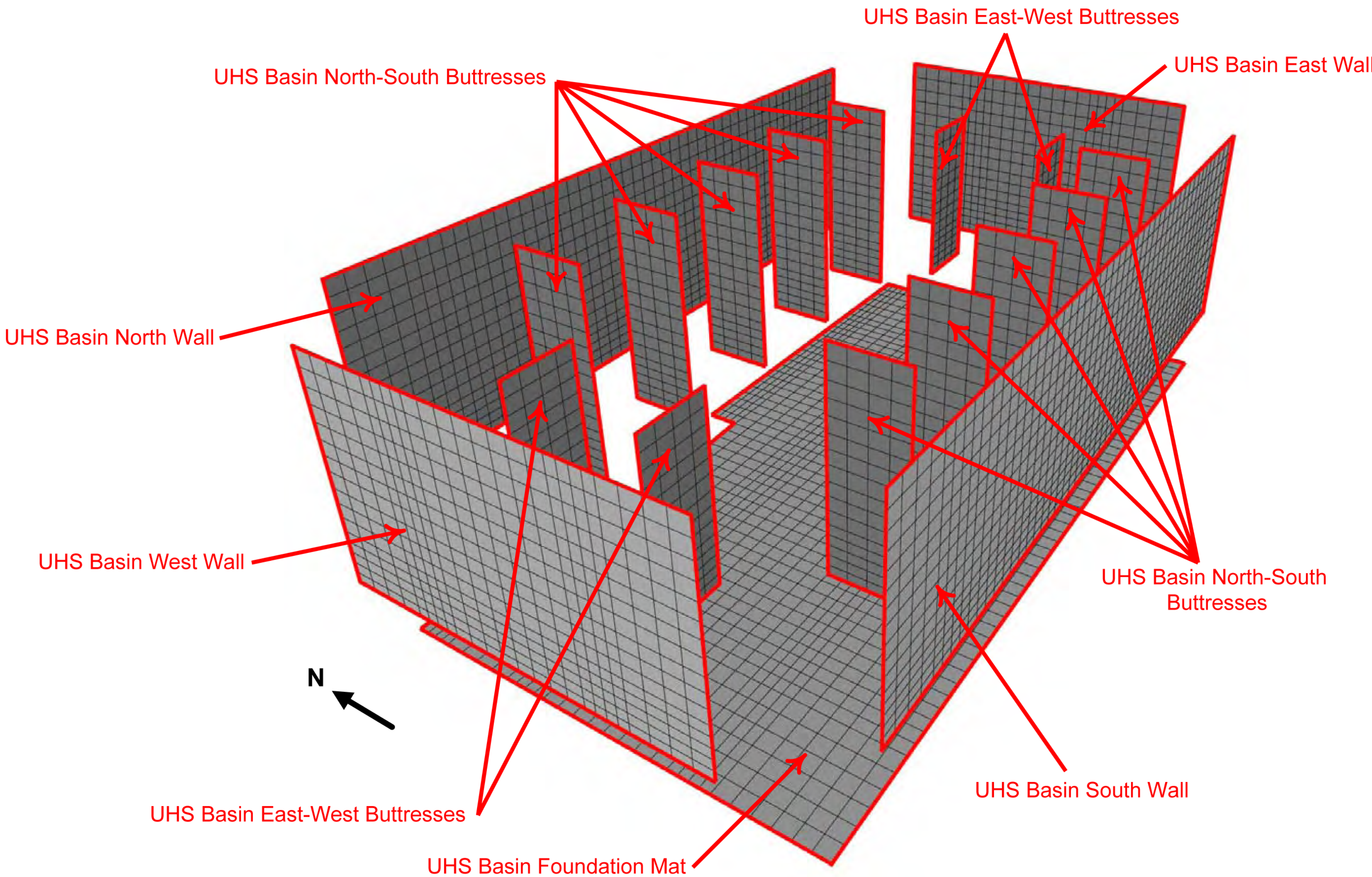


Figure 3H.6-40B UHS Basin Wall and Slab Labeling Convention

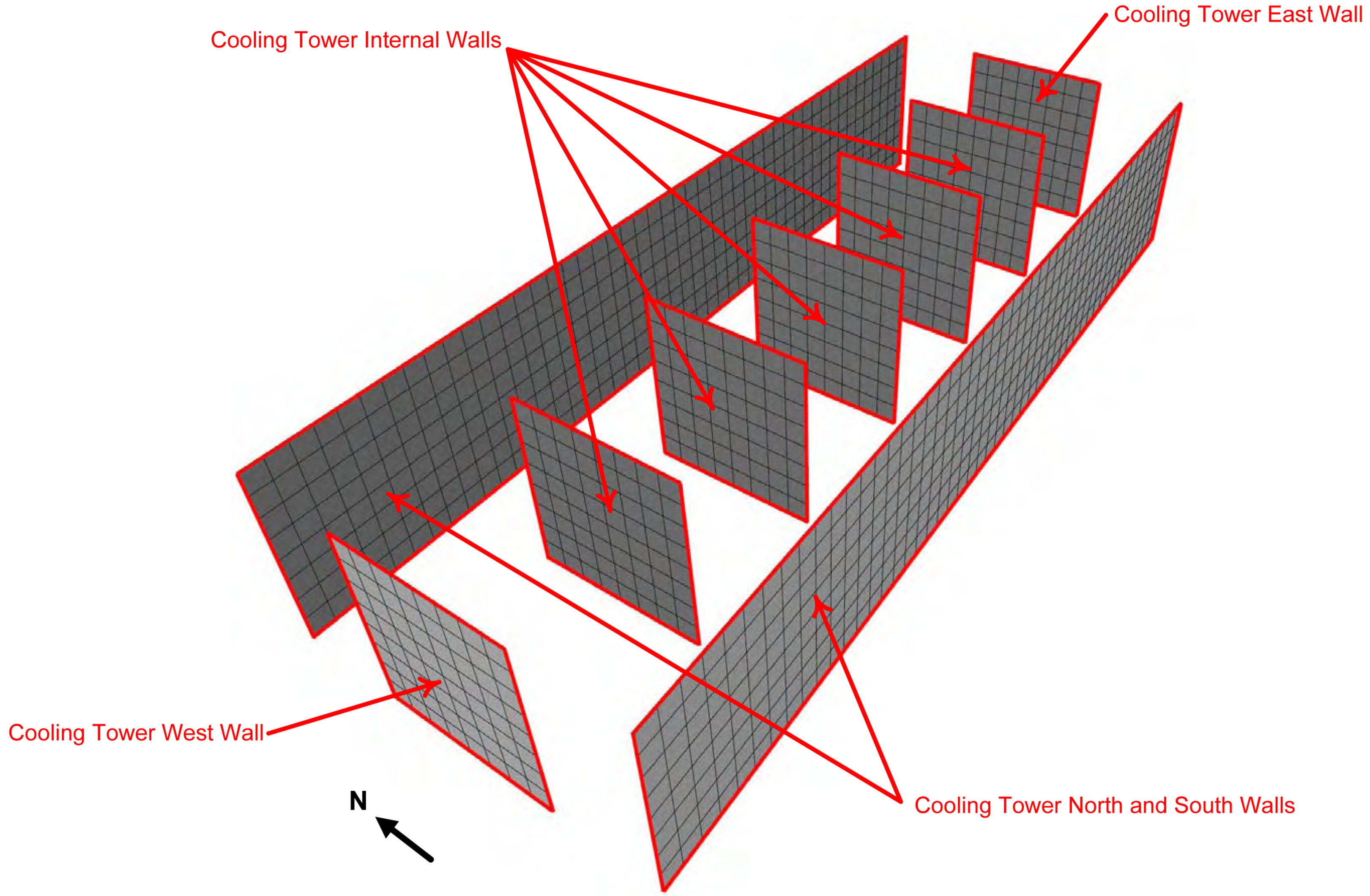


Figure 3H.6-40C UHS Cooling Tower Wall Labeling Convention

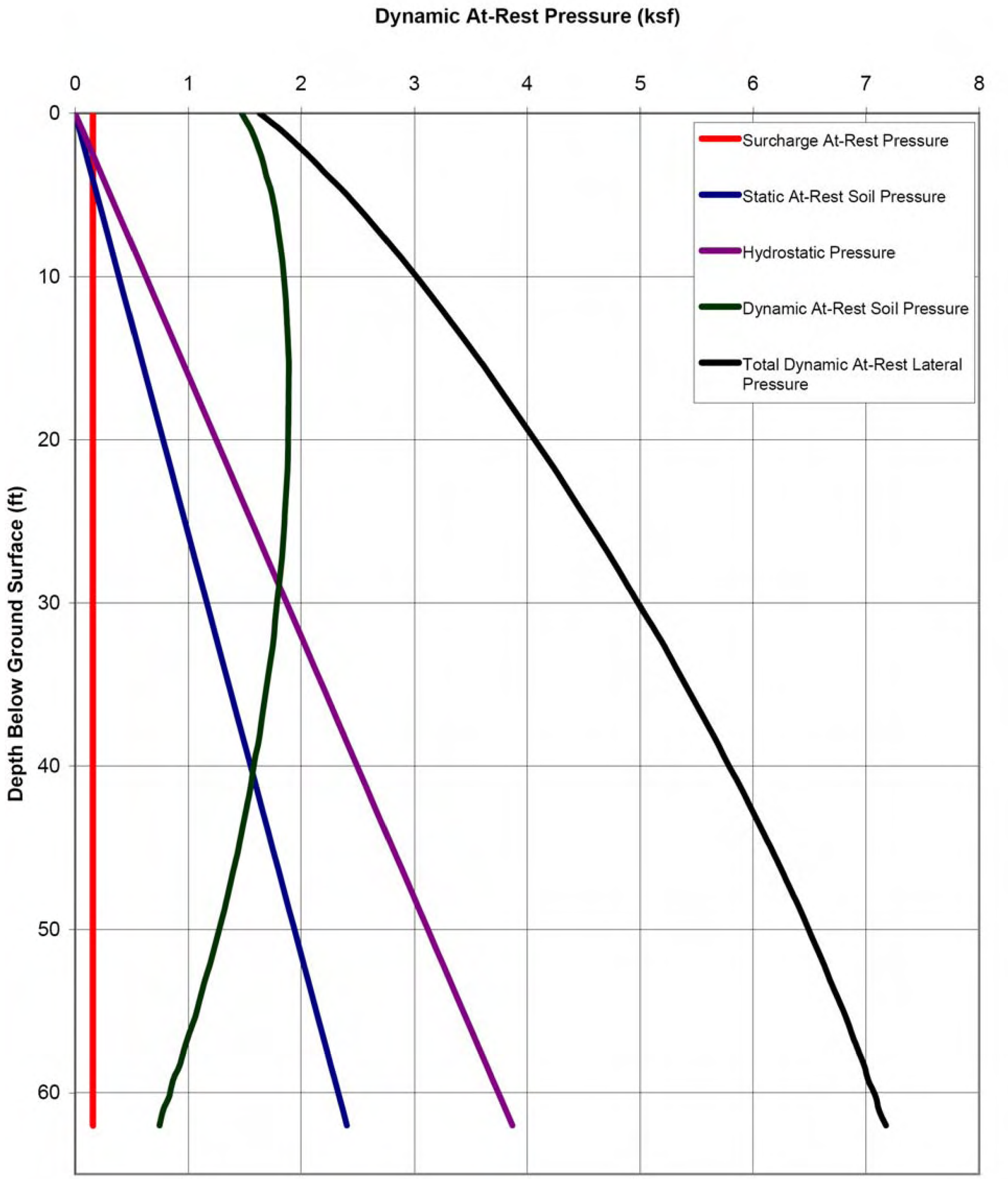


Figure 3H.6-41 Dynamic At-Rest Lateral Earth Pressure (Excluding SSI and SSSI Seismic Soil Pressures) on the East, West, and North Walls of Pump House

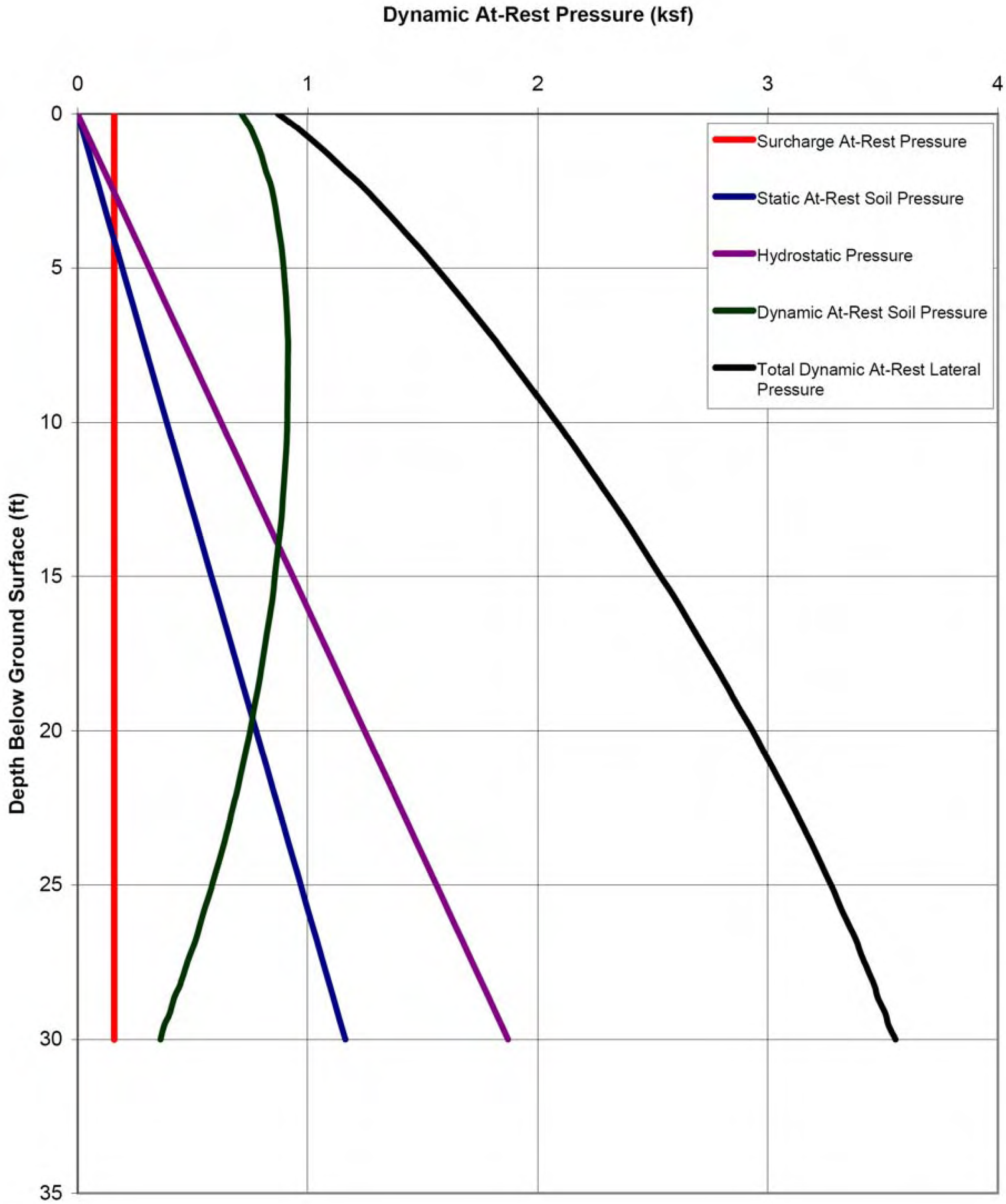


Figure 3H.6-42 Dynamic At-Rest Lateral Earth Pressure (Excluding SSI and SSSI Seismic Soil Pressures) on the UHS Basin Walls

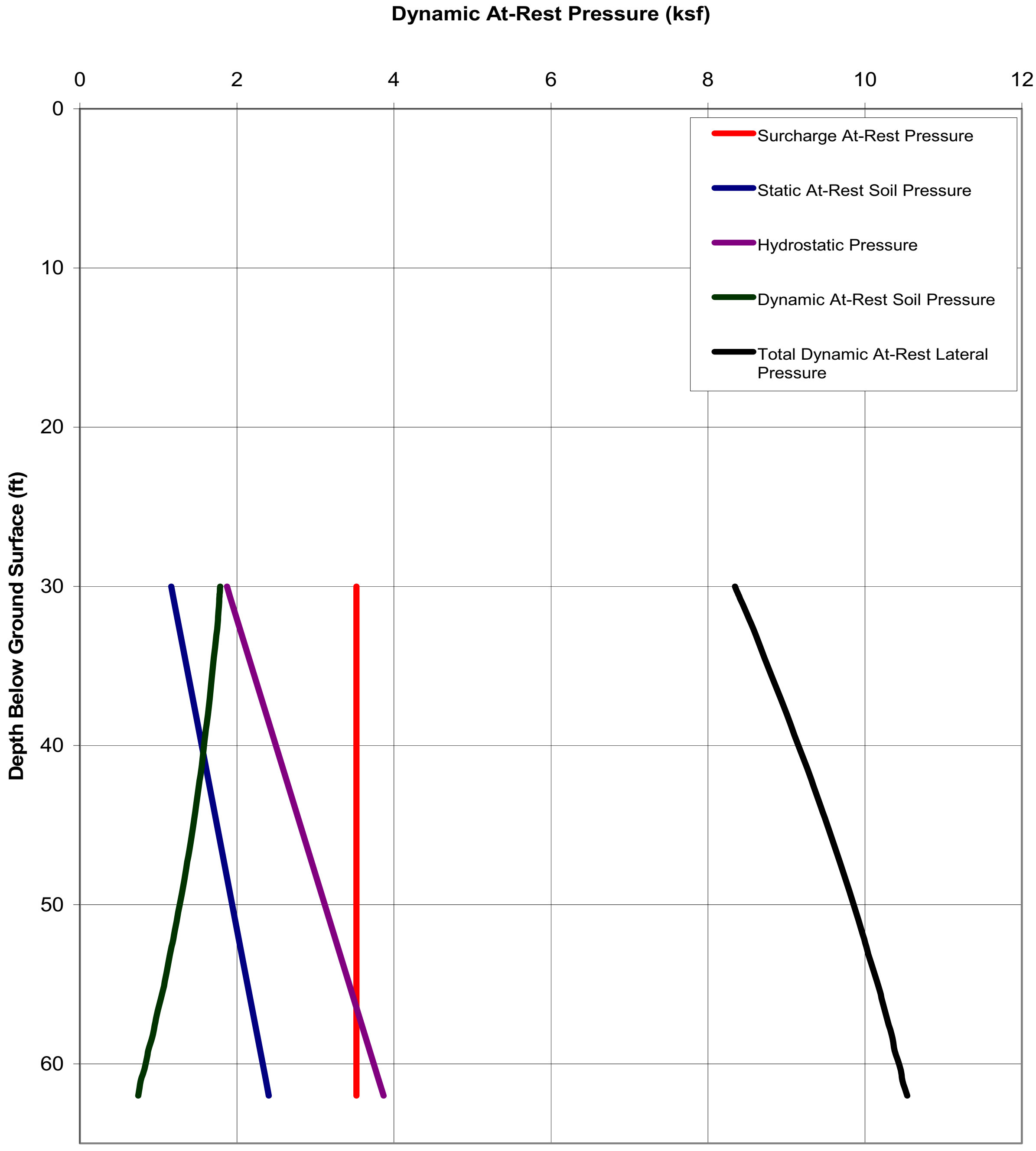


Figure 3H.6-43 Dynamic At-Rest Lateral Earth Pressure (Excluding SSI and SSSI Seismic Soil Pressures) on the South Wall of RSW Pump House

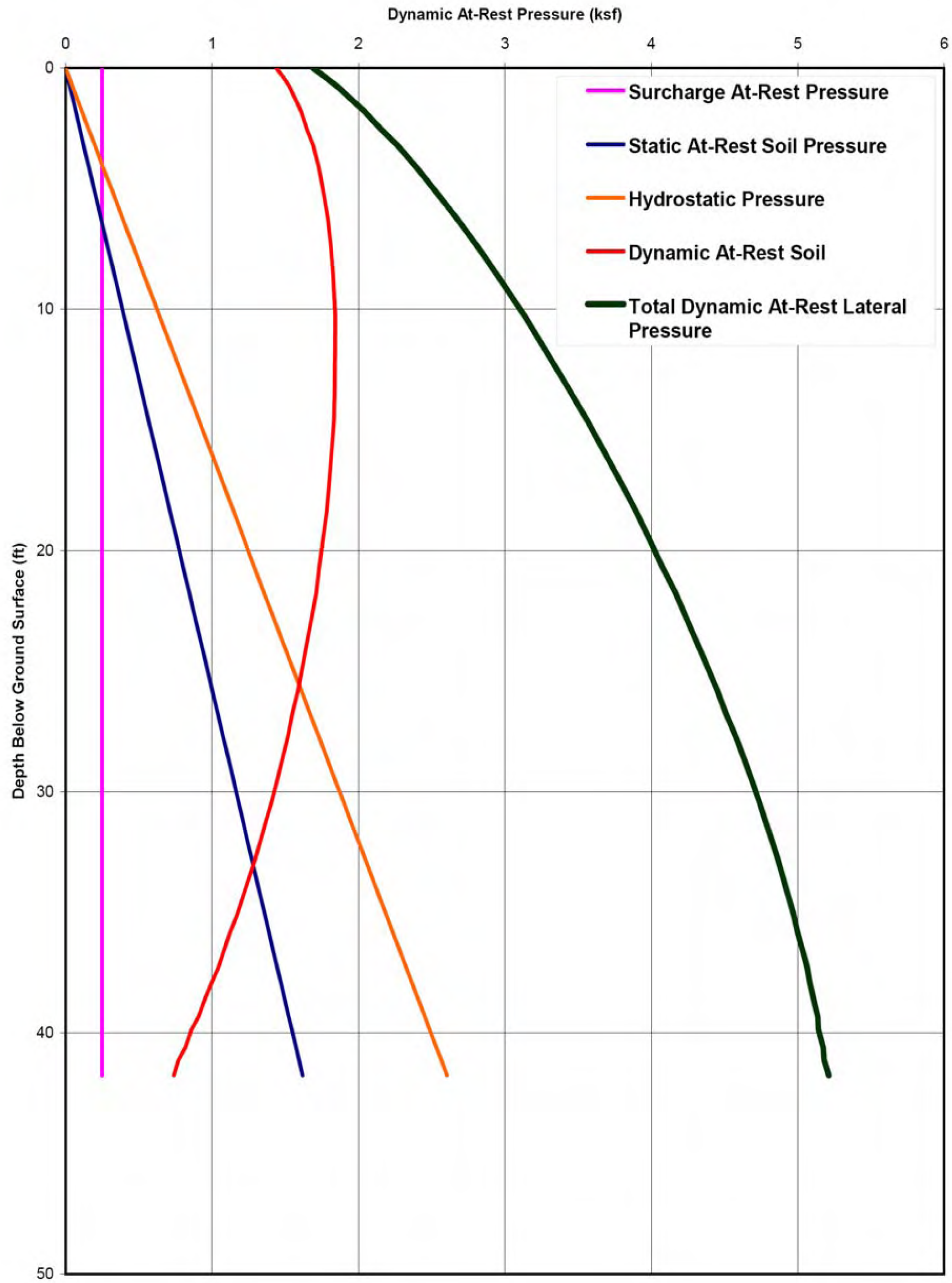


Figure 3H.6-44 Dynamic At-Rest Lateral Earth Pressure Diagrams (Excluding SSI and SSSI Seismic Soil Pressures) for Typical Section of RSW Tunnel

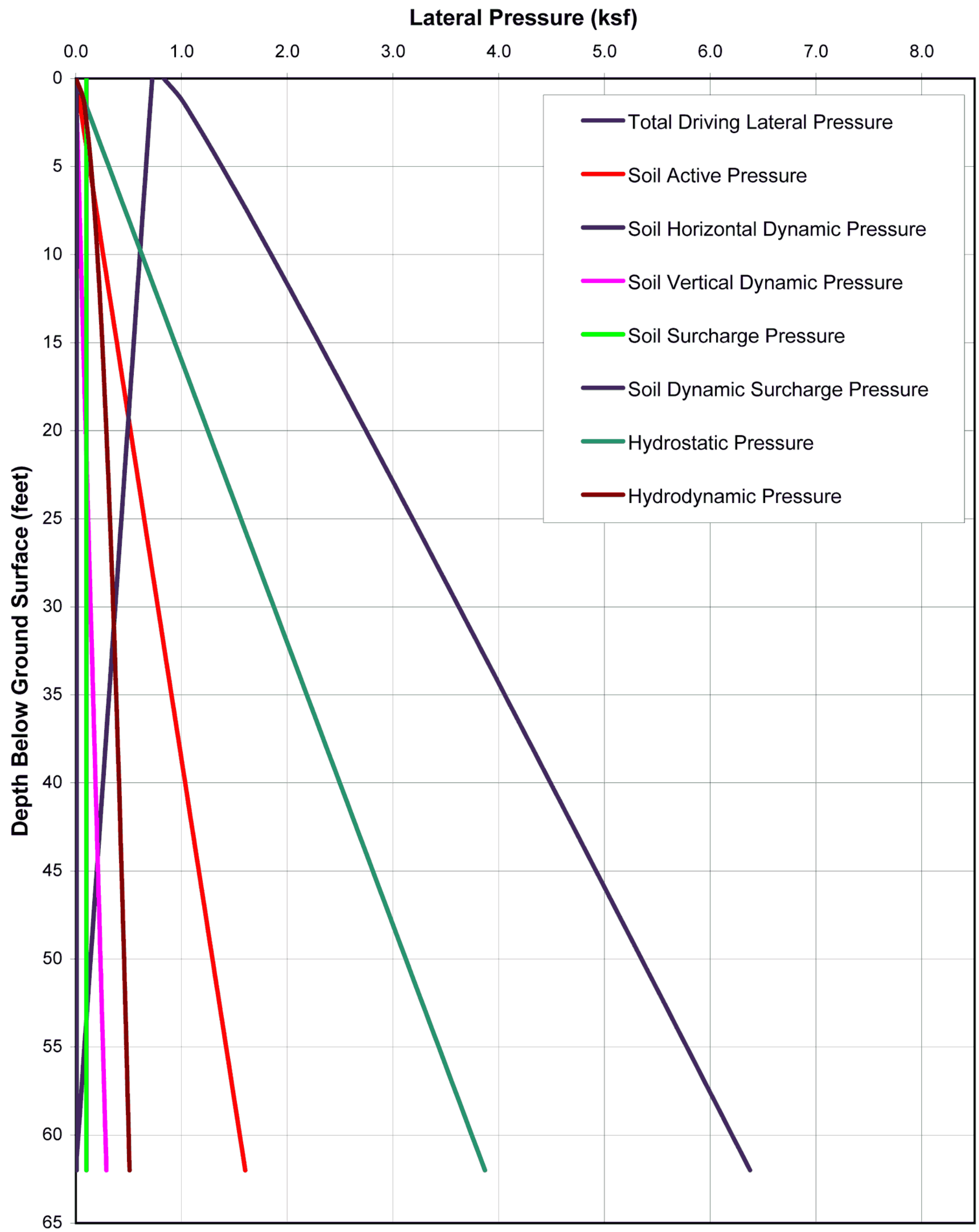


Figure 3H.6-45 Driving Lateral Pressure on the East, West, and North Walls of Pump House (for Stability Evaluation)

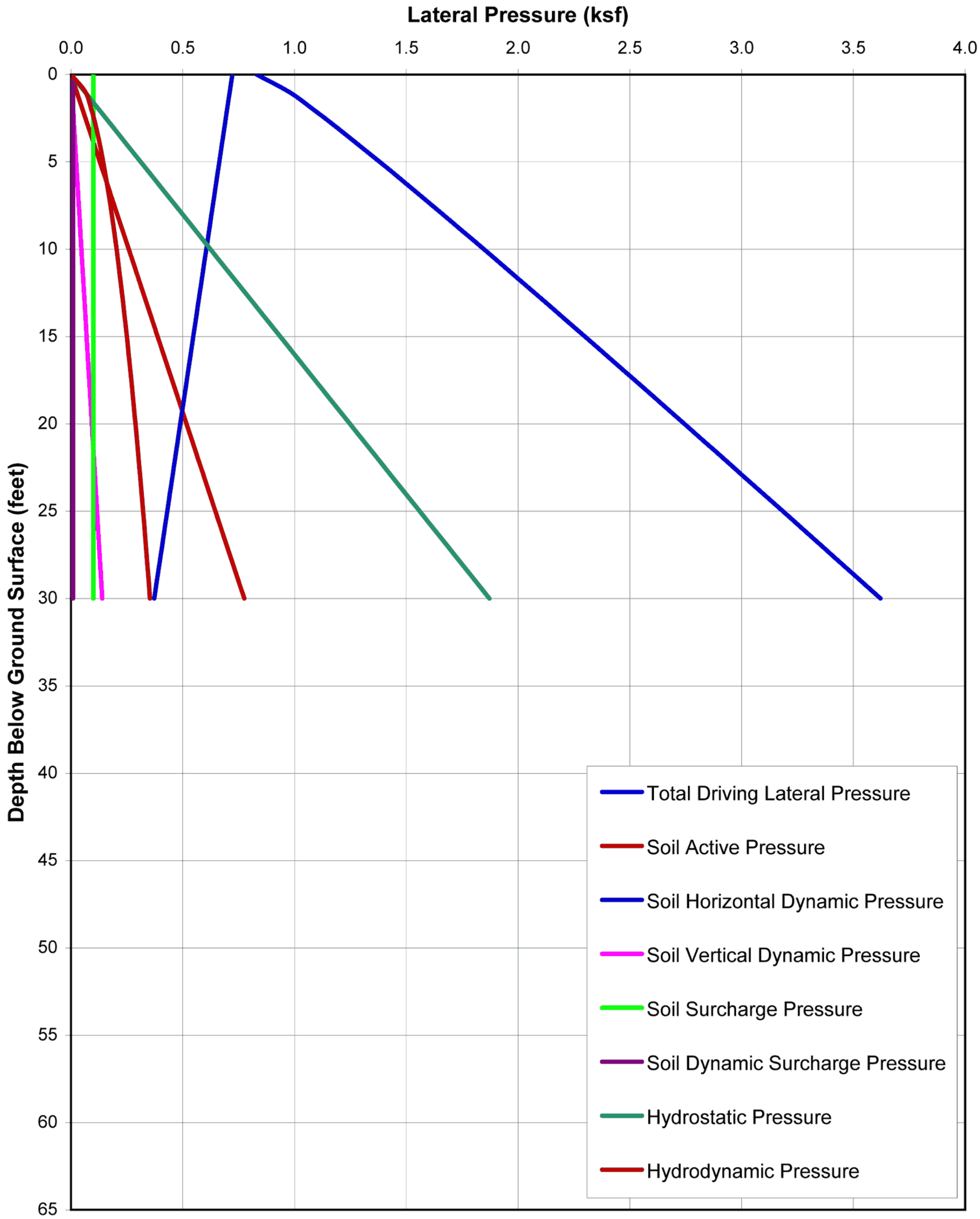


Figure 3H.6-46 Driving Lateral Pressure on Basin Walls (for Stability Evaluation)

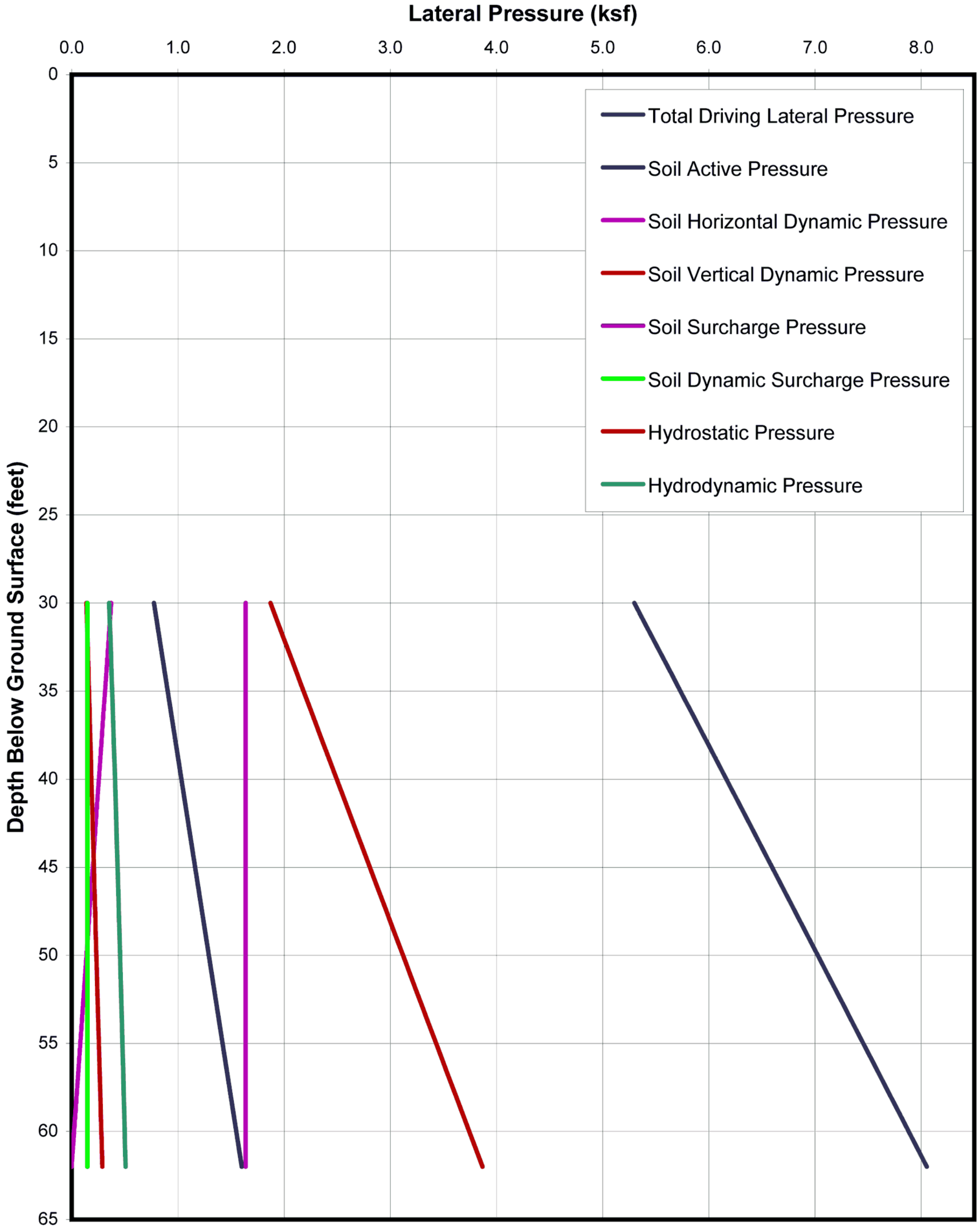


Figure 3H.6-47 Driving Lateral Pressure on the South Wall of Pump House (for Stability Evaluation)

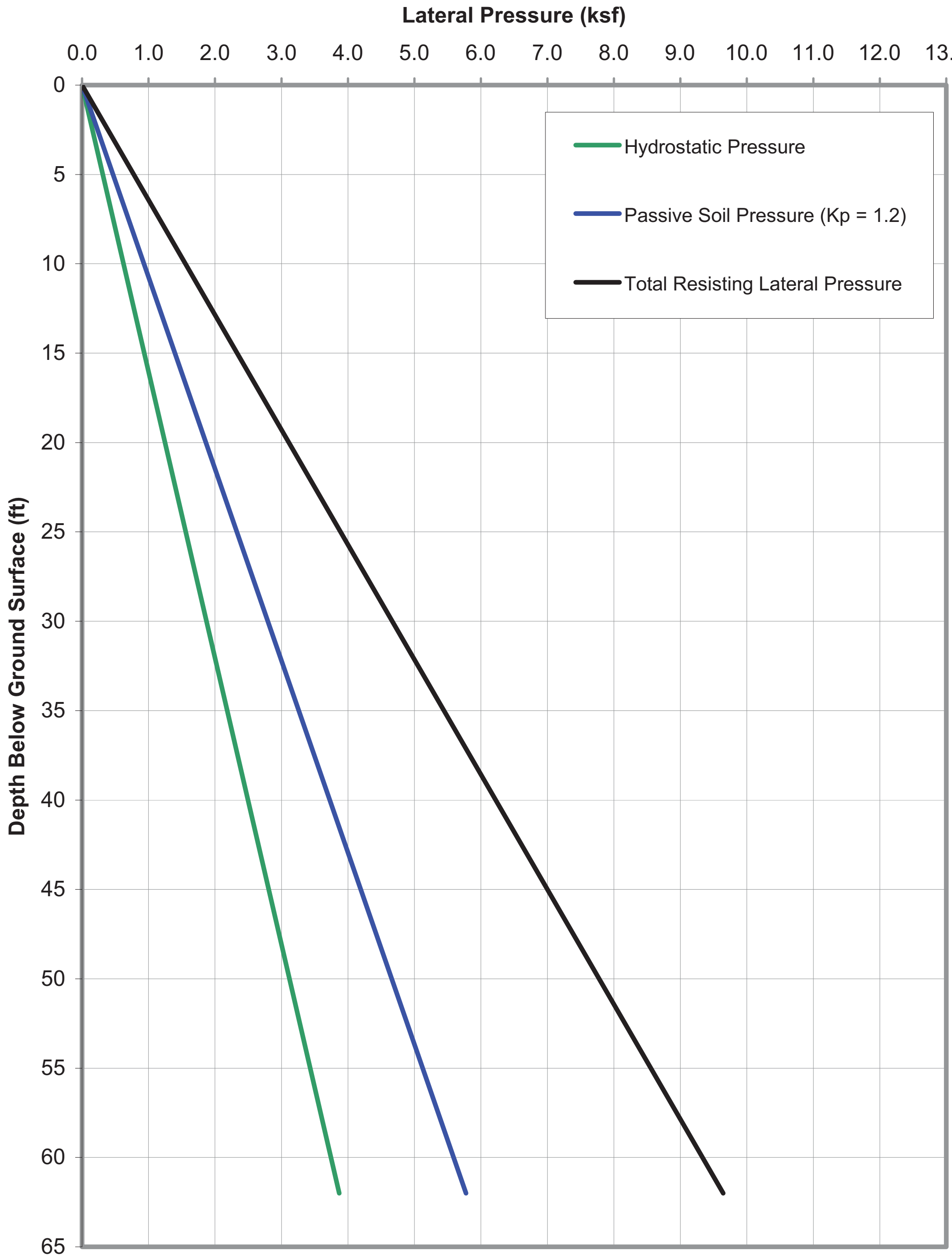


Figure 3H.6-48 Resisting Lateral Pressure on the East, West, and North Walls of Pump House (for Stability Evaluation)

