

Appendix D

Roadway Construction Noise Model and Vibration Noise Calculations

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: #####

Case Description: 575 Los Trancos Road

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Single Family Residential		65	60	55

		Equipment				
		Impact	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Description	Device	Usage(%)				
Backhoe	No	40		77.6	230	0
Compactor (ground)	No	20		83.2	230	0
Tractor	No	40	84		230	0
Dozer	No	40		81.7	230	0
Dump Truck	No	40		76.5	230	0
Excavator	No	40		80.7	230	0
Grader	No	40	85		230	0
Front End Loader	No	40		79.1	230	0
All Other Equipment >	No	50	85		230	0

Results

	Calculated (dBA)			Noise Limits (dBA)			
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Backhoe	64.3	60.3	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	70	63	N/A	N/A	N/A	N/A	N/A
Tractor	70.7	66.8	N/A	N/A	N/A	N/A	N/A
Dozer	68.4	64.4	N/A	N/A	N/A	N/A	N/A
Dump Truck	63.2	59.2	N/A	N/A	N/A	N/A	N/A
Excavator	67.5	63.5	N/A	N/A	N/A	N/A	N/A
Grader	71.7	67.8	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.9	61.9	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	71.7	68.7	N/A	N/A	N/A	N/A	N/A
Total	71.7	74.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Single Family Residential		65	60	55

		Equipment			
		Spec	Actual	Receptor	Estimated

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Backhoe	No	40		77.6	250	0
Compactor (ground)	No	20		83.2	250	0
Tractor	No	40	84		250	0
Dozer	No	40		81.7	250	0
Dump Truck	No	40		76.5	250	0
Excavator	No	40		80.7	250	0
Grader	No	40	85		250	0
Front End Loader	No	40		79.1	250	0
All Other Equipment >	No	50	85		250	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				
	*Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax
Backhoe	63.6	59.6	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	69.3	62.3	N/A	N/A	N/A	N/A	N/A
Tractor	70	66	N/A	N/A	N/A	N/A	N/A
Dozer	67.7	63.7	N/A	N/A	N/A	N/A	N/A
Dump Truck	62.5	58.5	N/A	N/A	N/A	N/A	N/A
Excavator	66.7	62.8	N/A	N/A	N/A	N/A	N/A
Grader	71	67	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.1	61.2	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	71	68	N/A	N/A	N/A	N/A	N/A
Total	71	73.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

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Roadway Construction Noise Model (RCNM),Version 1.1

Report date: #####

Case Description: 575 Los Trancos Road - Grading

---- Receptor #1 ----

		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Single Fami	Residential	65	60	55			
		Equipment					
		Impact		Spec	Actual	Receptor	Estimated
		Device	Usage(%)	Lmax	Lmax	Distance	Shielding
Description				(dBA)	(dBA)	(feet)	(dBA)
Backhoe	No		40		77.6	230	0
Compactor (ground)	No		20		83.2	230	0
Dozer	No		40		81.7	230	0
Excavator	No		40		80.7	230	0
Grader	No		40	85		230	0
Front End Loader	No		40		79.1	230	0
All Other Equipment >	No		50	85		230	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day	Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		64.3	60.3	N/A	N/A	N/A	N/A
Compactor (ground)		70	63	N/A	N/A	N/A	N/A
Dozer		68.4	64.4	N/A	N/A	N/A	N/A
Excavator		67.5	63.5	N/A	N/A	N/A	N/A
Grader		71.7	67.8	N/A	N/A	N/A	N/A
Front End Loader		65.9	61.9	N/A	N/A	N/A	N/A
All Other Equipment >		71.7	68.7	N/A	N/A	N/A	N/A
Total		71.7	73.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Single Fami	Residential	65	60	55			
		Equipment					
				Spec	Actual	Receptor	Estimated
		Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)	
Backhoe	No	40		77.6	250	0	
Compactor (ground)	No	20		83.2	250	0	

Dozer	No	40		81.7	250	0
Excavator	No	40		80.7	250	0
Grader	No	40	85		250	0
Front End Loader	No	40		79.1	250	0
All Other Equipment >	No	50	85		250	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				
	*Lmax	Leq	Day	Leq	Evening	Leq	Night
			Lmax		Lmax		Lmax
Backhoe	63.6	59.6	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	69.3	62.3	N/A	N/A	N/A	N/A	N/A
Dozer	67.7	63.7	N/A	N/A	N/A	N/A	N/A
Excavator	66.7	62.8	N/A	N/A	N/A	N/A	N/A
Grader	71	67	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.1	61.2	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	71	68	N/A	N/A	N/A	N/A	N/A
Total	71	72.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

