
Appendix B: SCV Water Seismic Analysis

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Seismic Risk Evaluation and Mitigation Report

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Prepared for
Santa Clarita Valley Water
Agency
27234 Bouget Canyon Road
Santa Clarita, CA 91350

KJ Project No. 2044228*00

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Section 1: Draft Seismic Risk Analysis

1.1 Overview

The Urban Water Management Planning Act requires urban water suppliers to evaluate potential seismic risk to the facilities in their system and produce a mitigation plan. This section describes the review of the existing documentation and preliminary evaluation of seismic risk to SCV Water's existing facilities. This section also provides recommendations for mitigation of the existing risks. Current structural design practice is to design structures for ground motion with a 2.5% probability of exceedance in any 50-year period. This design earthquake is highly dependent on conditions at any given location. Earthquake magnitude is an estimate of the total energy released by a given earthquake and cannot be directly translated into the design earthquake used for structural design. However, The U.S Geological Survey estimates that there is a 99% chance that California will experience a 6.7 magnitude earthquake within 30 years. The current design earthquake has a lower probability of occurring than an earthquake of similar magnitude to the 1994 Northridge Earthquake, 6.7.

The facilities review as part of this assessment include approximately 45 well sites, 44 booster pump station, and 92 steel water storage tanks, the Earl Schmidt Filtration Plant (ESFP), and the Rio Vista Treatment Plant (RVTP). SCV Water was formed by the merger of CLWA, NCWD, SCWD and VWC. The facilities described in this report were constructed between 1961 and 2020. There are significant gaps in the construction documentation of many of these facilities. Final seismic risk mitigation planning will require site visits by a Structural or Civil Engineer experienced in design of water treatment facilities to evaluate the existing conditions. Where possible an initial determination of the seismic loads at the facilities has been determined in accordance with the 2010 Edition Minimum Design Loads Associate for Buildings and Other Structures (ASCE 7-10) using the web based Hazard Maps by the Applied Technology Council (ATC). The 2010 edition was used in this stage because ASCE 7-16 as referenced in the current California Building Code (CBC) requires site specific geotechnical investigations for most conditions and structures. When implementing the final mitigation recommendations, a geotechnical investigation will be required for most of SCV Water's facilities.

1.2 Water Storage Tank Evaluation Summary

The seismic evaluation of SCV Water was conducted by applying the seismic design provision of the 2011 edition of Welded Carbon Steel Tanks for Water Storage by the American Water Works Association (AWWA D100-11). SCV Water currently operates over 90 steel water storage tanks. For our analysis we were provided the diameter, height to the overflow and maximum capacity of the storage tank. Using this information, ASCE 7-10 seismic parameters, and the seismic provision of AWWA D100-11, we determined the seismic loads, sloshing wave height, and anchorage requirements of SCV Water's storage tanks. We were provided with the overflow height rather than the maximum. Final design of welded and bolted steel water storage tanks is typically conducted by specialty contractors and submitted during construction. The construction drawings rarely indicate the final plate thicknesses, location and size of columns, size and location of anchors or other significant aspects of design beyond size and design criteria. Further field investigations will be required quantify further risk.

Storage tanks built prior to 1984 are unlikely to be compliant with current building standards and are unlikely to have been designed for lateral loads due to seismic events. Storage tanks built between 1984 and 2011 were probably designed with seismic loads however they may not be designed to withstand seismic loads determined in accordance with the current building code. Storage tanks designed after 2011 are likely designed to meet current building code requirements.

Table 1-1 Tank Design Use Group
AWWA D100-11 Design use Group and Seismic Importance Factor

Use Group	*Importance Factor, I_e	Description
I	1	Tanks that provide services to facilities deemed essential for post-earthquake recovery and essential to the life, health and safety of the public, including post-earthquake recovery.
II	1.25	Tanks that provide service to facilities that are deemed important to the welfare of the public
III	1.5	All Other

Note: *Importance Factor is used to amplify loads from earthquakes.

74 of the existing storage tanks require anchors and foundations. The remaining storage tanks will experience uplift due to seismic loads but do not require anchors at the foundation. It is our understanding that very few of the existing tanks are anchored or provided with concrete anchors. The sloshing wave height and required freeboard varies between seven and nine feet in height. We have not been provided the height of the roof framing, however, it is probable that in all cases, the required free board exceeds the distance from the bottom of the roof framing to the maximum operating water level.

Table 1-2 Anchorage, Freeboard, and Capacity Reduction

Tank Geometry				Results of the Analysis in accordance with AWWA D100-11									
Tank Site	Address	Date Built	Dia	Volume (gallons)	Overflow Height	Seismic Use Group	Importance Factor, I _e	¹ Overturning Ratio, J	Anchors	Allowable Water Height to Prevent Uplift	Sloshing Height, d (ft)	² Minimum Required Freeboard (ft)	³ Actual Freeboard
N Tank 1	21575 Deputy Jakes Way	1962	64	745,578	31	iii	1.5	2.79	Unstable	23	9.87	9.87	
N Tank 1A	21575 Deputy Jakes Way	1995	132	3,069,307	30	iii	1.5	1.47	Stable	30	9.87	9.87	
N Tank 1B	23780 N. Pine Street	1995	60	634,154	30	iii	1.5	3.25	Unstable	20	9.87	9.87	
N Tank 2*	23554 Dockweiler Drive	1989	80	1,428,022	38	iii	1.5	4.36	Unstable	23	9.87	9.87	2
N Tank 3	23252 1/2 Haskell Vista Lane	1995	60	634,154	30	iii	1.5	3.19	Unstable	20	9.87	9.87	
N Tank 4	24548-1/2 Peachland Avenue	1994	60	634,154	30	iii	1.5	3.01	Unstable	21.5	9.87	9.87	
N Tank 4A	24548-1/2 Peachland Avenue	1975	90	1,450,628	30.5	iii	1.5	2.09	Unstable	26	9.87	9.87	2
N Tank 5	24001-1/2 Briardale Way	1983	60	465,047	22	iii	1.5	1.80	Unstable	19	9.87	9.87	5
N Tank 6	23500 The Old Road	1994	20	46,035	20	iii	1.5	7.55	Unstable	6.5	9.87	9.87	
N Tank 7	23071 1/2 Pine St.	2019	79	1,099,377	30	iii	1.5	2.24	Unstable	25	9.87	9.87	
C Tank 1A	33030 Ridge Route Rd	1999	130	3,076,236	31	iii	1.5	1.22	Stable	31	9.87	9.87	
C Tank 1D	32601 N. Ridge Top Lane	1998	92	1,490,967	30	iii	1.5	1.34	Stable	30	9.87	9.87	2
C Tank 2	28768-1/2 Greenwood Place	1988	60	613,016	29	iii	1.5	1.83	Unstable	26	9.87	9.87	3
C Tank 3	31527U Valley Creek Rd	2016	66	767,327	30	iii	1.5	2.55	Unstable	23	9.87	9.87	
P Tank 1	29515 Poppy Meadow Street	2005	81	1,463,945	38	iii	1.5	2.49	Unstable	29.5	9.87	9.87	
P Tank 1A	29515 Poppy Meadow Street	1999	80	1,428,022	38	iii	1.5	2.51	Unstable	29.5	9.87	9.87	
P Tank 2	14751 Hydrangea Way	2004	92	1,490,967	30	iii	1.5	2.53	Unstable	2	9.87	9.87	2
P Tank 3	29251 Mammoth Lane	1993	80	1,127,386	30	iii	1.5	1.48	Stable	30	9.87	9.87	
P Tank 4	15644 Nahin Ln	2007	46	410,016	33	iii	1.5	2.91	Unstable	20	9.87	9.87	
P Tank 4A	15644 Nahin Ln	2006	62	744,850	33	iii	1.5	2.27	Unstable	26	9.87	9.87	
T Tank 1	29505 Avenida Rancho Tesoro	2002	81	1,155,746	30	iii	1.5	1.17	Stable	30	9.87	9.87	2
T Tank 1A	29505 Avenida Rancho Tesoro	2002	81	1,155,746	30	iii	1.5	1.40	Stable	30	9.87	9.87	2
T Tank 2	29505 Avenida Rancho Tesoro	2003	68	814,536	30	iii	1.5	1.53	Stable	30	9.87	9.87	2
T Tank 2A	29505 Avenida Rancho Tesoro	2003	68	814,536	30	iii	1.5	1.53	Stable	30	9.87	9.87	2

- Note:
1. Overturning Ratio is determined in accordance with AWWA D100-11 Equation 13-36, J Greater than or Equal to 1.54 requires anchors to the foundation.
 2. The minimum required freeboard is equal to the sloshing wave height for Use Group III and may be reduced for Use Group I and II.
 3. Freeboard was only determined in cases where available documentation indicated the roof height.

Tank Geometry

Results of the Analysis in accordance with AWWA D100-11

TankName	Address	Date Built	Dia	Volume (gallons)	Overflow Height	Seismic Use Group	I _E	¹ Overturning Ratio, J	Anchors	Allowable Water Height to Prevent Uplift	Sloshing Height, d (ft)	² Minimum Required Freeboard (ft)	³ Actual Freeboard
Bouquet	Through RVTP west gate, past solar panels, through park gate, overlooking park	1984	105	2,006,834	31	iii	1.5	1.91	Provide Anchors	27.5	9.87	9.87	
No Longer in Service	22200 Pamplico Dr.	1971	60	0		iii	1.5	-	-	-	-	-	
No Longer in Service	22200 Pamplico Dr.	1971	60	0		iii	1.5	-	-	-	-	-	
Catala 3	22200 Pamplico Dr.	1978	104	1,397,207	22	iii	1.5	0.81	Uplift but Stable	22	9.87	9.87	
Catala 4	22200 Pamplico Dr.	1989	104	1,397,207	22	iii	1.5	0.81	Uplift but Stable	22	9.87	9.87	
Benz	On Copper Hill xs is Benz Rd.	1999	104	1,968,791	31	iii	1.5	1.93	Provide Anchors	27	9.87	9.87	
Copper Hill 1	22000 Beldove Ct.	1988	105	1,942,098	30	iii	1.5	1.44	Uplift but Stable	30	9.87	9.87	
Copper Hill 2	22000 Beldove Ct.	1988	105	2,006,834	31	iii	1.5	1.54	Uplift but Stable	31	9.87	9.87	
Mesa	27238 Bouquet Canyon (next to Rio Vista)	2013	170	3,733,290	22	iii	1.5	0.53	Tank Is Stable	22	9.87	9.87	
Seco 1	28801 Garnet Canyon Dr. (access road marked as Edison Rd. on map)	1999	73	970,015	31	iii	1.5	1.92	Provide Anchors	27	9.87	9.87	
Seco 2	28801 Garnet Canyon Dr. (access road marked as Edison Rd. on map)	1999	105	2,006,834	31	iii	1.5	1.48	Uplift but Stable	31	9.87	9.87	
Sky Blue 1	West side of Whites Canyon before it turns into Plum Canyon (top of hill)	1988	73	970,015	31	iii	1.5	2.19	Provide Anchors	25	9.87	9.87	
Sky Blue 2	West side of Whites Canyon before it turns into Plum Canyon (top of hill)	1999	104	1,968,791	31	iii	1.5	1.68	Provide Anchors	29.5	9.87	9.87	
Sky Blue 3	West side of Whites Canyon before it turns into Plum Canyon (top of hill)	2003	104	1,968,791	31	iii	1.5	1.68	Provide Anchors	29.5	9.87	9.87	
Sky Blue 4	West side of Whites Canyon before it turns into Plum Canyon (top of hill)	2007	104	1,968,791	31	iii	1.5	1.68	Provide Anchors	29.5	9.87	9.87	
Sky Blue East	28452 Hawks Ridge	1999	73	970,015	31	iii	1.5	2.13	Provide Anchors	26	9.87	9.87	
Sky Blue North	28558 Santa Catarina	1990	105	2,006,834	31	iii	1.5	1.51	Uplift but Stable	31	9.87	9.87	
Honby 1	20251 Keaton St.	1981	132	3,990,099	39	iii	1.5	2.38	Provide Anchors	31	9.87	9.87	
Honby 2	20251 Keaton St.	1995	114	2,976,087	39	iii	1.5	2.68	Provide Anchors	29.5	9.87	9.87	
Nonby South	20225 Jennifer Ct.	1987	114	2,976,087	39	iii	1.5	3.06	Provide Anchors	28	9.87	9.87	
North Oaks 1	18501 Olympian Ct. follow signs to Helispot 107C	1974	73	719,689	23	iii	1.5	1.31	Uplift but Stable	23	9.87	9.87	
North Oaks 2	18501 Olympian Ct. follow signs to Helispot 107C	1980	146	3,880,062	31	iii	1.5	1.32	Uplift but Stable	31	9.87	9.87	
North Oaks 3	18501 Olympian Ct. follow signs to Helispot 107C	1995	130	3,076,236	31	iii	1.5	1.50	Uplift but Stable	31	9.87	9.87	

Tank Geometry

Results of the Analysis in accordance with AWWA D100-11

Tank Site	Address	Date Built	Dia	Volume (gallons)	Overflow Height	Seismic Use Group	I _E	¹ Overturning Ratio, J	Anchors	Allowable Water Height to Prevent Uplift	Sloshing Height, d (ft)	² Minimum Required Freeboard (ft)	³ Actual Freeboard
North Oaks 4	18501 Olympian Ct. follow signs to Helispot 107C	2000	73	970,015	31	iii	1.5	2.38	Provide Anchors	25	9.87	9.87	
Lower Fair Oaks 1	17705 Heron Ln	1999	134	2,424,983	23	iii	1.5	0.84	Uplift but Stable	23	9.87	9.87	
Lower Fair Oaks 2	17705 Heron Ln	1999	134	2,424,983	23	iii	1.5	0.84	Uplift but Stable	23	9.87	9.87	
Sand Canyon	27200 Sand Canyon Rd. (Between 27230 and 27166 Sand Canyon Rd)	1979	28	142,708	31	iii	1.5	7.08	Provide Anchors	10	9.87	9.87	
Fairway	27201 Appaloosa Rd.	1999	104	1,460,716	23	iii	1.5	0.95	Uplift but Stable	23	9.87	9.87	
Dean 1	28613 Winterdale Dr.	1977	73	970,015	31	iii	1.5	2.14	Provide Anchors	26	9.87	9.87	
Dean 2	28613 Winterdale Dr.	1985	73	970,015	31	iii	1.5	2.14	Provide Anchors	26	9.87	9.87	
Placerita 1	16742 Placerita Canyon Rd.	1980	73	970,015	31	iii	1.5	2.71	Provide Anchors	23.5	9.87	9.87	
Placerita 2	16742 Placerita Canyon Rd.	1995	73	970,015	31	iii	1.5	2.71	Provide Anchors	23.5	9.87	9.87	
Golden Valley	Golden Valley Road before Robert C Lee Pkwy	2003	104	1,968,791	31	iii	1.5	2.18	Provide Anchors	26	9.87	9.87	
Live Oak	15126 Live Oak Springs Cyn Rd	1999	73	970,015	31	iii	1.5	2.34	Provide Anchors	25	9.87	9.87	
Friendly Valley 2	20092 Avenue of the Oaks (inside gated community)	1973	80	1,240,124	33	iii	1.5	3.04	Provide Anchors	23.5	9.87	9.87	
Friendly Valley 4	20092 Avenue of the Oaks (inside gated community)	1985	80	1,240,124	33	iii	1.5	3.04	Provide Anchors	23.5	9.87	9.87	
Friendly Valley 5	18623 Cedar Valley Way (inside private gate next to house overlooking 14fwy)	1979	60	486,185	23	iii	1.5	1.75	Provide Anchors	21	9.87	9.87	
Princess 1	25529 Mountain Pass Rd.	1980	73	970,015	31	iii	1.5	2.83	Provide Anchors	23	9.87	9.87	
Princess 2	25529 Mountain Pass Rd.	1987	73	970,015	31	iii	1.5	2.83	Provide Anchors	23	9.87	9.87	
Golden Valley Ranch 1	Oak Crest Dr.	2005	90	1,474,409	31	iii	1.5	2.43	Provide Anchors	24.5	9.87	9.87	
Golden Valley Ranch 2	Oak Crest Dr.	2005	90	1,474,409	31	iii	1.5	2.43	Provide Anchors	24.5	9.87	9.87	
Plum 1	Benison Dr. (West cul-de-sac)	2007	73	970,015	31	iii	1.5	1.96	Provide Anchors	27	9.87	9.87	
Plum 2	Benison Dr. (West cul-de-sac)	2007	73	970,015	31	iii	1.5	1.96	Provide Anchors	27	9.87	9.87	
Cherry Willow 1	26833 Cherry Willow Dr.	2006	60	486,185	23	iii	1.5	1.66	Provide Anchors	21.5	9.87	9.87	
Cherry Willow 2	26833 Cherry Willow Dr.	2006	60	486,185	23	iii	1.5	1.66	Provide Anchors	21.5	9.87	9.87	
Upper Fair Oaks 1	17705 Heron Ln above Lower Fair Oaks Tanks (continue on access road)	1998	73	970,015	31	iii	1.5	2.70	Provide Anchors	23.5	9.87	9.87	

Upper Fair Oaks 2	17705 Heron Ln above Lower Fair Oaks Tanks (continue on access road)	1998	73	970,015	31	iii	1.5	2.70	Provide Anchors	23.5	9.87	9.87
Circle J 1	25198 Karie Ln	1981	73	970,015	31	iii	1.5	2.81	Provide Anchors	23	9.87	9.87
Circle J 2	25198 Karie Ln	1987	73	970,015	31	iii	1.5	2.81	Provide Anchors	23	9.87	9.87

Tank Geometry

Results of the Analysis in accordance with AWWA D100-11

Tank Site	Address	Date Built	Dia	Volume (gallons)	Overflow Height	Seismic Use Group	I _E	¹ Overturning Ratio, J	Anchors	Allowable Water Height to Prevent Uplift	Sloshing Height, d (ft)	² Minimum Required Freeboard (ft)	³ Actual Freeboard
Hasley Canyon	Firebrand, between 27840 & 27902, Castaic	1988	114	2,473,202	39	iii	1.5	2.34	Provide Anchors	32.5	9.87	9.87	
Round Mountain	Access end of Anza Drive, Valencia	1989	120	2,451,341	31	iii	1.5	1.77	Provide Anchors	29	9.87	9.87	
Post Office	Franklin Pkwy., west of Post Office, Valencia	1992	108	1,918,317	36	iii	1.5	2.82	Provide Anchors	28	9.87	9.87	
Magic Mountain 5	26975 Westridge Pkwy., Valencia	2001	135	3,095,237	38	iii	1.5	3.13	Provide Anchors	29	9.87	9.87	
Northbridge	Harwick Place, between 27659 & 27663, Valencia	1989	140	3,864,378	39	iii	1.5	2.18	Provide Anchors	33.5	9.87	9.87	
Rye Canyon	25112 Rye Canyon Loop, Valencia	2003	116	2,441,622	37.25	iii	1.5	2.37	Provide Anchors	31	9.87	9.87	3
Cal Arts	25841 Tournament Rd., Valencia	1996	109	1,538,141	22	iii	1.5	1.05	Uplift but Stable	22	9.87	9.87	
Villa	Yucca Place, between 30563 & 30568, Castaic	1990	66	673,261	31.2	iii	1.5	2.22	Provide Anchors	26	9.87	9.87	
Presley	30016 Hamlet Wy., Castaic (changed 1/06)	1989	66	673,261	31.2	iii	1.5	2.12	Provide Anchors	26.5	9.87	9.87	
Commerce Center 1	28636 Livingston Ave., Valencia	1999	89	1,155,236	30.33	iii	1.5	2.42	Provide Anchors	25	9.87	9.87	
Commerce Center 2	28636 Livingston Ave., Valencia	1999	89	1,155,236	30.33	iii	1.5	2.42	Provide Anchors	25	9.87	9.87	
Seco I	28400 Copper Hill, Saugus	1996	108	2,115,513	34.5	iii	1.5	1.94	Provide Anchors	31	9.87	9.87	
Seco II	28400 Copper Hill, Saugus	1998	116	2,336,119	34.5	iii	1.5	1.85	Provide Anchors	32	9.87	9.87	2
Benz	28820 Bellows Ct., Valencia	2008	104	1,888,670	33	iii	1.5	1.90	Provide Anchors	30	9.87	9.87	
4 Million	Access road end of Oakview Estates Drive, Valencia	2006	128	2,693,888	29.5	iii	1.5	1.74	Provide Anchors	28	9.87	9.87	3
Westridge	25774 Oak Meadow Drive., Valencia	2001	142	2,619,577	29.5	iii	1.5	1.76	Provide Anchors	28	9.87	9.87	3
Hillcrest 1	30400 Vineyard Ln., Castaic	1996	72	859,632	30.5	iii	1.5	1.77	Provide Anchors	28.5	9.87	9.87	
Hillcrest 2	30400 Vineyard Ln., Castaic	1999	71	845,539	30	iii	1.5	1.72	Provide Anchors	28.5	9.87	9.87	
Mtn. View 1	29238 Black Pine Wy., Saugus	2001	80	831,447	29.5	iii	1.5	1.74	Provide Anchors	26.5	9.87	9.87	3
Mtn. View 2	29238 Black Pine Wy., Saugus	2001	80	831,447	29.5	iii	1.5	1.74	Provide Anchors	26.5	9.87	9.87	3
Poe	26024 Kavenaugh Ln., Stevenson Ranch	1989	90	1,130,517	31	iii	1.5	2.79	Provide Anchors	24	9.87	9.87	
Sunset Pointe	25101 Sagecrest Cir., Stevenson Ranch	1995	98	1,397,438	30.5	iii	1.5	2.53	Provide Anchors	25	9.87	9.87	
West Hills 1	28834 Bellows Ct., Valencia	2008	56	290,020	21	iii	1.5	1.64	Provide Anchors	20	9.87	9.87	2
West Hills 2	28834 Bellows Ct., Valencia	2008	56	290,020	21	iii	1.5	1.64	Provide Anchors	20	9.87	9.87	2
Stevenson Ranch	26748 Sandburn, Stevenson Ranch	1999	111	1,923,390	30.33	iii	1.5	2.12	Provide Anchors	26.5	9.87	9.87	

Note:

1. Overturning Ratio is determined in accordance with AWWA D100-11 Equation 13-36, J Greater than or Equal to 1.54 requires anchors to the foundation.
2. The minimum required freeboard is equal to the sloshing wave height for Use Group III and may be reduced for Use Group I and II.
3. Freeboard was only determined in cases where available documentation indicated the roof height.