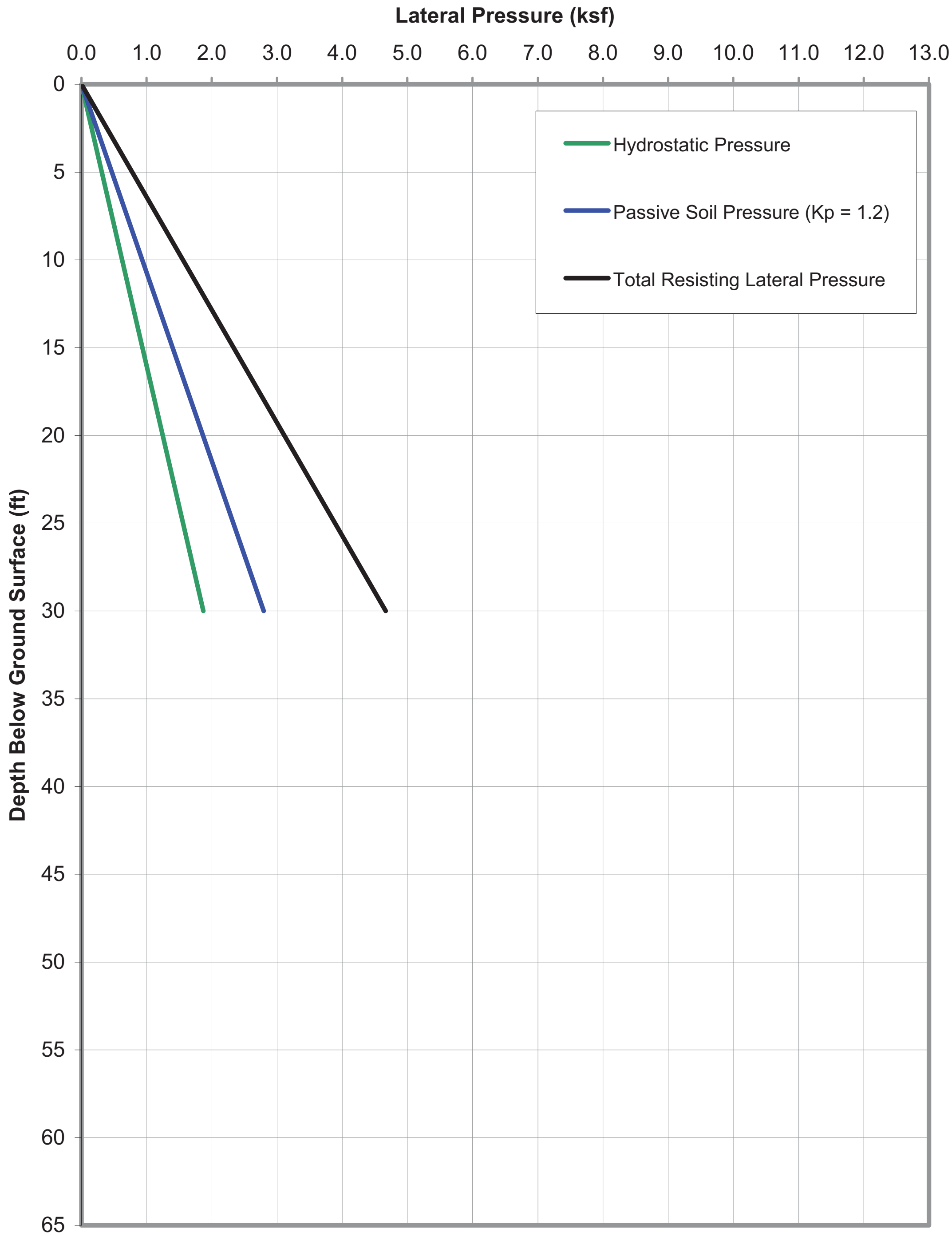


Figure 3H.6-49 Resisting Lateral Pressure on Basin Walls (for Stability Evaluation)

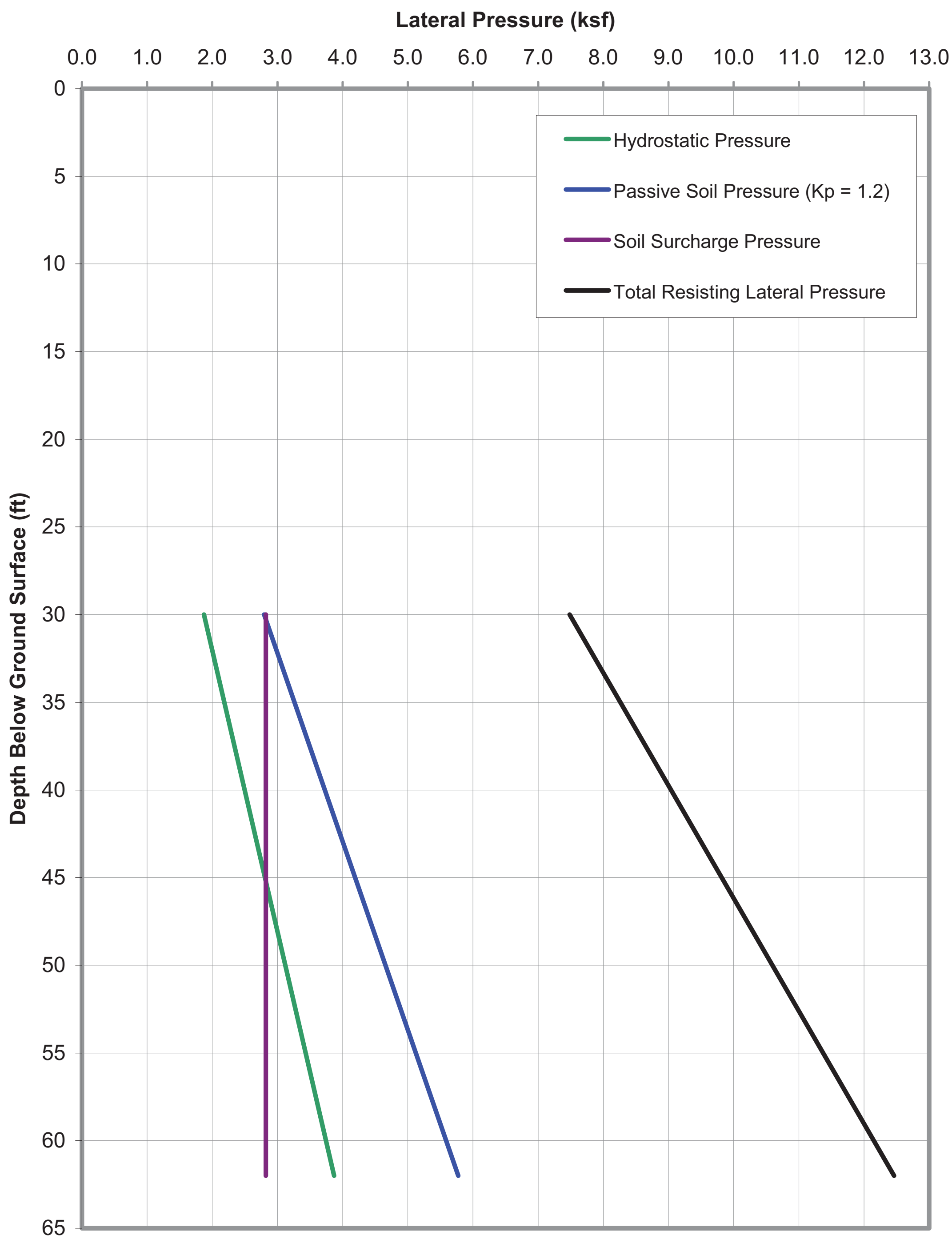


Figure 3H.6-50 Resisting Lateral Pressure on the South Wall of Pump House (for Stability Evaluation)

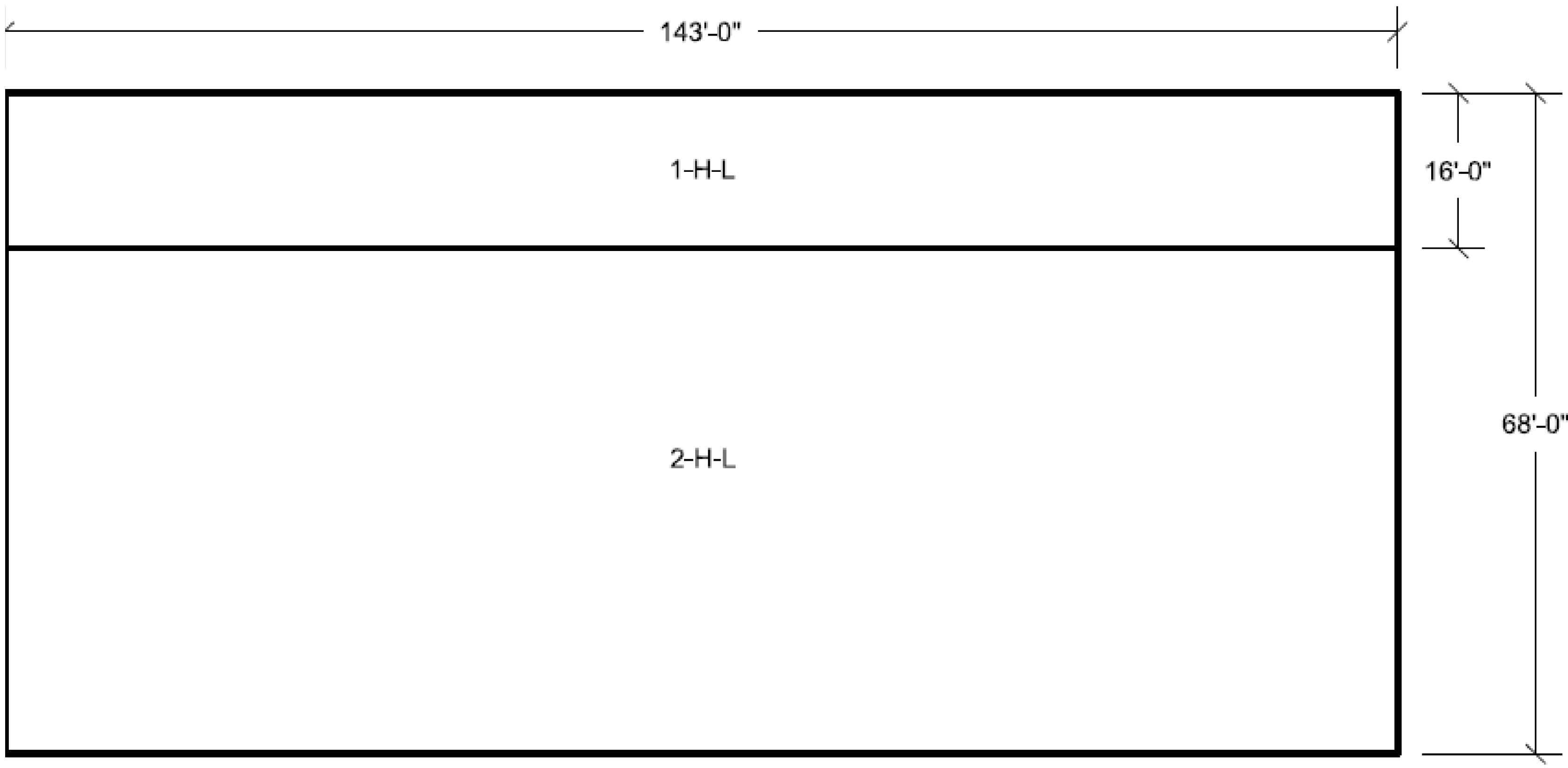


Figure 3H.6-51 Pump House North Wall Looking South Horizontal Reinforcement Zones Near Side Face

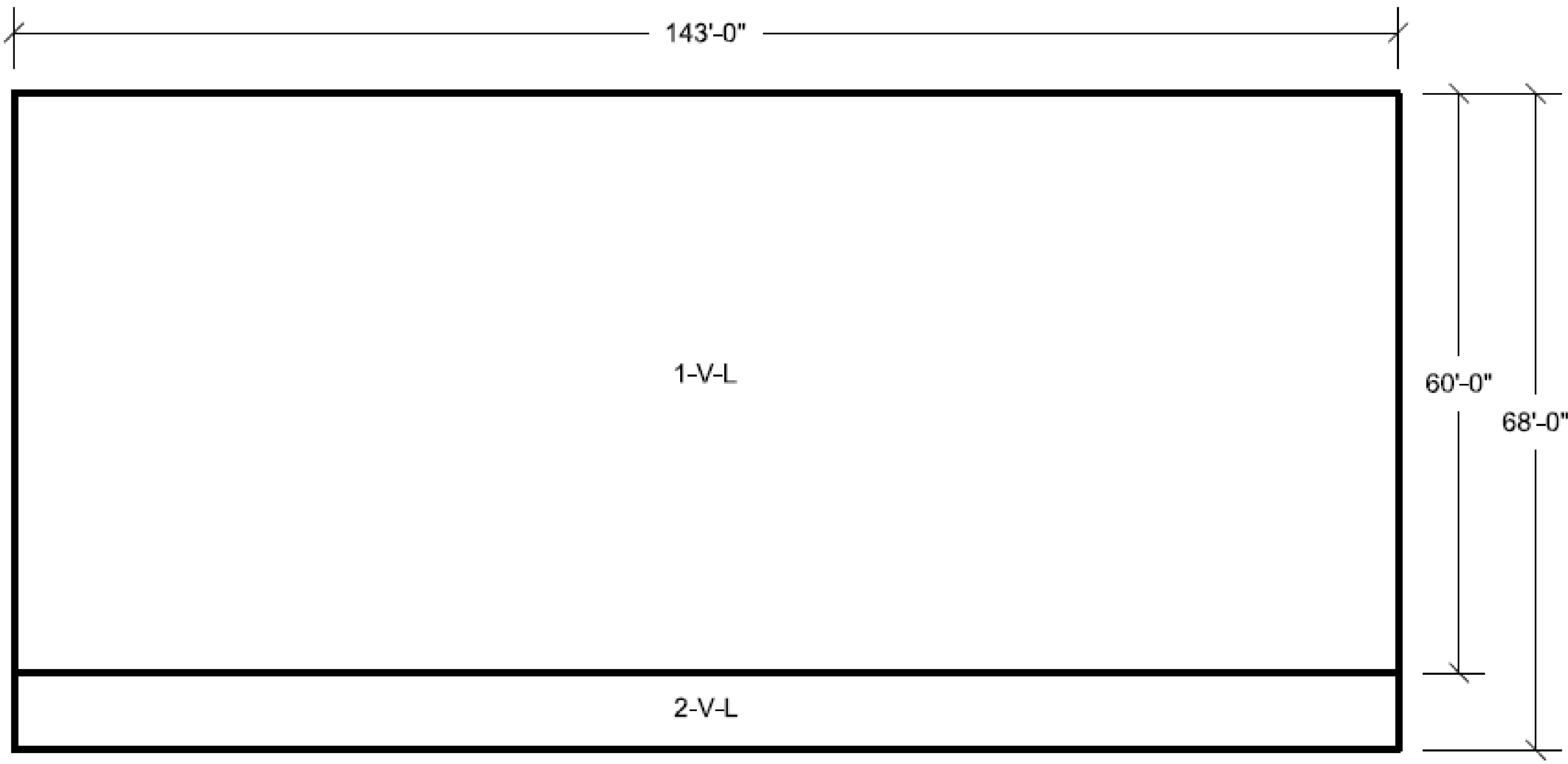


Figure 3H.6-52 Pump House North Wall Looking South Vertical Reinforcement Zones Near Side Face

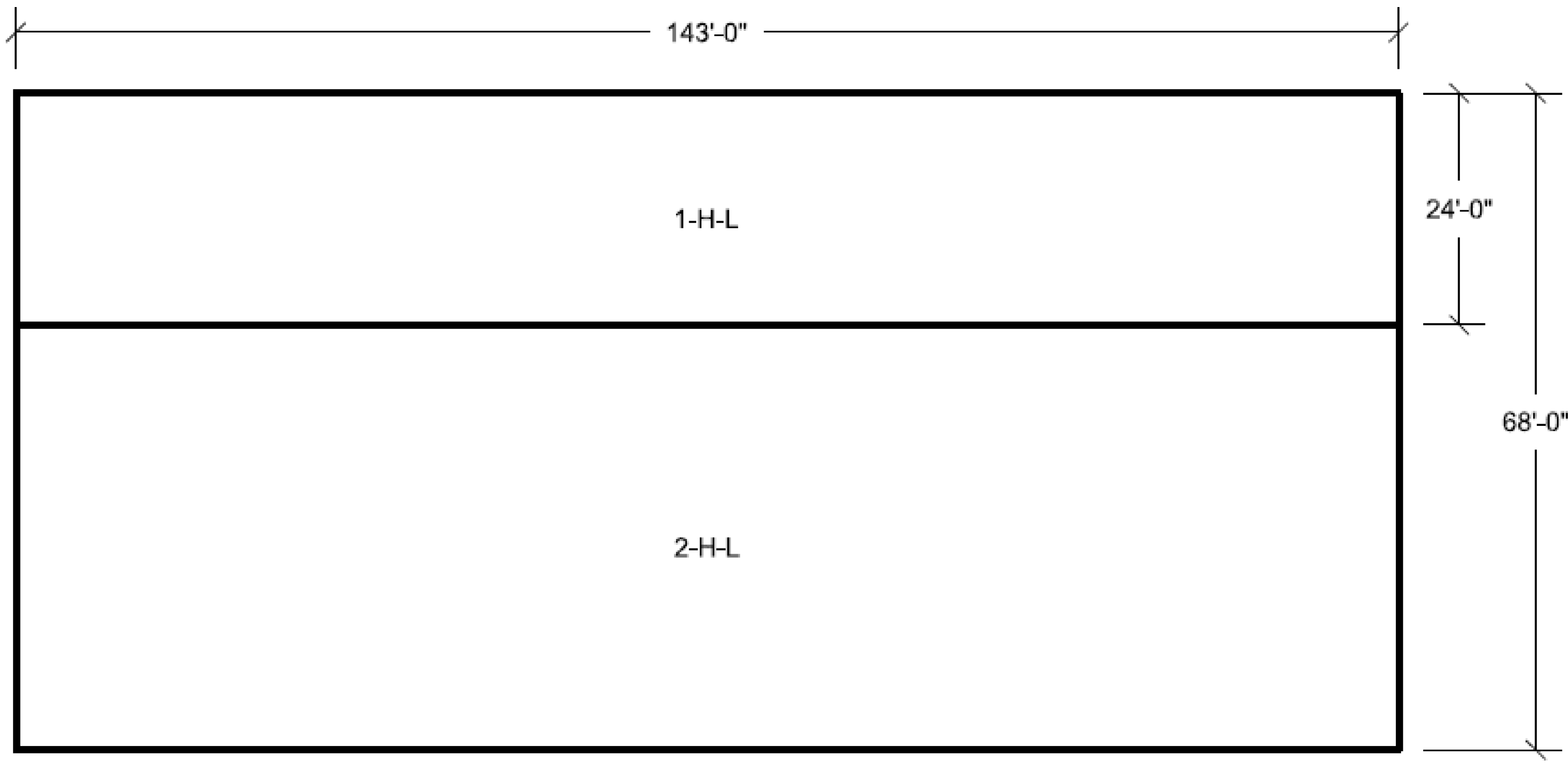


Figure 3H.6-53 Pump House North Wall Looking South Horizontal Reinforcement Zones Far Side Face

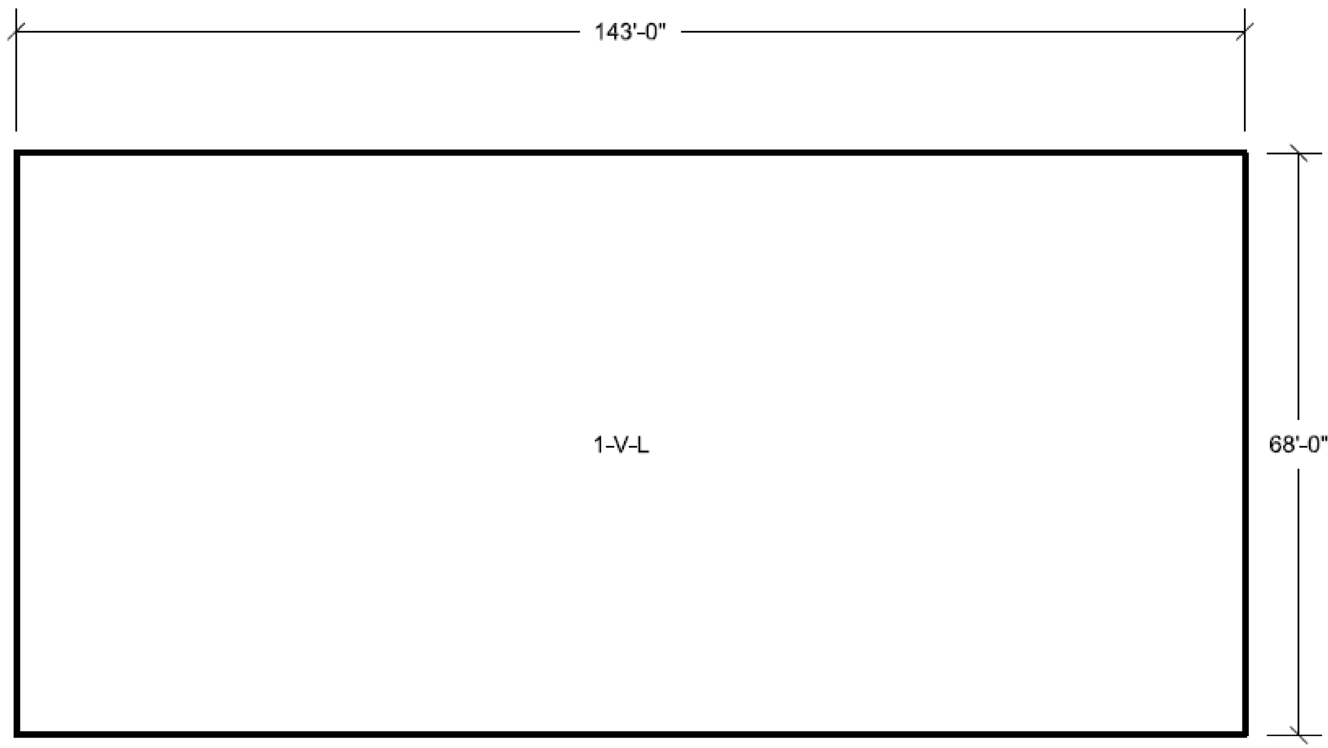


Figure 3H.6-54 Pump House North Wall Looking South Vertical Reinforcement Zones Far Side Face

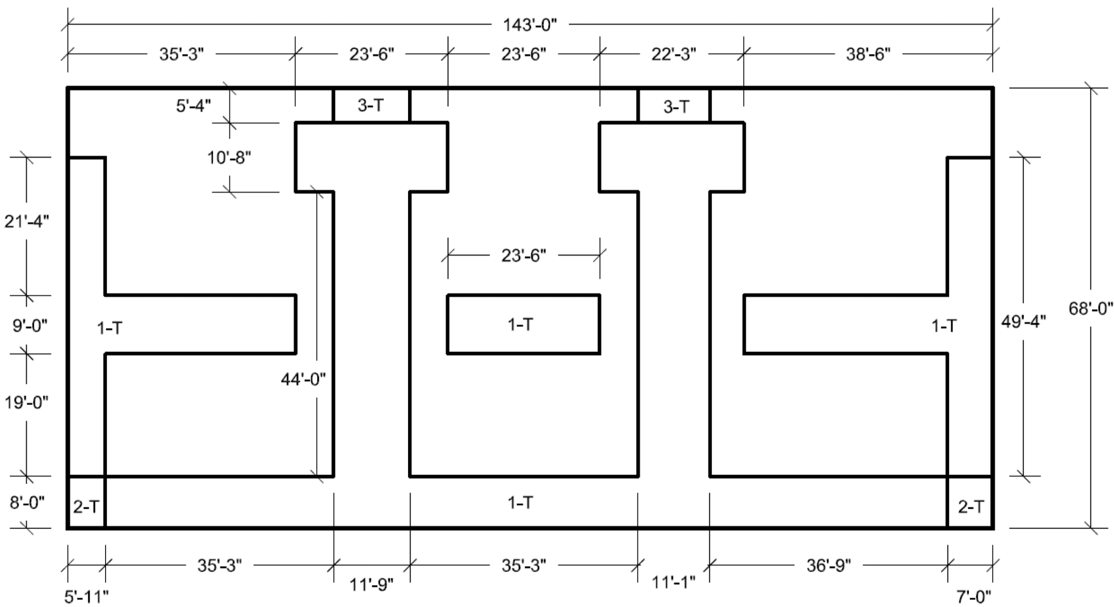


Figure 3H.6-55 Pump House North Wall Looking South Transverse Reinforcement Zones

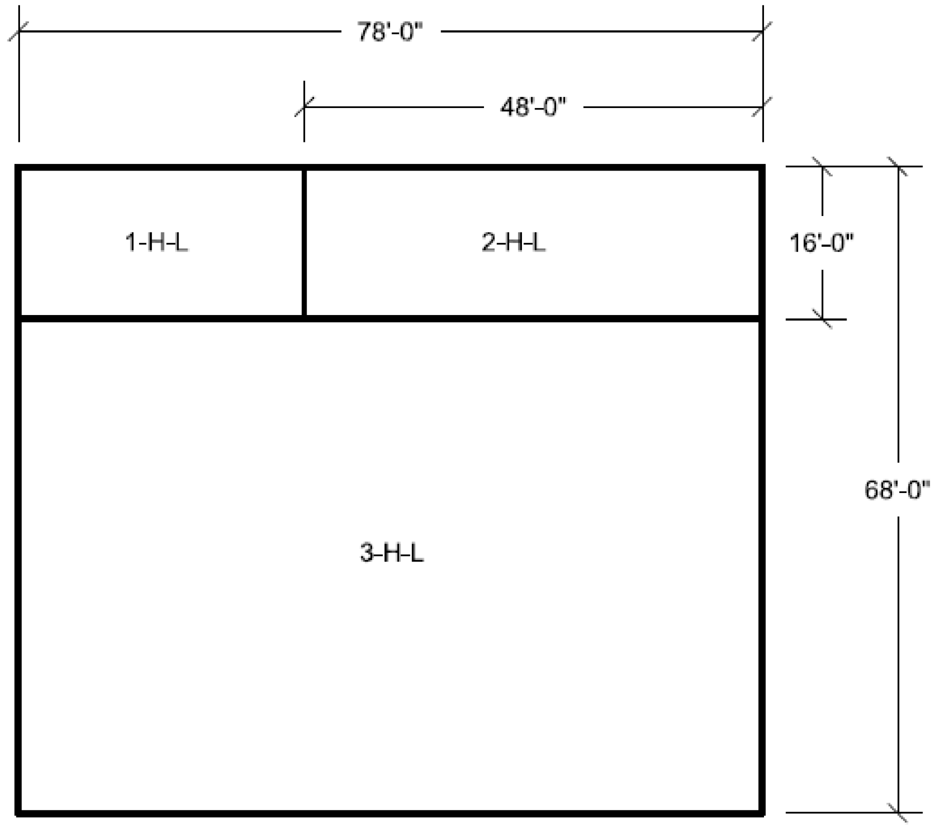


Figure 3H.6-56 Pump House East Wall Looking West Horizontal Reinforcement Zones Near Side Face

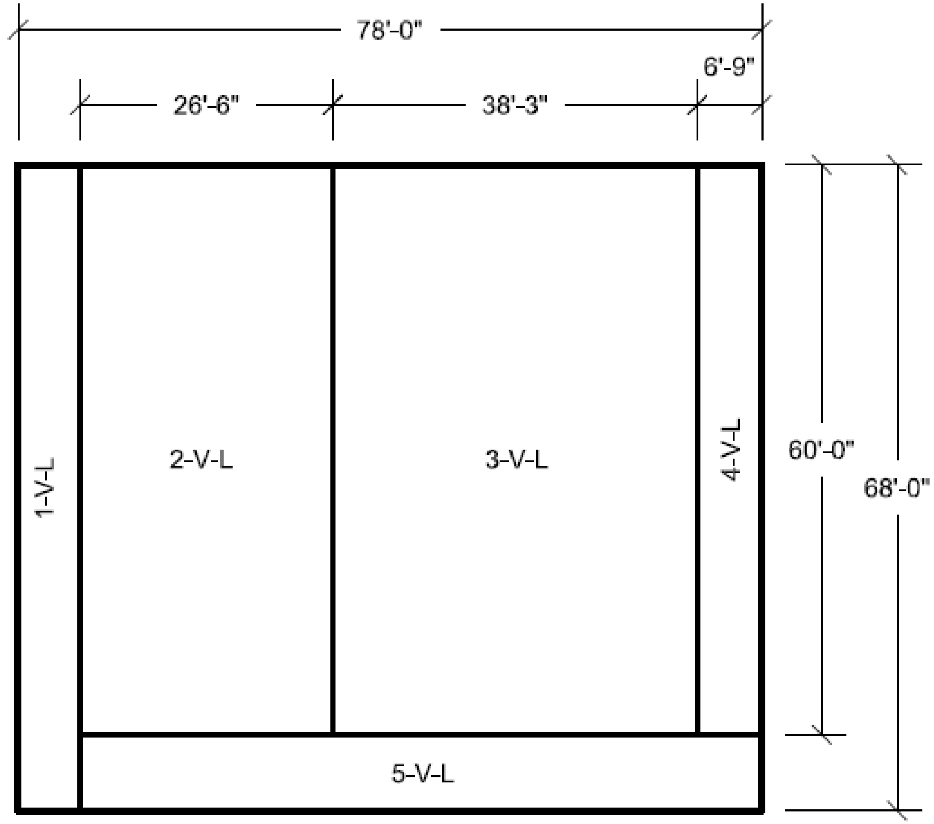


Figure 3H.6-57 Pump House East Wall Looking West Vertical Reinforcement Zones Near Side Face

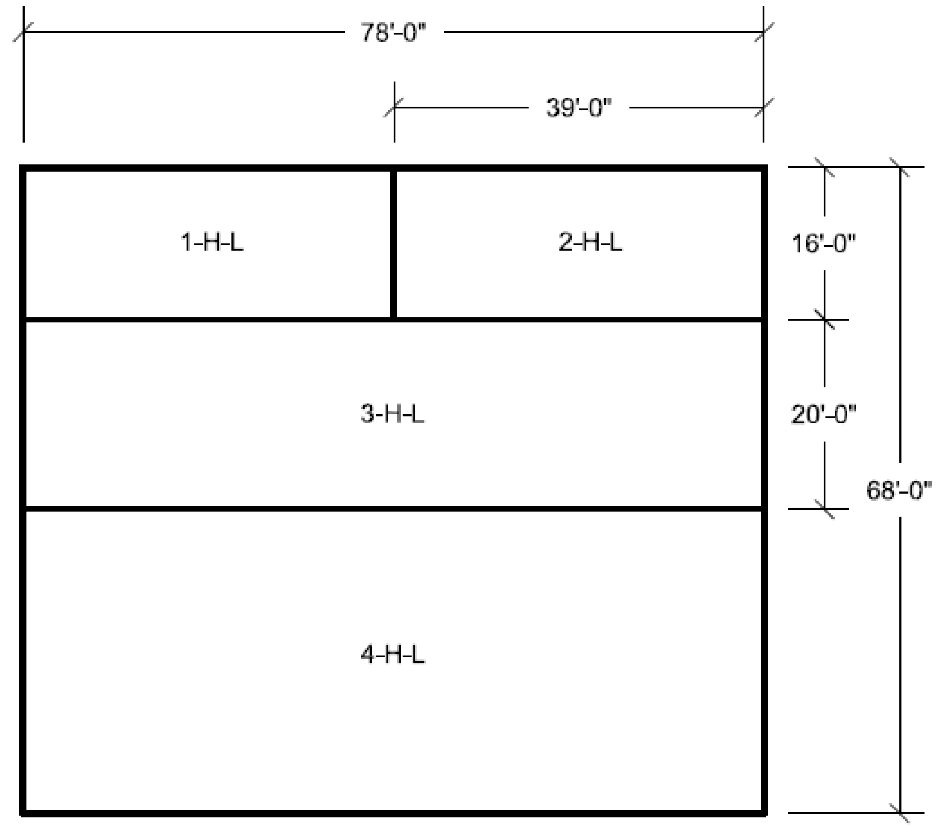


Figure 3H.6-58 Pump House East Wall Looking West Horizontal Reinforcement Zones Far Side Face

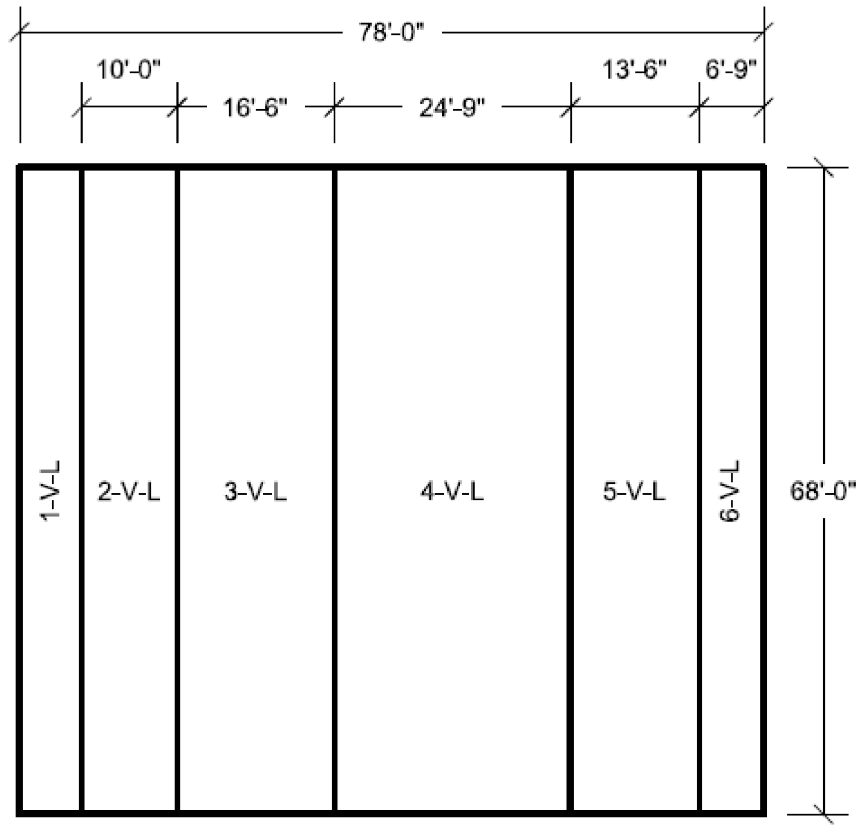


Figure 3H.6-59 Pump House East Wall Looking West Vertical Reinforcement Zones Far Side Face

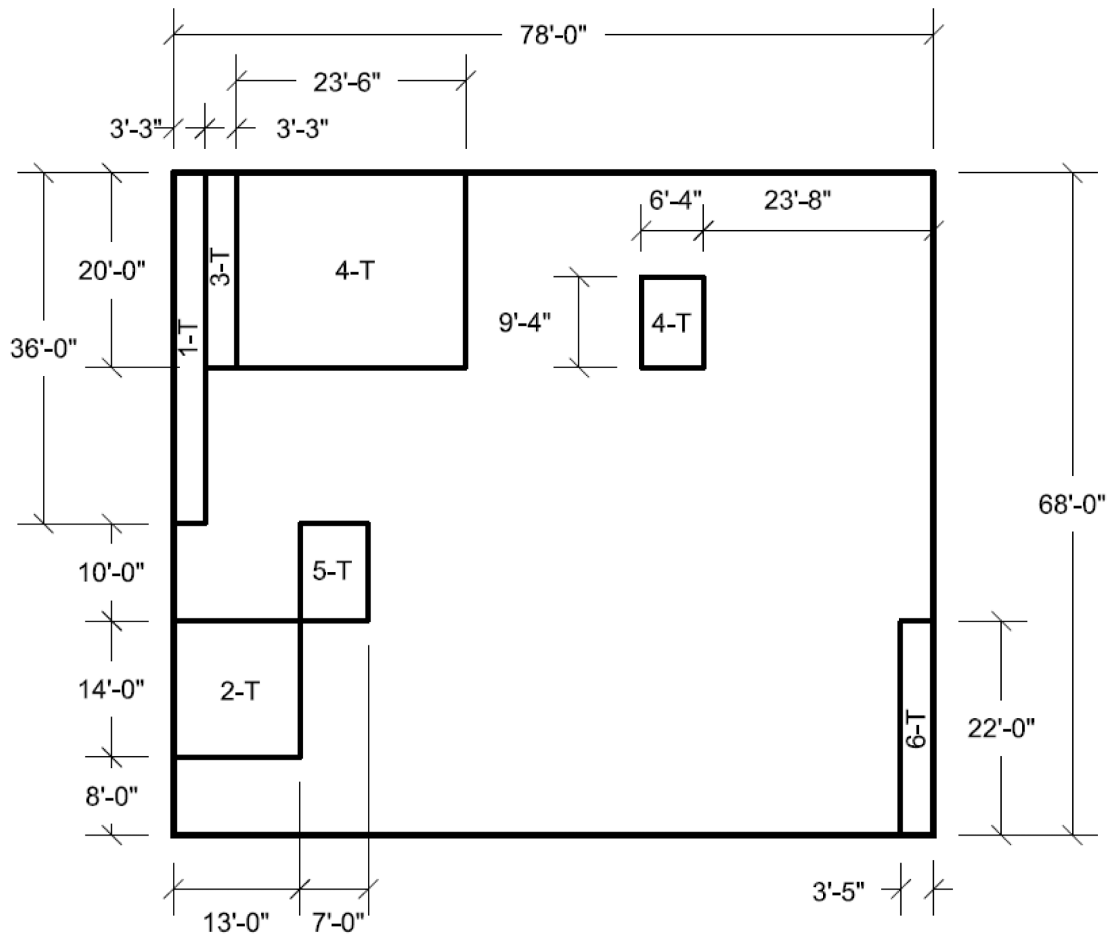


Figure 3H.6-60 Pump House East Wall Looking West Transverse Reinforcement Zones

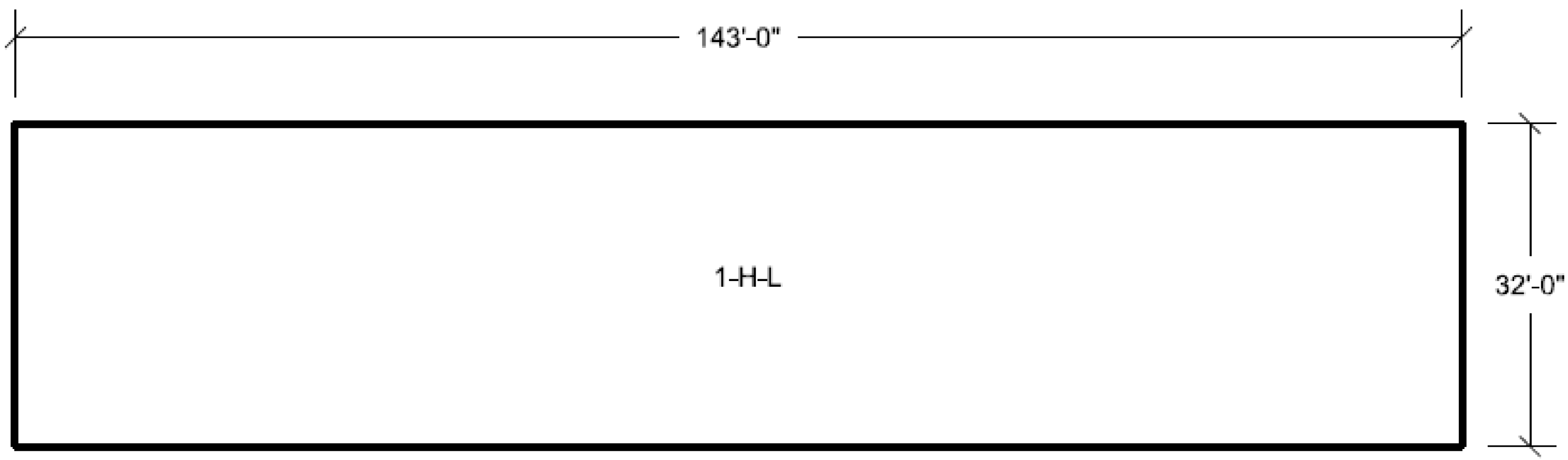


Figure 3H.6-61 Pump House South Wall Looking South Horizontal Reinforcement Zones Near Side Face