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Roadway Construction Noise Model (RCNM),Version 1.1

Report date: #####

Case Description: 575 Los Trancos Road - Building Construction

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Single Family Residential		65	60	55

		Equipment				
		Impact	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Description	Device	Usage(%)				
Man Lift	No	20		74.7	230	0
Concrete Mixer Truck	No	40		78.8	230	0
Concrete Saw	No	20		89.6	230	0
Compactor (ground)	No	20		83.2	230	0
Compressor (air)	No	40		77.7	230	0
Crane	No	16		80.6	230	0
Dump Truck	No	40		76.5	230	0
Generator	No	50		80.6	230	0
Pumps	No	50		80.9	230	0
All Other Equipment >	No	50	85		230	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day	Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Lmax
Man Lift		61.4	54.5	N/A	N/A	N/A	N/A
Concrete Mixer Truck		65.5	61.6	N/A	N/A	N/A	N/A
Concrete Saw		76.3	69.3	N/A	N/A	N/A	N/A
Compactor (ground)		70	63	N/A	N/A	N/A	N/A
Compressor (air)		64.4	60.4	N/A	N/A	N/A	N/A
Crane		67.3	59.3	N/A	N/A	N/A	N/A
Dump Truck		63.2	59.2	N/A	N/A	N/A	N/A
Generator		67.4	64.4	N/A	N/A	N/A	N/A
Pumps		67.7	64.7	N/A	N/A	N/A	N/A
All Other Equipment >		71.7	68.7	N/A	N/A	N/A	N/A
Total		76.3	74.5	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Single Family Residential		65	60	55

Description	Impact Device	Usage(%)	Equipment			
			Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Man Lift	No	20		74.7	250	0
Concrete Mixer Truck	No	40		78.8	250	0
Concrete Saw	No	20		89.6	250	0
Compactor (ground)	No	20		83.2	250	0
Compressor (air)	No	40		77.7	250	0
Crane	No	16		80.6	250	0
Dump Truck	No	40		76.5	250	0
Generator	No	50		80.6	250	0
Pumps	No	50		80.9	250	0
All Other Equipment >	No	50	85		250	0

Equipment	Results				Noise Limits (dBA)		
	Calculated (dBA)		Day	Evening	Night	Lmax	Leq
	*Lmax	Leq					
Man Lift	60.7	53.7	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	64.8	60.8	N/A	N/A	N/A	N/A	N/A
Concrete Saw	75.6	68.6	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	69.3	62.3	N/A	N/A	N/A	N/A	N/A
Compressor (air)	63.7	59.7	N/A	N/A	N/A	N/A	N/A
Crane	66.6	58.6	N/A	N/A	N/A	N/A	N/A
Dump Truck	62.5	58.5	N/A	N/A	N/A	N/A	N/A
Generator	66.7	63.6	N/A	N/A	N/A	N/A	N/A
Pumps	67	64	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	71	68	N/A	N/A	N/A	N/A	N/A
Total	75.6	73.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

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Roadway Construction Noise Model (RCNM),Version 1.1

Report date: #####

Case Description: 575 Los Trancos Road - Paving

---- Receptor #1 ----

		Baselines (dBA)				
Description	Land Use	Daytime	Evening	Night		
Single Fami Residential		65	60	55		
		Equipment				
		Spec		Actual	Receptor	Estimated
		Lmax	Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Backhoe	No	40		77.6	230	0
Concrete Saw	No	20		89.6	230	0
Compactor (ground)	No	20		83.2	230	0
Tractor	No	40	84		230	0
Grader	No	40	85		230	0
Front End Loader	No	40		79.1	230	0
Paver	No	50		77.2	230	0
Roller	No	20		80	230	0
All Other Equipment >	No	50	85		230	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day	Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		64.3	60.3	N/A	N/A	N/A	N/A
Concrete Saw		76.3	69.3	N/A	N/A	N/A	N/A
Compactor (ground)		70	63	N/A	N/A	N/A	N/A
Tractor		70.7	66.8	N/A	N/A	N/A	N/A
Grader		71.7	67.8	N/A	N/A	N/A	N/A
Front End Loader		65.9	61.9	N/A	N/A	N/A	N/A
Paver		64	61	N/A	N/A	N/A	N/A
Roller		66.7	59.8	N/A	N/A	N/A	N/A
All Other Equipment >		71.7	68.7	N/A	N/A	N/A	N/A
Total		76.3	75.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Single Fami	Residential	65	60	55			
		Equipment					
		Spec		Actual	Receptor	Estimated	

