- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 90.8 - 2018/02/28 07:37:36
- Level Range : 40-100
- SEL : 105.5
- Leq : 76.0
-

No.s	Date Time	(dB)
1	2018/02/28 07:37:31	66.9
2	2018/02/28 07:37:34	89.9
3	2018/02/28 07:37:37	77.5
4	2018/02/28 07:37:40	70.0
5	2018/02/28 07:37:43	68.6
6	2018/02/28 07:37:46	61.8
7	2018/02/28 07:37:49	57.1
8	2018/02/28 07:37:52	58.6
9	2018/02/28 07:37:55	70.1
10	2018/02/28 07:37:58	71.3
11	2018/02/28 07:38:01	72.2
12	2018/02/28 07:38:04	75.7
13	2018/02/28 07:38:07	79.0
14	2018/02/28 07:38:10	76.8
15	2018/02/28 07:38:13	79.8
16	2018/02/28 07:38:16	77.1
17	2018/02/28 07:38:19	78.9
18	2018/02/28 07:38:22	77.9
19	2018/02/28 07:38:25	69.5
20	2018/02/28 07:38:28	70.1
21	2018/02/28 07:38:31	68.8
22	2018/02/28 07:38:34	67.0
23	2018/02/28 07:38:37	63.6
24	2018/02/28 07:38:40	66.2
25	2018/02/28 07:38:43	71.9
26	2018/02/28 07:38:46	73.7
27	2018/02/28 07:38:49	83.2
28	2018/02/28 07:38:52	81.5
29	2018/02/28 07:38:55	80.0
30	2018/02/28 07:38:58	75.9
31	2018/02/28 07:39:01	74.2
32	2018/02/28 07:39:04	74.9
33	2018/02/28 07:39:07	75.5
34	2018/02/28 07:39:10	70.4
35	2018/02/28 07:39:13	77.5
36	2018/02/28 07:39:16	76.8
37	2018/02/28 07:39:19	63.0
38	2018/02/28 07:39:22	65.0
39	2018/02/28 07:39:25	67.9
40	2018/02/28 07:39:28	65.2
41	2018/02/28 07:39:31	60.8
42	2018/02/28 07:39:34	70.3
43	2018/02/28 07:39:37	76.6
44	2018/02/28 07:39:40	74.7
45	2018/02/28 07:39:43	69.9
46	2018/02/28 07:39:46	70.9
47	2018/02/28 07:39:49	80.2
48	2018/02/28 07:39:52	81.6
49	2018/02/28 07:39:55	77.9
50	2018/02/28 07:39:58	79.8
51	2018/02/28 07:40:01	84.4
52	2018/02/28 07:40:04	81.0
53	2018/02/28 07:40:07	81.5
54	2018/02/28 07:40:10	76.9
55	2018/02/28 07:40:13	77.0
56	2018/02/28 07:40:16	77.7
57	2018/02/28 07:40:19	69.1
58	2018/02/28 07:40:22	64.1
59	2018/02/28 07:40:25	62.1
60	2018/02/28 07:40:28	55.6
61	2018/02/28 07:40:31	53.5
62	2018/02/28 07:40:34	54.9
63	2018/02/28 07:40:37	60.8
64	2018/02/28 07:40:40	62.4
65	2018/02/28 07:40:43	59.0
66	2018/02/28 07:40:46	77.1
67	2018/02/28 07:40:49	79.3
68	2018/02/28 07:40:52	76.8
69	2018/02/28 07:40:55	75.2
70	2018/02/28 07:40:58	79.9
71	2018/02/28 07:41:01	73.8
72	2018/02/28 07:41:04	72.2
73	2018/02/28 07:41:07	65.6
74	2018/02/28 07:41:10	59.9
75	2018/02/28 07:41:13	57.0
76	2018/02/28 07:41:16	59.5
77	2018/02/28 07:41:19	77.6
78	2018/02/28 07:41:22	63.9
79	2018/02/28 07:41:25	57.8
80	2018/02/28 07:41:28	58.6
81	2018/02/28 07:41:31	70.1
82	2018/02/28 07:41:34	68.6
83	2018/02/28 07:41:37	69.6
84	2018/02/28 07:41:40	69.6
85	2018/02/28 07:41:43	71.9

86	2018/02/28	07:41:46	75.8
87	2018/02/28	07:41:49	70.2
88	2018/02/28	07:41:52	77.0
89	2018/02/28	07:41:55	74.3
90	2018/02/28	07:41:58	77.3
91	2018/02/28	07:42:01	78.9
92	2018/02/28	07:42:04	80.1
93	2018/02/28	07:42:07	79.2
94	2018/02/28	07:42:10	77.5
95	2018/02/28	07:42:13	70.8
96	2018/02/28	07:42:16	76.0
97	2018/02/28	07:42:19	76.3
98	2018/02/28	07:42:22	74.8
99	2018/02/28	07:42:25	71.4
100	2018/02/28	07:42:28	76.2
101	2018/02/28	07:42:31	77.8
102	2018/02/28	07:42:34	75.7
103	2018/02/28	07:42:37	67.5
104	2018/02/28	07:42:40	75.1
105	2018/02/28	07:42:43	71.0
106	2018/02/28	07:42:46	76.1
107	2018/02/28	07:42:49	68.9
108	2018/02/28	07:42:52	78.3
109	2018/02/28	07:42:55	66.7
110	2018/02/28	07:42:58	62.6
111	2018/02/28	07:43:01	55.0
112	2018/02/28	07:43:04	53.4
113	2018/02/28	07:43:07	52.8
114	2018/02/28	07:43:10	52.4
115	2018/02/28	07:43:13	57.0
116	2018/02/28	07:43:16	60.4
117	2018/02/28	07:43:19	62.7
118	2018/02/28	07:43:22	62.9
119	2018/02/28	07:43:25	60.7
120	2018/02/28	07:43:28	61.1
121	2018/02/28	07:43:31	59.9
122	2018/02/28	07:43:34	67.2
123	2018/02/28	07:43:37	71.6
124	2018/02/28	07:43:40	74.6
125	2018/02/28	07:43:43	67.7
126	2018/02/28	07:43:46	69.5
127	2018/02/28	07:43:49	74.9
128	2018/02/28	07:43:52	80.3
129	2018/02/28	07:43:55	78.2
130	2018/02/28	07:43:58	78.0
131	2018/02/28	07:44:01	79.0
132	2018/02/28	07:44:04	78.7
133	2018/02/28	07:44:07	80.5
134	2018/02/28	07:44:10	78.7
135	2018/02/28	07:44:13	77.0
136	2018/02/28	07:44:16	81.2
137	2018/02/28	07:44:19	77.0
138	2018/02/28	07:44:22	79.7
139	2018/02/28	07:44:25	80.0
140	2018/02/28	07:44:28	78.3
141	2018/02/28	07:44:31	76.3
142	2018/02/28	07:44:34	76.4
143	2018/02/28	07:44:37	76.4
144	2018/02/28	07:44:40	70.0
145	2018/02/28	07:44:43	75.4
146	2018/02/28	07:44:46	79.8
147	2018/02/28	07:44:49	78.6
148	2018/02/28	07:44:52	76.1
149	2018/02/28	07:44:55	73.1
150	2018/02/28	07:44:58	71.5
151	2018/02/28	07:45:01	72.5
152	2018/02/28	07:45:04	65.7
153	2018/02/28	07:45:07	63.3
154	2018/02/28	07:45:10	67.3
155	2018/02/28	07:45:13	69.4
156	2018/02/28	07:45:16	71.2
157	2018/02/28	07:45:19	86.3
158	2018/02/28	07:45:22	73.3
159	2018/02/28	07:45:25	72.5
160	2018/02/28	07:45:28	74.3
161	2018/02/28	07:45:31	68.9
162	2018/02/28	07:45:34	65.0
163	2018/02/28	07:45:37	65.4
164	2018/02/28	07:45:40	67.0
165	2018/02/28	07:45:43	75.0
166	2018/02/28	07:45:46	78.4
167	2018/02/28	07:45:49	79.5
168	2018/02/28	07:45:52	79.3
169	2018/02/28	07:45:55	78.4
170	2018/02/28	07:45:58	81.4
171	2018/02/28	07:46:01	77.5
172	2018/02/28	07:46:04	79.8
173	2018/02/28	07:46:07	77.3
174	2018/02/28	07:46:10	77.6
175	2018/02/28	07:46:13	77.3
176	2018/02/28	07:46:16	75.3
177	2018/02/28	07:46:19	80.9
178	2018/02/28	07:46:22	69.5
179	2018/02/28	07:46:25	67.8
180	2018/02/28	07:46:28	73.4
181	2018/02/28	07:46:31	68.8
182	2018/02/28	07:46:34	68.7
183	2018/02/28	07:46:37	63.1
184	2018/02/28	07:46:40	57.5

