Appendix J

Noise Calculations

2159 Bay Street Project

Noise Calculations Worksheets

Provided by Acoustical Engineering Services

June 2, 2022

Ambient Noise Measurements

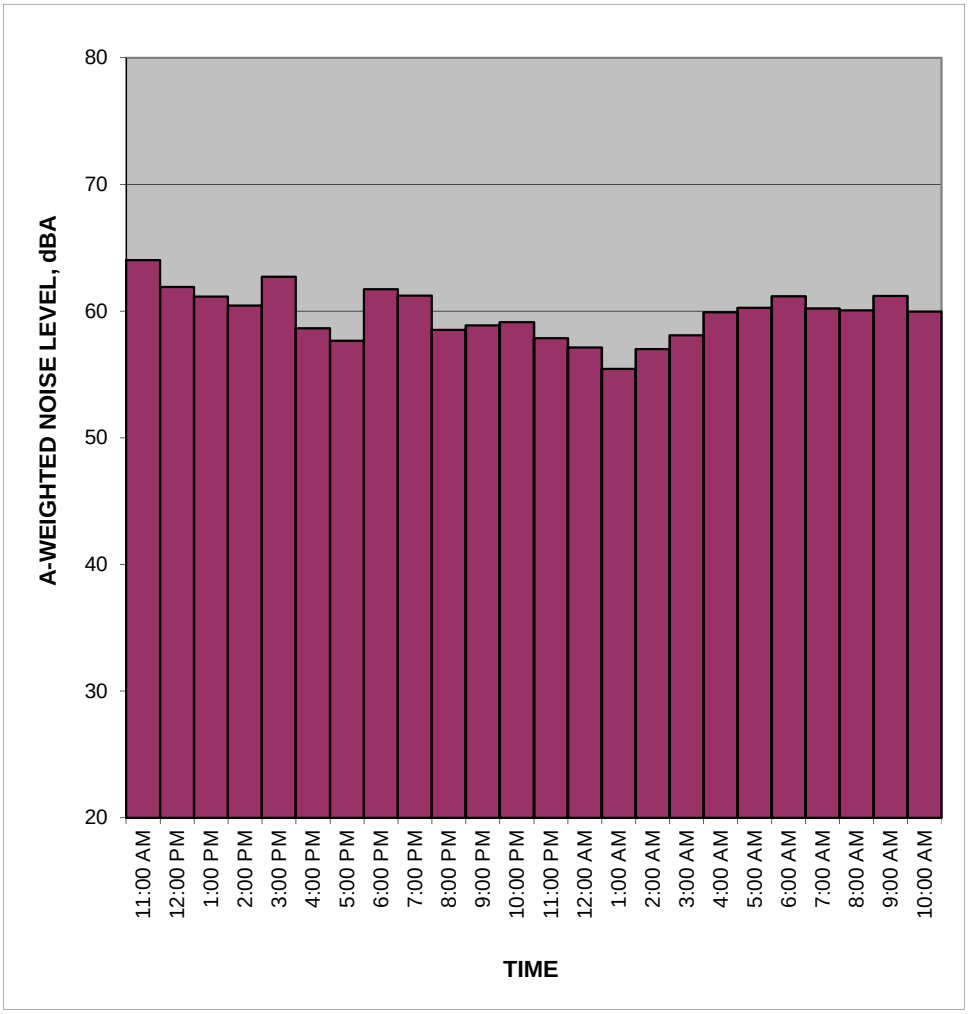
Measured Ambient Noise Levels

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street
Location: P1
Sources: Ambient

Date: 2/26 to 2/27/2019

TIME	HNL, dB(A)
11:00 AM	64.0
12:00 PM	61.9
1:00 PM	61.1
2:00 PM	60.4
3:00 PM	62.7
4:00 PM	58.6
5:00 PM	57.7
6:00 PM	61.7
7:00 PM	61.2
8:00 PM	58.5
9:00 PM	58.9
10:00 PM	59.1
11:00 PM	57.8
12:00 AM	57.1
1:00 AM	55.4
2:00 AM	57.0
3:00 AM	58.1
4:00 AM	59.9
5:00 AM	60.2
6:00 AM	61.2
7:00 AM	60.2
8:00 AM	60.0
9:00 AM	61.2
10:00 AM	59.9
CNEL, dB(A):	**65.8**



NOTES:

Daytime Average: 60.9 dBA Leq

Nighttime Average: 58.8 dBA Leq

AES
ACOUSTICAL ENGINEERING SERVICES

Location: R1 -
Date: 2/26/2019

Time	Overload	Leq	Lmax	L10	L90
10:38:19 AM	No	55.5	64.8	59.1	50.9
10:39:19 AM	No	50.2	53.7	51.5	48.9
10:40:19 AM	No	59	65.5	62.3	51.2
10:41:19 AM	No	53.3	60.3	56.1	49.3
10:42:19 AM	No	50.8	53.4	52.3	49.5
10:43:19 AM	No	51.3	56.2	52.4	50.1
10:44:19 AM	No	51.8	53.6	52.8	50.7
10:45:19 AM	No	63.6	70.8	68.2	53.4
10:46:19 AM	No	60.9	73.7	64.7	50.7
10:47:19 AM	No	59.4	64.8	62.8	51.9
10:48:19 AM	No	64.2	76.9	68.6	51.8
10:49:19 AM	No	57.6	67.8	60.2	52.9
10:50:19 AM	No	54.1	60.4	56.9	50.6
10:51:19 AM	No	53.4	60.3	55.3	51.7
10:52:19 AM	No	59.1	73.8	60.1	52
		58.6			

Time	Overload	Leq	Lmax	L10	L90
9:59:46 PM	No	52.3	55.7	53.3	51.5
10:00:46 PM	No	52.6	56.9	53.5	51.6
10:01:46 PM	No	55.2	63.2	57.6	52.2
10:02:46 PM	No	57.9	66.9	61.3	51.8
10:03:46 PM	No	53.7	58.4	55.1	52.1
10:04:46 PM	No	53.3	57.7	54.9	51.1
10:05:46 PM	No	54.7	59.7	57.3	52
10:06:46 PM	No	53	56.7	54.3	51.6
10:07:46 PM	No	52.7	58.4	54.4	50.9
10:08:46 PM	No	53	58.1	55.4	50.7
10:09:46 PM	No	51.3	54.4	52.6	50.1
10:10:46 PM	No	51.9	56.1	52.8	51.2
10:11:46 PM	No	51.5	54.9	52.4	50.5
10:12:46 PM	No	52.3	59	53.4	50.7
10:13:46 PM	No	51.9	58.3	52.5	50.4
		53.6			

