Appendix IS-10

Noise

8th and Alameda Project

Noise Calculations Worksheets

Provided by Acoustical Engineering Services

Ambient Noise Measurements

Project: 8th & Alameda
Measurements Date: 4/6/2021

Leq			**Estimated CNEL Levels**			
Receptor	Daytime	Nighttime	CNEL	Ld	Le	Ln
R1	69.2	65.4	71.1	69.2	69.2	65.4
R2	69.5	61.2	69.1	69.5	69.5	61.2

CNEL levels are estimated based on FTA guidelines, FTA Transit Noise and Vibration Impact Assessment Manual, September 2018, Appendix E.

AES
ACOUSTICAL ENGINEERING SERVICES

Location: R1
Date: 4/6/2021

Time	Leq	Lmax
1:31:20 PM	71.5	76.5
1:31:30 PM	71.9	76.1
1:31:40 PM	70.3	72.9
1:31:50 PM	67.8	68.5
1:32:00 PM	70.7	73.8
1:32:10 PM	66.8	70.6
	60.4	61.4
1:32:30 PM	71.5	75.9
1:32:40 PM	71.0	74.8
1:32:50 PM	67.9	72.3
1:33:00 PM	70.9	72.6
1:33:10 PM	63.7	68.2
1:33:20 PM	57.9	58.8
1:33:30 PM	62.9	67.6
1:33:40 PM	67.9	69.9
1:33:50 PM	67.2	68.9
1:34:00 PM	70.5	74.5
1:34:10 PM	74.1	78.7
1:34:20 PM	60.8	64.8
1:34:30 PM	59.7	61.6
1:34:40 PM	59.4	62.1
1:34:50 PM	67.5	68.9
1:35:00 PM	64.9	67.4
1:35:10 PM	60.3	63.5
1:35:20 PM	71.5	75.4
1:35:30 PM	67.2	73.8
1:35:40 PM	60.0	61.7
1:35:50 PM	60.0	60.9
1:36:00 PM	66.0	69.1
1:36:10 PM	67.4	70.0
1:36:20 PM	69.6	71.6
1:36:30 PM	64.3	67.1
1:36:40 PM	61.6	64.1
1:36:50 PM	61.4	63.4
1:37:00 PM	66.6	67.9
1:37:10 PM	74.3	77.5
1:37:20 PM	66.8	69.8
1:37:30 PM	67.2	70.2
1:37:40 PM	70.2	72.1
1:37:50 PM	63.9	64.9
1:38:00 PM	64.7	65.0

1:38:10 PM	65.3	66.1
1:38:20 PM	72.9	75.9
1:38:30 PM	69.3	74.4
1:38:40 PM	69.9	71.8
1:38:50 PM	71.1	74.2
1:39:00 PM	62.5	67.0
1:39:10 PM	62.2	65.1
1:39:20 PM	62.1	63.6
1:39:30 PM	70.3	74.6
1:39:40 PM	72.3	74.6
1:39:50 PM	71.7	75.3
1:40:00 PM	68.7	70.7
1:40:10 PM	66.3	67.7
1:40:20 PM	65.4	65.7
1:40:30 PM	66.0	69.5
1:40:40 PM	80.4	82.6
1:40:50 PM	70.7	77.0
1:41:00 PM	65.3	67.9
1:41:10 PM	66.1	67.9
1:41:20 PM	67.7	73.0
1:41:30 PM	72.9	73.3
1:41:40 PM	72.8	73.1
1:41:50 PM	72.8	74.0
1:42:00 PM	67.7	71.5
1:42:10 PM	65.9	67.0
1:42:20 PM	67.0	67.9
1:42:30 PM	64.2	66.8
1:42:40 PM	62.9	65.6
1:42:50 PM	60.7	63.0
1:43:00 PM	65.1	67.5
1:43:10 PM	67.9	69.9
1:43:20 PM	67.5	69.5
1:43:30 PM	68.6	70.8
1:43:40 PM	66.3	69.6
1:43:50 PM	62.6	63.6
1:44:00 PM	63.3	64.7
1:44:10 PM	74.4	77.6
1:44:20 PM	70.2	76.0
1:44:30 PM	67.2	69.5
1:44:40 PM	68.9	72.3
1:44:50 PM	64.7	67.2
1:45:00 PM	63.7	65.4
1:45:10 PM	60.9	61.8
1:45:20 PM	67.1	69.9
1:45:30 PM	66.7	69.9