185	2018/02/28	07:46:43	59.1
186	2018/02/28	07:46:46	64.6
187	2018/02/28	07:46:49	71.1
188	2018/02/28	07:46:52	61.0
189	2018/02/28	07:46:55	67.5
190	2018/02/28	07:46:58	70.9
191	2018/02/28	07:47:01	78.4
192	2018/02/28	07:47:04	72.0
193	2018/02/28	07:47:07	79.7
194	2018/02/28	07:47:10	80.4
195	2018/02/28	07:47:13	79.4
196	2018/02/28	07:47:16	82.7
197	2018/02/28	07:47:19	77.7
198	2018/02/28	07:47:22	80.2
199	2018/02/28	07:47:25	79.2
200	2018/02/28	07:47:28	74.3
201	2018/02/28	07:47:31	71.1
202	2018/02/28	07:47:34	77.7
203	2018/02/28	07:47:37	78.7
204	2018/02/28	07:47:40	70.8
205	2018/02/28	07:47:43	75.7
206	2018/02/28	07:47:46	72.2
207	2018/02/28	07:47:49	64.9
208	2018/02/28	07:47:52	80.9
209	2018/02/28	07:47:55	80.9
210	2018/02/28	07:47:58	77.2
211	2018/02/28	07:48:01	74.9
212	2018/02/28	07:48:04	79.7
213	2018/02/28	07:48:07	80.7
214	2018/02/28	07:48:10	78.9
215	2018/02/28	07:48:13	77.1
216	2018/02/28	07:48:16	78.8
217	2018/02/28	07:48:19	77.4
218	2018/02/28	07:48:22	79.6
219	2018/02/28	07:48:25	70.4
220	2018/02/28	07:48:28	74.3
221	2018/02/28	07:48:31	75.1
222	2018/02/28	07:48:34	73.3
223	2018/02/28	07:48:37	75.5
224	2018/02/28	07:48:40	68.3
225	2018/02/28	07:48:43	80.9
226	2018/02/28	07:48:46	70.4
227	2018/02/28	07:48:49	78.2
228	2018/02/28	07:48:52	80.3
229	2018/02/28	07:48:55	77.0
230	2018/02/28	07:48:58	74.1
231	2018/02/28	07:49:01	74.2
232	2018/02/28	07:49:04	73.0
233	2018/02/28	07:49:07	73.5
234	2018/02/28	07:49:10	68.7
235	2018/02/28	07:49:13	71.7
236	2018/02/28	07:49:16	64.6
237	2018/02/28	07:49:19	71.1
238	2018/02/28	07:49:22	70.2
239	2018/02/28	07:49:25	76.2
240	2018/02/28	07:49:28	72.9
241	2018/02/28	07:49:31	71.5
242	2018/02/28	07:49:34	71.8
243	2018/02/28	07:49:37	75.2
244	2018/02/28	07:49:40	80.1
245	2018/02/28	07:49:43	69.0
246	2018/02/28	07:49:46	80.3
247	2018/02/28	07:49:49	74.1
248	2018/02/28	07:49:52	82.2
249	2018/02/28	07:49:55	79.2
250	2018/02/28	07:49:58	77.9
251	2018/02/28	07:50:01	77.3
252	2018/02/28	07:50:04	81.0
253	2018/02/28	07:50:07	78.6
254	2018/02/28	07:50:10	74.7
255	2018/02/28	07:50:13	77.4
256	2018/02/28	07:50:16	81.4
257	2018/02/28	07:50:19	78.2
258	2018/02/28	07:50:22	75.0
259	2018/02/28	07:50:25	67.9
260	2018/02/28	07:50:28	65.4
261	2018/02/28	07:50:31	65.6
262	2018/02/28	07:50:34	65.5
263	2018/02/28	07:50:37	61.7
264	2018/02/28	07:50:40	67.4
265	2018/02/28	07:50:43	65.0
266	2018/02/28	07:50:46	69.9
267	2018/02/28	07:50:49	79.3
268	2018/02/28	07:50:52	77.7
269	2018/02/28	07:50:55	80.7
270	2018/02/28	07:50:58	80.6
271	2018/02/28	07:51:01	74.3
272	2018/02/28	07:51:04	79.7
273	2018/02/28	07:51:07	68.8
274	2018/02/28	07:51:10	76.5
275	2018/02/28	07:51:13	79.6
276	2018/02/28	07:51:16	72.7
277	2018/02/28	07:51:19	71.8
278	2018/02/28	07:51:22	77.0
279	2018/02/28	07:51:25	69.0
280	2018/02/28	07:51:28	72.3
281	2018/02/28	07:51:31	73.7
282	2018/02/28	07:51:34	66.4
283	2018/02/28	07:51:37	70.5

284	2018/02/28	07:51:40	79.3
285	2018/02/28	07:51:43	71.1
286	2018/02/28	07:51:46	72.5
287	2018/02/28	07:51:49	78.2
288	2018/02/28	07:51:52	77.0
289	2018/02/28	07:51:55	82.8
290	2018/02/28	07:51:58	79.2
291	2018/02/28	07:52:01	77.1
292	2018/02/28	07:52:04	75.9
293	2018/02/28	07:52:07	80.2
294	2018/02/28	07:52:10	77.9
295	2018/02/28	07:52:13	77.5
296	2018/02/28	07:52:16	79.8
297	2018/02/28	07:52:19	68.2
298	2018/02/28	07:52:22	67.1
299	2018/02/28	07:52:25	78.7
300	2018/02/28	07:52:28	78.2

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 66.8 - 2018/02/28 08:22:13
- Level Range : 40-100
- SEL : 78.3
- Leq : 48.8
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No.s	Date Time	(dB)
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2	2018/02/28 08:10:57	52.5
3	2018/02/28 08:11:00	49.4
4	2018/02/28 08:11:03	46.6
5	2018/02/28 08:11:06	52.5
6	2018/02/28 08:11:09	46.4
7	2018/02/28 08:11:12	45.7
8	2018/02/28 08:11:15	44.6
9	2018/02/28 08:11:18	44.9
10	2018/02/28 08:11:21	44.6
11	2018/02/28 08:11:24	45.5
12	2018/02/28 08:11:27	47.2
13	2018/02/28 08:11:30	45.0
14	2018/02/28 08:11:33	45.8
15	2018/02/28 08:11:36	45.0
16	2018/02/28 08:11:39	45.6
17	2018/02/28 08:11:42	44.4
18	2018/02/28 08:11:45	45.5
19	2018/02/28 08:11:48	44.6
20	2018/02/28 08:11:51	44.3
21	2018/02/28 08:11:54	44.6
22	2018/02/28 08:11:57	44.0
23	2018/02/28 08:12:00	43.8
24	2018/02/28 08:12:03	43.5
25	2018/02/28 08:12:06	43.8
26	2018/02/28 08:12:09	44.6
27	2018/02/28 08:12:12	44.7
28	2018/02/28 08:12:15	44.2
29	2018/02/28 08:12:18	43.2
30	2018/02/28 08:12:21	45.6
31	2018/02/28 08:12:24	43.6
32	2018/02/28 08:12:27	45.7
33	2018/02/28 08:12:30	45.8
34	2018/02/28 08:12:33	47.2
35	2018/02/28 08:12:36	45.6
36	2018/02/28 08:12:39	46.1
37	2018/02/28 08:12:42	48.2
38	2018/02/28 08:12:45	46.8
39	2018/02/28 08:12:48	47.9
40	2018/02/28 08:12:51	47.0
41	2018/02/28 08:12:54	46.0
42	2018/02/28 08:12:57	45.4
43	2018/02/28 08:13:00	48.5
44	2018/02/28 08:13:03	46.1
45	2018/02/28 08:13:06	45.0
46	2018/02/28 08:13:09	44.7
47	2018/02/28 08:13:12	46.0
48	2018/02/28 08:13:15	46.2
49	2018/02/28 08:13:18	46.4
50	2018/02/28 08:13:21	45.9
51	2018/02/28 08:13:24	47.5
52	2018/02/28 08:13:27	50.2
53	2018/02/28 08:13:30	49.0
54	2018/02/28 08:13:33	48.4
55	2018/02/28 08:13:36	48.3
56	2018/02/28 08:13:39	47.9
57	2018/02/28 08:13:42	45.6
58	2018/02/28 08:13:45	45.5
59	2018/02/28 08:13:48	47.2
60	2018/02/28 08:13:51	44.8
61	2018/02/28 08:13:54	44.1
62	2018/02/28 08:13:57	45.0
63	2018/02/28 08:14:00	44.1
64	2018/02/28 08:14:03	44.1
65	2018/02/28 08:14:06	44.3
66	2018/02/28 08:14:09	46.8
67	2018/02/28 08:14:12	45.0
68	2018/02/28 08:14:15	45.2
69	2018/02/28 08:14:18	46.2
70	2018/02/28 08:14:21	45.1
71	2018/02/28 08:14:24	46.0
72	2018/02/28 08:14:27	45.0
73	2018/02/28 08:14:30	51.3
74	2018/02/28 08:14:33	47.3
75	2018/02/28 08:14:36	45.6
76	2018/02/28 08:14:39	46.3
77	2018/02/28 08:14:42	45.8
78	2018/02/28 08:14:45	47.3
79	2018/02/28 08:14:48	49.5
80	2018/02/28 08:14:51	49.0
81	2018/02/28 08:14:54	47.7
82	2018/02/28 08:14:57	46.6
83	2018/02/28 08:15:00	49.1
84	2018/02/28 08:15:03	47.4
85	2018/02/28 08:15:06	48.5

86	2018/02/28	08:15:09	45.3
87	2018/02/28	08:15:12	45.6
88	2018/02/28	08:15:15	45.8
89	2018/02/28	08:15:18	48.3
90	2018/02/28	08:15:21	44.6
91	2018/02/28	08:15:24	49.8
92	2018/02/28	08:15:27	56.8
93	2018/02/28	08:15:30	54.3
94	2018/02/28	08:15:33	55.5
95	2018/02/28	08:15:36	45.1
96	2018/02/28	08:15:39	46.3
97	2018/02/28	08:15:42	44.4
98	2018/02/28	08:15:45	43.6
99	2018/02/28	08:15:48	43.9
100	2018/02/28	08:15:51	44.6
101	2018/02/28	08:15:54	44.6
102	2018/02/28	08:15:57	45.0
103	2018/02/28	08:16:00	44.8
104	2018/02/28	08:16:03	45.9
105	2018/02/28	08:16:06	44.9
106	2018/02/28	08:16:09	45.3
107	2018/02/28	08:16:12	44.5
108	2018/02/28	08:16:15	44.8
109	2018/02/28	08:16:18	43.8
110	2018/02/28	08:16:21	45.4
111	2018/02/28	08:16:24	45.2
112	2018/02/28	08:16:27	46.2
113	2018/02/28	08:16:30	46.7
114	2018/02/28	08:16:33	45.2
115	2018/02/28	08:16:36	45.5
116	2018/02/28	08:16:39	46.8
117	2018/02/28	08:16:42	46.0
118	2018/02/28	08:16:45	44.0
119	2018/02/28	08:16:48	43.8
120	2018/02/28	08:16:51	43.5
121	2018/02/28	08:16:54	43.8
122	2018/02/28	08:16:57	44.4
123	2018/02/28	08:17:00	43.4
124	2018/02/28	08:17:03	44.4
125	2018/02/28	08:17:06	44.1
126	2018/02/28	08:17:09	46.4
127	2018/02/28	08:17:12	45.2
128	2018/02/28	08:17:15	44.8
129	2018/02/28	08:17:18	46.1
130	2018/02/28	08:17:21	45.2
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- Time Weight : FAST
- Level Range : 40-100
- Max dB : 70.0 - 2018/02/28 08:37:39
- Level Range : 40-100
- SEL : 87.2
- Leq : 57.7
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3	2018/02/28 08:34:10	51.7
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6	2018/02/28 08:34:19	52.4
7	2018/02/28 08:34:22	53.4
8	2018/02/28 08:34:25	53.2
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10	2018/02/28 08:34:31	52.2
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23	2018/02/28 08:35:10	63.0
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257	2018/02/28	08:46:52	55.1
258	2018/02/28	08:46:55	54.8
259	2018/02/28	08:46:58	52.9
260	2018/02/28	08:47:01	51.0
261	2018/02/28	08:47:04	52.0
262	2018/02/28	08:47:07	54.3
263	2018/02/28	08:47:10	54.7
264	2018/02/28	08:47:13	55.5
265	2018/02/28	08:47:16	56.7
266	2018/02/28	08:47:19	62.1
267	2018/02/28	08:47:22	56.3
268	2018/02/28	08:47:25	55.7
269	2018/02/28	08:47:28	54.0
270	2018/02/28	08:47:31	55.8
271	2018/02/28	08:47:34	59.0
272	2018/02/28	08:47:37	59.9
273	2018/02/28	08:47:40	62.1
274	2018/02/28	08:47:43	62.0
275	2018/02/28	08:47:46	61.3
276	2018/02/28	08:47:49	58.7
277	2018/02/28	08:47:52	59.9
278	2018/02/28	08:47:55	57.5
279	2018/02/28	08:47:58	56.0
280	2018/02/28	08:48:01	54.8
281	2018/02/28	08:48:04	53.6
282	2018/02/28	08:48:07	51.8
283	2018/02/28	08:48:10	52.2

