Appendix H

Ambient Noise Measurement Data and Noise Modeling Worksheets for Construction, Off-Site Traffic and Stationary Sources

NOISE APPENDIX

Noise Field Data

		Slow Response		dBA weighting	
Start Date	Start Time	LeqPeriod	Leq	Lmax	Lmin
6/13/2022	10:54:46 AM	15.1 min	65.6	71.3	58.9

		Slow Response		dBA weighting	
Start Date	Start Time	LeqPeriod	Leq	Lmax	Lmin
6/13/2022	12:10:27 PM	15.1 min	59.7	67.9	56

		Slow Response		dBA weighting	
Start Date	Start Time	LeqPeriod	Leq	Lmax	Lmin
6/13/2022	11:25:56 AM	15.3 min	70.2	75.5	62.3

		Slow Response	dBA weighting		
Start Date	Start Time	LeqPeriod	Leq	Lmax	Lmin
6/13/2022	10:11:27 PM	15.1 min	58.7	65.6	53.9

Rec 1 to 27		Slow Response	dBA weighting		
Start Date	Start Time	LeqPeriod	Leq	Lmax	Lmin
6/13/2022	10:00:02 AM	1.0 hour	67.9	94.2	54.1
6/13/2022	11:00:02 AM	1.0 hour	58.8	71.2	52.6
6/13/2022	12:00:02 PM	1.0 hour	63.6	71.6	54.7
6/13/2022	1:00:02 PM	1.0 hour	63.9	70.7	52.3
6/13/2022	2:00:02 PM	1.0 hour	64.9	76	60.5
6/13/2022	3:00:02 PM	1.0 hour	64.9	75.1	61.1
6/13/2022	4:00:02 PM	1.0 hour	64.4	75.9	60
6/13/2022	5:00:02 PM	1.0 hour	65.4	82.1	61.4
6/13/2022	6:00:02 PM	1.0 hour	63.9	77.9	51.7
6/13/2022	7:00:02 PM	1.0 hour	63.8	71.1	52.9
6/13/2022	8:00:02 PM	1.0 hour	63.2	74.1	54.8
6/13/2022	9:00:02 PM	1.0 hour	59.7	70.8	53.8
6/13/2022	10:00:02 PM	1.0 hour	62.2	75.6	53.4
6/13/2022	11:00:02 PM	1.0 hour	57.2	66.8	48.3
6/14/2022	12:00:02 AM	1.0 hour	59.9	68.4	49.6
6/14/2022	1:00:02 AM	1.0 hour	61.2	76.3	50.1
6/14/2022	2:00:02 AM	1.0 hour	57.3	69.4	45.8
6/14/2022	3:00:02 AM	1.0 hour	58.4	67.9	47.7
6/14/2022	4:00:02 AM	1.0 hour	61.1	74.6	51.6
6/14/2022	5:00:02 AM	1.0 hour	64.7	70.4	52.2
6/14/2022	6:00:02 AM	1.0 hour	64	72.4	56
6/14/2022	7:00:02 AM	1.0 hour	63.3	73.5	54.8
6/14/2022	8:00:02 AM	1.0 hour	61.3	75.8	54.6
6/14/2022	9:00:02 AM	1.0 hour	58	71.1	52.3
6/14/2022	10:00:02 AM	1.0 hour	60	74.9	53.9
6/14/2022	11:00:02 AM	1.0 hour	62.6	69.8	54.8
6/14/2022	12:00:01 PM	40.3 min	65.9	87.7	51.9

Rec 1 to 27		Slow Response	dBA weighting		
Start Date	Start Time	LeqPeriod	Leq	Lmax	Lmin
6/13/2022	9:39:32 AM	1.0 hour	38.4	62.3	34.8
6/13/2022	10:39:32 AM	1.0 hour	38.3	51.7	34.8
6/13/2022	11:39:32 AM	1.0 hour	38.8	56.9	34.6
6/13/2022	12:39:32 PM	1.0 hour	39.8	55.7	35.7
6/13/2022	1:39:32 PM	1.0 hour	44.2	61.4	34.8
6/13/2022	2:39:32 PM	1.0 hour	44.3	60.1	35.8
6/13/2022	3:39:32 PM	1.0 hour	45.5	61	36.2
6/13/2022	4:39:32 PM	1.0 hour	43.6	59.8	35.8
6/13/2022	5:39:32 PM	1.0 hour	38.1	55.4	31.8
6/13/2022	6:39:32 PM	1.0 hour	36.1	53.7	31.7
6/13/2022	7:39:32 PM	1.0 hour	39.9	52.9	31.8
6/13/2022	8:39:32 PM	1.0 hour	45.4	54.8	41.4
6/13/2022	9:39:32 PM	1.0 hour	42.9	49.3	38.1
6/13/2022	10:39:32 PM	1.0 hour	43.9	51	39.9
6/13/2022	11:39:32 PM	1.0 hour	43.1	45.6	38.2
6/14/2022	12:39:32 AM	1.0 hour	41.4	48.8	36.6
6/14/2022	1:39:32 AM	1.0 hour	38.4	46.3	35.2
6/14/2022	2:39:32 AM	1.0 hour	39.4	42.8	35.7
6/14/2022	3:39:32 AM	1.0 hour	37.3	42.3	33.4
6/14/2022	4:39:32 AM	1.0 hour	39.2	58.4	31.8
6/14/2022	5:39:32 AM	1.0 hour	35.4	48.9	31.8
6/14/2022	6:39:32 AM	1.0 hour	36	52.9	31.8
6/14/2022	7:39:32 AM	1.0 hour	39.3	64.3	33.5
6/14/2022	8:39:32 AM	1.0 hour	38.5	53.4	33.6
6/14/2022	9:39:32 AM	1.0 hour	39.2	57.2	33.5
6/14/2022	10:39:32 AM	1.0 hour	38.4	50.6	34.7
6/14/2022	11:39:32 AM	53.6 min	40.7	67.4	34.6

Leq	Time	Adjustment					
59.9	Midnight	10	69.9	69.9			
61.2	1	10	71.2	71.2			
57.3	2	10	67.3	67.3			
58.4	3	10	68.4	68.4			
61.1	4	10	71.1	71.1			
64.7	5	10	74.7	74.7			
64	6	10	74	74			
63.3	7am		63.3	63.3			
61.3	8		61.3	61.3			
58	9		58	58			
67.9	10		67.9	67.9			
58.8	11		58.8	58.8			
63.6	noon		63.6	63.6			
63.9	1		63.9	63.9			
64.9	2		64.9	64.9			
64.9	3		64.9	64.9			
64.4	4		64.4	64.4			
65.4	5		65.4	65.4			
63.9	6		63.9	63.9			
63.8	7	5	68.8	63.8			
63.2	8	5	68.2	63.2			
59.7	9	5	64.7	59.7			
62.2	10	10	72.2	72.2			
57.2	11	10	67.2	67.2			
			68.6	68.3			
			CNEL	LDN			

Leq	Time	Adjustment		
43.1	Midnight	10	53.1	53.1
41.4	1	10	51.4	51.4
38.4	2	10	48.4	48.4
39.4	3	10	49.4	49.4
37.3	4	10	47.3	47.3
39.2	5	10	49.2	49.2
35.4	6	10	45.4	45.4
36	7am		36	36
39.3	8		39.3	39.3
38.5	9		38.5	38.5
38.4	10		38.4	38.4
38.3	11		38.3	38.3
38.8	noon		38.8	38.8
39.8	1		39.8	39.8
44.2	2		44.2	44.2
44.3	3		44.3	44.3
45.5	4		45.5	45.5
43.6	5		43.6	43.6
38.1	6		38.1	38.1
36.1	7	5	41.1	36.1
39.9	8	5	44.9	39.9
45.4	9	5	50.4	45.4
42.9	10	10	52.9	52.9
43.9	11	10	53.9	53.9
			47.8	47.4
			CNEL	LDN

NOISE APPENDIX

Construction Noise Modeling Data

LOT 2 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 205 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Leq):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	205	76		72
	Grader	2	40	85	88	205	76		72
	Dump Truck	2	40	76	79	205	67		63
						Total Lmax for Phase:	**79**	Total Leq for Grading Phase:	**75**
Balancing/Aggregate Base	Grader	1	40	85	85	205	73		69
	Scraper	1	40	84	84	205	72		68
	Front End Loader	1	40	79	79	205	67		63
	Roller	1	20	80	80	205	68		61
						Total Lmax for Phase:	**76**	Total Leq for Balancing/Aggregate Base Phase:	**72**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	205	0		0
	Front End Loader	2	40	79	82	205	70		66
						Total Lmax for Phase:	**70**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**66**
Building Construction	Crane	1	16	81	81	285	66		58
	Gradall	3	40	83	88	285	73		69
	Generator	0	50	72	0	285	0		0
	Backhoe	3	40	78	83	285	68		64
	Welder / Torch	0	40	73	0	285	0		0
						Total Lmax for Phase:	**74**	Total Leq for Building Construction Phase:	**70**
Architectural Coating	Compressor (air)	0	40	78	0	285	0		0
						Total Lmax for Phase:	**0**	Total Leq for Architectural Coating Phase:	**0**
Asphalt Paving	Paver	1	50	77	77	205	65		62
	Grader	1	40	85	85	205	73		69
	Roller	1	20	80	80	205	68		61
						Total Lmax for Phase:	**74**	Total Leq for Asphalt Paving Phase:	**70**

LOT 2 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 510 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	510	68		64
	Grader	2	40	85	88	510	68		64
	Dump Truck	2	40	76	79	510	59		55
						Total Lmax for Phase:	**71**	Total Leq for Grading Phase:	**67**
Balancing/Aggregate Base	Grader	1	40	85	85	510	65		61
	Scraper	1	40	84	84	510	64		60
	Front End Loader	1	40	79	79	510	59		55
	Roller	1	20	80	80	510	60		53
						Total Lmax for Phase:	**69**	Total Leq for Balancing/Aggregate Base Phase:	**64**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	510	0		0
	Front End Loader	2	40	79	82	510	62		58
						Total Lmax for Phase:	**62**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**58**
Building Construction	Crane	1	16	81	81	510	61		53
	Gradall	3	40	83	88	510	68		64
	Generator	0	50	72	0	510	0		0
	Backhoe	3	40	78	83	510	63		59
	Welder / Torch	0	40	73	0	510	0		0
						Total Lmax for Phase:	**69**	Total Leq for Building Construction Phase:	**65**
Architectural Coating	Compressor (air)	0	40	78	0	510	0		0
						Total Lmax for Phase:	**0**	Total Leq for Architectural Coating Phase:	**0**
Asphalt Paving	Paver	1	50	77	77	510	57		54
	Grader	1	40	85	85	510	65		61
	Roller	1	20	80	80	510	60		53
						Total Lmax for Phase:	**67**	Total Leq for Asphalt Paving Phase:	**62**

