Appendix F
Noise Modeling (July 2024)

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = 75
allowable hours over which Leq is to be averaged = 12

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 12-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
1	Trenching/Boring/Conduit	compressor (air)	2	40	78	90	0		71.0	4	240	65	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		auger drill rig	1	20	84	90	0		77.0	6	360	67	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	1	20	90	90	0		83.0	1	60	65	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		excavator	1	40	81	90	0		74.0	6	360	67	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		skidsteer*	1	40	80	90	0		73.0	6	360	66	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		excavator	1	40	81	90	0		74.0	6	360	67	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	1	40	78	90	0		71.0	4	240	62	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	90	0		73.0	3	180	60	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compactor (ground)	1	20	80	90	0		73.0	3	180	60	5	5	0	5	85	90	7.1	85.1	90.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Trenching/Boring/Conduit Phase			**74.7**																
2	Cabling & Connection	generator	3	50	72	35	0		75.0	8	480	75	5	5	0	5	30	35	7.1	30.4	35.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Cabling & Connection Phase			**75.0**																
3	Cut-Overs	man lift	3	20	75	35	0		78.0	8	480	74	5	5	0	5	30	35	7.1	30.4	35.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Cut-Overs Phase			**74.0**																
4	Removal of Overhead Utilities	compressor (air)	2	40	78	65	0		75.6	6	360	72	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		man lift	2	20	75	65	0		72.6	8	480	67	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		crane	2	16	81	65	0		78.6	5	300	70	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Removal of Overhead Utilities Phase			**74.6**																
5	Post-Undergrounding Improvements	skidsteer*	1	40	80	160	0		66.3	8	480	61	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	1	20	90	160	0		76.3	2	120	62	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	2	50	85	160	0		71.3	8	480	70	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compressor (air)	1	40	78	160	0		64.3	8	480	59	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		crane	1	16	81	160	0		67.3	2	120	52	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	2	20	90	160	0		76.3	8	480	71	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	160	0		71.3	8	480	67	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compressor (air)	2	40	78	160	0		64.3	8	480	62	5	5	0	5	155	160	7.1	155.1	160.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Post-Undergrounding Improvements Phase			**74.8**																
6	Street Restoration	skidsteer*	1	40	80	120	0		69.5	8	480	64	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	1	40	79	120	0		68.5	8	480	63	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		paver	1	50	77	120	0		66.5	8	480	62	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		vacuum street sweeper	1	10	80	120	0		69.5	8	480	58	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	120	0		69.5	8	480	61	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	120	0		74.5	8	480	70	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	1	40	78	120	0		67.5	8	480	62	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	1	40	79	120	0		68.5	8	480	63	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		vacuum street sweeper	1	10	80	120	0		69.5	8	480	58	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	120	0		74.5	8	480	70	5	5	0	5	115	120	7.1	115.1	120.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Street Restoration Phase			**74.8**																

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = 85
allowable hours over which Leq is to be averaged = 8

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
1	Trenching/Boring/Conduit	compressor (air)	2	40	78	45	0		78.8	4	240	75	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		auger drill rig	1	20	84	45	0		84.8	6	360	77	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	1	20	90	45	0		90.8	1	60	75	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		excavator	1	40	81	45	0		81.8	6	360	77	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		skidsteer*	1	40	80	45	0		80.8	6	360	76	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		excavator	1	40	81	45	0		81.8	6	360	77	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	1	40	78	45	0		78.8	4	240	72	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	45	0		80.8	3	180	70	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compactor (ground)	1	20	80	45	0		80.8	3	180	70	5	5	0	5	40	45	7.1	40.3	45.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Trenching/Boring/Conduit Phase			**84.3**																
2	Cabling & Connection	generator	3	50	72	15	0		82.4	8	480	84	5	5	0	5	10	15	7.1	11.2	15.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Cabling & Connection Phase			**84.1**																
3	Cut-Overs	man lift	3	20	75	15	0		85.4	8	480	83	5	5	0	5	10	15	7.1	11.2	15.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Cut-Overs Phase			**83.2**																
4	Removal of Overhead Utilities	compressor (air)	2	40	78	25	0		83.9	6	360	82	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		man lift	2	20	75	25	0		80.9	8	480	77	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		crane	2	16	81	25	0		86.9	5	300	80	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Removal of Overhead Utilities Phase			**84.7**																
5	Post-Undergrounding Improvements	skidsteer*	1	40	80	80	0		74.6	8	480	71	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	1	20	90	80	0		84.6	2	120	72	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	2	50	85	80	0		79.6	8	480	80	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compressor (air)	1	40	78	80	0		72.6	8	480	69	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		crane	1	16	81	80	0		75.6	2	120	62	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	2	20	90	80	0		84.6	8	480	81	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	80	0		79.6	8	480	77	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compressor (air)	2	40	78	80	0		72.6	8	480	72	5	5	0	5	75	80	7.1	75.2	80.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Post-Undergrounding Improvements Phase			**84.8**																
6	Street Restoration	skidsteer*	1	40	80	65	0		77.6	8	480	74	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	1	40	79	65	0		76.6	8	480	73	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		paver	1	50	77	65	0		74.6	8	480	72	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		vacuum street sweeper	1	10	80	65	0		77.6	8	480	68	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	65	0		77.6	8	480	71	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	65	0		82.6	8	480	80	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	1	40	78	65	0		75.6	8	480	72	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	1	40	79	65	0		76.6	8	480	73	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		vacuum street sweeper	1	10	80	65	0		77.6	8	480	68	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	65	0		82.6	8	480	80	5	5	0	5	60	65	7.1	60.2	65.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Street Restoration Phase			**84.7**																