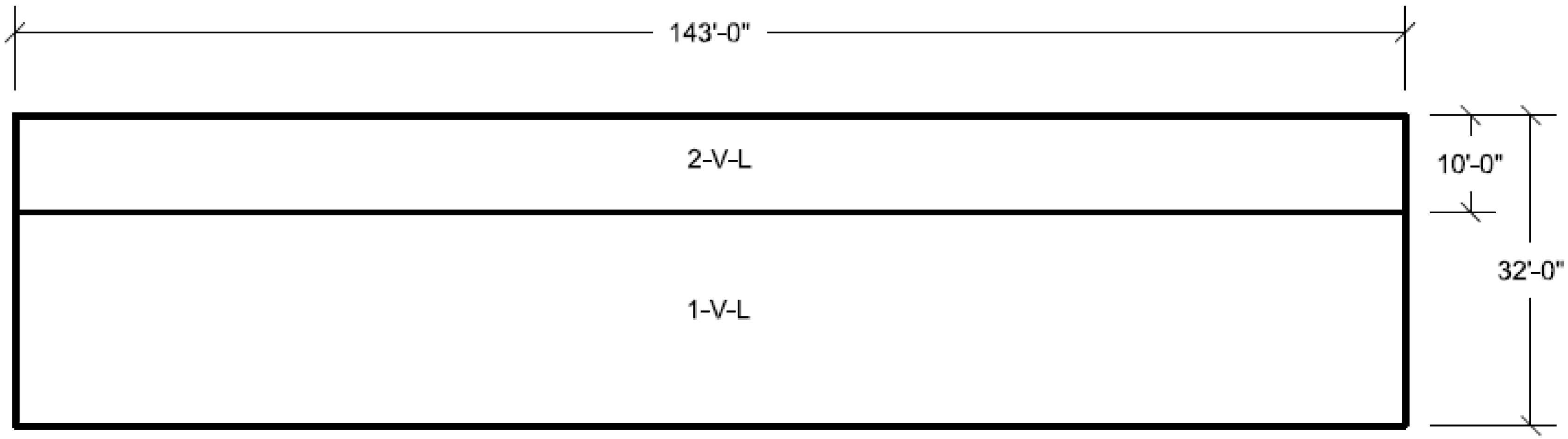


Figure 3H.6-62 Pump House South Wall Looking South Vertical Reinforcement Zones Near Side Face

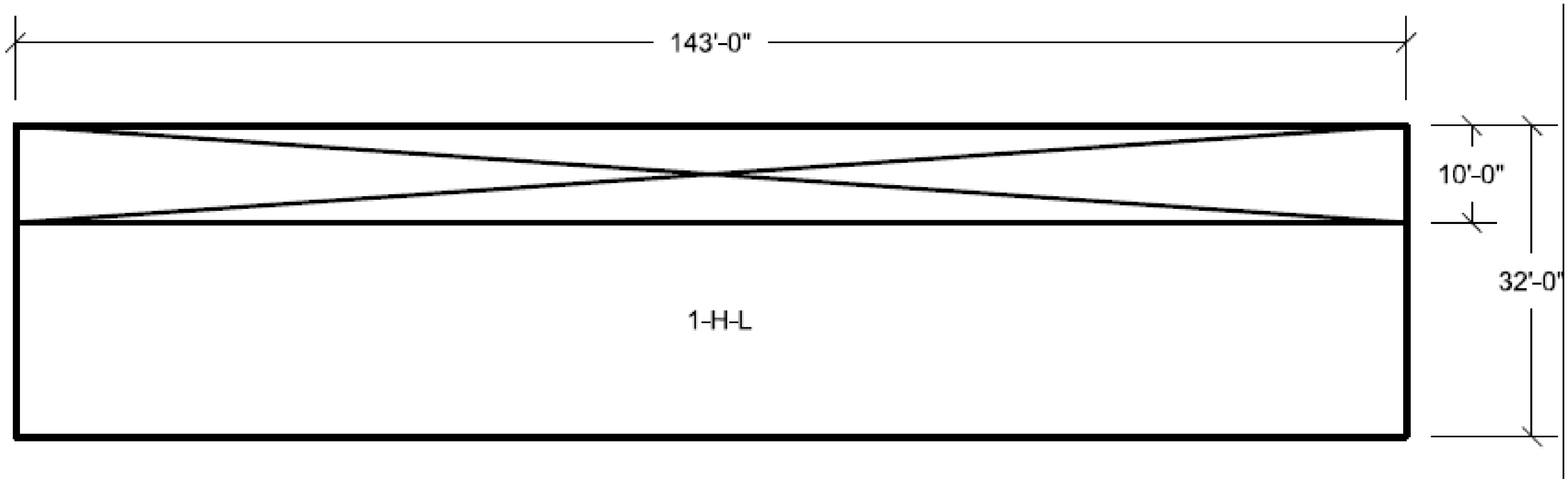


Figure 3H.6-63 Pump House South Wall Looking South Horizontal Reinforcement Zones Far Side Face

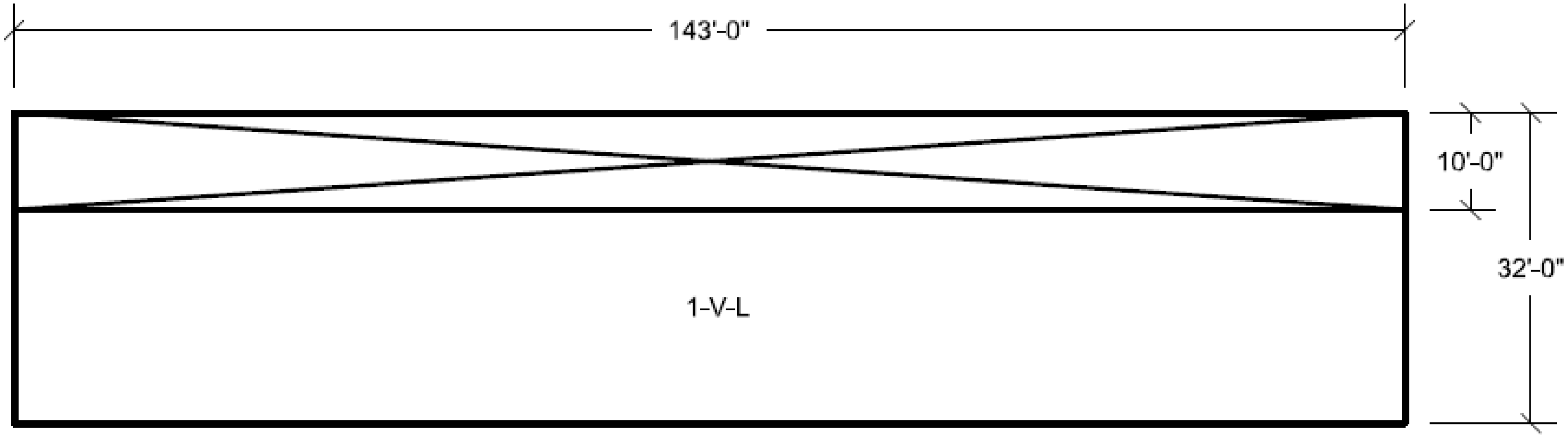


Figure 3H.6-64 Pump House South Wall Looking South Vertical Reinforcement Zones Far Side Face

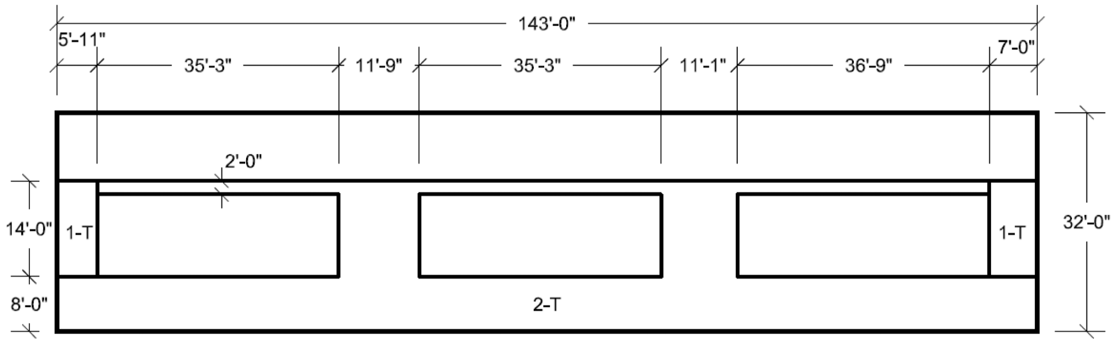


Figure 3H.6-65 Pump House South Wall Looking South Transverse Reinforcement Zones

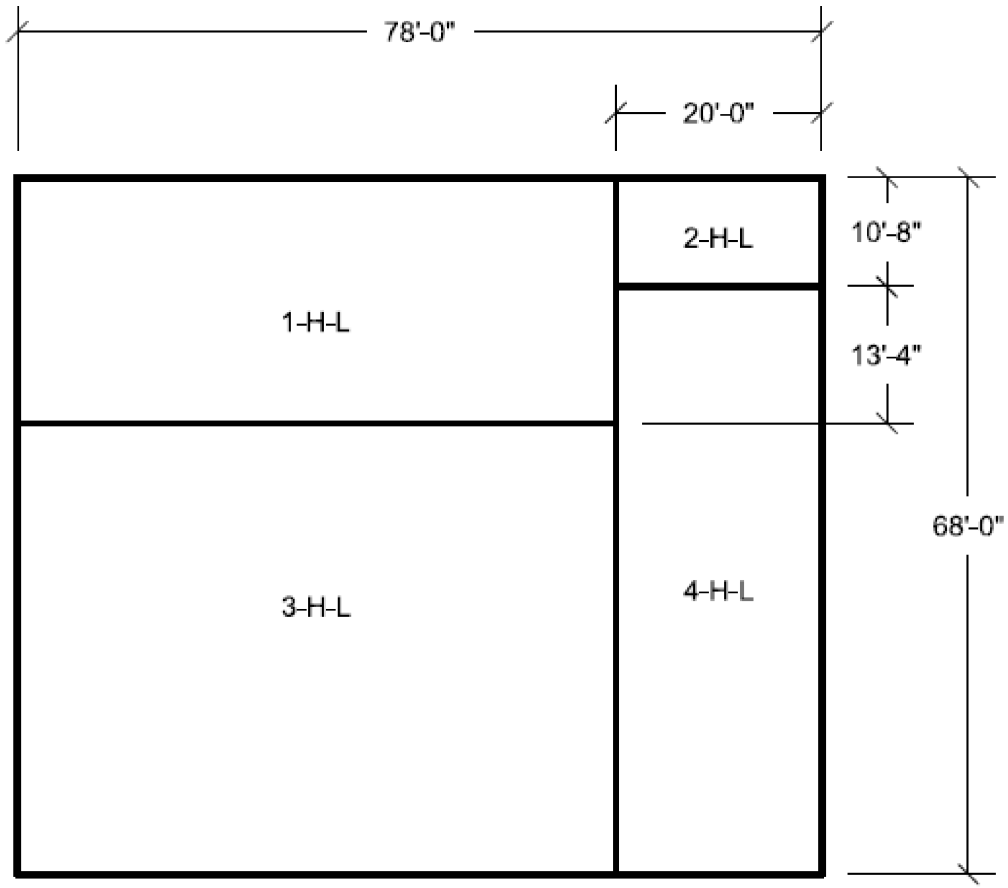


Figure 3H.6-66 Pump House West Wall Looking East Horizontal Reinforcement Zones Near Side Face

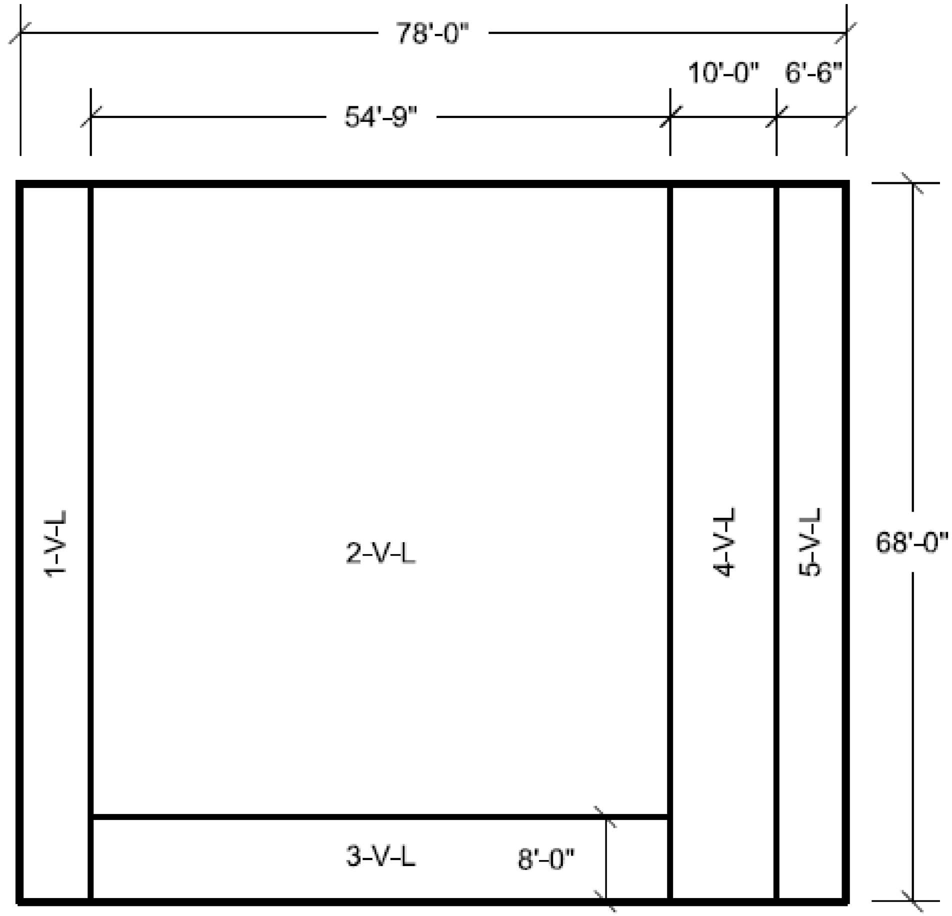


Figure 3H.6-67 Pump House West Wall Looking East Vertical Reinforcement Zones Near Side Face

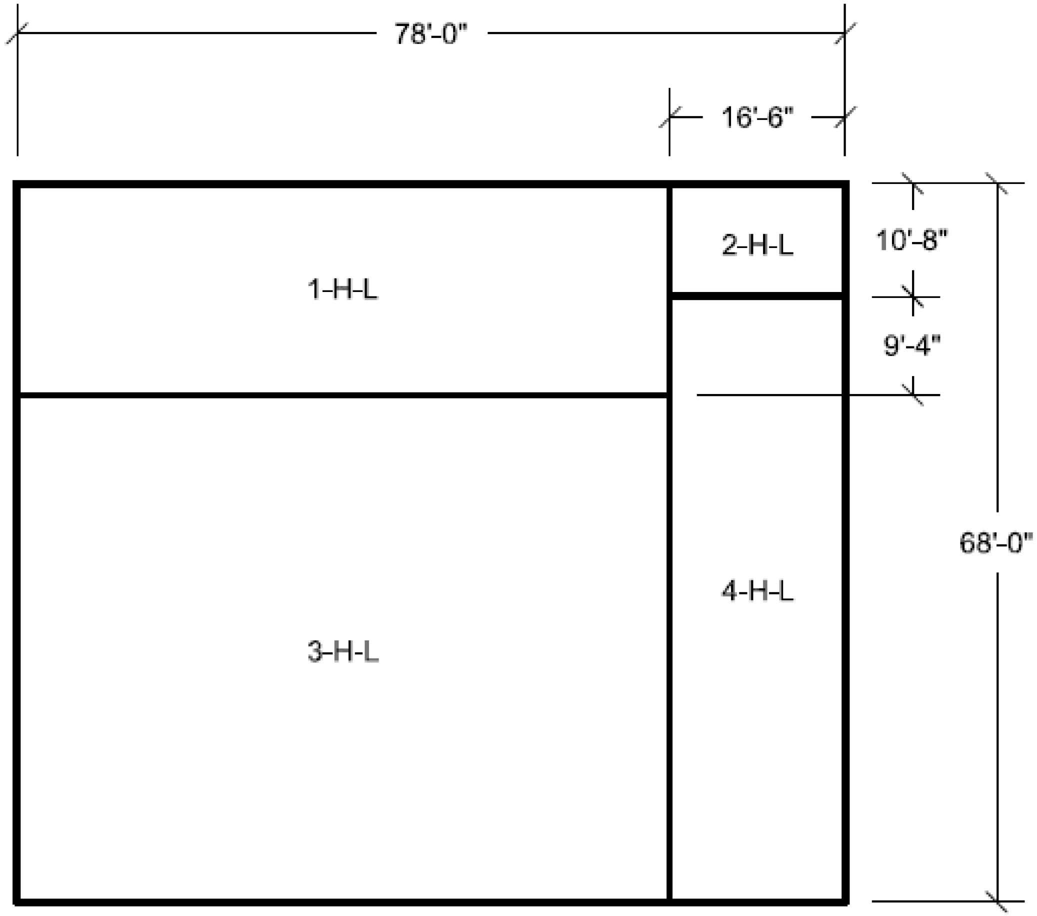


Figure 3H.6-68 Pump House West Wall Looking East Horizontal Reinforcement Zones Far Side Face

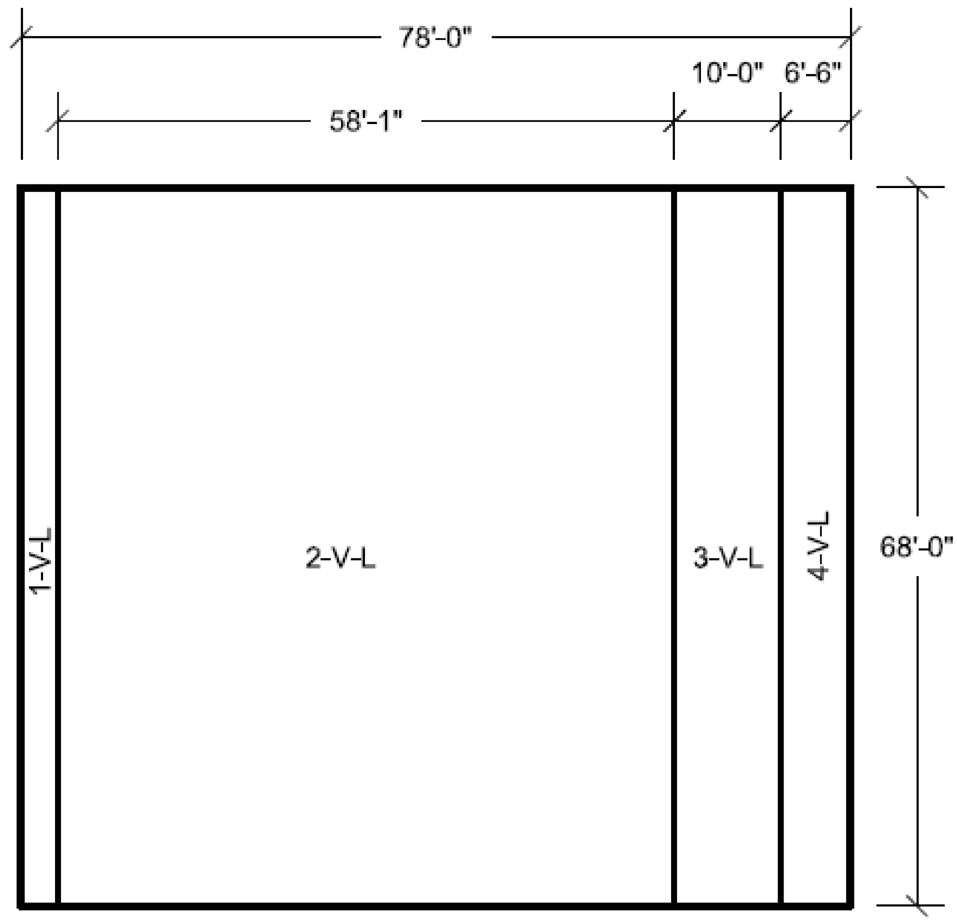


Figure 3H.6-69 Pump House West Wall Looking East Vertical Reinforcement Zones Far Side Face

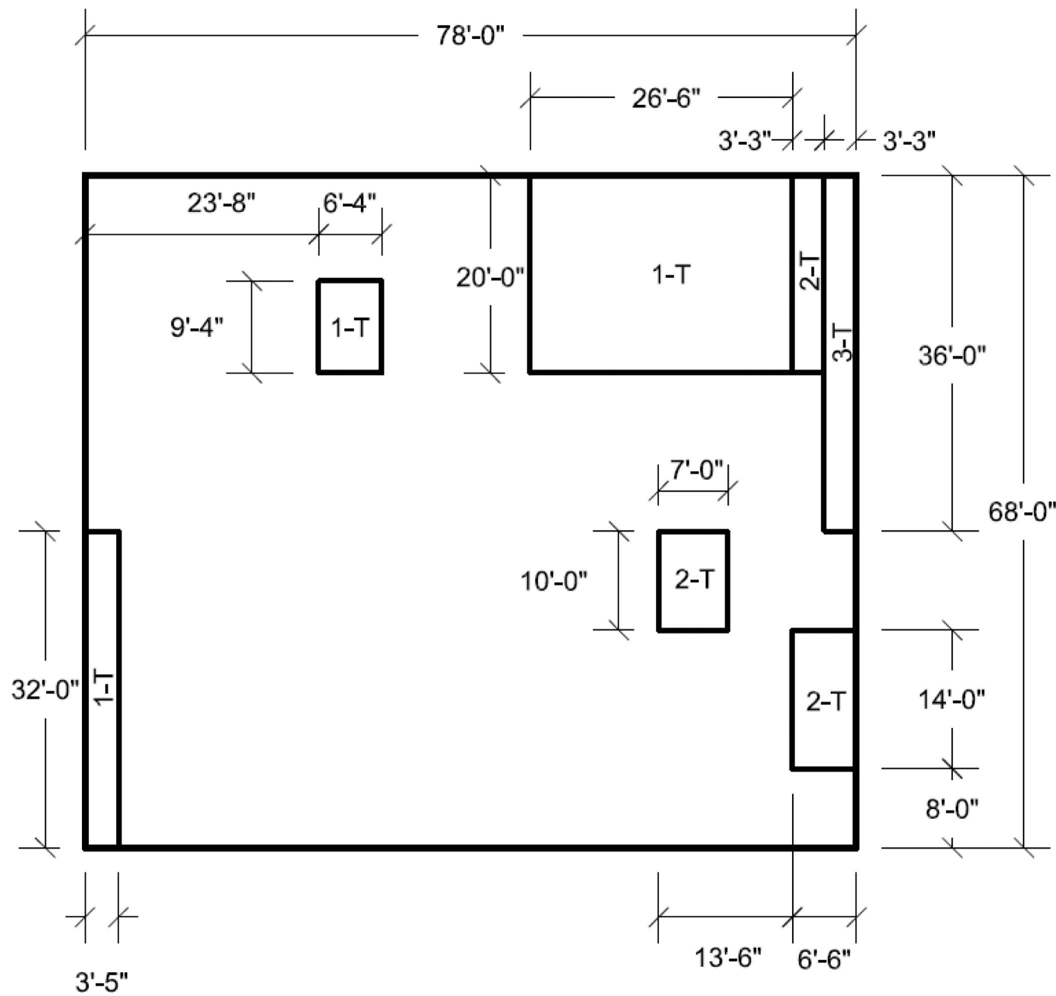


Figure 3H.6-70 Pump House West Wall Looking East Transverse Reinforcement Zones

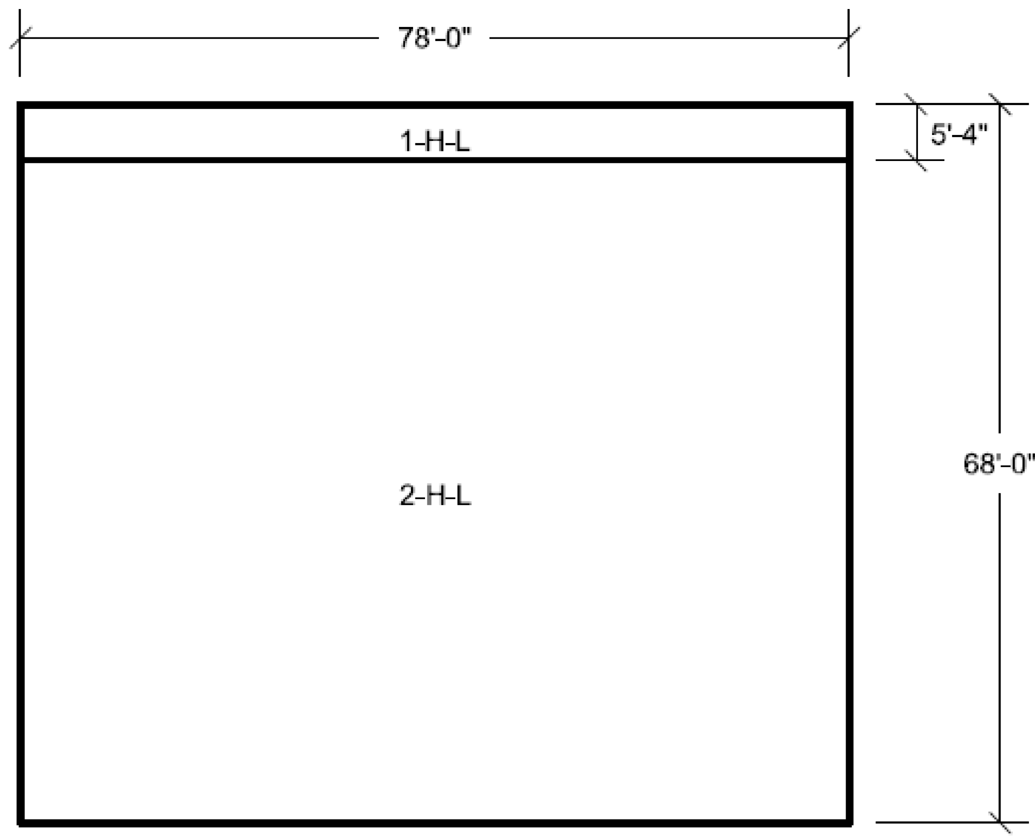


Figure 3H.6-71 Pump House Internal East Wall Looking West Horizontal Reinforcement Zones Near Side Face

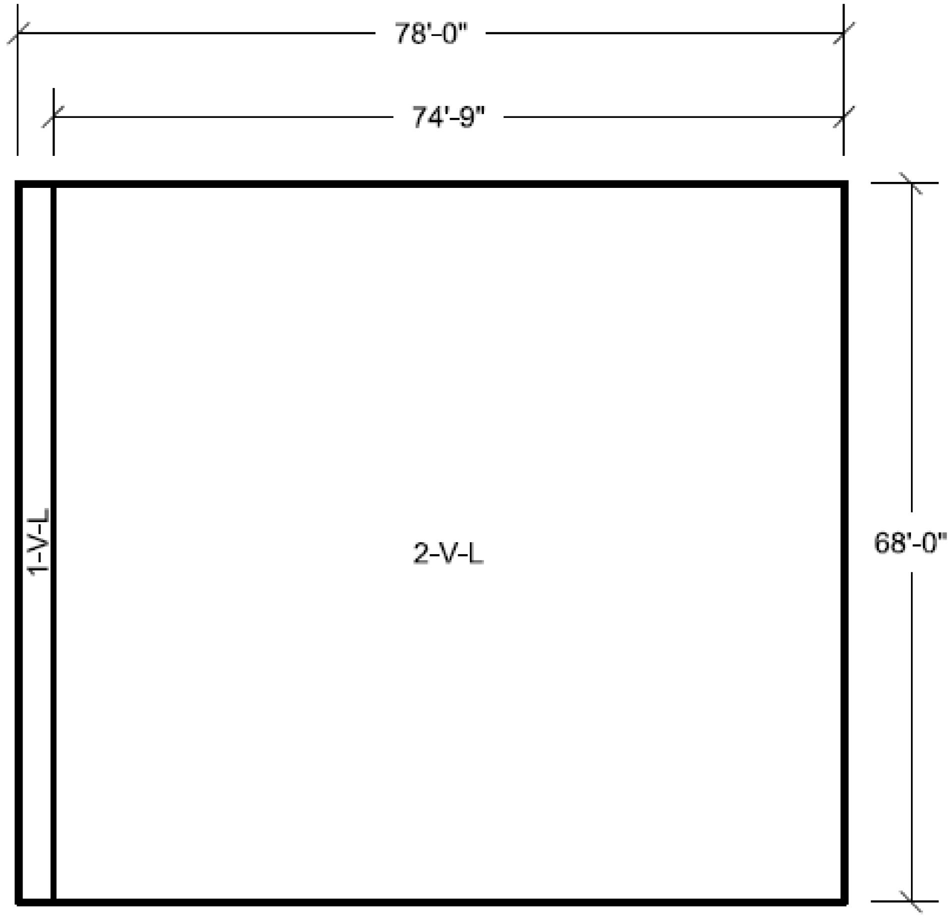


Figure 3H.6-72 Pump House Internal East Wall Looking West Vertical Reinforcement Zones Near Side Face

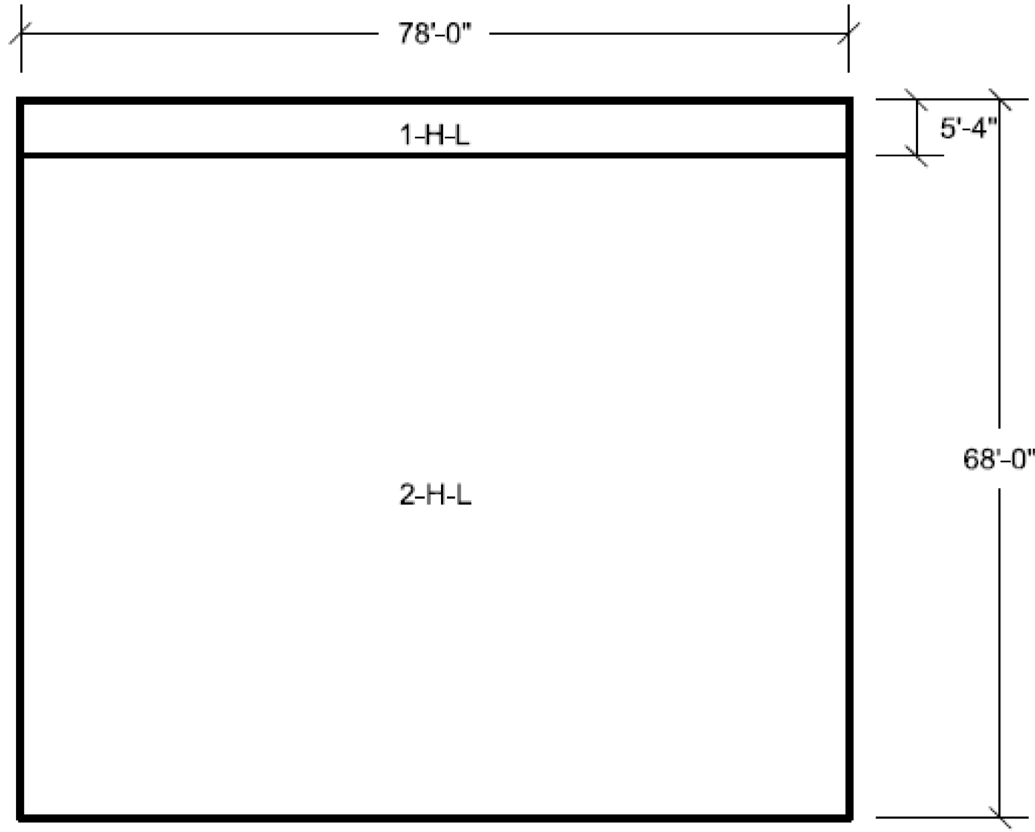


Figure 3H.6-73 Pump House Internal East Wall Looking West Horizontal Reinforcement Zones Far Side Face

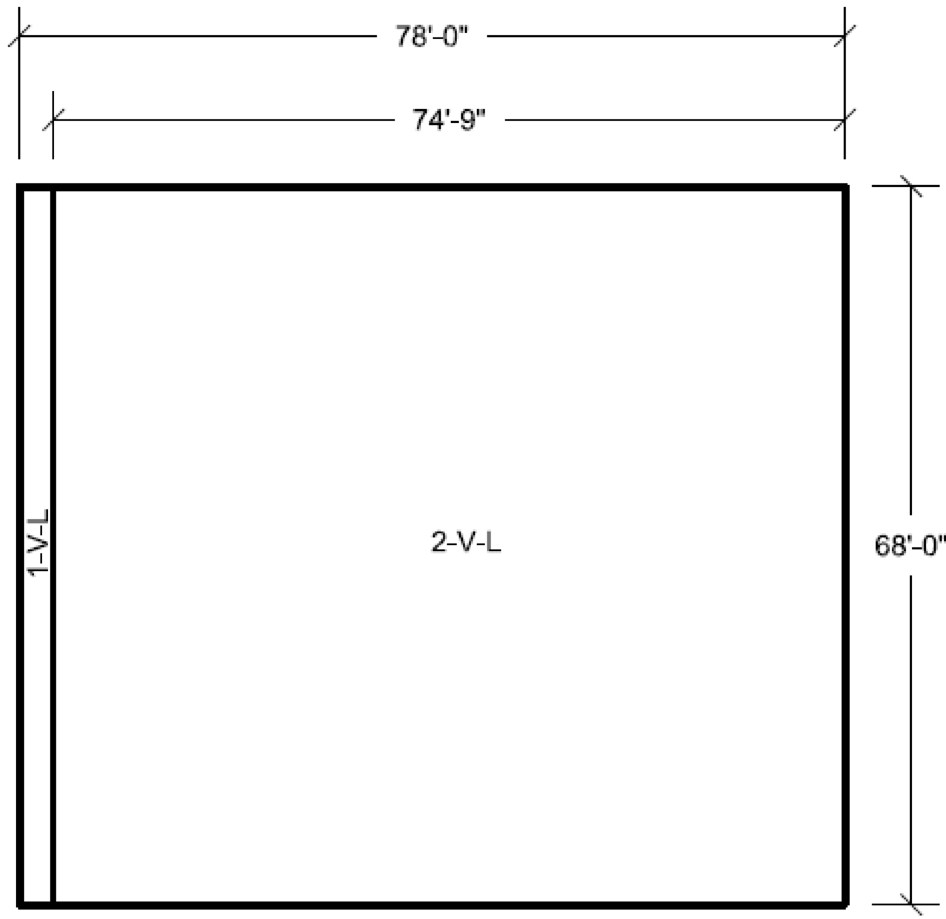


Figure 3H.6-74 Pump House Internal East Wall Looking West Vertical Reinforcement Zones Far Side Face

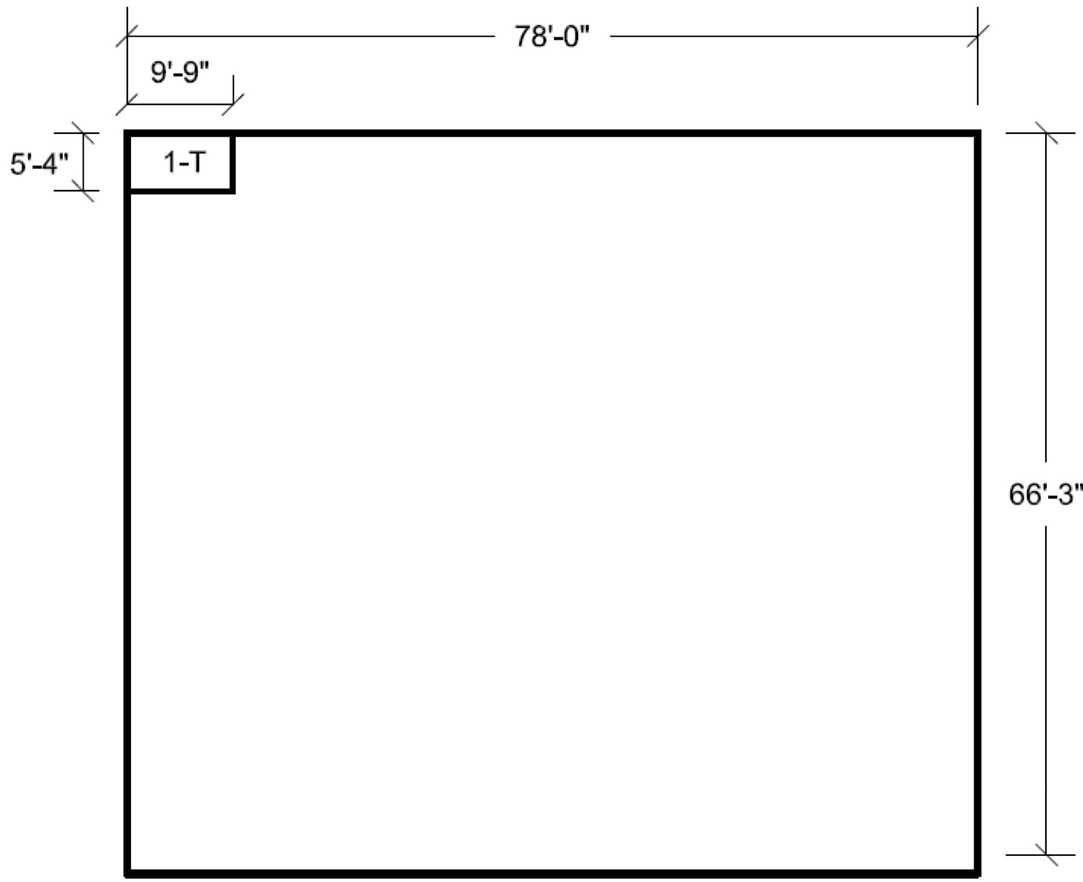


Figure 3H.6-74A Pump House Internal East Wall Looking West Transverse Reinforcement Zones