To determine if the storage tank walls and roof systems are adequate to resist potential seismic loads, field visits will be required to determine the existing plate thicknesses and structural sections used in construction. Further analysis will then be performed to determine the capacity of the storage tank structural system. For those storage tanks that required anchors, greater freeboard, or do not have the structural capacity to meet demand we recommend reducing the operating capacity and overflow height in order to reduce the seismic demands on the structures. Water storage tanks designed in accordance with AWWA D100 and D103 can be classified in one of three seismic use groups as described in Table 1. The initial analysis has been conducted assuming all of the storage tanks are in Use Group III, essential for post-earthquake recovery and essential to the life, health and safety of the public, including post-earthquake fire suppression. For those facilities that are not required for post-earthquake recovery, the use group may be designated as Use Group II, tanks that provide direct service to facilities that are deemed important to the welfare of the public. In rare cases they may be assigned to Use Group I, those that are not essential to the health and safety of the public. This will reduce the design seismic load by twenty-five percent and fifty percent. The final report will assess the impacts of this reduction on SCV Water's facilities and include tables summarizing our findings.

Field investigation are necessary to determine the structural capacity of the existing storage tanks. Thickness of the tank shells and roofs will be determined using an ultrasonic thickness gauge, the size number and location of columns will be determined. In our experience the most common mode of failure for steel storage tanks is buckling of the lowest shell plate.

1.3 Water Treatment Facilities

SCV Water's treatment facilities consist of the ESFP, RVTP, perchlorate treatment facility, and multiple PFAS treatment facilities under construction and design currently. We have recently found copies of several as-built drawing for the ESFP and RVTP facilities in Kennedy Jenks archives and are currently undergoing a more detailed analysis than was available previously. Analysis of the seismic loads will be in accordance with the ASCE 7-10 due to the current requirements of the California Building Code for site specific geotechnical investigations. Prior to the final mitigation planning, we recommend that a qualified civil or structural engineer visit the sites to verify existing conditions and that a geotechnical engineering firm be consulted to determine the current seismic design criteria. The results of that analysis will be included in the final report. The PFAS facilities are designed and constructed to current building standards and do not represent substantial risk to SCV Water or their customers.

ACI 350.3, Seismic Design of Liquid Containing Structures was not adopted until 2001, therefore, structures designed and built prior to 2001 are likely at risk to cracking due to earthquake forces. Liquid containing structure have generally been designed with long term durability and to limit cracking. This results in structures that tend to be resistant to earthquake loads. Structures at ESFP and RVTP also withstood the 1994 Northridge Earthquake. Those structures that were damaged were later repaired and strengthened. Lateral forces in concrete water retaining structures result in stress concentrations at corners. Review of the as-built drawings indicates that there may be insufficient reinforcing by current standards of practice. There is potential for cracking to occur as a result of earthquake loads. Tables 3 and 4 summarize the findings from the initial analysis of the treatment plants. It should be noted that where no specific risks were noted, field investigations and/or geotechnical investigations could reveal risks that were not observed in the available documentation.

Table 1-3 Rio Vista Treatment Plant Structures and Risks

Rio Vista Water Treatment Plant

	Structure	Date Built	Structural System	Lateral Load Path	Notable Risks
1	Administration Building	1991	Two Story Steel Braced Frame	Complete	Chevron braced frames exhibit poor seismic performance relative to other lateral systems.
2	Chemical Building	1991	Steel Framed Roof over Concrete Shear Walls	Complete	None Noted
3	Ozone Building	1991	Steel Framed Roof over Concrete Walls with Chevron Braced Frames	Complete	Chevron braced frames exhibit poor seismic performance relative to other lateral systems.
4	Clarifier Filter Structures (2)	1991	Concrete Shear Walls	Complete	None Noted
5	Control Room Building	2008	Steel Framed Roof over Cantilever Columns	Complete	None Noted
6	Maintenance -Equipment Building	1991	Metal Framed Roof over Concrete Shear Walls	Complete	None Noted
7	Chlorine Building	2008	Steel Framed Roof Over Concrete Shear Walls	Complete	None Noted
8	Sludge Thickness (2)	1991	Circular Steel Tank with Concrete Floor	Complete	None Noted
9	Water Level Control Structure	2008	Circular Concrete Tank	Complete	None Noted
10	Wash Water Recovery Basins (3)	1991	Concrete Slab-on-Grade with Sloped Walls	Complete	None Noted
11	Clearwells (2)	1991	Cantilever Retaining Walls	Complete	None Noted
12	Pre-Ozone Contractor	1991	CIP Concrete Shear Walls, Steel Cantilver Columns	Complete	None Noted
13	Ozone Injection Station	2008	Steel Framed Roof over CMU Shear Walls and Steel Framing	Complete	None Noted
14	Ammonia Injection Vault	2008	CIP Sub Grade Concrete Shear Wall	Complete	None Noted
15	Treated Water Vault	1991	Concrete Shear Walls	Complete	None Noted
16	Plant Water Pump Station	2008	CIP Concrete Shear Walls	Complete	None Noted
17	Sludge Pump Station	2008	Subgrade CIP Concrete Vault	Complete	None Noted
18	Intake Pump Station	1992	CIP Concrete Roof over Steel Brace Frame	Complete	None Noted
19	Intake Pump Station Building	1992			

Table 1-4 Earl Schmidt Filtration Plant Structures and Risks

Earl Schmidt Filtration Plant

	Structure	Date Built	Structural System	Lateral Load Path	Risks
1	Chemical Building	1979	Wood truss roof over CMU shear walls	Complete	None noted
2	Operations Building	1979	Wood truss roof over CMU shear walls	Complete	None noted
5	Flocclation Basins	1979	CIP Concrete Shear Wall Basin	Complete	Potentially insufficient reinforcing at corners
6	Sedimentation Basin	1979	CIP Concrete Shear Wall Basin	Complete	Potentially insufficient reinforcing at corners
7	Clarifier	1979			
8	Filters	1979	CIP Concrete Shear Wall Basin	Complete	Potentially insufficient reinforcing at corners
9	Washwater Recovery Basins (2)	1979	CIP Concrete Shear Wall Basin	Complete	Potentially insufficient reinforcing at corners
10	Central Pumping Plant	1979	Pre-engineered Metal Building	Appears Complete	None Noted
11	Sludge Drying Bed (2)	1979	Concrete Slab-on-Grade with Sand Bedding	Complete	None Noted
12	Sludge Drying Bed Sump	1979	Sub Grade CIP Concrete Shear Walls	Complete	None Noted
13	Sludge Effluent Vault	1979	Sub Grade CIP Concrete Shear Walls	Complete	None Noted
14	Sludge Thickener	1979	Circular Steel Tank with Concrete Floor	Complete	None Noted

1.4 Source Water Supply

SCV Water's source water mainly consists of imported water that is stored in Castaic Lake Reservoir and more than 45 well sites. The Castaic Lake Reservoir is administered by the California Department of Water Resources and under the jurisdiction of the California Division of Safety of Dams. The Division of Safety of Dams inspects the Castaic Lake Dam on an annual basis and periodically reviews the stability of dams in light of improved design approaches. Review and analysis of the Castaic Lake Reservoir is out of scope of this project, however, it represents minimal risk to SCV Water due to the inspection and review by the Division of Dam Safety.

Due to lack of documentation, we have not conducted a systematic analysis of the well sites. Site visits by a qualified civil or structural engineer should be conducted to verify the existing conditions at each site. The typical well site consists of vertical turbine pumps embedded directly into the soil and represent minimal risk of failure during or after an earthquake. Above ground piping is generally rigid and also represents minimal risk of failure during an earthquake. It is typical for the piping systems at older well sites to lack support for lateral loads due to earthquakes. The inspections should take note of any pipe supports that are not anchored into concrete foundation.

1.5 Booster Pump Stations

Lack of available documentation of the Booster Pump Stations makes a detailed analysis of the risks impossible without site visits to verify the existing conditions. Pump stations may consist of above grade or below grade structures with multiple pumps wet wells, and additional equipment. Like steel water storage tanks older facilities are less likely to be designed for. Those designed and built later than 2000 are unlikely to pose a substantial risk in the event of an earthquake. Site visits should verify that existing equipment is anchored to the foundations and walls, and that there is an adequate load path to transfer lateral loads from the roof and walls to the foundations.

1.6 Mitigation Planning

SCV Water should identify which facilities are required to operate immediately following an earthquake, are required for the health and safety of the public, and those that are not either. The highest priority should be given to those facilities that supply fire suppression systems. The first step in mitigating the risks identified in this report will be to arrange for a civil or structural engineer experienced in design of water treatment and distribution systems to inspect SCV Water's facilities. Once SCV Water and Kennedy Jenks has identified the most critical and at risk facilities, SCV Water should consult with a geotechnical engineering firm to perform site investigations of the most crucial facilities to allow a qualified engineer to perform a more accurate and detailed analysis and provide the most appropriate mitigation efforts.

For those storage tanks that require anchorage and or have insufficient freeboard height to accommodate wave action the district may take immediate action to reduce the risk. As shown in Table 2, SCV Water may choose to reduce the operational capacity in order to prevent instability, increase freeboard, and reduce the sloshing wave height. SCV Water may determine

that some of the storage tanks are not required for immediate post-earthquake recovery and do not pose a substantial risk to human life. In those cases the Seismic Use Group will be reduced to reduce the required freeboard and demands do to seismic loads. This may result in no further action being required. Kennedy Jenks recommends providing anchors for all steel water storage tanks.

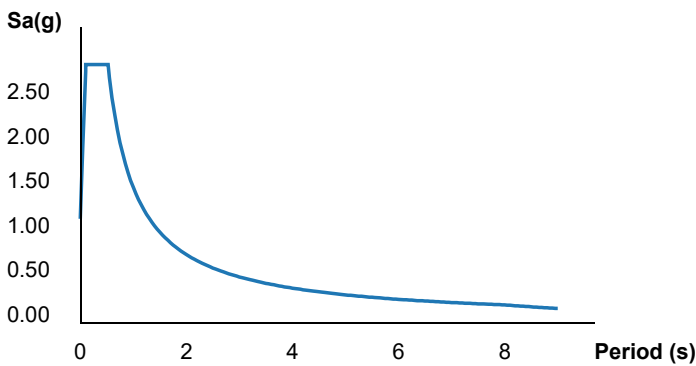
Appendix A: Detailed Calculations

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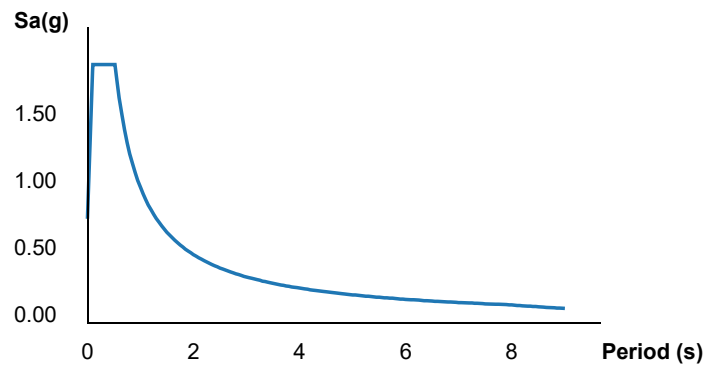
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.884	MCE _R ground motion (period=0.2s)
S ₁	1.004	MCE _R ground motion (period=1.0s)
S _{MS}	2.884	Site-modified spectral acceleration value
S _{M1}	1.507	Site-modified spectral acceleration value
S _{DS}	1.923	Numeric seismic design value at 0.2s SA
S _{D1}	1.004	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.947	Coefficient of risk (0.2s)

CR ₁	0.965	Coefficient of risk (1.0s)
PGA	1.065	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.065	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.884	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.047	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.023	Factored deterministic acceleration value (0.2s)
S1RT	1.004	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.041	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.218	Factored deterministic acceleration value (1.0s)
PGA _d	1.175	Factored deterministic acceleration value (PGA)

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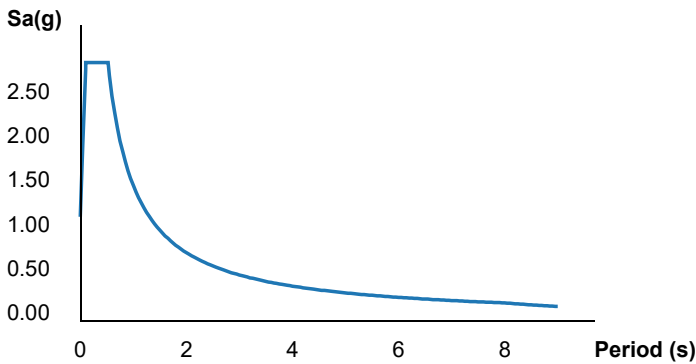
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Reference Document: ASCE7-10
Risk Category: III
Site Class: D

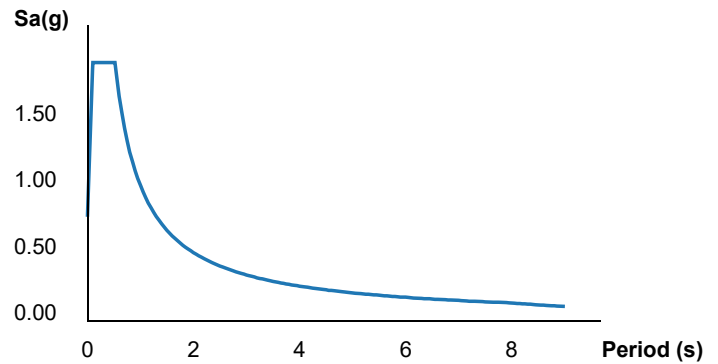


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.907	MCE _R ground motion (period=0.2s)
S ₁	1.012	MCE _R ground motion (period=1.0s)
S _{MS}	2.907	Site-modified spectral acceleration value
S _{M1}	1.517	Site-modified spectral acceleration value
S _{DS}	1.938	Numeric seismic design value at 0.2s SA
S _{D1}	1.012	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.947	Coefficient of risk (0.2s)

CR ₁	0.965	Coefficient of risk (1.0s)
PGA	1.073	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.073	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.907	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.071	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.017	Factored deterministic acceleration value (0.2s)
S1RT	1.012	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.048	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.224	Factored deterministic acceleration value (1.0s)
PGA _d	1.175	Factored deterministic acceleration value (PGA)

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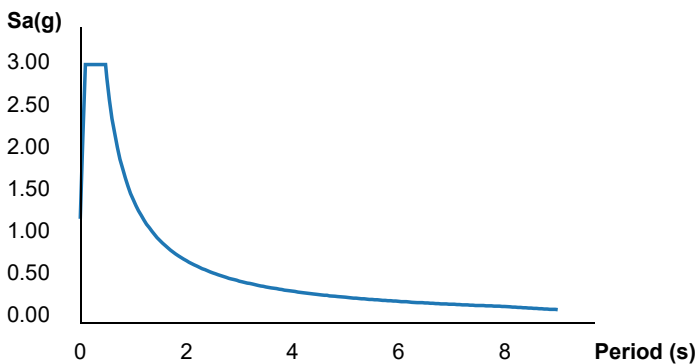
ATC Hazards by Location

Search Information

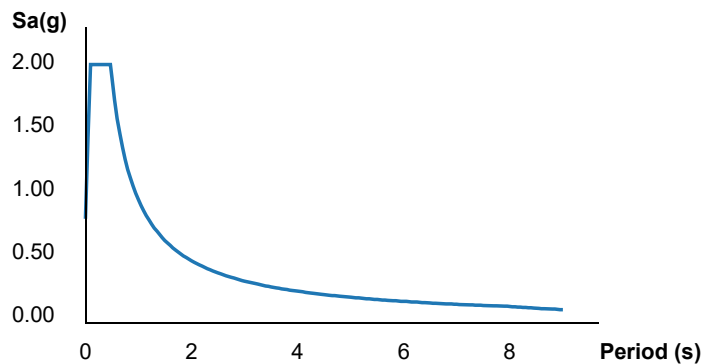
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Elevation: 1552 ft
Timestamp: 2021-03-05T03:59:58.630Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.055	MCE _R ground motion (period=0.2s)
S ₁	0.966	MCE _R ground motion (period=1.0s)
S _{MS}	3.055	Site-modified spectral acceleration value
S _{M1}	1.449	Site-modified spectral acceleration value
S _{DS}	2.037	Numeric seismic design value at 0.2s SA
S _{D1}	0.966	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.925	Coefficient of risk (0.2s)

CR ₁	0.947	Coefficient of risk (1.0s)
PGA	1.147	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.147	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.17	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.426	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.055	Factored deterministic acceleration value (0.2s)
S1RT	1.099	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.161	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.966	Factored deterministic acceleration value (1.0s)
PGA _d	1.147	Factored deterministic acceleration value (PGA)

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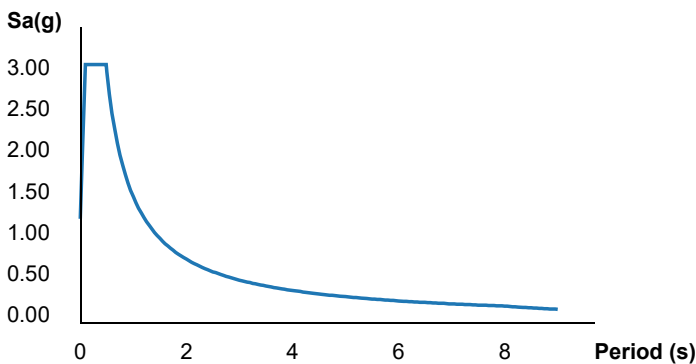
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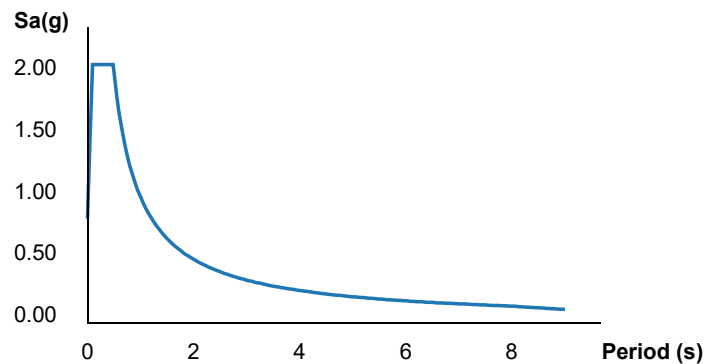
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.126	MCE _R ground motion (period=0.2s)
S ₁	1.012	MCE _R ground motion (period=1.0s)
S _{MS}	3.126	Site-modified spectral acceleration value
S _{M1}	1.519	Site-modified spectral acceleration value
S _{DS}	2.084	Numeric seismic design value at 0.2s SA
S _{D1}	1.012	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.919	Coefficient of risk (0.2s)

CR ₁	0.941	Coefficient of risk (1.0s)
PGA	1.187	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.187	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.229	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.513	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.126	Factored deterministic acceleration value (0.2s)
S1RT	1.122	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.192	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.012	Factored deterministic acceleration value (1.0s)
PGA _d	1.187	Factored deterministic acceleration value (PGA)

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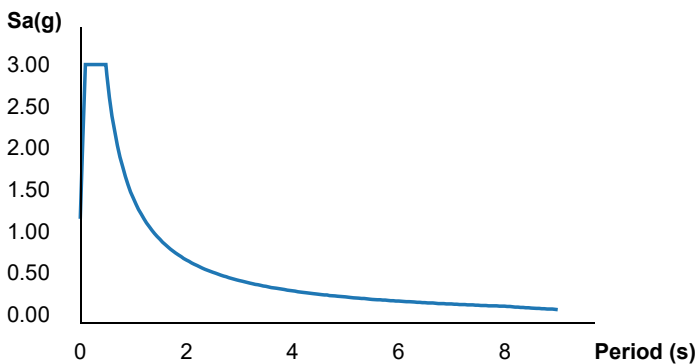
ATC Hazards by Location

Search Information

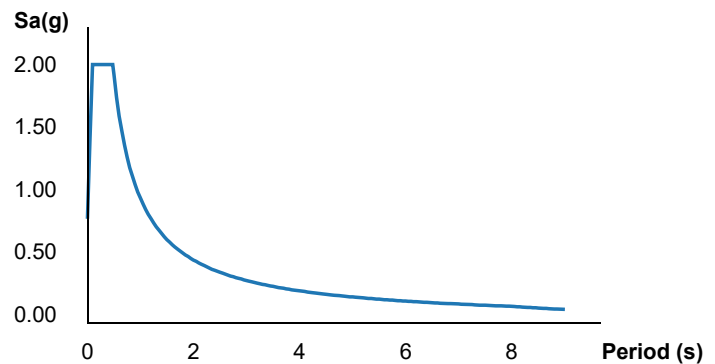
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	3.086	MCE_R ground motion (period=0.2s)
S_1	0.988	MCE_R ground motion (period=1.0s)
S_{MS}	3.086	Site-modified spectral acceleration value
S_{M1}	1.481	Site-modified spectral acceleration value
S_{DS}	2.057	Numeric seismic design value at 0.2s SA
S_{D1}	0.988	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.926	Coefficient of risk (0.2s)