284	2018/02/28	08:48:13	55.5
285	2018/02/28	08:48:16	58.0
286	2018/02/28	08:48:19	57.8
287	2018/02/28	08:48:22	61.5
288	2018/02/28	08:48:25	59.5
289	2018/02/28	08:48:28	59.3
290	2018/02/28	08:48:31	57.6
291	2018/02/28	08:48:34	57.4
292	2018/02/28	08:48:37	57.1
293	2018/02/28	08:48:40	56.1
294	2018/02/28	08:48:43	57.7
295	2018/02/28	08:48:46	55.7
296	2018/02/28	08:48:49	53.1
297	2018/02/28	08:48:52	52.5
298	2018/02/28	08:48:55	53.6
299	2018/02/28	08:48:58	54.9
300	2018/02/28	08:49:01	54.1

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 88.8 - 2018/02/28 09:09:20
- Level Range : 40-100
- SEL : 99.5
- Leq : 70.0
-

No.s	Date Time	(dB)
1	2018/02/28 08:55:54	68.6
2	2018/02/28 08:55:57	66.8
3	2018/02/28 08:56:00	62.3
4	2018/02/28 08:56:03	58.3
5	2018/02/28 08:56:06	62.2
6	2018/02/28 08:56:09	67.6
7	2018/02/28 08:56:12	63.8
8	2018/02/28 08:56:15	67.4
9	2018/02/28 08:56:18	62.2
10	2018/02/28 08:56:21	63.8
11	2018/02/28 08:56:24	63.8
12	2018/02/28 08:56:27	62.9
13	2018/02/28 08:56:30	65.4
14	2018/02/28 08:56:33	71.0
15	2018/02/28 08:56:36	72.2
16	2018/02/28 08:56:39	73.0
17	2018/02/28 08:56:42	70.3
18	2018/02/28 08:56:45	73.3
19	2018/02/28 08:56:48	70.3
20	2018/02/28 08:56:51	66.9
21	2018/02/28 08:56:54	65.7
22	2018/02/28 08:56:57	67.6
23	2018/02/28 08:57:00	66.2
24	2018/02/28 08:57:03	72.8
25	2018/02/28 08:57:06	74.2
26	2018/02/28 08:57:09	77.9
27	2018/02/28 08:57:12	78.7
28	2018/02/28 08:57:15	71.9
29	2018/02/28 08:57:18	66.6
30	2018/02/28 08:57:21	64.9
31	2018/02/28 08:57:24	65.6
32	2018/02/28 08:57:27	65.7
33	2018/02/28 08:57:30	67.2
34	2018/02/28 08:57:33	65.9
35	2018/02/28 08:57:36	64.9
36	2018/02/28 08:57:39	66.1
37	2018/02/28 08:57:42	66.9
38	2018/02/28 08:57:45	66.0
39	2018/02/28 08:57:48	66.2
40	2018/02/28 08:57:51	65.3
41	2018/02/28 08:57:54	64.6
42	2018/02/28 08:57:57	67.0
43	2018/02/28 08:58:00	67.3
44	2018/02/28 08:58:03	64.3
45	2018/02/28 08:58:06	61.6
46	2018/02/28 08:58:09	63.3
47	2018/02/28 08:58:12	71.3
48	2018/02/28 08:58:15	65.1
49	2018/02/28 08:58:18	64.4
50	2018/02/28 08:58:21	65.3
51	2018/02/28 08:58:24	64.8
52	2018/02/28 08:58:27	62.4
53	2018/02/28 08:58:30	67.8
54	2018/02/28 08:58:33	81.2
55	2018/02/28 08:58:36	79.0
56	2018/02/28 08:58:39	77.2
57	2018/02/28 08:58:42	74.2
58	2018/02/28 08:58:45	80.5
59	2018/02/28 08:58:48	79.0
60	2018/02/28 08:58:51	75.7
61	2018/02/28 08:58:54	71.0
62	2018/02/28 08:58:57	69.0
63	2018/02/28 08:59:00	66.8
64	2018/02/28 08:59:03	65.5
65	2018/02/28 08:59:06	61.3
66	2018/02/28 08:59:09	61.0
67	2018/02/28 08:59:12	68.1
68	2018/02/28 08:59:15	76.2
69	2018/02/28 08:59:18	73.3
70	2018/02/28 08:59:21	77.8
71	2018/02/28 08:59:24	70.4
72	2018/02/28 08:59:27	68.0
73	2018/02/28 08:59:30	70.4
74	2018/02/28 08:59:33	83.3
75	2018/02/28 08:59:36	73.4
76	2018/02/28 08:59:39	68.1
77	2018/02/28 08:59:42	66.3
78	2018/02/28 08:59:45	65.4
79	2018/02/28 08:59:48	65.3
80	2018/02/28 08:59:51	70.5
81	2018/02/28 08:59:54	69.3
82	2018/02/28 08:59:57	67.1
83	2018/02/28 09:00:00	65.3
84	2018/02/28 09:00:03	65.4
85	2018/02/28 09:00:06	67.5

86	2018/02/28	09:00:09	66.9
87	2018/02/28	09:00:12	66.0
88	2018/02/28	09:00:15	74.3
89	2018/02/28	09:00:18	69.8
90	2018/02/28	09:00:21	60.6
91	2018/02/28	09:00:24	60.8
92	2018/02/28	09:00:27	63.3
93	2018/02/28	09:00:30	70.7
94	2018/02/28	09:00:33	79.0
95	2018/02/28	09:00:36	77.8
96	2018/02/28	09:00:39	77.6
97	2018/02/28	09:00:42	78.1
98	2018/02/28	09:00:45	69.0
99	2018/02/28	09:00:48	60.6
100	2018/02/28	09:00:51	56.8
101	2018/02/28	09:00:54	56.1
102	2018/02/28	09:00:57	58.4
103	2018/02/28	09:01:00	63.2
104	2018/02/28	09:01:03	66.3
105	2018/02/28	09:01:06	76.8
106	2018/02/28	09:01:09	77.9
107	2018/02/28	09:01:12	79.1
108	2018/02/28	09:01:15	72.9
109	2018/02/28	09:01:18	80.7
110	2018/02/28	09:01:21	76.3
111	2018/02/28	09:01:24	68.9
112	2018/02/28	09:01:27	71.1
113	2018/02/28	09:01:30	65.7
114	2018/02/28	09:01:33	69.5
115	2018/02/28	09:01:36	65.3
116	2018/02/28	09:01:39	60.0
117	2018/02/28	09:01:42	59.0
118	2018/02/28	09:01:45	61.3
119	2018/02/28	09:01:48	65.6
120	2018/02/28	09:01:51	66.1
121	2018/02/28	09:01:54	68.6
122	2018/02/28	09:01:57	67.6
123	2018/02/28	09:02:00	66.8
124	2018/02/28	09:02:03	68.0
125	2018/02/28	09:02:06	67.2
126	2018/02/28	09:02:09	64.3
127	2018/02/28	09:02:12	60.7
128	2018/02/28	09:02:15	60.5
129	2018/02/28	09:02:18	67.3
130	2018/02/28	09:02:21	69.0
131	2018/02/28	09:02:24	63.4
132	2018/02/28	09:02:27	62.4
133	2018/02/28	09:02:30	68.4
134	2018/02/28	09:02:33	65.7
135	2018/02/28	09:02:36	78.5
136	2018/02/28	09:02:39	71.8
137	2018/02/28	09:02:42	77.9
138	2018/02/28	09:02:45	75.2
139	2018/02/28	09:02:48	76.9
140	2018/02/28	09:02:51	77.2
141	2018/02/28	09:02:54	75.8
142	2018/02/28	09:02:57	73.0
143	2018/02/28	09:03:00	70.8
144	2018/02/28	09:03:03	85.8
145	2018/02/28	09:03:06	76.9
146	2018/02/28	09:03:09	71.2
147	2018/02/28	09:03:12	71.5
148	2018/02/28	09:03:15	73.0
149	2018/02/28	09:03:18	70.9
150	2018/02/28	09:03:21	71.7
151	2018/02/28	09:03:24	60.8
152	2018/02/28	09:03:27	59.2
153	2018/02/28	09:03:30	57.2
154	2018/02/28	09:03:33	61.1
155	2018/02/28	09:03:36	63.4
156	2018/02/28	09:03:39	72.8
157	2018/02/28	09:03:42	69.3
158	2018/02/28	09:03:45	66.9
159	2018/02/28	09:03:48	66.5
160	2018/02/28	09:03:51	66.3
161	2018/02/28	09:03:54	70.8
162	2018/02/28	09:03:57	65.8
163	2018/02/28	09:04:00	60.9
164	2018/02/28	09:04:03	63.7
165	2018/02/28	09:04:06	64.5
166	2018/02/28	09:04:09	64.9
167	2018/02/28	09:04:12	64.6
168	2018/02/28	09:04:15	64.4
169	2018/02/28	09:04:18	62.5
170	2018/02/28	09:04:21	62.5
171	2018/02/28	09:04:24	60.0
172	2018/02/28	09:04:27	59.2
173	2018/02/28	09:04:30	63.7
174	2018/02/28	09:04:33	69.7
175	2018/02/28	09:04:36	67.2
176	2018/02/28	09:04:39	67.2
177	2018/02/28	09:04:42	78.5
178	2018/02/28	09:04:45	77.2
179	2018/02/28	09:04:48	76.4
180	2018/02/28	09:04:51	78.2
181	2018/02/28	09:04:54	77.8
182	2018/02/28	09:04:57	74.9
183	2018/02/28	09:05:00	72.1
184	2018/02/28	09:05:03	71.1