AES
ACOUSTICAL ENGINEERING SERVICES

Location: R2 -
Date: 2/26/2019

Time	Overload	Leq	Lmax	L10	L90
10:58:12 AM	No	54.3	59.1	56.2	52.3
10:59:12 AM	No	54.2	62.7	56	52.3
11:00:12 AM	No	53.2	59	55	51.7
11:01:12 AM	No	57.5	62.6	60.8	52
11:02:12 AM	No	51.3	52.8	52.1	50.7
11:03:12 AM	No	54.1	59.2	56.6	51.5
11:04:12 AM	No	52.8	57.7	54.3	51.3
11:05:12 AM	No	56.2	60.8	57.9	53.6
11:06:12 AM	No	53.6	57.7	54.6	52.3
11:07:12 AM	No	53.2	57.5	54.2	52
11:08:12 AM	No	57.4	65.6	61.5	51.1
11:09:12 AM	No	52.6	58.8	54.6	50.3
11:10:12 AM	No	52.2	56.9	53.3	50.6
11:11:12 AM	No	54.7	60.6	57.2	52
11:12:12 AM	No	70.3	73.1	72.4	61.8
		59.9			

Time	Overload	Leq	Lmax	L10	L90
10:18:23 PM	No	52.8	60.3	54.8	50.4
10:19:23 PM	No	51.9	56.2	53.1	50.8
10:20:23 PM	No	52.4	55.9	54.1	51.1
10:21:23 PM	No	53.5	57.4	54.9	51.1
10:22:23 PM	No	57.2	63.4	61.7	50.9
10:23:23 PM	No	63	69.1	67.4	57.3
10:24:23 PM	No	52.9	59.9	55	50.4
10:25:23 PM	No	54.4	61.7	56.5	51.3
10:26:23 PM	No	54.6	58.5	57.7	50.7
10:27:23 PM	No	53.9	57.3	55.5	51.9
10:28:23 PM	No	57.1	61.5	60.5	53.2
10:29:23 PM	No	54	58.6	56.5	51.7
10:30:23 PM	No	64.5	72	69.9	54.5
10:31:23 PM	No	55.9	59.2	57.7	52
10:32:23 PM	No	56.9	66.5	59.4	50.6
		57.7			

AES
ACOUSTICAL ENGINEERING SERVICES

Location: R3
Date: 2/26/2019

Time	Overload	Leq	Lmax	L10	L90
11:18:48 AM	No	66.7	78.2	67.9	61.4
11:19:48 AM	No	70.5	83.8	70.9	66.2
11:20:48 AM	No	65.8	72.7	68.1	61.9
11:21:48 AM	No	65.3	68.4	67.7	61.5
11:22:48 AM	No	68.1	76.7	69.2	66.1
11:23:48 AM	No	68.7	80.5	71.2	61
11:24:48 AM	No	66.3	67.9	67.4	63.4
11:25:48 AM	No	64.2	73.2	65.7	60.8
11:26:48 AM	No	67	68.8	68.1	64.1
11:27:48 AM	No	64.7	68.2	67.1	60.6
11:28:48 AM	No	66.1	69.3	68.8	60.9
11:29:48 AM	No	68.1	70.2	69.1	66.6
11:30:48 AM	No	58.9	63.5	60.8	56.8
11:31:48 AM	No	59.1	63.6	61.7	56.1
11:32:48 AM	No	58.4	62	60.1	56.1
		66.4			

Time	Overload	Leq	Lmax	L10	L90
10:38:00 PM	No	54.7	65.1	58.2	48.9
10:39:00 PM	No	54.1	60.7	57.9	49.9
10:40:00 PM	No	54.6	61.8	57.9	50.3
10:41:00 PM	No	57.6	62.3	60.6	53.1
10:42:00 PM	No	56.4	63.2	60.2	50.5
10:43:00 PM	No	55	60.8	57.7	51.3
10:44:00 PM	No	52.2	56.7	54.9	49.5
10:45:00 PM	No	57.4	62.1	60.2	51.3
10:46:00 PM	No	54.3	60.2	56.2	52.1
10:47:00 PM	No	60.3	65.8	63.3	52.8
10:48:00 PM	No	55	61.3	57.7	49.7
10:49:00 PM	No	55	62.1	57	50.5
10:50:00 PM	No	51	56.8	53.5	48.2
10:51:00 PM	No	50.4	55	52.2	49
10:52:00 PM	No	52	57.1	54.2	49.3
		55.5			

AES
ACOUSTICAL ENGINEERING SERVICES

Location: R4
Date: 2/26/2019

Time	Overload	Leq	Lmax	L10	L90
11:39:54 AM	No	73.2	82.4	76.6	65.2
11:40:54 AM	No	78.8	89.9	82	67.4
11:41:54 AM	No	72.6	79.1	76.6	66.7
11:42:54 AM	Yes	76.4	93.9	75.8	70
11:43:54 AM	No	80	93.9	80.5	70.6
11:44:54 AM	No	74.6	79.9	77.5	69.3
11:45:54 AM	No	73.9	78.6	76.7	68.5
11:46:54 AM	No	79.1	89.7	82.5	69.7
11:47:54 AM	No	75.2	82.7	79.1	70.6
11:48:54 AM	No	73	80	75.7	69.3
11:49:54 AM	No	76.6	83.9	79.4	68.1
11:50:54 AM	No	73.2	78.4	76.2	69.8
11:51:54 AM	No	74.4	83.6	76.6	69.7
11:52:54 AM	No	71.4	74.7	73.2	69.1
11:53:54 AM	No	77.4	84	80.7	73.2
		76.1			

Time	Overload	Leq	Lmax	L10	L90
10:57:08 PM	No	67.5	69.9	68.9	65.5
10:58:08 PM	No	71.7	78.6	75.1	65.6
10:59:08 PM	No	72.6	80.4	77.9	63.7
11:00:08 PM	No	70.7	76.8	75.1	64.3
11:01:08 PM	No	70.3	79	75.8	62.5
11:02:08 PM	No	67.1	73.1	70.5	63.3
11:03:08 PM	No	67.8	75.4	71.6	61.9
11:04:08 PM	No	70.3	78.4	73	66.7
11:05:08 PM	No	74.5	83.1	78.5	65.4
11:06:08 PM	No	68	75.6	72.4	62.5
11:07:08 PM	No	66.7	72.6	70	61.5
11:08:08 PM	No	66.7	72.5	69.1	62.4
11:09:08 PM	No	63.5	69.3	65.8	59.3
11:10:08 PM	No	67.2	73.8	68.9	65.4
11:11:08 PM	No	66.9	72.7	69.3	63.5
		69.7			

Construction Noise & Vibration Calculations

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: *Demolition*

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	10	0
Excavator	1	81	40%	25	0
Rubber Tired Dozer	1	82	40%	50	0
Rubber Tired Loader	1	79	40%	50	0
Air Compressor	1	78	40%	75	0
Crushing/Proc. Equip	1	85	50%	75	0
Generator Set	1	81	50%	100	0
Water Truck	1	82	10%	100	0
Tractor/Loader/Backhoe	2	79	40%	125	0
Trencher	1	80	50%	125	0
	11				