CR ₁	0.946	Coefficient of risk (1.0s)
PGA	1.166	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.166	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.174	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.426	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.086	Factored deterministic acceleration value (0.2s)
S1RT	1.108	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.171	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.988	Factored deterministic acceleration value (1.0s)
PGAd	1.166	Factored deterministic acceleration value (PGA)

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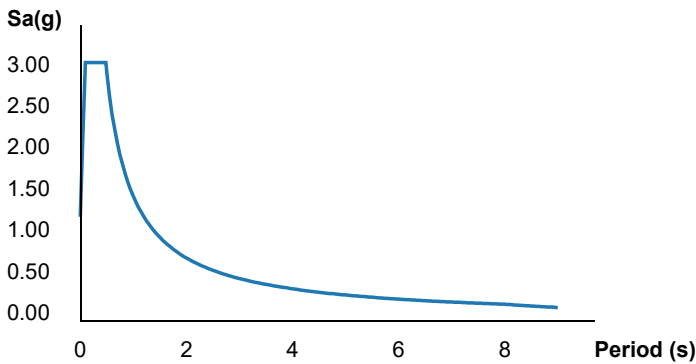
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Reference Document: ASCE7-10
Risk Category: III
Site Class: D

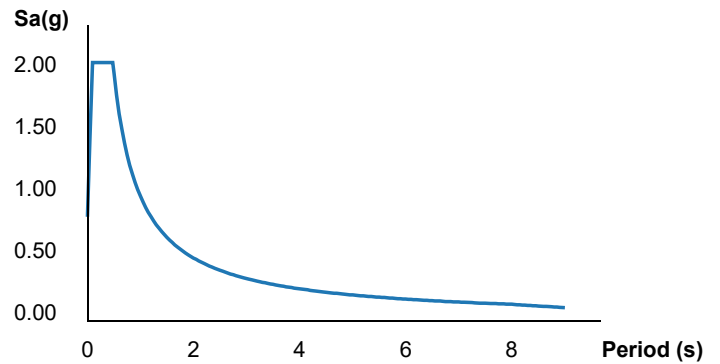


Map data ©2021 Imagery ©2021, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.106	MCE _R ground motion (period=0.2s)
S ₁	0.995	MCE _R ground motion (period=1.0s)
S _{MS}	3.106	Site-modified spectral acceleration value
S _{M1}	1.492	Site-modified spectral acceleration value
S _{DS}	2.071	Numeric seismic design value at 0.2s SA
S _{D1}	0.995	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.922	Coefficient of risk (0.2s)

CR ₁	0.944	Coefficient of risk (1.0s)
PGA	1.174	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.174	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.198	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.469	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.106	Factored deterministic acceleration value (0.2s)
S1RT	1.108	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.173	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.995	Factored deterministic acceleration value (1.0s)
PGAd	1.174	Factored deterministic acceleration value (PGA)

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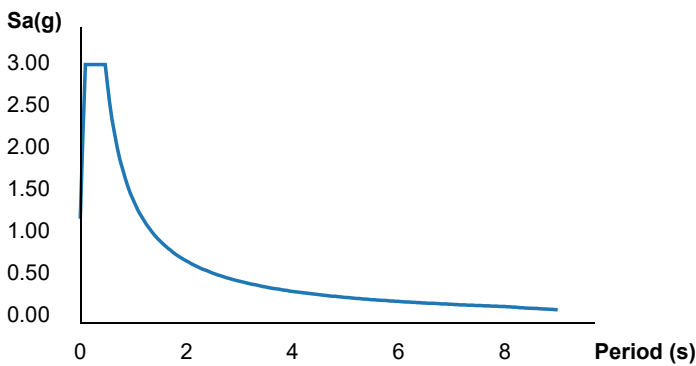
ATC Hazards by Location

Search Information

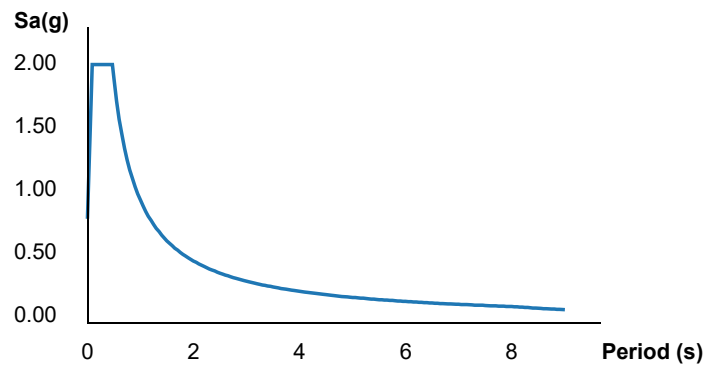
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Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.065	MCE _R ground motion (period=0.2s)
S ₁	0.965	MCE _R ground motion (period=1.0s)
S _{MS}	3.065	Site-modified spectral acceleration value
S _{M1}	1.447	Site-modified spectral acceleration value
S _{DS}	2.043	Numeric seismic design value at 0.2s SA
S _{D1}	0.965	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.928	Coefficient of risk (0.2s)

CR ₁	0.951	Coefficient of risk (1.0s)
PGA	1.148	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.148	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.138	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.383	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.065	Factored deterministic acceleration value (0.2s)
S1RT	1.082	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.138	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.965	Factored deterministic acceleration value (1.0s)
PGAd	1.148	Factored deterministic acceleration value (PGA)

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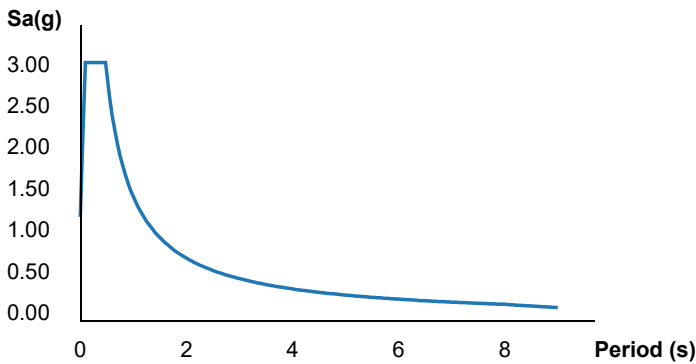
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Search Information

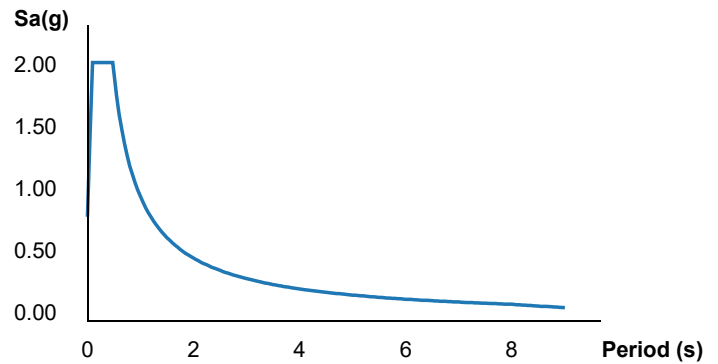
Address: 25101 Sagecrest Cir
Coordinates: 34.37405, -118.57363
Elevation: 1693 ft
Timestamp: 2021-03-05T05:21:48.982Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.105	MCE _R ground motion (period=0.2s)
S ₁	0.991	MCE _R ground motion (period=1.0s)
S _{MS}	3.105	Site-modified spectral acceleration value
S _{M1}	1.487	Site-modified spectral acceleration value
S _{DS}	2.07	Numeric seismic design value at 0.2s SA
S _{D1}	0.991	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.929	Coefficient of risk (0.2s)

CR ₁	0.951	Coefficient of risk (1.0s)
PGA	1.172	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.172	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.153	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.395	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.105	Factored deterministic acceleration value (0.2s)
S1RT	1.089	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.145	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.991	Factored deterministic acceleration value (1.0s)
PGAd	1.172	Factored deterministic acceleration value (PGA)

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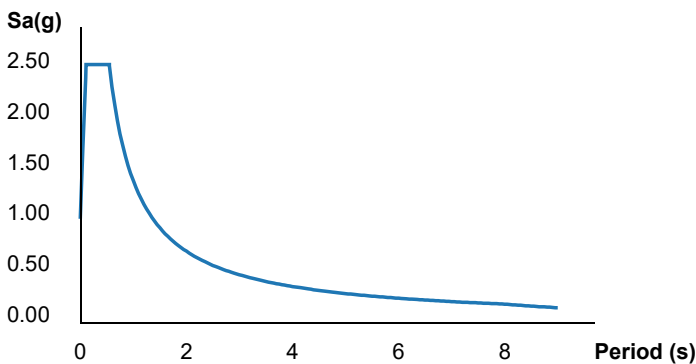
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Search Information

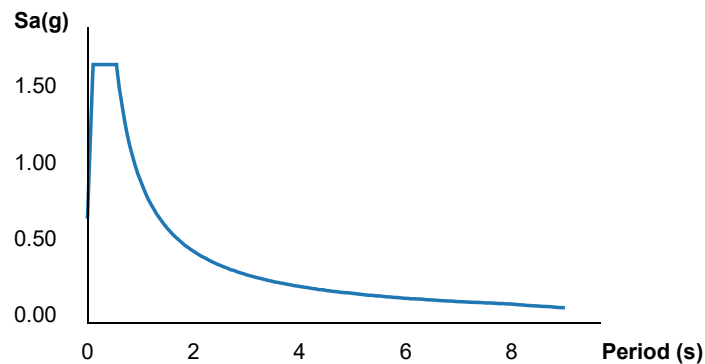
Address: 25112 Rye Canyon Loop
Coordinates: 34.45933, -118.58156
Elevation: 1402 ft
Timestamp: 2021-03-05T05:01:58.635Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.53	MCE _R ground motion (period=0.2s)
S ₁	0.924	MCE _R ground motion (period=1.0s)
S _{MS}	2.53	Site-modified spectral acceleration value
S _{M1}	1.386	Site-modified spectral acceleration value
S _{DS}	1.686	Numeric seismic design value at 0.2s SA
S _{D1}	0.924	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.998	Coefficient of risk (0.2s)

CR ₁	0.997	Coefficient of risk (1.0s)
PGA	0.887	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.887	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.53	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.536	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.96	Factored deterministic acceleration value (0.2s)
S1RT	0.924	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.926	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.261	Factored deterministic acceleration value (1.0s)
PGA _d	1.151	Factored deterministic acceleration value (PGA)

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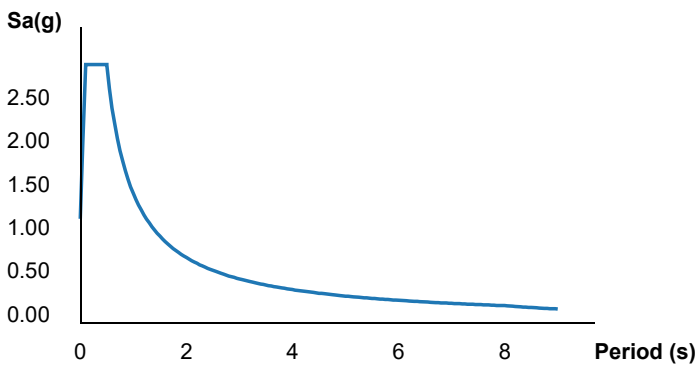
Search Information

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Coordinates: 34.39044, -118.51254
Elevation: 1452 ft
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

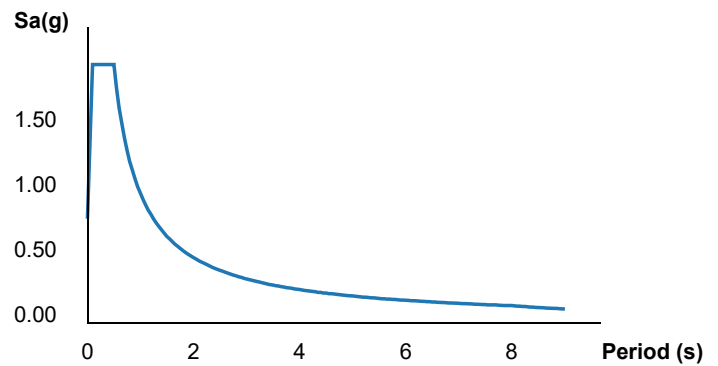


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.961	MCE _R ground motion (period=0.2s)
S ₁	0.985	MCE _R ground motion (period=1.0s)
S _{MS}	2.961	Site-modified spectral acceleration value
S _{M1}	1.477	Site-modified spectral acceleration value
S _{DS}	1.974	Numeric seismic design value at 0.2s SA
S _{D1}	0.985	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.935	Coefficient of risk (0.2s)

CR ₁	0.956	Coefficient of risk (1.0s)
PGA	1.094	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.094	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.069	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.281	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.961	Factored deterministic acceleration value (0.2s)
S1RT	1.065	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.114	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.985	Factored deterministic acceleration value (1.0s)
PGAd	1.094	Factored deterministic acceleration value (PGA)

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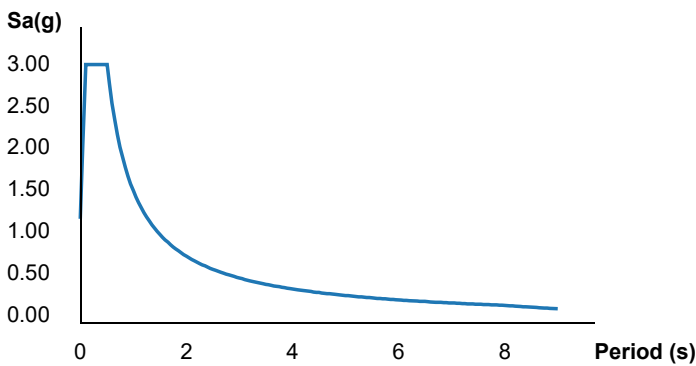
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Search Information

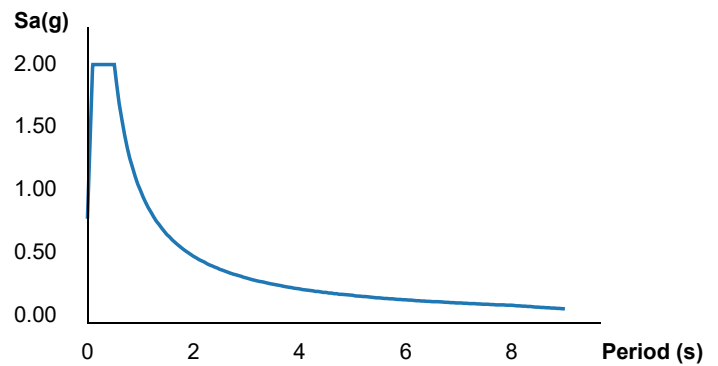
Address: 25774 Oak Meadow Drive
Coordinates: 34.3976, -118.58555
Elevation: 1531 ft
Timestamp: 2021-03-05T05:13:50.309Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.07	MCE _R ground motion (period=0.2s)
S ₁	1.043	MCE _R ground motion (period=1.0s)
S _{MS}	3.07	Site-modified spectral acceleration value
S _{M1}	1.564	Site-modified spectral acceleration value
S _{DS}	2.046	Numeric seismic design value at 0.2s SA
S _{D1}	1.043	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.939	Coefficient of risk (0.2s)

CR ₁	0.964	Coefficient of risk (1.0s)
PGA	1.149	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.149	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.089	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.291	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.07	Factored deterministic acceleration value (0.2s)
S1RT	1.055	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.094	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.043	Factored deterministic acceleration value (1.0s)
PGA _d	1.187	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

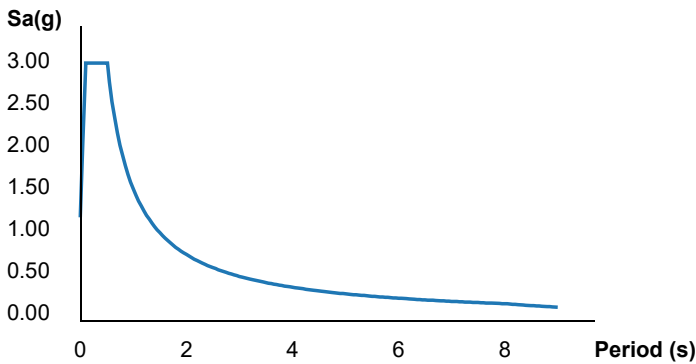
Search Information

Coordinates: 34.389446676720965, -118.56244267672118
Elevation: 1276 ft
Timestamp: 2021-03-05T05:04:00.419Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

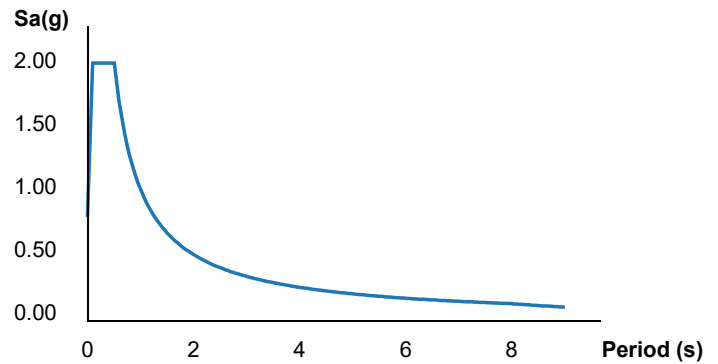


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.062	MCE _R ground motion (period=0.2s)
S ₁	1.04	MCE _R ground motion (period=1.0s)
S _{MS}	3.062	Site-modified spectral acceleration value
S _{M1}	1.561	Site-modified spectral acceleration value
S _{DS}	2.041	Numeric seismic design value at 0.2s SA
S _{D1}	1.04	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.937	Coefficient of risk (0.2s)
CR ₁	0.961	Coefficient of risk (1.0s)

PGA	1.146	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.146	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.062	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.267	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.071	Factored deterministic acceleration value (0.2s)
S1RT	1.051	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.094	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.04	Factored deterministic acceleration value (1.0s)
PGA _d	1.187	Factored deterministic acceleration value (PGA)

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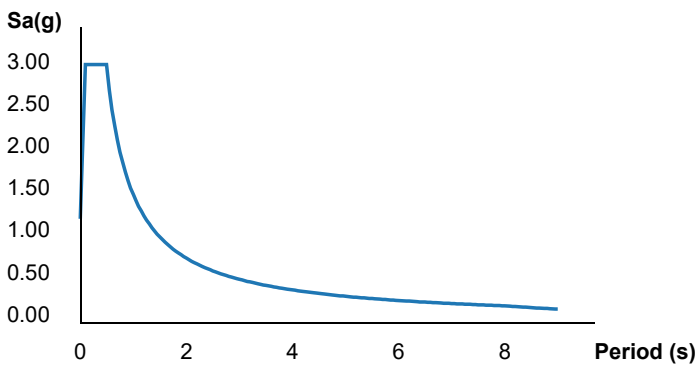
Search Information

Address: 26024 Kavenaugh Lane
Coordinates: 34.39184, -118.59197
Elevation: 1694 ft
Timestamp: 2021-03-05T05:20:23.018Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

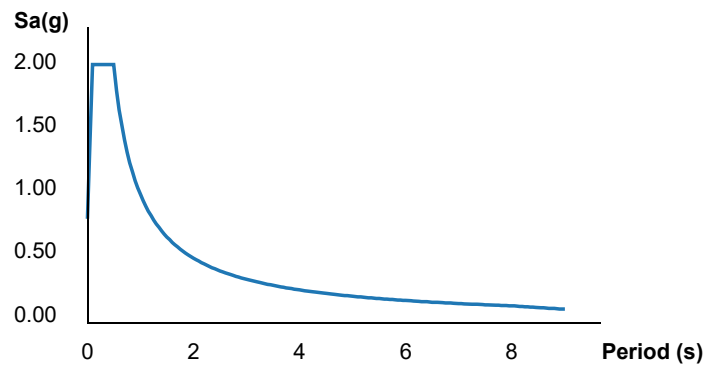


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.047	MCE _R ground motion (period=0.2s)
S ₁	1.004	MCE _R ground motion (period=1.0s)
S _{MS}	3.047	Site-modified spectral acceleration value
S _{M1}	1.506	Site-modified spectral acceleration value
S _{DS}	2.031	Numeric seismic design value at 0.2s SA
S _{D1}	1.004	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.935	Coefficient of risk (0.2s)

CR ₁	0.96	Coefficient of risk (1.0s)
PGA	1.169	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.169	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.127	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.343	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.047	Factored deterministic acceleration value (0.2s)
S1RT	1.071	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.115	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.004	Factored deterministic acceleration value (1.0s)
PGA _d	1.172	Factored deterministic acceleration value (PGA)

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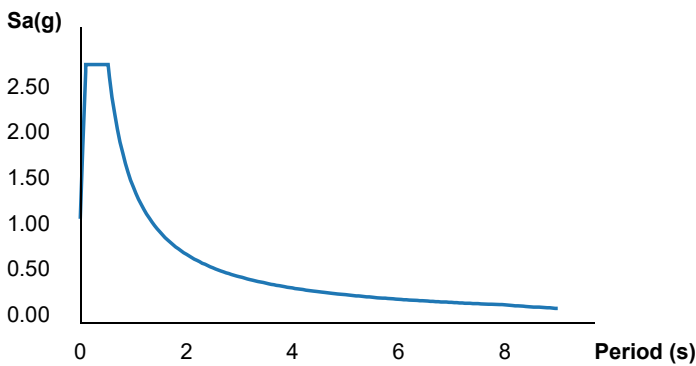
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Search Information