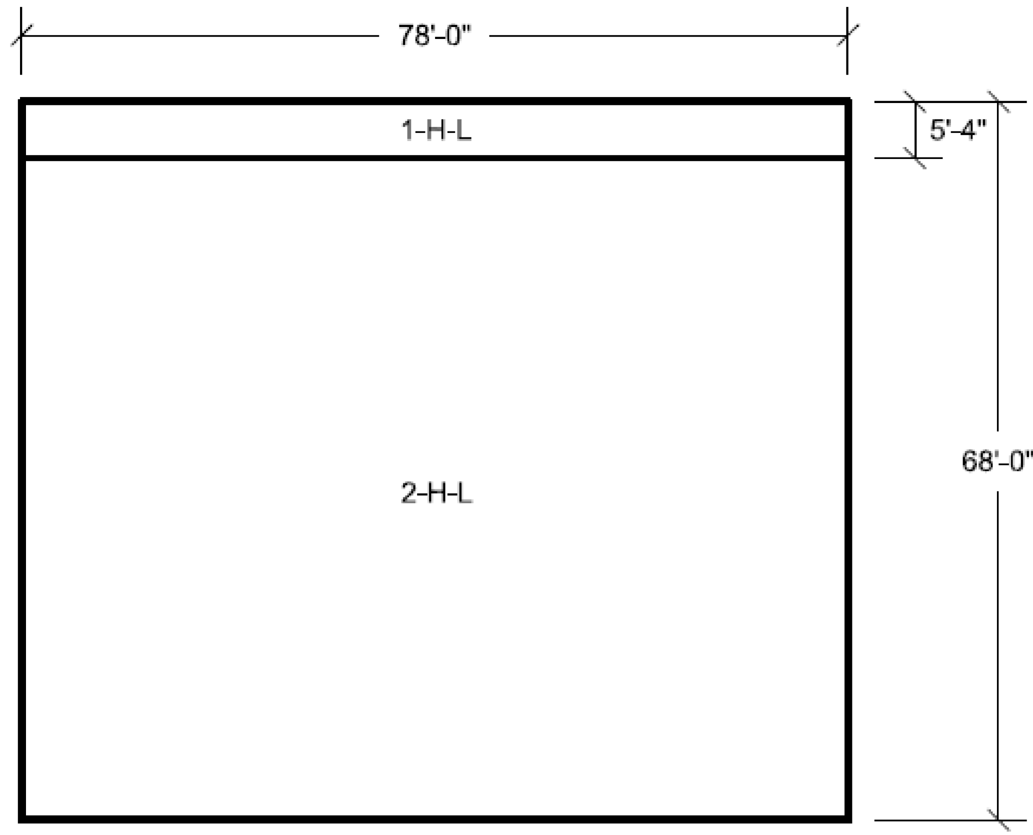


Figure 3H.6-75 Pump House Internal West Wall Looking West Horizontal Reinforcement Zones Near Side Face

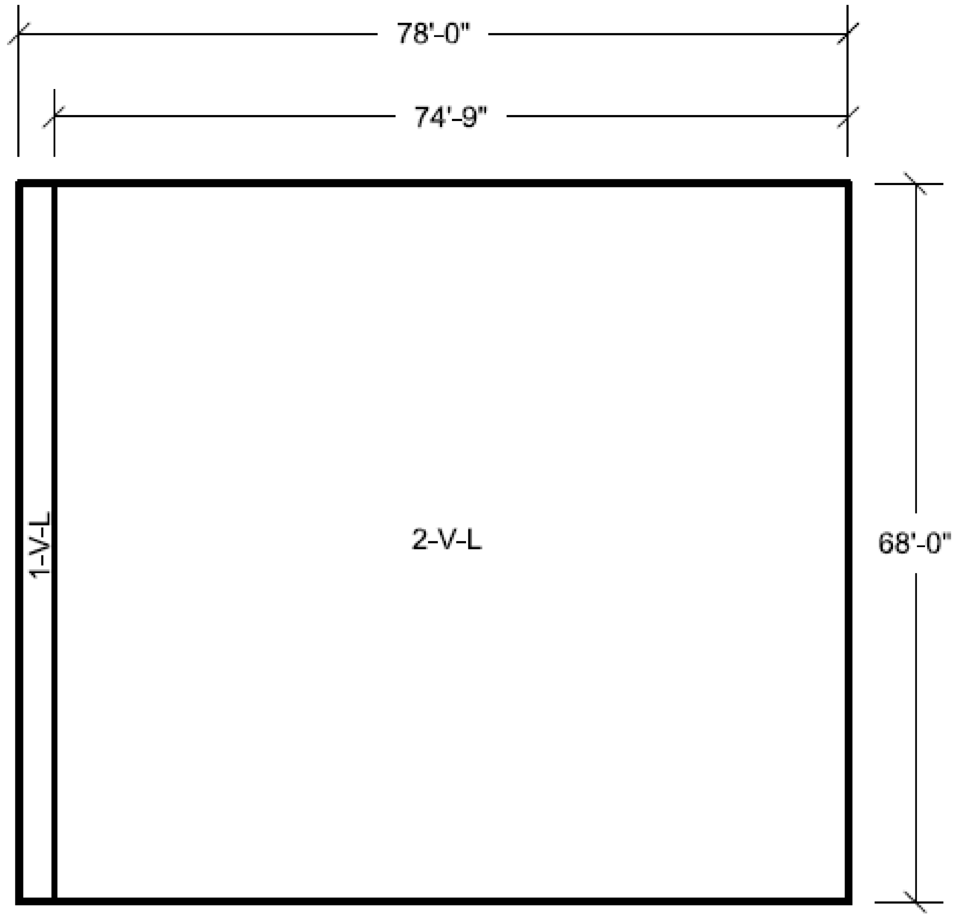


Figure 3H.6-76 Pump House Internal West Wall Looking West Vertical Reinforcement Zones Near Side Face

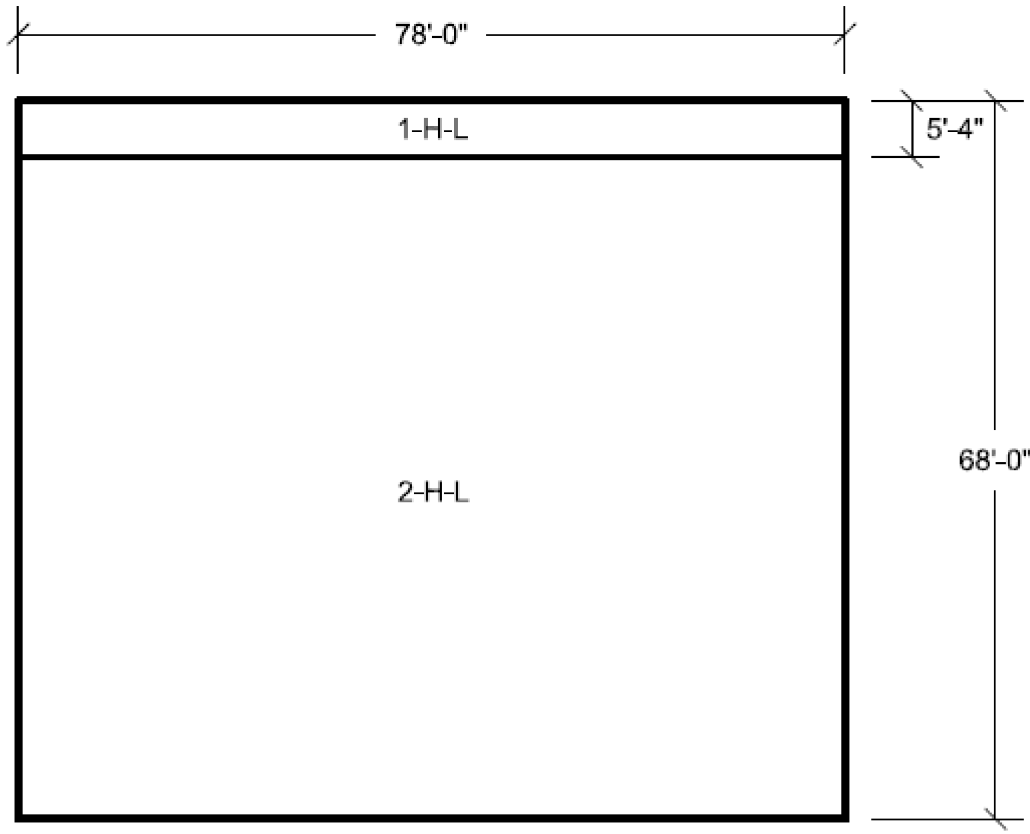


Figure 3H.6-77 Pump House Internal West Wall Looking West Horizontal Reinforcement Zones Far Side Face

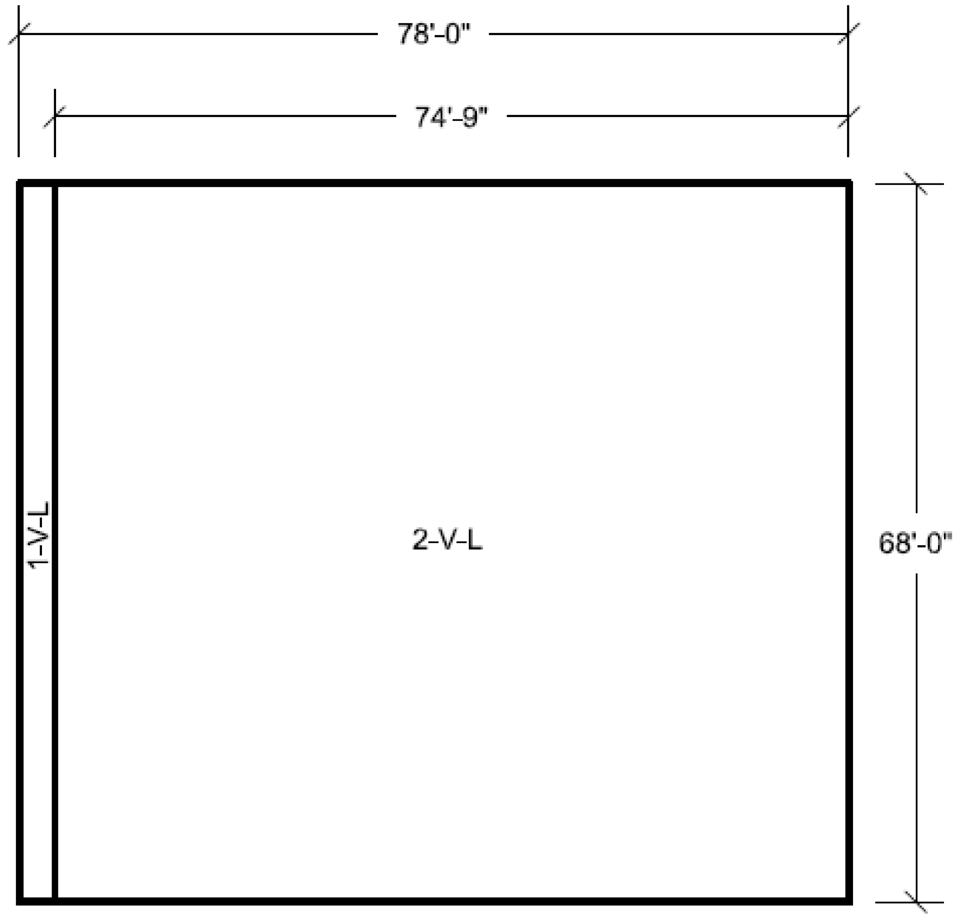


Figure 3H.6-78 Pump House Internal West Wall Looking West Vertical Reinforcement Zones Far Side Face

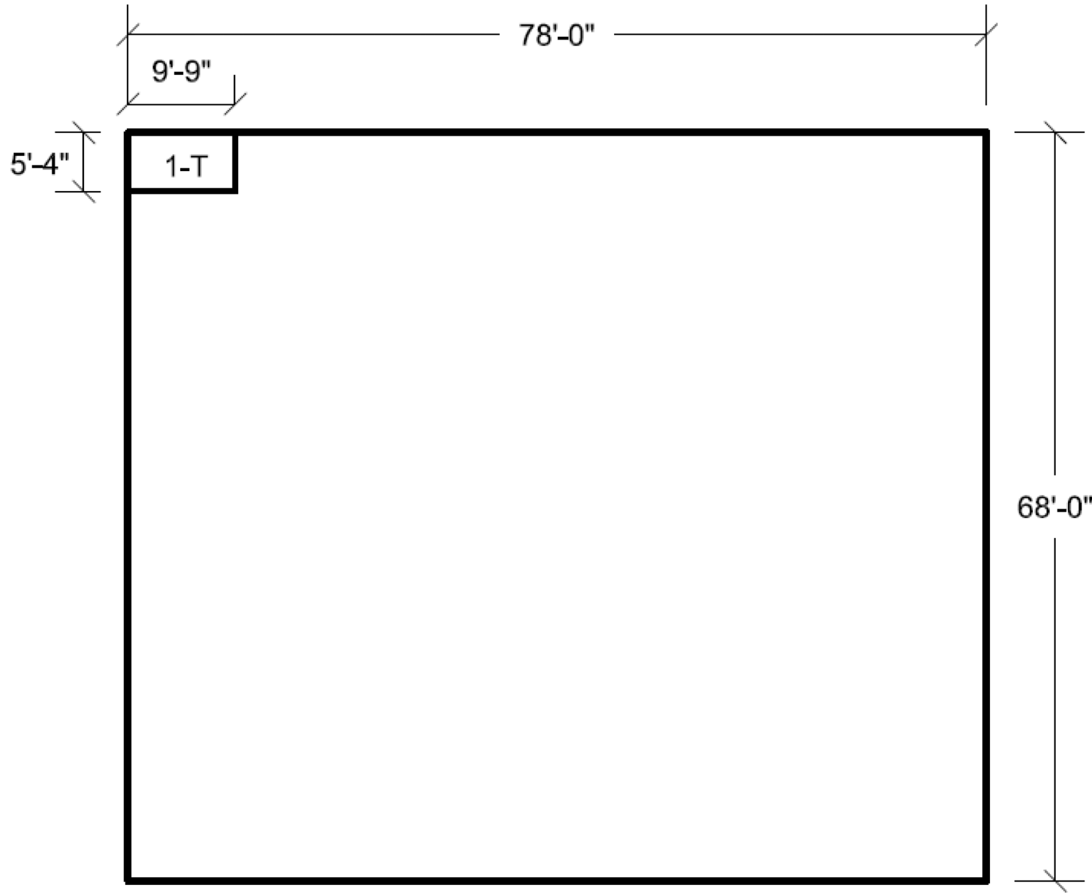


Figure 3H.6-78A Pump House Internal West Wall Looking West Transverse Reinforcement Zones

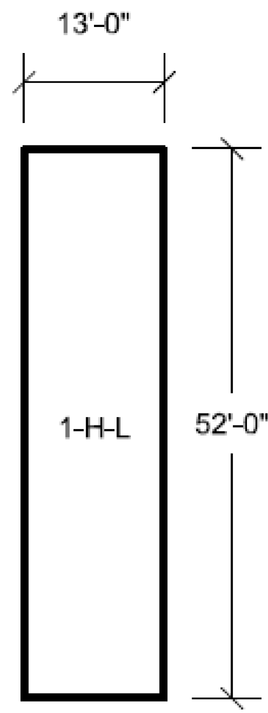


Figure 3H.6-79 Pump House East & West Buttresses Horizontal Reinforcement Zones Both Faces

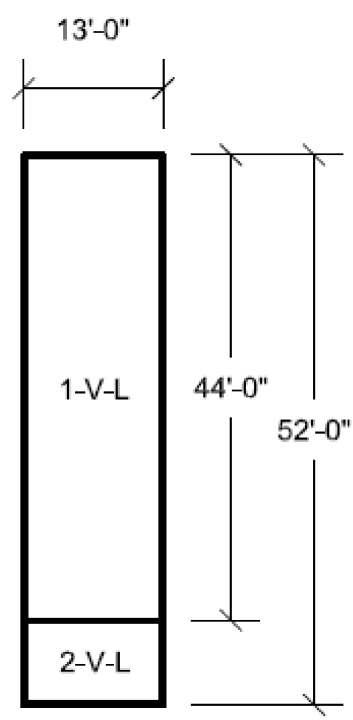


Figure 3H.6-80 Pump House East & West Buttresses Vertical Reinforcement Zones Both Faces

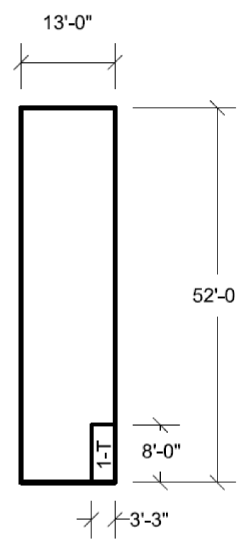


Figure 3H.6-81 Pump House East Buttress Looking North & Pump House West Buttress Looking South Transverse Reinforcement Zones

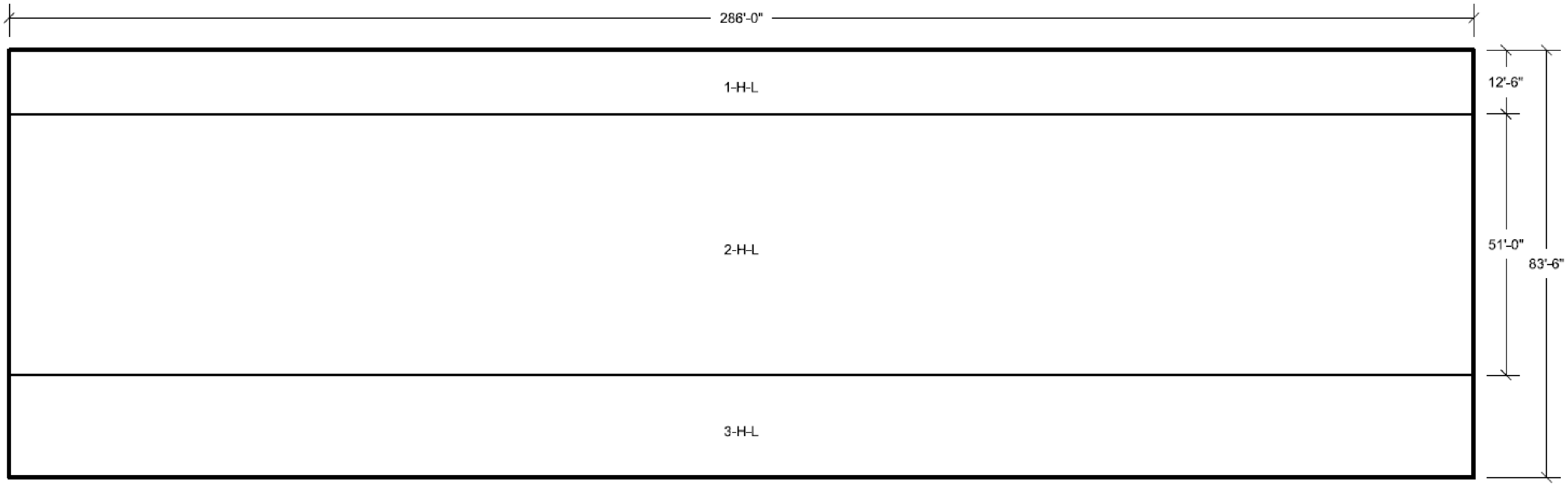


Figure 3H.6-82 UHS Basin North Wall Looking South Horizontal Reinforcement Zones Near Side Face

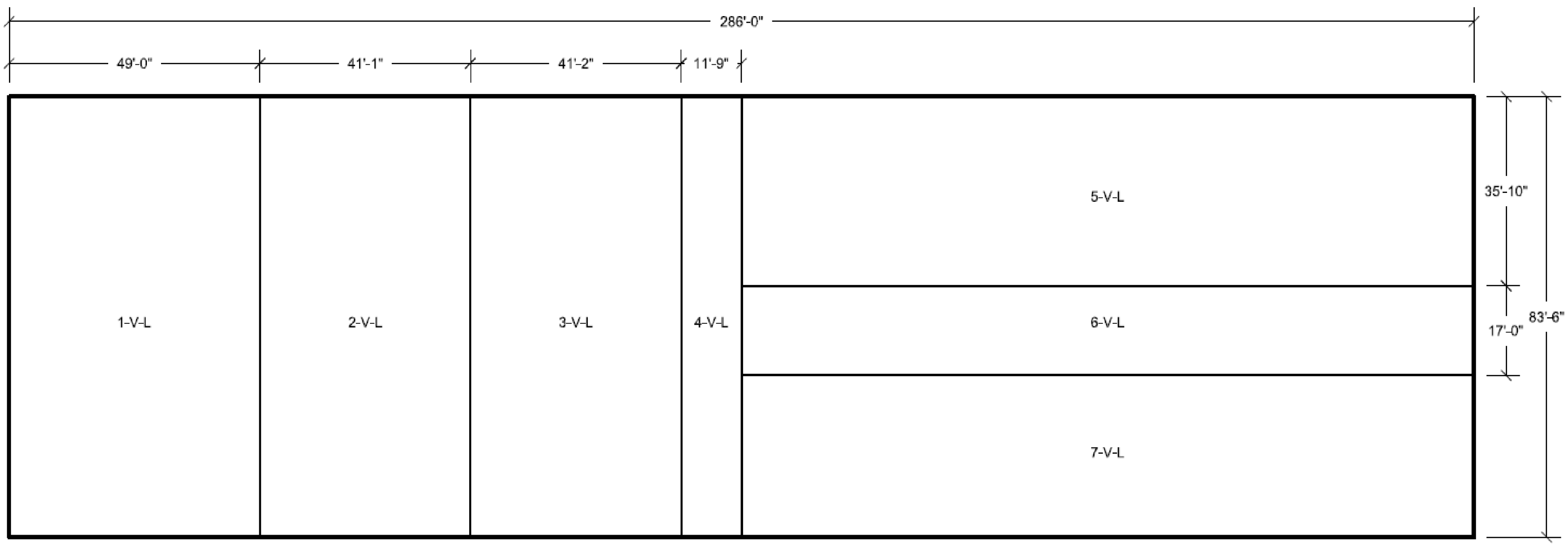


Figure 3H.6-83 UHS Basin North Wall Looking South Vertical Reinforcement Zones Near Side Face

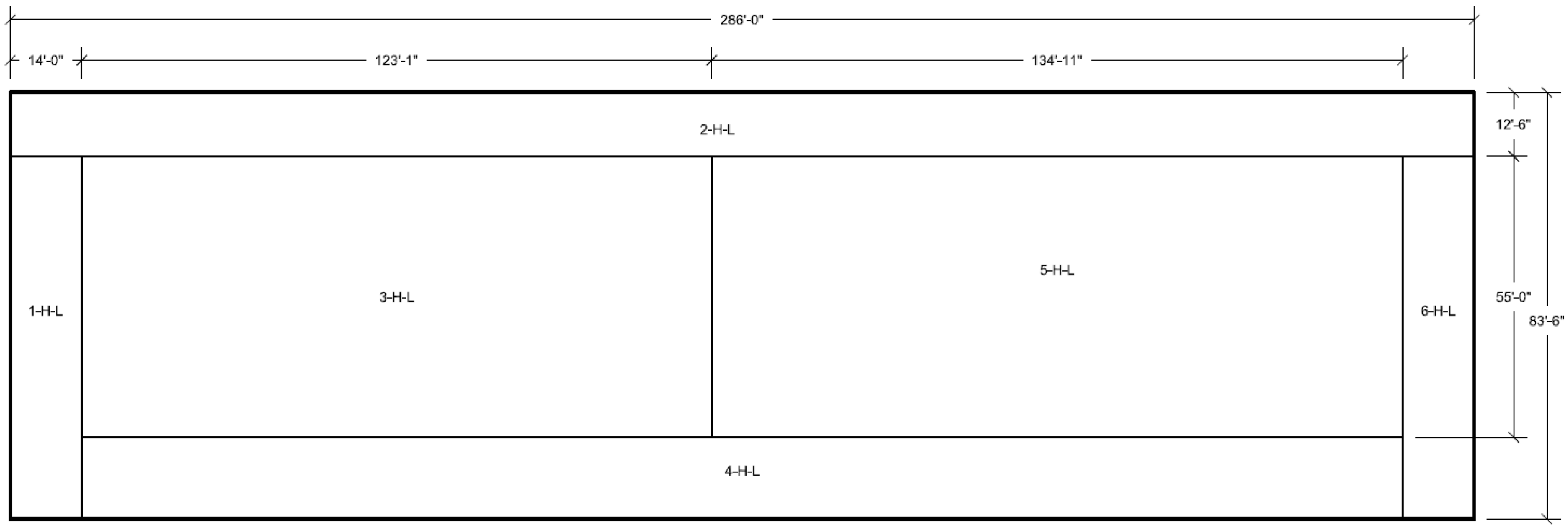


Figure 3H.6-84 UHS Basin North Wall Looking South Horizontal Reinforcement Zones Far Side Face

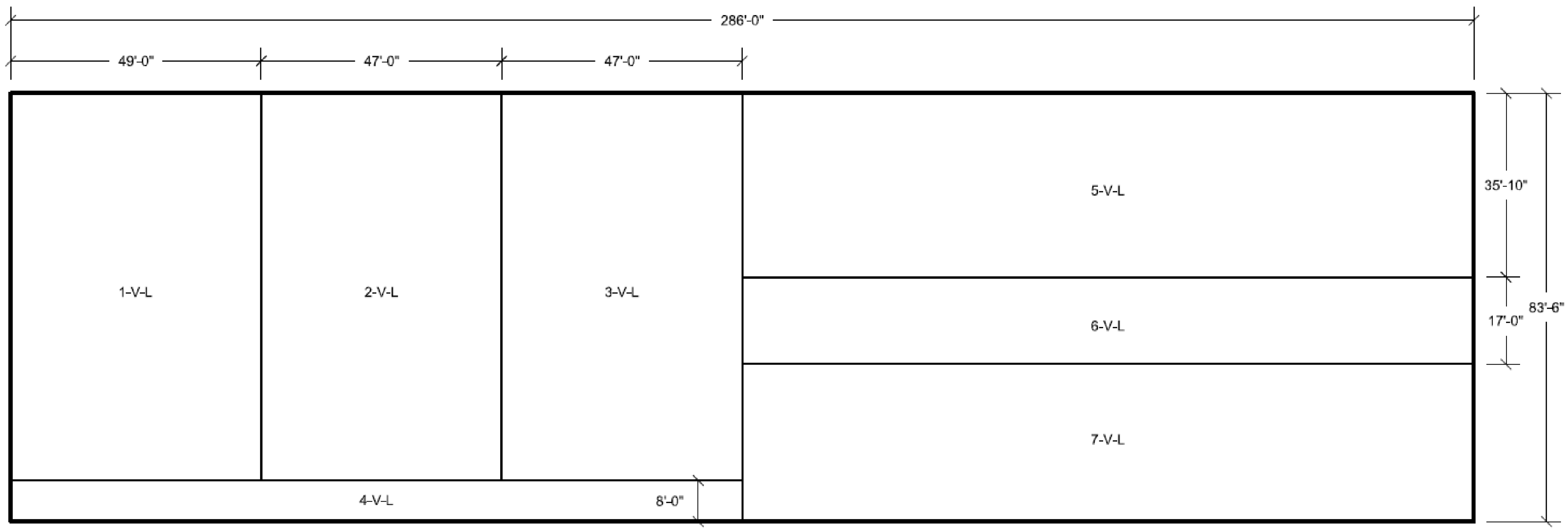


Figure 3H.6-85 UHS Basin North Wall Looking South Vertical Reinforcement Zones Far Side Face

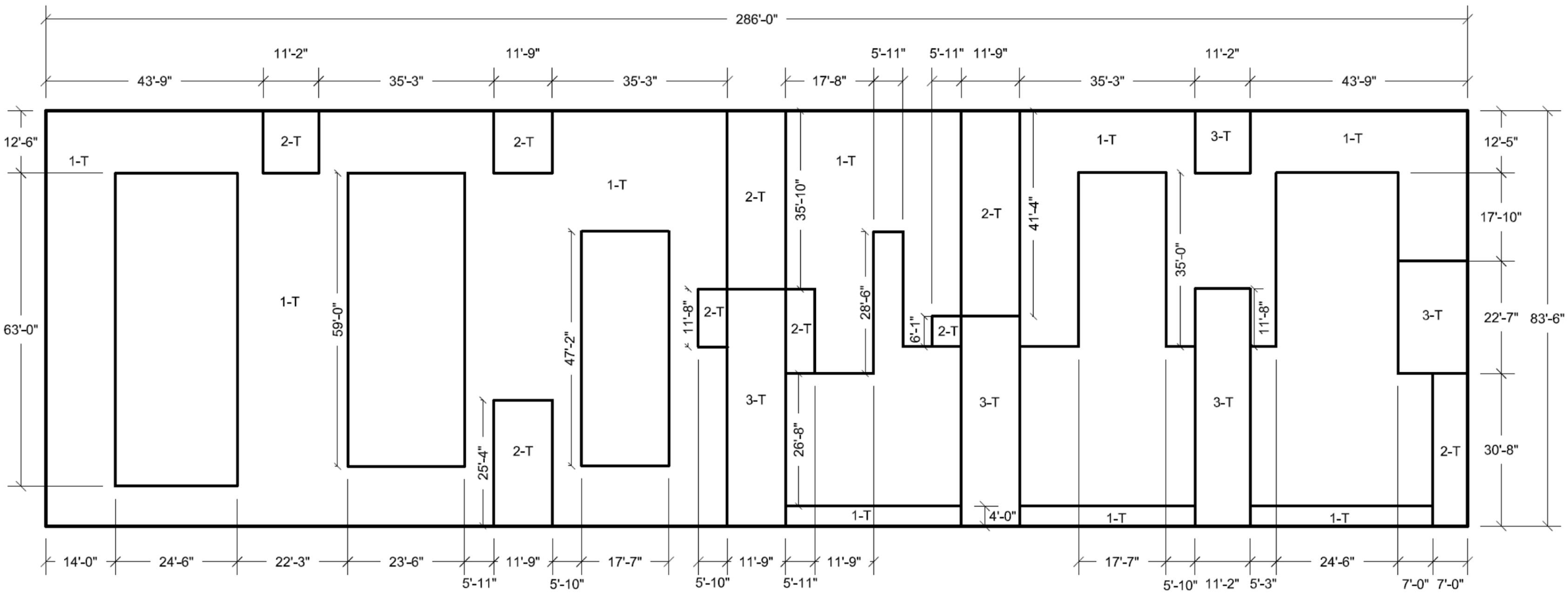


Figure 3H.6-86 UHS Basin North Wall Looking South Transverse Reinforcement Zones

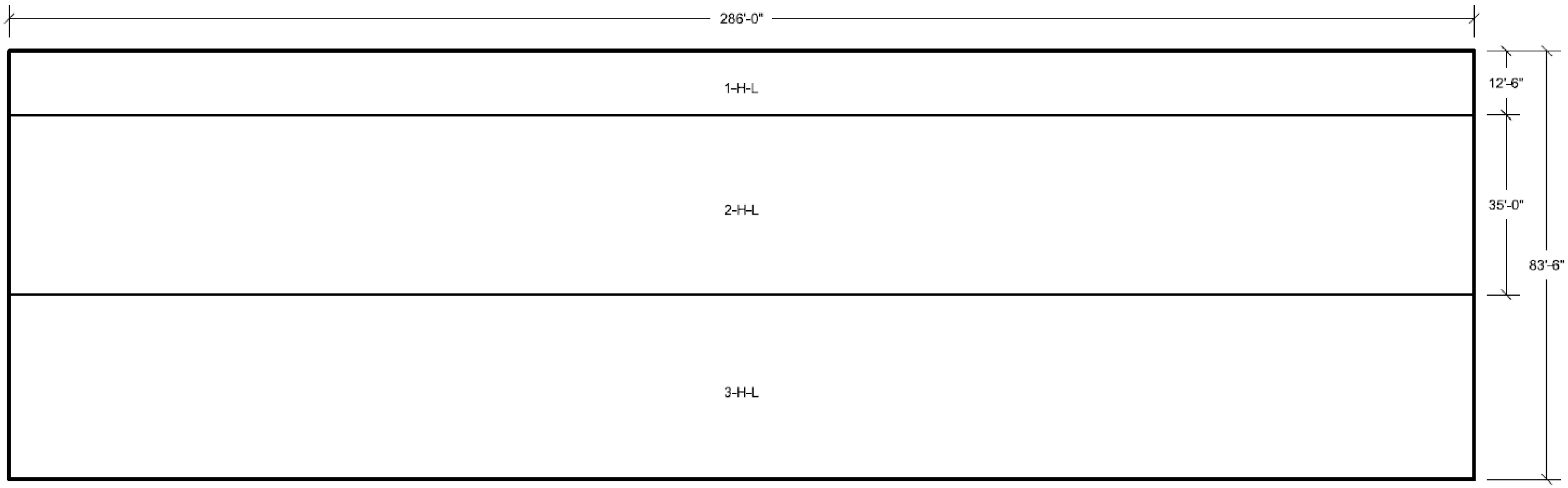


Figure 3H.6-87 UHS Basin South Wall Looking North Horizontal Reinforcement Zones Near Side Face

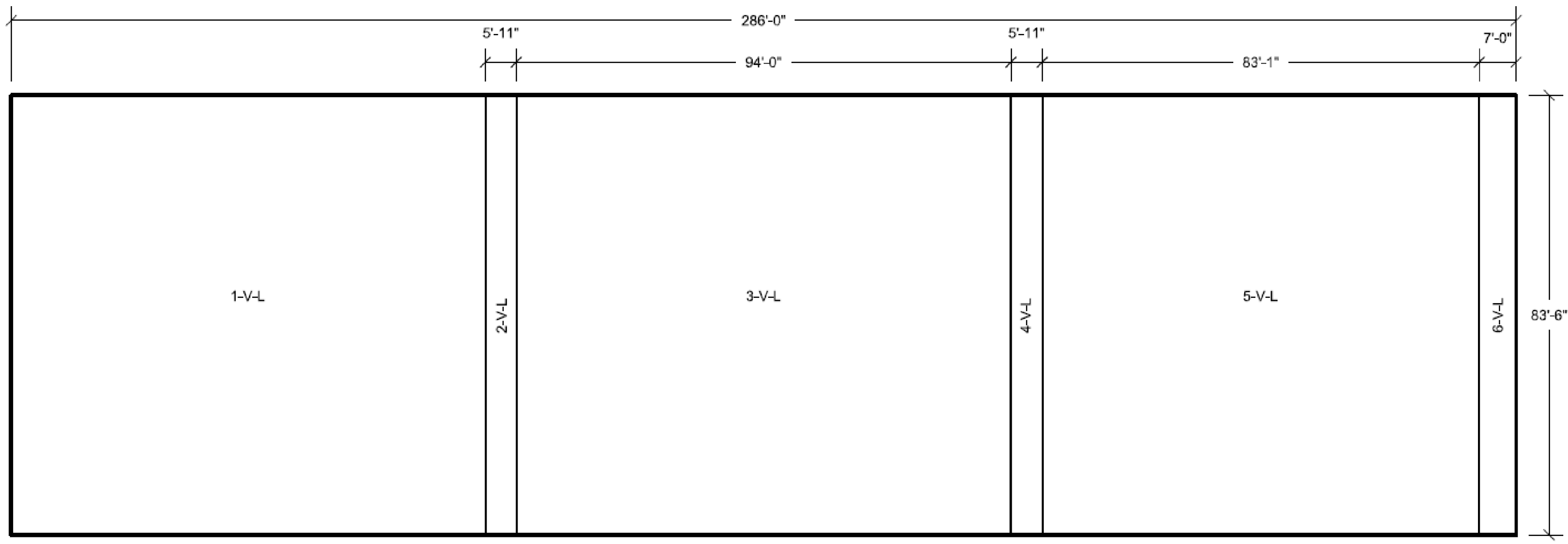


Figure 3H.6-88 UHS Basin South Wall Looking North Vertical Reinforcement Zones Near Side Face

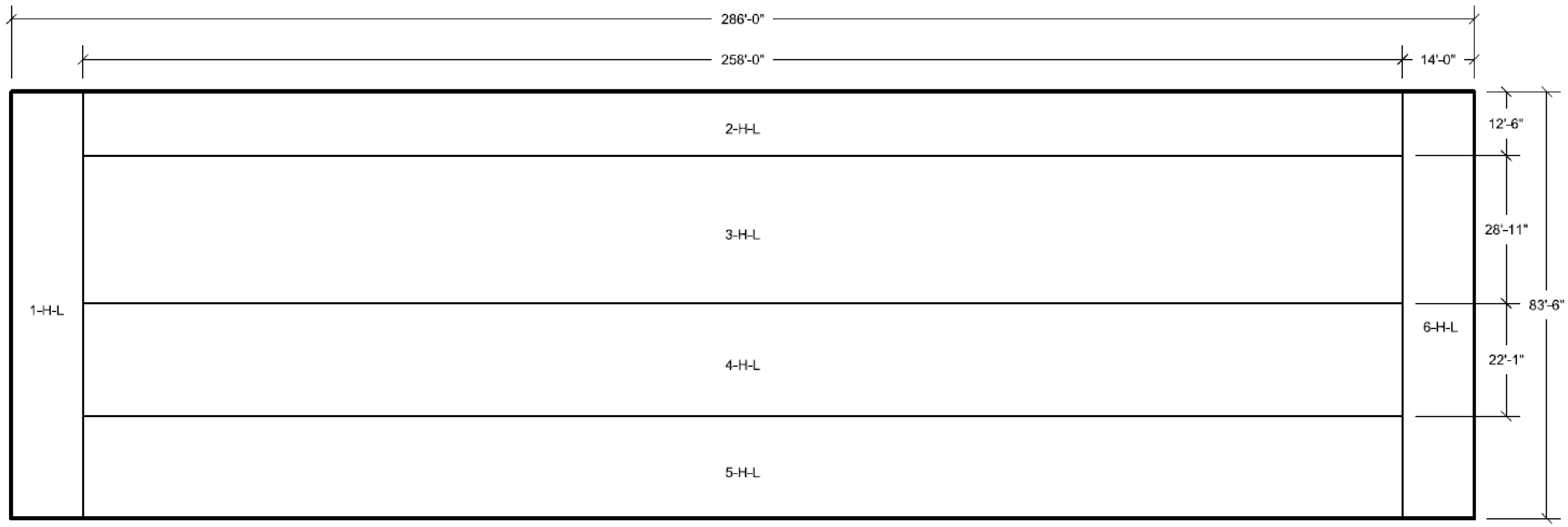


Figure 3H.6-89 UHS Basin South Wall Looking North Horizontal Reinforcement Zones Far Side Face