Receptor: ***R1***

Results:

1-hour Leq: 97.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Grader	1	85	40%	10	0
Bore/Drill Rig	1	84	20%	25	0
Excavator	1	81	40%	50	0
Welders	1	74	40%	50	0
Trencher	1	80	50%	75	0
Fork Lift	1	75	20%	75	0
Water Truck	1	82	10%	100	0
Rubber Tired Loader	1	79	40%	100	0
Tractor/Loader/Backhoe	1	79	40%	125	0
Excavator	1	81	40%	125	0
Welders	1	74	40%	150	0
	11				

Receptor: ***R1***

Results:

1-hour Leq: 95.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Foundation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bore/Drill Rig	1	84	20%	10	0
Crane	1	81	16%	25	0
Generator Set	1	81	50%	50	0
Water Truck	1	82	10%	50	0
Concrete Pump	1	81	20%	75	0
Trencher	1	80	50%	75	0
Welders	1	74	40%	100	0
Concrete Pump	1	81	20%	100	0
Concrete Pump	1	81	20%	125	0
Concrete Pump	1	81	20%	125	0
Concrete Pump	1	81	20%	150	0
	11				

Receptor: ***R1***

Results:

1-hour Leq: 91.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: *Basement*

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	10	0
Crane	1	81	16%	25	0
Concrete Pump	1	81	20%	50	0
Fork Lift	1	75	20%	50	0
Generator Set	1	81	50%	75	0
Welders	1	74	40%	75	0
Concrete Pump	1	81	20%	100	0
Fork Lift	1	75	20%	100	0
	8				

Receptor: ***R1***

Results:

1-hour Leq: 97.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	10	0
Crane	1	81	16%	25	0
Concrete Pump	1	81	20%	50	0
Air Compressor	1	78	40%	50	0
Aerial Lift	1	75	20%	75	0
Fork Lift	1	75	20%	75	0
Generator Set	1	81	50%	100	0
Welders	1	74	40%	100	0
Concrete Saw	1	90	20%	125	0
Concrete Pump	1	81	20%	125	0
Aerial Lift	1	75	20%	150	0
Fork Lift	1	75	20%	150	0
	12				

Receptor: ***R1***

Results:

1-hour Leq: 97.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Architectural Façade***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Crane	1	81	16%	10	0
Generator Set	1	81	50%	25	0
Air Compressor	1	78	40%	50	0
Aerial Lift	1	75	20%	50	0
Fork Lift	1	75	20%	75	0
Fork Lift	1	75	20%	75	0

6

Receptor: ***R1***

Results:

1-hour Leq: 89.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Interior***

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 Mixer	1	80	50%	10	0
Generator Set	1	81	50%	25	0
Air Compressor	1	78	40%	50	0
Paving Equipment	1	77	50%	50	0
Fork Lift	1	75	20%	75	0
Plate Compactor	1	83	20%	75	0
Tractor/Loader/Backhoe	1	79	40%	100	0
Welders	1	74	40%	100	0
Fork Lift	1	75	20%	125	0
	9				

Receptor: ***R1***

Results:

1-hour Leq: 92.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	10	0
Generator Set	1	81	50%	25	0
Paver	1	77	50%	50	0
Plate Compactor	1	83	20%	50	0
Tractor/Loader/Backhoe	1	79	40%	75	0
Welders	1	74	40%	75	0
Cement and Mortar Mixer	1	80	50%	100	0
Paving Equipment	1	77	50%	100	0

8

Receptor: ***R1***

Results:

1-hour Leq: 97.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: *Demolition*

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	365	5
Excavator	1	81	40%	365	5
Rubber Tired Dozer	1	82	40%	385	5
Rubber Tired Loader	1	79	40%	385	5
Air Compressor	1	78	40%	405	5
Crushing/Proc. Equip	1	85	50%	405	5
Generator Set	1	81	50%	425	5
Water Truck	1	82	10%	425	5
Tractor/Loader/Backhoe	2	79	40%	445	5
Trencher	1	80	50%	445	5
	11				

Receptor: ***R2***

Results:

1-hour Leq: 65.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Grader	1	85	40%	365	5
Bore/Drill Rig	1	84	20%	365	5
Excavator	1	81	40%	385	5
Welders	1	74	40%	385	5
Trencher	1	80	50%	405	5
Fork Lift	1	75	20%	405	5
Water Truck	1	82	10%	425	5
Rubber Tired Loader	1	79	40%	425	5
Tractor/Loader/Backhoe	1	79	40%	445	5
Excavator	1	81	40%	445	5
Welders	1	74	40%	465	5
	11				

Receptor: ***R2***

Results:

1-hour Leq: 63.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Foundation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bore/Drill Rig	1	84	20%	365	5
Crane	1	81	16%	365	5
Generator Set	1	81	50%	385	5
Water Truck	1	82	10%	385	5
Concrete Pump	1	81	20%	405	5
Trencher	1	80	50%	405	5
Welders	1	74	40%	425	5
Concrete Pump	1	81	20%	425	5
Concrete Pump	1	81	20%	445	5
Concrete Pump	1	81	20%	445	5
Concrete Pump	1	81	20%	465	5

11

Receptor: ***R2***

Results:

1-hour Leq: 62.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: *Basement*

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	365	5
Crane	1	81	16%	365	5
Concrete Pump	1	81	20%	385	5
Fork Lift	1	75	20%	385	5
Generator Set	1	81	50%	405	5
Welders	1	74	40%	405	5
Concrete Pump	1	81	20%	425	5
Fork Lift	1	75	20%	425	5
	8				

Receptor: ***R2***

Results:

1-hour Leq: 62.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	365	5
Crane	1	81	16%	365	5
Concrete Pump	1	81	20%	385	5
Air Compressor	1	78	40%	385	5
Aerial Lift	1	75	20%	405	5
Fork Lift	1	75	20%	405	5
Generator Set	1	81	50%	425	5
Welders	1	74	40%	425	5
Concrete Saw	1	90	20%	445	5
Concrete Pump	1	81	20%	445	5
Aerial Lift	1	75	20%	465	5
Fork Lift	1	75	20%	465	5
	12				

Receptor: ***R2***

Results:

1-hour Leq: 64.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Architectural Façade***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Crane	1	81	16%	365	5
Generator Set	1	81	50%	365	5
Air Compressor	1	78	40%	385	5
Aerial Lift	1	75	20%	385	5
Fork Lift	1	75	20%	405	5
Fork Lift	1	75	20%	405	5

6

Receptor: ***R2***

Results:

1-hour Leq: 58.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Interior***

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 Mixer	1	80	50%	365	5
Generator Set	1	81	50%	365	5
Air Compressor	1	78	40%	385	5
Paving Equipment	1	77	50%	385	5
Fork Lift	1	75	20%	405	5
Plate Compactor	1	83	20%	405	5
Tractor/Loader/Backhoe	1	79	40%	425	5
Welders	1	74	40%	425	5
Fork Lift	1	75	20%	445	5
	9				

Receptor: ***R2***

Results:

1-hour Leq: 61.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	365	5
Generator Set	1	81	50%	365	5
Paver	1	77	50%	385	5
Plate Compactor	1	83	20%	385	5
Tractor/Loader/Backhoe	1	79	40%	405	5
Welders	1	74	40%	405	5
Cement and Mortar Mixer	1	80	50%	425	5
Paving Equipment	1	77	50%	425	5
	8				

Receptor: ***R2***

Results:

1-hour Leq: 63.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	250	10
Excavator	1	81	40%	250	10
Rubber Tired Dozer	1	82	40%	270	10
Rubber Tired Loader	1	79	40%	270	10
Air Compressor	1	78	40%	290	10
Crushing/Proc. Equip	1	85	50%	290	10
Generator Set	1	81	50%	310	10
Water Truck	1	82	10%	310	10
Tractor/Loader/Backhoe	2	79	40%	330	10
Trencher	1	80	50%	330	10
	11				

Receptor: ***R3***

Results:

1-hour Leq: 63.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Grader	1	85	40%	250	10
Bore/Drill Rig	1	84	20%	250	10
Excavator	1	81	40%	270	10
Welders	1	74	40%	270	10
Trencher	1	80	50%	290	10
Fork Lift	1	75	20%	290	10
Water Truck	1	82	10%	310	10
Rubber Tired Loader	1	79	40%	310	10
Tractor/Loader/Backhoe	1	79	40%	330	10
Excavator	1	81	40%	330	10
Welders	1	74	40%	350	10
	11				

Receptor: ***R3***

Results:

1-hour Leq: 61.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: *Foundation*

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bore/Drill Rig	1	84	20%	250	10
Crane	1	81	16%	250	10
Generator Set	1	81	50%	270	10
Water Truck	1	82	10%	270	10
Concrete Pump	1	81	20%	290	10
Trencher	1	80	50%	290	10
Welders	1	74	40%	310	10
Concrete Pump	1	81	20%	310	10
Concrete Pump	1	81	20%	330	10
Concrete Pump	1	81	20%	330	10
Concrete Pump	1	81	20%	350	10
	11				

Receptor: ***R3***

Results:

1-hour Leq: 60.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: *Basement*

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	250	10
Crane	1	81	16%	250	10
Concrete Pump	1	81	20%	270	10
Fork Lift	1	75	20%	270	10
Generator Set	1	81	50%	290	10
Welders	1	74	40%	290	10
Concrete Pump	1	81	20%	310	10
Fork Lift	1	75	20%	310	10
	8				

Receptor: ***R3***

Results:

1-hour Leq: 61.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	250	10
Crane	1	81	16%	250	10
Concrete Pump	1	81	20%	270	10
Air Compressor	1	78	40%	270	10
Aerial Lift	1	75	20%	290	10
Fork Lift	1	75	20%	290	10
Generator Set	1	81	50%	310	10
Welders	1	74	40%	310	10
Concrete Saw	1	90	20%	330	10
Concrete Pump	1	81	20%	330	10
Aerial Lift	1	75	20%	350	10
Fork Lift	1	75	20%	350	10
	12				

Receptor: ***R3***

Results:

1-hour Leq: 62.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Architectural Façade***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Crane	1	81	16%	250	10
Generator Set	1	81	50%	250	10
Air Compressor	1	78	40%	270	10
Aerial Lift	1	75	20%	270	10
Fork Lift	1	75	20%	290	10
Fork Lift	1	75	20%	290	10

6

Receptor: ***R3***

Results:

1-hour Leq: 56.8

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Interior***

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 Mixer	1	80	50%	250	10
Generator Set	1	81	50%	250	10
Air Compressor	1	78	40%	270	10
Paving Equipment	1	77	50%	270	10
Fork Lift	1	75	20%	290	10
Plate Compactor	1	83	20%	290	10
Tractor/Loader/Backhoe	1	79	40%	310	10
Welders	1	74	40%	310	10
Fork Lift	1	75	20%	330	10
	9				

Receptor: ***R3***

Results:

1-hour Leq: 59.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	250	10
Generator Set	1	81	50%	250	10
Paver	1	77	50%	270	10
Plate Compactor	1	83	20%	270	10
Tractor/Loader/Backhoe	1	79	40%	290	10
Welders	1	74	40%	290	10
Cement and Mortar Mixer	1	80	50%	310	10
Paving Equipment	1	77	50%	310	10
	8				

Receptor: ***R3***

Results:

1-hour Leq: 62.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	500	10
Excavator	1	81	40%	500	10
Rubber Tired Dozer	1	82	40%	520	10
Rubber Tired Loader	1	79	40%	520	10
Air Compressor	1	78	40%	540	10
Crushing/Proc. Equip	1	85	50%	540	10
Generator Set	1	81	50%	560	10
Water Truck	1	82	10%	560	10
Tractor/Loader/Backhoe	2	79	40%	580	10
Trencher	1	80	50%	580	10
	11				

Receptor: ***R4***

Results:

1-hour Leq: 58.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Grader	1	85	40%	500	10
Bore/Drill Rig	1	84	20%	500	10
Excavator	1	81	40%	520	10
Welders	1	74	40%	520	10
Trencher	1	80	50%	540	10
Fork Lift	1	75	20%	540	10
Water Truck	1	82	10%	560	10
Rubber Tired Loader	1	79	40%	560	10
Tractor/Loader/Backhoe	1	79	40%	580	10
Excavator	1	81	40%	580	10
Welders	1	74	40%	600	10
	11				

Receptor: ***R4***

Results:

1-hour Leq: 55.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Foundation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bore/Drill Rig	1	84	20%	500	10
Crane	1	81	16%	500	10
Generator Set	1	81	50%	520	10
Water Truck	1	82	10%	520	10
Concrete Pump	1	81	20%	540	10
Trencher	1	80	50%	540	10
Welders	1	74	40%	560	10
Concrete Pump	1	81	20%	560	10
Concrete Pump	1	81	20%	580	10
Concrete Pump	1	81	20%	580	10
Concrete Pump	1	81	20%	600	10
	11				

Receptor: ***R4***

Results:

1-hour Leq: 54.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: *Basement*

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	500	10
Crane	1	81	16%	500	10
Concrete Pump	1	81	20%	520	10
Fork Lift	1	75	20%	520	10
Generator Set	1	81	50%	540	10
Welders	1	74	40%	540	10
Concrete Pump	1	81	20%	560	10
Fork Lift	1	75	20%	560	10
	8				