185	2018/02/28	09:05:06	68.7
186	2018/02/28	09:05:09	68.2
187	2018/02/28	09:05:12	67.3
188	2018/02/28	09:05:15	69.6
189	2018/02/28	09:05:18	74.0
190	2018/02/28	09:05:21	77.7
191	2018/02/28	09:05:24	69.2
192	2018/02/28	09:05:27	65.2
193	2018/02/28	09:05:30	64.5
194	2018/02/28	09:05:33	64.2
195	2018/02/28	09:05:36	67.9
196	2018/02/28	09:05:39	67.8
197	2018/02/28	09:05:42	68.4
198	2018/02/28	09:05:45	67.3
199	2018/02/28	09:05:48	65.0
200	2018/02/28	09:05:51	66.5
201	2018/02/28	09:05:54	64.2
202	2018/02/28	09:05:57	60.8
203	2018/02/28	09:06:00	63.6
204	2018/02/28	09:06:03	76.4
205	2018/02/28	09:06:06	65.5
206	2018/02/28	09:06:09	60.3
207	2018/02/28	09:06:12	63.4
208	2018/02/28	09:06:15	74.0
209	2018/02/28	09:06:18	59.8
210	2018/02/28	09:06:21	59.8
211	2018/02/28	09:06:24	69.5
212	2018/02/28	09:06:27	65.0
213	2018/02/28	09:06:30	59.1
214	2018/02/28	09:06:33	60.0
215	2018/02/28	09:06:36	69.4
216	2018/02/28	09:06:39	67.2
217	2018/02/28	09:06:42	66.2
218	2018/02/28	09:06:45	73.6
219	2018/02/28	09:06:48	73.9
220	2018/02/28	09:06:51	75.0
221	2018/02/28	09:06:54	79.8
222	2018/02/28	09:06:57	74.4
223	2018/02/28	09:07:00	74.1
224	2018/02/28	09:07:03	70.9
225	2018/02/28	09:07:06	71.0
226	2018/02/28	09:07:09	70.8
227	2018/02/28	09:07:12	68.7
228	2018/02/28	09:07:15	69.2
229	2018/02/28	09:07:18	76.0
230	2018/02/28	09:07:21	79.1
231	2018/02/28	09:07:24	72.3
232	2018/02/28	09:07:27	69.9
233	2018/02/28	09:07:30	80.9
234	2018/02/28	09:07:33	73.0
235	2018/02/28	09:07:36	77.9
236	2018/02/28	09:07:39	69.5
237	2018/02/28	09:07:42	72.0
238	2018/02/28	09:07:45	71.7
239	2018/02/28	09:07:48	69.1
240	2018/02/28	09:07:51	68.1
241	2018/02/28	09:07:54	79.8
242	2018/02/28	09:07:57	72.5
243	2018/02/28	09:08:00	74.4
244	2018/02/28	09:08:03	69.5
245	2018/02/28	09:08:06	66.6
246	2018/02/28	09:08:09	70.4
247	2018/02/28	09:08:12	70.9
248	2018/02/28	09:08:15	67.7
249	2018/02/28	09:08:18	66.5
250	2018/02/28	09:08:21	67.8
251	2018/02/28	09:08:24	65.1
252	2018/02/28	09:08:27	71.2
253	2018/02/28	09:08:30	70.6
254	2018/02/28	09:08:33	61.2
255	2018/02/28	09:08:36	60.8
256	2018/02/28	09:08:39	64.8
257	2018/02/28	09:08:42	72.4
258	2018/02/28	09:08:45	72.7
259	2018/02/28	09:08:48	70.3
260	2018/02/28	09:08:51	73.6
261	2018/02/28	09:08:54	73.1
262	2018/02/28	09:08:57	69.7
263	2018/02/28	09:09:00	72.5
264	2018/02/28	09:09:03	72.8
265	2018/02/28	09:09:06	71.1
266	2018/02/28	09:09:09	70.6
267	2018/02/28	09:09:12	71.5
268	2018/02/28	09:09:15	71.5
269	2018/02/28	09:09:18	82.2
270	2018/02/28	09:09:21	75.4
271	2018/02/28	09:09:24	76.8
272	2018/02/28	09:09:27	77.6
273	2018/02/28	09:09:30	72.2
274	2018/02/28	09:09:33	75.2
275	2018/02/28	09:09:36	71.0
276	2018/02/28	09:09:39	75.0
277	2018/02/28	09:09:42	72.8
278	2018/02/28	09:09:45	66.5
279	2018/02/28	09:09:48	65.7
280	2018/02/28	09:09:51	65.8
281	2018/02/28	09:09:54	65.6
282	2018/02/28	09:09:57	68.4
283	2018/02/28	09:10:00	67.8

284	2018/02/28	09:10:03	62.7
285	2018/02/28	09:10:06	63.7
286	2018/02/28	09:10:09	61.6
287	2018/02/28	09:10:12	62.3
288	2018/02/28	09:10:15	68.7
289	2018/02/28	09:10:18	62.5
290	2018/02/28	09:10:21	60.2
291	2018/02/28	09:10:24	60.5
292	2018/02/28	09:10:27	62.6
293	2018/02/28	09:10:30	61.7
294	2018/02/28	09:10:33	65.0
295	2018/02/28	09:10:36	66.1
296	2018/02/28	09:10:39	72.1
297	2018/02/28	09:10:42	78.8
298	2018/02/28	09:10:45	85.1
299	2018/02/28	09:10:48	78.9
300	2018/02/28	09:10:51	79.0

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/03/2019
Case Description: Site Preparation

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Description	Impact Device	Usage (%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	25.0	0.0
Dozer	No	40		81.7	25.0	0.0
Dozer	No	40		81.7	25.0	0.0
Dozer	No	40		81.7	25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Tractor	No	40	84.0		25.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Dozer	87.7	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	87.7	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	87.7	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	87.7	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90.0	86.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90.0	86.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90.0	86.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90.0	86.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	90.0	94.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	75.0	0.0
Dozer	No	40		81.7	75.0	0.0
Dozer	No	40		81.7	75.0	0.0
Dozer	No	40		81.7	75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Tractor	No	40	84.0		75.0	0.0

Results

Noise Limit Exceedance (dBA)

Noise Limits (dBA)

Night	Day	Calculated (dBA) Evening	Night	Day	Evening	Night
Equipment	Lmax Leq	Lmax Leq	Lmax Leq	Lmax	Leq	Lmax
Dozer	78.1 74.2	N/A N/A	N/A N/A	N/A	N/A	N/A
Dozer	78.1 74.2	N/A N/A	N/A N/A	N/A	N/A	N/A
Dozer	78.1 74.2	N/A N/A	N/A N/A	N/A	N/A	N/A
Dozer	78.1 74.2	N/A N/A	N/A N/A	N/A	N/A	N/A
Tractor	80.5 76.5	N/A N/A	N/A N/A	N/A	N/A	N/A
Tractor	80.5 76.5	N/A N/A	N/A N/A	N/A	N/A	N/A
Tractor	80.5 76.5	N/A N/A	N/A N/A	N/A	N/A	N/A
Tractor	80.5 76.5	N/A N/A	N/A N/A	N/A	N/A	N/A
Total	80.5 84.5	N/A N/A	N/A N/A	N/A	N/A	N/A

**** Receptor #3 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	225.0	0.0
Dozer	No	40		81.7	225.0	0.0
Dozer	No	40		81.7	225.0	0.0
Dozer	No	40		81.7	225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Tractor	No	40	84.0		225.0	0.0

Results

Noise Limit Exceedance (dBA)

Noise Limits (dBA)

Equipment	Calculated (dBA) Day Leq	Day Lmax	Evening Leq	Evening Lmax	Night Leq	Night Lmax	Day Leq	Day Lmax	Evening Leq	Evening Lmax	Night Leq	Night Lmax
Dozer	68.6	64.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	68.6	64.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	68.6	64.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	68.6	64.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.9	75.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)

Dozer	No	40		81.7	675.0	0.0
Dozer	No	40		81.7	675.0	0.0
Dozer	No	40		81.7	675.0	0.0
Dozer	No	40		81.7	675.0	0.0
Tractor	No	40	84.0		675.0	0.0
Tractor	No	40	84.0		675.0	0.0
Tractor	No	40	84.0		675.0	0.0
Tractor	No	40	84.0		675.0	0.0

Results

Noise Limit Exceedance (dBA)

Noise Limits (dBA)

Equipment	Calculated (dBA) Day Leq	Day Lmax	Evening Leq	Evening Lmax	Night Leq	Night Lmax	Day Leq	Day Lmax	Evening Leq	Evening Lmax	Night Leq	Night Lmax
Dozer		59.1	55.1		N/A		N/A		N/A		N/A	
Dozer		59.1	55.1		N/A		N/A		N/A		N/A	
Dozer		59.1	55.1		N/A		N/A		N/A		N/A	
Dozer		59.1	55.1		N/A		N/A		N/A		N/A	
Tractor		61.4	57.4		N/A		N/A		N/A		N/A	
Tractor		61.4	57.4		N/A		N/A		N/A		N/A	
Tractor		61.4	57.4		N/A		N/A		N/A		N/A	
Tractor		61.4	57.4		N/A		N/A		N/A		N/A	
Total		61.4	65.4		N/A		N/A		N/A		N/A	