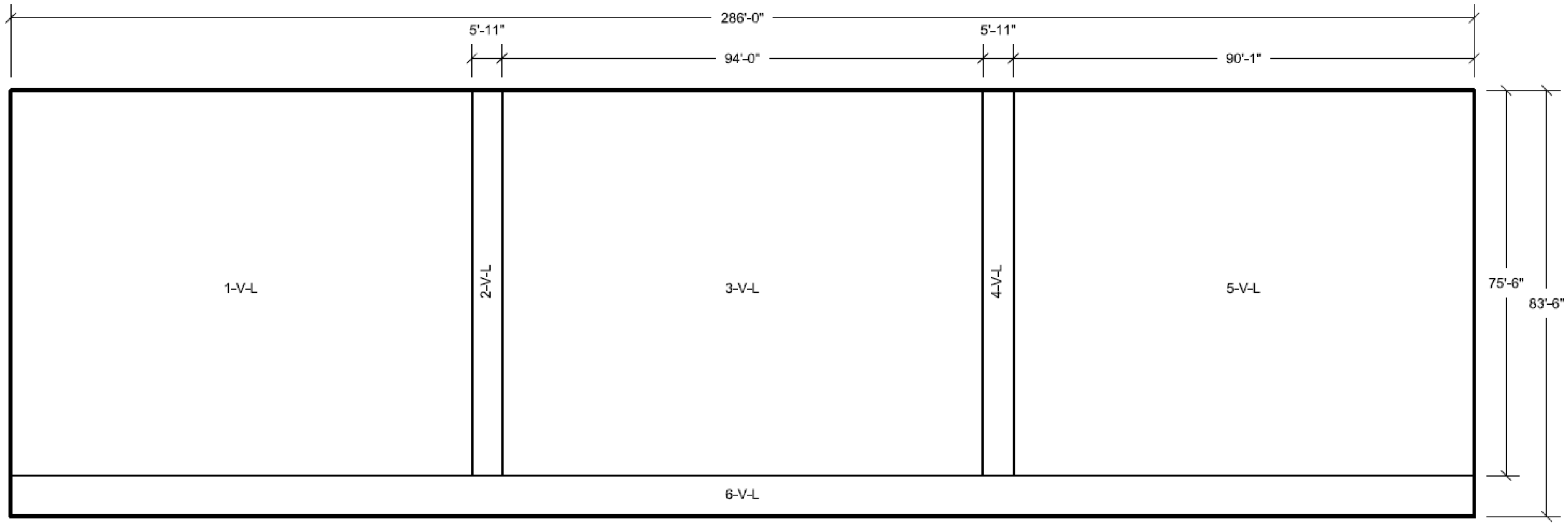


Figure 3H.6-90 UHS Basin South Wall Looking North Vertical Reinforcement Zones Far Side Face

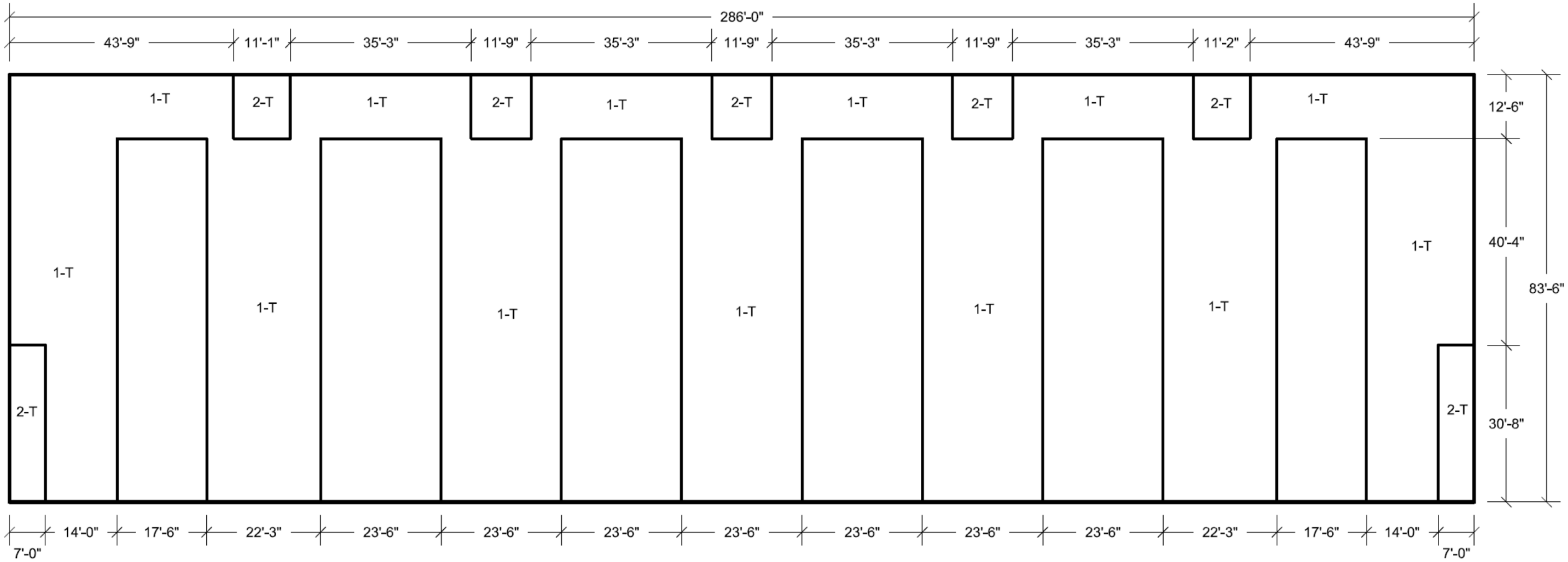


Figure 3H.6-91 UHS Basin South Wall Looking North Transverse Reinforcement Zones

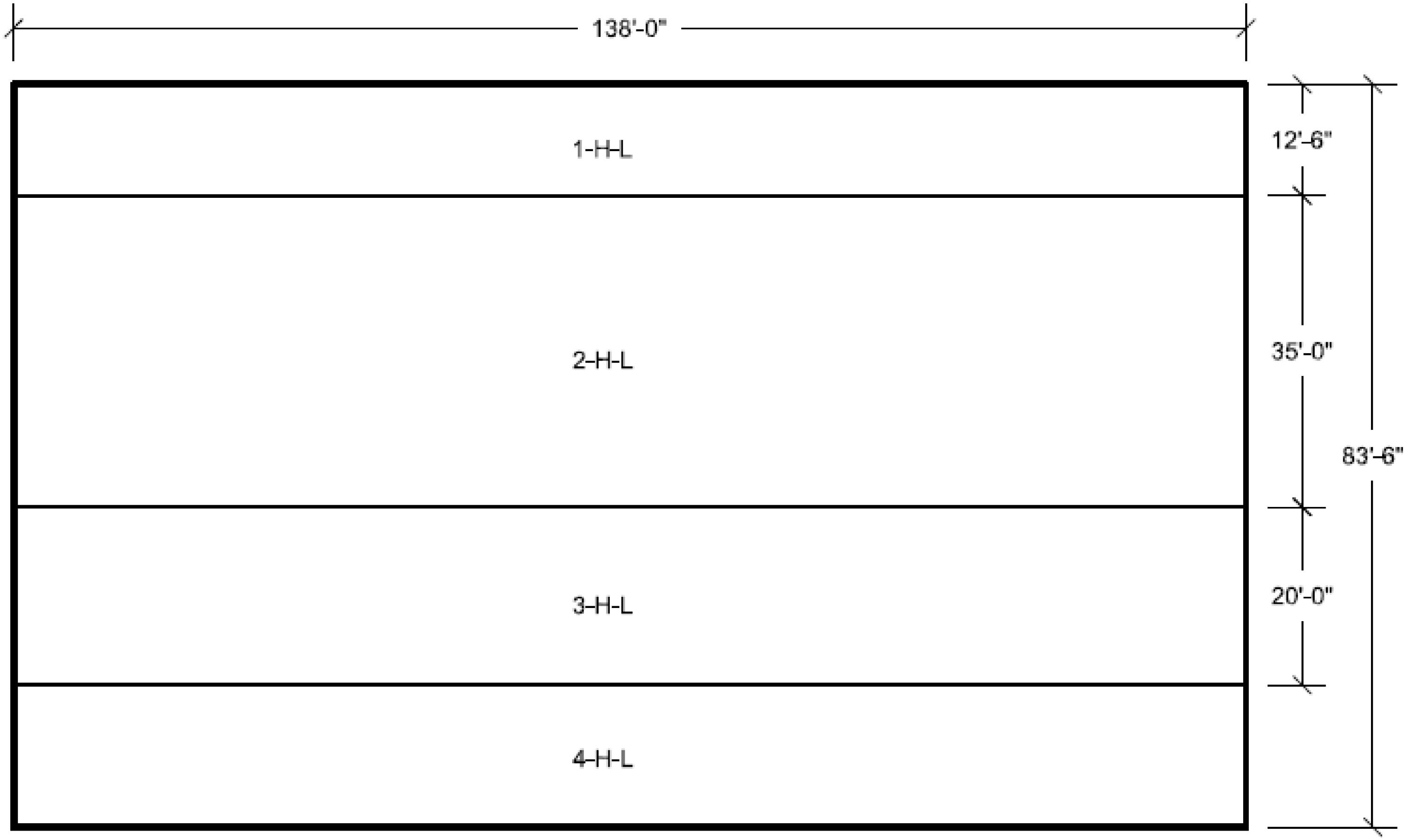


Figure 3H.6-92 UHS Basin East Wall Looking West Horizontal Reinforcement Zones Near Side Face

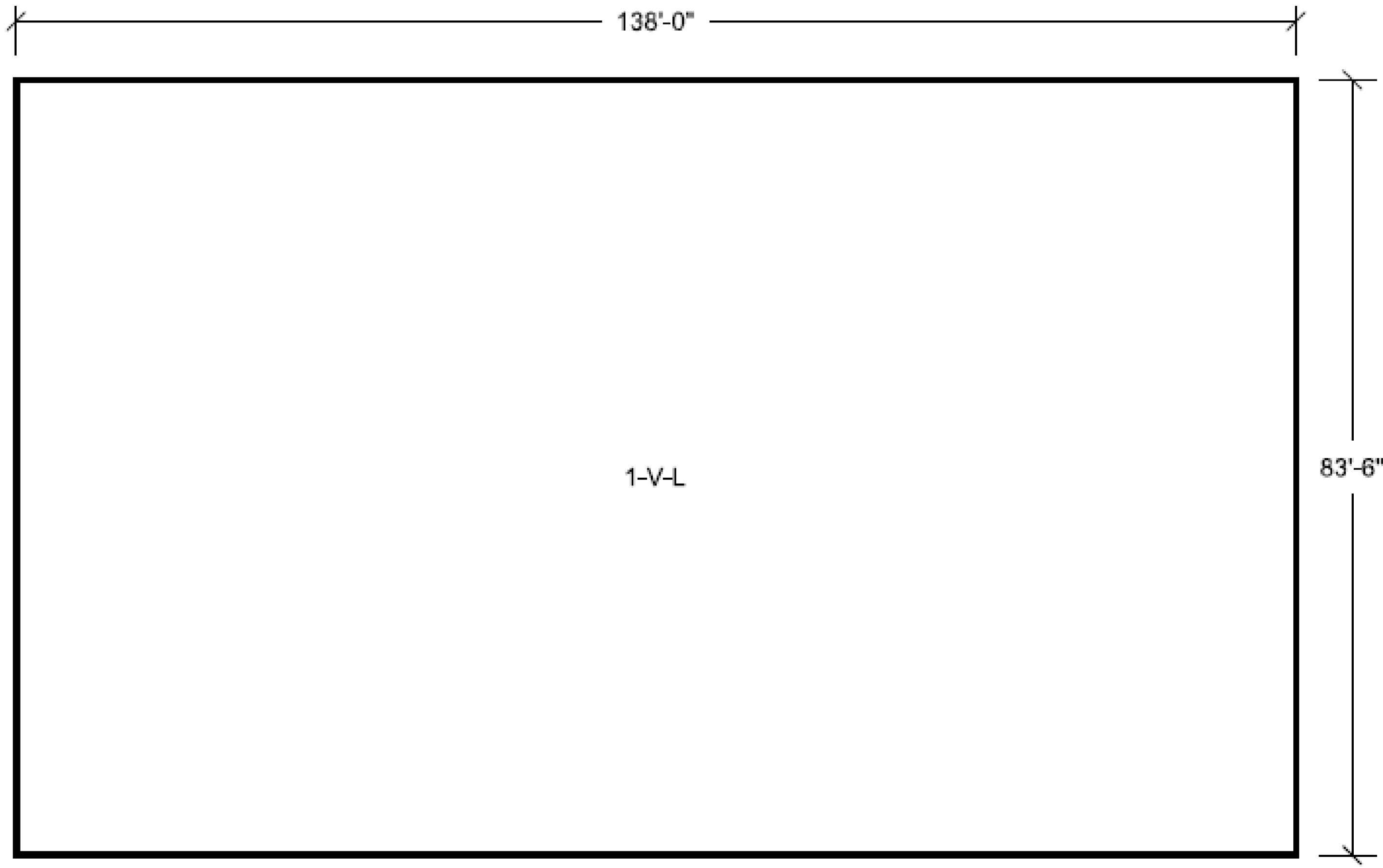


Figure 3H.6-93 UHS Basin East Wall Looking West Vertical Reinforcement Zones Near Side Face

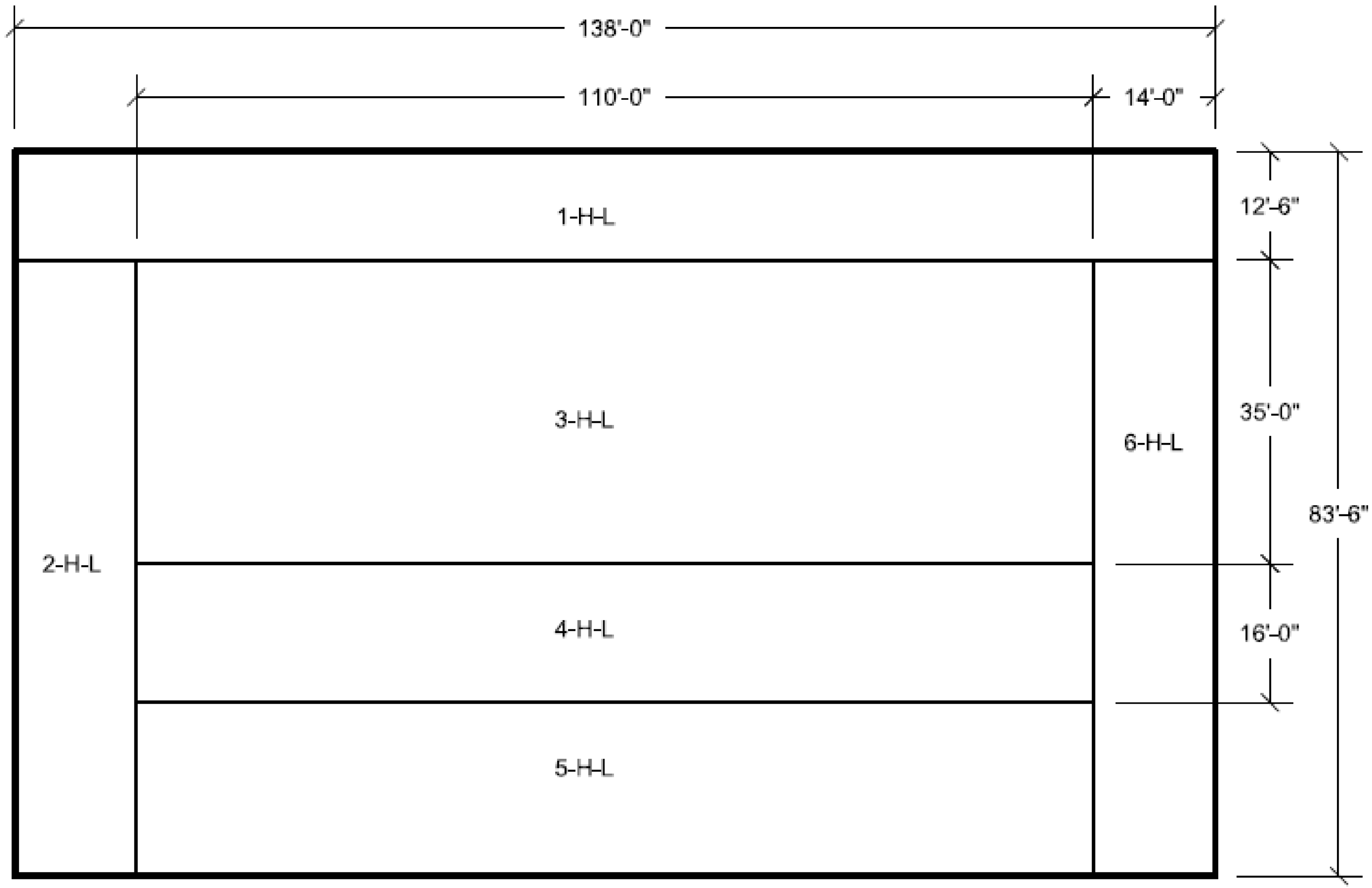


Figure 3H.6-94 UHS Basin East Wall Looking West Horizontal Reinforcement Zones Far Side Face

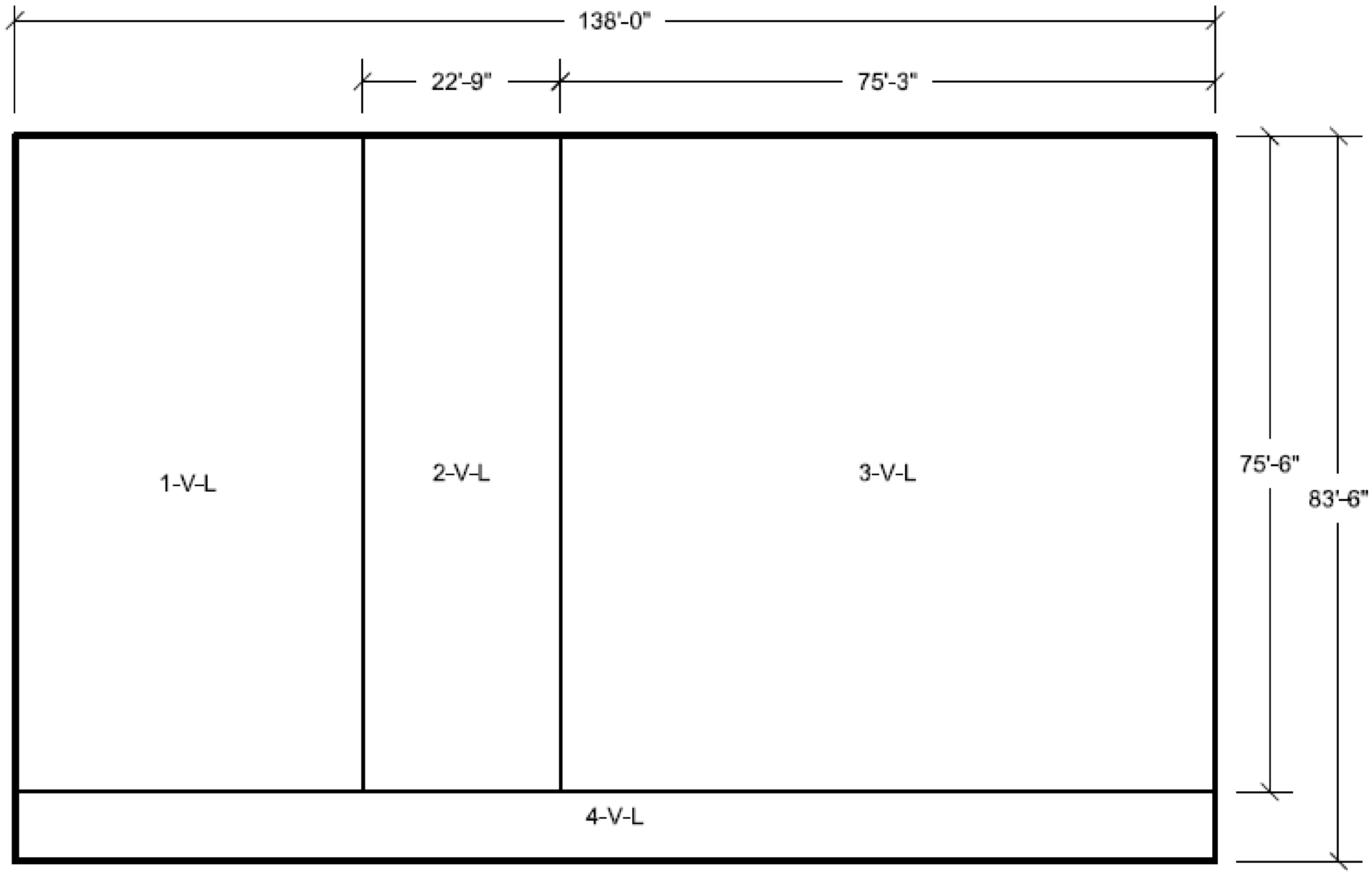


Figure 3H.6-95 UHS Basin East Wall Looking West Vertical Reinforcement Zones Far Side Face

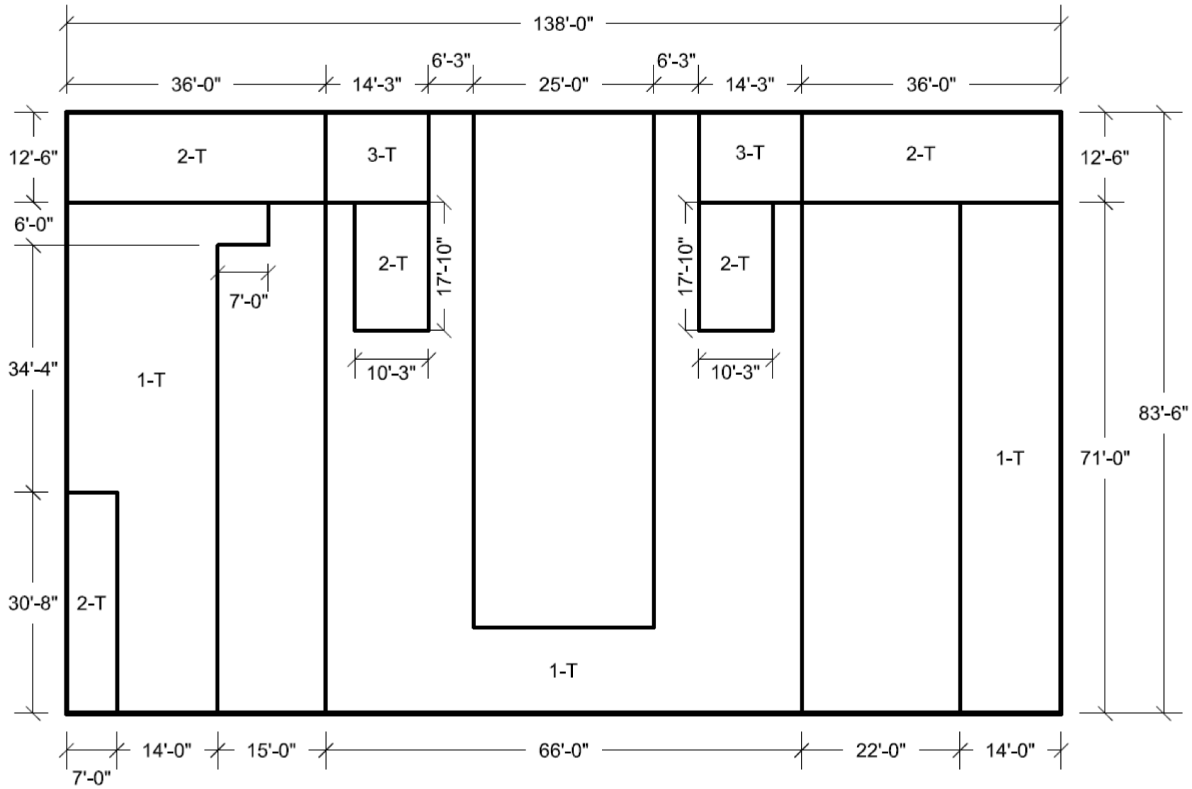


Figure 3H.6-96 UHS Basin East Wall Looking West Transverse Reinforcement Zones

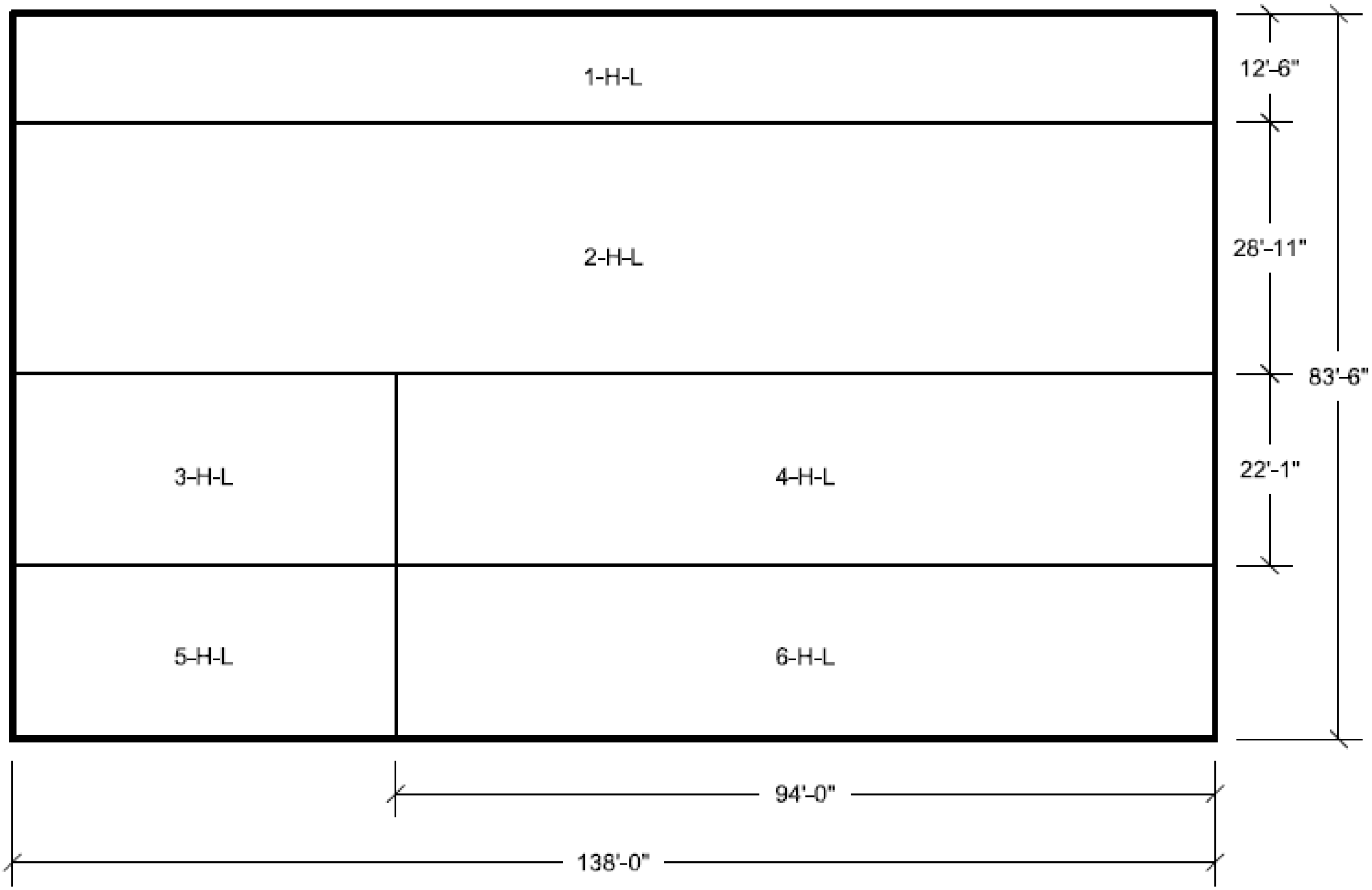


Figure 3H.6-97 UHS Basin West Wall Looking East Horizontal Reinforcement Zones Near Side Face

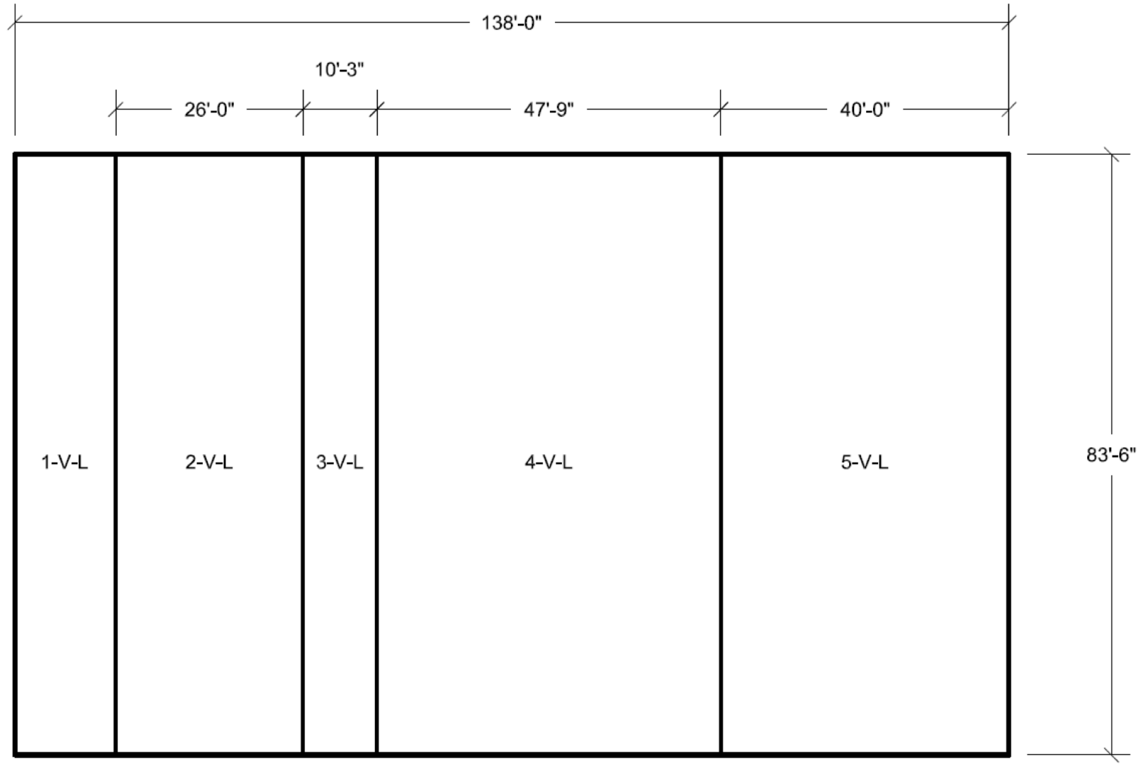


Figure 3H.6-98 UHS Basin West Wall Looking East Vertical Reinforcement Zones Near Side Face

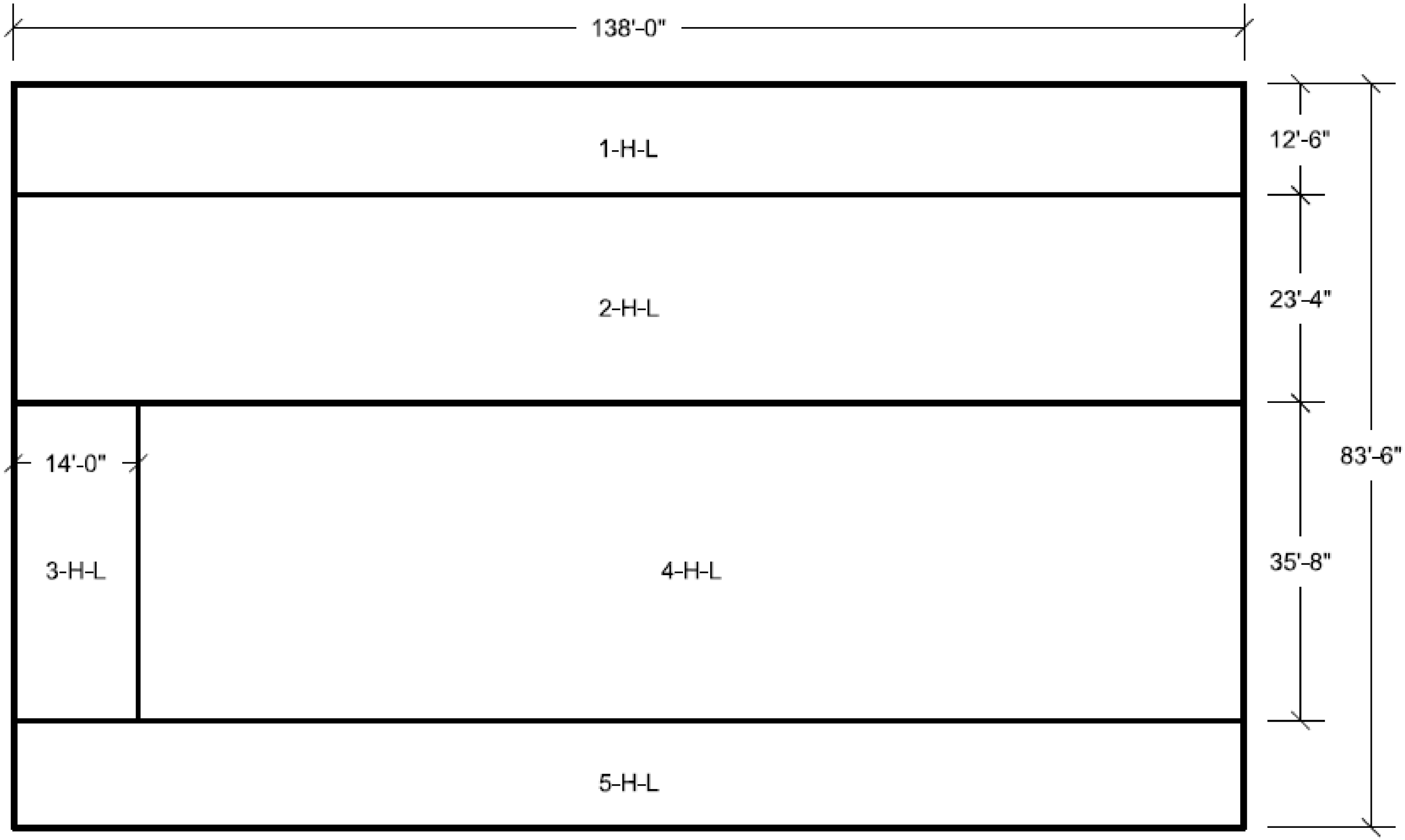


Figure 3H.6-99 UHS Basin West Wall Looking East Horizontal Reinforcement Zones Far Side Face

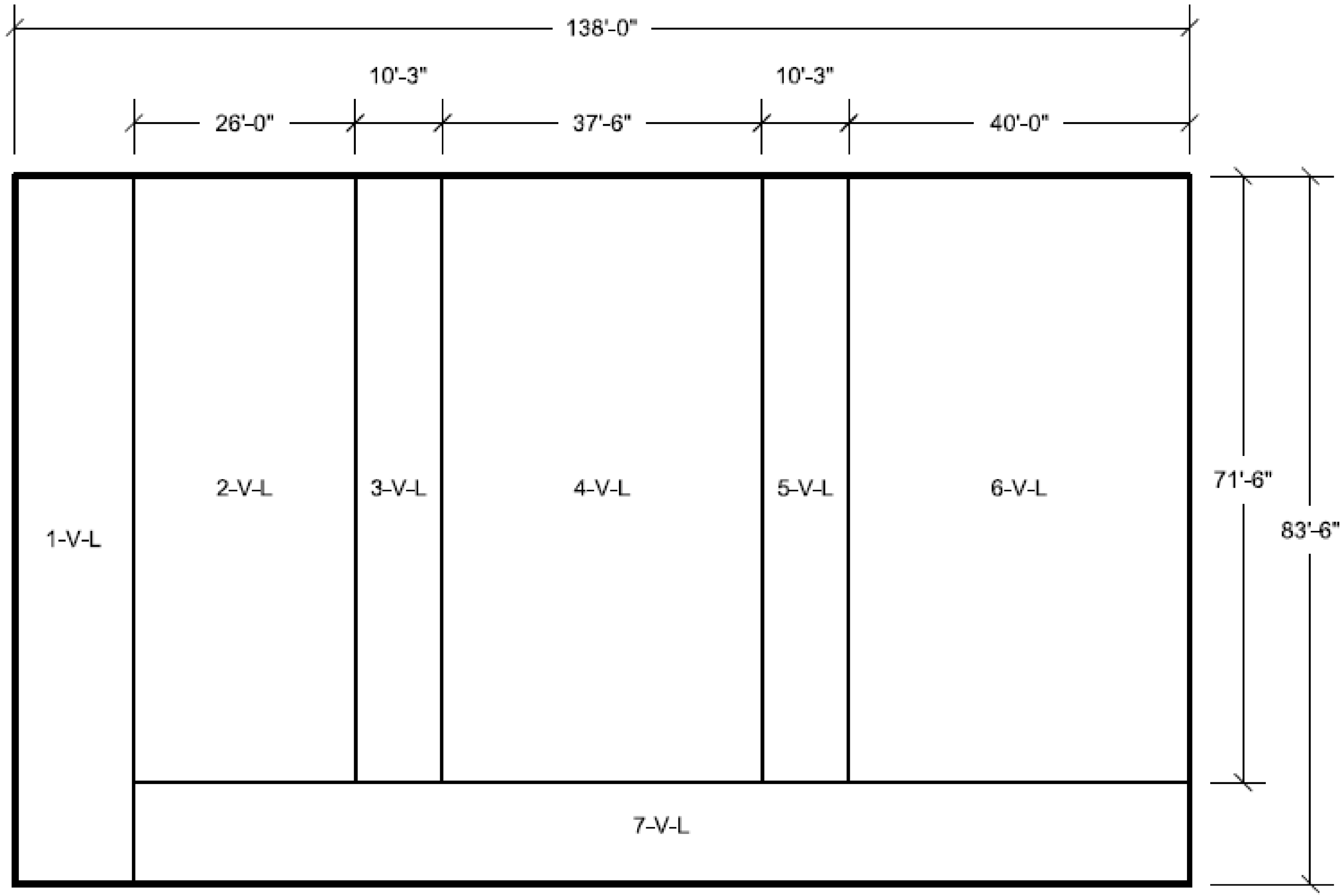


Figure 3H.6-100 UHS Basin West Wall Looking East Vertical Reinforcement Zones Far Side Face