Receptor: ***R4***

Results:

1-hour Leq: 55.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	500	10
Crane	1	81	16%	500	10
Concrete Pump	1	81	20%	520	10
Air Compressor	1	78	40%	520	10
Aerial Lift	1	75	20%	540	10
Fork Lift	1	75	20%	540	10
Generator Set	1	81	50%	560	10
Welders	1	74	40%	560	10
Concrete Saw	1	90	20%	580	10
Concrete Pump	1	81	20%	580	10
Aerial Lift	1	75	20%	600	10
Fork Lift	1	75	20%	600	10
	12				

Receptor: ***R4***

Results:

1-hour Leq: 57.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Architectural Façade***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Crane	1	81	16%	500	10
Generator Set	1	81	50%	500	10
Air Compressor	1	78	40%	520	10
Aerial Lift	1	75	20%	520	10
Fork Lift	1	75	20%	540	10
Fork Lift	1	75	20%	540	10

6

Receptor: ***R4***

Results:

1-hour Leq: 50.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Interior***

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 Mixer	1	80	50%	500	10
Generator Set	1	81	50%	500	10
Air Compressor	1	78	40%	520	10
Paving Equipment	1	77	50%	520	10
Fork Lift	1	75	20%	540	10
Plate Compactor	1	83	20%	540	10
Tractor/Loader/Backhoe	1	79	40%	560	10
Welders	1	74	40%	560	10
Fork Lift	1	75	20%	580	10
	9				

Receptor: ***R4***

Results:

1-hour Leq: 53.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	500	10
Generator Set	1	81	50%	500	10
Paver	1	77	50%	520	10
Plate Compactor	1	83	20%	520	10
Tractor/Loader/Backhoe	1	79	40%	540	10
Welders	1	74	40%	540	10
Cement and Mortar Mixer	1	80	50%	560	10
Paving Equipment	1	77	50%	560	10
	8				

Receptor: ***R4***

Results:

1-hour Leq: 56.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Off-Site Haul Trucks

	Maximum Number of Truck One Way Trips (delivery/haul)		Worker Trips		Estimated Project Noise (from TNM Outputs)	
Phase	Per Day	Per Hour (8-hr day)	Daily Trips	Trips during Pk Hr.	Bay Street	Santa Fe Ave.
1. Demolition	30	5	25	10	60.6	59.8
2. Grading/Excavation	260	44	25	10	69.8	68.9
3. Foundation (cont. pour)	160	20	125	50	66.7	65.9
4. Basement to Podium	240	30	250	100	68.6	67.8
5. Building Construction	80	10	400	160	65.6	64.8
6. Architectural Façade	120	15	350	140	66.5	65.7
7. Building Interior	120	15	300	120	66.3	65.5
8. Finish Sitework/Paving	40	5	100	40	61.6	60.7
Hauls: 6 hours, applicable to Demolition and Grading phases				Ambient, dBA	58.6	76.1
Other Phases: 8 hours				Significance Criteria, dBA	63.6	81.1

	Project + Ambient	
Phase	Bay Street	Santa Fe Ave.
1. Demolition	62.7	76.2
2. Grading/Excavation	70.1	76.9
3. Foundation (cont. pour)	67.3	76.5
4. Basement to Podium	69.0	76.7
5. Building Construction	66.4	76.4
6. Architectural Façade	67.2	76.5
7. Building Interior	67.0	76.5
8. Finish Sitework/Paving	63.4	76.2

	Noise Exceedance	
Phase	Bay Street	Santa Fe Ave.
1. Demolition	0.0	0.0
2. Grading/Excavation	6.5	0.0
3. Foundation (cont. pour)	3.7	0.0
4. Basement to Podium	5.4	0.0
5. Building Construction	2.8	0.0
6. Architectural Façade	3.6	0.0
7. Building Interior	3.4	0.0
8. Finish Sitework/Paving	0.0	0.0
Maximum Exceedance, dBA (Leq)	6.5	0.0

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Demo Phase

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Haul Route	12.0	point1	1	0.0	0.0	0.00	Signal	0.00	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Demo Phase**

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	10	35	0	0	5	35	0	0	0	0
	point2	2										

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Demo Phase

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	71	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	66	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Demo Phase
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	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Bay Street	1	1	0.0	60.6	71	60.6	5	----	60.6	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	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

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Grading Phase

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Haul Route	12.0	point1	1	0.0	0.0	0.00	Signal	0.00	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Grading Phase**

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	10	35	0	0	44	35	0	0	0	0
	point2	2										

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Grading Phase

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	71	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	66	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Grading Phase
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		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
Along Bay Street	1	1	0.0	69.8	71	69.8	5	----	69.8	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

Eyestone Environmental	16 November 2021
Sean Bui	TNM 2.5

INPUT: ROADWAYS	Average pavement type shall be used unless
PROJECT/CONTRACT:	2159 Bay Street Project	a State highway agency substantiates the use
RUN:	Construction - Foudation Phase	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	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Foudation Phase**

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	50	35	0	0	20	35	0	0	0	0
	point2	2										

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Foudation Phase

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	71	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	66	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Foudation Phase
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	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Bay Street	1	1	0.0	66.7	71	66.7	5	----	66.7	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	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

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Basement to Podium Phase

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Haul Route	12.0	point1	1	0.0	0.0	0.00	Signal	0.00	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Basement to Podium Phase**

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	100	35	0	0	30	35	0	0	0	0
	point2	2										

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Basement to Podium Phase

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	71	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	66	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Basement to Podium Phase
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	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Bay Street	1	1	0.0	68.6	71	68.6	5	----	68.6	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Building Const. Phase

Average pavement type shall be used unless a State highway agency substantiates the use 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	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Building Const. Phase**

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	160	35	0	0	10	35	0	0	0	0
	point2	2										

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Building Const. Phase

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	0	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	0	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Building Const. Phase
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	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Bay Street	1	1	0.0	65.6	0	65.6	5	Snd Lvl	65.6	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	64.8	0	64.8	10	Snd Lvl	64.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Architectural Facade

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Haul Route	12.0	point1	1	0.0	0.0	0.00	Signal	0.00	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Architectural Facade**

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	140	35	0	0	15	35	0	0	0	0
	point2	2										

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Architectural Facade

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	0	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	0	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Architectural Facade
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	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Bay Street	1	1	0.0	66.5	0	66.5	5	Snd Lvl	66.5	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	65.7	0	65.7	10	Snd Lvl	65.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Building Interior

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Haul Route	12.0	point1	1	0.0	0.0	0.00	Signal	0.00	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Building Interior**

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	120	35	0	0	15	35	0	0	0	0
	point2	2										

Eyestone Environmental 16 November 2021
Sean Bui TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Building Interior