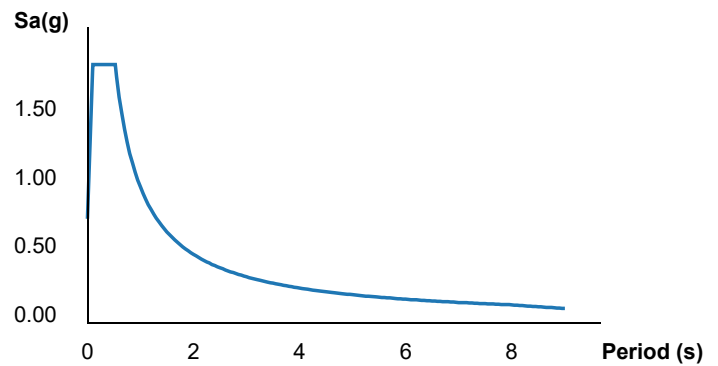
Address: 26833 Cherry Willow Dr
Coordinates: 34.401, -118.435
Elevation: 1822 ft
Timestamp: 2021-03-05T04:50:28.656Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.816	MCE _R ground motion (period=0.2s)
S ₁	0.983	MCE _R ground motion (period=1.0s)
S _{MS}	2.816	Site-modified spectral acceleration value
S _{M1}	1.475	Site-modified spectral acceleration value
S _{DS}	1.877	Numeric seismic design value at 0.2s SA
S _{D1}	0.983	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.95	Coefficient of risk (0.2s)

CR ₁	0.969	Coefficient of risk (1.0s)
PGA	1.037	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.037	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.816	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.965	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.013	Factored deterministic acceleration value (0.2s)
S1RT	0.983	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.015	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.18	Factored deterministic acceleration value (1.0s)
PGAd	1.171	Factored deterministic acceleration value (PGA)

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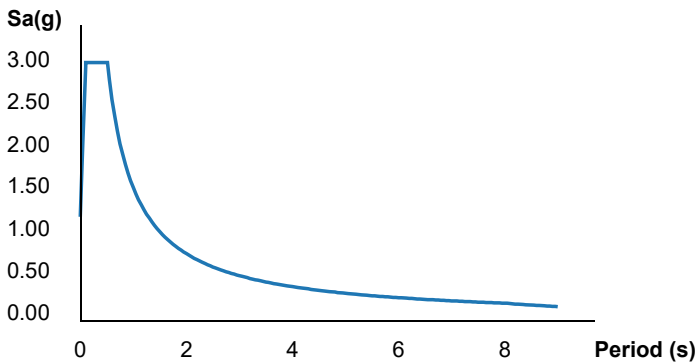
Search Information

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Coordinates: 34.40646, -118.59633
Elevation: 1403 ft
Timestamp: 2021-03-05T04:59:29.113Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

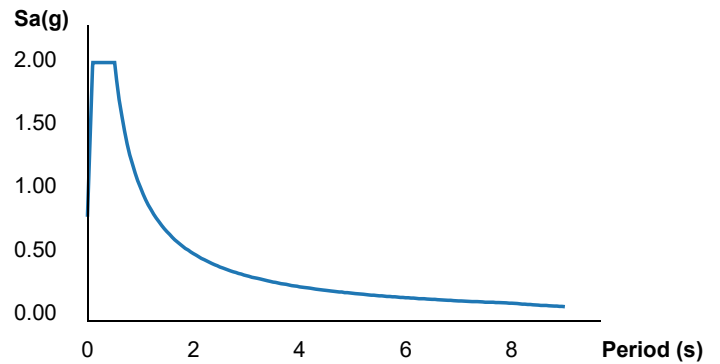


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.053	MCE _R ground motion (period=0.2s)
S ₁	1.045	MCE _R ground motion (period=1.0s)
S _{MS}	3.053	Site-modified spectral acceleration value
S _{M1}	1.567	Site-modified spectral acceleration value
S _{DS}	2.035	Numeric seismic design value at 0.2s SA
S _{D1}	1.045	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.945	Coefficient of risk (0.2s)

CR ₁	0.968	Coefficient of risk (1.0s)
PGA	1.125	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.125	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.053	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.23	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.078	Factored deterministic acceleration value (0.2s)
S1RT	1.045	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.079	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.069	Factored deterministic acceleration value (1.0s)
PGA _d	1.193	Factored deterministic acceleration value (PGA)

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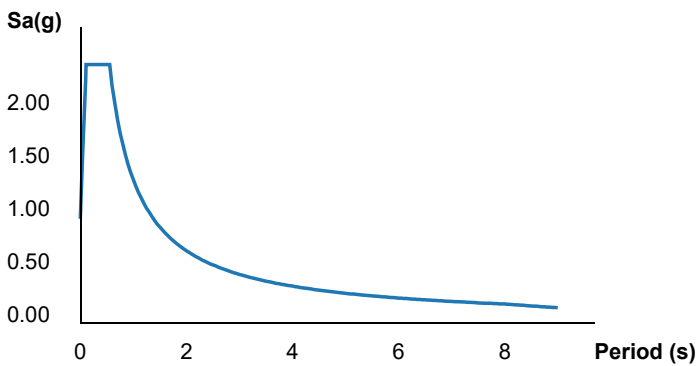
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Search Information

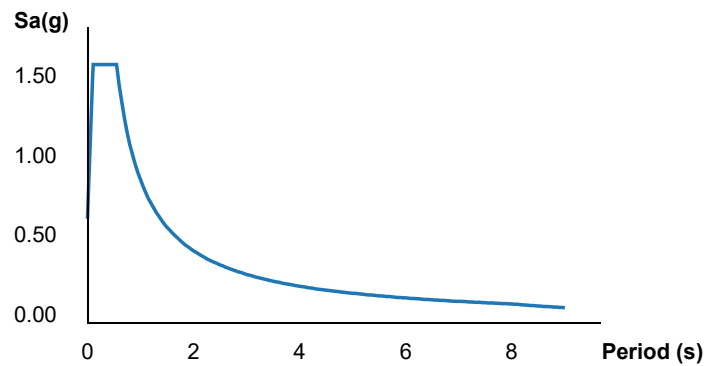
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Coordinates: 34.46276, -118.54011
Elevation: 1508 ft
Timestamp: 2021-03-05T05:09:59.697Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.423	MCE _R ground motion (period=0.2s)
S ₁	0.892	MCE _R ground motion (period=1.0s)
S _{MS}	2.423	Site-modified spectral acceleration value
S _{M1}	1.338	Site-modified spectral acceleration value
S _{DS}	1.615	Numeric seismic design value at 0.2s SA
S _{D1}	0.892	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.002	Coefficient of risk (0.2s)

CR ₁	1.004	Coefficient of risk (1.0s)
PGA	0.855	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.855	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.423	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.419	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.005	Factored deterministic acceleration value (0.2s)
S1RT	0.892	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.888	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.15	Factored deterministic acceleration value (1.0s)
PGA _d	1.166	Factored deterministic acceleration value (PGA)

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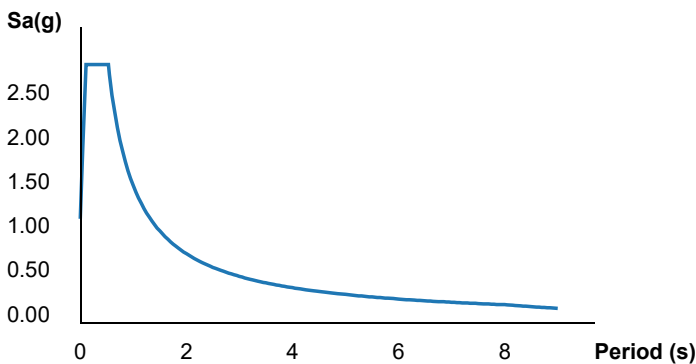
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Search Information

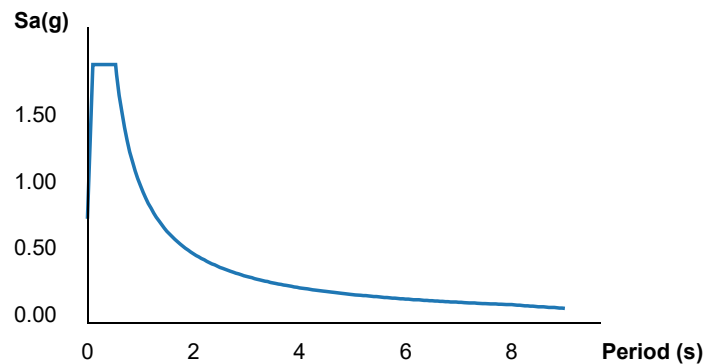
Address: 28636 Livingston Ave
Coordinates: 34.44301, -118.64083
Elevation: 1409 ft
Timestamp: 2021-03-05T05:08:35.378Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.899	MCE _R ground motion (period=0.2s)
S ₁	1.022	MCE _R ground motion (period=1.0s)
S _{MS}	2.899	Site-modified spectral acceleration value
S _{M1}	1.533	Site-modified spectral acceleration value
S _{DS}	1.933	Numeric seismic design value at 0.2s SA
S _{D1}	1.022	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.975	Coefficient of risk (0.2s)

CR ₁	0.987	Coefficient of risk (1.0s)
PGA	1.031	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.031	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.899	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.973	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.017	Factored deterministic acceleration value (0.2s)
S1RT	1.022	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.035	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.141	Factored deterministic acceleration value (1.0s)
PGAd	1.17	Factored deterministic acceleration value (PGA)

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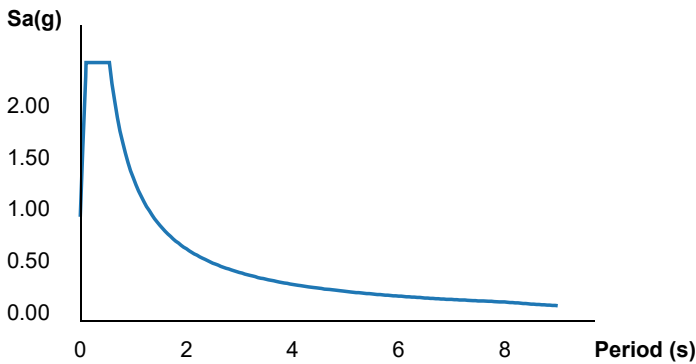
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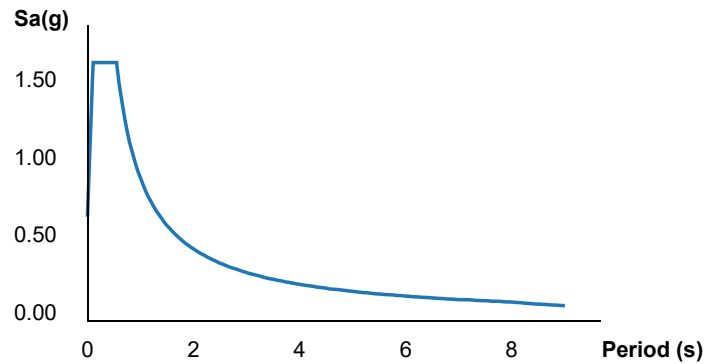
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Coordinates: 34.46251, -118.57125
Elevation: 1523 ft
Timestamp: 2021-03-05T05:11:45.366Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.485	MCE _R ground motion (period=0.2s)
S ₁	0.912	MCE _R ground motion (period=1.0s)
S _{MS}	2.485	Site-modified spectral acceleration value
S _{M1}	1.368	Site-modified spectral acceleration value
S _{DS}	1.657	Numeric seismic design value at 0.2s SA
S _{D1}	0.912	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1	Coefficient of risk (0.2s)

CR ₁	1	Coefficient of risk (1.0s)
PGA	0.873	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.873	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.485	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.484	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.013	Factored deterministic acceleration value (0.2s)
S1RT	0.912	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.912	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.251	Factored deterministic acceleration value (1.0s)
PGA _d	1.174	Factored deterministic acceleration value (PGA)

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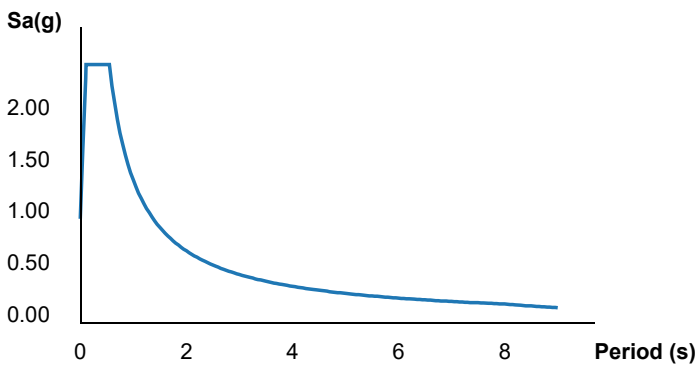
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Search Information

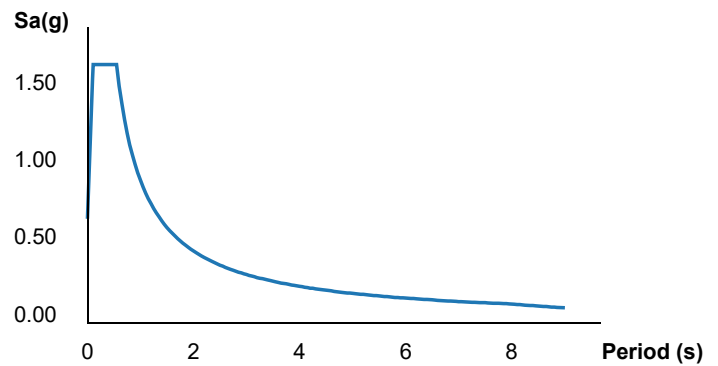
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Coordinates: 34.46299, -118.57431
Elevation: 1620 ft
Timestamp: 2021-03-05T05:22:43.199Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.489	MCE _R ground motion (period=0.2s)
S ₁	0.913	MCE _R ground motion (period=1.0s)
S _{MS}	2.489	Site-modified spectral acceleration value
S _{M1}	1.37	Site-modified spectral acceleration value
S _{DS}	1.66	Numeric seismic design value at 0.2s SA
S _{D1}	0.913	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.001	Coefficient of risk (0.2s)

CR ₁	1	Coefficient of risk (1.0s)
PGA	0.874	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.874	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.489	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.488	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.01	Factored deterministic acceleration value (0.2s)
S1RT	0.913	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.913	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.257	Factored deterministic acceleration value (1.0s)
PGA _d	1.172	Factored deterministic acceleration value (PGA)

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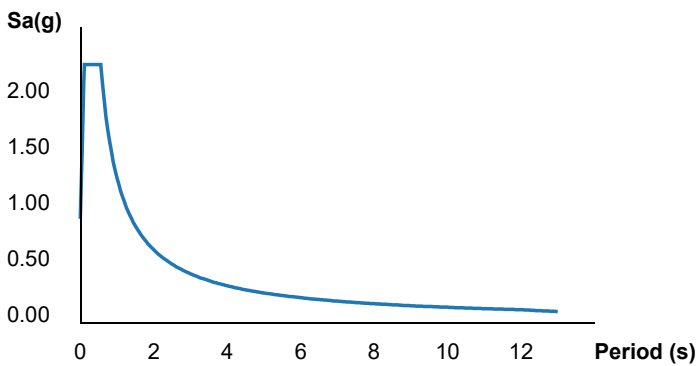
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Search Information

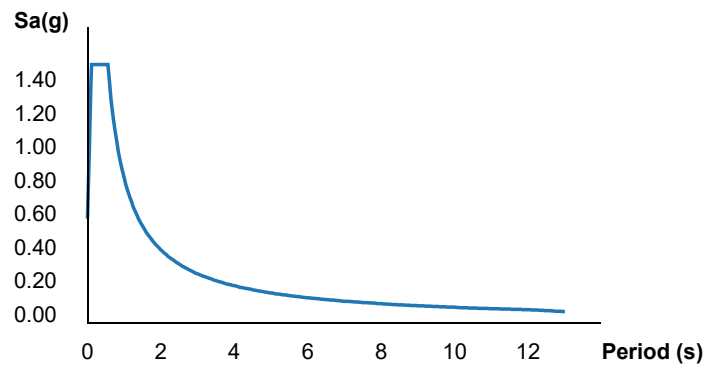
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Coordinates: 34.48081, -118.53213
Elevation: 1685 ft
Timestamp: 2021-03-05T05:18:49.049Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.299	MCE _R ground motion (period=0.2s)
S ₁	0.857	MCE _R ground motion (period=1.0s)
S _{MS}	2.299	Site-modified spectral acceleration value
S _{M1}	1.285	Site-modified spectral acceleration value
S _{DS}	1.533	Numeric seismic design value at 0.2s SA
S _{D1}	0.857	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.019	Coefficient of risk (0.2s)

CR ₁	1.016	Coefficient of risk (1.0s)
PGA	0.807	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.807	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.299	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.256	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.948	Factored deterministic acceleration value (0.2s)
S1RT	0.857	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.843	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.061	Factored deterministic acceleration value (1.0s)
PGAd	1.131	Factored deterministic acceleration value (PGA)

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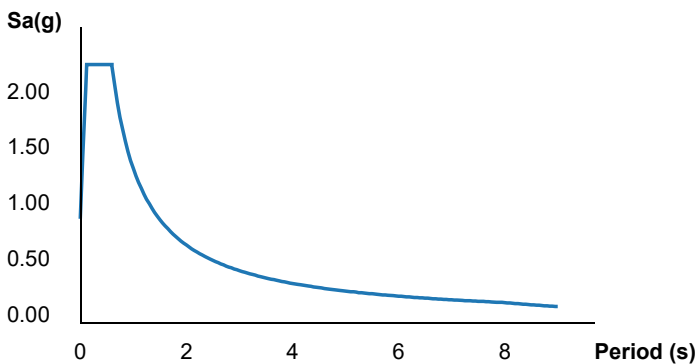
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

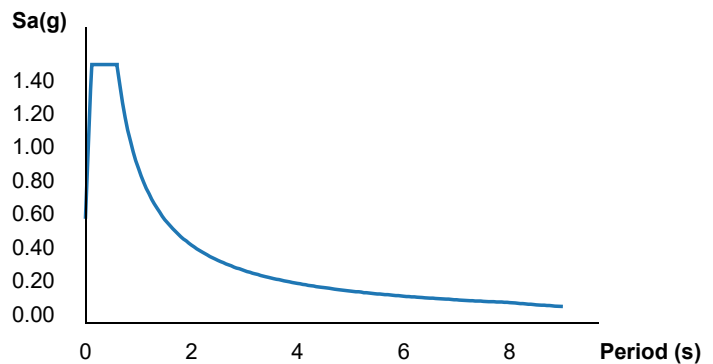


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.304	MCE _R ground motion (period=0.2s)
S ₁	0.915	MCE _R ground motion (period=1.0s)
S _{MS}	2.304	Site-modified spectral acceleration value
S _{M1}	1.373	Site-modified spectral acceleration value
S _{DS}	1.536	Numeric seismic design value at 0.2s SA
S _{D1}	0.915	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.996	Coefficient of risk (0.2s)

CR ₁	0.998	Coefficient of risk (1.0s)
PGA	0.879	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.879	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.649	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.66	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.304	Factored deterministic acceleration value (0.2s)
S1RT	0.958	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.959	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.915	Factored deterministic acceleration value (1.0s)
PGAd	0.879	Factored deterministic acceleration value (PGA)

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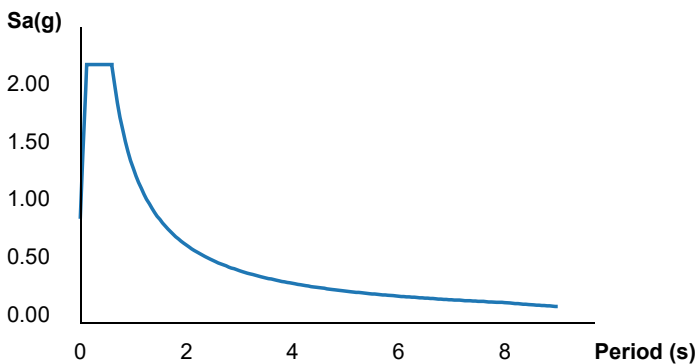
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Search Information

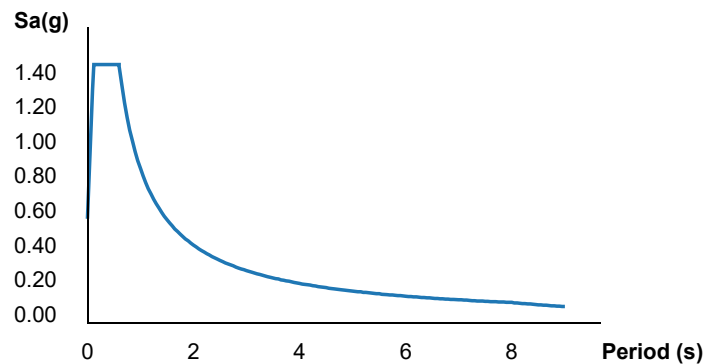
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Elevation: 1630 ft
Timestamp: 2021-03-05T05:17:07.165Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.228	MCE _R ground motion (period=0.2s)
S ₁	0.885	MCE _R ground motion (period=1.0s)
S _{MS}	2.228	Site-modified spectral acceleration value
S _{M1}	1.327	Site-modified spectral acceleration value
S _{DS}	1.485	Numeric seismic design value at 0.2s SA
S _{D1}	0.885	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.999	Coefficient of risk (0.2s)