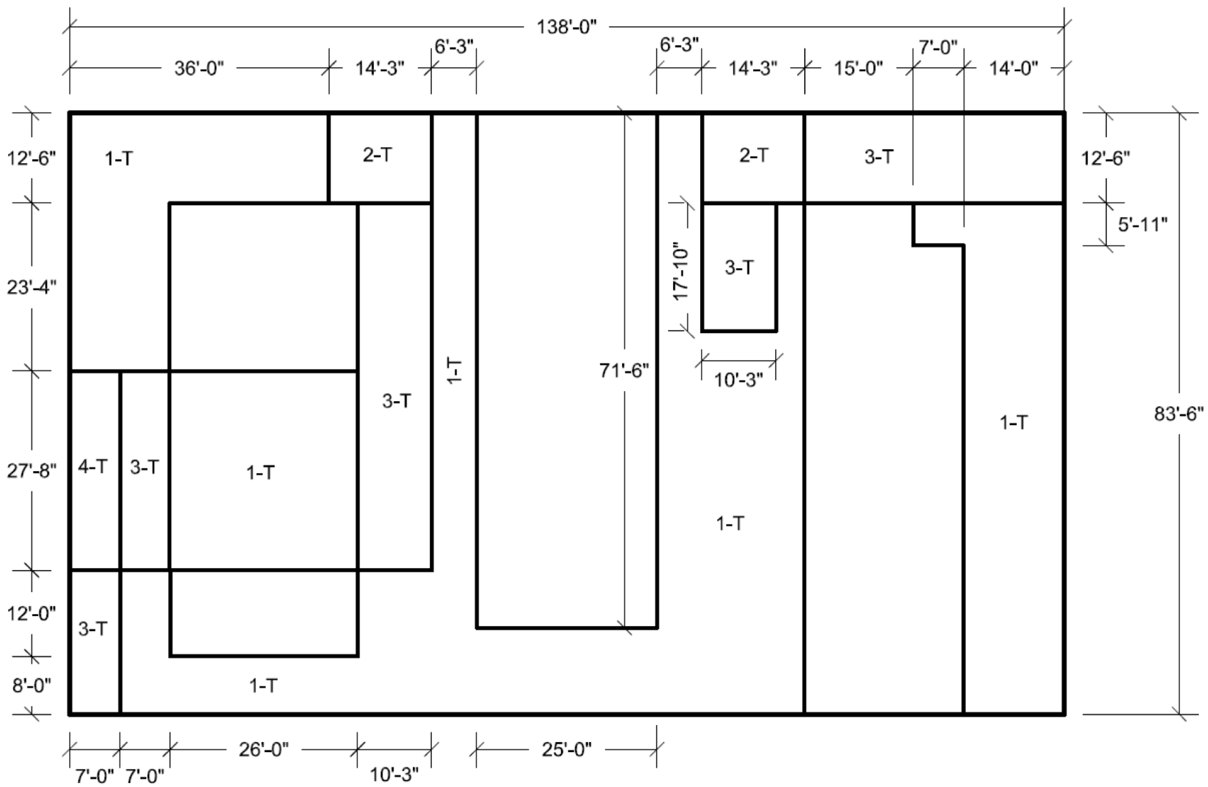


Figure 3H.6-101 UHS Basin West Wall Looking East Transverse Reinforcement Zones

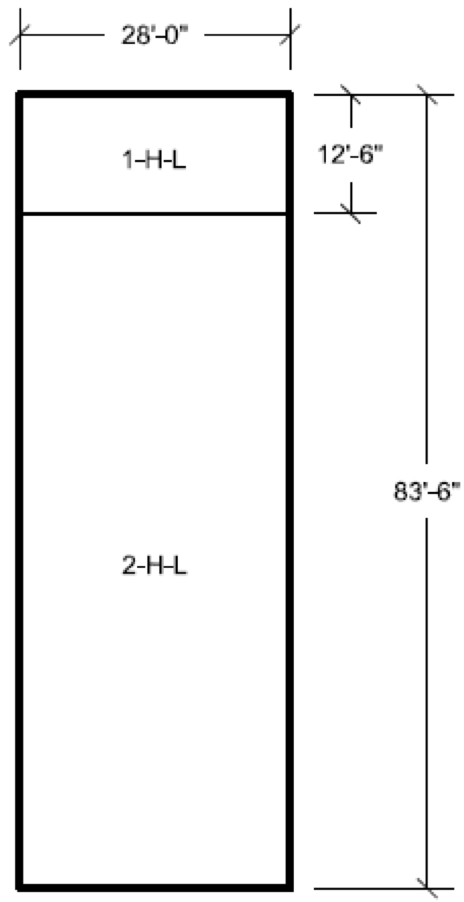


Figure 3H.6-102 UHS Basin North & South Buttresses Horizontal Reinforcement Zones Both Faces

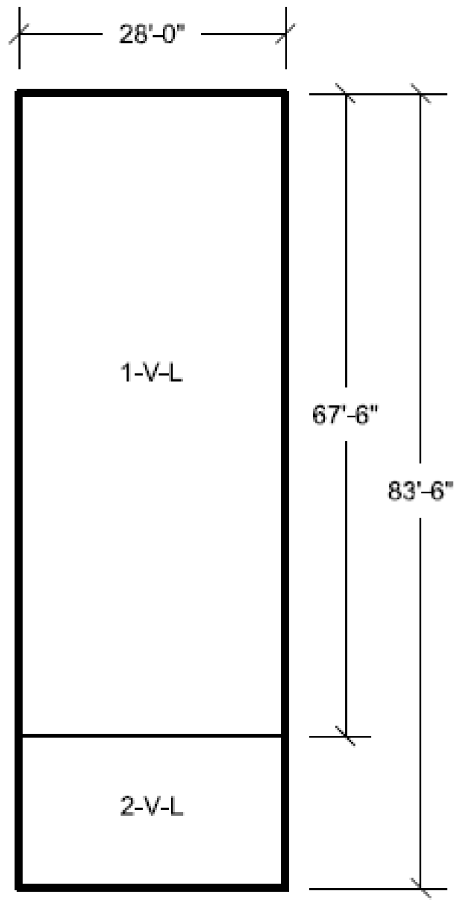


Figure 3H.6-103 UHS Basin North & South Buttresses Vertical Reinforcement Zones Both Faces

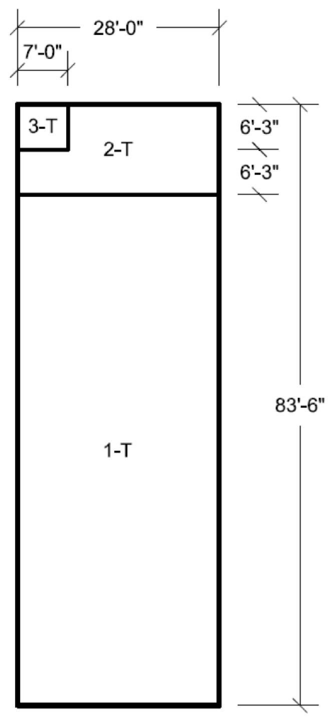


Figure 3H.6-104 UHS Basin North Buttress Looking West & UHS Basin South Buttress Looking East Transverse Reinforcement Zones

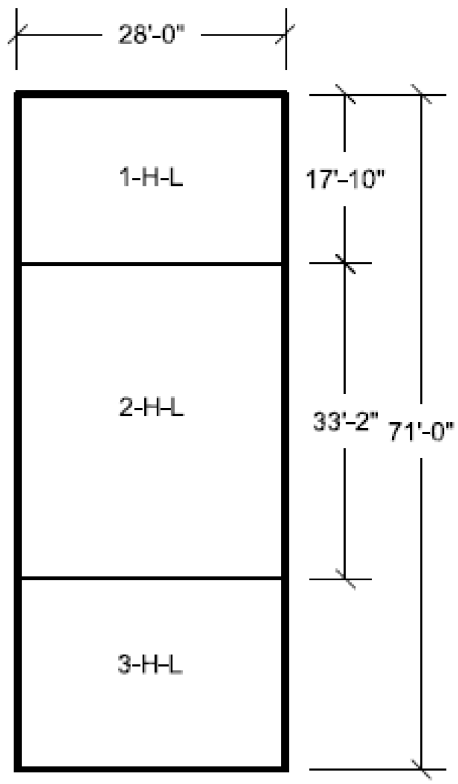


Figure 3H.6-105 UHS Basin East & West Buttresses Horizontal Reinforcement Zones Both Faces

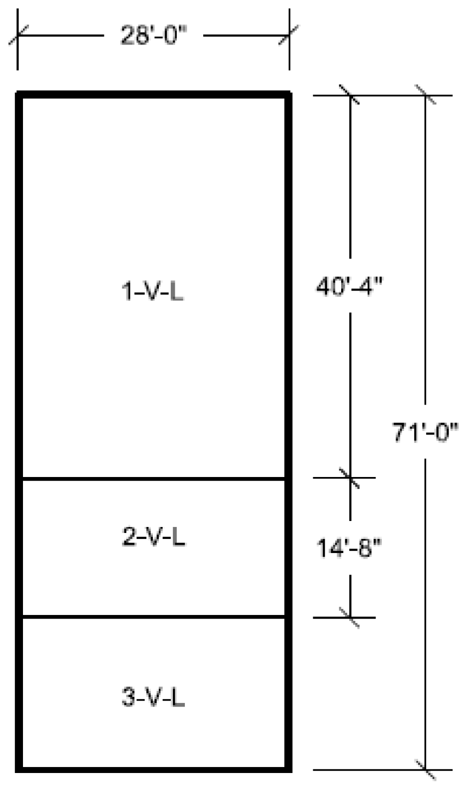


Figure 3H.6-106 UHS Basin East & West Buttresses Vertical Reinforcement Zones Near and Far Side Faces

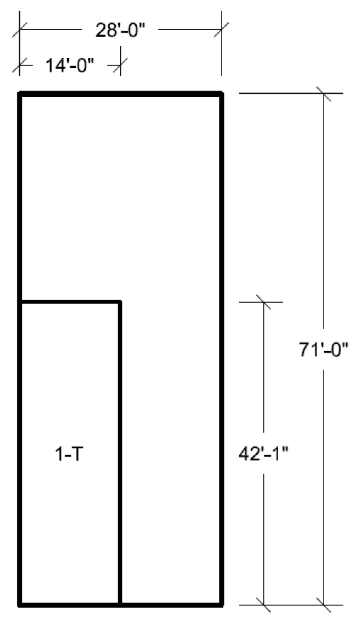


Figure 3H.6-107 UHS Basin East Buttress Looking North & UHS Basin West Buttress Looking South Transverse Reinforcement Zones

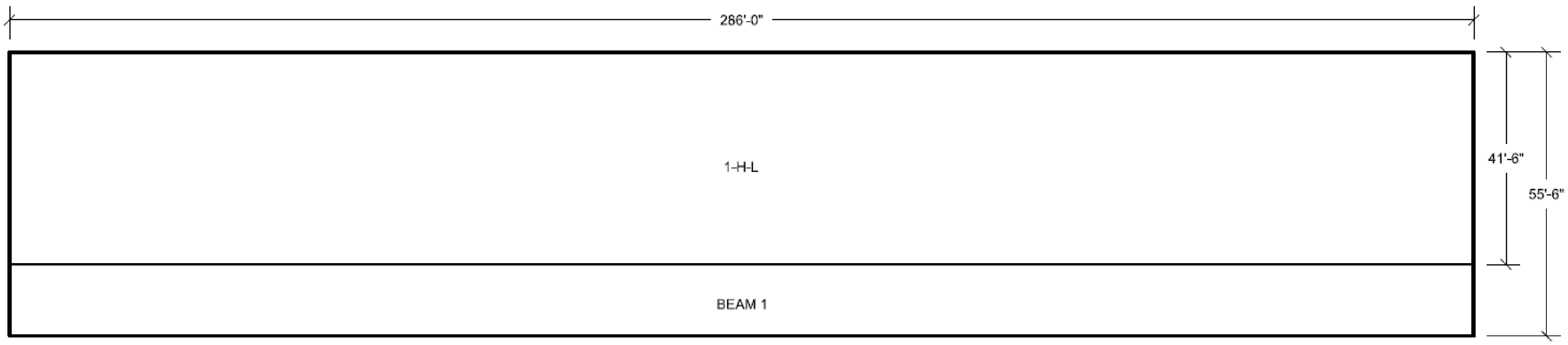


Figure 3H.6-108 Cooling Tower North (and South) Wall Looking South (North) Horizontal Reinforcement Zones Near Side Face

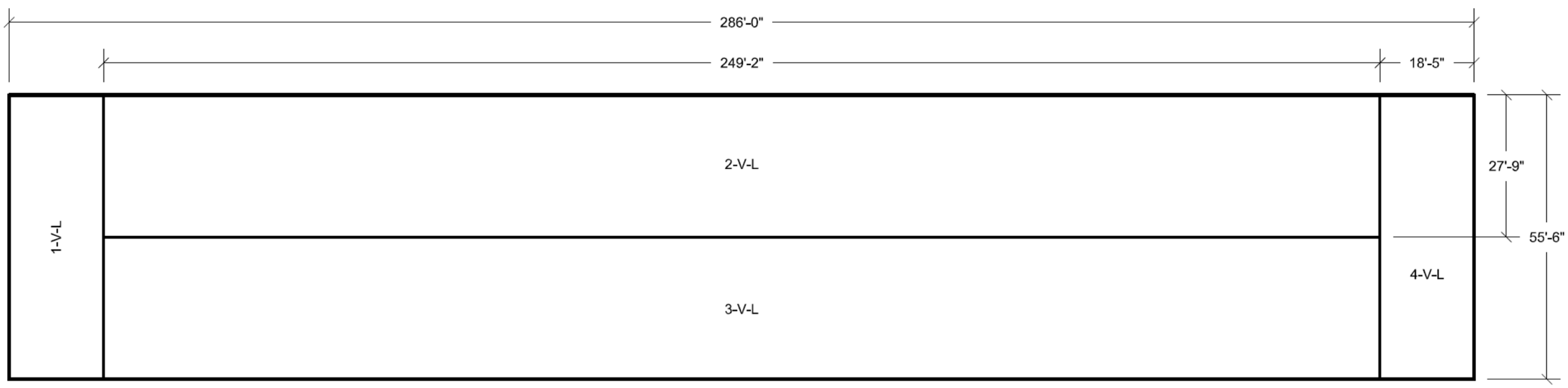


Figure 3H.6-109 Cooling Tower North (and South) Wall Looking South (North) Vertical Reinforcement Zones Near Side Face

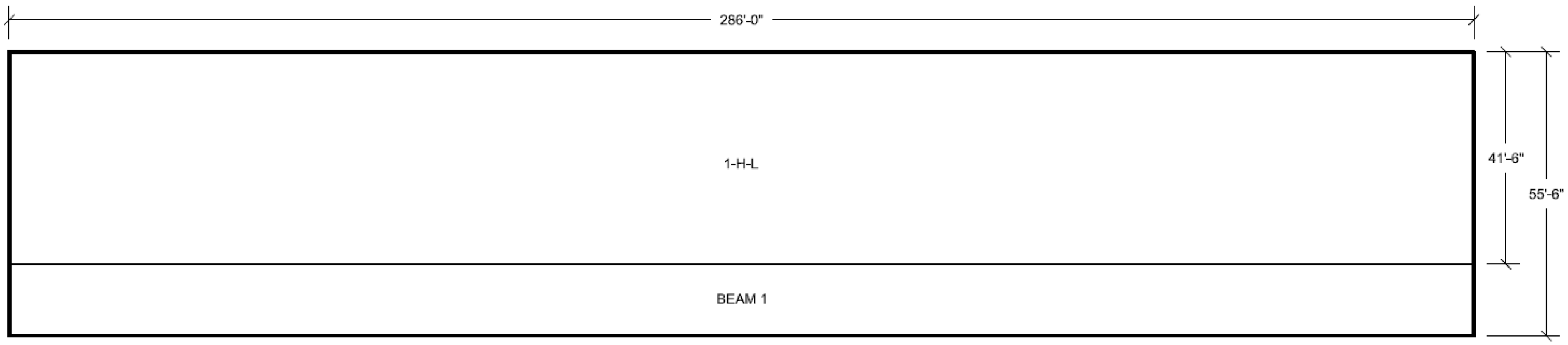


Figure 3H.6-110 Cooling Tower North (and South) Wall Looking South (North) Horizontal Reinforcement Zones Far Side Face

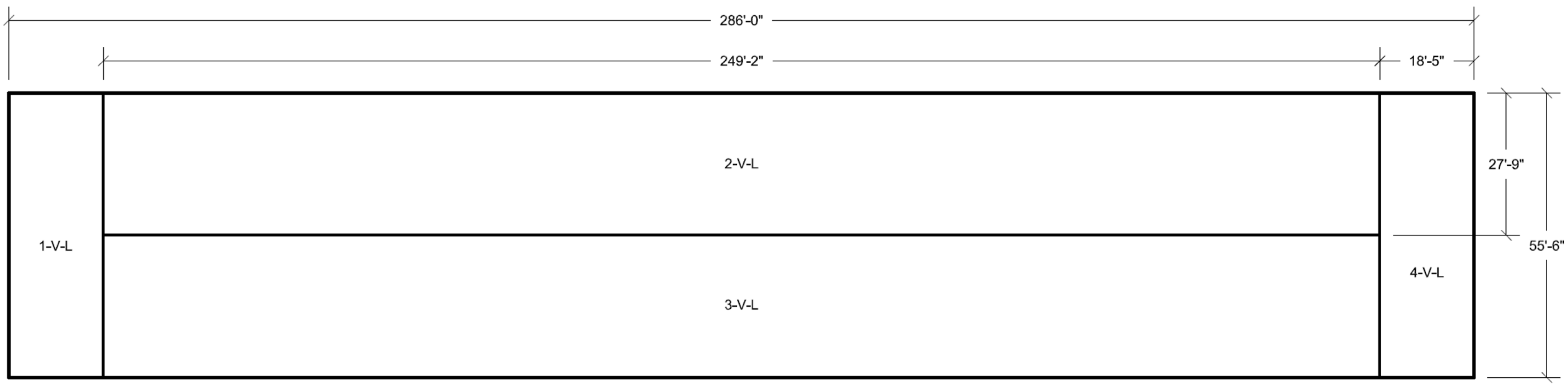


Figure 3H.6-111 Cooling Tower North (and South) Wall Looking South (North) Vertical Reinforcement Zones Far Side Face

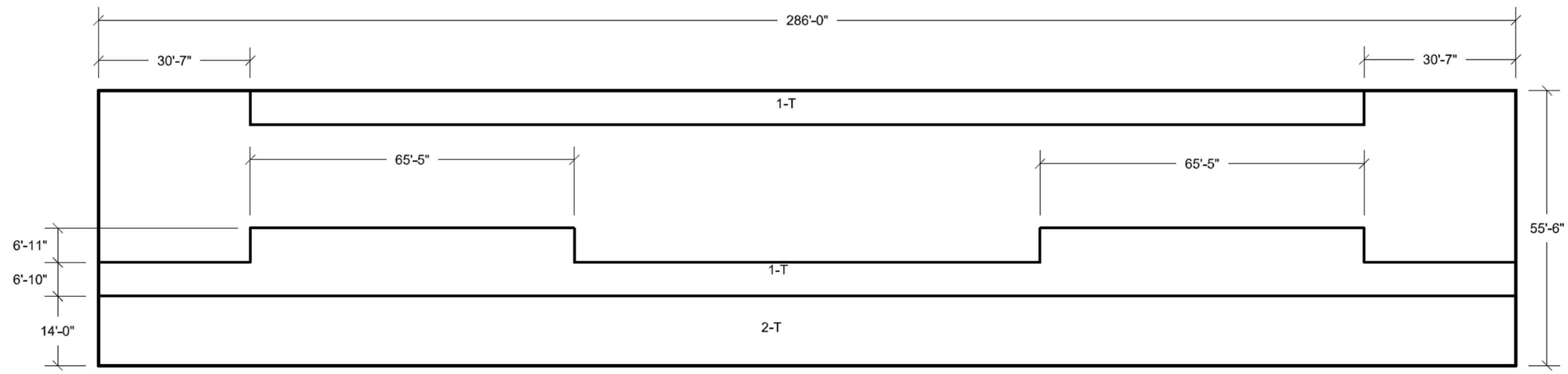


Figure 3H.6-112 Cooling Tower North (and South) Wall Looking South (North) Transverse Reinforcement Zones

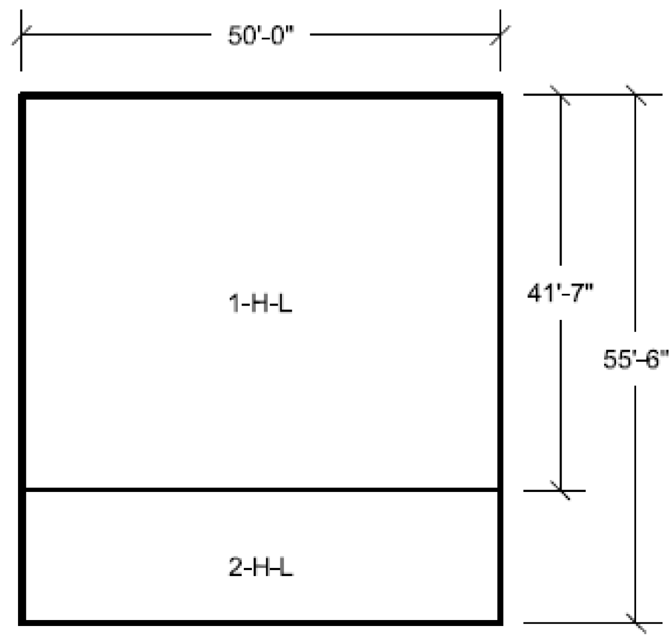


Figure 3H.6-113 Cooling Tower East Wall Looking West Horizontal Reinforcement Zones Near Side Face

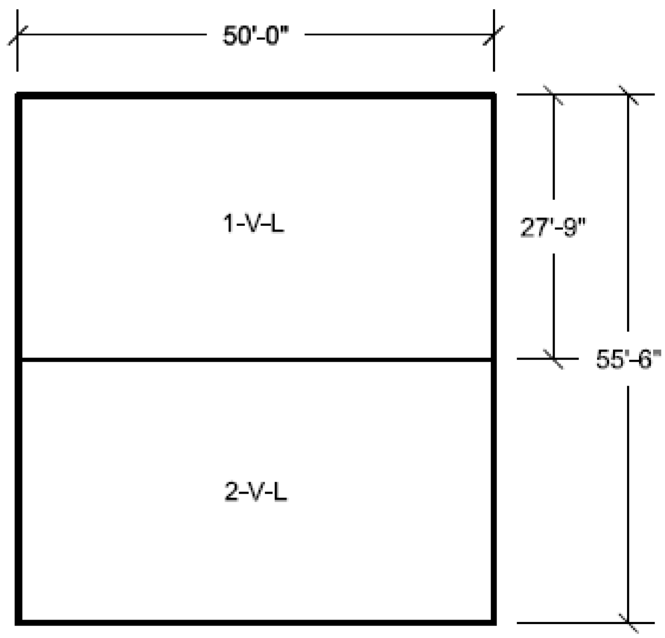


Figure 3H.6-114 Cooling Tower East Wall Looking West Vertical Reinforcement Zones Near Side Face

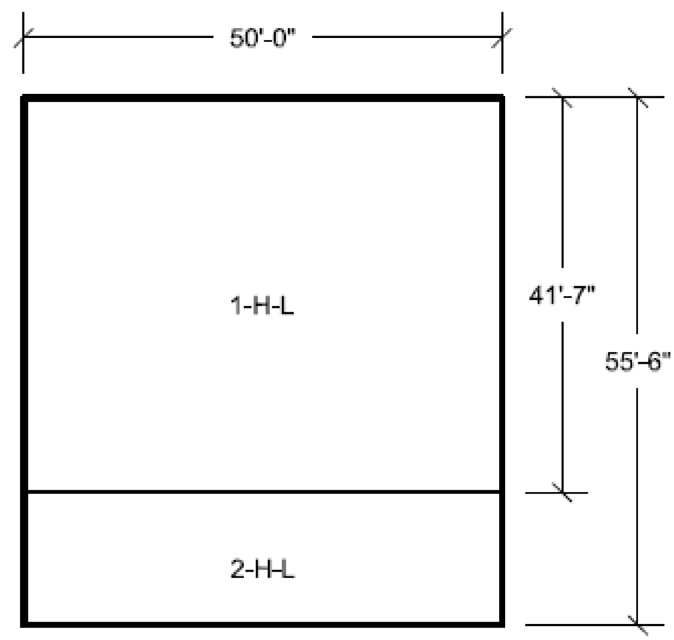


Figure 3H.6-115 Cooling Tower East Wall Looking West Horizontal Reinforcement Zones Far Side Face

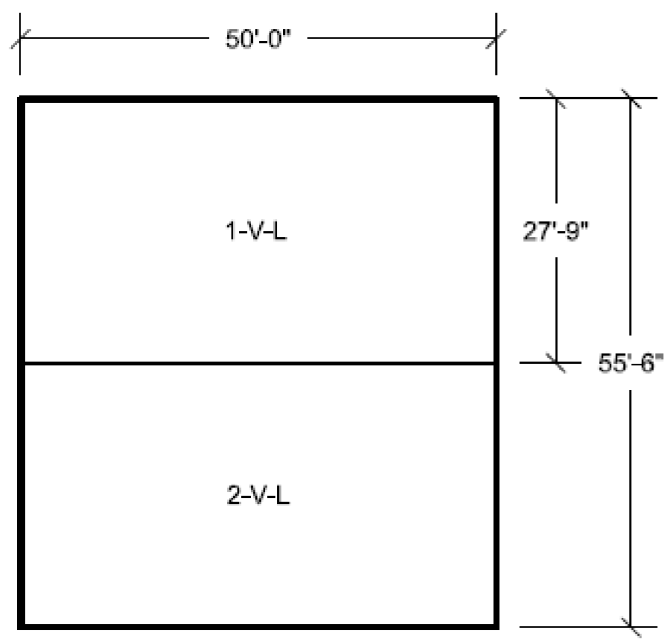


Figure 3H.6-116 Cooling Tower East Wall Looking West Vertical Reinforcement Zones Far Side Face

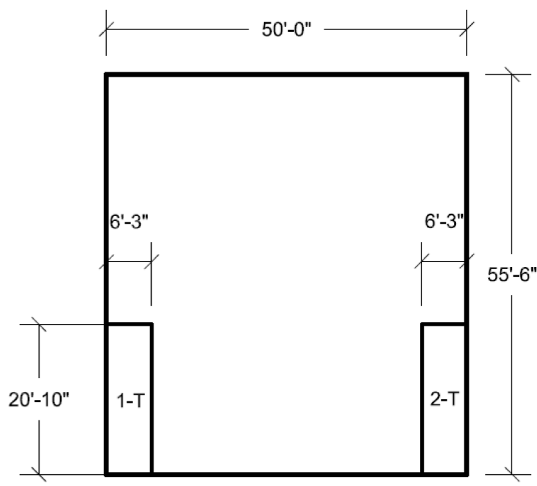


Figure 3H.6-116A Cooling Tower East Wall Looking West Transverse Reinforcement Zones

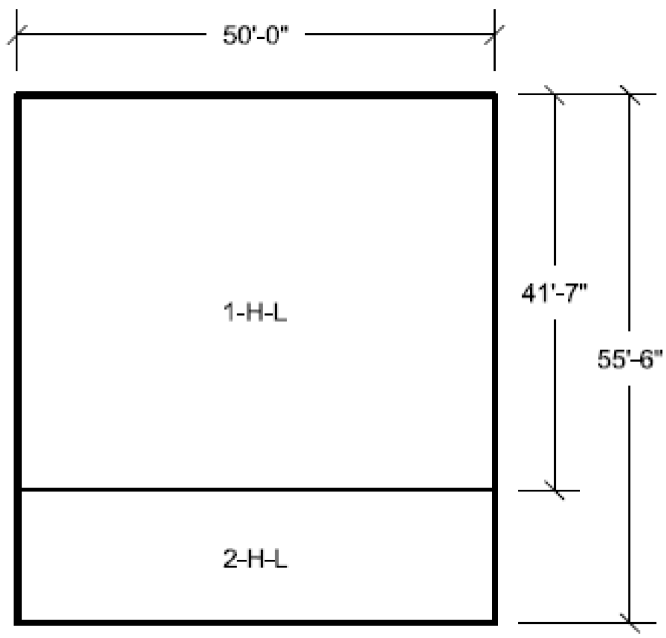


Figure 3H.6-117 Cooling Tower West Wall Looking East Horizontal Reinforcement Zones Near Side Face

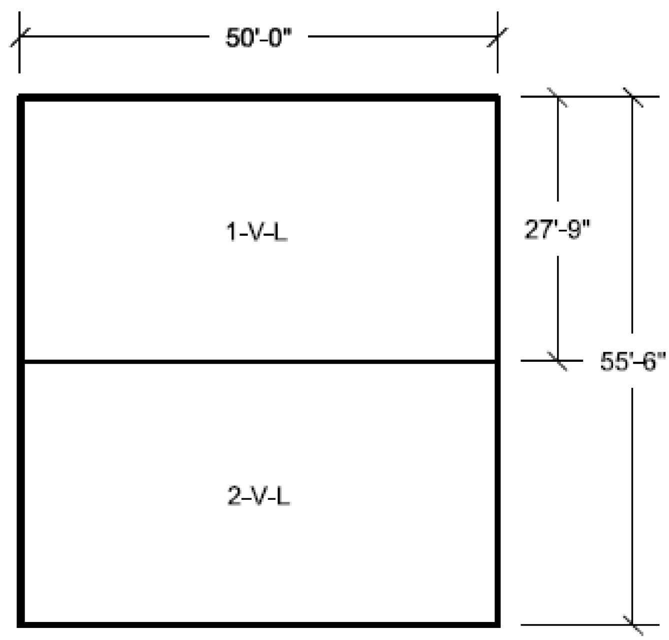


Figure 3H.6-118 Cooling Tower West Wall Looking East Vertical Reinforcement Zones Near Side Face

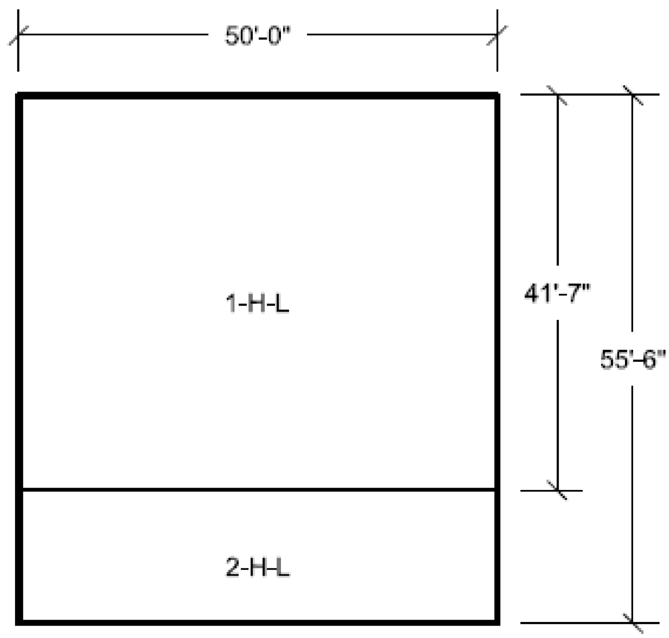


Figure 3H.6-119 Cooling Tower West Wall Looking East Horizontal Reinforcement Zones Far Side Face

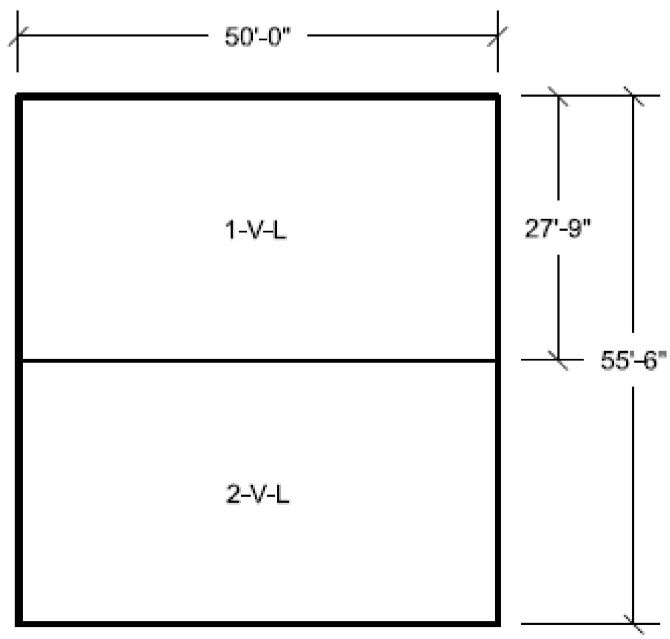


Figure 3H.6-120 Cooling Tower West Wall Looking East Vertical Reinforcement Zones Far Side Face

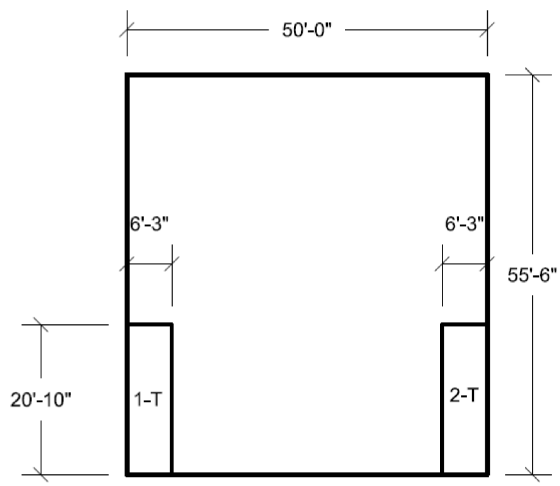


Figure 3H.6-120A Cooling Tower West Wall Looking East Transverse Reinforcement Zones

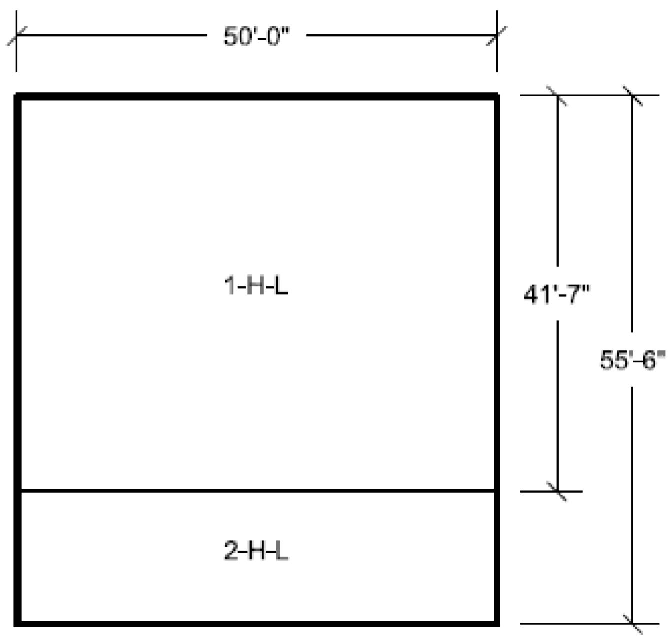


Figure 3H.6-121 Cooling Tower Internal Walls Horizontal Reinforcement Zones Both Faces

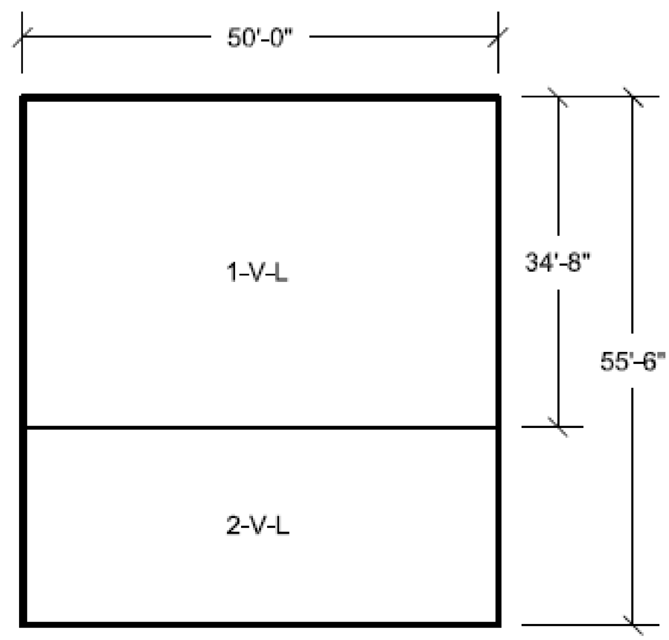


Figure 3H.6-122 Cooling Tower Internal Walls Vertical Reinforcement Zones Both Faces

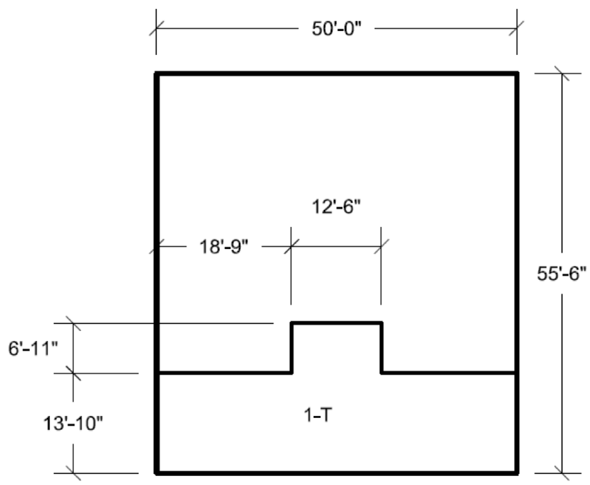


Figure 3H.6-122A Cooling Tower Internal Wall Looking West Transverse Reinforcement Zones