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	0	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	0	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Building Interior
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	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Bay Street	1	1	0.0	66.3	0	66.3	5	Snd Lvl	66.3	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	65.5	0	65.5	10	Snd Lvl	65.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

Eyestone Environmental	16 November 2021
Sean Bui	TNM 2.5

INPUT: ROADWAYS	Average pavement type shall be used unless
PROJECT/CONTRACT:	2159 Bay Street Project	a State highway agency substantiates the use
RUN:	Construction - Finish/Paving	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	100	Average	
		point2	2	1,000.0	0.0	0.00					

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **2159 Bay Street Project**
RUN: **Construction - Finish/Paving**

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	40	35	0	0	5	35	0	0	0	0
	point2	2										

Eyestone Environmental **16 November 2021**
Sean Bui **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Finish/Paving

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Bay Street	1	1	250.0	30.0	0.00	4.92	0.00	0	5.0	0.0	Y
Along Santa Fe Avenue	8	1	250.0	35.0	0.00	4.92	0.00	0	10.0	8.0	Y

Eyestone Environmental
Sean Bui

16 November 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 2159 Bay Street Project
RUN: Construction - Finish/Paving
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	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Bay Street	1	1	0.0	61.6	0	61.6	5	Snd Lvl	61.6	0.0	0	0.0
Along Santa Fe Avenue	8	1	0.0	60.7	0	60.7	10	Snd Lvl	60.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

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Project: 2159 Bay Street Project EIR

Construction Vibration Impacts

Reference Levels at 25 feet are based on FTA, 2006 (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	Single-Story Industrial Building the South	Single-Story Industrial building to the west	Single-Story Industrial building to the east			
		45	50	5	5			
Large Bulldozer	0.089	0.037	0.032	0.523	0.523			
Caisson Drilling	0.089	0.037	0.032	0.523	0.523			
Loaded Trucks	0.076	0.032	0.027	0.446	0.446			
Jackhammer	0.035	0.015	0.012	0.206	0.206			
Small bulldozer	0.003	0.001	0.001	0.018	0.018			
Significance Threshold, PPV		0.2	0.2	0.2	0.2			

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	R3	R4			
		10	365	250	500			
Large Bulldozer	87	99	52	57	48			
Caisson Drilling	87	99	52	57	48			
Loaded Trucks	86	98	51	56	47			
Jackhammer	79	91	44	49	40			
Small bulldozer	58	70	23	28	19			
Significance Threshold, VdB		72	72	72	72			

OFF-SITE CONSTRUCTION HAUL TRUCKS

Table 3: Off-Site Haul Trucks - Building Damage

Equipment	Reference Vibration Levels at 50 ft., PPV	Estimated Vibration Levels at noted distance in feet, PPV						
		20						
Typical road surface	0.00565	0.022						
Significance Threshold, PPV		0.12						

Ref. Levels based on FTA Figure 7-3 (converted from VdB to PPV)

Table 4: Off-Site Haul Trucks - Human Annoyance

Equipment	Reference Vibration Levels at 50 ft., VdB	Estimated Vibration Levels at noted distance in feet, VdB						
		22						
Typical road surface	63	74						
Significance Threshold, VdB		72						

Ref. Levels based on FTA Figure 7-3

Operation Noise Calculations

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Project Composite Noise Calculations (CNEL)

Project: 2159 Bay Street Project

Receptor	Ambient	Traffic[a]	Mechanical	Parking	Loading	Outdoor		Project Composite	Ambient + Project	Increase
R1	59.8	49.9	54.8	38.1	48.4	56.3		59.5	62.7	2.9
R2	62.9	47.0	43.6	19.2	31.7	53.5		54.7	63.5	0.6
R3	65.2	49.9	44.8	21.9	34.0	50.5		53.8	65.5	0.3
R4	76.5	59.3	44.9	17.4	30.9	47.3		59.8	76.6	0.1

[a] - traffic noise levels at each receptor is based on the traffic noise analysis for the roadway segment in front of the receptor.

		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	Bay St.	58.2	58.8	49.9	10	58.2	58.8	0	30	0.0
R2	Santa Fe	58.5	58.8	47.0	165	70.8	71.1	5	35	-7.3
R3	Bay St.	58.2	58.8	49.9	10	58.2	58.8	0	30	0.0
R4	Santa Fe	70.8	71.1	59.3	10	70.8	71.1	0	35	0.0

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Outdoor Mechanical Equipment Noise Calculations

Project: 2159 Bay Street 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	6
R1	49.5	54.8	49.5	49.5	47.7
R2	38.3	43.6	38.3	38.3	36.5
R3	39.5	44.8	39.5	39.5	37.7
R4	39.6	44.9	39.6	39.6	37.8

Receptor	Ambient CNEL	Ambient + Project (CNEL)	Increase (CNEL)	ambient (Leq)	Ambient + Project (Leq)
R1	59.8	61.0	1.2	53.6	55.0
R2	62.9	63.0	0.1	57.7	57.7
R3	65.2	65.2	0.0	55.5	55.6
R4	76.5	76.5	0.0	69.7	69.7

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Parking Structure Noise Calculations

Project: 2159 Bay Street 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	31.4	38.1	31.4	31.4	31.4
R2	12.5	19.2	12.5	12.5	12.5
R3	15.2	21.9	15.2	15.2	15.2
R4	10.7	17.4	10.7	10.7	10.7

Receptor	Ambient CNEL	Ambient + Project (CNEL)	Increase (CNEL)	nighttime ambient (Leq)	Ambient + Project (Leq)	Increase (Leq)
R1	59.8	59.8	0.0	53.6	53.6	0.0
R2	62.9	62.9	0.0	57.7	57.7	0.0
R3	65.2	65.2	0.0	55.5	55.5	0.0
R4	76.5	76.5	0.0	69.7	69.7	0.0

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ACOUSTICAL ENGINEERING SERVICES

Loading and Trash Compactor Noise Calculations

Project: 2159 Bay Street Project

LOADING

	Estimated Noise Levels, Leq from SOUNDPLAN		Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Leq	CNEL	3	3	0
R1	45.5	42.7	39.5	45.5	0.0
R2	30.4	27.6	24.4	30.4	0.0
R3	33.8	31.0	27.8	33.8	0.0
R4	30.8	28.0	24.8	30.8	0.0

TRASH COMPACTOR

	Estimated Noise Levels, Leq from SOUNDPLAN		Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Leq	CNEL	0	0	0
R1	49.9	47.1	43.9	49.9	0.0
R2	32.4	29.6	26.4	32.4	0.0
R3	33.8	31.0	27.8	33.8	0.0
R4	30.5	27.7	24.5	30.5	0.0