CR ₁	1.001	Coefficient of risk (1.0s)
PGA	0.849	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.849	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.646	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.65	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.228	Factored deterministic acceleration value (0.2s)
S1RT	0.958	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.957	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.885	Factored deterministic acceleration value (1.0s)
PGAd	0.849	Factored deterministic acceleration value (PGA)

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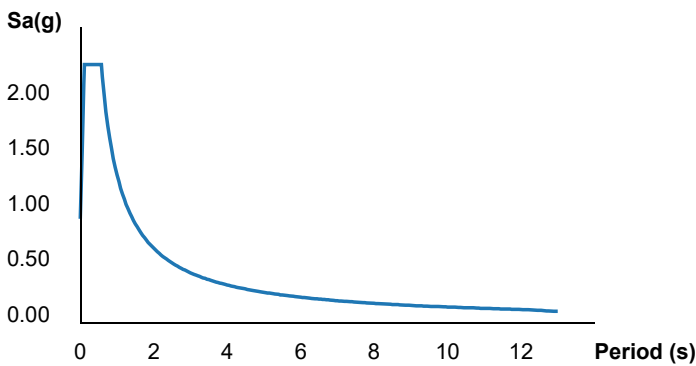
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

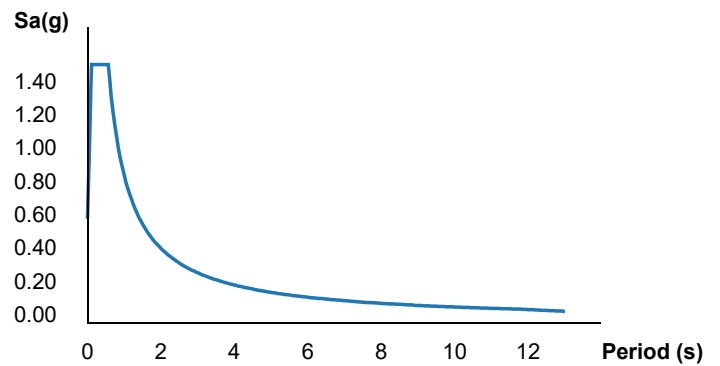


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.314	MCE _R ground motion (period=0.2s)
S ₁	0.881	MCE _R ground motion (period=1.0s)
S _{MS}	2.314	Site-modified spectral acceleration value
S _{M1}	1.321	Site-modified spectral acceleration value
S _{DS}	1.543	Numeric seismic design value at 0.2s SA
S _{D1}	0.881	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.029	Coefficient of risk (0.2s)

CR ₁	1.017	Coefficient of risk (1.0s)
PGA	0.805	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.805	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.314	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.248	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.007	Factored deterministic acceleration value (0.2s)
S1RT	0.881	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.866	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.263	Factored deterministic acceleration value (1.0s)
PGA _d	1.171	Factored deterministic acceleration value (PGA)

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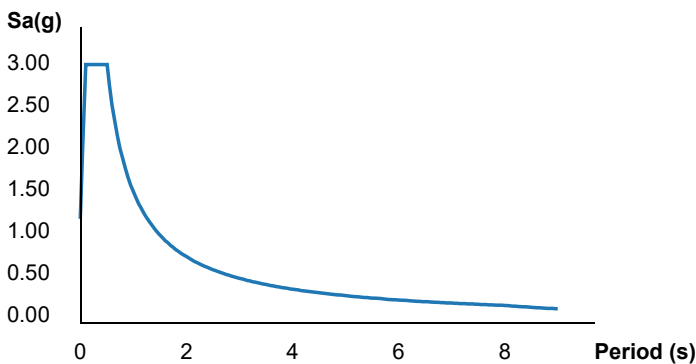
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Search Information

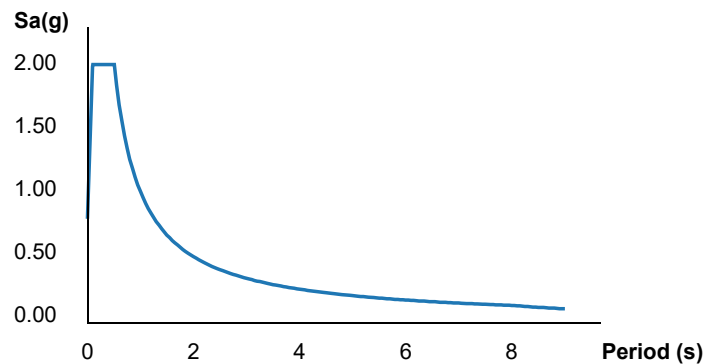
Address: Access Road at Oakview Estates Drive
Coordinates: 34.3949, -118.58269
Elevation: 1533 ft
Timestamp: 2021-03-05T05:12:47.247Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	3.065	MCE _R ground motion (period=0.2s)
S ₁	1.034	MCE _R ground motion (period=1.0s)
S _{MS}	3.065	Site-modified spectral acceleration value
S _{M1}	1.551	Site-modified spectral acceleration value
S _{DS}	2.043	Numeric seismic design value at 0.2s SA
S _{D1}	1.034	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.938	Coefficient of risk (0.2s)

CR ₁	0.962	Coefficient of risk (1.0s)
PGA	1.153	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.153	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	3.091	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.296	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.065	Factored deterministic acceleration value (0.2s)
S1RT	1.057	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.099	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.034	Factored deterministic acceleration value (1.0s)
PGAd	1.184	Factored deterministic acceleration value (PGA)

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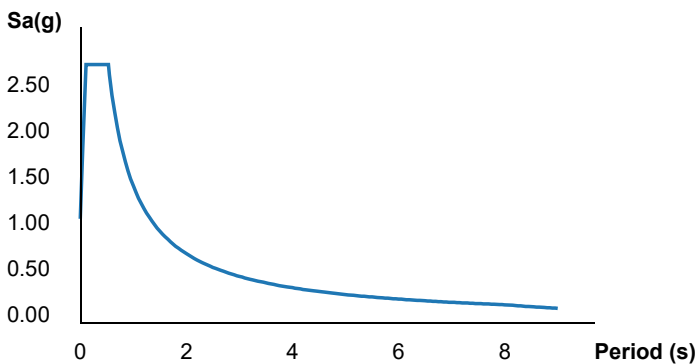
Search Information

Address: Anza Drive, Valencia, CA
Coordinates: 34.4293, -118.58067
Elevation: 1276 ft
Timestamp: 2021-03-05T04:57:13.901Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

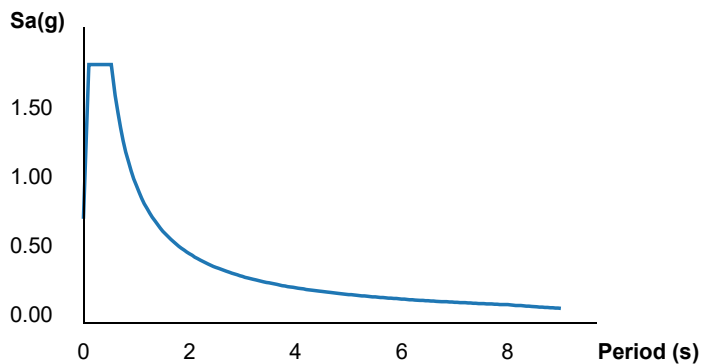


Imager, ©2021, CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.793	MCE _R ground motion (period=0.2s)
S ₁	0.984	MCE _R ground motion (period=1.0s)
S _{MS}	2.793	Site-modified spectral acceleration value
S _{M1}	1.475	Site-modified spectral acceleration value
S _{DS}	1.862	Numeric seismic design value at 0.2s SA
S _{D1}	0.984	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.97	Coefficient of risk (0.2s)

CR ₁	0.981	Coefficient of risk (1.0s)
PGA	1.003	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.003	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.793	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.88	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.918	Factored deterministic acceleration value (0.2s)
S1RT	0.984	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.002	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.12	Factored deterministic acceleration value (1.0s)
PGA _d	1.128	Factored deterministic acceleration value (PGA)

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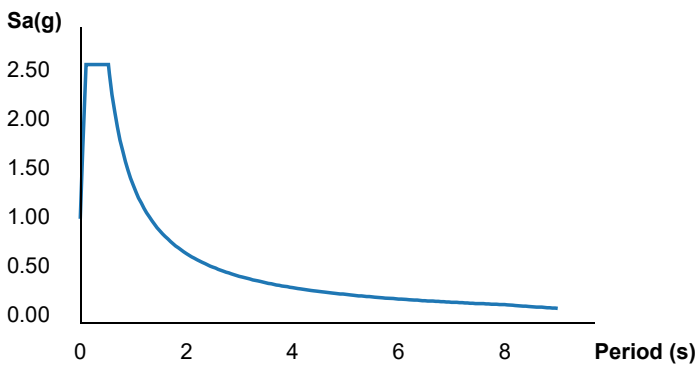
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Search Information

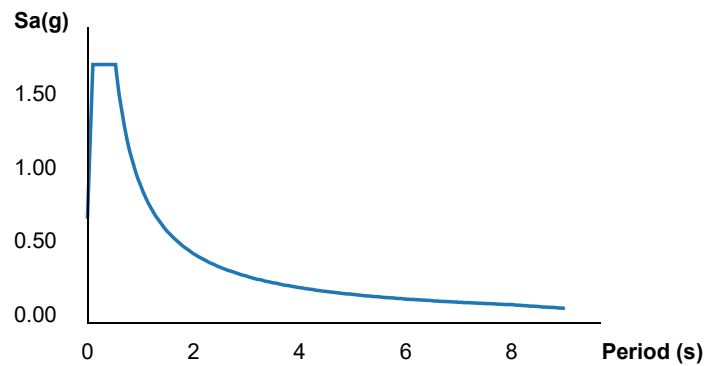
Address: Appaloosa Rd
Coordinates: 34.40957, -118.40853
Elevation: 1753 ft
Timestamp: 2021-03-05T04:38:20.109Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.62	MCE _R ground motion (period=0.2s)
S ₁	0.926	MCE _R ground motion (period=1.0s)
S _{MS}	2.62	Site-modified spectral acceleration value
S _{M1}	1.389	Site-modified spectral acceleration value
S _{DS}	1.746	Numeric seismic design value at 0.2s SA
S _{D1}	0.926	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.963	Coefficient of risk (0.2s)

CR ₁	0.982	Coefficient of risk (1.0s)
PGA	0.956	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.956	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.62	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.721	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.968	Factored deterministic acceleration value (0.2s)
S1RT	0.926	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.942	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.086	Factored deterministic acceleration value (1.0s)
PGA _d	1.143	Factored deterministic acceleration value (PGA)

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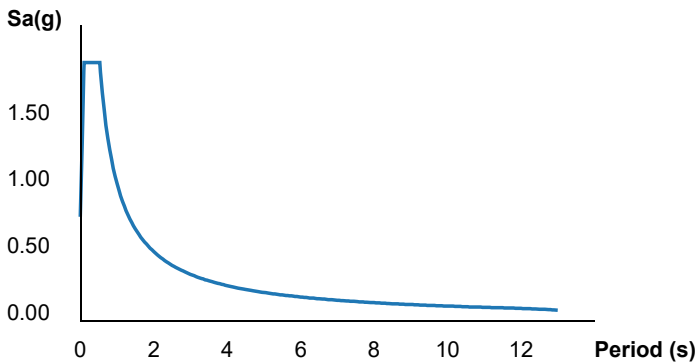
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Search Information

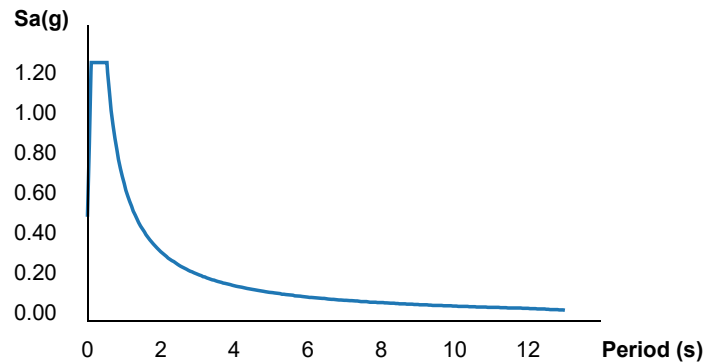
Address: N Pine St, Orange, CA, USA
Coordinates: 34.47829, -118.40689
Elevation: 2087 ft
Timestamp: 2021-03-05T04:21:27.552Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	1.928	MCE _R ground motion (period=0.2s)
S ₁	0.681	MCE _R ground motion (period=1.0s)
S _{MS}	1.928	Site-modified spectral acceleration value
S _{M1}	1.021	Site-modified spectral acceleration value
S _{DS}	1.286	Numeric seismic design value at 0.2s SA
S _{D1}	0.681	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.037	Coefficient of risk (0.2s)

CR ₁	1.023	Coefficient of risk (1.0s)
PGA	0.718	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.718	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.118	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.043	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.928	Factored deterministic acceleration value (0.2s)
S1RT	0.81	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.792	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.681	Factored deterministic acceleration value (1.0s)
PGAd	0.718	Factored deterministic acceleration value (PGA)

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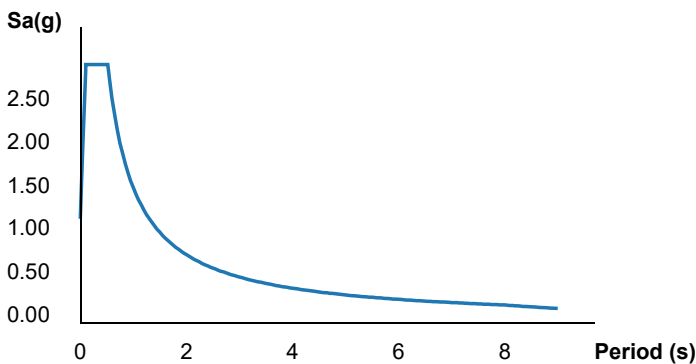
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Search Information

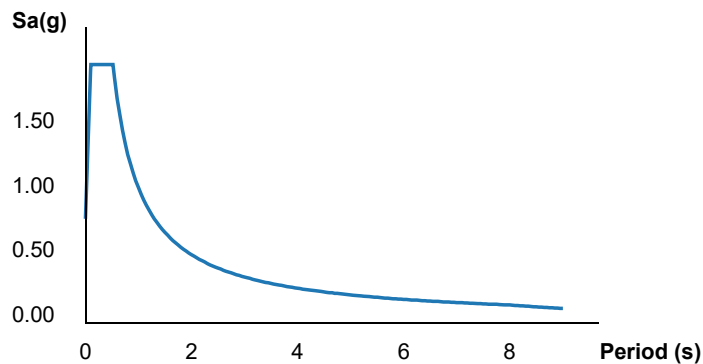
Address: Avenue of The Oaks
Coordinates: 34.40261, -118.48959
Elevation: 1670 ft
Timestamp: 2021-03-05T04:44:12.292Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.979	MCE _R ground motion (period=0.2s)
S ₁	1.035	MCE _R ground motion (period=1.0s)
S _{MS}	2.979	Site-modified spectral acceleration value
S _{M1}	1.552	Site-modified spectral acceleration value
S _{DS}	1.986	Numeric seismic design value at 0.2s SA
S _{D1}	1.035	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.942	Coefficient of risk (0.2s)

CR ₁	0.962	Coefficient of risk (1.0s)
PGA	1.105	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.105	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.979	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.162	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.005	Factored deterministic acceleration value (0.2s)
S1RT	1.035	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.075	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.269	Factored deterministic acceleration value (1.0s)
PGAd	1.169	Factored deterministic acceleration value (PGA)

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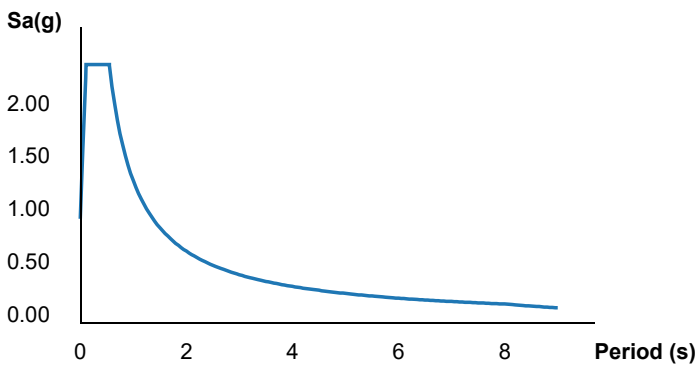
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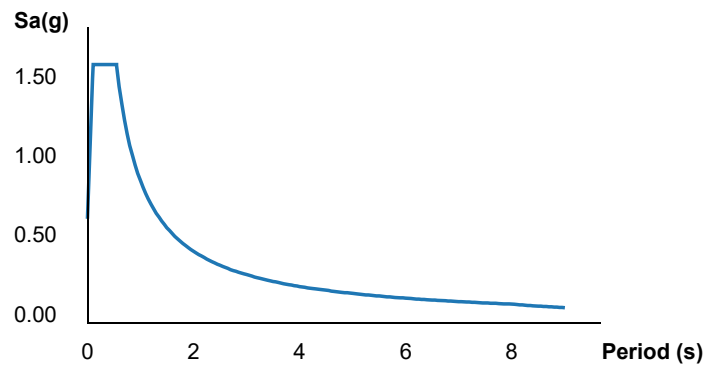
Address: N Pine St, Orange, CA, USA
Coordinates: 34.45818, -118.52358
Elevation: 1610 ft
Timestamp: 2021-03-05T04:25:30.403Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.433	MCE _R ground motion (period=0.2s)
S ₁	0.89	MCE _R ground motion (period=1.0s)
S _{MS}	2.433	Site-modified spectral acceleration value
S _{M1}	1.334	Site-modified spectral acceleration value
S _{DS}	1.622	Numeric seismic design value at 0.2s SA
S _{D1}	0.89	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.998	Coefficient of risk (0.2s)

CR ₁	1.004	Coefficient of risk (1.0s)
PGA	0.858	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.858	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.433	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.437	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.993	Factored deterministic acceleration value (0.2s)
S1RT	0.89	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.886	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.122	Factored deterministic acceleration value (1.0s)
PGA _d	1.157	Factored deterministic acceleration value (PGA)

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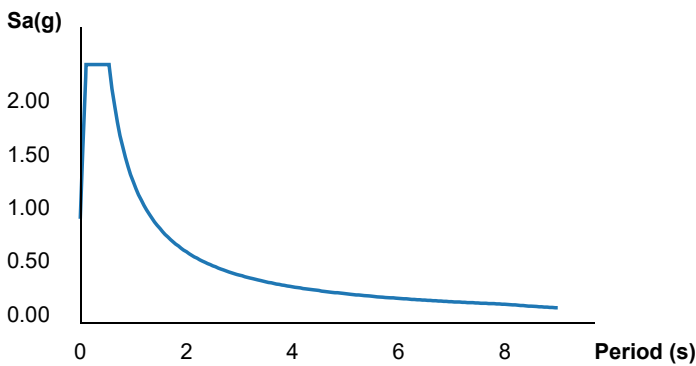
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Search Information

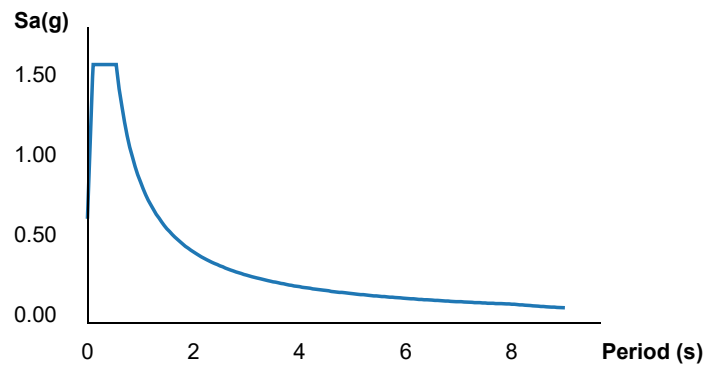
Address: Benison Dr
Coordinates: 34.45475, -118.47522
Elevation: 2019 ft
Timestamp: 2021-03-05T04:49:23.613Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.406	MCE _R ground motion (period=0.2s)
S ₁	0.872	MCE _R ground motion (period=1.0s)
S _{MS}	2.406	Site-modified spectral acceleration value
S _{M1}	1.307	Site-modified spectral acceleration value
S _{DS}	1.604	Numeric seismic design value at 0.2s SA
S _{D1}	0.872	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.996	Coefficient of risk (0.2s)

CR ₁	1.006	Coefficient of risk (1.0s)
PGA	0.845	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.845	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.406	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.417	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.905	Factored deterministic acceleration value (0.2s)
S1RT	0.872	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.866	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.022	Factored deterministic acceleration value (1.0s)
PGAd	1.107	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates: 34.49857558191984, -118.60213