**** Receptor #5 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	1325.0	0.0
Dozer	No	40		81.7	1325.0	0.0
Dozer	No	40		81.7	1325.0	0.0
Dozer	No	40		81.7	1325.0	0.0
Tractor	No	40	84.0		1325.0	0.0
Tractor	No	40	84.0		1325.0	0.0

Tractor	No	40	84.0	1325.0	0.0
Tractor	No	40	84.0	1325.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)							Day		Evening		Night	
Equipment			Lmax	Leq		Lmax	Leq	Lmax	Leq	Lmax	Leq	
Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq						
Dozer			53.2	49.2		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Dozer			53.2	49.2		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Dozer			53.2	49.2		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Dozer			53.2	49.2		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Tractor			55.5	51.6		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Tractor			55.5	51.6		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Tractor			55.5	51.6		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
Tractor			55.5	51.6		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						
	Total		55.5	59.6		N/A	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A						

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/03/2019
Case Description: Site Preparation

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	25.0	0.0
Excavator	No	40		80.7	25.0	0.0
Dozer	No	40		81.7	25.0	0.0
Grader	No	40	85.0		25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Scraper	No	40		83.6	25.0	0.0
Scraper	No	40		83.6	25.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	86.7	82.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	86.7	82.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	87.7	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	91.0	87.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90.0	86.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90.0	86.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	89.6	85.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	89.6	85.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	91.0	94.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	75.0	0.0
Excavator	No	40		80.7	75.0	0.0
Dozer	No	40		81.7	75.0	0.0
Grader	No	40	85.0		75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Scraper	No	40		83.6	75.0	0.0
Scraper	No	40		83.6	75.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	77.2	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	77.2	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	78.1	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	81.5	77.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	80.5	76.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	80.5	76.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	80.1	76.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	80.1	76.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	81.5	84.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #3 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	225.0	0.0
Excavator	No	40		80.7	225.0	0.0
Dozer	No	40		81.7	225.0	0.0
Grader	No	40	85.0		225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Scraper	No	40		83.6	225.0	0.0
Scraper	No	40		83.6	225.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	67.6	63.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	67.6	63.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	68.6	64.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	71.9	68.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	70.5	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	70.5	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.9	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)

Excavator	No	40		80.7	675.0	0.0
Excavator	No	40		80.7	675.0	0.0
Dozer	No	40		81.7	675.0	0.0
Grader	No	40	85.0		675.0	0.0
Tractor	No	40	84.0		675.0	0.0
Tractor	No	40	84.0		675.0	0.0
Scraper	No	40		83.6	675.0	0.0
Scraper	No	40		83.6	675.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

	Calculated (dBA)				Day		Evening		
Night	Day		Evening		Night				
Equipment		Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq				
Excavator		58.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Excavator		58.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Dozer		59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Grader		62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Tractor		61.4	57.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Tractor		61.4	57.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Scraper		61.0	57.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Scraper		61.0	57.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
	Total	62.4	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A				

**** Receptor #5 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1325.0	0.0
Excavator	No	40		80.7	1325.0	0.0
Dozer	No	40		81.7	1325.0	0.0
Grader	No	40	85.0		1325.0	0.0
Tractor	No	40	84.0		1325.0	0.0
Tractor	No	40	84.0		1325.0	0.0

Scraper	No	40	83.6	1325.0	0.0
Scraper	No	40	83.6	1325.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	52.2	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	52.2	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	53.2	49.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	56.5	52.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.5	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.5	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	55.1	51.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	55.1	51.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	56.5	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/03/2019
Case Description: Building Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	25.0	0.0
All Other Equipment > 5 HP	No	50	85.0		25.0	0.0
All Other Equipment > 5 HP	No	50	85.0		25.0	0.0
All Other Equipment > 5 HP	No	50	85.0		25.0	0.0
Generator	No	50		80.6	25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Tractor	No	40	84.0		25.0	0.0
Welder / Torch	No	40		74.0	25.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Crane	86.6	78.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	91.0	88.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	91.0	88.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	91.0	88.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Generator				86.7	83.6	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Tractor				90.0	86.0	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Tractor				90.0	86.0	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Tractor				90.0	86.0	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Welder / Torch				80.0	76.0	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
		Total		91.0	95.4	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	75.0	0.0
All Other Equipment > 5 HP	No	50	85.0		75.0	0.0
All Other Equipment > 5 HP	No	50	85.0		75.0	0.0
All Other Equipment > 5 HP	No	50	85.0		75.0	0.0
Generator	No	50		80.6	75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Tractor	No	40	84.0		75.0	0.0
Welder / Torch	No	40		74.0	75.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq
	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq
	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq

Crane				77.0	69.1		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
All Other Equipment > 5 HP				81.5	78.5		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
All Other Equipment > 5 HP				81.5	78.5		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
All Other Equipment > 5 HP				81.5	78.5		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
Generator				77.1	74.1		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
Tractor				80.5	76.5		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
Tractor				80.5	76.5		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
Tractor				80.5	76.5		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
Welder / Torch				70.5	66.5		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			
		Total		81.5	85.8		N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A			

**** Receptor #3 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	225.0	0.0
All Other Equipment > 5 HP	No	50	85.0		225.0	0.0
All Other Equipment > 5 HP	No	50	85.0		225.0	0.0
All Other Equipment > 5 HP	No	50	85.0		225.0	0.0
Generator	No	50		80.6	225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Tractor	No	40	84.0		225.0	0.0
Welder / Torch	No	40		74.0	225.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Night Lmax	Night Leq
Crane	67.5	59.5	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A
Generator	67.6	64.6	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	70.9	67.0	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	60.9	57.0	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.9	76.3	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	675.0	0.0
All Other Equipment > 5 HP	No	50	85.0		675.0	0.0
All Other Equipment > 5 HP	No	50	85.0		675.0	0.0
All Other Equipment > 5 HP	No	50	85.0		675.0	0.0
Generator	No	50		80.6	675.0	0.0
Tractor	No	40	84.0		675.0	0.0
Tractor	No	40	84.0		675.0	0.0
Tractor	No	40	84.0		675.0	

0.0
Welder / Torch No 40 74.0 675.0
0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Night	Day	Calculated (dBA) Evening		Day Night		Evening	
Equipment		Lmax	Leq	Lmax	Leq	Lmax	Leq
Lmax Leq	Lmax Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		57.9	50.0	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
All Other Equipment > 5 HP		62.4	59.4	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
All Other Equipment > 5 HP		62.4	59.4	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
All Other Equipment > 5 HP		62.4	59.4	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
Generator		58.0	55.0	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
Welder / Torch		51.4	47.4	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		
	Total	62.4	66.7	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	N/A	N/A	N/A	N/A		

**** Receptor #5 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1325.0	0.0
All Other Equipment > 5 HP	No	50	85.0		1325.0	0.0
All Other Equipment > 5 HP	No	50	85.0		1325.0	0.0

All Other Equipment > 5 HP	No	50	85.0		1325.0	0.0
Generator	No	50		80.6	1325.0	0.0
Tractor	No	40	84.0		1325.0	0.0
Tractor	No	40	84.0		1325.0	0.0
Tractor	No	40	84.0		1325.0	0.0
Welder / Torch	No	40		74.0	1325.0	0.0

Results

Noise Limit Exceedance (dBA)

Noise Limits (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Crane	52.1	44.1			N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	56.5	53.5			N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	56.5	53.5			N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	56.5	53.5			N/A	N/A	N/A	N/A	N/A	N/A
Generator	52.2	49.2			N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.5	51.6			N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.5	51.6			N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.5	51.6			N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	45.5	41.6			N/A	N/A	N/A	N/A	N/A	N/A
Total	56.5	60.9			N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/03/2019
Case Description: Paving

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	25.0	0.0
Paver	No	50		77.2	25.0	0.0
Pavement Scarafier	No	20		89.5	25.0	0.0
Pavement Scarafier	No	20		89.5	25.0	0.0
Roller	No	20		80.0	25.0	0.0
Roller	No	20		80.0	25.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	83.2	80.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	83.2	80.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	95.5	88.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	95.5	88.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	95.5	92.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Paving.txt

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	75.0	0.0
Paver	No	50		77.2	75.0	0.0
Pavement Scarafier	No	20		89.5	75.0	0.0
Pavement Scarafier	No	20		89.5	75.0	0.0
Roller	No	20		80.0	75.0	0.0
Roller	No	20		80.0	75.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)

Equipment	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	73.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	73.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	76.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	76.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.0	83.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #3 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	225.0	0.0
Paver	No	50		77.2	225.0	0.0
Pavement Scarafier	No	20		89.5	225.0	0.0
Pavement Scarafier	No	20		89.5	225.0	0.0
Roller	No	20		80.0	225.0	0.0
Roller	No	20		80.0	225.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	64.2	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	64.2	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	76.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	76.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	76.4	73.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	675.0	0.0
Paver	No	50		77.2	675.0	0.0
Pavement Scarafier	No	20		89.5	675.0	0.0
Pavement Scarafier	No	20		89.5	675.0	0.0
Roller	No	20		80.0	675.0	0.0
Roller	No	20		80.0	675.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq

Equipment	Lmax Leq	Lmax	Leq Lmax	Leq Leq	Lmax Lmax	Leq Leq	Lmax	Leq	Lmax
Paver		54.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Paver		54.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Roller		57.4	50.4	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Roller		57.4	50.4	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Total		66.9	63.9	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			

**** Receptor #5 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	1325.0	0.0
Paver	No	50		77.2	1325.0	0.0
Pavement Scarafier	No	20		89.5	1325.0	0.0
Pavement Scarafier	No	20		89.5	1325.0	0.0
Roller	No	20		80.0	1325.0	0.0
Roller	No	20		80.0	1325.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA) Night	Day	Evening	Day Night	Evening