LOT 2 - STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 205 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	60
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	0	40	82	0	205	0		0
	Grader	0	40	85	0	205	0		0
	Dump Truck	0	40	76	0	205	0		0
						Total Lmax for Phase:	**0**	Total Leq for Grading Phase:	**0.0**
Balancing/Aggregate Base	Grader	0	40	85	0	205	0		0
	Scraper	0	40	84	0	205	0		0
	Front End Loader	0	40	79	0	205	0		0
	Roller	0	20	80	0	205	0		0
						Total Lmax for Phase:	**0**	Total Leq for Balancing/Aggregate Base Phase:	**0.0**
Concrete Flatwork/Curb & Gutter	Stationary Cement Mixer	1	50	85	85	205	73		70
	Front End Loader	0	40	79	0	205	0		0
						Total Lmax for Phase:	**73**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**69.7**
Building Construction	Crane	0	16	81	0	285	0		0
	Gradall	0	40	83	0	285	0		0
	Generator	1	50	72	72	285	57		54
	Backhoe	0	40	78	0	285	0		0
	Welder / Torch	1	40	73	73	285	58		54
						Total Lmax for Phase:	**60**	Total Leq for Building Construction Phase:	**56.9**
Architectural Coating	Compressor (air)	1	40	78	78	285	63		59
						Total Lmax for Phase:	**63**	Total Leq for Architectural Coating Phase:	**58.9**
Asphalt Paving	Paver	0	50	77	0	205	0		0
	Grader	0	40	85	0	205	0		0
	Roller	0	20	80	0	205	0		0
						Total Lmax for Phase:	**0**	Total Leq for Asphalt Paving Phase:	**0.0**

LOT 3 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 425 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	425	69		65
	Grader	2	40	85	88	425	69		65
	Dump Truck	2	40	76	79	425	60		56
						Total Lmax for Phase:	**73**	Total Leq for Grading Phase:	**69**
Balancing/Aggregate Base	Grader	1	40	85	85	425	66		62
	Scraper	1	40	84	84	425	65		61
	Front End Loader	1	40	79	79	425	60		56
	Roller	1	20	80	80	425	61		54
						Total Lmax for Phase:	**70**	Total Leq for Balancing/Aggregate Base Phase:	**66**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	425	0		0
	Front End Loader	2	40	79	82	425	63		59
						Total Lmax for Phase:	**63**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**59**
Building Construction	Crane	1	16	81	81	525	61		53
	Gradall	3	40	83	88	525	67		63
	Generator	0	50	72	0	525	0		0
	Backhoe	3	40	78	83	525	62		58
	Welder / Torch	0	40	73	0	525	0		0
						Total Lmax for Phase:	**69**	Total Leq for Building Construction Phase:	**65**
Architectural Coating	Compressor (air)	0	40	78	0	525	0		0
						Total Lmax for Phase:	**0**	Total Leq for Architectural Coating Phase:	**0**
Asphalt Paving	Paver	1	50	77	77	425	58		55
	Grader	1	40	85	85	425	66		62
	Roller	1	20	80	80	425	61		54
						Total Lmax for Phase:	**68**	Total Leq for Asphalt Paving Phase:	**64**

LOT 3 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 850 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	850	63		59
	Grader	2	40	85	88	850	63		59
	Dump Truck	2	40	76	79	850	54		50
						Total Lmax for Phase:	**67**	Total Leq for Grading Phase:	**63**
Balancing/Aggregate Base	Grader	1	40	85	85	850	60		56
	Scraper	1	40	84	84	850	59		55
	Front End Loader	1	40	79	79	850	54		50
	Roller	1	20	80	80	850	55		48
						Total Lmax for Phase:	**64**	Total Leq for Balancing/Aggregate Base Phase:	**60**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	850	0		0
	Front End Loader	2	40	79	82	850	57		53
						Total Lmax for Phase:	**57**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**53**
Building Construction	Crane	1	16	81	81	850	56		48
	Gradall	3	40	83	88	850	63		59
	Generator	0	50	72	0	850	0		0
	Backhoe	3	40	78	83	850	58		54
	Welder / Torch	0	40	73	0	850	0		0
						Total Lmax for Phase:	**65**	Total Leq for Building Construction Phase:	**61**
Architectural Coating	Compressor (air)	0	40	78	0	850	0		0
						Total Lmax for Phase:	**0**	Total Leq for Architectural Coating Phase:	**0.0**
Asphalt Paving	Paver	1	50	77	77	850	52		49
	Grader	1	40	85	85	850	60		56
	Roller	1	20	80	80	850	55		48
						Total Lmax for Phase:	**62**	Total Leq for Asphalt Paving Phase:	**58**

LOT 3 - STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 425 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	60
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	0	40	82	0	425	0		0
	Grader	0	40	85	0	425	0		0
	Dump Truck	0	40	76	0	425	0		0
						Total Lmax for Phase:	**0**	Total Leq for Grading Phase:	**0**
Balancing/Aggregate Base	Grader	0	40	85	0	425	0		0
	Scraper	0	40	84	0	425	0		0
	Front End Loader	0	40	79	0	425	0		0
	Roller	0	20	80	0	425	0		0
						Total Lmax for Phase:	**0**	Total Leq for Balancing/Aggregate Base Phase:	**0**
Concrete Flatwork/Curb & Gutter	Stationary Cement Mixer	1	50	85	85	425	66		63
	Front End Loader	0	40	79	0	425	0		0
						Total Lmax for Phase:	**66**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**63**
Building Construction	Crane	0	16	81	0	525	0		0
	Gradall	0	40	83	0	525	0		0
	Generator	1	50	72	72	525	52		49
	Backhoe	0	40	78	0	525	0		0
	Welder / Torch	1	40	73	73	525	53		49
						Total Lmax for Phase:	**55**	Total Leq for Building Construction Phase:	**52**
Architectural Coating	Compressor (air)	1	40	78	78	525	58		54
						Total Lmax for Phase:	**58**	Total Leq for Architectural Coating Phase:	**54**
Asphalt Paving	Paver	0	50	77	0	425	0		0
	Grader	0	40	85	0	425	0		0
	Roller	0	20	80	0	425	0		0
						Total Lmax for Phase:	**0**	Total Leq for Asphalt Paving Phase:	**0**

LOT 10 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 225 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	225	75		71
	Grader	2	40	85	88	225	75		71
	Dump Truck	2	40	76	79	225	66		62
						Total Lmax for Phase:	**78**	Total Leq for Grading Phase:	**74**
Balancing/Aggregate Base	Grader	1	40	85	85	225	72		68
	Scraper	1	40	84	84	225	71		67
	Front End Loader	1	40	79	79	225	66		62
	Roller	1	20	80	80	225	67		60
						Total Lmax for Phase:	**76**	Total Leq for Balancing/Aggregate Base Phase:	**71**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	225	0		0
	Front End Loader	2	40	79	82	225	69		65
						Total Lmax for Phase:	**69**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**65**
Building Construction	Crane	1	16	81	81	225	68		60
	Gradall	3	40	83	88	225	75		71
	Generator	0	50	72	0	225	0		0
	Backhoe	3	40	78	83	225	70		66
	Welder / Torch	0	40	73	0	225	0		0
						Total Lmax for Phase:	**77**	Total Leq for Building Construction Phase:	**72**
Architectural Coating	Compressor (air)	0	40	78	0	225	0		0
						Total Lmax for Phase:	**0**	Total Leq for Architectural Coating Phase:	**0**
Asphalt Paving	Paver	1	50	77	77	225	64		61
	Grader	1	40	85	85	225	72		68
	Roller	1	20	80	80	225	67		60
						Total Lmax for Phase:	**74**	Total Leq for Asphalt Paving Phase:	**69**

LOT 10 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 500 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	500	68		64
	Grader	2	40	85	88	500	68		64
	Dump Truck	2	40	76	79	500	59		55
						Total Lmax for Phase:	**71**	Total Leq for Grading Phase:	**67**
Balancing/Aggregate Base	Grader	1	40	85	85	500	65		61
	Scraper	1	40	84	84	500	64		60
	Front End Loader	1	40	79	79	500	59		55
	Roller	1	20	80	80	500	60		53
						Total Lmax for Phase:	**69**	Total Leq for Balancing/Aggregate Base Phase:	**64**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	500	0		0
	Front End Loader	2	40	79	82	500	62		58
						Total Lmax for Phase:	**62**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**58**
Building Construction	Crane	1	16	81	81	500	61		53
	Gradall	3	40	83	88	500	68		64
	Generator	0	50	72	0	500	0		0
	Backhoe	3	40	78	83	500	63		59
	Welder / Torch	0	40	73	0	500	0		0
						Total Lmax for Phase:	**70**	Total Leq for Building Construction Phase:	**65**
Architectural Coating	Compressor (air)	0	40	78	0	500	0		0
						Total Lmax for Phase:	**0**	Total Leq for Architectural Coating Phase:	**0**
Asphalt Paving	Paver	1	50	77	77	500	57		54
	Grader	1	40	85	85	500	65		61
	Roller	1	20	80	80	500	60		53
						Total Lmax for Phase:	**67**	Total Leq for Asphalt Paving Phase:	**62**

LOT 10 - STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 225 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	60
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	0	40	82	0	225	0		0
	Grader	0	40	85	0	225	0		0
	Dump Truck	0	40	76	0	225	0		0
						Total Lmax for Phase:	**0**	Total Leq for Grading Phase:	**0**
Balancing/Aggregate Base	Grader	0	40	85	0	225	0		0
	Scraper	0	40	84	0	225	0		0
	Front End Loader	0	40	79	0	225	0		0
	Roller	0	20	80	0	225	0		0
						Total Lmax for Phase:	**0**	Total Leq for Balancing/Aggregate Base Phase:	**0**
Concrete Flatwork/Curb & Gutter	Stationary Cement Mixer	1	50	85	85	225	72		69
	Front End Loader	0	40	79	0	225	0		0
						Total Lmax for Phase:	**72**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**69**
Building Construction	Crane	0	16	81	0	350	0		0
	Gradall	0	40	83	0	350	0		0
	Generator	1	50	72	72	350	55		52
	Backhoe	0	40	78	0	350	0		0
	Welder / Torch	1	40	73	73	350	56		52
						Total Lmax for Phase:	**59**	Total Leq for Building Construction Phase:	**55**
Architectural Coating	Compressor (air)	1	40	78	78	350	61		57
						Total Lmax for Phase:	**61**	Total Leq for Architectural Coating Phase:	**57**
Asphalt Paving	Paver	0	50	77	0	225	0		0
	Grader	0	40	85	0	225	0		0
	Roller	0	20	80	0	225	0		0
						Total Lmax for Phase:	**0**	Total Leq for Asphalt Paving Phase:	**0.0**

LOT 8 & 9 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 245 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	245	74		70
	Grader	2	40	85	88	245	74		70
	Dump Truck	2	40	76	79	245	65		61
					Total Lmax for Phase:		**77**	Total Leq for Grading Phase:	**74**
Balancing/Aggregate Base	Grader	1	40	85	85	245	71		67
	Scraper	1	40	84	84	245	70		66
	Front End Loader	1	40	79	79	245	65		61
	Roller	1	20	80	80	245	66		59
					Total Lmax for Phase:		**75**	Total Leq for Balancing/Aggregate Base Phase:	**71**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	285	0		0
	Front End Loader	2	40	79	82	285	67		63
					Total Lmax for Phase:		**67**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**63**
Building Construction	Crane	1	16	81	81	365	64		56
	Gradall	3	40	83	88	365	71		67
	Generator	0	50	72	0	365	0		0
	Backhoe	3	40	78	83	365	66		62
	Welder / Torch	0	40	73	0	365	0		0
					Total Lmax for Phase:		**72**	Total Leq for Building Construction Phase:	**68**
Architectural Coating	Compressor (air)	0	40	78	0	365	0		0
					Total Lmax for Phase:		**0**	Total Leq for Architectural Coating Phase:	**0**
Asphalt Paving	Paver	1	50	77	77	245	63		60
	Grader	1	40	85	85	245	71		67
	Roller	1	20	80	80	245	66		59
					Total Lmax for Phase:		**73**	Total Leq for Asphalt Paving Phase:	**69**