TOTAL COMBINED

Receptor	Project CNEL	Ambient CNEL	Ambient + Project (CNEL)	Increase (CNEL)	Project Noise, (Leq)	daytime ambient (Leq)	Ambient + Project (Leq)
R1	48.4	59.8	60.1	0.3	51.2	58.6	59.3
R2	31.7	62.9	62.9	0.0	34.5	59.9	59.9
R3	34.0	65.2	65.2	0.0	36.8	66.4	66.4
R4	30.9	76.5	76.5	0.0	33.7	76.1	76.1

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Outdoor Noise Calculations

Project: 2159 Bay Street Project

					Hours of Operations		
	Estimated noise levels, Leq (FROM SOUNDPLAN)				Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Sound System	Occupants	Total, Leq	CNEL	9	**3**	**5**
R1	48.0	49.3	51.7	56.3	50.5	51.7	49.1
R2	48.8	32.4	48.9	53.5	47.7	48.9	46.3
R3	43.3	42.5	45.9	50.5	44.7	45.9	43.3
R4	42.6	27.9	42.7	47.3	41.5	42.7	40.1

Receptor	Project (CNEL)	Ambient (CNEL)	Ambient + Project (CNEL)	Increase (CNEL)	Project Noise, (Leq)	Ambient (Leq)	Ambient + Project (Leq)
R1	56.3	59.8	61.4	1.6	51.7	53.6	55.8
R2	53.5	62.9	63.4	0.5	48.9	57.7	58.2
R3	50.5	65.2	65.3	0.1	45.9	55.5	56.0
R4	47.3	76.5	76.5	0.0	42.7	69.7	69.7

2159 Bay Street
Source Levels in dB(A) - Mechanical (2021)

Name	Source type	Lw dB(A)	
Garage Fan 1	Point	94.0	
Garage Fan 2	Point	94.0	
Garage Fan 3	Point	94.0	
Garage Fan 4	Point	94.0	
Mechanical Bldg. B	Point	80.0	
Mechanical Bldg. B	Point	80.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building A	Point	90.0	
Mechanical Building C	Point	90.0	
Mechanical Building C	Point	90.0	
Mechanical Building C	Point	90.0	
Mechanical Building C	Point	90.0	
Mechanical Building C	Point	90.0	
Mechanical Building C	Point	90.0	
Transformer	Point	75.0	
Transformer	Point	75.0	
Transformer	Point	75.0	

2159 Bay Street
Contribution level - Mechanical (2021)

Source	Source type	Leq,d dB(A)	
Receiver R1 Ld 49.5 dB(A)			
Mechanical Building C	Point	24.2	
Mechanical Building C	Point	23.9	
Mechanical Building C	Point	23.7	
Mechanical Building C	Point	23.4	
Mechanical Building C	Point	22.2	
Mechanical Building C	Point	21.7	
Mechanical Bldg. B	Point	45.2	
Mechanical Bldg. B	Point	44.3	
Garage Fan 1	Point	19.8	
Garage Fan 2	Point	40.2	
Garage Fan 3	Point	39.9	
Garage Fan 4	Point	38.3	
Transformer	Point	19.8	
Transformer	Point	17.8	
Transformer	Point	19.4	
Mechanical Building A	Point	22.1	
Mechanical Building A	Point	22.4	
Mechanical Building A	Point	22.9	
Mechanical Building A	Point	21.4	
Mechanical Building A	Point	21.0	
Mechanical Building A	Point	20.5	
Mechanical Building A	Point	20.1	
Mechanical Building A	Point	19.7	
Mechanical Building A	Point	19.3	
Mechanical Building A	Point	19.3	
Mechanical Building A	Point	19.8	
Receiver R2 Ld 38.3 dB(A)			
Mechanical Building C	Point	20.4	
Mechanical Building C	Point	20.8	
Mechanical Building C	Point	20.9	
Mechanical Building C	Point	20.8	
Mechanical Building C	Point	20.4	
Mechanical Building C	Point	20.7	
Mechanical Bldg. B	Point	20.8	
Mechanical Bldg. B	Point	20.3	
Garage Fan 1	Point	13.4	
Garage Fan 2	Point	28.1	
Garage Fan 3	Point	28.3	
Garage Fan 4	Point	21.8	

Source	Source type	Leq,d dB(A)	
Transformer	Point	6.3	
Transformer	Point	5.4	
Transformer	Point	7.8	
Mechanical Building A	Point	25.4	
Mechanical Building A	Point	26.9	
Mechanical Building A	Point	29.4	
Mechanical Building A	Point	25.2	
Mechanical Building A	Point	24.2	
Mechanical Building A	Point	24.2	
Mechanical Building A	Point	25.0	
Mechanical Building A	Point	24.2	
Mechanical Building A	Point	24.0	
Mechanical Building A	Point	25.1	
Mechanical Building A	Point	27.6	
Receiver R3 Ld 39.5 dB(A)			
Mechanical Building C	Point	23.3	
Mechanical Building C	Point	23.2	
Mechanical Building C	Point	23.1	
Mechanical Building C	Point	22.9	
Mechanical Building C	Point	17.9	
Mechanical Building C	Point	17.8	
Mechanical Bldg. B	Point	26.1	
Mechanical Bldg. B	Point	24.0	
Garage Fan 1	Point	19.3	
Garage Fan 2	Point	34.8	
Garage Fan 3	Point	34.1	
Garage Fan 4	Point	24.9	
Transformer	Point	4.1	
Transformer	Point	7.0	
Transformer	Point	7.6	
Mechanical Building A	Point	24.3	
Mechanical Building A	Point	24.4	
Mechanical Building A	Point	24.5	
Mechanical Building A	Point	21.4	
Mechanical Building A	Point	19.9	
Mechanical Building A	Point	18.8	
Mechanical Building A	Point	17.9	
Mechanical Building A	Point	17.2	
Mechanical Building A	Point	16.6	
Mechanical Building A	Point	16.5	
Mechanical Building A	Point	17.2	

Source	Source type	Leq,d dB(A)	
Receiver R4 Ld 39.6 dB(A)			
Mechanical Building C	Point	29.1	
Mechanical Building C	Point	29.3	
Mechanical Building C	Point	29.2	
Mechanical Building C	Point	29.3	
Mechanical Building C	Point	27.6	
Mechanical Building C	Point	28.8	
Mechanical Bldg. B	Point	17.8	
Mechanical Bldg. B	Point	18.2	
Garage Fan 1	Point	23.7	
Garage Fan 2	Point	15.1	
Garage Fan 3	Point	15.0	
Garage Fan 4	Point	27.4	
Transformer	Point	10.6	
Transformer	Point	8.8	
Transformer	Point	3.7	
Mechanical Building A	Point	26.8	
Mechanical Building A	Point	26.7	
Mechanical Building A	Point	26.6	
Mechanical Building A	Point	24.6	
Mechanical Building A	Point	24.5	
Mechanical Building A	Point	24.4	
Mechanical Building A	Point	24.3	
Mechanical Building A	Point	24.3	
Mechanical Building A	Point	24.2	
Mechanical Building A	Point	23.2	
Mechanical Building A	Point	22.3	