To User: bordered cells are inputs, unbordered cells have formulae
enter "0" to turn off air or grnd absorption terms, "1" to turn on

air abs? 1
grnd abs? 1

magnitude of threshold (dBA) = 90
allowable hours over which Leq is to be averaged = 8

Source, receptor, and barrier all share same reference grade elevation; unless otherwise noted)
= Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
1	Trenching/Boring/Conduit	compressor (air)	2	40	78	25	0		83.9	4	240	80	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		auger drill rig	1	20	84	25	0		89.9	6	360	82	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	1	20	90	25	0		95.9	1	60	80	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		excavator	1	40	81	25	0		86.9	6	360	82	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		skidsteer*	1	40	80	25	0		85.9	6	360	81	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		excavator	1	40	81	25	0		86.9	6	360	82	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	1	40	78	25	0		83.9	4	240	77	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	25	0		85.9	3	180	75	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compactor (ground)	1	20	80	25	0		85.9	3	180	75	5	5	0	5	20	25	7.1	20.6	25.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Trenching/Boring/Conduit Phase			**89.4**																
2	Cabling & Connection	generator	3	50	72	10	0		85.9	8	480	88	5	5	0	5	5	10	7.1	7.1	10.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Cabling & Connection Phase			**87.7**																
3	Cut-Overs	man lift	3	20	75	10	0		88.9	8	480	87	5	5	0	5	5	10	7.1	7.1	10.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Cut-Overs Phase			**86.7**																
4	Removal of Overhead Utilities	compressor (air)	2	40	78	15	0		88.4	6	360	86	5	5	0	5	10	15	7.1	11.2	15.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		man lift	2	20	75	15	0		85.4	8	480	81	5	5	0	5	10	15	7.1	11.2	15.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		crane	2	16	81	15	0		91.4	5	300	84	5	5	0	5	10	15	7.1	11.2	15.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Removal of Overhead Utilities Phase			**89.2**																
5	Post-Undergrounding Improvements	skidsteer*	1	40	80	55	0		79.1	8	480	75	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	1	20	90	55	0		89.1	2	120	76	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	2	50	85	55	0		84.1	8	480	84	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compressor (air)	1	40	78	55	0		77.1	8	480	73	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		crane	1	16	81	55	0		80.1	2	120	66	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		concrete saw	2	20	90	55	0		89.1	8	480	85	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	55	0		84.1	8	480	81	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		compressor (air)	2	40	78	55	0		77.1	8	480	76	5	5	0	5	50	55	7.1	50.2	55.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Post-Undergrounding Improvements Phase			**89.2**																
6	Street Restoration	skidsteer*	1	40	80	40	0		81.8	8	480	78	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	1	40	79	40	0		80.8	8	480	77	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		paver	1	50	77	40	0		78.8	8	480	76	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		vacuum street sweeper	1	10	80	40	0		81.8	8	480	72	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	40	0		81.8	8	480	75	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	40	0		86.8	8	480	84	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	1	40	78	40	0		79.8	8	480	76	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	1	40	79	40	0		80.8	8	480	77	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		vacuum street sweeper	1	10	80	40	0		81.8	8	480	72	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		all other equipment > 5 HP	1	50	85	40	0		86.8	8	480	84	5	5	0	5	35	40	7.1	35.4	40.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
									Total Aggregate Noise Exposure from Street Restoration Phase			**88.9**																

To User: boxed cells are user inputs. Leave others alone.

Non-transient groundborne vibration at exterior façade of following FTA Building/Structural Category

	I. R-concrete, steel, or timber		***II. E-concrete and masonry***		***III. N-E timber and masonry***		***IV. Extremely susceptible***	
exponent	1.5		1.5		1.5		1.5	
threshold	0.5	ips PPV	0.3	ips PPV	0.2	ips PPV	0.12	ips PPV

Groundborne Vibration Source (equipment or process)	PPV (at 25 feet)	VdB	Rcvr dist. (feet)	PPV rcvr	VdB*	Rcvr dist. (feet)	PPV rcvr	VdB*	Rcvr dist. (feet)	PPV rcvr	VdB*	Rcvr dist. (feet)	PPV rcvr	VdB*
vibratory roller	0.21	94	15	0.452	101	20	0.293	97	26	0.198	94	37	0.117	89
large bulldozer	0.089	87	10	0.352	99	15	0.191	94	15	0.191	94	21	0.116	89
caisson drilling	0.089	87	10	0.352	99	15	0.191	94	15	0.191	94	21	0.116	89
small bulldozer	0.003	58	5	0.034	78	5	0.034	78	1.6	0.185	93	2.25	0.111	89
jackhammer	0.035	79	25	0.035	79	25	0.035	79	8	0.193	94	11	0.120	90

*root mean square of the PPV, and presumes crest factor of 4 per FTA calculation technique

Tables below are from FTA's 2018 *Transit Noise and Vibration Impact Assessment Manual:*

Table 7-4 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft, in/sec	Approximate L_v* at 25 ft
Pile Driver (impact)	upper range	1.518	112
	typical	0.644	104
Pile Driver (sonic)	upper range	0.734	105
	typical	0.17	93
Clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.21	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

* RMS velocity in decibels, VdB re 1 micro-in/sec

Table 7-5 Construction Vibration Damage Criteria

Building/ Structural Category	PPV, in/sec	Approximate L_v*
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

*RMS velocity in decibels, VdB re 1 micro-in/sec