LOT 8 & 9 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 460 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	460	69		65
	Grader	2	40	85	88	460	69		65
	Dump Truck	2	40	76	79	460	60		56
					Total Lmax for Phase:		**72**	Total Leq for Grading Phase:	**68**
Balancing/Aggregate Base	Grader	1	40	85	85	460	66		62
	Scraper	1	40	84	84	460	65		61
	Front End Loader	1	40	79	79	460	60		56
	Roller	1	20	80	80	460	61		54
					Total Lmax for Phase:		**69**	Total Leq for Balancing/Aggregate Base Phase:	**65**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	460	0		0
	Front End Loader	2	40	79	82	460	63		59
					Total Lmax for Phase:		**63**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**59**
Building Construction	Crane	1	16	81	81	460	62		54
	Gradall	3	40	83	88	460	68		65
	Generator	0	50	72	0	460	0		0
	Backhoe	3	40	78	83	460	63		60
	Welder / Torch	0	40	73	0	460	0		0
					Total Lmax for Phase:		**70**	Total Leq for Building Construction Phase:	**66**
Architectural Coating	Compressor (air)	0	40	78	0	460	0		0
					Total Lmax for Phase:		**0**	Total Leq for Architectural Coating Phase:	**0**
Asphalt Paving	Paver	1	50	77	77	460	58		55
	Grader	1	40	85	85	460	66		62
	Roller	1	20	80	80	460	61		54
					Total Lmax for Phase:		**67**	Total Leq for Asphalt Paving Phase:	**63**

LOT 8 & 9 - STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 460 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Lmax):	60
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	0	40	82	0	245	0		0
	Grader	0	40	85	0	245	0		0
	Dump Truck	0	40	76	0	245	0		0
						Total Lmax for Phase:	**0**	Total Leq for Grading Phase:	**0**
Balancing/Aggregate Base	Grader	0	40	85	0	245	0		0
	Scraper	0	40	84	0	245	0		0
	Front End Loader	0	40	79	0	245	0		0
	Roller	0	20	80	0	245	0		0
						Total Lmax for Phase:	**0**	Total Leq for Balancing/Aggregate Base Phase:	**0**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	1	50	85	85	285	70		67
	Front End Loader	0	40	79	0	285	0		0
						Total Lmax for Phase:	**70**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**66.9**
Building Construction	Crane	0	16	81	0	365	0		0
	Gradall	0	40	83	0	365	0		0
	Generator	1	50	72	72	365	55		52
	Backhoe	0	40	78	0	365	0		0
	Welder / Torch	1	40	73	73	365	56		52
						Total Lmax for Phase:	**58**	Total Leq for Building Construction Phase:	**55**
Architectural Coating	Compressor (air)	1	40	78	78	365	61		57
						Total Lmax for Phase:	**61**	Total Leq for Architectural Coating Phase:	**57**
Asphalt Paving	Paver	0	50	77	0	245	0		0
	Grader	0	40	85	0	245	0		0
	Roller	0	20	80	0	245	0		0
						Total Lmax for Phase:	**5**	Total Leq for Asphalt Paving Phase:	**0**

LOT 8 & 9 - MOBILE EQUIPMENT EVALUATION - DISTANCE TO CLOSEST OFFSITE COMMERCIAL RECEIVER

County Ordinance Limit (Lmax):	85
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	75	84		81
	Grader	2	40	85	88	75	84		81
	Dump Truck	2	40	76	79	75	75		72
						Total Lmax for Phase:	**88**	Total Leq for Grading Phase:	**84**
Balancing/Aggregate Base	Grader	1	40	85	85	75	81		77
	Scraper	1	40	84	84	75	80		76
	Front End Loader	1	40	79	79	75	75		71
	Roller	1	20	80	80	75	76		69
						Total Lmax for Phase:	**85**	Total Leq for Balancing/Aggregate Base Phase:	**81**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	1	50	85	85	100	79		76
	Front End Loader	2	40	79	82	100	76		72
						Total Lmax for Phase:	**81**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**77**
Building Construction	Crane	1	16	81	81	100	75		67
	Gradall	3	40	83	88	100	82		78
	Generator	1	50	72	72	100	66		63
	Backhoe	3	40	78	83	100	77		73
	Welder / Torch	1	40	73	73	100	67		63
						Total Lmax for Phase:	**84**	Total Leq for Building Construction Phase:	**79**
Architectural Coating	Compressor (air)	1	40	78	78	100	72		68
						Total Lmax for Phase:	**72**	Total Leq for Architectural Coating Phase:	**68**
Asphalt Paving	Paver	1	50	77	77	50	77		74
	Grader	1	40	85	85	50	85		81
	Roller	1	20	80	80	450	61		54
						Total Lmax for Phase:	**86**	Total Leq for Asphalt Paving Phase:	**82**

LOT 22 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 110 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Leq):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	110	81		77
	Grader	2	40	85	88	110	81		77
	Dump Truck	2	40	76	79	110	72		68
						Total Lmax for Phase:	**84**	Total Leq for Grading Phase:	**80**
Balancing/Aggregate Base	Grader	1	40	85	85	110	78		74
	Scraper	1	40	84	84	110	77		73
	Front End Loader	1	40	79	79	110	72		68
	Roller	1	20	80	80	110	73		66
						Total Lmax for Phase:	**82**	Total Leq for Balancing/Aggregate Base Phase:	**78**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	205	0		0
	Front End Loader	2	40	79	82	205	70		66
						Total Lmax for Phase:	**70**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**66**
Asphalt Paving	Paver	1	50	77	77	205	65		62
	Grader	1	40	85	85	205	73		69
	Roller	1	20	80	80	205	68		61
						Total Lmax for Phase:	**74**	Total Leq for Asphalt Paving Phase:	**70**

LOT 22 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 110 FEET TO OFFSITE RECEIVER - MITIGATED

County Ordinance Limit (Leq):	75
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	1	40	82	82	110	75		71
	Grader	0	40	85	0	110	0		0
	Dump Truck	0	40	76	0	110	0		0
						Total Lmax for Phase:	**75**	Total Leq for Grading Phase:	**71**
Balancing/Aggregate Base	Grader	1	40	85	85	110	78		74
	Scraper	0	40	84	0	110	0		0
	Front End Loader	0	40	79	0	110	0		0
	Roller	0	20	80	0	110	0		0
						Total Lmax for Phase:	**78**	Total Leq for Balancing/Aggregate Base Phase:	**74**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	0	50	85	0	205	0		0
	Front End Loader	2	40	79	82	205	70		66
						Total Lmax for Phase:	**70**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**66**
Asphalt Paving	Paver	1	50	77	77	205	65		62
	Grader	1	40	85	85	205	73		69
	Roller	1	20	80	80	205	68		61
						Total Lmax for Phase:	**74**	Total Leq for Asphalt Paving Phase:	**70**

LOT 22 - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 545 FEET TO OFFSITE RECEIVER

Mobile Construction Equipment

County Ordinance Limit (Leq): 75
Averaging Period (in hours): 1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	4	40	82	88	545	67		63
	Grader	2	40	85	88	545	67		63
	Dump Truck	2	40	76	79	545	58		54
						Total Lmax for Phase:	**71**	Total Leq for Grading Phase:	**67**
Balancing/Aggregate Base	Grader	1	40	85	85	545	64		60
	Scraper	1	40	84	84	545	63		59
	Front End Loader	1	40	79	79	545	58		54
	Roller	1	20	80	80	545	59		52
						Total Lmax for Phase:	**68**	Total Leq for Balancing/Aggregate Base Phase:	**64**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	1	50	85	85	545	64		61
	Front End Loader	2	40	79	82	545	61		57
						Total Lmax for Phase:	**66**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**63**
Asphalt Paving	Paver	1	50	77	77	545	56		53
	Grader	1	40	85	85	545	64		60
	Roller	1	20	80	80	545	59		52
						Total Lmax for Phase:	**66**	Total Leq for Asphalt Paving Phase:	**62**

LOT 22 - STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 110 FEET TO OFFSITE RECEIVER

County Ordinance Limit (Leq):	60
Averaging Period (in hours):	1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax for Quantity of Equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 1-hour Leq
Grading	Dozer	0	40	82	0	110	0		0
	Grader	0	40	85	0	110	0		0
	Dump Truck	0	40	76	0	110	0		0
						Total Lmax for Phase:	**0**	Total Leq for Grading Phase:	**0**
Balancing/Aggregate Base	Grader	0	40	85	0	110	0		0
	Scraper	0	40	84	0	110	0		0
	Front End Loader	0	40	79	0	110	0		0
	Roller	0	20	80	0	110	0		0
						Total Lmax for Phase:	**0**	Total Leq for Balancing/Aggregate Base Phase:	**0**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	1	50	85	85	205	73		70
	Front End Loader	0	40	79	0	205	0		0
						Total Lmax for Phase:	**73**	Total Leq for Concrete Flatwork/Curb & Gutter Phase:	**70**
Asphalt Paving	Paver	0	50	77	0	205	0		0
	Grader	0	40	85	0	205	0		0
	Roller	0	20	80	0	205	0		0
						Total Lmax for Phase:	**0**	Total Leq for Asphalt Paving Phase:	**0**

THE OLD ROAD IMPROVEMENTS- MOBILE EQUIPMENT EVALUATION - DISTANCE OF 435 FEET TO RECEIVER

Mobile Construction Equipment

County Ordinance Limit (Lmax dBA): 75
Averaging Period (in hours): 1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax @ 50 ft. for quantify of equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 11-hour Leq
Grading	Dozer	1	40	82	82	435	63.2		59
	Grader	1	40	85	85	435	66.2		62
	Dump Truck	1	40	76	76	435	57.2		53
						Total Lmax for Grading Phase:	**68.3**	Total Leq for Phase:	**64.3**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	1	50	85	85	435	66.2		63
	Front End Loader	1	40	79	79	435	60.2		56
						Total for Concrete Flatwork/Curb & Gutter Phase:	**67.2**	Total Leq for Phase:	**64.0**
Asphalt Paving	Paver	1	50	77	77	435	58.2		55
	Grader	1	40	85	85	435	66.2		62
	Roller	1	20	80	80	435	61.2		54
						Total for Asphalt Paving Phase:	**67.9**	Total Leq for Phase:	**63.6**

THE OLD ROAD IMPROVEMENTS- STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 435 FEET TO RECEIVER

Mobile Construction Equipment

County Ordinance Limit (Lmax dBA): 75
Averaging Period (in hours): 1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax @ 50 ft. for quantify of equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 11-hour Leq
Grading	Dozer	0	40	82	0	435	0.0		0
	Grader	0	40	85	0	435	0.0		0
	Dump Truck	0	40	76	0	435	0.0		0
						Total Lmax for Grading Phase:	**0.0**	Total Leq for Phase:	**0.0**
Concrete Flatwork/Curb & Gutter	All Other Equipment > 5 HP	1	50	85	85	435	66.2		63
	Front End Loader	0	40	79	0	435	0.0		0
						Total for Concrete Flatwork/Curb & Gutter Phase:	**66.2**	Total Leq for Phase:	**63.2**
Asphalt Paving	Paver	0	50	77	0	435	0.0		0
	Grader	0	40	85	0	435	0.0		0
	Roller	0	20	80	0	435	0.0		0
						Total for Asphalt Paving Phase:	**0.0**	Total Leq for Phase:	**0.0**