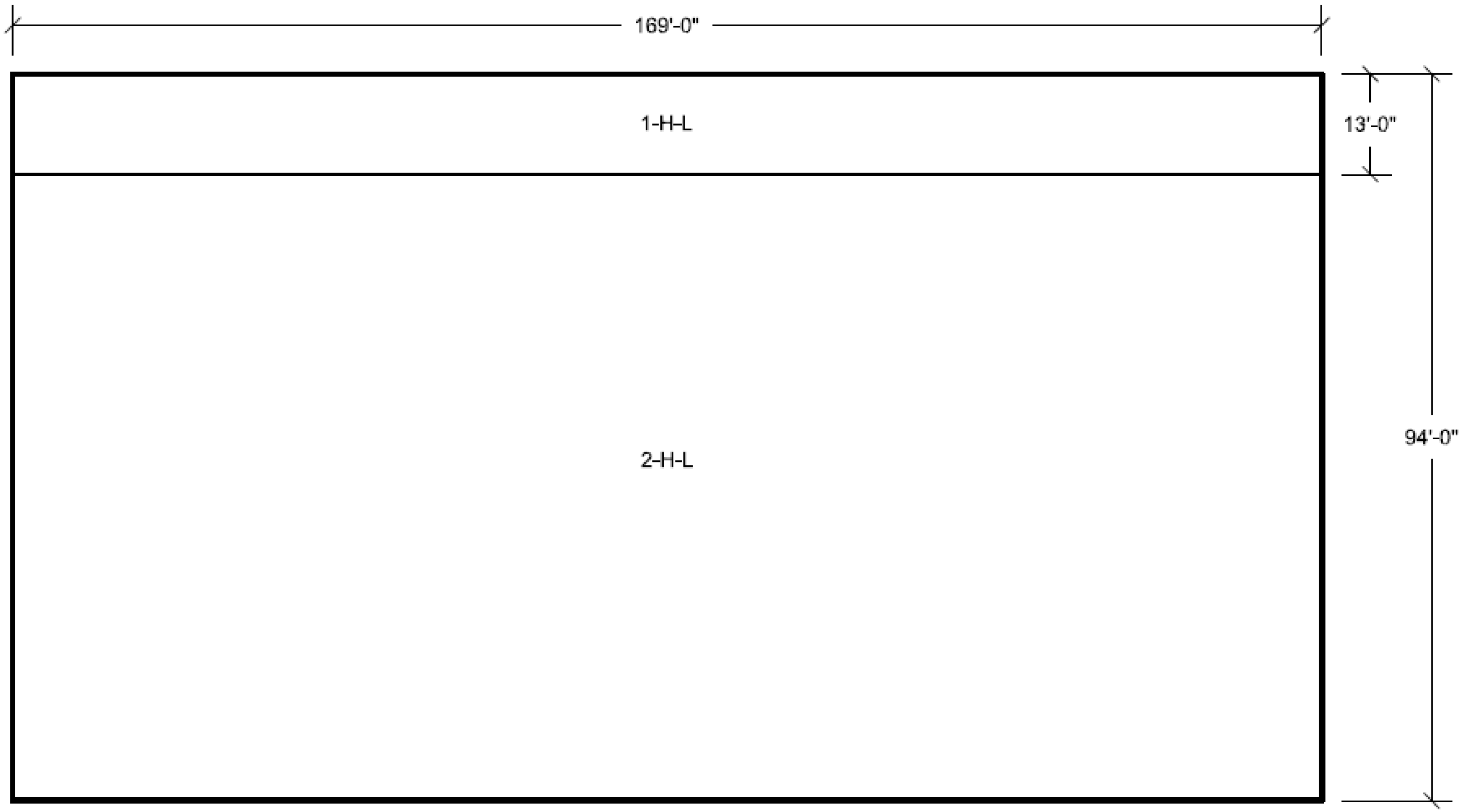


Figure 3H.6-123 Pump House Foundation Mat East/West Reinforcement Zones Top Face

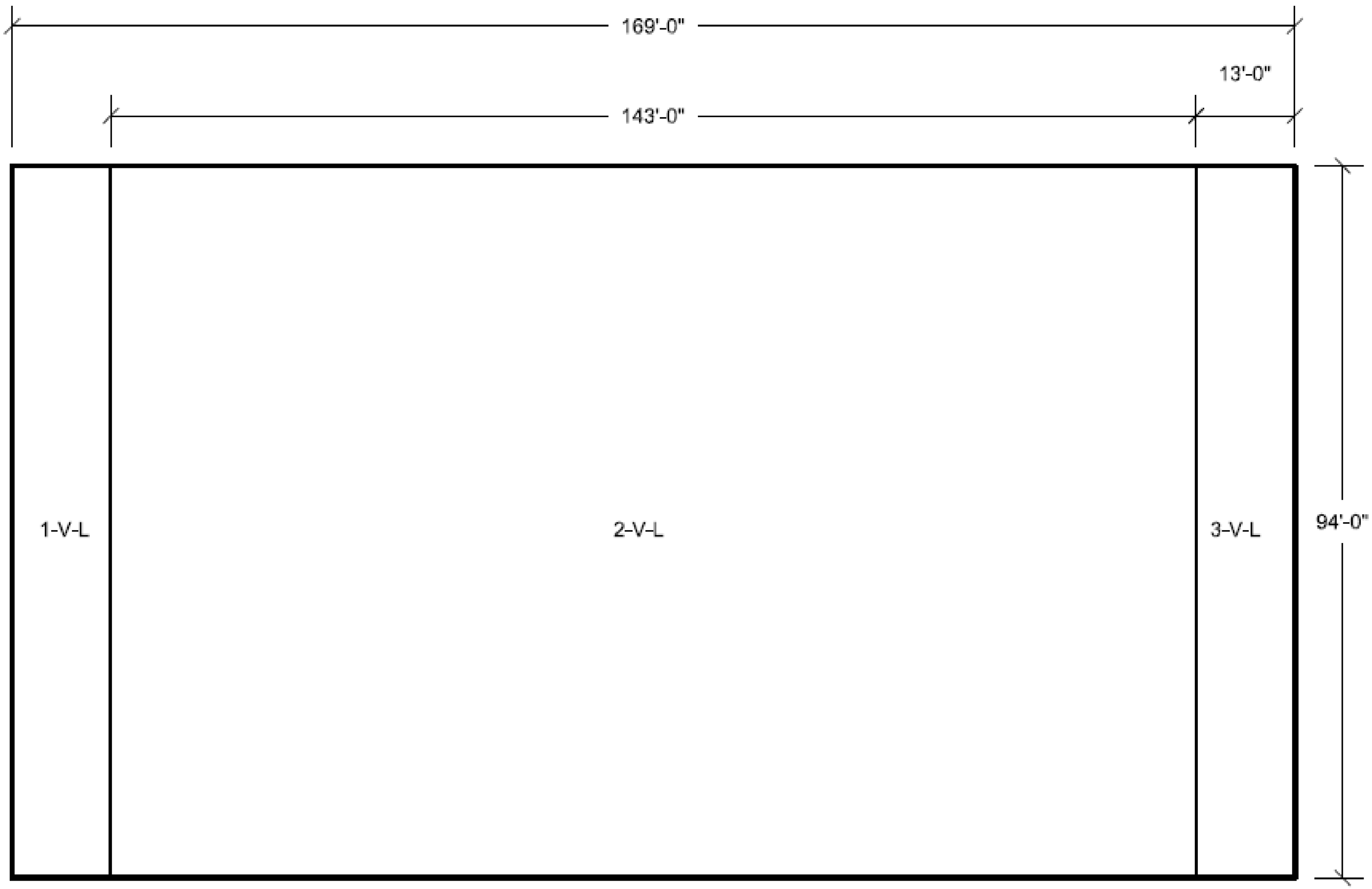


Figure 3H.6-124 Pump House Foundation Mat North/South Reinforcement Zones Top Face

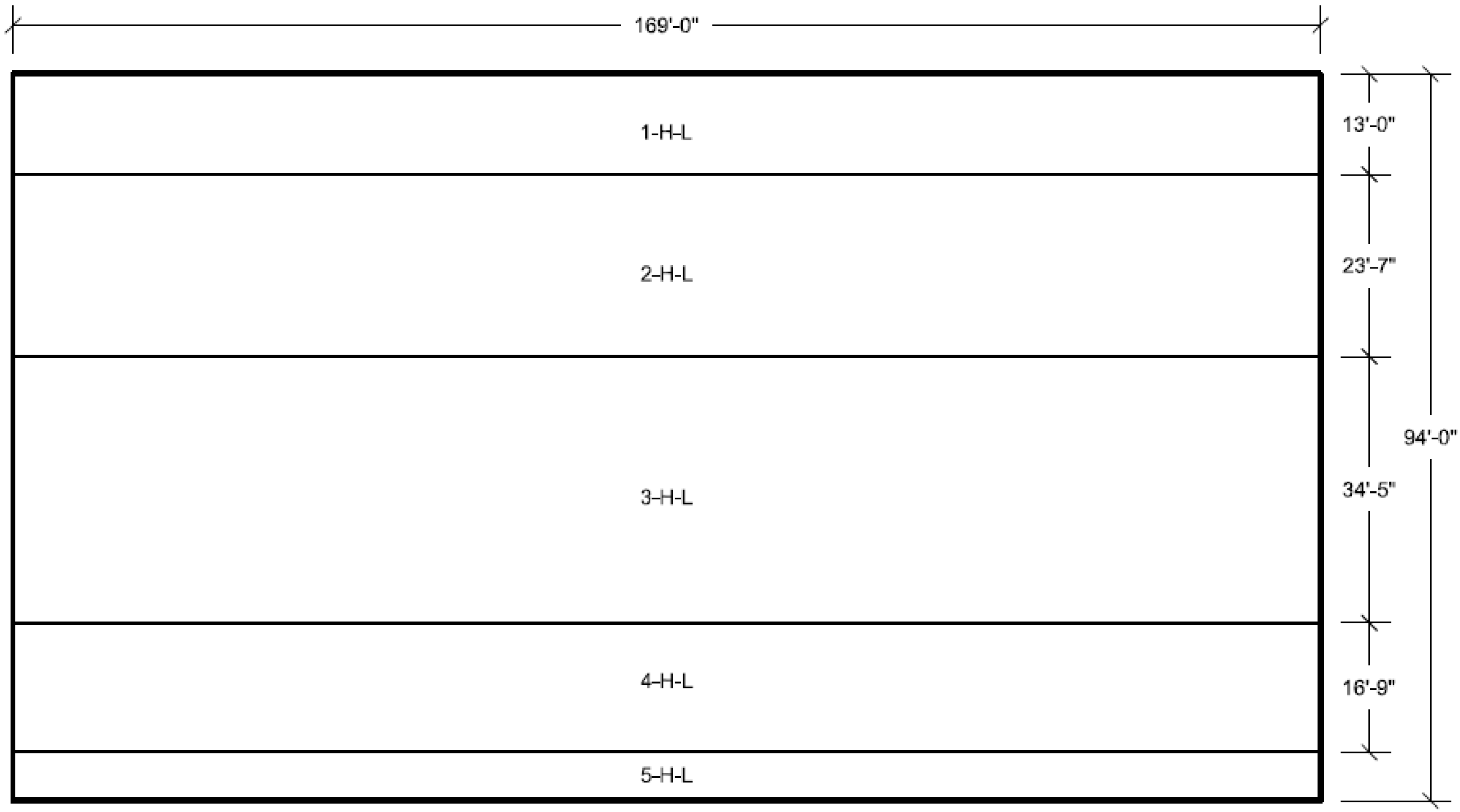


Figure 3H.6-125 Pump House Foundation Mat East/West Reinforcement Zones Bottom Face

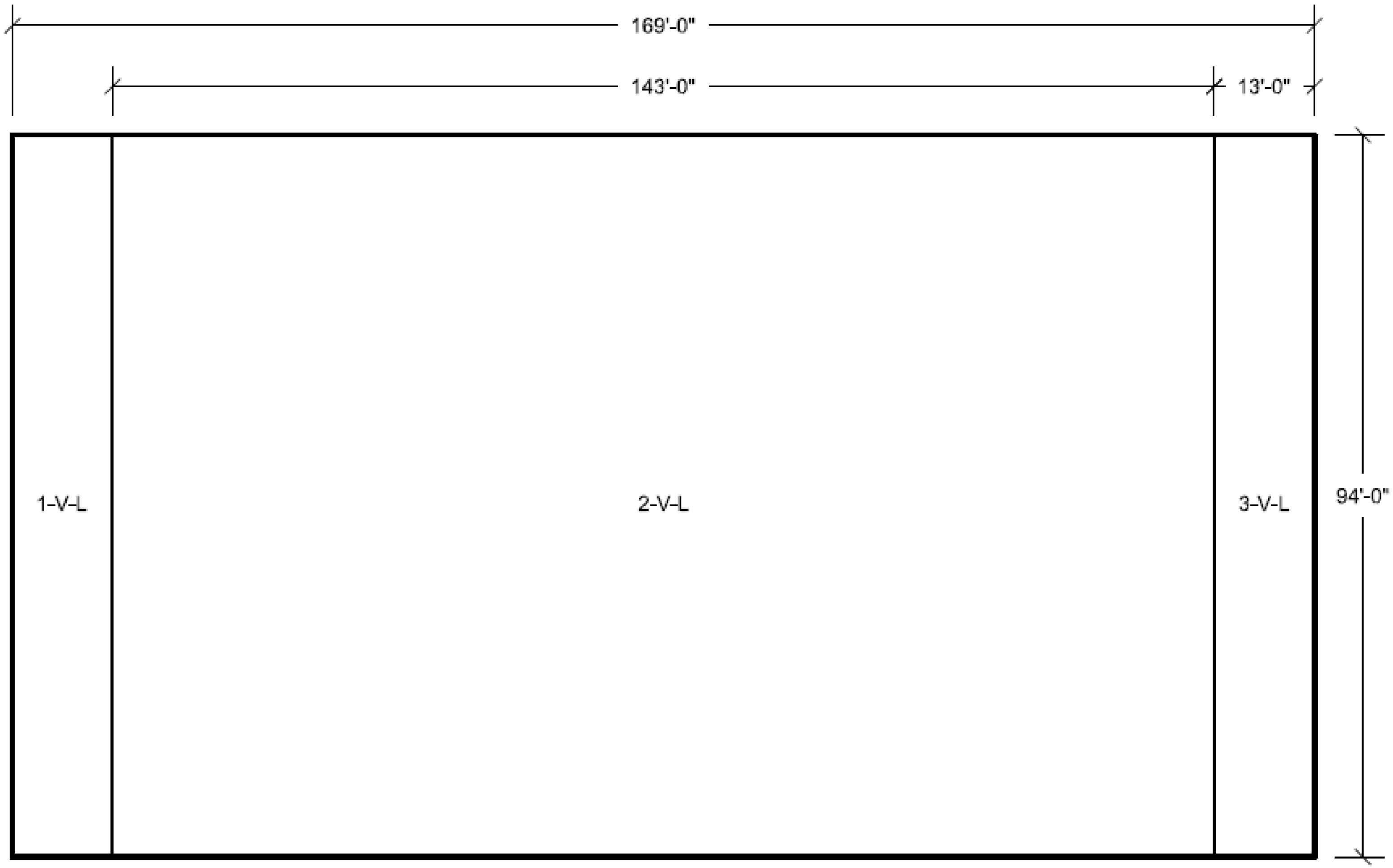


Figure 3H.6-126 Pump House Foundation Mat North/South Reinforcement Zones Bottom Face

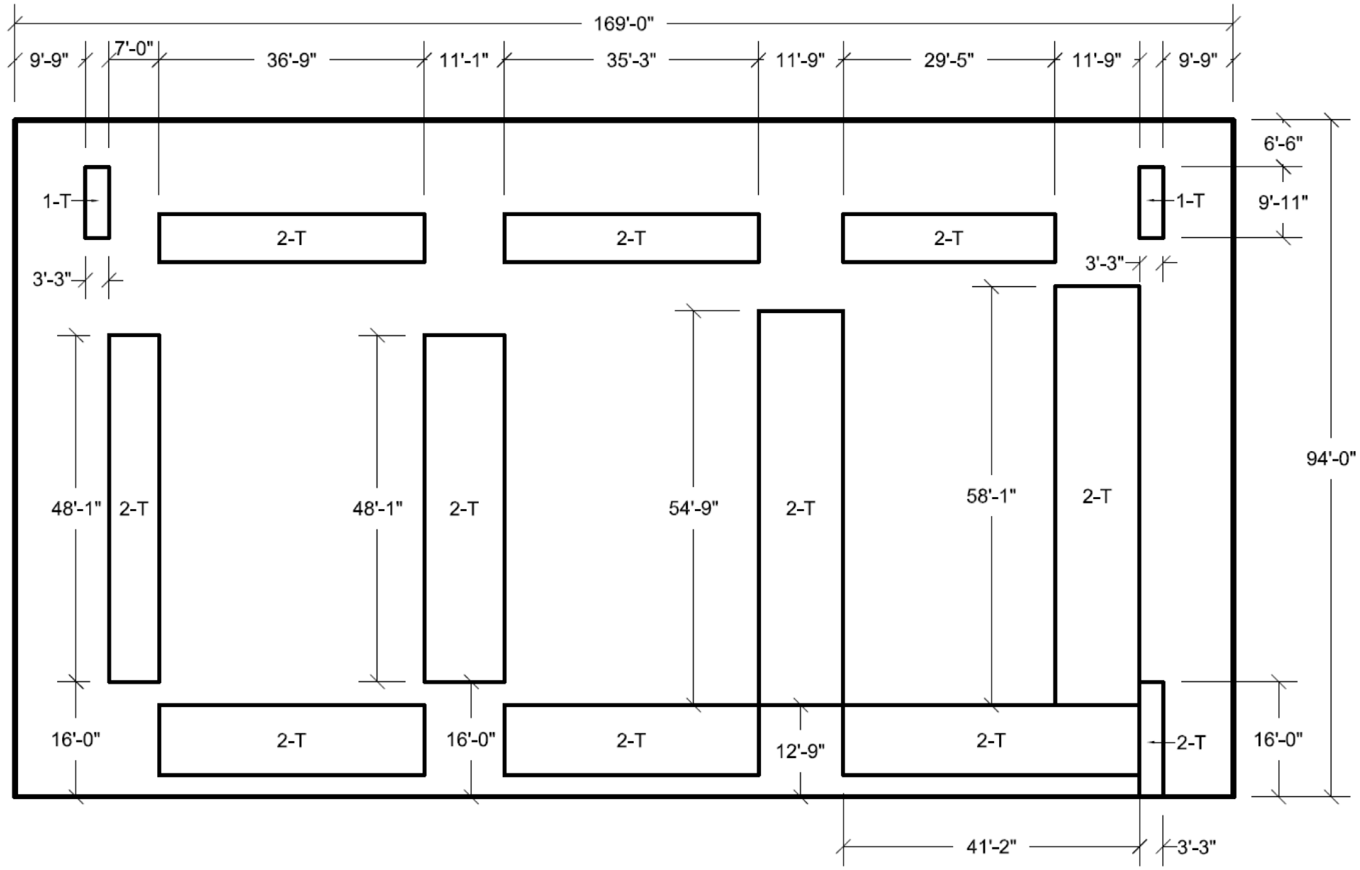


Figure 3H.6-126A Pump House Foundation Mat Transverse Reinforcement Zones

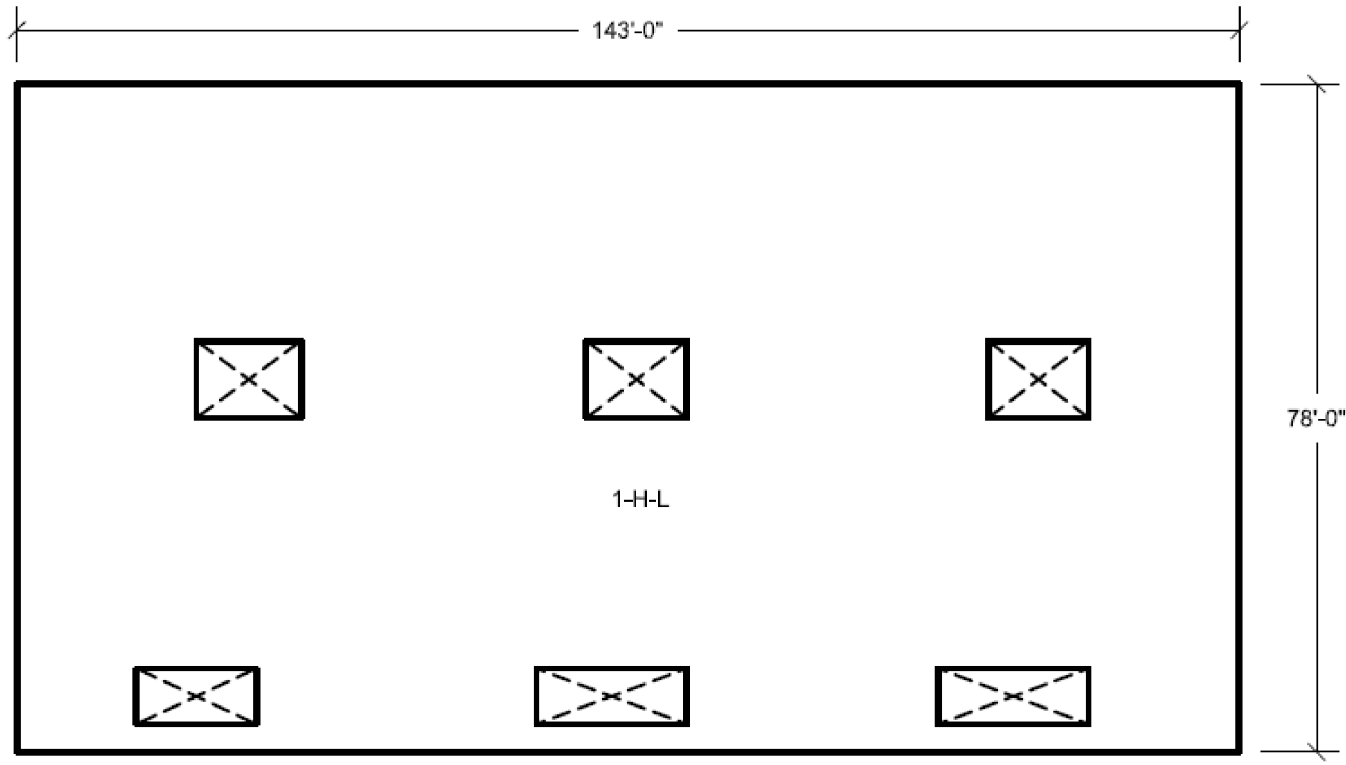


Figure 3H.6-127 Pump House Floor El 15'-2" East/ West Reinforcement Zones Top Face

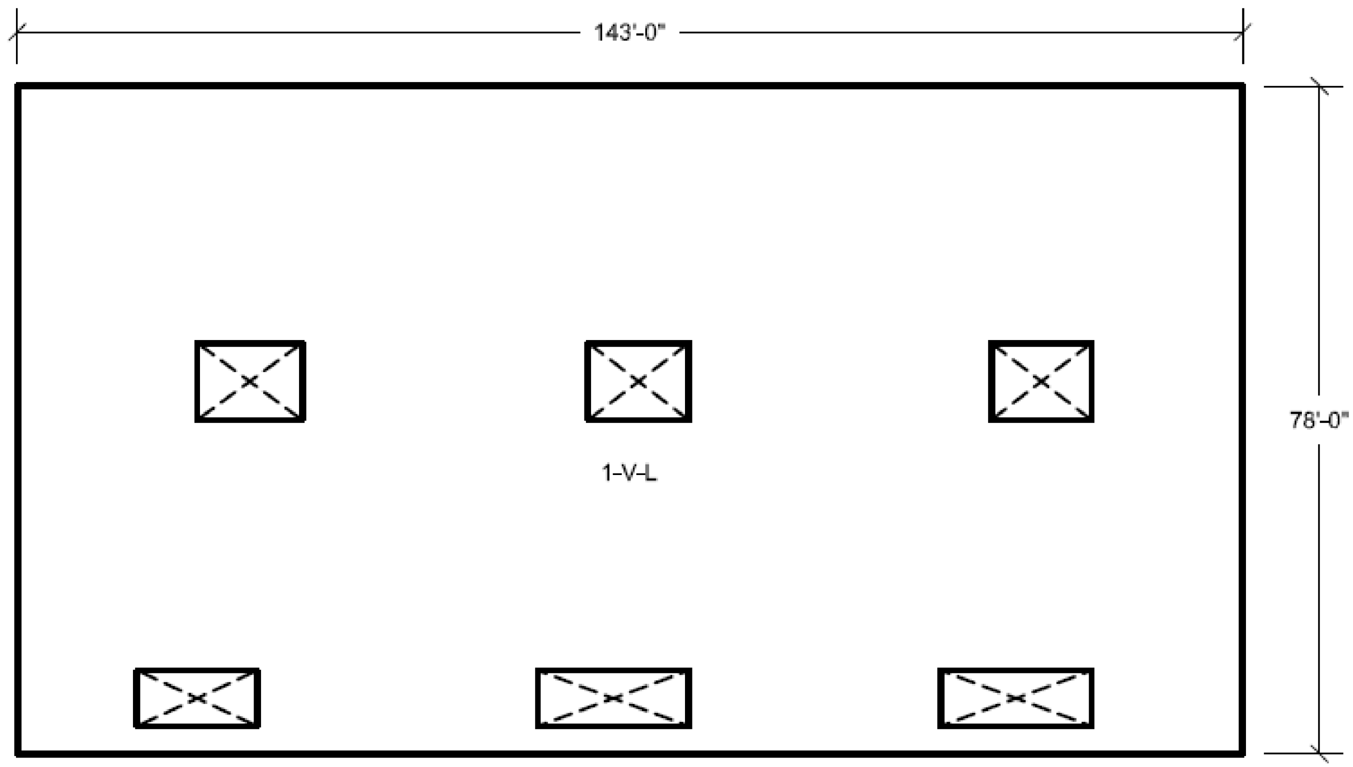


Figure 3H.6-128 Pump House Floor El 15’-2” North/South Reinforcement Zones Top Face

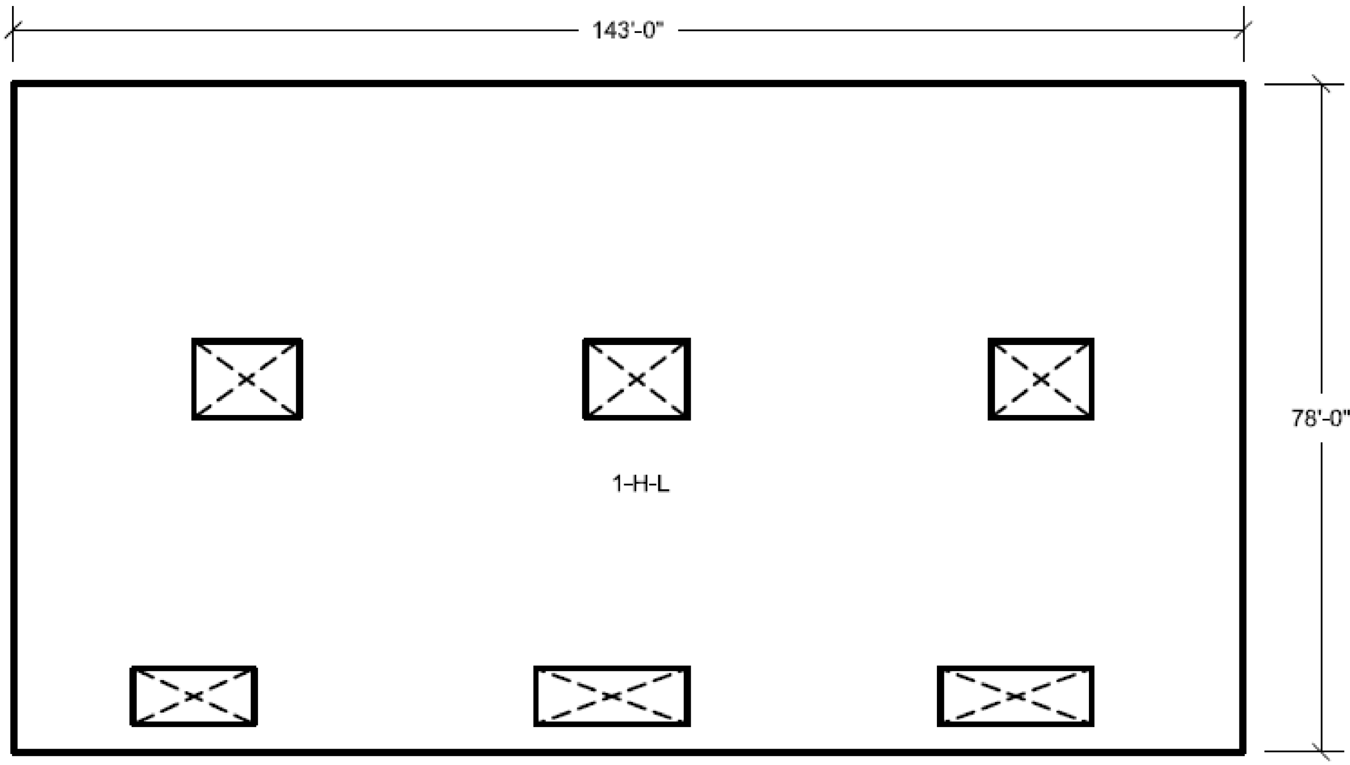


Figure 3H.6-129 Pump House Floor El 15'-2"
East/West Reinforcement Zones Bottom Face

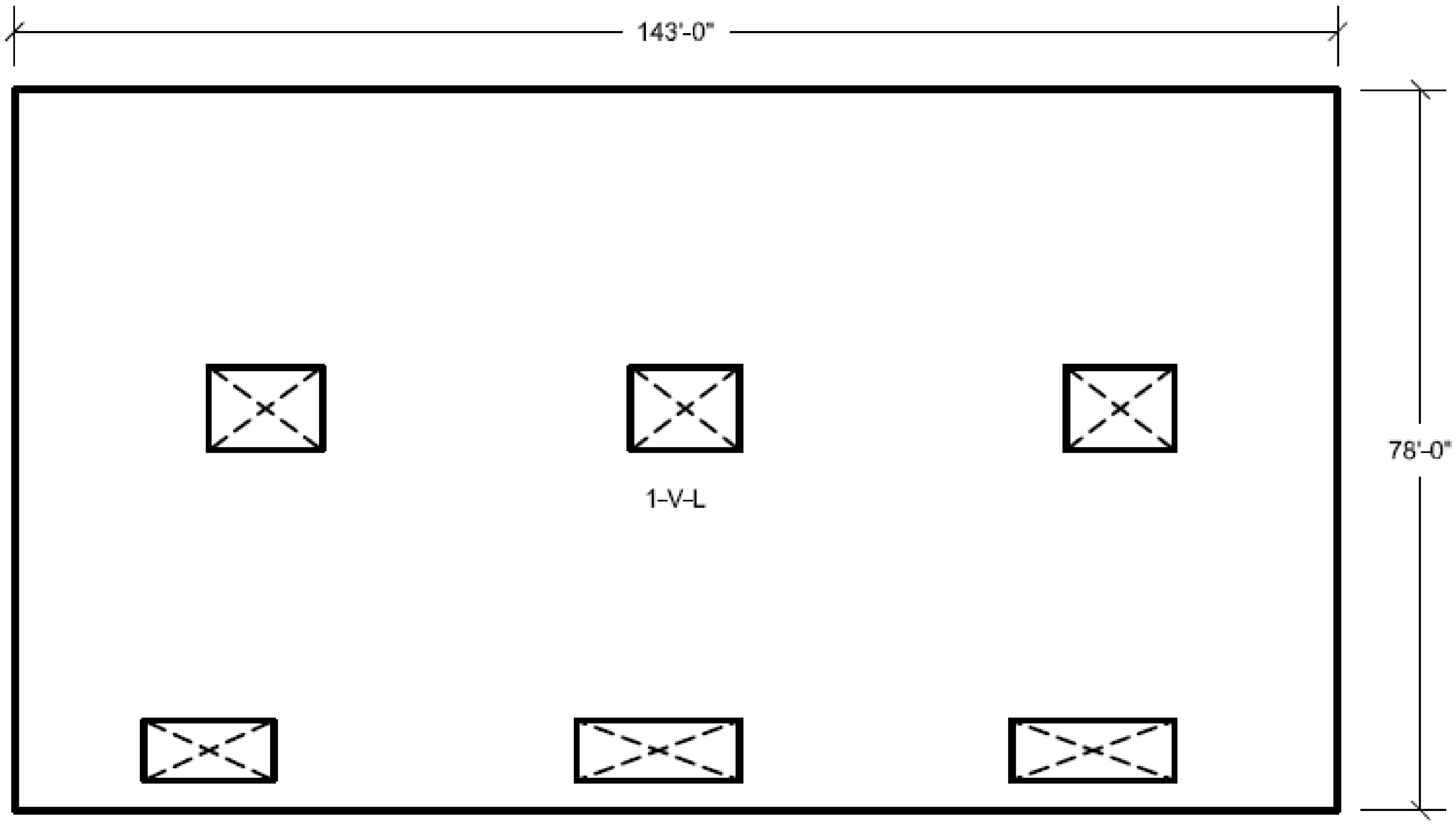


Figure 3H.6-130 Pump House Floor El 15'-2"
North/South Reinforcement Zones Bottom Face

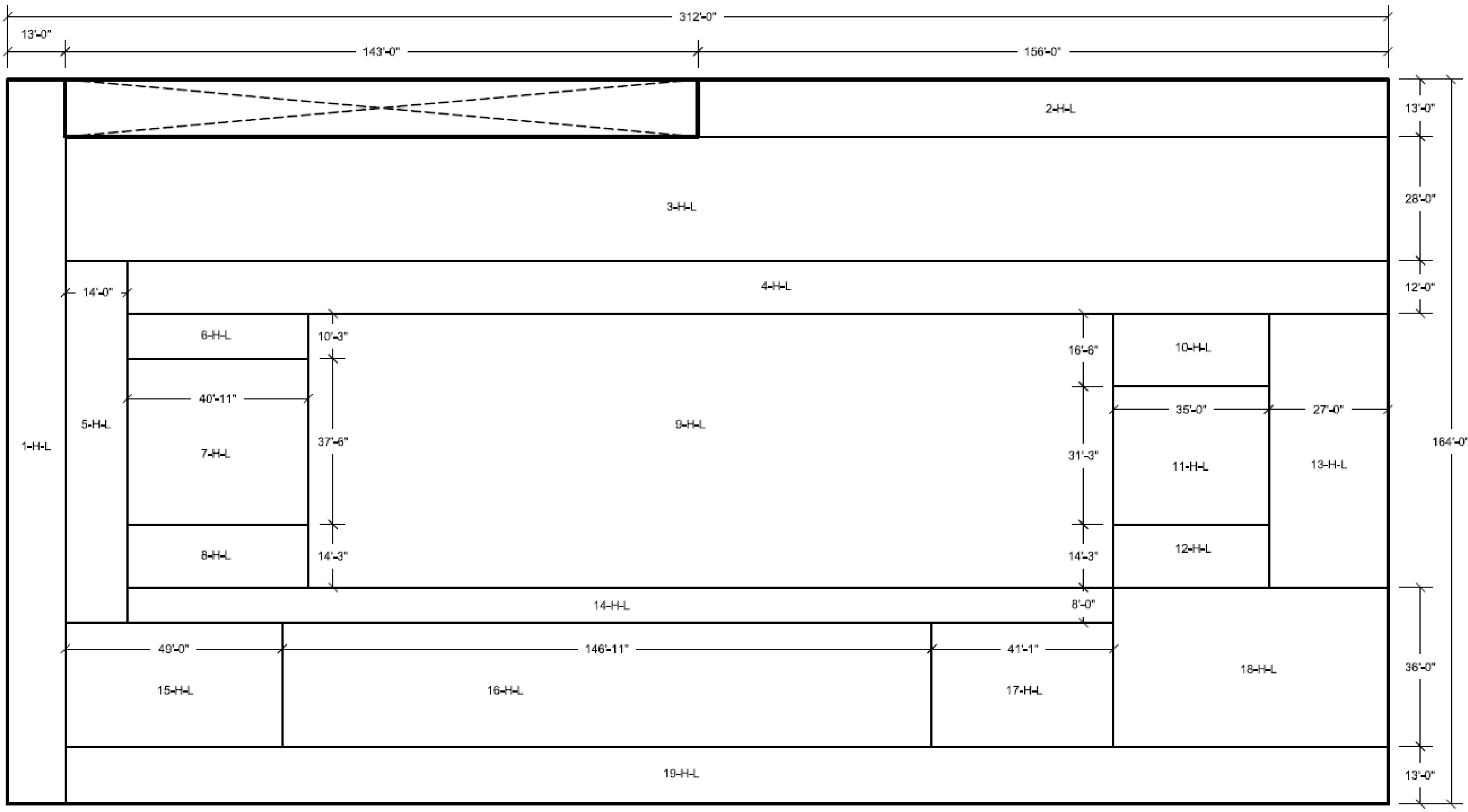


Figure 3H.6-131 UHS Basin Foundation Mat East/West Reinforcement Zones Top Face

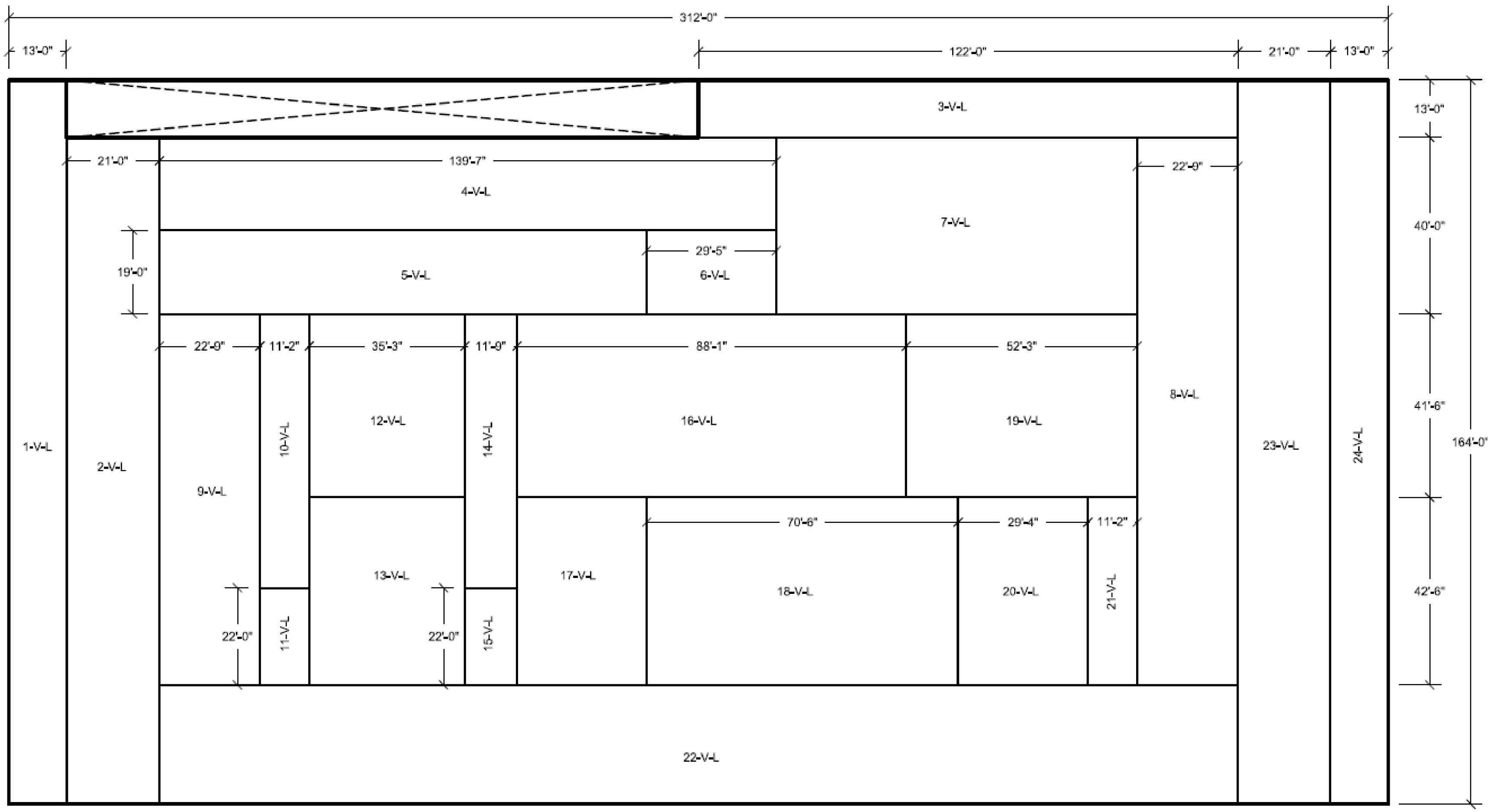


Figure 3H.6-132 UHS Basin Foundation Mat North/South Reinforcement Zones Top Face