Elevation: 1441 ft

Timestamp: 2021-03-29T18:23:23.628Z

Hazard Type: Seismic

Reference Document: ASCE7-10

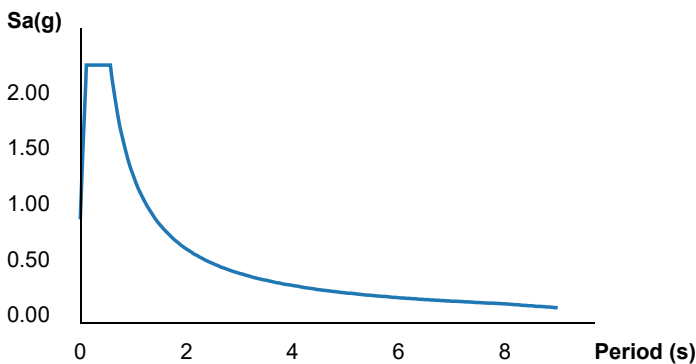
Risk Category: III

Site Class: D

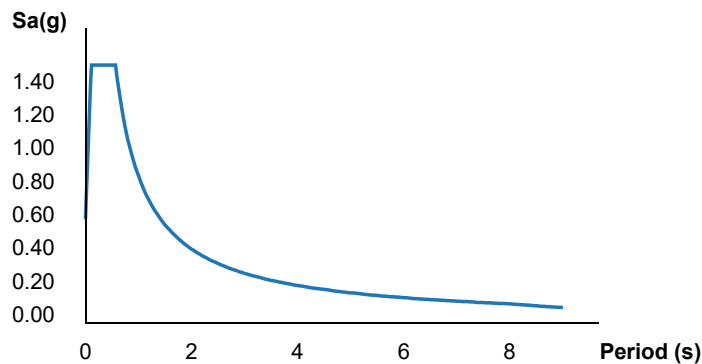


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.311	MCE _R ground motion (period=0.2s)
S_1	0.876	MCE _R ground motion (period=1.0s)
S_{MS}	2.311	Site-modified spectral acceleration value
S_{M1}	1.315	Site-modified spectral acceleration value
S_{DS}	1.541	Numeric seismic design value at 0.2s SA
S_{D1}	0.876	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	1.024	Coefficient of risk (0.2s)
CR_1	1.014	Coefficient of risk (1.0s)

PGA	0.812	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.812	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.311	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.257	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.017	Factored deterministic acceleration value (0.2s)
S1RT	0.876	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.864	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.23	Factored deterministic acceleration value (1.0s)
PGA _d	1.176	Factored deterministic acceleration value (PGA)

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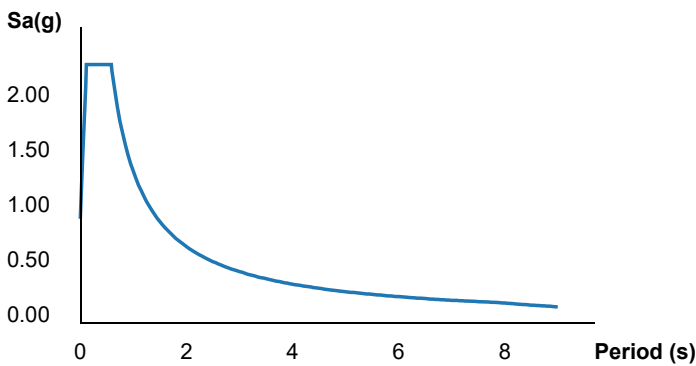
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Search Information

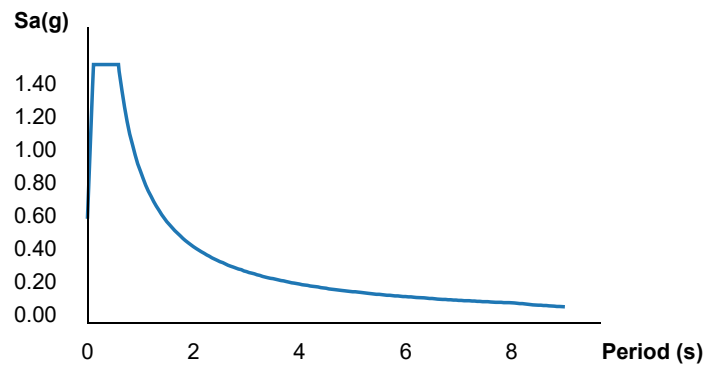
Address: Firebrand
Coordinates: 34.45906, -118.62423
Elevation: 1282 ft
Timestamp: 2021-03-05T04:54:40.174Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.341	MCE _R ground motion (period=0.2s)
S ₁	0.912	MCE _R ground motion (period=1.0s)
S _{MS}	2.341	Site-modified spectral acceleration value
S _{M1}	1.368	Site-modified spectral acceleration value
S _{DS}	1.561	Numeric seismic design value at 0.2s SA
S _{D1}	0.912	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.993	Coefficient of risk (0.2s)

CR ₁	0.996	Coefficient of risk (1.0s)
PGA	0.891	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.891	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.679	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.699	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.341	Factored deterministic acceleration value (0.2s)
S1RT	0.965	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.969	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.912	Factored deterministic acceleration value (1.0s)
PGAd	0.891	Factored deterministic acceleration value (PGA)

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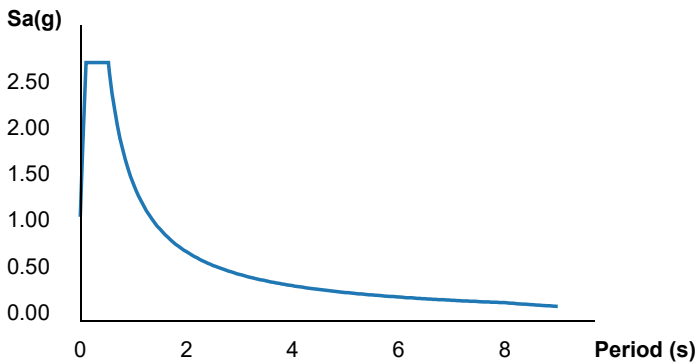
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

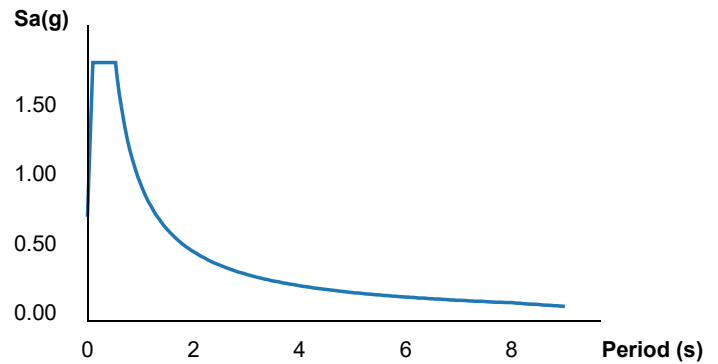


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.784	MCE _R ground motion (period=0.2s)
S ₁	0.981	MCE _R ground motion (period=1.0s)
S _{MS}	2.784	Site-modified spectral acceleration value
S _{M1}	1.472	Site-modified spectral acceleration value
S _{DS}	1.856	Numeric seismic design value at 0.2s SA
S _{D1}	0.981	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.971	Coefficient of risk (0.2s)

CR ₁	0.982	Coefficient of risk (1.0s)
PGA	0.999	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.999	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.784	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.868	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.897	Factored deterministic acceleration value (0.2s)
S1RT	0.981	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.116	Factored deterministic acceleration value (1.0s)
PGAd	1.12	Factored deterministic acceleration value (PGA)

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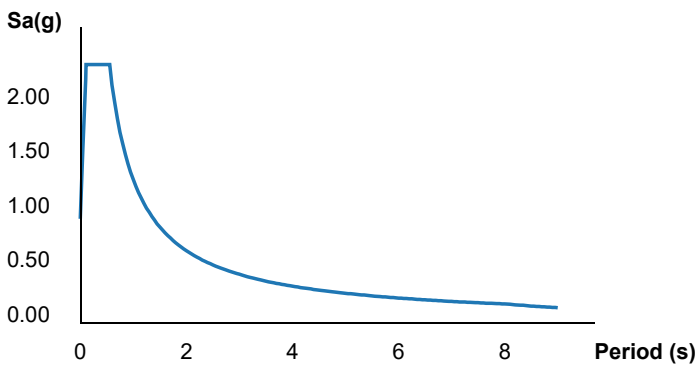
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Coordinates: 34.46892, -118.51875
Elevation: 1827 ft
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

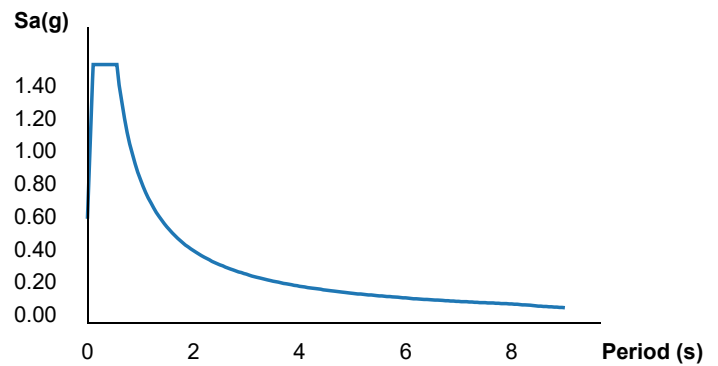


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.36	MCE _R ground motion (period=0.2s)
S ₁	0.869	MCE _R ground motion (period=1.0s)
S _{MS}	2.36	Site-modified spectral acceleration value
S _{M1}	1.304	Site-modified spectral acceleration value
S _{DS}	1.573	Numeric seismic design value at 0.2s SA
S _{D1}	0.869	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.009	Coefficient of risk (0.2s)

CR ₁	1.011	Coefficient of risk (1.0s)
PGA	0.829	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.829	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.36	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.339	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.952	Factored deterministic acceleration value (0.2s)
S1RT	0.869	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.86	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.064	Factored deterministic acceleration value (1.0s)
PGAd	1.133	Factored deterministic acceleration value (PGA)

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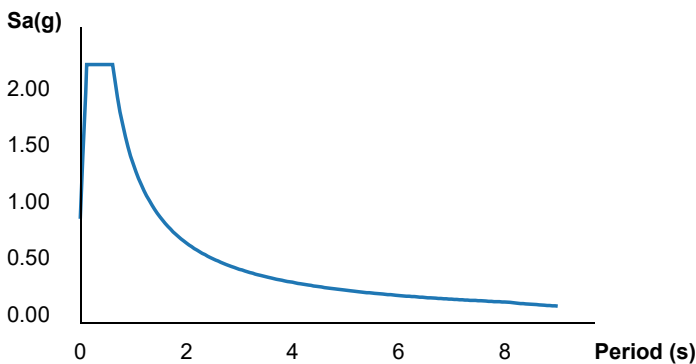
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Search Information

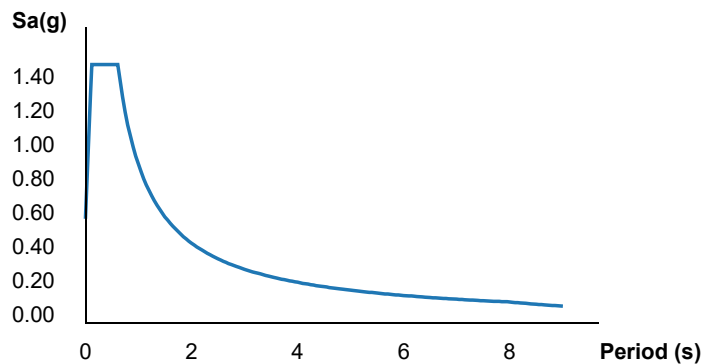
Address: N Pine St, Orange, CA, USA
Coordinates: 34.48329, -118.63962
Elevation: 1722 ft
Timestamp: 2021-03-05T04:13:11.309Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.271	MCE _R ground motion (period=0.2s)
S ₁	0.927	MCE _R ground motion (period=1.0s)
S _{MS}	2.271	Site-modified spectral acceleration value
S _{M1}	1.39	Site-modified spectral acceleration value
S _{DS}	1.514	Numeric seismic design value at 0.2s SA
S _{D1}	0.927	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.012	Coefficient of risk (0.2s)

CR ₁	1.01	Coefficient of risk (1.0s)
PGA	0.872	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.872	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.515	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.485	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.271	Factored deterministic acceleration value (0.2s)
S1RT	0.927	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.917	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.948	Factored deterministic acceleration value (1.0s)
PGA _d	0.872	Factored deterministic acceleration value (PGA)

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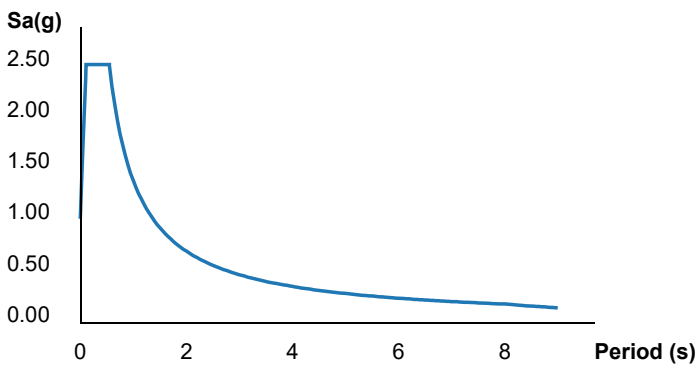
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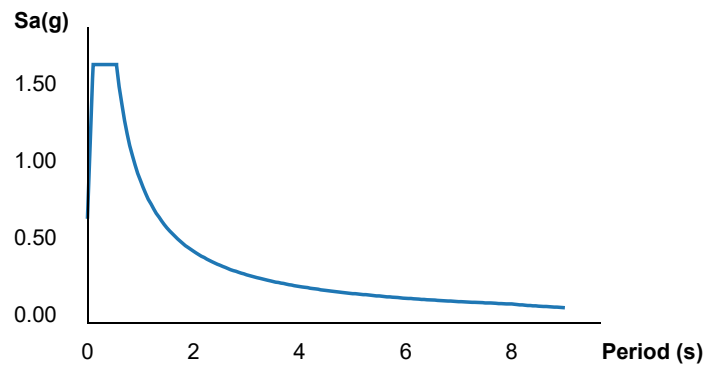
Address: Harwick Place
Coordinates: 34.44964, -118.54338
Elevation: 1402 ft
Timestamp: 2021-03-05T05:00:37.308Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.508	MCE _R ground motion (period=0.2s)
S ₁	0.917	MCE _R ground motion (period=1.0s)
S _{MS}	2.508	Site-modified spectral acceleration value
S _{M1}	1.375	Site-modified spectral acceleration value
S _{DS}	1.672	Numeric seismic design value at 0.2s SA
S _{D1}	0.917	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.99	Coefficient of risk (0.2s)

CR ₁	0.996	Coefficient of risk (1.0s)
PGA	0.889	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.889	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.508	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.534	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.018	Factored deterministic acceleration value (0.2s)
S1RT	0.917	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.92	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.213	Factored deterministic acceleration value (1.0s)
PGAd	1.176	Factored deterministic acceleration value (PGA)

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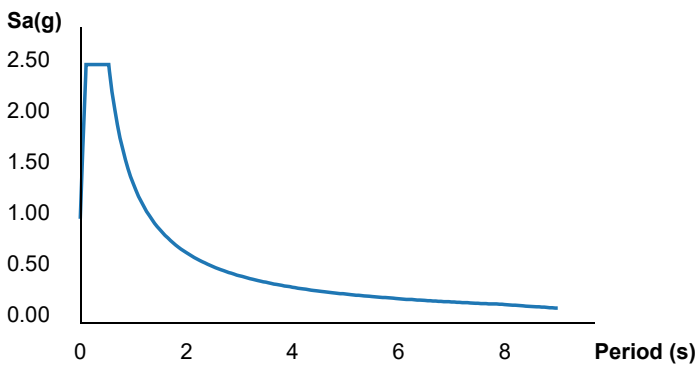
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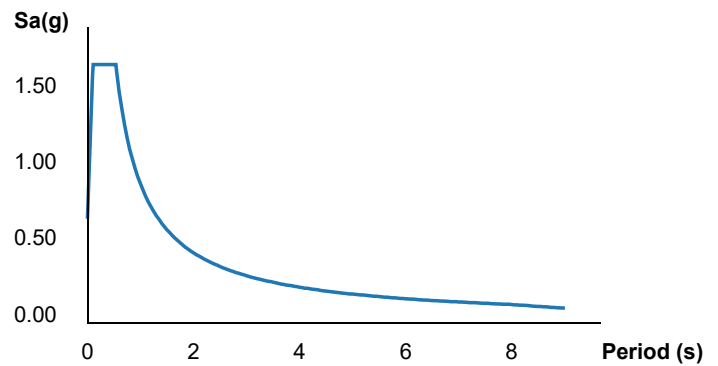
Address: N Pine St, Orange, CA, USA
Coordinates: 34.44116, -118.46717
Elevation: 1824 ft
Timestamp: 2021-03-05T04:29:21.407Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.525	MCE _R ground motion (period=0.2s)
S ₁	0.903	MCE _R ground motion (period=1.0s)
S _{MS}	2.525	Site-modified spectral acceleration value
S _{M1}	1.354	Site-modified spectral acceleration value
S _{DS}	1.683	Numeric seismic design value at 0.2s SA
S _{D1}	0.903	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.982	Coefficient of risk (0.2s)

CR ₁	0.997	Coefficient of risk (1.0s)
PGA	0.896	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.896	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.525	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.572	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.944	Factored deterministic acceleration value (0.2s)
S1RT	0.903	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.906	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.056	Factored deterministic acceleration value (1.0s)
PGA _d	1.128	Factored deterministic acceleration value (PGA)

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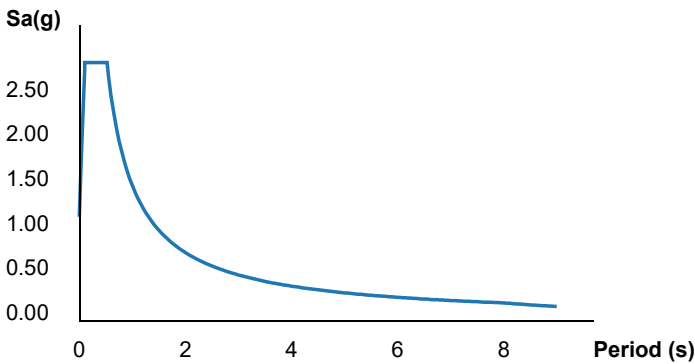
Search Information

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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

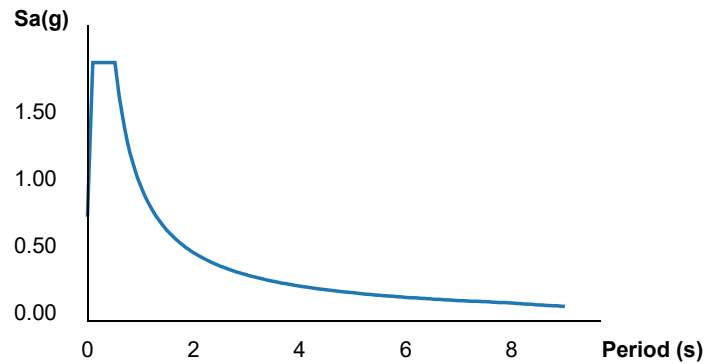


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.881	MCE _R ground motion (period=0.2s)
S ₁	1.004	MCE _R ground motion (period=1.0s)
S _{MS}	2.881	Site-modified spectral acceleration value
S _{M1}	1.505	Site-modified spectral acceleration value
S _{DS}	1.921	Numeric seismic design value at 0.2s SA
S _{D1}	1.004	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.947	Coefficient of risk (0.2s)

CR ₁	0.965	Coefficient of risk (1.0s)
PGA	1.064	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.064	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.881	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.044	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.024	Factored deterministic acceleration value (0.2s)
S1RT	1.004	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.04	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.217	Factored deterministic acceleration value (1.0s)
PGA _d	1.175	Factored deterministic acceleration value (PGA)

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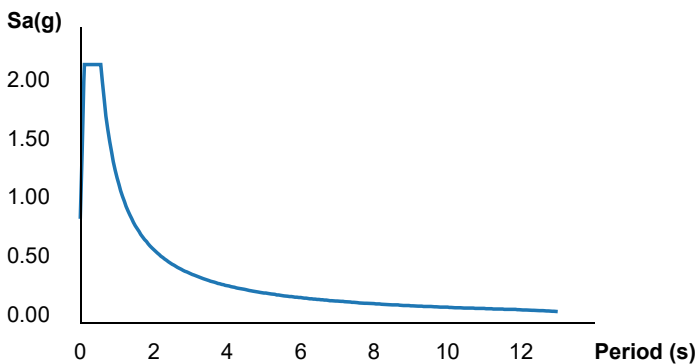
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Search Information

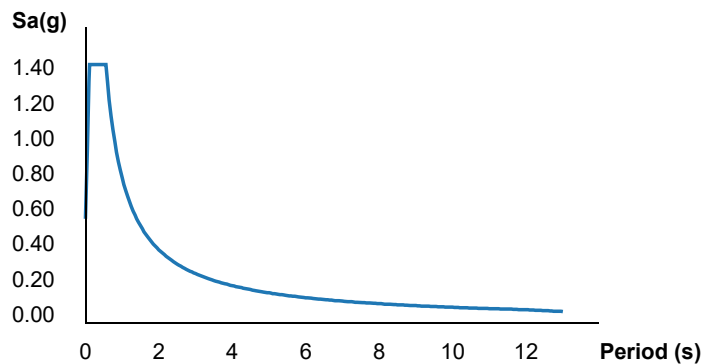
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Elevation: 2103 ft
Timestamp: 2021-03-05T04:18:31.170Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.191	MCE _R ground motion (period=0.2s)
S ₁	0.818	MCE _R ground motion (period=1.0s)
S _{MS}	2.191	Site-modified spectral acceleration value
S _{M1}	1.227	Site-modified spectral acceleration value
S _{DS}	1.461	Numeric seismic design value at 0.2s SA
S _{D1}	0.818	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.019	Coefficient of risk (0.2s)

CR ₁	1.022	Coefficient of risk (1.0s)
PGA	0.767	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.767	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.191	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.151	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.366	Factored deterministic acceleration value (0.2s)
S1RT	0.818	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.801	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.819	Factored deterministic acceleration value (1.0s)
PGAd	0.879	Factored deterministic acceleration value (PGA)