PUMP STATION 4 & 5 IMPROVEMENTS - MOBILE EQUIPMENT EVALUATION - DISTANCE OF 35 FEET TO RECEIVER

Mobile Construction Equipment

County Ordinance Limit (Lmax dBA): 75
Averaging Period (in hours): 1

Construction Phase	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Lmax @ 50 ft. for quantify of equipment	Source to NSR Distance (ft.)	Distance-Adjusted Lmax		Predicted 11-hour Leq
Pumps Upgrade	Backhoe	1	40	78	78	35	81.1		77
	Man Lift	1	20	75	75	35	78.1		71
	Dump Truck	1	40	76	76	35	79.1		75
						Total Lmax for Pumps Upgrade Phase:	84.4	Total Leq for Phase:	**79.9**

MOBILE EQUIPMENT EVALUATION - DISTANCE OF 250 FEET - ONSITE GROUND LEVEL RECEIVER - NO BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Mobile Source(s) of Noise at each Project Phase for onsite receiver position at first floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 75
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	250	0		68.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	0	40	85	250	0		71.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		dump truck	0	40	76	250	0		62.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Grading Phase	**0.0**																
2	Balancing / Aggregate Base	grader	0	40	85	250	0		71.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		scraper	0	40	84	250	0		70.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	250	0		65.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	0	20	80	250	0		66.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**0.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	250	0		65.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	250	0		65.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**0.0**																
4	Building Construction	crane	1	16	81	250	0		67.0	1	60	59	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		gradall	3	40	83	250	0		69.0	1	60	70	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		generator	0	50	72	250	0		58.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	3	40	78	250	0		64.0	1	60	65	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		welder / torch	0	40	73	250	0		59.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Building Construction Phase	**71.2**																
5	Architectural Coating	compressor (air)	0	40	78	250	0		64.0	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Architectural Coating Phase	**0.0**																
7	Asphalt Paving	paver	1	50	77	250	0		63.0	1	60	60	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	1	40	85	250	0		71.0	1	60	67	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	250	0		66.0	1	60	59	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	**68.3**																

MOBILE EQUIPMENT EVALUATION - DISTANCE OF 100 FEET - ONSITE GROUND LEVEL RECEIVER - NO BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Mobile Source(s) of Noise at each Project Phase for onsite receiver position at first floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 75
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	100	0		75.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	0	40	85	100	0		78.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		dump truck	0	40	76	100	0		69.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Grading Phase	**0.0**																
2	Balancing / Aggregate Base	grader	0	40	85	100	0		78.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		scraper	0	40	84	100	0		77.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	100	0		72.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	0	20	80	100	0		73.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**0.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	100	0		72.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	100	0		72.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**0.0**																
4	Building Construction	crane	1	16	81	100	0		74.9	1	60	67	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		gradall	3	40	83	100	0		76.9	1	60	78	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		generator	0	50	72	100	0		65.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	3	40	78	100	0		71.9	1	60	73	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		welder / torch	0	40	73	100	0		66.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Building Construction Phase	79.2																
5	Architectural Coating	compressor (air)	0	40	78	100	0		71.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Architectural Coating Phase	**0.0**																
7	Asphalt Paving	paver	1	50	77	100	0		70.9	1	60	68	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	1	40	85	100	0		78.9	1	60	75	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	1	20	80	100	0		73.9	1	60	67	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	76.3																

MOBILE EQUIPMENT EVALUATION - DISTANCE OF 50 FEET - ONSITE GROUND LEVEL RECEIVER - NO BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Mobile Source(s) of Noise at each Project Phase | onsite receiver position at | third floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 75
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	50	0		81.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		dump truck	0	40	76	50	0		75.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Grading Phase	**4.8**																
2	Balancing / Aggregate Base	grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		scraper	0	40	84	50	0		83.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	0	20	80	50	0		79.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**6.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**3.0**																
4	Building Construction	crane	1	16	81	50	0		80.9	1	60	73	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		gradall	3	40	83	50	0		82.9	1	60	84	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		generator	0	50	72	50	0		71.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		backhoe	3	40	78	50	0		77.9	1	60	79	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		welder / torch	0	40	73	50	0		72.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Building Construction Phase	**85.2**																
5	Architectural Coating	compressor (air)	0	40	78	50	0		77.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Architectural Coating Phase	**0.0**																
7	Asphalt Paving	paver	1	50	77	50	0		76.9	1	60	74	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	1	40	85	50	0		84.9	1	60	81	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	1	20	80	50	0		79.9	1	60	73	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	**82.3**																

MOBILE EQUIPMENT EVALUATION - DISTANCE OF 100 FEET - ONSITE THIRD BUILDING LEVEL RECEIVER - 12 FEET HIGH BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Mobile Source(s) of Noise at each Project Phase | onsite receiver position at | third floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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enter "0" to turn off air or grnd absorption terms, "1" to turn on

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 75
allowable hours over which Leq is to be averaged = 1

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 1-hour Leq
1	Grading	dozer	0	40	82	100	0		75.9	1	60	0
		grader	0	40	85	100	0		78.9	1	60	0
		dump truck	0	40	76	100	0		69.9	1	60	0
									Total Aggregate Noise Exposure from Grading Phase			**0.0**
2	Balancing / Aggregate Base	grader	0	40	85	100	0		78.9	1	60	0
		scraper	0	40	84	100	0		77.9	1	60	0
		front end loader	0	40	79	100	0		72.9	1	60	0
		roller	0	20	80	100	0		73.9	1	60	0
									Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase			**0.0**
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	100	0		72.9	1	60	0
		front end loader	0	40	79	100	0		72.9	1	60	0
									Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase			**0.0**
4	Building Construction	crane	1	16	81	100	11		64.5	1	60	56
		gradall	3	40	83	100	11		66.5	1	60	67
		generator	0	50	72	100	0		65.9	1	60	0
		backhoe	3	40	78	100	11		61.5	1	60	62
		welder / torch	0	40	73	100	0		66.9	1	60	0
									Total Aggregate Noise Exposure from Building Construction Phase			**68.7**
5	Architectural Coating	compressor (air)	0	40	78	100	0		71.9	1	60	0
									Total Aggregate Noise Exposure from Architectural Coating Phase			**0.0**
7	Asphalt Paving	paver	1	50	77	100	11		60.5	1	60	57
		grader	1	40	85	100	11		68.5	1	60	64
		roller	1	20	80	100	11		63.5	1	60	56
									Total Aggregate Noise Exposure from Asphalt Paving Phase			**65.8**

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	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	Grading	dozer	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		dump truck	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
2	Balancing / Aggregate Base	grader	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		scraper	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
4	Building Construction	crane	5	23	12	15	85	100	16.6	85.7	101.6	0.65	11.2	26.0	14.0	0.3	0.5	10.5
		gradall	5	23	12	15	85	100	16.6	85.7	101.6	0.65	11.2	26.0	14.0	0.3	0.5	10.5
		generator	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		backhoe	5	23	12	15	85	100	16.6	85.7	101.6	0.65	11.2	26.0	14.0	0.3	0.5	10.5
		welder / torch	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
5	Architectural Coating	compressor (air)	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
7	Asphalt Paving	paver	5	23	12	15	85	100	16.6	85.7	101.6	0.65	11.2	26.0	14.0	0.3	0.5	10.5
		grader	5	23	12	15	85	100	16.6	85.7	101.6	0.65	11.2	26.0	14.0	0.3	0.5	10.5
		roller	5	23	12	15	85	100	16.6	85.7	101.6	0.65	11.2	26.0	14.0	0.3	0.5	10.5

MOBILE EQUIPMENT EVALUATION - DISTANCE OF 50 FEET - ONSITE THIRD BUILDING LEVEL RECEIVER - 14 FEET HIGH BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Mobile Source(s) of Noise at each Project Phase | onsite receiver position at | third floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 75
allowable hours over which Leq is to be averaged = 1

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 1-hour Leq
1	Grading	dozer	0	40	82	50	0		81.9	1	60	0
		grader	0	40	85	50	0		84.9	1	60	0
		dump truck	0	40	76	50	0		75.9	1	60	0
									Total Aggregate Noise Exposure from Grading Phase			**4.8**
2	Balancing / Aggregate Base	grader	0	40	85	50	0		84.9	1	60	0
		scraper	0	40	84	50	0		83.9	1	60	0
		front end loader	0	40	79	50	0		78.9	1	60	0
		roller	0	20	80	50	0		79.9	1	60	0
									Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase			**6.0**
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	50	0		78.9	1	60	0
		front end loader	0	40	79	50	0		78.9	1	60	0
									Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase			**3.0**
4	Building Construction	crane	1	16	81	50	10		71.1	1	60	63
		gradall	3	40	83	50	10		73.1	1	60	74
		generator	0	50	72	50	0		71.9	1	60	0
		backhoe	3	40	78	50	10		68.1	1	60	69
		welder / torch	0	40	73	50	0		72.9	1	60	0
									Total Aggregate Noise Exposure from Building Construction Phase			**75.3**
5	Architectural Coating	compressor (air)	0	40	78	50	0		77.9	1	60	0
									Total Aggregate Noise Exposure from Architectural Coating Phase			**0.0**
7	Asphalt Paving	paver	1	50	77	50	10		67.1	1	60	64
		grader	1	40	85	50	10		75.1	1	60	71
		roller	1	20	80	50	10		70.1	1	60	63
									Total Aggregate Noise Exposure from Asphalt Paving Phase			**72.4**

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	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	Grading	dozer	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		dump truck	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
2	Balancing / Aggregate Base	grader	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		scraper	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
4	Building Construction	crane	5	23	14	15	35	50	17.5	36.1	53.1	0.49	9.9	28.0	14.0	0.3	0.5	9.9
		gradall	5	23	14	15	35	50	17.5	36.1	53.1	0.49	9.9	28.0	14.0	0.3	0.5	9.9
		generator	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		backhoe	5	23	14	15	35	50	17.5	36.1	53.1	0.49	9.9	28.0	14.0	0.3	0.5	9.9
		welder / torch	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
5	Architectural Coating	compressor (air)	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
7	Asphalt Paving	paver	5	23	14	15	35	50	17.5	36.1	53.1	0.49	9.9	28.0	14.0	0.3	0.5	9.9
		grader	5	23	14	15	35	50	17.5	36.1	53.1	0.49	9.9	28.0	14.0	0.3	0.5	9.9
		roller	5	23	14	15	35	50	17.5	36.1	53.1	0.49	9.9	28.0	14.0	0.3	0.5	9.9

STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 300 FEET - ONSITE GROUND LEVEL RECEIVER - NO BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Stationary Source(s) of Noise at each Project Phase | onsite receiver position at | first floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 60
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	300	0		66.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	0	40	85	300	0		69.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		dump truck	0	40	76	300	0		60.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Grading Phase	**0.0**																
2	Balancing / Aggregate Base	grader	0	40	85	300	0		69.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		scraper	0	40	84	300	0		68.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	300	0		63.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	0	20	80	300	0		64.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**0.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	300	0		63.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	300	0		63.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**0.0**																
4	Building Construction	crane	0	16	81	300	0		65.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		gradall	0	40	83	300	0		67.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		generator	1	50	72	300	0		56.4	1	60	53	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	0	40	78	300	0		62.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		welder / torch	1	40	73	300	0		57.4	1	60	53	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Building Construction Phase	**56.4**																
5	Architectural Coating	compressor (air)	1	40	78	300	0		62.4	1	60	58	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Architectural Coating Phase	**58.4**																
7	Asphalt Paving	paver	0	50	77	300	0		61.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	0	40	85	300	0		69.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	0	20	80	300	0		64.4	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	**0.0**																

STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 100 FEET - ONSITE GROUND LEVEL RECEIVER - NO BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Stationary Source(s) of Noise at each Project Phase | onsite receiver position at | first floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 60
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	100	0		75.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	0	40	85	100	0		78.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		dump truck	0	40	76	100	0		69.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Grading Phase	**0.0**																
2	Balancing / Aggregate Base	grader	0	40	85	100	0		78.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		scraper	0	40	84	100	0		77.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	100	0		72.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	0	20	80	100	0		73.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**0.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	100	0		72.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		front end loader	0	40	79	100	0		72.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**0.0**																
4	Building Construction	crane	0	16	81	100	0		74.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		gradall	0	40	83	100	0		76.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		generator	1	50	72	100	0		65.9	1	60	63	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		backhoe	0	40	78	100	0		71.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		welder / torch	1	40	73	100	0		66.9	1	60	63	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Building Construction Phase	**65.9**																
5	Architectural Coating	compressor (air)	1	40	78	100	0		71.9	1	60	68	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Architectural Coating Phase	**67.9**																
7	Asphalt Paving	paver	0	50	77	100	0		70.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		grader	0	40	85	100	0		78.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
		roller	0	20	80	100	0		73.9	1	60	0	5	5	0	15	85	100	15.8	85.1	100.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	**0.0**																

STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 50 FEET - ONSITE THIRD BUILDING LEVEL RECEIVER - 11 FEET HIGH BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Stationary Source(s) of Noise at each Project Phase | onsite receiver position at | third floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 60
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	50	0		81.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		dump truck	0	40	76	50	0		75.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Grading Phase	**0.0**																
2	Balancing / Aggregate Base	grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		scraper	0	40	84	50	0		83.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	0	20	80	50	0		79.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**0.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**0.0**																
4	Building Construction	crane	0	16	81	50	0		80.9	1	60	0	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		gradall	0	40	83	50	0		82.9	1	60	0	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		generator	1	50	72	50	0		71.9	1	60	69	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		backhoe	0	40	78	50	0		77.9	1	60	0	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		welder / torch	1	40	73	50	0		72.9	1	60	69	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Building Construction Phase	**72.0**																
5	Architectural Coating	compressor (air)	1	40	78	50	0		77.9	1	60	74	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Architectural Coating Phase	**74.0**																
7	Asphalt Paving	paver	0	50	77	50	0		76.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	0	20	80	50	0		79.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	**0.0**																

STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 100 FEET - ONSITE THIRD BUILDING LEVEL RECEIVER - 11 FEET HIGH BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Stationary Source(s) of Noise at each Project Phase | onsite receiver position at | third floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

magnitude of threshold (dBA) = 60
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	100	0		75.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	0	40	85	100	0		78.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		dump truck	0	40	76	100	0		69.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Grading Phase	**0.0**																
2	Balancing / Aggregate Base	grader	0	40	85	100	0		78.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		scraper	0	40	84	100	0		77.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	100	0		72.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	0	20	80	100	0		73.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**0.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	100	0		72.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	100	0		72.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**0.0**																
4	Building Construction	crane	0	16	81	100	0		74.9	1	60	0	5	23	0	5	95	100	7.1	97.7	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		gradall	0	40	83	100	0		76.9	1	60	0	5	23	0	5	95	100	7.1	97.7	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		generator	1	50	72	100	14		51.6	1	60	49	5	23	11	5	95	100	7.8	95.8	101.6	1.96	15.0	25.0	14.0	0.3	0.5	14.4
		backhoe	0	40	78	100	0		71.9	1	60	0	5	23	0	5	95	100	7.1	97.7	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		welder / torch	1	40	73	100	14		52.6	1	60	49	5	23	11	5	95	100	7.8	95.8	101.6	1.96	15.0	25.0	14.0	0.3	0.5	14.4
											Total Aggregate Noise Exposure from Building Construction Phase	**51.6**																
5	Architectural Coating	compressor (air)	1	40	78	100	14		57.6	1	60	54	5	23	11	5	95	100	7.8	95.8	101.6	1.96	15.0	25.0	14.0	0.3	0.5	14.4
											Total Aggregate Noise Exposure from Architectural Coating Phase	**53.6**																
7	Asphalt Paving	paver	0	50	77	100	0		70.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	0	40	85	100	0		78.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	0	20	80	100	0		73.9	1	60	0	5	23	0	15	85	100	15.8	88.1	101.6	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	**0.0**																

STATIONARY EQUIPMENT EVALUATION - DISTANCE OF 50 FEET - ONSITE THIRD BUILDING LEVEL RECEIVER - 11 FEET HIGH BARRIER

FHWA RCNM Emulator - Construction Noise Prediction

Stationary Source(s) of Noise at each Project Phase | onsite receiver position at | third floor level

Barrier insertion loss calculations below based upon FTA *Transit Noise and Vibration Impact Assessment* (2006)

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

apply air absorption? 0
apply ground absorption? 0

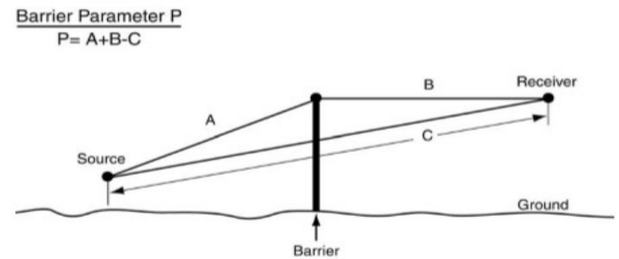
magnitude of threshold (dBA) = 60
allowable hours over which Leq is to be averaged = 1

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 1-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	Grading	dozer	0	40	82	50	0		81.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		dump truck	0	40	76	50	0		75.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Grading Phase	**0.0**																
2	Balancing / Aggregate Base	grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		scraper	0	40	84	50	0		83.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	0	20	80	50	0		79.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Balancing / Aggregate Base Phase	**0.0**																
3	Concrete Flatwork/Curb & Gutter	concrete mixer truck	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		front end loader	0	40	79	50	0		78.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Concrete Flatwork/Curb & Gutter Phase	**0.0**																
4	Building Construction	crane	0	16	81	50	0		80.9	1	60	0	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		gradall	0	40	83	50	0		82.9	1	60	0	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		generator	1	50	72	50	14		58.1	1	60	55	5	23	11	5	45	50	7.8	46.6	53.1	1.24	13.9	25.0	14.0	0.3	0.5	13.9
		backhoe	0	40	78	50	0		77.9	1	60	0	5	23	0	5	45	50	7.1	50.5	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		welder / torch	1	40	73	50	14		59.1	1	60	55	5	23	11	5	45	50	7.8	46.6	53.1	1.24	13.9	25.0	14.0	0.3	0.5	13.9
											Total Aggregate Noise Exposure from Building Construction Phase	**58.1**																
5	Architectural Coating	compressor (air)	1	40	78	50	14		64.1	1	60	60	5	23	11	5	45	50	7.8	46.6	53.1	1.24	13.9	25.0	14.0	0.3	0.5	13.9
											Total Aggregate Noise Exposure from Architectural Coating Phase	**60.1**																
7	Asphalt Paving	paver	0	50	77	50	0		76.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		grader	0	40	85	50	0		84.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
		roller	0	20	80	50	0		79.9	1	60	0	5	23	0	15	35	50	15.8	41.9	53.1	0.00	0.1	14.0	14.0	0.5	0.5	0.1
											Total Aggregate Noise Exposure from Asphalt Paving Phase	**0.0**																

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Lesser of or available Lmax	Spec. 721 Lmax	Measured L_{max} @50ft (dBA, slow)
All Other Equipment > 5 HP	No	50	85	85	-- N/A --
Auger Drill Rig	No	20	84	85	84
Backhoe	No	40	78	80	78
Bar Bender	No	20	80	80	-- N/A --
Blasting	Yes	-- N/A --	94	94	-- N/A --
Boring Jack Power Unit	No	50	80	80	83
Chain Saw	No	20	84	85	84
Clam Shovel (dropping)	Yes	20	87	93	87
Compactor (ground)	No	20	80	80	83
Compressor (air)	No	40	78	80	78
Concrete Batch Plant	No	15	83	83	-- N/A --
Concrete Mixer Truck	No	40	79	85	79
Concrete Pump Truck	No	20	81	82	81
Concrete Saw	No	20	90	90	90
Crane	No	16	81	85	81
Dozer	No	40	82	85	82
Drill Rig Truck	No	20	79	84	79
Drum Mixer	No	50	80	80	80
Dump Truck	No	40	76	84	76
Excavator	No	40	81	85	81
Flat Bed Truck	No	40	74	84	74
Front End Loader	No	40	79	80	79
Generator	No	50	72	72	81
Generator (<25KVA, VMS signs)	No	50	70	70	73
Gradall	No	40	83	85	83
Grader	No	40	85	85	-- N/A --
Grapple (on backhoe)	No	40	85	85	87
Horizontal Boring Hydr. Jack	No	25	80	80	82
Hydra Break Ram	Yes	10	90	90	-- N/A --
Impact Pile Driver	Yes	20	95	95	101
Jackhammer	Yes	20	85	85	89
Man Lift	No	20	75	85	75
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	90
Pavement Scarafier	No	20	85	85	90
Paver	No	50	77	85	77
Pickup Truck	No	40	55	55	75
Pneumatic Tools	No	50	85	85	85
Pumps	No	50	77	77	81
Refrigerator Unit	No	100	73	82	73
Rivit Buster/chipping gun	Yes	20	79	85	79
Rock Drill	No	20	81	85	81
Roller	No	20	80	85	80
Sand Blasting (Single Nozzle)	No	20	85	85	96
Scraper	No	40	84	85	84
Shears (on backhoe)	No	40	85	85	96
*Skidsteer**	*No*	*40*	*80*	*-- N/A --*	*-- N/A --*
Slurry Plant	No	100	78	78	78
Slurry Trenching Machine	No	50	80	82	80
Soil Mix Drill Rig	No	50	80	80	-- N/A --
Tractor	No	40	84	84	-- N/A --
Vacuum Excavator (Vac-truck)	No	40	85	85	85
Vacuum Street Sweeper	No	10	80	80	82
Ventilation Fan	No	100	79	85	79
Vibrating Hopper	No	50	85	85	87
Vibratory Concrete Mixer	No	20	80	80	80
Vibratory Pile Driver	No	20	95	95	101
Warning Horn	No	5	83	85	83
Welder / Torch	No	40	73	73	74