1:45:40 PM	69.5	75.3
1:45:50 PM	73.2	76.9
1:46:00 PM	67.9	72.3
1:46:10 PM	63.6	65.0
	69.2	

Time	Leq	Lmax
9:43:25 PM	55.9	58.2
9:43:35 PM	60.5	64.4
9:43:45 PM	65.0	65.8
9:43:55 PM	68.9	72.5
9:44:05 PM	62.5	65.8
9:44:15 PM	56.2	58.2
9:44:25 PM	57.1	58.1
9:44:35 PM	55.0	56.9
9:44:45 PM	63.7	67.7
9:44:55 PM	68.7	74.0
9:45:05 PM	64.5	67.1
9:45:15 PM	64.8	68.7
9:45:25 PM	61.8	64.3
9:45:35 PM	64.7	67.9
9:45:45 PM	67.1	69.0
9:45:55 PM	72.4	76.3
9:46:05 PM	72.7	76.2
9:46:15 PM	67.1	70.6
9:46:25 PM	68.2	73.3
9:46:35 PM	61.3	67.6
9:46:45 PM	58.2	64.6
9:46:55 PM	58.5	59.5
9:47:05 PM	61.4	65.4
9:47:15 PM	66.1	70.6
9:47:25 PM	66.9	70.4
9:47:35 PM	65.4	69.6
9:47:45 PM	62.3	64.8
9:47:55 PM	56.9	57.7
9:48:05 PM	56.7	57.6
9:48:15 PM	60.7	64.6
9:48:25 PM	67.2	68.9
9:48:35 PM	64.4	66.8
9:48:45 PM	67.3	70.2
9:48:55 PM	67.7	72.6
9:49:05 PM	60.0	62.6
9:49:15 PM	68.5	71.6
9:49:25 PM	58.2	60.7
9:49:35 PM	67.8	72.4

9:49:45 PM	64.5	68.8
9:49:55 PM	55.2	56.1
9:50:05 PM	55.6	56.2
9:50:15 PM	55.8	56.3
9:50:25 PM	56.6	57.7
9:50:35 PM	56.4	57.5
9:50:45 PM	58.2	63.9
9:50:55 PM	68.1	71.7
9:51:05 PM	68.0	71.7
9:51:15 PM	62.6	66.6
9:51:25 PM	58.7	60.6
9:51:35 PM	54.8	55.7
9:51:45 PM	58.5	63.2
9:51:55 PM	60.2	63.2
9:52:05 PM	67.7	70.6
9:52:15 PM	65.4	68.3
9:52:25 PM	67.1	71.4
9:52:35 PM	59.6	61.0
9:52:45 PM	56.1	59.6
9:52:55 PM	58.3	63.0
9:53:05 PM	63.2	67.0
9:53:15 PM	69.1	73.8
9:53:25 PM	70.2	72.5
9:53:35 PM	61.4	65.8
9:53:45 PM	58.8	62.0
9:53:55 PM	56.7	58.5
9:54:05 PM	63.9	68.8
9:54:15 PM	68.9	71.3
9:54:25 PM	65.5	68.1
9:54:35 PM	66.2	68.5
9:54:45 PM	68.4	73.2
9:54:55 PM	59.3	62.0
9:55:05 PM	56.8	58.2
9:55:15 PM	65.8	72.6
9:55:25 PM	71.2	73.9
9:55:35 PM	70.7	74.5
9:55:45 PM	67.7	71.4
9:55:55 PM	62.1	67.9
9:56:05 PM	56.9	60.7
9:56:15 PM	58.6	60.9
9:56:25 PM	60.3	62.7
9:56:35 PM	69.6	72.9
9:56:45 PM	71.2	72.8
9:56:55 PM	66.7	72.4
9:57:05 PM	58.2	63.4

9:57:15 PM	53.6	54.7
9:57:25 PM	52.4	52.9
9:57:35 PM	55.5	61.5
9:57:45 PM	63.8	66.6
9:57:55 PM	64.7	70.7
9:58:05 PM	67.0	71.3
9:58:15 PM	61.5	66.9
	65.4	

AES
ACOUSTICAL ENGINEERING SERVICES

Location: R2
Date: 4/6/2021

Time	Leq	Lmax
1:55:54 PM	64.7	67.8
1:56:04 PM	64.3	66.7
1:56:14 PM	65.6	67.8
1:56:24 PM	67.6	71.9
1:56:34 PM	70.3	75.0
1:56:44 PM	66.3	73.0
	62.4	64.0
1:57:04 PM	63.4	64.1
1:57:14 PM	69.8	76.3
1:57:24 PM	76.0	82.6
1:57:34 PM	68.4	74.9
1:57:44 PM	79.8	87.1
1:57:54 PM	64.4	70.0
1:58:04 PM	63.1	66.3
1:58:14 PM	66.6	71.0
1:58:24 PM	69.6	73.0
1:58:34 PM	66.7	73.0
1:58:44 PM	62.2	62.5
1:58:54 PM	65.2	68.8
1:59:04 PM	69.5	75.8
1:59:14 PM	69.3	73.3
1:59:24 PM	70.9	77.0
1:59:34 PM	71.2	76.3
1:59:44 PM	68.4	72.5
1:59:54 PM	71.4	74.4
2:00:04 PM	65.8	67.8
2:00:14 PM	65.5	68.5
2:00:24 PM	63.4	65.0
2:00:34 PM	61.7	62.5
2:00:44 PM	66.5	72.6
2:00:54 PM	63.2	65.6
2:01:04 PM	65.0	68.7
2:01:14 PM	61.3	61.8
2:01:24 PM	67.5	77.4
2:01:34 PM	72.9	77.8
2:01:44 PM	68.7	72.9
2:01:54 PM	67.4	70.2
2:02:04 PM	63.0	64.0
2:02:14 PM	61.7	62.5
2:02:24 PM	66.6	71.0
2:02:34 PM	68.0	72.5