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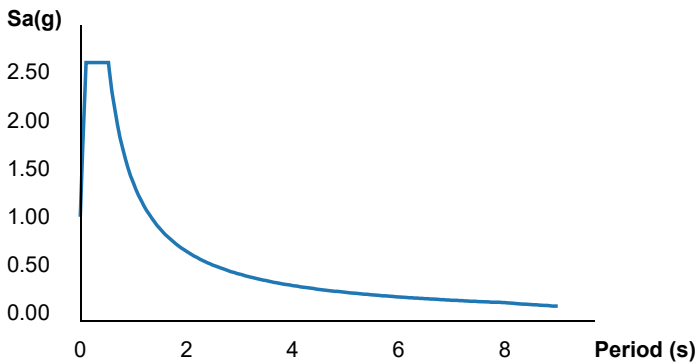
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Address: N Pine St, Orange, CA, USA
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

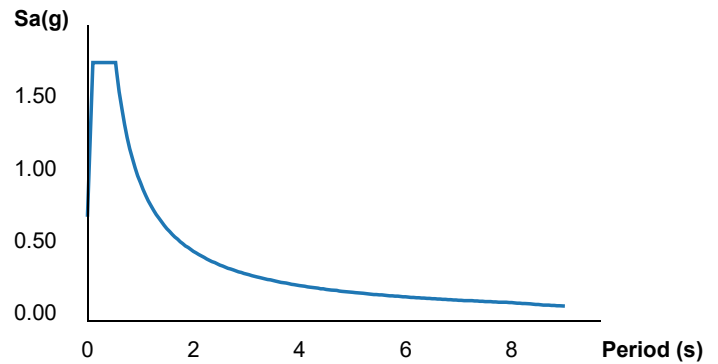


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.672	MCE _R ground motion (period=0.2s)
S ₁	0.947	MCE _R ground motion (period=1.0s)
S _{MS}	2.672	Site-modified spectral acceleration value
S _{M1}	1.421	Site-modified spectral acceleration value
S _{DS}	1.781	Numeric seismic design value at 0.2s SA
S _{D1}	0.947	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.971	Coefficient of risk (0.2s)

CR ₁	0.986	Coefficient of risk (1.0s)
PGA	0.961	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.961	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.672	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.752	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.01	Factored deterministic acceleration value (0.2s)
S1RT	0.947	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.96	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.163	Factored deterministic acceleration value (1.0s)
PGAd	1.169	Factored deterministic acceleration value (PGA)

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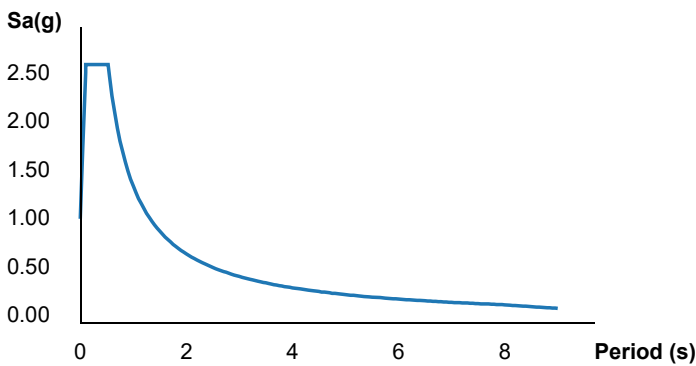
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Search Information

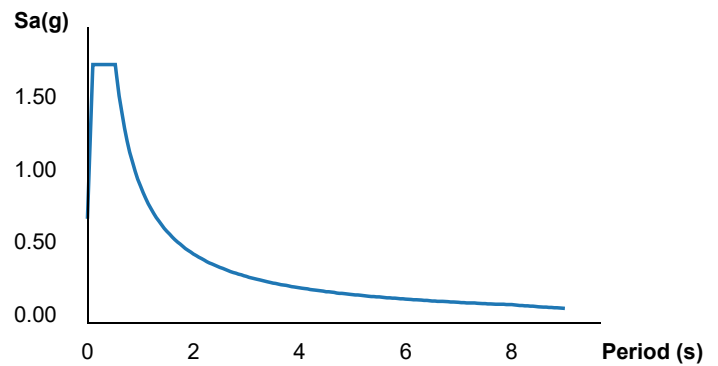
Address: Live Oak Springs Cyn Rd
Coordinates: 34.40035, -118.39916
Elevation: 1949 ft
Timestamp: 2021-03-05T04:43:11.961Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.653	MCE _R ground motion (period=0.2s)
S ₁	0.932	MCE _R ground motion (period=1.0s)
S _{MS}	2.653	Site-modified spectral acceleration value
S _{M1}	1.399	Site-modified spectral acceleration value
S _{DS}	1.769	Numeric seismic design value at 0.2s SA
S _{D1}	0.932	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.954	Coefficient of risk (0.2s)

CR ₁	0.976	Coefficient of risk (1.0s)
PGA	0.977	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.977	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.653	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.782	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.986	Factored deterministic acceleration value (0.2s)
S1RT	0.932	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.955	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.115	Factored deterministic acceleration value (1.0s)
PGAd	1.154	Factored deterministic acceleration value (PGA)

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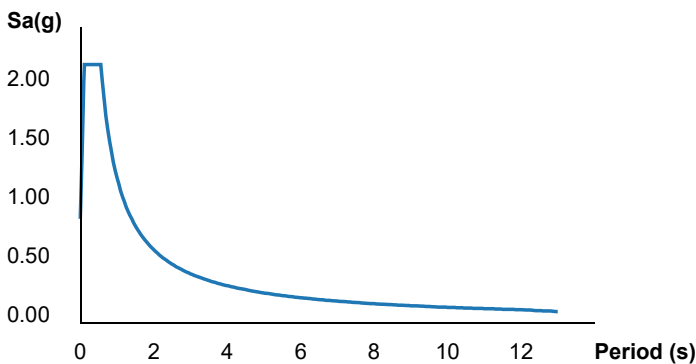
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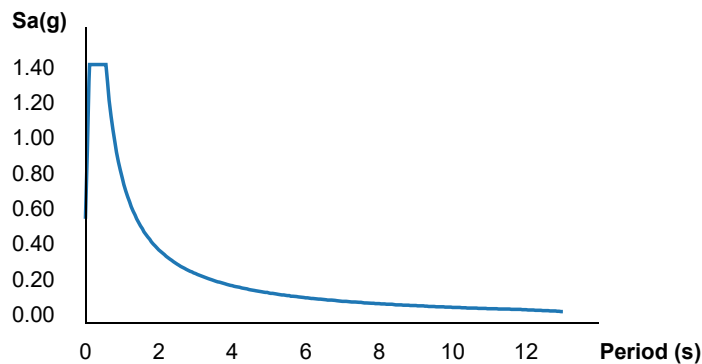
Address: N Pine St, Orange, CA, USA
Coordinates: 34.44763, -118.38085
Elevation: 2254 ft
Timestamp: 2021-03-05T04:19:35.515Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.184	MCE _R ground motion (period=0.2s)
S ₁	0.815	MCE _R ground motion (period=1.0s)
S _{MS}	2.184	Site-modified spectral acceleration value
S _{M1}	1.222	Site-modified spectral acceleration value
S _{DS}	1.456	Numeric seismic design value at 0.2s SA
S _{D1}	0.815	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.021	Coefficient of risk (0.2s)

CR ₁	1.022	Coefficient of risk (1.0s)
PGA	0.763	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.763	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.184	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.14	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.384	Factored deterministic acceleration value (0.2s)
S1RT	0.815	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.798	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.825	Factored deterministic acceleration value (1.0s)
PGA _d	0.885	Factored deterministic acceleration value (PGA)

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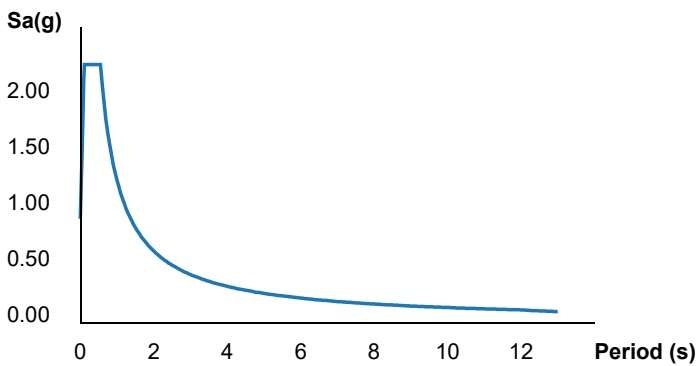
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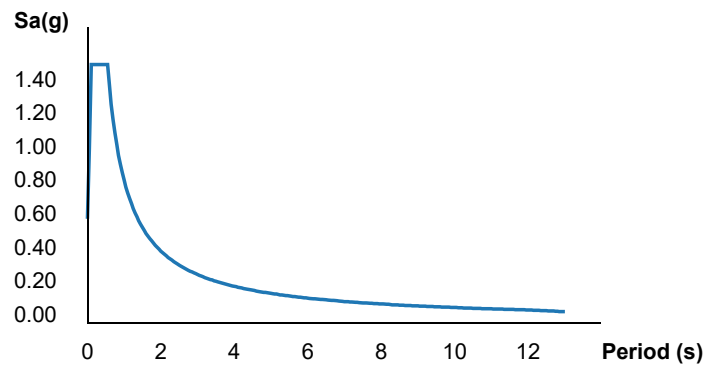
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Coordinates: 34.44483, -118.40689
Elevation: 2051 ft
Timestamp: 2021-03-05T04:20:38.580Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.297	MCE _R ground motion (period=0.2s)
S ₁	0.842	MCE _R ground motion (period=1.0s)
S _{MS}	2.297	Site-modified spectral acceleration value
S _{M1}	1.263	Site-modified spectral acceleration value
S _{DS}	1.531	Numeric seismic design value at 0.2s SA
S _{D1}	0.842	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.004	Coefficient of risk (0.2s)

CR ₁	1.014	Coefficient of risk (1.0s)
PGA	0.81	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.81	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.297	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.288	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.705	Factored deterministic acceleration value (0.2s)
S1RT	0.842	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.831	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.925	Factored deterministic acceleration value (1.0s)
PGAd	1.015	Factored deterministic acceleration value (PGA)

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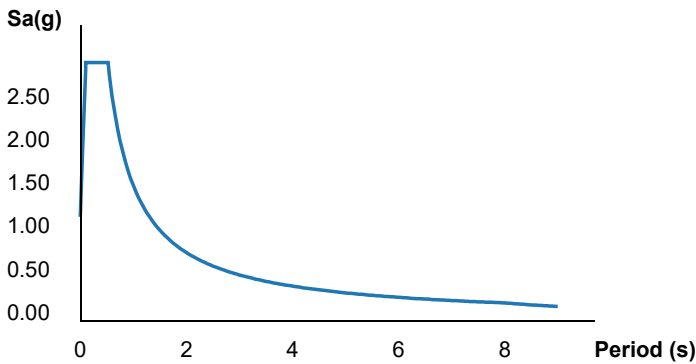
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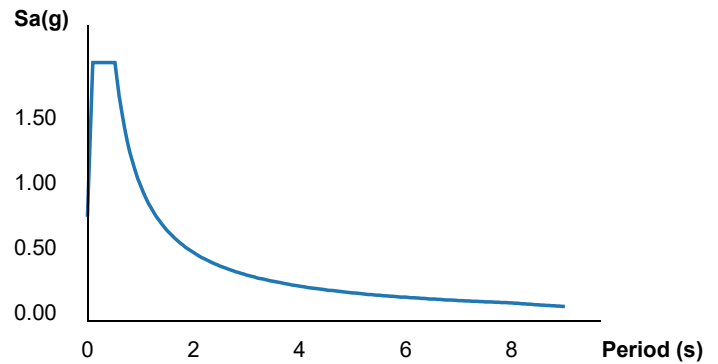
Address: Oakl Crest Dr
Coordinates: 34.38585, -118.45845
Elevation: 1960 ft
Timestamp: 2021-03-05T04:47:45.298Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.973	MCE _R ground motion (period=0.2s)
S ₁	1.035	MCE _R ground motion (period=1.0s)
S _{MS}	2.973	Site-modified spectral acceleration value
S _{M1}	1.553	Site-modified spectral acceleration value
S _{DS}	1.982	Numeric seismic design value at 0.2s SA
S _{D1}	1.035	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.941	Coefficient of risk (0.2s)

CR ₁	0.96	Coefficient of risk (1.0s)
PGA	1.105	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.105	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.973	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.159	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.997	Factored deterministic acceleration value (0.2s)
S1RT	1.035	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.078	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.244	Factored deterministic acceleration value (1.0s)
PGAd	1.14	Factored deterministic acceleration value (PGA)

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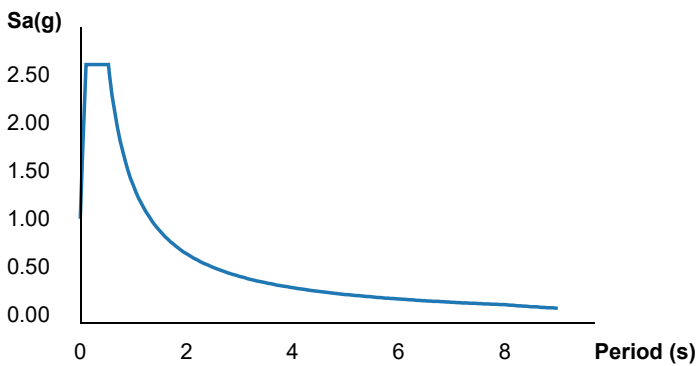
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Search Information

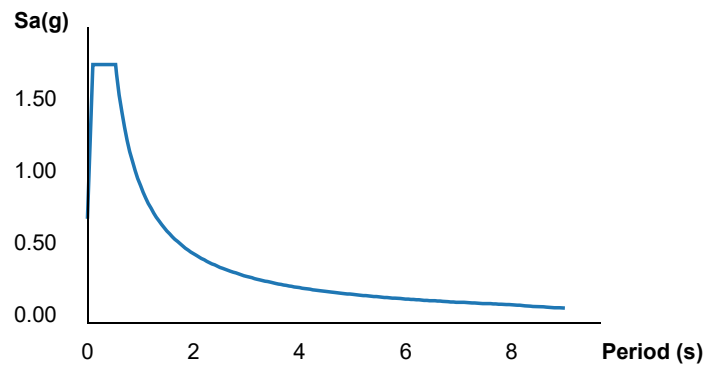
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Elevation: 1749 ft
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.686	MCE _R ground motion (period=0.2s)
S ₁	0.948	MCE _R ground motion (period=1.0s)
S _{MS}	2.686	Site-modified spectral acceleration value
S _{M1}	1.422	Site-modified spectral acceleration value
S _{DS}	1.791	Numeric seismic design value at 0.2s SA
S _{D1}	0.948	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.967	Coefficient of risk (0.2s)

CR ₁	0.984	Coefficient of risk (1.0s)
PGA	0.969	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.969	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.686	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.779	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.983	Factored deterministic acceleration value (0.2s)
S1RT	0.948	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.964	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.109	Factored deterministic acceleration value (1.0s)
PGAd	1.152	Factored deterministic acceleration value (PGA)

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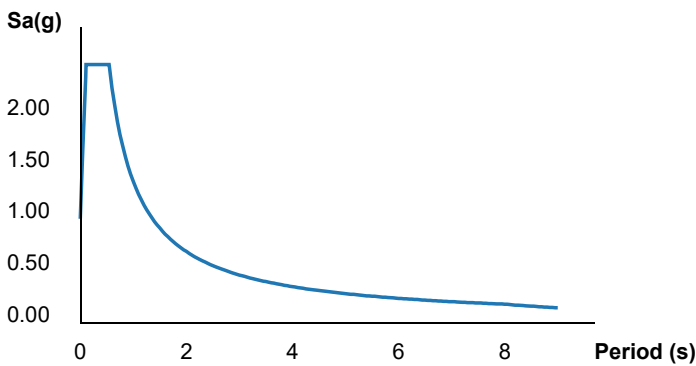
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Search Information

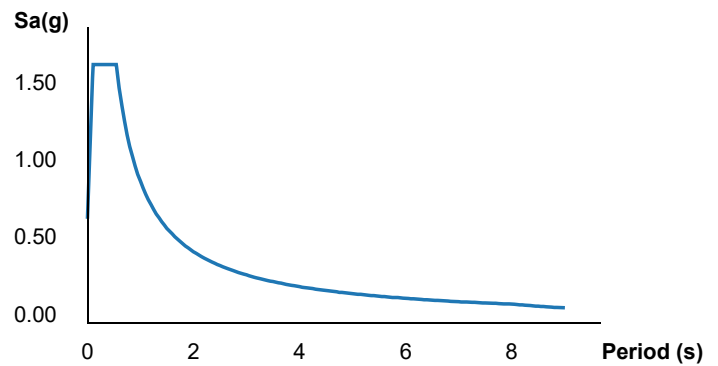
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Elevation: 1616 ft
Timestamp: 2021-03-05T04:23:39.915Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.489	MCE _R ground motion (period=0.2s)
S ₁	0.905	MCE _R ground motion (period=1.0s)
S _{MS}	2.489	Site-modified spectral acceleration value
S _{M1}	1.357	Site-modified spectral acceleration value
S _{DS}	1.659	Numeric seismic design value at 0.2s SA
S _{D1}	0.905	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.99	Coefficient of risk (0.2s)

CR ₁	0.998	Coefficient of risk (1.0s)
PGA	0.88	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.88	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.489	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.514	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.011	Factored deterministic acceleration value (0.2s)
S1RT	0.905	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.906	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.165	Factored deterministic acceleration value (1.0s)
PGAd	1.169	Factored deterministic acceleration value (PGA)

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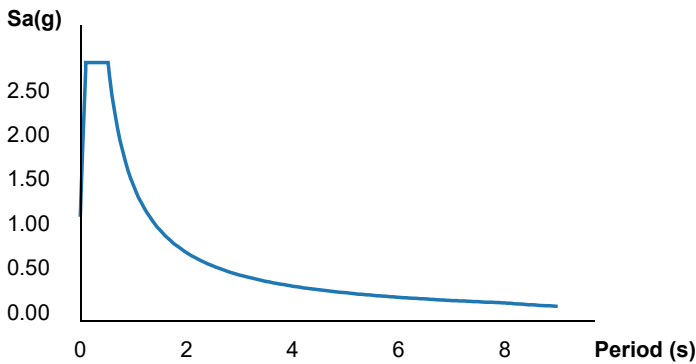
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

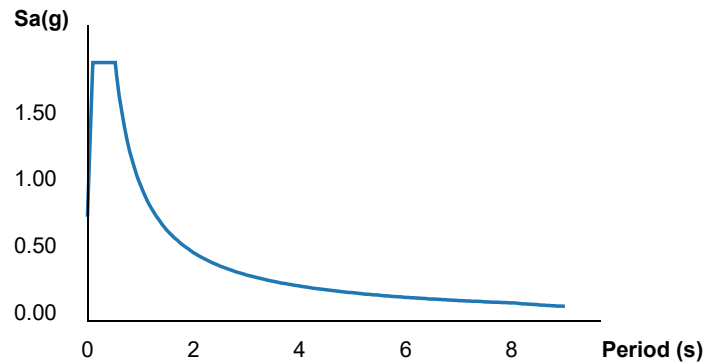


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.892	MCE _R ground motion (period=0.2s)
S ₁	1.009	MCE _R ground motion (period=1.0s)
S _{MS}	2.892	Site-modified spectral acceleration value
S _{M1}	1.513	Site-modified spectral acceleration value
S _{DS}	1.928	Numeric seismic design value at 0.2s SA
S _{D1}	1.009	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.94	Coefficient of risk (0.2s)

CR ₁	0.961	Coefficient of risk (1.0s)
PGA	1.081	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.081	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.892	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.075	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.251	Factored deterministic acceleration value (0.2s)
S1RT	1.009	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.05	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.261	Factored deterministic acceleration value (1.0s)
PGAd	1.189	Factored deterministic acceleration value (PGA)

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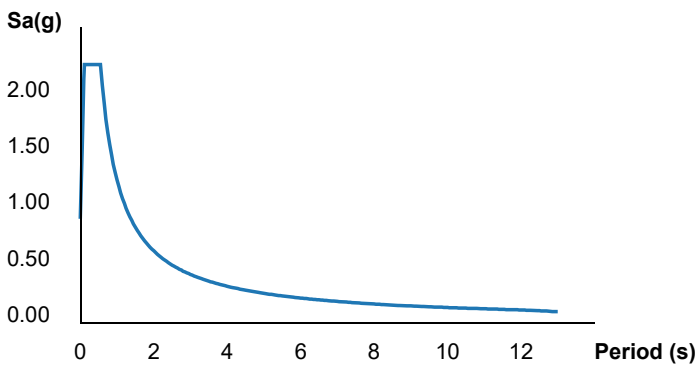
Search Information

Address: N Pine St, Orange, CA, USA
Coordinates: 34.44275, -118.39835
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

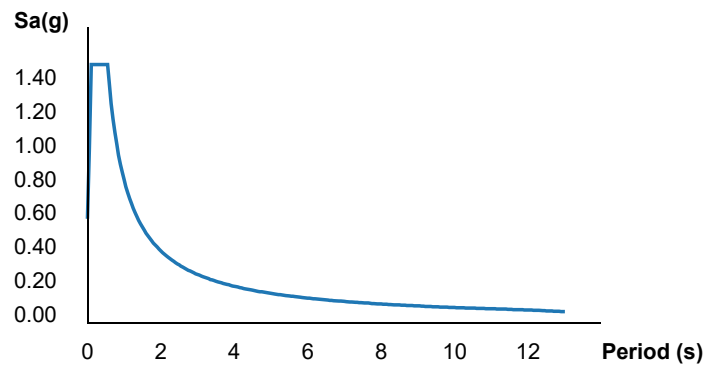


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.283	MCE_R ground motion (period=0.2s)
S_1	0.839	MCE_R ground motion (period=1.0s)
S_{MS}	2.283	Site-modified spectral acceleration value
S_{M1}	1.258	Site-modified spectral acceleration value
S_{DS}	1.522	Numeric seismic design value at 0.2s SA
S_{D1}	0.839	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	1.005	Coefficient of risk (0.2s)