* https://ia.cpuc.ca.gov/Environment/info/ene/mesa/attachment/A1503003%20ED-SCE-01%20Q.PD-01%20Attachment%20(Revised%20Noise%20Levels%20Construction%20Equipment).pdf



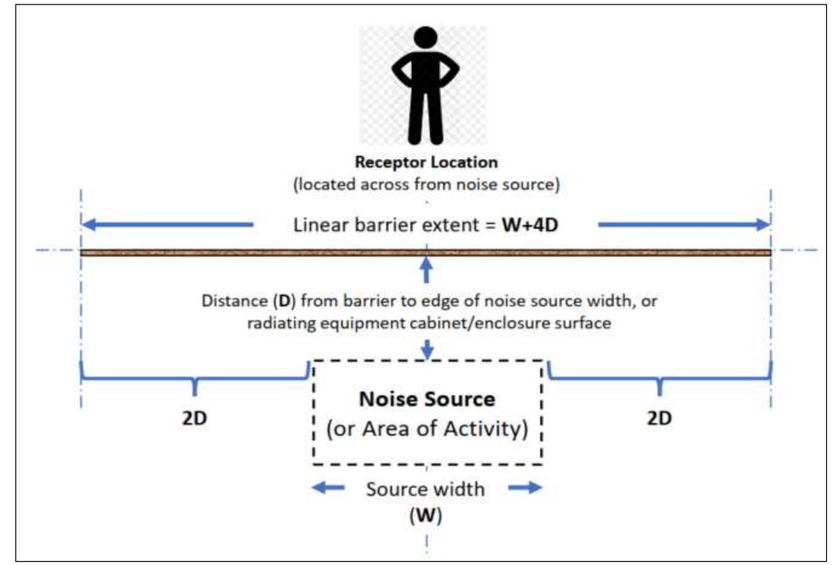
For all other barriers, and for protrusion of terrain above the line of sight:	$A_{barrier} = \min\left\{15 or \left[20 \times \log\left(\frac{2.51\sqrt{P}}{\tanh\left[4.46\sqrt{P}\right]}\right)+5\right]\right\}$
Barrier Insertion Loss	$IL_{barrier} = \max\left\{0 or \left[A_{barrier} - 10(G_{NB} - G_B)\log\left(\frac{D}{50}\right)\right]\right\}$

D = closest distance between the receiver and the source, in feet
P = path length difference, in feet (see figure below)
G_{NB} = Ground factor G computed *without barrier* (see Figure 6-5)
G_B = Ground factor G computed *with barrier* (see Figure 6-5)

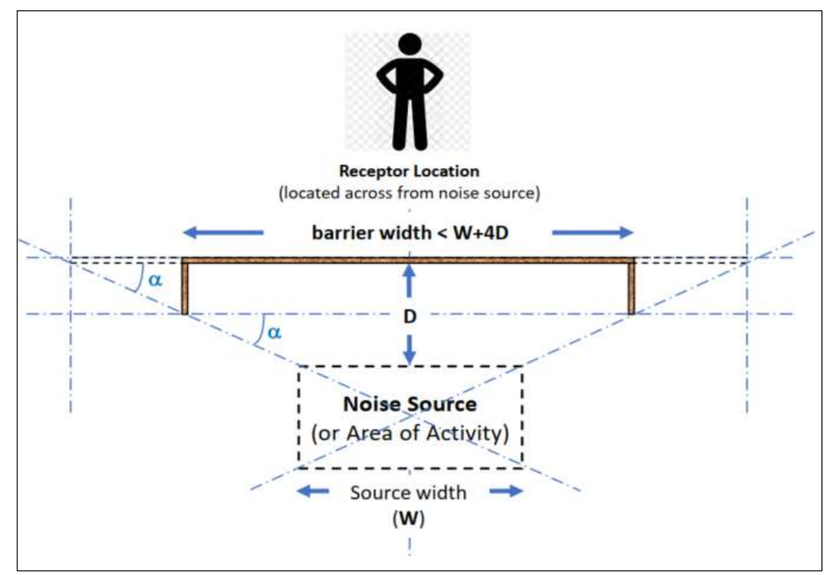
† The term "tanh(variable)" stands for hyperbolic tangent, available on many scientific calculators. If "tanh" is not available, then compute E = exp(variable), and set tanh(variable) = (E - 1/E) / (E + 1/E), where exp(variable) is the "exponential" function, also written as e^x on calculator keypads.

above sources: Transit Noise & Vibration Impact Assessment (FTA 2006)

11/26/21, MCS:
the calculations herein assume the "In General" calculation of Heff per Figure 6-5, which then allows a calculation of "G" with and without barrier.



Barrier Length Extent Compared to Distance to Receiver and Width of Noise Source Area



FHWA - HIGHWAY TRAFFIC NOISE PREDICTION MODEL

(modified for CNEL)

DUDEK

PROJECT:	Trails at Lyon Canyon	JN:	14319
ROADWAY:	Various	DATE:	7/5/2022
Scenario:	**Construction Traffic**	BY:	J. Leech

ADT	356		PK HR VOL	178
SPEED	45			
PK HR %	50			
DIST CTL	40			
DIST N/F	36	(M=76,P=52,S=36,C=12)	AUTO SLE DISTANCE	36.1
DIST WALL	0		MED TRUCK SLE DIST	35.8
DIST W/OB	40		HVY TRUCK SLE DIST	35.8
HTH WALL	0.0	********		
HTH OBS	5.0			
AMBIENT	45.0			
ROADWAY VIEW:				
LF ANGLE	-45			
RT ANGLE	45			
DF ANGLE	90			

SITE CONDITIONS: (15=HARD SITE, 10=SOFT SITE)

AUTOM	15.0	
MED TR	15.0	
HVY TR	15.0	
BARRIER	0	(0=WALL,1=BERM)

ELEVATIONS:

PAD	0.0		AUTOMOBILES =	0.00	
ROAD	0.0		MEDIUM TRUCKS=	2.30	
			HEAVY TRUCKS =	8.01	
GRADE:	0.0	%	GRADE ADJUSTM=	0.0	(TO HEAVY TRUCKS)

VEHICLE DISTRIBUTION:

	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.770	0.127	0.096	0.8190
MEDIUM TRUCKS	0.874	0.051	0.075	0.0010
HEAVY TRUCKS	0.891	0.028	0.081	0.1800

NOISE IMPACTS WITHOUT TOPO OR BARRIER SHIELDING:

	LEQ PK HR	LEQ DAY	LEQ EVE	LEQ NIGHT	CNEL
AUTOMOBILES	58.2	49.3	47.5	41.5	50.7
MEDIUM TRUCKS	40.1	31.7	25.4	22.3	31.8
HEAVY TRUCKS	67.4	59.2	50.2	50.0	59.2
VEHICULAR NOISE	**67.9**	59.6	52.1	50.5	59.7

NOISE APPENDIX

Operational Noise Modeling Worksheets

Technical Basis of Dudek's "NoisePro" Excel-based Outdoor Sound Propagation Prediction Model

In summary, the Microsoft Excel-based **NoisePro** outdoor sound propagation model developed by Dudek calculates the aggregate sound pressure level (SPL) received by each and every cell within a two-dimensional (2D) array (a product of X columns of cells by Y rows of cells). The quantity of this received SPL, in A-weighted decibels (dBA), is the logarithmic sum of acoustical contribution from each of "n" user-input sound emitting point sources located on the same 2D array, which may be written as follows:

$$SPL_{X,Y} = 10 * \log \sum_{i=1}^{n} 10^{0.1[L_i - A_i]}$$

where each individual source sound level (L_i) is attenuated by an algebraic sum of three attenuation factors ($A_i = A_{div} + A_{atm} + A_{gr}$) that are each dependent on the distance between the sound source position on the X by Y array and the receiving $SPL_{X,Y}$ position on a different position in the same 2D array of worksheet cells, where each cell is defined by the user as representing the center of a square area having equal sides of user-defined length in feet. The above expression is based on Equation 5 from the International Organization for Standardization (ISO) 9613-2 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation", and the individual attenuation factors used by **NoisePro** emulate those in Equation 4 and may be summarized as follows:

- $\boldsymbol{A_{div}}$ = attenuation due to *geometrical divergence* (i.e., pure distance), equating to 20*LOG(d/d_{ref}); and where $\boldsymbol{d}$ is the horizontal distance between a source and a receiver position, while $\boldsymbol{d_{ref}}$ is the reference distance at which the sound source L_i is defined.
- $\boldsymbol{A_{atm}}$ = attenuation due to *atmospheric absorption*, which for 1,000 Hz (1 kHz) = 4.16*$\boldsymbol{d}$/3280 and is derived from Equation 5.7 in <u>Noise & Vibration Control Engineering</u> (Beranek and Ver, 1992).
- $\boldsymbol{A_{gr}}$ = attenuation due to *ground effects*, appearing as Equation 10 in ISO 9613-2 and can be expressed with the following Excel formula:

  $$\boldsymbol{A_{gr}} = \text{MAX}(0,4.8-[\boldsymbol{h_s}+\boldsymbol{h_r}]/\boldsymbol{d}*[17+984/\boldsymbol{d}])$$

  where $\boldsymbol{h_s}$ and $\boldsymbol{h_r}$ are the heights (in feet) of the sound source and receiver positions above grade, respectively. This means that for small distances, attenuation from ground effects will be small or essentially zero; and, even at great distances, the attenuation from ground effects is effectively capped at 4.8 dB.

The Excel workbook comprising **NoisePro** calculates $SPL_{X,Y}$ by using a coding loop to evaluate the acoustic contribution from each attenuated sound source ($\boldsymbol{L_i}$ - $\boldsymbol{A_i}$) in sequence, and logarithmically adding the new evaluation to the previous total in a cumulative manner. When all sources have been evaluated, the loop terminates and yields an aggregate or log-summed total $SPL_{X,Y}$ value that is thus unique to a position in the 2D array of cells represented by X and Y, and can thus be "mapped". If the user has defined a particular cell in the X by Y array as a uniquely tagged Receiver, then the corresponding $SPL_{X,Y}$ value can be indexed and displayed accordingly.

The resulting output array of cells, each having an individually calculated $SPL_{X,Y}$ numerical value, is then filled with a color (from a user-defined palette) by application of a Conditional Formatting rules set (an Excel formatting feature) that compares the dB quantity with user-defined "high" and "low" dB ranges for each available color. Each colored cell can thus be likened to a "pixel" within a 2D array that forms a composite image representing—visually—the sound propagation from all modeled sound sources.