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Backhoe	No	40		77.6	250	0
Concrete Saw	No	20		89.6	250	0
Compactor (ground)	No	20		83.2	250	0
Tractor	No	40	84		250	0
Grader	No	40	85		250	0
Front End Loader	No	40		79.1	250	0
Paver	No	50		77.2	250	0
Roller	No	20		80	250	0
All Other Equipment >	No	50	85		250	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				
	*Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax
Backhoe	63.6	59.6	N/A	N/A	N/A	N/A	N/A
Concrete Saw	75.6	68.6	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	69.3	62.3	N/A	N/A	N/A	N/A	N/A
Tractor	70	66	N/A	N/A	N/A	N/A	N/A
Grader	71	67	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.1	61.2	N/A	N/A	N/A	N/A	N/A
Paver	63.2	60.2	N/A	N/A	N/A	N/A	N/A
Roller	66	59	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	71	68	N/A	N/A	N/A	N/A	N/A
Total	75.6	74.5	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

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Roadway Construction Noise Model (RCNM),Version 1.1

Report date: #####

Case Description: 575 Los Trancos Road - Architectural Coating

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Single Family Residential		65	60	55

		Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
Description	Impact	Spec Lmax (dBA)	Actual Lmax (dBA)		
Compressor (air)	No	Usage(%) 40	77.7	230	0

Results

	Calculated (dBA)			Noise Limits (dBA)			
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)	64.4	60.4	N/A	N/A	N/A	N/A	N/A
Total	64.4	60.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Single Family Residential		65	60	55

		Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
Description	Impact	Spec Lmax (dBA)	Actual Lmax (dBA)		
Compressor (air)	No	Usage(%) 40	77.7	250	0

Results

	Calculated (dBA)			Noise Limits (dBA)			
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)	63.7	59.7	N/A	N/A	N/A	N/A	N/A
Total	63.7	59.7	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Noise Limit Exceedance (dBA)						
	Day	Evening		Night		
Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Noise Limit Exceedance (dBA)						
	Day	Evening		Night		
Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Groundborne Noise and Vibration Modeling

Notes

The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure.

Equipment	Reference Level Inputs			
	PPV _{ref} (in/sec)	Lv _{ref} (VdB)	RMS _{ref} (in/sec)	Reference Distance
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

Equipment	Vibration Level at Receiver			
	Distance (feet)	PPV _x (in/sec)	Lv _x (VdB)	RMS _x (in/sec)
Vibratory Roller	35	0.1450	91	0.035
Hoe Ram	35	0.0615	84	0.015
Large bulldozer	35	0.0615	84	0.015
Caisson drilling	35	0.0615	84	0.015
Loaded trucks	35	0.0525	80	0.010
Jack hammer	35	0.0242	76	0.006
Small bulldozer	35	0.0021	55	0.001

Equipment	Vibration Contours		
	Distance to (feet)		
	0.200 PPV	72.0 VdB	0.0080 RMS
Vibratory Roller	26	250	133
Hoe Ram	12	120	64
Large bulldozer	12	120	64
Caisson drilling	12	120	64
Loaded trucks	10	79	42
Jack hammer	5	52	28
Small bulldozer	1	6	3

Source

California Department of Transportation (Caltrans). 2013. Transportation and Construction
Last Updated: 4/11/2019

Groundborne Noise and Vibration Modeling

Notes

The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure.

Equipment	Reference Level Inputs			
	PPV _{ref} (in/sec)	Lv _{ref} (VdB)	RMS _{ref} (in/sec)	Reference Distance
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

Equipment	Vibration Level at Receiver			
	Distance (feet)	PPV _x (in/sec)	Lv _x (VdB)	RMS _x (in/sec)
Vibratory Roller	50	0.0980	87	0.023
Hoe Ram	50	0.0415	80	0.010
Large bulldozer	50	0.0415	80	0.010
Caisson drilling	50	0.0415	80	0.010
Loaded trucks	50	0.0355	76	0.007
Jack hammer	50	0.0163	72	0.004
Small bulldozer	50	0.0014	51	0.000

Equipment	Vibration Contours		
	Distance to (feet)		
	0.200 PPV	72.0 VdB	0.0080 RMS
Vibratory Roller	26	250	133
Hoe Ram	12	120	64
Large bulldozer	12	120	64
Caisson drilling	12	120	64
Loaded trucks	10	79	42
Jack hammer	5	52	28
Small bulldozer	1	6	3

Source

California Department of Transportation (Caltrans). 2013. Transportation and Construction
Last Updated: 4/11/2019