Appendix H

Noise Data

Project: **AutoZone Victorville**

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Average Distance (feet)		Shielding	Direction
1	Dr. Ralph H. Baker 21st Century Learning Center	500		0	N
2	Residential	875		0	SW
3	Commercial	120		0	S

						RECEPTOR 1		RECEPTOR 2		RECEPTOR 3	
Construction Phase	**Equipment Type**	**No. of Equip.**	**Acoustical Usage Factor**	**Reference Noise Level at 50ft per Unit, Lmax**		**Noise Level at Receptor 1, Lmax**	**Noise Level at Receptor 1, Leq**	**Noise Level at Receptor 2, Lmax**	**Noise Level at Receptor 2, Leq**	**Noise Level at Receptor 3, Lmax**	**Noise Level at Receptor 3, Leq**
Site Preparation											
	Grader	1	40%	85		65.0	61.0	60.1	56.2	77.4	73.4
	Tractor	1	40%	84		64.0	60.0	59.1	55.2	76.4	72.4
Combined LEQ							**63.6**		**58.7**		**76.0**
Grading											
	Grader	1	40%	85		65.0	61.0	60.1	56.2	77.4	73.4
	Dozer	1	40%	82		61.7	57.7	56.8	52.9	74.1	70.1
	Tractor	1	40%	84		64.0	60.0	59.1	55.2	76.4	72.4
Combined LEQ							**64.6**		**59.7**		**77.0**
Building Construction											
	Crane	1	16%	81		60.6	52.6	55.7	47.8	73.0	65.0
Forklift	All Other Equipment > 5 HP	1	50%	85		65.0	62.0	60.1	57.1	77.4	74.4
	Tractor	2	40%	84		67.0	63.0	62.1	58.2	79.4	75.4
	All Other Equipment > 5 HP	1	50%	85		65.0	62.0	60.1	57.1	77.4	74.4
Combined LEQ							**67.3**		**62.4**		**79.7**
Paving											
	Drum Mixer	4	50%	80		66.0	63.0	61.2	58.1	78.4	75.4
	Paver	1	50%	77		57.2	54.2	52.3	49.3	69.6	66.6
	Roller	1	20%	80		60.0	53.0	55.1	48.1	72.4	65.4
	Tractor	1	40%	84		64.0	60.0	59.1	55.2	76.4	72.4
Combined LEQ							**65.4**		**60.5**		**77.8**
Architectural Coating											
	Compressor (air)	1	40%	78		57.7	53.7	52.8	48.9	70.1	66.1
Combined LEQ							**53.7**		**48.9**		**66.1**
Maximum Noise Level							**67.3**		**62.4**		**79.7**

Source for Ref. Noise Levels: RCNM, 2005

* Loudest piece of equipment measured from the construction boundary nearest to the receptor.

** source

Project: AutoZone Victorville
Mechanical Equipment Noise Calculations

Receptor	Reference Level (dBA)	Reference Distance (feet)[1]	Distance to Receptor (feet)[2]	Level at Receptor (dBA)[3]	Noise Threshold	Significant?
Dr. Ralph H. Baker 21st Century Learning Center	52	50	385	34.3	65.0	No
AM/PM Gas Station and Convenience Store	52	50	120	44.4	70.0	No
Residential (Southwest)	52	50	901	26.9	65.0	No

1. Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, Noise Navigator Sound Level Database with Over 1700 Measurement Values, June 26, 2015.

2. Distance estimated using the nearest rooftop location to sensitive receptors on conceptural site plan

3. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1+20Log(d_1/d_2)$, where dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance.

Project: AutoZone Victorville
Truck Deliveries and Trash/Recycle Pick Up

Receptor	Reference Level (dBA)	Reference Distance (feet)[1]	Distance to Receptor (feet)[2]	Level at Receptor (dBA)[3]	Noise Threshold	Significant?
Dr. Ralph H. Baker 21st Century Learning Center	75	50	385	57.3	65.0	No
AM/PM Gas Station and Convenience Store	75	50	35	78.1	70.0	Yes
Residential (Southwest)	75	50	955	49.4	65.0	No

1. Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, Noise Navigator Sound Level Database with Over 1700 Measurement Values, June 26, 2015.