2:02:44 PM	66.8	69.7
2:02:54 PM	67.1	72.3
2:03:04 PM	80.1	84.5
2:03:14 PM	66.3	69.8
2:03:24 PM	64.0	69.3
2:03:34 PM	69.4	71.7
2:03:44 PM	64.6	70.6
2:03:54 PM	70.8	75.8
2:04:04 PM	71.7	74.2
2:04:14 PM	71.5	73.8
2:04:24 PM	68.3	70.3
2:04:34 PM	67.5	70.3
2:04:44 PM	67.1	68.9
2:04:54 PM	75.6	81.0
2:05:04 PM	70.1	77.4
2:05:14 PM	68.2	70.3
2:05:24 PM	67.8	70.3
2:05:34 PM	69.6	72.1
2:05:44 PM	64.1	66.6
2:05:54 PM	70.8	75.5
2:06:04 PM	68.4	70.9
2:06:14 PM	69.6	71.2
2:06:24 PM	66.6	68.3
2:06:34 PM	66.8	68.6
2:06:44 PM	66.7	69.3
2:06:54 PM	62.3	63.5
2:07:04 PM	68.7	73.2
2:07:14 PM	63.2	67.6
2:07:24 PM	64.3	70.3
2:07:34 PM	70.6	76.1
2:07:44 PM	63.5	67.9
2:07:54 PM	65.4	67.9
2:08:04 PM	61.7	62.5
2:08:14 PM	65.0	68.0
2:08:24 PM	66.1	69.4
2:08:34 PM	66.4	69.1
2:08:44 PM	64.1	69.1
2:08:54 PM	65.3	68.3
2:09:04 PM	73.6	77.7
2:09:14 PM	67.6	70.5
2:09:24 PM	68.7	72.5
2:09:34 PM	72.2	76.1
2:09:44 PM	72.2	76.6
2:09:54 PM	68.5	72.8
2:10:04 PM	66.8	71.5

2:10:14 PM	67.9	70.5
2:10:24 PM	63.7	67.1
2:10:34 PM	63.6	67.2
2:10:44 PM	61.8	63.3
	69.5	

Time	Leq	Lmax
10:14:42 PM	55.9	59.3
10:14:52 PM	52.2	53.3
10:15:02 PM	52.2	52.8
10:15:12 PM	61.2	65.3
10:15:22 PM	63.7	68.9
10:15:32 PM	51.8	53.5
10:15:42 PM	52.5	53.6
10:15:52 PM	54.1	55.2
10:16:02 PM	62.6	66.3
10:16:12 PM	62.7	67.5
10:16:22 PM	58.7	61.4
10:16:32 PM	62.5	66.1
10:16:42 PM	68.9	72.3
10:16:52 PM	58.1	63.2
10:17:02 PM	54.4	57.2
10:17:12 PM	60.9	64.3
10:17:22 PM	55.9	56.7
10:17:32 PM	63.6	66.8
10:17:42 PM	58.6	62.2
10:17:52 PM	52.5	54.3
10:18:02 PM	53.0	54.8
10:18:12 PM	56.2	58.7
10:18:22 PM	59.2	60.6
10:18:32 PM	56.1	58.5
10:18:42 PM	52.5	53.2
10:18:52 PM	51.9	53.0
10:19:02 PM	51.8	52.1
10:19:12 PM	51.9	52.6
10:19:22 PM	51.9	52.5
10:19:32 PM	52.1	52.7
10:19:42 PM	52.7	54.0
10:19:52 PM	52.0	52.2
10:20:02 PM	52.2	53.4
10:20:12 PM	53.4	54.5
10:20:22 PM	52.7	53.6
10:20:32 PM	53.0	54.3
10:20:42 PM	57.4	61.6
10:20:52 PM	55.7	60.5

10:21:02 PM	52.6	53.4
10:21:12 PM	52.2	52.6
10:21:22 PM	51.7	52.7
10:21:32 PM	52.6	53.7
10:21:42 PM	52.8	53.7
10:21:52 PM	60.4	64.4
10:22:02 PM	55.4	59.2
10:22:12 PM	53.5	55.4
10:22:22 PM	62.1	66.2
10:22:32 PM	63.5	67.4
10:22:42 PM	57.9	62.4
10:22:52 PM	52.9	55.1
10:23:02 PM	52.2	52.4
10:23:12 PM	52.2	52.6
10:23:22 PM	53.0	53.3
10:23:32 PM	57.9	63.3
10:23:42 PM	69.4	73.4
10:23:52 PM	58.2	62.1
10:24:02 PM	63.3	67.6
10:24:12 PM	58.2	62.9
10:24:22 PM	56.7	61.6
10:24:32 PM	64.1	68.1
10:24:42 PM	62.7	67.6
10:24:52 PM	55.2	56.2
10:25:02 PM	54.5	55.3
10:25:12 PM	55.8	56.5
10:25:22 PM	60.7	62.6
10:25:32 PM	69.2	71.7
10:25:42 PM	70.9	72.2
10:25:52 PM	67.1	68.3
10:26:02 PM	62.8	65.4
10:26:12 PM	62.1	65.3
10:26:22 PM	57.2	58.7
10:26:32 PM	67.8	74.5
10:26:42 PM	59.2	65.4
10:26:52 PM	53.1	54.0
10:27:02 PM	53.2	54.0
10:27:12 PM	55.8	60.3
10:27:22 PM	56.8	60.6
10:27:32 PM	53.6	54.7
10:27:42 PM	52.9	53.3
10:27:52 PM	53.0	55.4
10:28:02 PM	53.5	55.2
10:28:12 PM	54.2	55.2
10:28:22 PM	53.3	54.0