Equipment	Lmax Leq	Lmax	Leq Lmax	Leq Leq	Lmax Lmax	Leq Leq	Lmax	Leq	Lmax
Paver		48.8	45.7	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Paver		48.8	45.7	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		61.0	54.0	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		61.0	54.0	N/A	N/A	N/A	N/A	N/A	N/A

N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Roller			51.5	44.5	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Roller			51.5	44.5	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
	Total		61.0	58.1	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A				

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/03/2019
Case Description: Paving

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	25.0	0.0
Paver	No	50		77.2	25.0	0.0
Pavement Scarafier	No	20		89.5	25.0	0.0
Pavement Scarafier	No	20		89.5	25.0	0.0
Roller	No	20		80.0	25.0	0.0
Roller	No	20		80.0	25.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	83.2	80.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	83.2	80.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	95.5	88.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	95.5	88.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	95.5	92.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Paving.txt

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	75.0	0.0
Paver	No	50		77.2	75.0	0.0
Pavement Scarafier	No	20		89.5	75.0	0.0
Pavement Scarafier	No	20		89.5	75.0	0.0
Roller	No	20		80.0	75.0	0.0
Roller	No	20		80.0	75.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)

Equipment	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	73.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	73.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	86.0	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	76.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	76.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.0	83.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #3 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	225.0	0.0
Paver	No	50		77.2	225.0	0.0
Pavement Scarafier	No	20		89.5	225.0	0.0
Pavement Scarafier	No	20		89.5	225.0	0.0
Roller	No	20		80.0	225.0	0.0
Roller	No	20		80.0	225.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	64.2	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	64.2	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	76.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	76.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	76.4	73.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	675.0	0.0
Paver	No	50		77.2	675.0	0.0
Pavement Scarafier	No	20		89.5	675.0	0.0
Pavement Scarafier	No	20		89.5	675.0	0.0
Roller	No	20		80.0	675.0	0.0
Roller	No	20		80.0	675.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq

Equipment	Lmax Leq	Lmax	Leq Lmax	Leq Leq	Lmax Lmax	Leq Leq	Lmax	Leq	Lmax
Paver		54.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Paver		54.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		66.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Roller		57.4	50.4	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Roller		57.4	50.4	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Total		66.9	63.9	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			

**** Receptor #5 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	1325.0	0.0
Paver	No	50		77.2	1325.0	0.0
Pavement Scarafier	No	20		89.5	1325.0	0.0
Pavement Scarafier	No	20		89.5	1325.0	0.0
Roller	No	20		80.0	1325.0	0.0
Roller	No	20		80.0	1325.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA) Night	Day	Evening	Day Night	Evening

Equipment	Lmax Leq	Lmax	Leq Lmax	Leq Leq	Lmax Lmax	Leq Leq	Lmax	Leq	Lmax
Paver		48.8	45.7	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Paver		48.8	45.7	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		61.0	54.0	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Pavement Scarafier		61.0	54.0	N/A	N/A	N/A	N/A	N/A	N/A

N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Roller			51.5	44.5	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Roller			51.5	44.5	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A				
	Total		61.0	58.1	N/A	N/A	N/A	N/A	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A				

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 01/03/2019
Case Description: Architectural Coating

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	25.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)				Day		Evening		Night			
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	83.7	79.7		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	83.7	79.7		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	75.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Leq	Lmax	Evening Leq	Lmax	Night Leq	Lmax	Day Leq	Lmax	Evening Leq	Lmax	Night Leq	Lmax
Compressor (air)	74.1	N/A	70.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.1	N/A	70.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #3 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	225.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Leq	Lmax	Evening Leq	Lmax	Night Leq	Lmax	Day Leq	Lmax	Evening Leq	Lmax	Night Leq	Lmax
Compressor (air)	64.6	N/A	60.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.6	N/A	60.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)

Compressor (air)	No	40	77.7	675.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)									
Equipment	Day		Evening		Night		Day		Evening		Night	
	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)	55.1	N/A	51.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.1	N/A	51.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #5 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
SF Residences	Residential	60.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1325.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)									
Equipment	Day		Evening		Night		Day		Evening		Night	
	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)	49.2	N/A	45.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	49.2	N/A	45.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Walnut Specific Plan - South Coast Air Basin

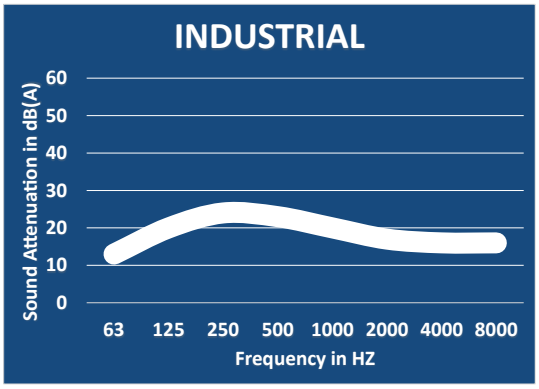
Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading II	Dumpers/Tenders	1	8.00	16	0.38
Grading II	Off-Highway Trucks	1	8.00	402	0.38
Grading II	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading II	Excavators	2	8.00	158	0.38
Grading II	Graders	1	8.00	187	0.41
Grading II	Rubber Tired Dozers	1	8.00	247	0.40
Grading II	Scrapers	2	8.00	367	0.48

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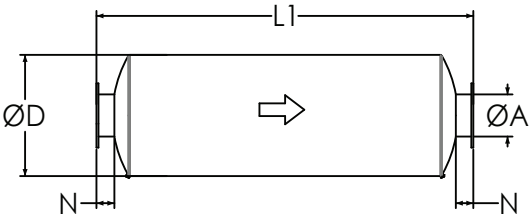
Industrial Grade Silencers

Model NTIN-C (Cylindrical), 15-20 dBA

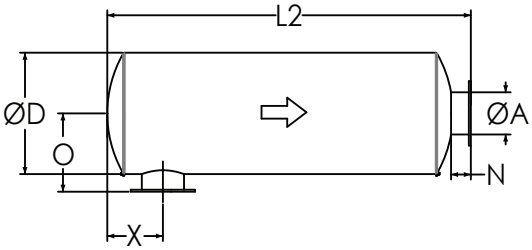
TYPICAL ATTENUATION CURVE



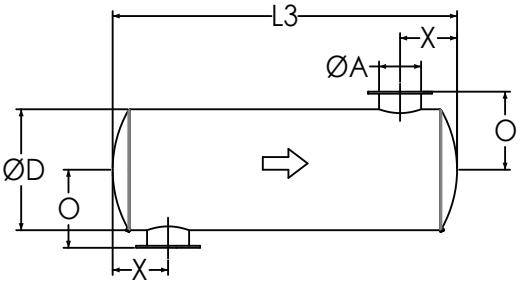
TYPICAL CONFIGURATIONS



END IN END OUT (EI-EO)



SIDE IN END OUT (SI-EO)



SIDE IN SIDE OUT (SI-SO)

Nett Technologies' Industrial Grade Silencers are designed to achieve maximum performance with the least amount of backpressure.
The silencers are Reactive Silencers and are typically used for reciprocating or positive displacement engines where noise level regulations are low.

FEATURES & BENEFITS

- Over 25 years of excellence in manufacturing noise and emission control solutions
- Compact modular designs providing ease of installations, less weight and less foot-print
- Responsive lead time for both standard and custom designs to meet your needs
- Customized engineered systems solutions to meet challenging integration and engine requirements

Contact Nett Technologies with your projects design requirements and specifications for optimized noise control solutions.

OPTIONS

- Versatile connections including ANSI pattern flanges, NPT, slip-on, engine flange, schedule 40 and others
- Aluminized Steel, Stainless Steel 304 or 316 construction
- Horizontal or vertical mounting brackets and lifting lugs

ACCESSORIES

- Hardware Kits
- Flexible connectors and expansion joints
- Elbows
- Thimbles
- Raincaps
- Thermal insulation: integrated or with thermal insulation blankets
- Please see our accessories catalog for a complete listing

PRODUCT DIMENSIONS (in)

Model*	A	D	L1	L2	L3	X**	X	N	O
	Outlet	Dia	EI-EO	SI-EO	SI-SO	Min	Max	Nipple	O
NTIN-C1	1	4	20	18	16	3	7	2	4
NTIN-C1.5	1.5	6	22	20	18	3	8	2	5
NTIN-C2	2	6	22	19	16	3	8	3	6
NTIN-C2.5	2.5	6	24	21	18	4	9	3	6
NTIN-C3	3	8	26	23	20	5	10	3	7
NTIN-C3.5	3.5	9	28	25	22	5	11	3	8
NTIN-C4	4	10	32	29	26	5	12	3	8
NTIN-C5	5	12	36	33	30	6	14	3	9
NTIN-C6	6	14	40	36	32	7	16	4	11
NTIN-C8	8	16	50	46	42	8	21	4	12
NTIN-C10	10	20	52	48	44	11	21	4	14
NTIN-C12	12	24	62	58	54	12	26	4	16
NTIN-C14	14	30	74	69	64	15	31	5	20
NTIN-C16	16	36	82	77	72	18	35	5	23
NTIN-C18	18	40	94	89	84	18	42	5	25
NTIN-C20	20	40	110	105	100	19	52	5	25
NTIN-C22	22	48	118	113	108	22	56	5	29
NTIN-C24	24	48	130	125	120	24	62	5	29

* Other models and custom designs are available upon request. Dimensions subject to change without notice. All silencers are equipped with drain ports on inlet side. The silencer is all welded construction and coated with high heat black paint for maximum durability.

** Standard inlet/outlet position.

Acoustical Surfaces, Inc.

SOUNDPROOFING, ACOUSTICS, NOISE & VIBRATION CONTROL SPECIALISTS

123 Columbia Court North • Suite 201 • Chaska, MN 55318

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Email: sales@acousticalsurfaces.com

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We Identify and S.T.O.P. Your Noise Problems



Echo Barrier™

The Industry's First Reusable, Indoor/ Outdoor Noise Barrier/Absorber

- Superior acoustic performance
- Industrial durability
- Simple and quick installation system
- Lightweight for easy handling
- Unique roll-up design for compact storage and transportation
- Double or triple up for noise 'hot spots'
- Ability to add branding or messages
- Range of accessories available
- Weatherproof – absorbs sound but not water
- Fire retardant
- 1 person can do the job of 2 or 3 people



Why is it all too often we see construction sites with fencing but no regard for sound issues created from the construction that is taking place? This is due to the fact that there has not been an efficient means of treating this type of noise that was cost effective ***until now.***

Echo Barrier temporary fencing is a reusable, outdoor noise barrier. Designed to fit on all types of temporary fencing. Echo Barrier absorbs sound while remaining quick to install, light to carry and tough to last.

