

Appendix F  
**Noise Analysis**

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## Noise Calculations for CHP Academy Drainage Channel Improvements Project

### Daytime calculations

Construction Equipment 1 (Concrete/Industrial Saw)	90	dBA at 50 feet
Construction Equipment 2 (Multiple)	85	dBA at 50 feet

### Combined Daytime Noise at 50 feet (Ltotal at 50 feet)

91.2 dBA

$$L_{total} = 10 \log(10^{L1/10} + 10^{L2/10})$$

### Noise Threshold Limits and Distances from Project Sites to those Limits for Construction Equipment

Noise Threshold	Threshold Level - CNEL db	Distance to Leq Threshold from Middle of Project Site (feet)
Ldn / CNEL for Low Density Residential	60	1,814.0

Source: West Sacramento Safety Element

### Nearest Sensitive Receptors and Approximate Distances from Middle of Project Site

Sensitive Receptor	Distance (feet)	Construction Noise level dBA	Noise Level Equation: $Leq = EL50 - 20 * \log(D/50)$
Nearest residences to center Project Site	3170	55.2	Residences on Garden Highway
Nearest church to center of Project Site	5300	50.7	Christ Holy Sanctified Church

### Vibration Source Levels for Construction Equipment (FTA 2018)

Equipment	PPV at 25 feet	VBA
Loaded Trucks	0.076	86
Large Bulldozer	0.089	87

### Vibration Calculations with Equations for Vibration-Causing Equipment (use of Loaded Trucks) for Project Site

Threshold	Distance to Threshold from Middle of Project Site (feet)	Notes
$PPV = PPV_{ref} * (25/d)^{1.5}$	18.4	Building damage threshold (sensitive buildings)
	125.3	Human Perception (65)
$Lvd = Lv_{ref} - 30 \log(D/25)$	39.6	Annoyance (Federal)

65 VdB - Also from Safety Element for Buildings with Sensitive Operations  
Federal - Annoyance 80 VdB, Damage, 0.12 PPV for sensitive buildings

### Vibration Calculations with Equations for Vibration-Causing Equipment (use of Large Bulldozer) for Project Site

Threshold	Distance to Threshold from Middle of Project Site (feet)	Notes
$PPV = PPV_{ref} * (25/d)^{1.5}$	20.5	Building damage threshold (sensitive buildings)
	135.3	Human Perception (65)
$Lvd = Lv_{ref} - 30 \log(D/25)$	42.8	Annoyance (Federal)

65 VdB