2. Distance estimated using location of trash enclosure as indicated in the conceptual site plan.

3. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1+20Log(d_1/d_2)$, where dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance.

Project: AutoZone Victorville
Parking Noise Calculations

Receptor	Reference Level (dBA)	Reference Distance (feet)[1]	Distance to Receptor (feet)[2]	Level at Receptor (dBA)[3]	Noise Threshold	Significant?
Dr. Ralph H. Baker 21st Century Learning Center	39.6	50	420	21.1	65.0	No
AM/PM Gas Station and Convenience Store	39.6	50	30	44.0	70.0	No
Residential (Southwest)	39.6	50	785	15.7	65.0	No

1. Source for reference level: Using the Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018 reference noise level of 92 dBA SEL and the Project's highest peak hour vehicle trips would generate noise levels of approximately 38.7 dBA

2. Distance estimated using location of parking areas as indicated in the conceptual site plan.

3. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1+20Log(d_1/d_2)$, where dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance.

Project: AutoZone Victorville

Composite Noise

Receptor	Mechanical Equipment (Leq)	Truck Delivery and Trash/Recycle Pickup	Parking (Leq)	Combined Noise at Receptor (Leq)	Ambient Level (dBA)	Combined Noise at Receptor (dBA Leq)	Noise Threshold	Significant?
Industrial	34.3	57.3	21.1	57.292945	64.2	65.0	65.0	No
Commercial	44.4	78.1	44.0	78.101594	64.2	78.3	70.0	Yes
Residential	26.9	49.4	15.7	49.405561	56.0	56.9	65.0	No

Parking Lot Noise

Number of Vehicles Per Hour:	21
Hourly L_{eq} at 50 feet:	39.6

$L_{eq(h)} = SEL_{ref} + 10\log(NA/1{,}000) - 35.6$

Where:

$L_{eq(h)}$	=	39.6	hourly L_{eq} noise level at 50 feet
SEL_{ref}	=	92	reference noise level for stationary noise source represented in sound exposure level (SEL) at 50 feet
NA	=	21	number of automobiles per hour
35.6	=	35.6	Constant, calculated as 10 times the logarithm of the number of seconds in an hour

FTA's reference noise level is 92 dBA SEL at 50 feet from the noise source for a parking lot
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual* , September 2018.

Equipment		PPV at 25 feet (in/sec)	Calculated distance (feet) 85
Pile Driver (impact)	upper range	1.518	0.2421
	typical	0.644	0.1027
Pile Driver (sonic)	upper range	0.734	0.1171
	typical	0.17	0.0271
Clam shovel drop (slurry wall)		0.202	0.0322
Hydromill (slurry wall)	in soil	0.008	0.0013
	in rock	0.017	0.0027
Vibratory Roller		0.21	0.0335
Hoe Ram		0.089	0.0142
Large bulldozer		0.089	0.0142
Caisson drilling		0.089	0.0142
Loaded trucks		0.076	0.0121
Jackhammer		0.035	0.0056
Small bulldozer		0.003	0.0005
Rock Breaker		0.059	0.0094
		PPV at 50 ft	
Blasting		0.4	0.1805

Approximate L_V (VdB) at 25 feet	Calculated distance (feet) 100
112	94
104	86
105	87
93	75
94	76
66	48
75	57
94	76
87	69
87	69
87	69
86	68
79	61
58	40

$L_v(D) = L_v(25 \text{ feet}) - (30 \times \log_{10}(D/25 \text{ feet}))$

Source: FTA, Noise and Vibration Manual, 2006. Page 12-11.

Notes:
1. Calculated using the following formula:
PPV equip = PPVref x (25/D)1.5

where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in in/sec from Table 12-2 of the FTA Transit Noise and Vibration Impact Assessment Guidelines
D = the distance from the equipment to the receiver