Construction Vibration Calculation

Project: PG&E R-1402 L-130 Sacramento Crossing Replacement and Decommissioning
Location: West Work Area, PG&E Pipeline Substation, Levee Work Area and East Work Area

Equipment	PPV at 25 Feet From Source (in/sec)	Scenario-1 PPV at 500 Feet From Source (in/sec)	Scenario-2 PPV at 630 Feet From Source (in/sec)	Scenario-3 PPV at 120 Feet From Source (in/sec)	Scenario-4 PPV at 190 Feet From Source (in/sec)
Large Bulldozer	0.089	0.0018	0.0013	0.0116	0.0052
Small Bulldozer	0.003	0.0001	0.0000	0.0004	0.0002
Loaded Haul Trucks	0.076	0.0015	0.0011	0.0099	0.0044
Caisson Drilling	0.089	0.0018	--	--	0.0052

Attenuation Value		
Weak or soft soils:	1.4	Used for Residence 4
Competent soils:	1.3	Used for all other locations
Hard soils:	1.1	
Hard, competent rock:	1	

Source: Caltrans, 2013

Formula used:

PPVEquipment = PPVRef (25/D)^n

PPVEquip - Vibration at a specified distance from equipment
PPVRef - Reference PPV at 25 ft.
n - attenuation rate through ground
D - distance from equipment to the receiver in feet.

Source: Caltrans, 2013

Construction Vibration Calculation

Project: PG&E R-1402 L-130 Sacramento Crossing Replacement and Decommissioning
Location: West Work Area, PG&E Pipeline Substation, Levee Work Area and East Work Area

Equipment	Velocity Level at 25 Feet From Source (VdB)	Scenario-1 500 Feet From Source (VdB)	Scenario-2 630 Feet From Source VdB)	Scenario-3 120 Feet From Source (VdB)	Scenario-4 190 Feet From Source (VdB)
Large Bulldozer	87	47.9691		66.5628	60.5756
Small Bulldozer	58	18.9691	15.9580	37.5628	31.5756
Loaded Haul Trucks	86	46.9691	43.9580	65.5628	59.5756
Caisson Drilling	87	47.9691	--	--	60.5756

Formula used:

$Lv(D) = Lv - 30\log(D/25)$

PPVEquip - Vibration at a specified distance from equipment
Lv - Reference VdB at 25 ft.
D - distance from equipment to the receiver in feet.
Source: NTA, 2006