GRID CALCULATION WORKSHEET

Example Portion of Concluded Calculations Loop

Source	189
Source Tag	L8002
Source X-coordinate	2390.8
Source Y-coordinate	593.4
Source Z-coordinate	3.5
Source Reference SPL	47.4
Source Ref. Distance (ft.)	35
Source ht above grade (ft.)	3.5

grid size (ft)

x 8.8

y 8.8

rcvr plane height (ft)

z 5

Grid Upper Left (C,R)

1 1

Grid Lower Right (C,R)

384 288

Receiver Location

Column	Row	X-coord	Y-coord	Z-coord	Cumulative SPL
1	1	8.8	8.8	5	20.7
1	2	8.8	17.6	5	20.7
1	3	8.8	26.4	5	20.8
1	4	8.8	35.2	5	20.8
1	5	8.8	44	5	20.8
1	6	8.8	52.8	5	20.8
1	7	8.8	61.6	5	20.9
1	8	8.8	70.4	5	20.9
1	9	8.8	79.2	5	20.9
1	10	8.8	88	5	20.9
1	11	8.8	96.8	5	21.0
1	12	8.8	105.6	5	21.0
1	13	8.8	114.4	5	21.0
1	14	8.8	123.2	5	21.0
1	15	8.8	132	5	21.0
1	16	8.8	140.8	5	21.1
1	17	8.8	149.6	5	21.1
1	18	8.8	158.4	5	21.1
1	19	8.8	167.2	5	21.1
1	20	8.8	176	5	21.1
1	21	8.8	184.8	5	21.2
1	22	8.8	193.6	5	21.2
1	23	8.8	202.4	5	21.2
1	24	8.8	211.2	5	21.2
1	25	8.8	220	5	21.3
1	26	8.8	228.8	5	21.3
1	27	8.8	237.6	5	21.3
1	28	8.8	246.4	5	21.3
1	29	8.8	255.2	5	21.3

SOURCE INVENTORY WITH MODEL GRID COORDINATE LOCATIONS AND SOUND PRESSURE REFERENCE LEVELS

grid axis	feet
x	8.8
y	8.8

Custom Source Description	Tag	SPL (dBA)		
this is intended to "clear" the cumulative+source on a "Reset" click	**CLEAR**	**-40**	additional notes below for Custom sources:	
residential 4-ton ACC unit	**SR**	**43**	Carrier 16NA-48 PWL - 8 Db (2 cluster)	Pressure level at 35 feet, with nominal 7.7 dB reduction for 5' high parapet wall
residential 4-ton ACC unit	**L1**	**42**	Carrier 16NA-48 PWL - 8 Db	Pressure level at 35 feet, with nominal 5.4 dB reduction for 3.5' high enslosure wall
residential 4-ton ACC unit	**L2**	**31.8**	Carrier 16NA-48 PWL - 8 Db	Pressure level at 35 feet, with 15.6 dB reduction for 8' high enslosure wall
residential 4-ton ACC unit	**L3**	**42.4**	Carrier 16NA-48 PWL - 8 Db	Pressure level at 35 feet, with nominal 5 dB reduction for 3' high enslosure wall
residential 4-ton ACC unit	**L4**	**38.2**	Carrier 16NA-48 PWL - 8 Db	Pressure level at 35 feet, with nominal 9.2 dB reduction for 5' high enclosure wall
residential 4-ton ACC unit	**L5**	**42.1**	Carrier 16NA-48 PWL - 8 Db	Pressure level at 35 feet, with nominal 5.3 dB reduction for 3.5' high enclosure wall
residential 4-ton ACC unit	**L7**	**42.1**	Carrier 16NA-48 PWL - 8 DB	Pressure level at 35 feet, with nominal 5.3 dB reduction for 3' high parapet wall
residential 4-ton ACC unit	**L8**	**47.4**	Carrier 16NA-48 PWL - 8 Db	Pressure level at 35 feet - no wall/barrier

Source	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Source Tag	ULC	SR001	SR002	SR003	SR004	SR005	SR006	SR007	SR008	SR009	SR010	SR011	SR012	SR013	SR014	SR015	SR016	SR017	SR018
Source X-coordinate	-8.8	1952.2	1952.2	1960.8	1960.8	1969.4	1969.4	1978	1978	1986.6	1986.6	1995.2	1995.2	1995.2	2003.8	2003.8	2012.4	2021	2029.6
Source Y-coordinate	-8.8	576.2	584.8	593.4	602	610.6	619.2	627.8	636.4	645	653.6	662.2	670.8	731	731	722.4	722.4	713.8	713.8
Source Z-coordinate	0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Source Type (enter abbrev.)	CLEAR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR
Source Reference SPL	-40	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Source Refer	3.28	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Heigh	6	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

Source	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**
Source Tag	L1001	L1002	L1003	L1004	L1005	L1006	L1007	L1008	L1009	L1010	L1011	L1012	L1013	L1014	L1015	L1016	L1017	L1018	L1019
Source X-coordinate	1229.8	1255.6	1281.4	1307.2	1324.4	1341.6	1367.4	1401.8	1419	1444.8	1462	1479.2	1496.4	1522.2	1565.2	1591	1608.2	1634	1642.6
Source Y-coordinate	688	679.4	679.4	679.4	670.8	670.8	662.2	662.2	662.2	653.6	653.6	645	636.4	636.4	627.8	619.2	619.2	610.6	610.6
Source Z-coordinate	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Source Type (enter abbrev.)	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	L1
Source Reference SPL	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

Source	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**
Source Tag	L1020	L1021	L1022	L1023	L1024	L1025	L1026	L1027	L1028	L2001	L2002	L2003	L2004	L2005	L2006	L2007	L2008	L2009	L2010
Source X-coordinate	1668.4	1685.6	1720	1737.2	1754.4	1780.2	1797.4	1823.2	1840.4	1092.2	1040.6	1014.8	989	971.8	954.6	928.8	911.6	946	971.8
Source Y-coordinate	602	602	593.4	593.4	584.8	584.8	576.2	567.6	567.6	713.8	722.4	748.2	774	799.8	825.6	851.4	911.6	920.2	937.4
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L1	L1	L1	L1	L1	L1	L1	L1	L1	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2
Source Reference SPL	42	42	42	42	42	42	42	42	42	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**
Source Tag	L2011	L2012	L2013	L2014	L2015	L2016	L2017	L2018	L2019	L2020	L2021	L2022	L2023	L2024	L2025	L2026	L2027	L2028	L2029
Source X-coordinate	997.6	946	920.2	885.8	860	825.6	860	894.4	920.2	920.2	885.8	860	825.6	817	851.4	885.8	911.6	920.2	894.4
Source Y-coordinate	954.6	1049.2	1040.6	1032	1014.8	1083.6	1092.2	1100.8	1118	1135.2	1135.2	1135.2	1135.2	1264.2	1264.2	1264.2	1264.2	1272.8	1281.4
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2
Source Reference SPL	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**
Source Tag	L2030	L2031	L2032	L2033	L2034	L2035	L2036	L2037	L2038	L2039	L2040	L2041	L2042	L2043	L3001	L3002	L3003	L3004	L3005
Source X-coordinate	860	825.6	877.2	911.6	937.4	971.8	980.4	946	920.2	885.8	920.2	954.6	980.4	1014.8	954.6	997.6	1014.8	1032	1040.6
Source Y-coordinate	1290	1298.6	1410.4	1401.8	1384.6	1376	1393.2	1401.8	1410.4	1427.6	1479.2	1470.6	1453.4	1436.2	1539.4	1642.6	1677	1711.4	1745.8
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L3	L3	L3	L3	L3
Source Reference SPL	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	42.4	42.4	42.4	42.4	42.4
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	**96**	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**	**111**	**112**	**113**	**114**
Source Tag	L3006	L3007	L3008	L3009	L3010	L3011	L3012	L3013	L3014	L3015	L3016	L3017	L3018	L3019	L3020	L3021	L3022	L3023	L3024
Source X-coordinate	1049.2	1066.4	1066.4	1083.6	1083.6	1092.2	1092.2	1092.2	1169.6	1212.6	1255.6	1298.6	1333	1376	1505	1513.6	1513.6	1513.6	1505
Source Y-coordinate	1780.2	1823.2	1866.2	1960.8	2003.8	2046.8	2089.8	2141.4	2227.4	2227.4	2227.4	2227.4	2236	2244.6	2322	2279	2210.2	2167.2	2124.2
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3
Source Reference SPL	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	**115**	**116**	**117**	**118**	**119**	**120**	**121**	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**	**131**	**132**	**133**
Source Tag	L3025	L3026	L3027	L3028	L3029	L3030	L3031	L3032	L3033	L3034	L3035	L4001	L4002	L4003	L4004	L4005	L4006	L4007	L4008
Source X-coordinate	1505	1496.4	1487.8	1479.2	1470.6	1462	1462	1453.4	1444.8	1436.2	1427.6	1565.2	1625.4	1685.6	1754.4	1814.6	1883.4	1943.6	2003.8
Source Y-coordinate	2089.8	2038.2	2003.8	1943.6	1917.8	1866.2	1840.4	1788.8	1763	1711.4	1677	1548	1548	1548	1548	1548	1548	1548	1548
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L3	L4	L4	L4	L4	L4	L4	L4	L4
Source Reference SPL	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	38.2	38.2	38.2	38.2	38.2	38.2	38.2	38.2
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	**134**	**135**	**136**	**137**	**138**	**139**	**140**	**141**	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**	**151**	**152**
Source Tag	L4009	L4010	L4011	L4012	L5001	L5002	L5003	L5004	L5005	L5006	L5007	L5008	L5009	L5010	L5011	L5012	L5013	L5014	L5015
Source X-coordinate	2081.2	2141.4	2210.2	2279	2408	2416.6	2433.8	2442.4	2451	2459.6	2519.8	2537	2545.6	2554.2	2562.8	2580	2545.6	2554.2	2562.8
Source Y-coordinate	1548	1548	1548	1548	1470.6	1487.8	1505	1530.8	1548	1556.6	1393.2	1419	1444.8	1462	1479.2	1496.4	1376	1401.8	1419
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L4	L4	L4	L4	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5
Source Reference SPL	38.2	38.2	38.2	38.2	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**	**161**	**162**	**163**	**164**	**165**	**166**	**167**	**168**	**169**	**170**	**171**
Source Tag	L5016	L5017	L5018	L5019	L5020	L5021	L5022	L5023	L5024	L5025	L5026	L5027	L5028	L5029	L5030	L5031	L5032	L5033	L5034
Source X-coordinate	2571.4	2580	2597.2	2666	2683.2	2700.4	2726.2	2734.8	2752	2717.6	2709	2700.4	2683.2	2674.6	2666	2614.4	2605.8	2597.2	2588.6
Source Y-coordinate	1436.2	1453.4	1470.6	1548	1539.4	1530.8	1522.2	1505	1487.8	1401.8	1393.2	1376	1358.8	1341.6	1324.4	1238.4	1229.8	1212.6	1195.4
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5
Source Reference SPL	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	**172**	**173**	**174**	**175**	**176**	**177**	**178**	**179**	**180**	**181**	**182**	**183**	**184**	**185**	**186**	**187**	**188**	**189**	190
Source Tag	L5035	L5036	L5037	L5038	L5039	L5040	L5041	L5042	L5043	L5044	L5045	L5046	L5047	L5048	L5049	L5050	L5051	L5052	L5053
Source X-coordinate	2571.4	2562.8	2537	2537	2519.8	2511.2	2502.6	2494	2425.2	2416.6	2399.4	2390.8	2373.6	2365	2393.6	2384.8	2367.2	2358.4	2261.6
Source Y-coordinate	1169.6	1152.4	1118	1100.8	1083.6	1066.4	1049.2	1032	954.6	937.4	920.2	903	885.8	868.6	589.6	572	554.4	528	580.8
Source Z-coordinate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Source Type (enter abbrev.)	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5
Source Reference SPL	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
Source Reference Distance (ft.)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	23
Source Height Above Grade (ft.)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Source	191	192	193	194	195
Source Tag	L5054	L5055	L5056	L7001	L7002
Source X-coordinate	2270.4	2288	2296.8	1548.8	1566.4
Source Y-coordinate	607.2	624.8	660	1302.4	1337.6
Source Z-coordinate	3.5	3.5	3.5	20	20
Source Type (enter abbrev.)	L5	L5	L5	L7	L7
Source Reference SPL	42.1	42.1	42.1	42.1	42.1
Source Reference Distance (ft.)	35	35	35	35	35
Source Height Above Grade (ft.)	3.5	3.5	3.5	20	20