BENEFITS: Echo Barrier can help reduce noise complaints, enhance your company reputation, extend site operating hours, reduce project timescales & costs, and improve working conditions.

APPLICATIONS: Echo Barrier works great for construction & demolition sites; rail maintenance & replacement; music, sports and other public events; road construction; utility/maintenance sites; loading and unloading areas; outdoor gun ranges.

DIMENSIONS: 6.56' × 4.49'.

WEIGHT: 13 lbs.

ACOUSTIC PERFORMANCE: 10-20dB noise reduction (greater if barrier is doubled up).

INSTALLATION: The Echo Barrier is easily installed using our quick hook system and specially designed elastic ties.

Echo Barrier Transmission Loss Field Data							
	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz
Single Layer	6	12	16	23	28	30	30
Double Layer	7	19	24	28	32	31	32

Rincon Consultants, Inc.
<Analysis By?>

20 September 2018
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Walnut SP - Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 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		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Magnolia Street	1	1	0.0	58.8	66	58.8	10	----	58.8	0.0	8	-8.0
Spur Trail Ave	3	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
On-Site	5	1	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
Valley Blvd	13	1	0.0	74.9	66	74.9	10	Snd Lvl	74.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

20 September 2018
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Walnut SP - Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 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		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Magnolia Street	1	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
Spur Trail Ave	3	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
On-Site	5	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
Valley Blvd	13	1	0.0	75.5	66	75.5	10	Snd Lvl	75.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

7 January 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Walnut SP - Existing + Project (Internal)
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 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		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Magnolia Street	1	1	0.0	58.9	66	58.9	10	----	58.9	0.0	8	-8.0
Spur Trail Ave	3	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
On-Site	5	1	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
Valley Blvd	13	1	0.0	75.0	66	75.0	10	Snd Lvl	75.0	0.0	8	-8.0
Timberland Lane	21	1	0.0	50.0	66	50.0	10	----	50.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	5	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

22 May 2018
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Walnut SP - Cumulative
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 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
Magnolia Street	1	1	0.0	59.7	66	59.7	10	----	59.7	0.0	8	-8.0
Spur Trail Ave	3	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
On-Site	5	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
Valley Blvd	13	1	0.0	75.9	66	75.9	10	Snd Lvl	75.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

22 May 2018
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Walnut SP - Cumulative Plus Project
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 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		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Magnolia Street	1	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
Spur Trail Ave	3	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
On-Site	5	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
Valley Blvd	13	1	0.0	75.9	66	75.9	10	Snd Lvl	75.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Vibration Analysis - Walnut Mixed Use

PPV (in/sec) = PPV {ref} * (25/D)^1.5
Where PPV = Peak Particle Velocity
{ref} = PPV at the reference distance of 25 feet
D = distance to the receptor

Equipment =	**Vibratory Roller**		
PPV{ref} =	0.21	in/sec	
D =	25	feet	
PPV at receptor =	***0.210***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.053***	***in/sec***
Receptor Lv =		***94***	***VdB***

Equipment =	**Bulldozer - Large**		
PPV{ref} =	0.089	in/sec	
D =	25	feet	
PPV at receptor =	***0.089***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.022***	***in/sec***
Receptor Lv =		***87***	***VdB***

Equipment =	**Loaded Trucks**		
PPV{ref} =	0.076	in/sec	
D =	25	feet	
PPV at receptor =	***0.076***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.019***	***in/sec***
Receptor Lv =		***86***	***VdB***

Source: Section 5 Transit Vibration
Section 6 Vibration Impact Analysis
Section 7 Noise and Vibration during Construction
Transit Noise and Vibration Assessment , September 2018
John A. Volpe National Transportation Systems Center
Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of ~4

Criterion

Building Damage	
Type	VdB
Extremely susceptible to vibration damage	90
Non-engineered timber and masonry buildings	94
Engineered concrete and masonry buildings	98
Typical buildings	100
Reinforced concrete, steel, or timber buildings	102

Canmet, Bauer, and Calder, 1977		
Equipment	PPV Threshold, in/sec	Type of Damage
Rigid Mercury Switches	0.5	Trip Out
House	2	Cracked Plaster
Concrete Block	8	Crack in Block
Cased Drill Holes	15	Horizontol Offset
Pumps, Compressors	40	Shaft Misalignment

Human Response Criteria

Level, Lv in VdB	Equivalent Noise Level, dBA		Human Response
	Low Freq (30 Hz)	Mid Freq (60 Hz)	
65	25	40	Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping
75	35	50	Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space.
85	45	60	Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities.

Impact Criteria

Land Use	Lv in VdB		
	Frequent Events (70+/day)	Occasional Events (30-70/day)	Infrequent (<30 events/day)
Category 1: Vibration Sensitive	65	65	65
Concert Halls	65	65	65
TV Studios	65	65	65
Recording Studios	65	65	65
Category 2: Residences, hotels, sleeping areas	72	75	80
Auditoriums	72	80	80
Theaters	72	80	80
Category 3: Institutional with primarily daytime use only (i.e. schools and churches)	75	78	83

Vibration Source Levels For Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate Lv at 25 feet *
Impact Pile Driver - Upper Range	1.518	112
Impact Pile Driver - Typical	0.644	104
Sonic Pile Driver - Upper Range	0.734	105
Sonic Pile Driver - Typical	0.17	93
Clam Shovel Drop (slurry wall construction)	0.202	94
Hydromill (slurry wall construction) - in Soil	0.008	66
Hydromill (slurry wall construction) - in Rock	0.017	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Bulldozer - Large	0.089	87
Bulldozer - Small	0.003	58
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79

Vibration Analysis - Walnut Mixed Use

PPV (in/sec) = PPV {ref} * (25/D)^1.5
Where PPV = Peak Particle Velocity
{ref} = PPV at the reference distance of 25 feet
D = distance to the receptor

Equipment =	**Vibratory Roller**		
PPV{ref} =	0.21	in/sec	
D =	75	feet	
PPV at receptor =	***0.040***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.010***	***in/sec***
Receptor Lv =		***80***	***VdB***

Equipment =	**Bulldozer - Large**		
PPV{ref} =	0.089	in/sec	
D =	75	feet	
PPV at receptor =	***0.017***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.004***	***in/sec***
Receptor Lv =		***73***	***VdB***

Equipment =	**Loaded Trucks**		
PPV{ref} =	0.076	in/sec	
D =	75	feet	
PPV at receptor =	***0.015***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.004***	***in/sec***
Receptor Lv =		***71***	***VdB***

Source: Section 5 Transit Vibration
Section 6 Vibration Impact Analysis
Section 7 Noise and Vibration during Construction
Transit Noise and Vibration Assessment , September 2018
John A. Volpe National Transportation Systems Center
Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of ~4

Criterion

Building Damage	
Type	VdB
Extremely susceptible to vibration damage	90
Non-engineered timber and masonry buildings	94
Engineered concrete and masonry buildings	98
Typical buildings	100
Reinforced concrete, steel, or timber buildings	102

Canmet, Bauer, and Calder, 1977		
Equipment	PPV Threshold, in/sec	Type of Damage
Rigid Mercury Switches	0.5	Trip Out
House	2	Cracked Plaster
Concrete Block	8	Crack in Block
Cased Drill Holes	15	Horizontol Offset
Pumps, Compressors	40	Shaft Misalignment

Human Response Criteria

Level, Lv in VdB	Equivalent Noise Level, dBA		Human Response
	Low Freq (30 Hz)	Mid Freq (60 Hz)	
65	25	40	Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping
75	35	50	Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space.
85	45	60	Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities.

Impact Criteria

Land Use	Lv in VdB		
	Frequent Events (70+/day)	Occasional Events (30-70/day)	Infrequent (<30 events/day)
Category 1: Vibration Sensitive	65	65	65
Concert Halls	65	65	65
TV Studios	65	65	65
Recording Studios	65	65	65
Category 2: Residences, hotels, sleeping areas	72	75	80
Auditoriums	72	80	80
Theaters	72	80	80
Category 3: Institutional with primarily daytime use only (i.e. schools and churches)	75	78	83

Vibration Source Levels For Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate Lv at 25 feet *
Impact Pile Driver - Upper Range	1.518	112
Impact Pile Driver - Typical	0.644	104
Sonic Pile Driver - Upper Range	0.734	105
Sonic Pile Driver - Typical	0.17	93
Clam Shovel Drop (slurry wall construction)	0.202	94
Hydromill (slurry wall construction) - in Soil	0.008	66
Hydromill (slurry wall construction) - in Rock	0.017	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Bulldozer - Large	0.089	87
Bulldozer - Small	0.003	58
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79

Vibration Analysis - Walnut Mixed Use

PPV (in/sec) = PPV {ref} * (25/D)^1.5
Where PPV = Peak Particle Velocity
{ref} = PPV at the reference distance of 25 feet
D = distance to the receptor

Equipment =	**Vibratory Roller**		
PPV{ref} =	0.21	in/sec	
D =	225	feet	
PPV at receptor =	***0.008***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.002***	***in/sec***
Receptor Lv =		***66***	***VdB***

Equipment =	**Bulldozer - Large**		
PPV{ref} =	0.089	in/sec	
D =	225	feet	
PPV at receptor =	***0.003***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.001***	***in/sec***
Receptor Lv =		***58***	***VdB***

Equipment =	**Loaded Trucks**		
PPV{ref} =	0.076	in/sec	
D =	225	feet	
PPV at receptor =	***0.003***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.001***	***in/sec***
Receptor Lv =		***57***	***VdB***

Source: Section 5 Transit Vibration
Section 6 Vibration Impact Analysis
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John A. Volpe National Transportation Systems Center
Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of ~4

Criterion

Building Damage	
Type	VdB
Extremely susceptible to vibration damage	90
Non-engineered timber and masonry buildings	94
Engineered concrete and masonry buildings	98
Typical buildings	100
Reinforced concrete, steel, or timber buildings	102

Canmet, Bauer, and Calder, 1977		
Equipment	PPV Threshold, in/sec	Type of Damage
Rigid Mercury Switches	0.5	Trip Out
House	2	Cracked Plaster
Concrete Block	8	Crack in Block
Cased Drill Holes	15	Horizontol Offset
Pumps, Compressors	40	Shaft Misalignment

Human Response Criteria

Level, Lv in VdB	Equivalent Noise Level, dBA		Human Response
	Low Freq (30 Hz)	Mid Freq (60 Hz)	
65	25	40	Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping
75	35	50	Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space.
85	45	60	Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities.