10:28:32 PM	55.8	57.7
10:28:42 PM	59.6	63.7
10:28:52 PM	64.3	66.3
10:29:02 PM	70.8	75.3
10:29:12 PM	66.9	73.8
10:29:22 PM	56.6	59.5
10:29:32 PM	54.2	55.5
	61.2	

Construction Noise & Vibration Calculations

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	770	5
Excavator	1	81	40%	770	5
Rubber Tired Loader	1	79	40%	790	5
Tractor/Loader/Backhoe	1	84	40%	790	5
Rubber Tired Dozers	1	82	40%	810	5
Rubber Tired Loader	1	79	40%	810	5
Water Truck	1	82	10%	830	5
Excavator	1	81	40%	830	5
Tractor/Loader/Backhoe	1	84	40%	850	5

9

Receptor: ***R1***

Results:

1-hour Leq: 57.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	770	5
Grader	1	85	40%	770	5
Excavator	1	81	40%	790	5
Rubber Tired Loader	1	79	40%	790	5
Trenchers	1	80	50%	810	5
Rubber Tired Dozers	1	82	40%	810	5
Water Truck	1	82	10%	830	5
Rubber Tired Loader	1	79	40%	830	5
	8				

Receptor: ***R1***

Results:

1-hour Leq: 57.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Foundation/Structure***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	770	5
Bore/Drill Rig	1	84	20%	770	5
Concrete/Industiral Saws	1	90	20%	795	5
Welders	1	74	40%	790	5
Cement and Mortar Mixers	1	80	50%	810	5
Cranes (Mobile)	1	81	16%	820	5
Forklifts	1	75	20%	845	5
Welders	1	74	40%	830	5
Cement and Mortar Mixers	1	80	50%	850	5
Plate Compactors	1	83	20%	850	5
Forklifts	1	75	20%	895	5
Pumps	1	81	20%	895	5
Forklifts	1	75	20%	920	5
Plate Compactors	1	83	20%	890	5
	14				

Receptor: ***R1***

Results:

1-hour Leq: 58.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Interior***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	770	5
Aerial Lift	1	75	20%	770	5
Cranes (Mobile)	1	81	16%	790	5
Forklifts	1	75	20%	790	5
Welders	1	74	40%	810	5
Air Compressor	1	78	40%	810	5
Aerial Lift	1	75	20%	830	5
Forklifts	1	75	20%	830	5
Welders	1	74	40%	850	5
Air Compressor	1	78	40%	850	5
Aerial Lift	1	75	20%	870	5
Forklifts	1	75	20%	870	5

12

Receptor: ***R1***

Results:

1-hour Leq: 52.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Paving/Landscape***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paving Equipment	1	77	50%	770	5
Concrete/Industiral Saws	1	90	20%	770	5
Cement and Mortar Mixes	1	80	50%	795	5
Forklifts	1	75	20%	795	5
Water Truck	1	82	10%	820	5
Skid Steer Loaders	1	79	40%	820	5
	6				

Receptor: ***R1***

Results:

1-hour Leq: 56.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Demo***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	770	5
Excavator	1	81	40%	770	5
Rubber Tired Loader	1	79	40%	790	5
Tractor/Loader/Backhoe	1	84	40%	790	5
Rubber Tired Dozers	1	82	40%	810	5
Rubber Tired Loader	1	79	40%	810	5
Water Truck	1	82	10%	830	5
Excavator	1	81	40%	830	5
Tractor/Loader/Backhoe	1	84	40%	850	5
	9				

Receptor: ***R1***

Results:

1-hour Leq: 57.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	1330	10
Grader	1	85	40%	1330	10
Excavator	1	81	40%	1350	10
Rubber Tired Loader	1	79	40%	1350	10
Trenchers	1	80	50%	1370	10
Rubber Tired Dozers	1	82	40%	1370	10
Water Truck	1	82	10%	1390	10
Rubber Tired Loader	1	79	40%	1390	10
	8				

Receptor: ***R1***

Results:

1-hour Leq: **47.7**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Foundation/Structure***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	770	5
Bore/Drill Rig	1	84	20%	770	5
Concrete/Industiral Saws	1	90	20%	795	5
Welders	1	74	40%	1350	10
Cement and Mortar Mixers	1	80	50%	1370	10
Cranes (Mobile)	1	81	16%	820	5
Forklifts	1	75	20%	845	5
Welders	1	74	40%	1390	10
Cement and Mortar Mixers	1	80	50%	1410	10
Plate Compactors	1	83	20%	1410	10
Forklifts	1	75	20%	895	5
Pumps	1	81	20%	895	5
Forklifts	1	75	20%	920	5
Plate Compactors	1	83	20%	1450	10
	14				