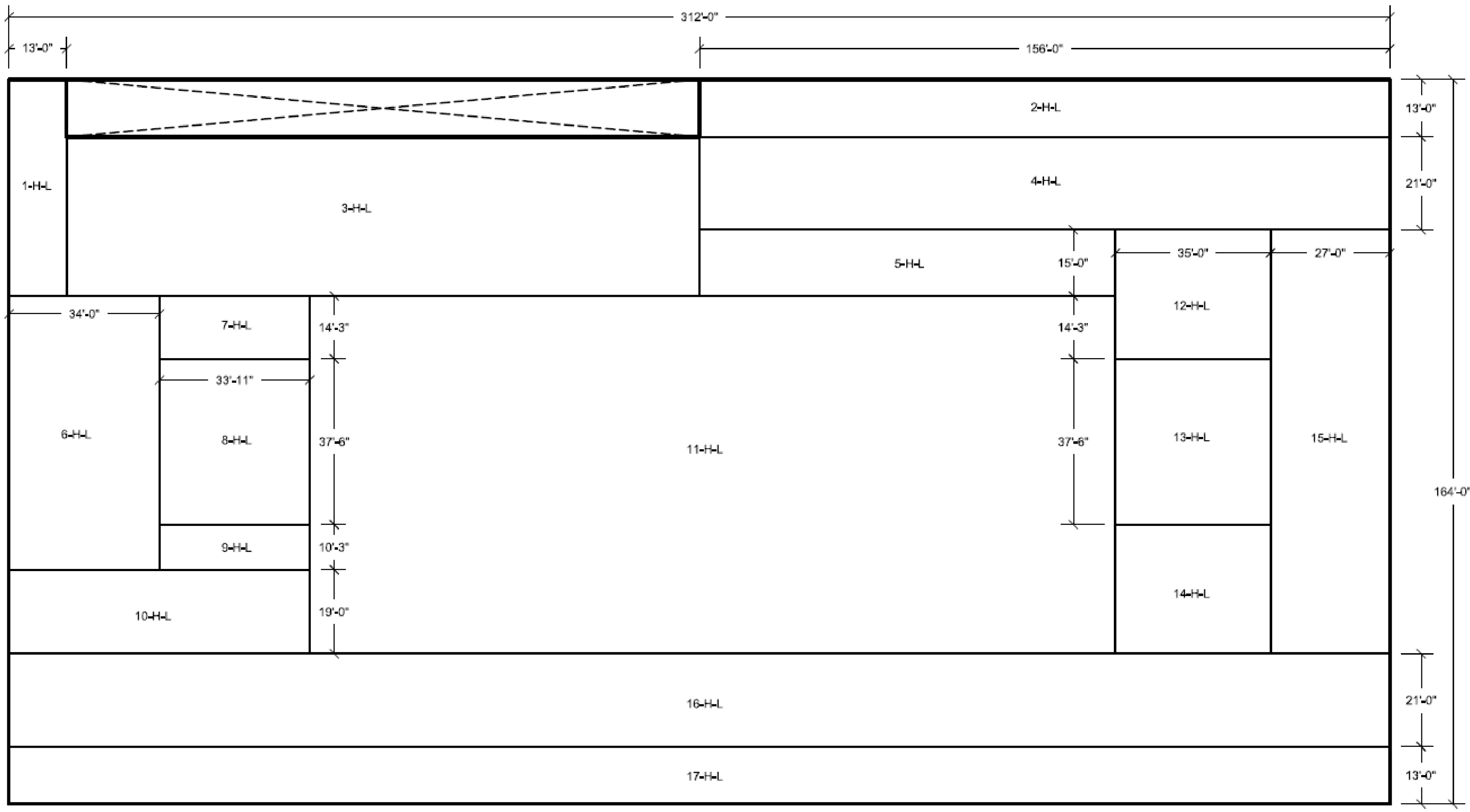


Figure 3H.6-133 UHS Basin Foundation Mat East/West Reinforcement Zones Bottom Face

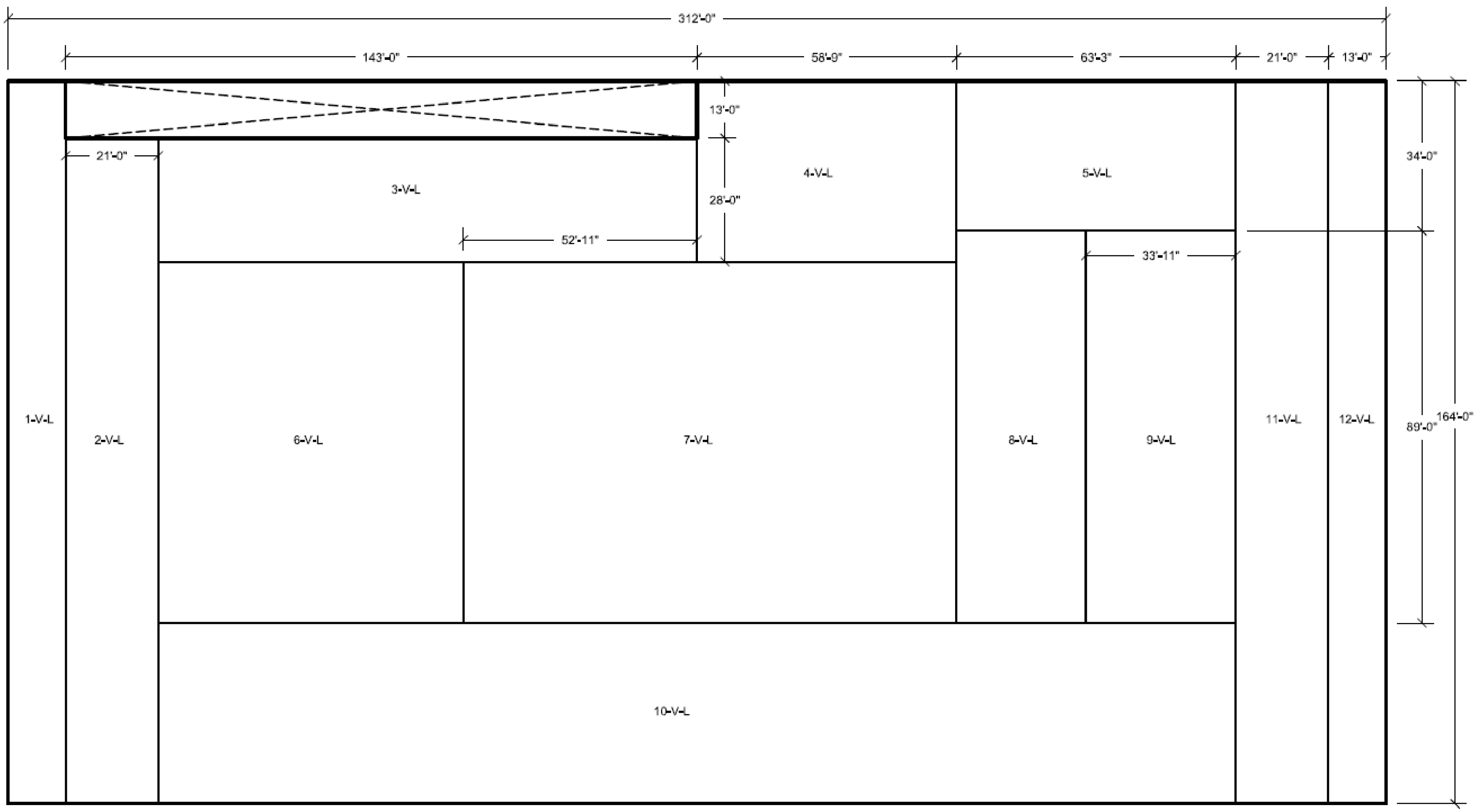


Figure 3H.6-134 UHS Basin Foundation Mat North/South Reinforcement Zones Bottom Face

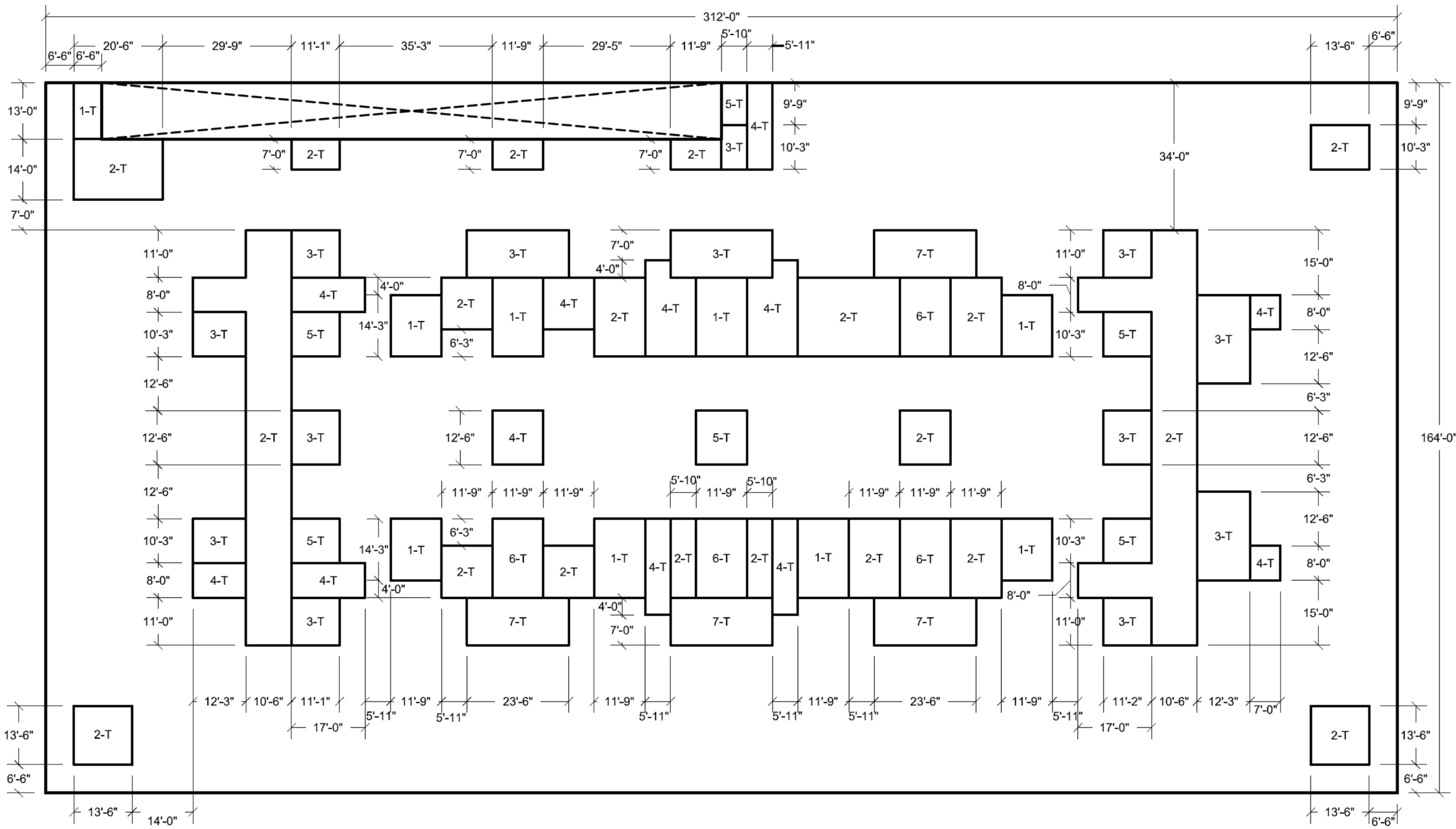


Figure 3H.6-134A UHS Basin Foundation Mat Transverse Reinforcement Zones

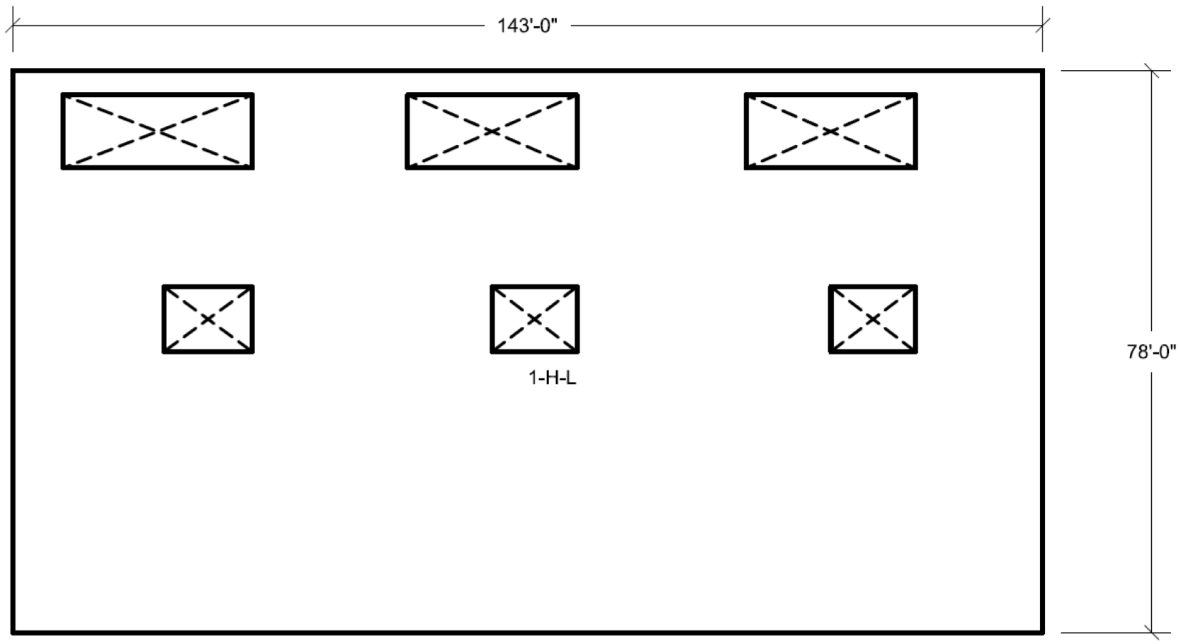


Figure 3H.6-135 Pump House Roof East/West Reinforcement Zones Top Face

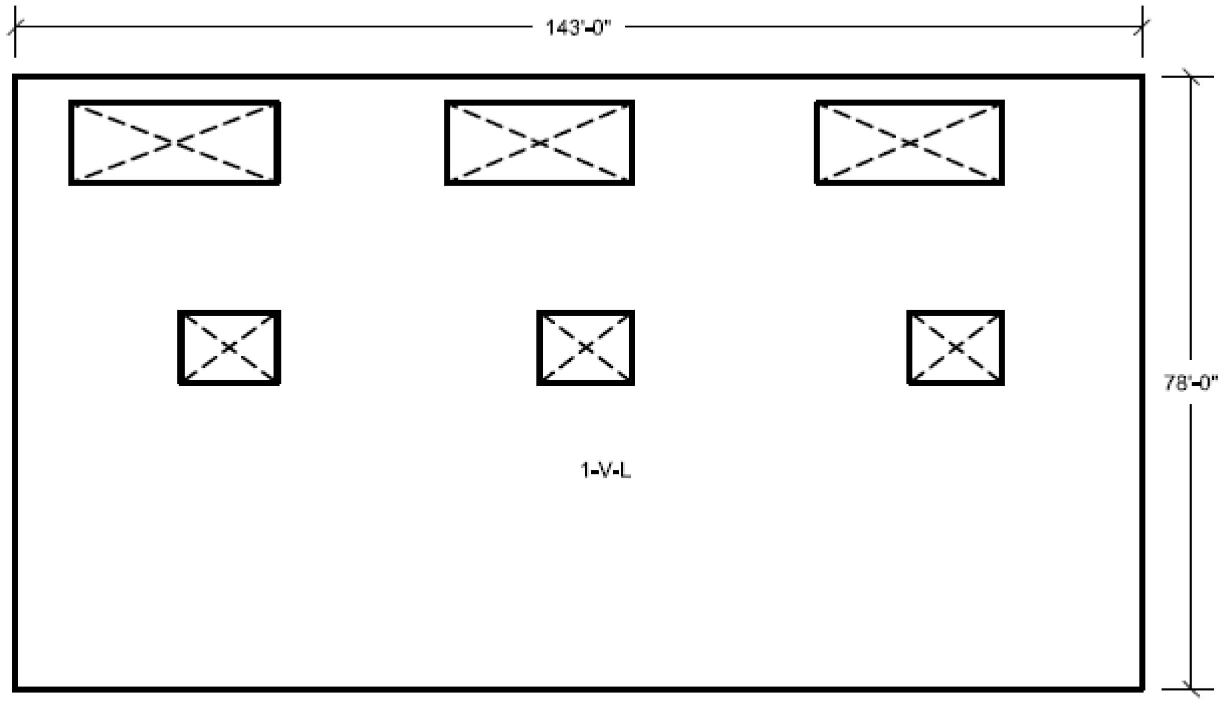


Figure 3H.6-136A Pump House Roof North/South Reinforcement Zones Top Face

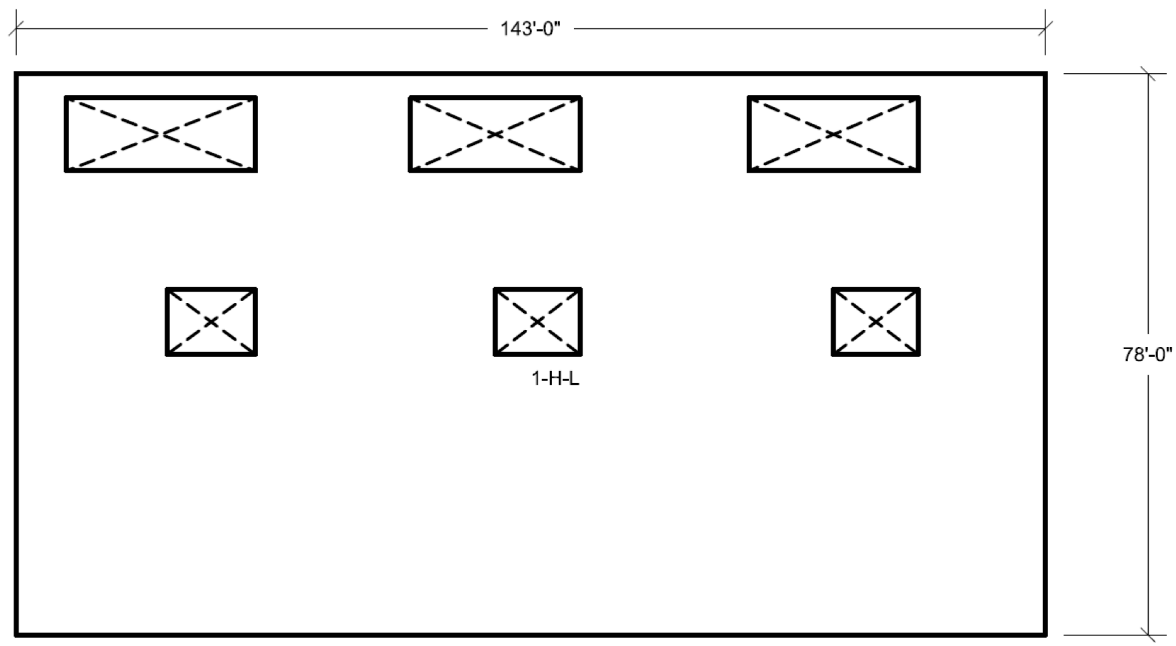


Figure 3H.6-136B Pump House Roof East/West Reinforcement Zones Bottom Face

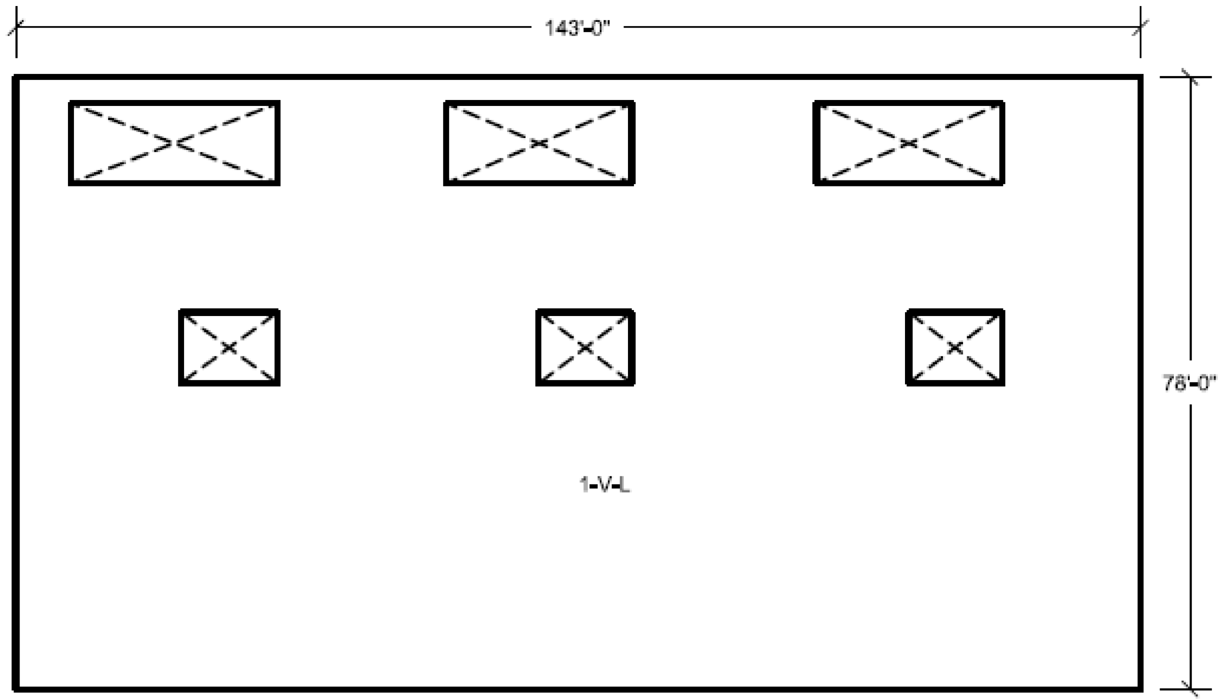


Figure 3H.6-136C Pump House Roof North/South Reinforcement Zones Bottom Face

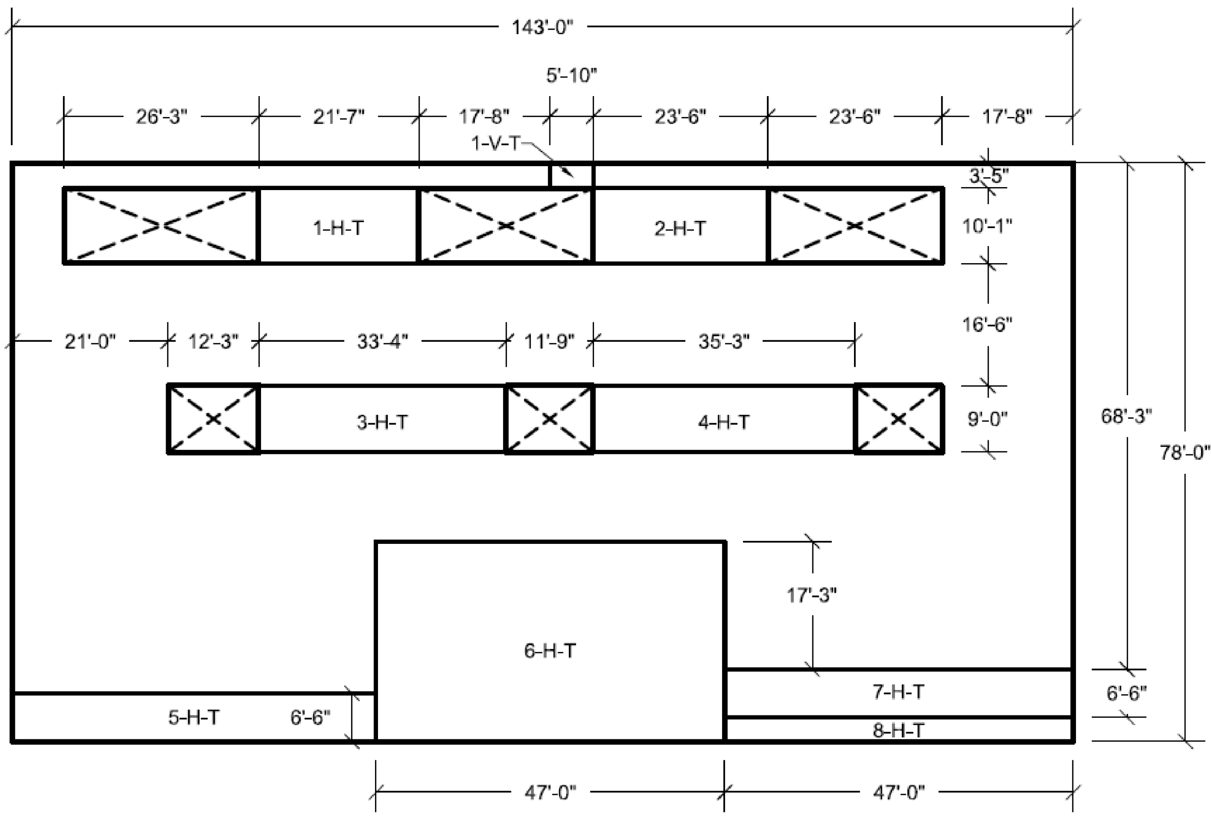
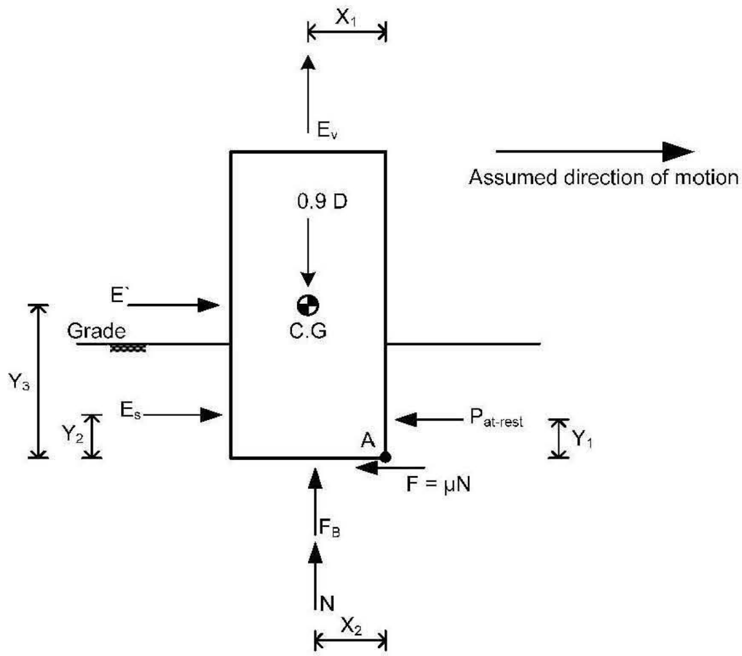


Figure 3H.6-136D Pump House Roof Transverse Vertical and Horizontal Reinforcement Zones



Factors of Safety against Sliding and Overturning about point A are calculated as follows:

$$SF_{sliding} = \frac{P_{at\_rest} + F}{E_s + E`}$$

$$SF_{OT\_A} = \frac{(P_{at\_rest})(Y_1) + (0.9D)(X_1)}{(F_B)(X_2) + (E_s)(Y_2) + (E`)(Y_3) + (E_v)(X_1)}$$

Where:

$SF_{sliding}$ = Safety factor against sliding
SF_{OT_A} = Safety factor against overturning about "A"
D = Dead load
P_{at_rest} = Total at-rest soil pressure
$F = \mu N$ = friction force and μ is the coefficient of friction
E_s = Static and dynamic soil pressure
E` = Self weight excitation in the horizontal direction
E_v = Self weight excitation in the vertical direction
F_B = Buoyancy force
N = Vertical reaction $= 0.9D - F_B - E_v$

Notes:

(1) If passive pressure is utilized, $P_{passive}$ is used instead of $P_{at\text{-}rest}$

(2) E' represents the inertia of the structure and it is either determined from equivalent static method or response spectrum analysis.

(3) E_s represents the static and dynamic loads from soil which includes seismic loads from soil and hydrodynamic pressure from groundwater. These loads are computed in accordance with Section 2.5S4.10.5.

Figure 3H.6-137 Formulations Used for Calculation of Factors of Safety Against Sliding and Overturning for Category I Site-Specific Structures

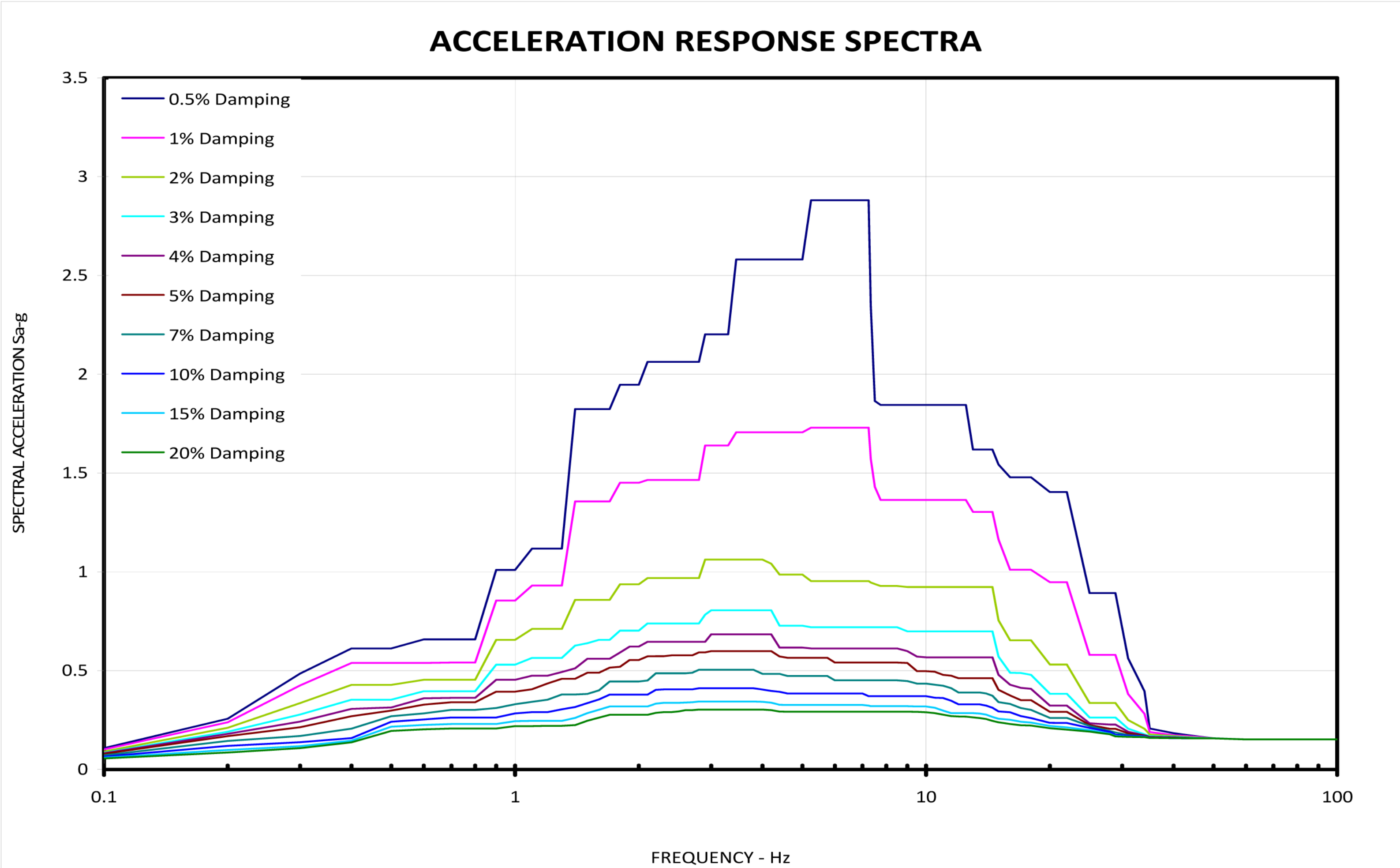


Figure 3H.6-138 RSW Piping Tunnel, Horizontal Response Spectra

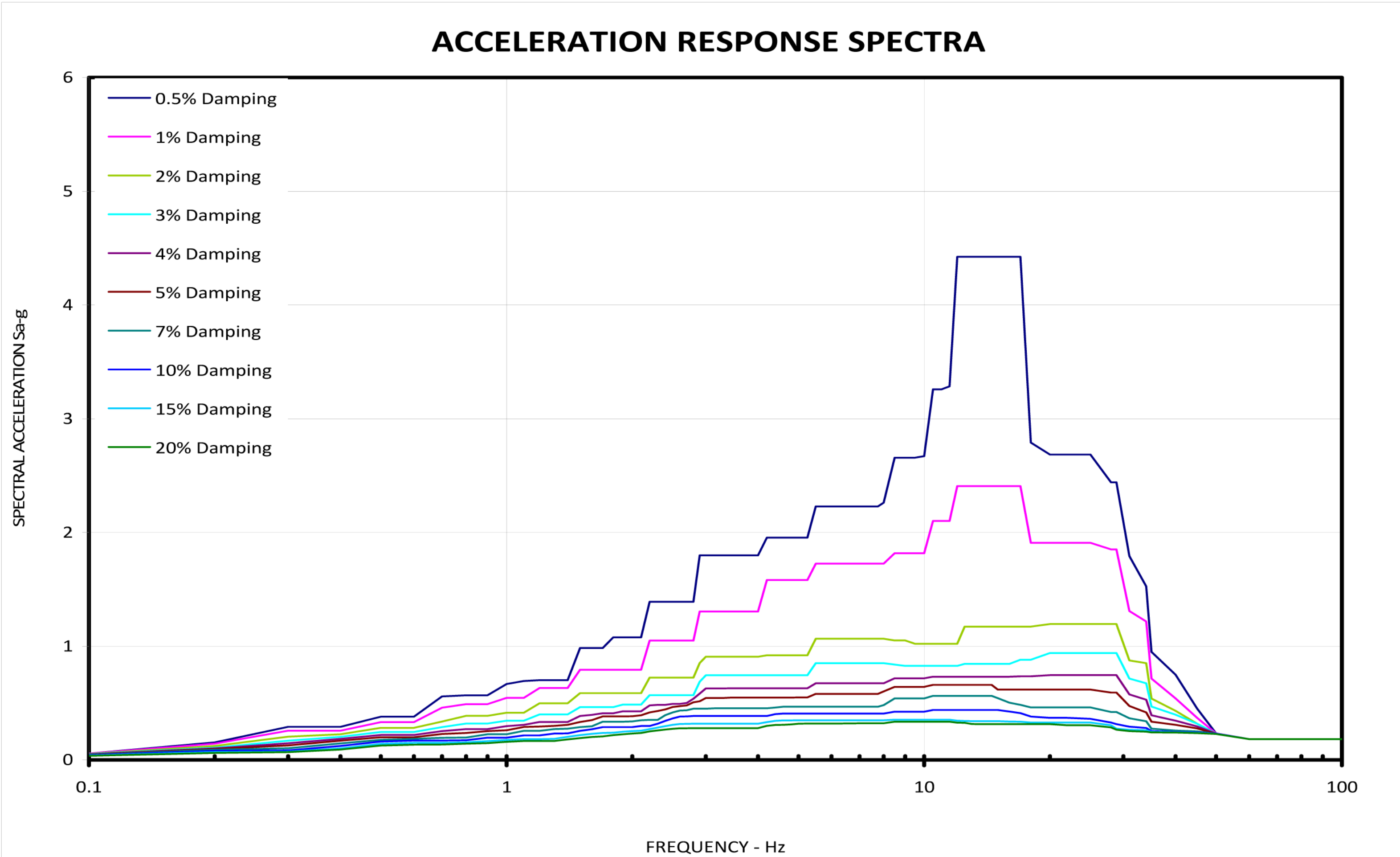


Figure 3H.6-139 RSW Piping Tunnel, Vertical Response Spectra