Impact Criteria

Land Use	Lv in VdB		
	Frequent Events (70+/day)	Occasional Events (30-70/day)	Infrequent (<30 events/day)
Category 1: Vibration Sensitive	65	65	65
Concert Halls	65	65	65
TV Studios	65	65	65
Recording Studios	65	65	65
Category 2: Residences, hotels, sleeping areas	72	75	80
Auditoriums	72	80	80
Theaters	72	80	80
Category 3: Institutional with primarily daytime use only (i.e. schools and churches)	75	78	83

Vibration Source Levels For Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate Lv at 25 feet *
Impact Pile Driver - Upper Range	1.518	112
Impact Pile Driver - Typical	0.644	104
Sonic Pile Driver - Upper Range	0.734	105
Sonic Pile Driver - Typical	0.17	93
Clam Shovel Drop (slurry wall construction)	0.202	94
Hydromill (slurry wall construction) - in Soil	0.008	66
Hydromill (slurry wall construction) - in Rock	0.017	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Bulldozer - Large	0.089	87
Bulldozer - Small	0.003	58
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79

Vibration Analysis - Walnut Mixed Use

PPV (in/sec) = PPV {ref} * (25/D)^1.5
Where PPV = Peak Particle Velocity
{ref} = PPV at the reference distance of 25 feet
D = distance to the receptor

Equipment =	**Vibratory Roller**		
PPV{ref} =	0.21	in/sec	
D =	675	feet	
PPV at receptor =	***0.001***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.000***	***in/sec***
Receptor Lv =		***51***	***VdB***

Equipment =	**Bulldozer - Large**		
PPV{ref} =	0.089	in/sec	
D =	675	feet	
PPV at receptor =	***0.001***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.000***	***in/sec***
Receptor Lv =		***44***	***VdB***

Equipment =	**Loaded Trucks**		
PPV{ref} =	0.076	in/sec	
D =	675	feet	
PPV at receptor =	***0.001***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.000***	***in/sec***
Receptor Lv =		***43***	***VdB***

Source: Section 5 Transit Vibration
Section 6 Vibration Impact Analysis
Section 7 Noise and Vibration during Construction
Transit Noise and Vibration Assessment , September 2018
John A. Volpe National Transportation Systems Center
Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of ~4

Criterion

Building Damage	
Type	VdB
Extremely susceptible to vibration damage	90
Non-engineered timber and masonry buildings	94
Engineered concrete and masonry buildings	98
Typical buildings	100
Reinforced concrete, steel, or timber buildings	102

Canmet, Bauer, and Calder, 1977		
Equipment	PPV Threshold, in/sec	Type of Damage
Rigid Mercury Switches	0.5	Trip Out
House	2	Cracked Plaster
Concrete Block	8	Crack in Block
Cased Drill Holes	15	Horizontol Offset
Pumps, Compressors	40	Shaft Misalignment

Human Response Criteria

Level, Lv in VdB	Equivalent Noise Level, dBA		Human Response
	Low Freq (30 Hz)	Mid Freq (60 Hz)	
65	25	40	Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping
75	35	50	Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space.
85	45	60	Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities.

Impact Criteria

Land Use	Lv in VdB		
	Frequent Events (70+/day)	Occasional Events (30-70/day)	Infrequent (<30 events/day)
Category 1: Vibration Sensitive	65	65	65
Concert Halls	65	65	65
TV Studios	65	65	65
Recording Studios	65	65	65
Category 2: Residences, hotels, sleeping areas	72	75	80
Auditoriums	72	80	80
Theaters	72	80	80
Category 3: Institutional with primarily daytime use only (i.e. schools and churches)	75	78	83

Vibration Source Levels For Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate Lv at 25 feet *
Impact Pile Driver - Upper Range	1.518	112
Impact Pile Driver - Typical	0.644	104
Sonic Pile Driver - Upper Range	0.734	105
Sonic Pile Driver - Typical	0.17	93
Clam Shovel Drop (slurry wall construction)	0.202	94
Hydromill (slurry wall construction) - in Soil	0.008	66
Hydromill (slurry wall construction) - in Rock	0.017	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Bulldozer - Large	0.089	87
Bulldozer - Small	0.003	58
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79

Vibration Analysis - Walnut Mixed Use

PPV (in/sec) = PPV {ref} * (25/D)^1.5
Where PPV = Peak Particle Velocity
{ref} = PPV at the reference distance of 25 feet
D = distance to the receptor

Equipment =	**Vibratory Roller**		
PPV{ref} =	0.21	in/sec	
D =	1325	feet	
PPV at receptor =	***0.001***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.000***	***in/sec***
Receptor Lv =		***43***	***VdB***

Equipment =	**Bulldozer - Large**		
PPV{ref} =	0.089	in/sec	
D =	1325	feet	
PPV at receptor =	***0.000***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.000***	***in/sec***
Receptor Lv =		***35***	***VdB***

Equipment =	**Loaded Trucks**		
PPV{ref} =	0.076	in/sec	
D =	1325	feet	
PPV at receptor =	***0.000***	***in/sec***	
PPV is 1.7x to 6x larger than RMS velocity			
Assume typical conversion factor of		4	PPV:RMS
Therefore estimated RMS velocity =		***0.000***	***in/sec***
Receptor Lv =		***34***	***VdB***

Source: Section 5 Transit Vibration
Section 6 Vibration Impact Analysis
Section 7 Noise and Vibration during Construction
Transit Noise and Vibration Assessment , September 2018
John A. Volpe National Transportation Systems Center
Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of ~4

Criterion

Building Damage	
Type	VdB
Extremely susceptible to vibration damage	90
Non-engineered timber and masonry buildings	94
Engineered concrete and masonry buildings	98
Typical buildings	100
Reinforced concrete, steel, or timber buildings	102

Canmet, Bauer, and Calder, 1977		
Equipment	PPV Threshold, in/sec	Type of Damage
Rigid Mercury Switches	0.5	Trip Out
House	2	Cracked Plaster
Concrete Block	8	Crack in Block
Cased Drill Holes	15	Horizontol Offset
Pumps, Compressors	40	Shaft Misalignment

Human Response Criteria

Level, Lv in VdB	Equivalent Noise Level, dBA		Human Response
	Low Freq (30 Hz)	Mid Freq (60 Hz)	
65	25	40	Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping
75	35	50	Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space.
85	45	60	Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities.

Impact Criteria

Land Use	Lv in VdB		
	Frequent Events (70+/day)	Occasional Events (30-70/day)	Infrequent (<30 events/day)
Category 1: Vibration Sensitive	65	65	65
Concert Halls	65	65	65
TV Studios	65	65	65
Recording Studios	65	65	65
Category 2: Residences, hotels, sleeping areas	72	75	80
Auditoriums	72	80	80
Theaters	72	80	80
Category 3: Institutional with primarily daytime use only (i.e. schools and churches)	75	78	83

Vibration Source Levels For Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate Lv at 25 feet *
Impact Pile Driver - Upper Range	1.518	112
Impact Pile Driver - Typical	0.644	104
Sonic Pile Driver - Upper Range	0.734	105
Sonic Pile Driver - Typical	0.17	93
Clam Shovel Drop (slurry wall construction)	0.202	94
Hydromill (slurry wall construction) - in Soil	0.008	66
Hydromill (slurry wall construction) - in Rock	0.017	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Bulldozer - Large	0.089	87
Bulldozer - Small	0.003	58
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79

Barrier Performance Module

This module provides to the user a measure on the barrier's effectiveness on noise reduction. A list of the input/output variables and their definitions, as well as illustrations of different scenarios are provided.

Calculator

View Day/Night Noise Level Calculator (/programs/environmental-review/dnl-calculator/)

View Descriptions of the Input/Output variables.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the Input and Output variables with the mouse.

WARNING: If there is direct line-of-sight between the Source and the Observer, the module will report erroneous attenuation. "Direct line-of-sight" means if the 5' tall Observer can see the noise Source (cars, trucks, trains, etc.) over the Barrier (wall, hill/excavation, building, etc.), the current version of Barrier Performance Module will not accurately calculate the attenuation provided. In this instance, there is unlikely to be any appreciable attenuation.

Road/Rail Site DNL:

Note: Barrier height must block the line of sight

Input Data

H	66	**R[1]**	150
S	6	**D[1]**	5
O	6	**α**	160

Calculate Output

Output Data

h	60	**R**	150
D	5	**FS**	10.6836

New Site DNL:

-10.6836

Refresh

Note: If you have separate Road and Rail DNL values, please enter the values below to calculate the new site DNL:

Road DNL:

Rail DNL:

Calculate

Combined New Site DNL:

Input/Output Variables

Input Variables

The following variables and definitions from the barrier being assessed are the input required for the web-based barrier performance module:

- H = Barrier Height
- S = Noise Source Height
- O = Observer Height (known as the receiver)
- R^1 = Distance from Noise Source to Barrier
- D^1 = Distance from the Observer to the Barrier
- α = Line of sight angle between the Observer and the Noise Source, subtended by the barrier at observer's location

Output Variables

Definitions of the output variables from the mitigation module of the Day/Night Noise Level Assessment Tools as part of the Assessment Tools for Environmental Compliance:

- h = The shortest distance from the barrier top to the line of sight from the Noise source to the Observer.
- R = Slant distance along the line of sight from the Barrier to the Noise Source
- D = Slant distance along the line of sight from the Barrier to the Observer

The “actual barrier performance for barriers of finite length” is noted on the worksheets(in the Guidebook) as **FS**.