Receptor: ***R1***

Results:

1-hour Leq: 56.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Interior***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1330	10
Aerial Lift	1	75	20%	1330	10
Cranes (Mobile)	1	81	16%	1350	10
Forklifts	1	75	20%	1350	10
Welders	1	74	40%	1370	10
Air Compressor	1	78	40%	1370	10
Aerial Lift	1	75	20%	1390	10
Forklifts	1	75	20%	1390	10
Welders	1	74	40%	1410	10
Air Compressor	1	78	40%	1410	10
Aerial Lift	1	75	20%	1430	10
Forklifts	1	75	20%	1430	10
	12				

Receptor: ***R1***

Results:

1-hour Leq: 43.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Paving/Landscape***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paving Equipment	1	77	50%	1330	10
Concrete/Industiral Saws	1	90	20%	1330	10
Cement and Mortar Mixes	1	80	50%	1355	10
Forklifts	1	75	20%	1355	10
Water Truck	1	82	10%	1380	10
Skid Steer Loaders	1	79	40%	1380	10

6

Receptor: ***R1***

Results:

1-hour Leq: 46.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Demo***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1375	10
Aerial Lift	1	75	20%	1375	10
Rubber Tired Loader	1	79	40%	790	5
Air Compressor	1	78	40%	1400	10
Aerial Lift	1	75	20%	1425	10
Rubber Tired Loader	1	79	40%	810	5
Air Compressor	1	78	40%	1450	10
Aerial Lift	1	75	20%	1450	10
Air Compressor	1	78	40%	1475	10
Aerial Lift	1	75	20%	1475	10
	10				

Receptor: ***R1***

Results:

1-hour Leq: 49.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Structural Upgrades***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Cement and Mortar Mixers	1	80	50%	770	5
Concrete/Industiral Saws	1	90	20%	1375	10
Cranes (Mobile)	1	81	16%	1400	10
Excavator	1	81	40%	790	5
Forklifts	1	75	20%	1425	10
Plate Compactors	1	83	20%	810	5
Rough Terrain Forklifts	1	83	40%	830	5
Skid Steer Loaders	1	79	40%	1450	10
Welders	1	74	40%	1475	10
Cement and Mortar Mixers	1	80	50%	850	5
Forklifts	1	75	20%	1500	10
Plate Compactors	1	83	20%	870	5
Rough Terrain Forklifts	1	83	40%	890	5
Skid Steer Loaders	1	79	40%	1525	10
Welders	1	74	40%	1525	10
	15				

Receptor: ***R1***

Results:

1-hour Leq: 56.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Interior***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1375	10
Aerial Lift	1	75	20%	1375	10
Cranes (Mobile)	1	81	16%	1395	10
Forklifts	1	75	20%	1395	10
Welders	1	74	40%	1415	10
Air Compressor	1	78	40%	1415	10
Aerial Lift	1	75	20%	1435	10
Forklifts	1	75	20%	1435	10
Welders	1	74	40%	1455	10
Air Compressor	1	78	40%	1455	10
Aerial Lift	1	75	20%	1475	10
Forklifts	1	75	20%	1475	10
	12				

Receptor: ***R1***

Results:

1-hour Leq: 42.8

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Paving/Landscape***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paving Equipment	1	77	50%	1375	10
Concrete/Industiral Saws	1	90	20%	1375	10
Cement and Mortar Mixes	1	80	50%	1400	10
Forklifts	1	75	20%	1400	10
Water Truck	1	82	10%	1425	10
Skid Steer Loaders	1	79	40%	1425	10

6

Receptor: ***R1***

Results:

1-hour Leq: 46.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	1265	15
Excavator	1	81	40%	1265	15
Rubber Tired Loader	1	79	40%	1285	15
Tractor/Loader/Backhoe	1	84	40%	1285	15
Rubber Tired Dozers	1	82	40%	1305	15
Rubber Tired Loader	1	79	40%	1305	15
Water Truck	1	82	10%	1325	15
Excavator	1	81	40%	1325	15
Tractor/Loader/Backhoe	1	84	40%	1345	15

9

Receptor: ***R2***

Results:

1-hour Leq: 43.8

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	1265	15
Grader	1	85	40%	1265	15
Excavator	1	81	40%	1285	15
Rubber Tired Loader	1	79	40%	1285	15
Trenchers	1	80	50%	1305	15
Rubber Tired Dozers	1	82	40%	1305	15
Water Truck	1	82	10%	1325	15
Rubber Tired Loader	1	79	40%	1325	15
	8				

Receptor: ***R2***

Results:

1-hour Leq: 43.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Foundation/Structure***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1265	15
Bore/Drill Rig	1	84	20%	1265	15
Concrete/Industiral Saws	1	90	20%	1285	15
Welders	1	74	40%	1285	15
Cement and Mortar Mixers	1	80	50%	1305	15
Cranes (Mobile)	1	81	16%	1305	15
Forklifts	1	75	20%	1325	15
Welders	1	74	40%	1325	15
Cement and Mortar Mixers	1	80	50%	1345	15
Plate Compactors	1	83	20%	1345	15
Forklifts	1	75	20%	1365	15
Pumps	1	81	20%	1365	15
Forklifts	1	75	20%	1385	15
Plate Compactors	1	83	20%	1385	15
	14				

Receptor: ***R2***

Results:

1-hour Leq: 44.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Interior***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1265	15
Aerial Lift	1	75	20%	1265	15
Cranes (Mobile)	1	81	16%	1285	15
Forklifts	1	75	20%	1285	15
Welders	1	74	40%	1305	15
Air Compressor	1	78	40%	1305	15
Aerial Lift	1	75	20%	1325	15
Forklifts	1	75	20%	1325	15
Welders	1	74	40%	1345	15
Air Compressor	1	78	40%	1345	15
Aerial Lift	1	75	20%	1365	15
Forklifts	1	75	20%	1365	15
	12				

Receptor: ***R2***

Results:

1-hour Leq: 38.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***New Buildings Paving/Landscape***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paving Equipment	1	77	50%	1265	15
Concrete/Industiral Saws	1	90	20%	1265	15
Cement and Mortar Mixes	1	80	50%	1285	15
Forklifts	1	75	20%	1285	15
Water Truck	1	82	10%	1305	15
Skid Steer Loaders	1	79	40%	1305	15
	6				

Receptor: ***R2***

Results:

1-hour Leq: 42.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Demo***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	1265	15
Excavator	1	81	40%	1265	15
Rubber Tired Loader	1	79	40%	1285	15
Tractor/Loader/Backhoe	1	84	40%	1285	15
Rubber Tired Dozers	1	82	40%	1305	15
Rubber Tired Loader	1	79	40%	1305	15
Water Truck	1	82	10%	1325	15
Excavator	1	81	40%	1325	15
Tractor/Loader/Backhoe	1	84	40%	1345	15

9

Receptor: ***R2***

Results:

1-hour Leq: 43.8

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Rubber Tired Dozers	1	82	40%	870	15
Grader	1	85	40%	870	15
Excavator	1	81	40%	890	15
Rubber Tired Loader	1	79	40%	890	15
Trenchers	1	80	50%	910	15
Rubber Tired Dozers	1	82	40%	910	15
Water Truck	1	82	10%	930	15
Rubber Tired Loader	1	79	40%	930	15
	8				

Receptor: ***R2***

Results:

1-hour Leq: 46.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Foundation/Structure***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1265	15
Bore/Drill Rig	1	84	20%	1265	15
Concrete/Industiral Saws	1	90	20%	1285	15
Welders	1	74	40%	890	15
Cement and Mortar Mixers	1	80	50%	910	15
Cranes (Mobile)	1	81	16%	1305	15
Forklifts	1	75	20%	1325	15
Welders	1	74	40%	930	15
Cement and Mortar Mixers	1	80	50%	950	15
Plate Compactors	1	83	20%	950	15
Forklifts	1	75	20%	1365	15
Pumps	1	81	20%	1365	15
Forklifts	1	75	20%	1385	15
Plate Compactors	1	83	20%	990	15
	14				

Receptor: ***R2***

Results:

1-hour Leq: 45.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Interior***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	870	15
Aerial Lift	1	75	20%	870	15
Cranes (Mobile)	1	81	16%	890	15
Forklifts	1	75	20%	890	15
Welders	1	74	40%	910	15
Air Compressor	1	78	40%	910	15
Aerial Lift	1	75	20%	930	15
Forklifts	1	75	20%	930	15
Welders	1	74	40%	950	15
Air Compressor	1	78	40%	950	15
Aerial Lift	1	75	20%	970	15
Forklifts	1	75	20%	970	15

12

Receptor: ***R2***

Results:

1-hour Leq: 41.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Parking Garage Paving/Landscape***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paving Equipment	1	77	50%	870	15
Concrete/Industiral Saws	1	90	20%	870	15
Cement and Mortar Mixes	1	80	50%	890	15
Forklifts	1	75	20%	890	15
Water Truck	1	82	10%	910	15
Skid Steer Loaders	1	79	40%	910	15
	6				

Receptor: ***R2***

Results:

1-hour Leq: 45.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Demo***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1020	15
Aerial Lift	1	75	20%	1020	15
Rubber Tired Loader	1	79	40%	1285	15
Air Compressor	1	78	40%	1040	15
Aerial Lift	1	75	20%	1060	15
Rubber Tired Loader	1	79	40%	1305	15
Air Compressor	1	78	40%	1080	15
Aerial Lift	1	75	20%	1080	15
Air Compressor	1	78	40%	1100	15
Aerial Lift	1	75	20%	1100	15
	10				

Receptor: ***R2***

Results:

1-hour Leq: 40.8

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Structural Upgrades***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Cement and Mortar Mixers	1	80	50%	1265	15
Concrete/Industiral Saws	1	90	20%	1020	15
Cranes (Mobile)	1	81	16%	1040	15
Excavator	1	81	40%	1285	15
Forklifts	1	75	20%	1060	15
Plate Compactors	1	83	20%	1305	15
Rough Terrain Forklifts	1	83	40%	1325	15
Skid Steer Loaders	1	79	40%	1080	15
Welders	1	74	40%	1100	15
Cement and Mortar Mixers	1	80	50%	1345	15
Forklifts	1	75	20%	1120	15
Plate Compactors	1	83	20%	1365	15
Rough Terrain Forklifts	1	83	40%	1385	15
Skid Steer Loaders	1	79	40%	1140	15
Welders	1	74	40%	1140	15
	15				

Receptor: ***R2***

Results:

1-hour Leq: 46.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Interior***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Air Compressor	1	78	40%	1020	15
Aerial Lift	1	75	20%	1020	15
Cranes (Mobile)	1	81	16%	1040	15
Forklifts	1	75	20%	1040	15
Welders	1	74	40%	1060	15
Air Compressor	1	78	40%	1060	15
Aerial Lift	1	75	20%	1080	15
Forklifts	1	75	20%	1080	15
Welders	1	74	40%	1100	15
Air Compressor	1	78	40%	1100	15
Aerial Lift	1	75	20%	1120	15
Forklifts	1	75	20%	1120	15
	12				

Receptor: ***R2***

Results:

1-hour Leq: 40.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Phase: ***Existing Buildings Paving/Landscape***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Paving Equipment	1	77	50%	1020	15
Concrete/Industiral Saws	1	90	20%	1020	15
Cement and Mortar Mixes	1	80	50%	1040	15
Forklifts	1	75	20%	1040	15
Water Truck	1	82	10%	1060	15
Skid Steer Loaders	1	79	40%	1060	15

6

Receptor: ***R2***

Results:

1-hour Leq: 43.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Off-Site Construction

	Worker Trips		Noise Levels along Alameda Street			
Phase	# of Workers/ Day	Trips during Pk Hr.	Project Noise (TNM Calcs)	Ambient	Project + Ambient	Increase over Ambient
Building Construction	400	400	64.3	69.2	70.4	1.2

Eyestone Environmental					**12 August 2021**						
Sean Bui					**TNM 2.5**						
INPUT: ROADWAYS							**Average pavement type shall be used unless**				
PROJECT/CONTRACT:	**8th & Alameda**						**a State highway agency substantiates the use**				
RUN:	**Off-site Construction - Workers**						**of a different type with the approval of FHWA**				
Roadway		**Points**									
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**			**Flow Control**			**Segment**	
				X	**Y**	**Z**	**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**
	ft			ft	ft	ft		mph	%		
Haul Route	12.0	point1	1	0.0	0.0	0.00	Signal	0.00	50	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental				**12 August 2021**								
Sean Bui				**TNM 2.5**								
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	**8th & Alameda**											
RUN:	**Off-site Construction - Workers**											
Roadway	**Points**											
Name	**Name**	**No.**	**Segment**									
			Autos		**MTrucks**		**HTrucks**		**Buses**		**Motorcycles**	
			V	**S**	**V**	**S**	**V**	**S**	**V**	**S**	**V**	**S**
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Haul Route	point1	1	400	35	0	0	0	0	0	0	0	0
	point2	2										

Eyestone Environmental						**12 August 2021**					
Sean Bui						**TNM 2.5**					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	**8th & Alameda**										
RUN:	**Off-site Construction - Workers**										
Receiver											
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**				**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**		**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**	**Goal**	**Calc.**
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Alameda St.	1	1	500.0	30.0	0.00	4.92	0.00	71	5.0	0.0	Y

Eyestone Environmental
Sean Bui

12 August 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 8th & Alameda
RUN: Off-site Construction - Workers
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Alameda St.	1	1	0.0	64.3	71	64.3	5	----	64.3	0.0	0	0.0

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	1	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 8th & Alameda

Construction Vibration Impacts

Reference Levels at 25 feet are based on FTA, 2018 (Transit Noise and Vibration Impact Assessment)
Calculations using FTA procedure with n= **1.5** (for receptors 25 feet or greater)
n= **1.1** (for receptors less than 25 feet, per Caltrans procedure)

ON-SITE CONSTRUCTION ACTIVITIES

Table 1: Construction Equipment Vibration Levels (PPV) - Building Damages

Equipment	Reference Vibration Levels at 25 ft., PPV	Estimated Vibration Levels at nearest off-site building structures (distance in feet), PPV						
		Single-Story Industrial building to the North	Overland Terminal Produce Warehouse	Western Electric Company Historic District				
		35	65	140				
Large Bulldozer	0.089	0.054	0.021	0.007				
Caisson Drilling	0.089	0.054	0.021	0.007				
Loaded Trucks	0.076	0.046	0.018	0.006				
Jackhammer	0.035	0.021	0.008	0.003				
Small bulldozer	0.003	0.002	0.001	0.000				
Significance Threshold, PPV		0.3	0.12	0.12				