CR ₁	1.015	Coefficient of risk (1.0s)
PGA	0.806	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.806	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.283	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.272	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.694	Factored deterministic acceleration value (0.2s)
S1RT	0.839	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.827	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.92	Factored deterministic acceleration value (1.0s)
PGA _d	1.01	Factored deterministic acceleration value (PGA)

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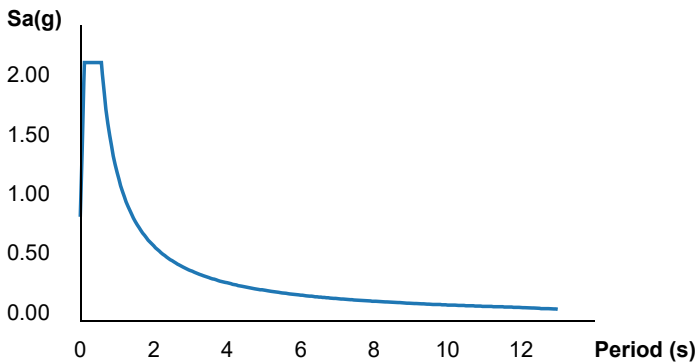
Search Information

Address: N Pine St, Orange, CA, USA
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Elevation: 1484 ft
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Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

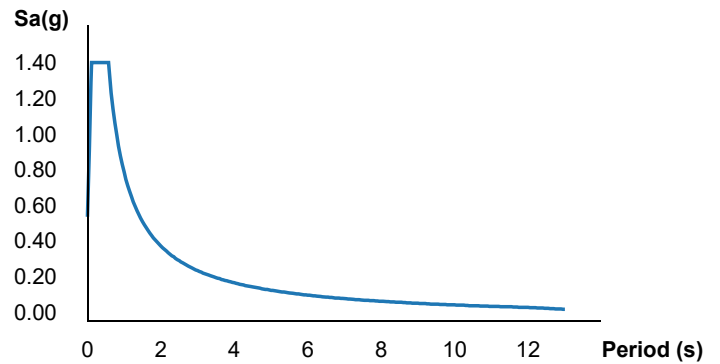


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.164	MCE_R ground motion (period=0.2s)
S_1	0.827	MCE_R ground motion (period=1.0s)
S_{MS}	2.164	Site-modified spectral acceleration value
S_{M1}	1.24	Site-modified spectral acceleration value
S_{DS}	1.442	Numeric seismic design value at 0.2s SA
S_{D1}	0.827	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	1.039	Coefficient of risk (0.2s)

CR ₁	1.024	Coefficient of risk (1.0s)
PGA	0.758	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.758	Site modified peak ground acceleration
T _L	12	Long-period transition period (s)
SsRT	2.164	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.082	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.86	Factored deterministic acceleration value (0.2s)
S1RT	0.827	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.807	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.988	Factored deterministic acceleration value (1.0s)
PGA _d	1.084	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

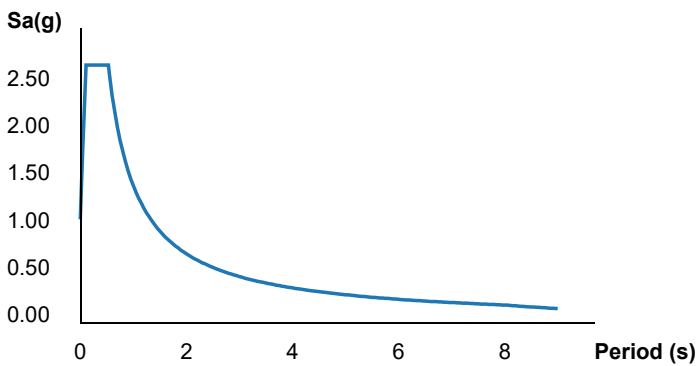
Search Information

Coordinates: 34.428466, -118.515572
Elevation: 1431 ft
Timestamp: 2021-03-29T18:31:04.138Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

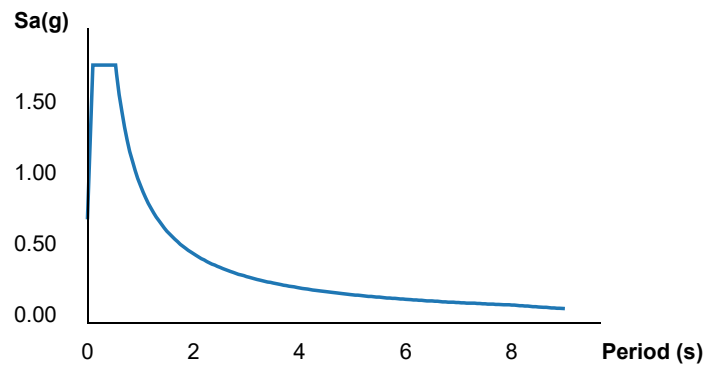


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.716	MCE _R ground motion (period=0.2s)
S_1	0.961	MCE _R ground motion (period=1.0s)
S_{MS}	2.716	Site-modified spectral acceleration value
S_{M1}	1.442	Site-modified spectral acceleration value
S_{DS}	1.811	Numeric seismic design value at 0.2s SA
S_{D1}	0.961	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.969	Coefficient of risk (0.2s)
CR_1	0.983	Coefficient of risk (1.0s)

PGA	0.981	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.981	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.716	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.805	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.017	Factored deterministic acceleration value (0.2s)
S1RT	0.961	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.978	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.232	Factored deterministic acceleration value (1.0s)
PGA _d	1.175	Factored deterministic acceleration value (PGA)

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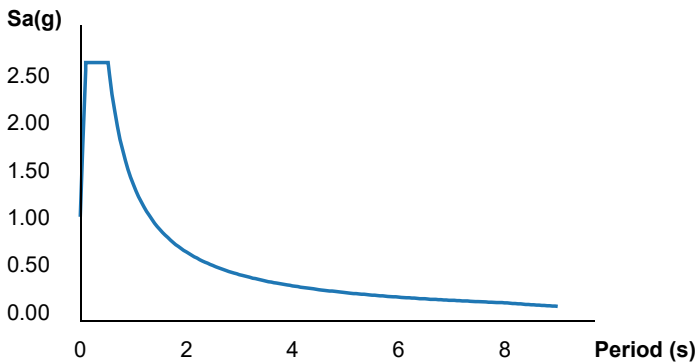
Search Information

Address: 27200 Sand Canyon Rd
Coordinates: 34.40309, -118.41687
Elevation: 1752 ft
Timestamp: 2021-03-05T04:36:33.700Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D

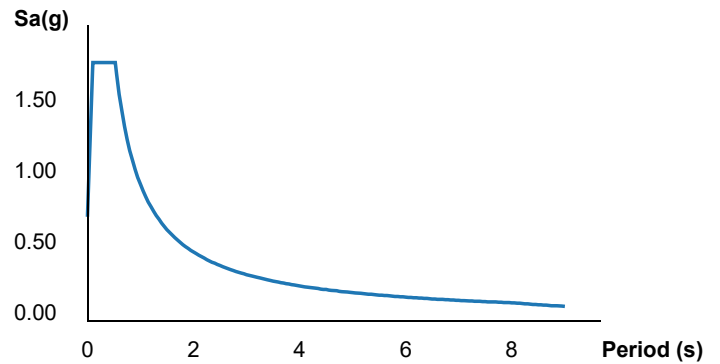


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MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.713	MCE _R ground motion (period=0.2s)
S ₁	0.952	MCE _R ground motion (period=1.0s)
S _{MS}	2.713	Site-modified spectral acceleration value
S _{M1}	1.428	Site-modified spectral acceleration value
S _{DS}	1.809	Numeric seismic design value at 0.2s SA
S _{D1}	0.952	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.954	Coefficient of risk (0.2s)

CR ₁	0.975	Coefficient of risk (1.0s)
PGA	0.997	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.997	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.713	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.843	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.996	Factored deterministic acceleration value (0.2s)
S1RT	0.952	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.977	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.133	Factored deterministic acceleration value (1.0s)
PGAd	1.16	Factored deterministic acceleration value (PGA)

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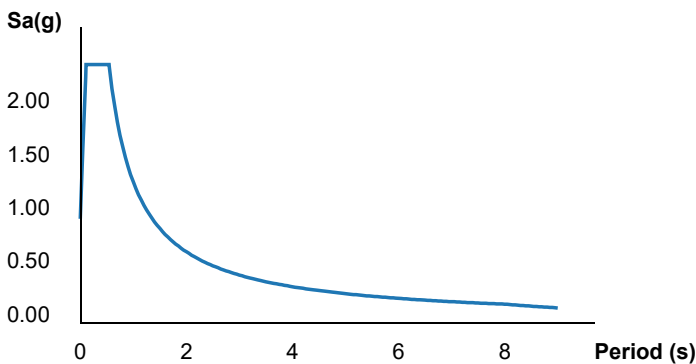
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Search Information

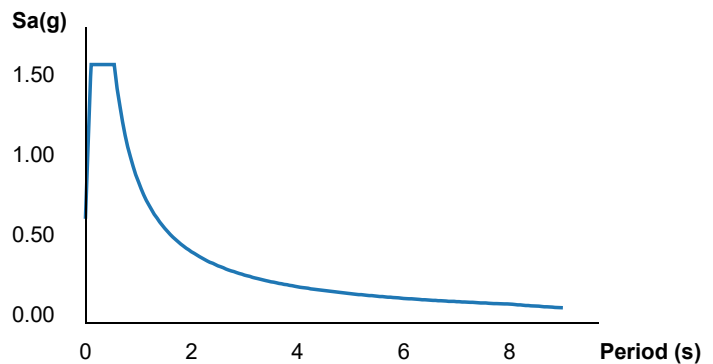
Address: N Pine St, Orange, CA, USA
Coordinates: 34.4551, -118.48029
Elevation: 1823 ft
Timestamp: 2021-03-05T04:30:20.539Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.408	MCE _R ground motion (period=0.2s)
S ₁	0.873	MCE _R ground motion (period=1.0s)
S _{MS}	2.408	Site-modified spectral acceleration value
S _{M1}	1.309	Site-modified spectral acceleration value
S _{DS}	1.605	Numeric seismic design value at 0.2s SA
S _{D1}	0.873	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.996	Coefficient of risk (0.2s)

CR ₁	1.006	Coefficient of risk (1.0s)
PGA	0.846	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.846	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.408	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.418	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.917	Factored deterministic acceleration value (0.2s)
S1RT	0.873	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.867	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.031	Factored deterministic acceleration value (1.0s)
PGA _d	1.114	Factored deterministic acceleration value (PGA)

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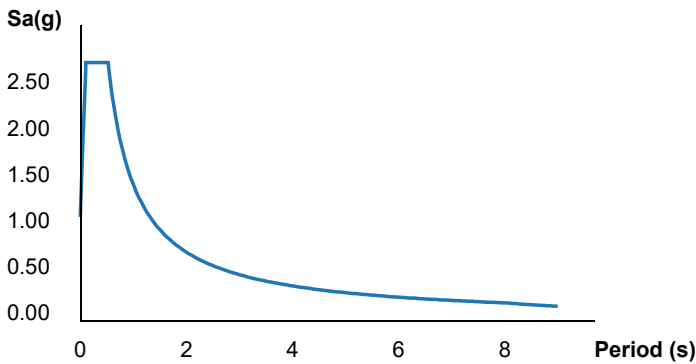
ATC Hazards by Location

Search Information

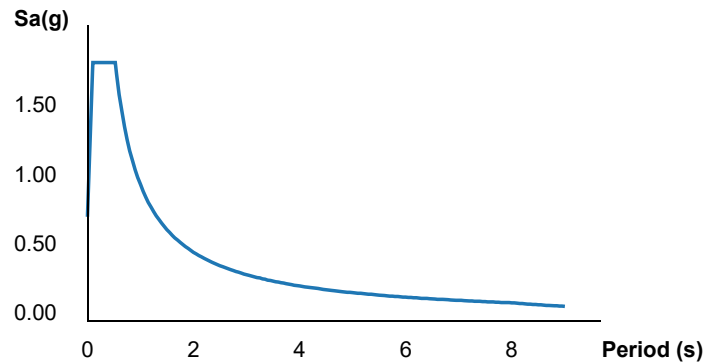
Address: 21575 Deputy Jakes Way
Coordinates: 34.4115746, -118.4497603
Elevation: 1447 ft
Timestamp: 2021-03-04T20:28:23.975Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.788	MCE _R ground motion (period=0.2s)
S ₁	0.977	MCE _R ground motion (period=1.0s)
S _{MS}	2.788	Site-modified spectral acceleration value
S _{M1}	1.465	Site-modified spectral acceleration value
S _{DS}	1.859	Numeric seismic design value at 0.2s SA
S _{D1}	0.977	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.957	Coefficient of risk (0.2s)

CR ₁	0.974	Coefficient of risk (1.0s)
PGA	1.017	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	1.017	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.788	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.914	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	3.006	Factored deterministic acceleration value (0.2s)
S1RT	0.977	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.002	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.156	Factored deterministic acceleration value (1.0s)
PGA _d	1.167	Factored deterministic acceleration value (PGA)

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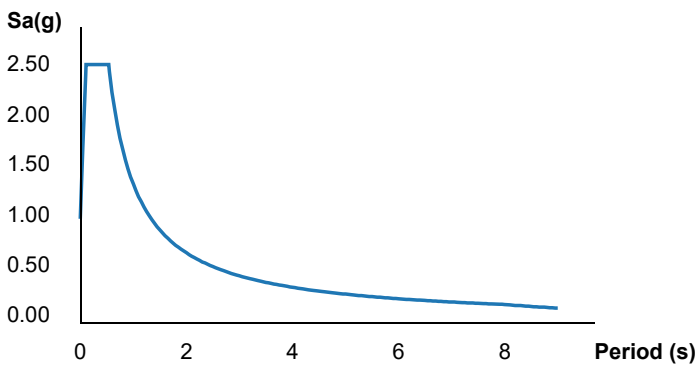
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Search Information

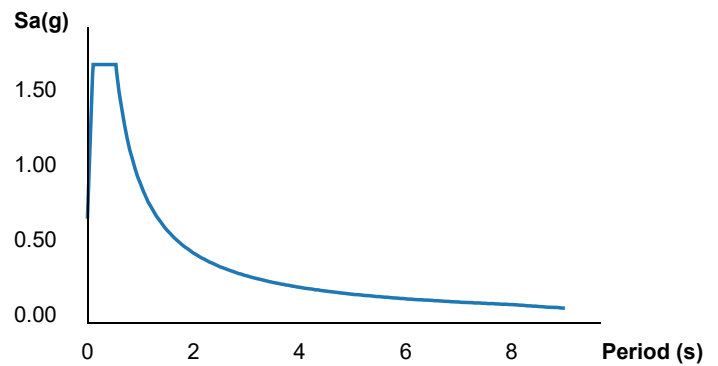
Address: N Pine St, Orange, CA, USA
Coordinates: 34.43882, -118.47974
Elevation: 1825 ft
Timestamp: 2021-03-05T04:27:56.668Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.566	MCE_R ground motion (period=0.2s)
S_1	0.916	MCE_R ground motion (period=1.0s)
S_{MS}	2.566	Site-modified spectral acceleration value
S_{M1}	1.374	Site-modified spectral acceleration value
S_{DS}	1.711	Numeric seismic design value at 0.2s SA
S_{D1}	0.916	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.979	Coefficient of risk (0.2s)

CR ₁	0.994	Coefficient of risk (1.0s)
PGA	0.914	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.914	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.566	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.621	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.978	Factored deterministic acceleration value (0.2s)
S1RT	0.916	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.921	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.096	Factored deterministic acceleration value (1.0s)
PGAd	1.148	Factored deterministic acceleration value (PGA)

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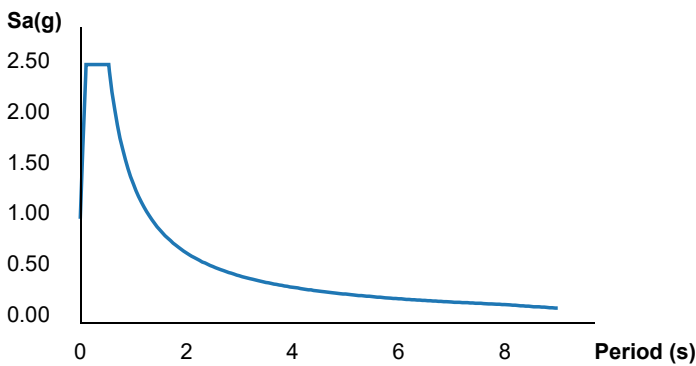
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Search Information

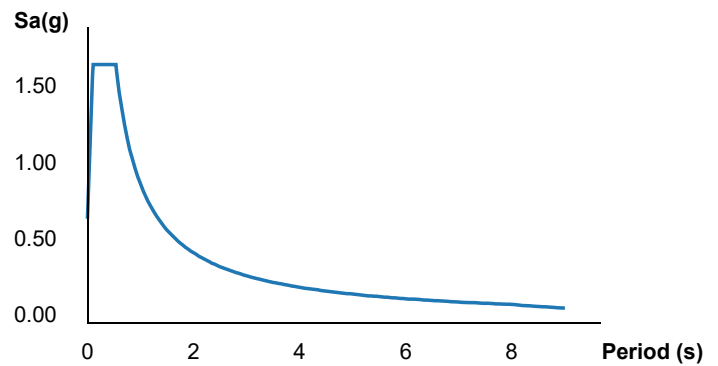
Address: Winterdale dr
Coordinates: 34.43161, -118.43327
Elevation: 1963 ft
Timestamp: 2021-03-05T04:39:19.511Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.53	MCE _R ground motion (period=0.2s)
S ₁	0.903	MCE _R ground motion (period=1.0s)
S _{MS}	2.53	Site-modified spectral acceleration value
S _{M1}	1.355	Site-modified spectral acceleration value
S _{DS}	1.686	Numeric seismic design value at 0.2s SA
S _{D1}	0.903	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	0.98	Coefficient of risk (0.2s)

CR ₁	0.995	Coefficient of risk (1.0s)
PGA	0.904	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.904	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.53	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.582	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.915	Factored deterministic acceleration value (0.2s)
S1RT	0.903	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.908	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.031	Factored deterministic acceleration value (1.0s)
PGAd	1.113	Factored deterministic acceleration value (PGA)

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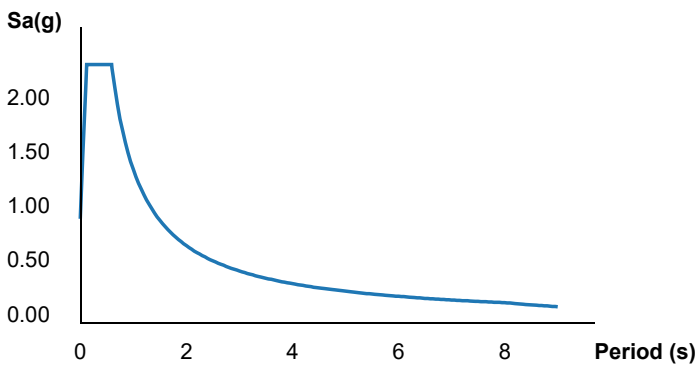
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Search Information

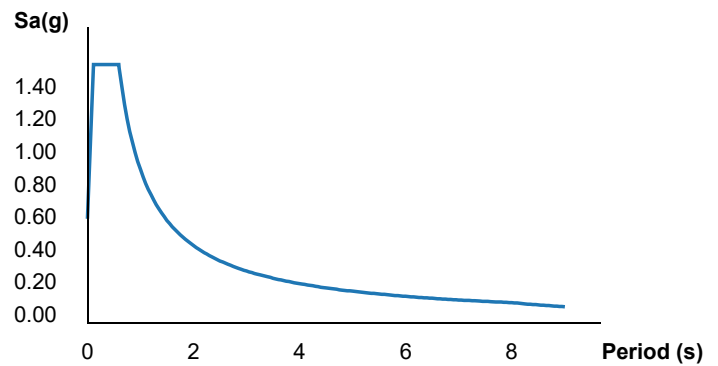
Address: Yucca Place
Coordinates: 34.4753, -118.62553
Elevation: 1422 ft
Timestamp: 2021-03-05T05:06:07.895Z
Hazard Type: Seismic
Reference Document: ASCE7-10
Risk Category: III
Site Class: D



MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S _S	2.366	MCE _R ground motion (period=0.2s)
S ₁	0.933	MCE _R ground motion (period=1.0s)
S _{MS}	2.366	Site-modified spectral acceleration value
S _{M1}	1.4	Site-modified spectral acceleration value
S _{DS}	1.577	Numeric seismic design value at 0.2s SA
S _{D1}	0.933	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	E	Seismic design category
F _a	1	Site amplification factor at 0.2s
F _v	1.5	Site amplification factor at 1.0s
CR _S	1.006	Coefficient of risk (0.2s)

CR ₁	1.005	Coefficient of risk (1.0s)
PGA	0.889	MCE _G peak ground acceleration
F _{PGA}	1	Site amplification factor at PGA
PGA _M	0.889	Site modified peak ground acceleration
T _L	8	Long-period transition period (s)
SsRT	2.548	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.533	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.366	Factored deterministic acceleration value (0.2s)
S1RT	0.933	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.929	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.992	Factored deterministic acceleration value (1.0s)
PGAd	0.91	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

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