RECEIVER INVENTORY WITH MODEL GRID COORDINATE LOCATIONS AND PREDICTED OPERATIONAL SOUND LEVEL EXPOSURE

Receiver	R4 / M1	M2	M3	M4	M5	R6 / M6	R2 / M7
Receiver Tag	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**
Receiver X-coordinate	1926.4	1616.8	1384.6	1186.8	842.8	533.2	2597.2
Receiver Y-coordinate	215	335.4	223.6	111.8	94.6	120.4	344
Receiver Height Above Ground	5	5	5	5	5	5	5
SPL Predicted at Receiver	**34**	**36**	**31**	**28**	**26**	**24**	**30**

NOISE APPENDIX

Traffic Noise Modeling Worksheets

Noise Section Appendix - Trails at Lyon Canyon EIR

Traffic Noise Modeling Calculations - Summary

Project: **14319 Trails at Lyon Canyon**

Number	Name	Segment Description and Location From	To	Existing	Existing + Project	Δ Existing – Existing + Project	Future (2029)	Future (2029) + Project	Δ Future (2029) – Future (2029) + Project
Summary of Net Changes									
1	Pico Boulevard	East of Old Road		73.1	73.3	0.1	73.6	73.7	0.1
2	Pico Boulevard	West of Old Road		70.7	70.8	0.1	70.7	70.8	0.1
3	Old Road	South of Pico Blvd.		68.0	68.6	0.6	68.1	68.7	0.6
4	Old Road	North of Calgrove Blvd.		69.9	70.1	0.2	70.0	70.0	0.0
5	Calgrove Boulevard	East of Old Road		70.9	71.3	0.5	70.9	71.9	0.9
6	Old Road	South Project Drive	Melrose				67.8	69.1	1.3
7	Old Road	North Project Drive	Sports Park				67.8	69.7	1.9

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Noise Section Appendix - Trails at Lyon Canyon EIR - 1

Traffic Noise Model Calculations

Project: 14319 Trails at Lyon Canyon

Noise Level Descriptor: CNEL
Site Conditions: Hard
Traffic Input: Peak
Traffic K-Factor: 10

Segment Description and Location				Input										Output				
						Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							Distance to Contour, (feet)[3]			
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Near	Far	% Auto	% Med	% Hvy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																		
1	Pico Boulevard	East of Old Road		1,727	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	73.1	71	226	713	2256
2	Pico Boulevard	West of Old Road		990	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.7	41	129	409	1293
3	Old Road	South of Pico Blvd.		689	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	68.0	25	79	249	788
4	Old Road	North of Calgrove Blvd.		1,068	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	69.9	39	122	386	1222
5	Calgrove Boulevard	East of Old Road		918	45	22	34	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.9	34	106	336	1063
6	Old Road	South Project Drive	Melrose	0	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%					
7	Old Road	North Project Drive	Sports Park	0	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%					

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Noise Section Appendix - Trails at Lyon Canyon EIR - 1

Traffic Noise Model Calculations

Project: 14319 Trails at Lyon Canyon

Noise Level Descriptor: CNEL
Site Conditions: Hard
Traffic Input: Peak
Traffic K-Factor: 10

Segment Description and Location				Input										Output				
						Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							Distance to Contour, (feet)[3]			
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Near	Far	% Auto	% Med	% Hvy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Existing + Project																		
1	Pico Boulevard	East of Old Road		1,783	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	73.3	74	233	737	2329
2	Pico Boulevard	West of Old Road		1,010	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.8	42	132	417	1319
3	Old Road	South of Pico Blvd.		795	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	68.6	29	91	288	910
4	Old Road	North of Calgrove Blvd.		1,116	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.1	40	128	404	1277
5	Calgrove Boulevard	East of Old Road		1,019	45	22	34	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	71.3	37	118	373	1180
6	Old Road	South Project Drive	Melrose	0	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%					
7	Old Road	North Project Drive	Sports Park	0	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%					

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Noise Section Appendix - Trails at Lyon Canyon EIR - 1

Traffic Noise Model Calculations

Project: 14319 Trails at Lyon Canyon

Noise Level Descriptor: CNEL
Site Conditions: Hard
Traffic Input: Peak
Traffic K-Factor: 10

Segment Description and Location				Input										Output				
						Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							Distance to Contour, (feet)[3]			
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Near	Far	% Auto	% Med	% Hvy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Future (2029) Without Project																		
1	Pico Boulevard	East of Old Road		1,919	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	73.6	79	251	793	2507
2	Pico Boulevard	West of Old Road		990	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.7	41	129	409	1293
3	Old Road	South of Pico Blvd.		713	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	68.1	26	82	258	816
4	Old Road	North of Calgrove Blvd.		1,097	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.0	40	126	397	1255
5	Calgrove Boulevard	East of Old Road		928	45	22	34	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.9	34	107	340	1075
6	Old Road	South Project Drive		660	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	67.8	24	76	239	755
7	Old Road	North Project Drive		660	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	67.8	24	76	239	755

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Noise Section Appendix - Trails at Lyon Canyon EIR - 1

Traffic Noise Model Calculations

Project: 14319 Trails at Lyon Canyon

Noise Level Descriptor: CNEL
Site Conditions: Hard
Traffic Input: Peak
Traffic K-Factor: 10

Segment Description and Location				Input										Output				
						Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							Distance to Contour, (feet)[3]			
Number	Name	From	To	Peak Hour Volume	Speed (mph)	Near	Far	% Auto	% Med	% Hvy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Future (2029) With Project																		
1	Pico Boulevard	East of Old Road		1,975	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	73.7	82	258	816	2580
2	Pico Boulevard	West of Old Road		1,010	45	20	60	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.8	42	132	417	1319
3	Old Road	South of Pico Blvd.		819	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	68.7	30	94	296	937
4	Old Road	North of Calgrove Blvd.		1,097	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	70.0	40	126	397	1255
5	Calgrove Boulevard	East of Old Road		1,145	45	22	34	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	71.9	42	133	419	1326
6	Old Road	South Project Drive		883	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	69.1	32	101	319	1010
7	Old Road	North Project Drive		1,025	45	34	46	97.0%	2.0%	1.0%	77.0%	13.4%	9.6%	69.7	37	117	371	1173

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Noise Section Appendix - Trails at Lyon Canyon EIR

Traffic Noise Modeling Calculations - References

Citation	Reference
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.
6	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-27), Pg 2-57.
7	Caltrans Technical Noise Supplement. 2009 (November). Pg 2-53.
8	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-7), Pg 5-45.
9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69

FHWA - HIGHWAY TRAFFIC NOISE PREDICTION MODEL

(modified for CNEL)

DUDEK

PROJECT:	Trails at Lyon Canyon	JN:	14319
ROADWAY:	I-5 Traffic	DATE:	7/5/2022
Scenario:	**2030 Traffic Levels - Lot 5 Residences**	BY:	J. Leech

ADT	235,750		PK HR VOL	23,575
SPEED	72			
PK HR %	10			
DIST CTL	285			
DIST N/F	76	(M=76,P=52,S=36,C=12)	AUTO SLE DISTANCE	282.5
DIST WALL	0		MED TRUCK SLE DIST	282.5
DIST W/OB	285		HVY TRUCK SLE DIST	282.5
HTH WALL	0.0	********		
HTH OBS	5.0			
AMBIENT	45.0			
ROADWAY VIEW:				
LF ANGLE	-90			
RT ANGLE	90			
DF ANGLE	180			

SITE CONDITIONS:		(15=HARD SITE, 10=SOFT SITE)			
AUTOM	15.0				
MED TR	15.0				
HVY TR	15.0				
BARRIER	0	(0=WALL,1=BERM)			
ELEVATIONS:					
PAD	0.0	AUTOMOBILES =	0.00		
ROAD	0.0	MEDIUM TRUCKS=	2.30		
		HEAVY TRUCKS =	8.01		
GRADE:	0.0 %	GRADE ADJUSTM=	0.0	(TO HEAVY TRUCKS)	

VEHICLE DISTRIBUTION:

	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.770	0.127	0.096	0.6000
MEDIUM TRUCKS	0.874	0.051	0.075	0.2000
HEAVY TRUCKS	0.891	0.028	0.081	0.2000

NOISE IMPACTS WITHOUT TOPO OR BARRIER SHIELDING:

	LEQ PK HR	LEQ DAY	LEQ EVE	LEQ NIGHT	CNEL
AUTOMOBILES	71.3	69.4	67.5	61.6	70.8
MEDIUM TRUCKS	76.6	75.3	68.9	65.9	75.4
HEAVY TRUCKS	79.5	78.3	69.3	69.1	78.3
VEHICULAR NOISE	**81.8**	80.4	73.4	71.3	80.5

FHWA - HIGHWAY TRAFFIC NOISE PREDICTION MODEL

(modified for CNEL)

DUDEK

PROJECT:	Trails at Lyon Canyon	JN:	14319
ROADWAY:	I-5 Traffic	DATE:	7/5/2022
Scenario:	**2030 Traffic Levels - Lot 6 Senior Residences**	BY:	J. Leech

ADT	235,750		PK HR VOL	23,575
SPEED	72			
PK HR %	10			
DIST CTL	430			
DIST N/F	76	(M=76,P=52,S=36,C=12)	AUTO SLE DISTANCE	428.3
DIST WALL	0		MED TRUCK SLE DIST	428.3
DIST W/OB	430		HVY TRUCK SLE DIST	428.3
HTH WALL	0.0	********		
HTH OBS	5.0			
AMBIENT	45.0			
ROADWAY VIEW:				
LF ANGLE	-90			
RT ANGLE	90			
DF ANGLE	180			

SITE CONDITIONS:		(15=HARD SITE, 10=SOFT SITE)			
AUTOM	15.0				
MED TR	15.0				
HVY TR	15.0				
BARRIER	0	(0=WALL,1=BERM)			
ELEVATIONS:					
PAD	0.0	AUTOMOBILES =	0.00		
ROAD	0.0	MEDIUM TRUCKS=	2.30		
		HEAVY TRUCKS =	8.01		
GRADE:	0.0 %	GRADE ADJUSTM=	0.0	(TO HEAVY TRUCKS)	

VEHICLE DISTRIBUTION:

	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.770	0.127	0.096	0.6000
MEDIUM TRUCKS	0.874	0.051	0.075	0.2000
HEAVY TRUCKS	0.891	0.028	0.081	0.2000

NOISE IMPACTS WITHOUT TOPO OR BARRIER SHIELDING:

	LEQ PK HR	LEQ DAY	LEQ EVE	LEQ NIGHT	CNEL
AUTOMOBILES	68.6	66.6	64.8	58.8	68.1
MEDIUM TRUCKS	73.9	72.6	66.2	63.1	72.6
HEAVY TRUCKS	76.8	75.5	66.6	66.4	75.6
VEHICULAR NOISE	**79.0**	77.7	70.7	68.5	77.8