Table 2: Construction Equipment Vibration Levels (VdB) - Human Annoyance

Equipment	Reference Vibration Levels at 25 ft., VdB	Estimated Vibration Levels at Off-Site Receptors (at note distance in feet), VdB						
		R1	R2					
		770	835					
Large Bulldozer	87	42	41					
Caisson Drilling	87	42	41					
Loaded Trucks	86	41	40					
Jackhammer	79	34	33					
Small bulldozer	58	13	12					
Significance Threshold, VdB		72	72					

Operation Noise Calculations

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Project Composite Noise Calculations (CNEL)

Project: 8th and Alameda Project

Receptor	Ambient	Traffic[a]	Mechanical	Loading	Parking	Outdoor		Project Composite	Ambient + Project	Increase
R1	71.1	58.3	50.1	41.9	40.6	27.9		59.1	71.4	0.3
R2	69.1	51.2	53.1	47.5	43.9	29.0		56.2	69.3	0.2

[a] - Project traffic noise levels at each receptor is based on the traffic noise analysis for the roadway segment in front of the receptor, adjusted for distance and barrier (if present), as provided in the table below.

		Traffic Noise Levels, CNEL								
Receptor	Roadway Segment	Existing	Existing + Project	Project Only	distance to roadway, ft	Existing	Existing + Project	barrier	distance to Center Line	adj. for distance
R1	Alameda	69.8	70.1	58.3	10	69.8	70.1	0	45	0.0
R2	Mateo	67.5	67.6	51.2	10	67.5	67.6	0	30	0.0

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Outdoor Mechanical Equipment Noise Calculations

Project: 8th and Alameda Project

	Estimated Noise Levels, Leq from SOUNDPLAN		Hours of Operations Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Leq	CNEL	12	3	9
R1	50.6	50.1	50.6	50.6	0.0
R2	46.4	53.1	46.4	46.4	46.4

Receptor	Ambient CNEL	Ambient + Project (CNEL)	Increase (CNEL)	ambient (Leq)	Ambient + Project (Leq)	Increase (Leq)
R1	71.1	71.1	0.0	65.4	65.5	0.1
R2	69.1	69.2	0.1	61.2	61.3	0.1

Receptor	Ambient, (Leq)	Project, (Leq)	Amb+Project, (Leq)	Criteria, (Leq)	Exceedance
R1	65.4	50.6	65.5	70.4	0.0
R2	61.2	46.4	61.3	66.2	0.0

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Loading & Trash Compactor Noise Calculations

Project: 8th and Alameda Project

					Hours of Operations		
Estimated noise levels, Leq (FROM SOUNDPLAN)					Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Loading	Trash Compactor	Total, Leq	CNEL	1	**0**	**4**
R1	39.4	27.1	39.6	41.9	28.8	0.0	36.1
R2	45.0	30.8	45.2	47.5	34.4	0.0	41.7

Receptor	Ambient CNEL	Ambient + Project (CNEL)	Increase (CNEL)	ambient (Leq)	Project (Leq)	Ambient + Project (Leq)	Increase (Leq)
R1	71.1	71.1	0.0	65.4	39.6	65.4	0.0
R2	69.1	69.1	0.0	61.2	45.2	61.3	0.1

Receptor	Ambient, (Leq)	Project, (Leq)	Ambient + Project, (Leq)	Criteria, (Leq)	Exceedance
R1	65.4	39.6	65.4	70.4	0.0
R2	61.2	45.2	61.3	66.2	0.0

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Parking Structure Noise Calculations

Project: 8th and Alameda Project

	Estimated Noise Levels, Leq from SOUNDPLAN		Hours of Operations Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Leq	CNEL	12	3	9
R1	33.9	40.6	33.9	33.9	33.9
R2	37.2	43.9	37.2	37.2	37.2

Receptor	Ambient CNEL	Ambient + Project (CNEL)	Increase (CNEL)	ambient (Leq)	Ambient + Project (Leq)	Increase (Leq)
R1	71.1	71.1	0.0	65.4	65.4	0.0
R2	69.1	69.1	0.0	61.2	61.2	0.0

Receptor	Ambient	Project	Amb+Project	Criteria	Exceedance
R1	65.4	33.9	65.4	70.4	0.0
R2	61.2	37.2	61.2	66.2	0.0

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Outdoor Noise Calculations

Project: 8th and Alameda Project

					Hours of Operations		
Estimated noise levels, Leq (FROM SOUNDPLAN)					Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor		Occupants	Total, Leq	CNEL	12	**3**	**2**
R1		25.5	25.5	27.9	25.5	25.5	19.0
R2		26.6	26.6	29.0	26.6	26.6	20.1

Receptor	Ambient CNEL	Ambient + Project (CNEL)	Increase (CNEL)	ambient (Leq)	Project (Leq)	Ambient + Project (Leq)	Increase (Leq)
R1	71.1	71.1	0.0	65.4	25.5	65.4	0.0
R2	69.1	69.1	0.0	61.2	26.6	61.2	0.0

Receptor	Ambient, (Leq)	Project, (Leq)	Ambient + Project, (Leq)	Criteria, (Leq)	Exceedance
R1	65.4	25.5	65.4	70.4	0.0
R2	61.2	26.6	61.2	66.2	0.0