2159 Bay Street
Input data parking lots - Parking (2021)

Parking lot	Parking Spaces	
Level 1 Parking	12	

2159 Bay Street
Source Levels in dB(A) - Parking (2021)

Name	Source type	Lw dB(A)	
Level 1 Parking	PLot	79.5	

2159 Bay Street
Contribution level - Parking (2021)

Source	Source type	Leq,d dB(A)	
Receiver R1 Ld 31.4 dB(A)			
Level 1 Parking	PLot	31.4	
Receiver R2 Ld 12.5 dB(A)			
Level 1 Parking	PLot	12.5	
Receiver R3 Ld 15.2 dB(A)			
Level 1 Parking	PLot	15.2	
Receiver R4 Ld 10.7 dB(A)			
Level 1 Parking	PLot	10.7	

2159 Bay Street
Source Levels in dB(A) - People (2021)

Name	Source type	Lw dB(A)	
People Commercial A-1	Area	77.4	
People Commercial A-2	Area	92.7	
People Commercial C-1	Area	78.9	
People Commercial C-2	Area	78.9	
People Commercial C-3	Area	86.5	
People Level PH	Area	93.5	
People Outdoor Forum	Area	92.0	

2159 Bay Street
Contribution level - People (2021)

Source	Source type	Leq,d dB(A)	
Receiver R1 Ld 49.3 dB(A)			
People Outdoor Forum	Area	48.7	
People Commercial A-2	Area	37.4	
People Commercial A-1	Area	36.5	
People Commercial C-3	Area	25.7	
People Commercial C-1	Area	14.5	
People Commercial C-2	Area	6.0	
People Level PH	Area	30.7	
Receiver R2 Ld 32.4 dB(A)			
People Outdoor Forum	Area	27.7	
People Commercial A-2	Area	20.0	
People Commercial A-1	Area	12.0	
People Commercial C-3	Area	13.9	
People Commercial C-1	Area	7.0	
People Commercial C-2	Area	-1.9	
People Level PH	Area	29.9	
Receiver R3 Ld 42.5 dB(A)			
People Outdoor Forum	Area	42.3	
People Commercial A-2	Area	22.7	
People Commercial A-1	Area	22.8	
People Commercial C-3	Area	12.8	
People Commercial C-1	Area	5.9	
People Commercial C-2	Area	3.0	
People Level PH	Area	25.7	
Receiver R4 Ld 27.9 dB(A)			
People Outdoor Forum	Area	8.8	
People Commercial A-2	Area	22.2	
People Commercial A-1	Area	-2.5	
People Commercial C-3	Area	19.4	
People Commercial C-1	Area	8.6	
People Commercial C-2	Area	2.3	
People Level PH	Area	25.4	

2159 Bay Street
Source Levels in dB(A) - Speakers (2021)

Name	Source type	Lw dB(A)	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level 1	Point	93.6	
Speaker Level Penthouse	Point	113.6	
Speaker Level Penthouse	Point	113.6	
Speaker Level Penthouse	Point	113.6	
Speaker Level Penthouse	Point	113.6	
Speaker Level Penthouse	Point	113.6	
Speaker Level Penthouse	Point	113.6	
Speaker Level Penthouse	Point	113.6	
Speaker Level Penthouse	Point	113.6	
Speakers Level 1	Point	93.6	

2159 Bay Street
Contribution level - Speakers (2021)

Source	Source type	Leq,d dB(A)	
Receiver R1 Ld 48.0 dB(A)			
Speakers Level 1	Point	26.6	
Speaker Level 1	Point	25.7	
Speaker Level 1	Point	29.8	
Speaker Level 1	Point	30.8	
Speaker Level 1	Point	35.3	
Speaker Level 1	Point	19.3	
Speaker Level 1	Point	19.6	
Speaker Level 1	Point	16.5	
Speaker Level 1	Point	3.8	
Speaker Level 1	Point	7.5	
Speaker Level 1	Point	43.2	
Speaker Level 1	Point	19.8	
Speaker Level 1	Point	14.6	
Speaker Level Penthouse	Point	42.2	
Speaker Level Penthouse	Point	28.1	
Speaker Level Penthouse	Point	36.3	
Speaker Level Penthouse	Point	37.1	
Speaker Level Penthouse	Point	35.4	
Speaker Level Penthouse	Point	33.7	
Speaker Level Penthouse	Point	33.7	
Speaker Level Penthouse	Point	21.0	
Receiver R2 Ld 48.8 dB(A)			
Speakers Level 1	Point	15.2	
Speaker Level 1	Point	14.7	
Speaker Level 1	Point	11.8	
Speaker Level 1	Point	11.8	
Speaker Level 1	Point	18.8	
Speaker Level 1	Point	12.6	
Speaker Level 1	Point	14.1	
Speaker Level 1	Point	-5.6	
Speaker Level 1	Point	-2.5	
Speaker Level 1	Point	-0.4	
Speaker Level 1	Point	19.8	
Speaker Level 1	Point	13.3	
Speaker Level 1	Point	-6.9	
Speaker Level Penthouse	Point	41.3	
Speaker Level Penthouse	Point	36.3	
Speaker Level Penthouse	Point	32.9	
Speaker Level Penthouse	Point	35.3	

Source	Source type	Leq,d dB(A)	
Speaker Level Penthouse	Point	42.9	
Speaker Level Penthouse	Point	42.2	
Speaker Level Penthouse	Point	41.8	
Speaker Level Penthouse	Point	28.8	
Receiver R3 Ld 43.3 dB(A)			
Speakers Level 1	Point	11.6	
Speaker Level 1	Point	11.2	
Speaker Level 1	Point	24.6	
Speaker Level 1	Point	22.4	
Speaker Level 1	Point	20.0	
Speaker Level 1	Point	-1.5	
Speaker Level 1	Point	8.8	
Speaker Level 1	Point	7.7	
Speaker Level 1	Point	-3.2	
Speaker Level 1	Point	-1.2	
Speaker Level 1	Point	29.7	
Speaker Level 1	Point	9.5	
Speaker Level 1	Point	9.2	
Speaker Level Penthouse	Point	35.8	
Speaker Level Penthouse	Point	23.0	
Speaker Level Penthouse	Point	37.4	
Speaker Level Penthouse	Point	38.5	
Speaker Level Penthouse	Point	31.5	
Speaker Level Penthouse	Point	29.1	
Speaker Level Penthouse	Point	28.0	
Speaker Level Penthouse	Point	17.4	
Receiver R4 Ld 42.6 dB(A)			
Speakers Level 1	Point	17.0	
Speaker Level 1	Point	16.6	
Speaker Level 1	Point	-8.8	
Speaker Level 1	Point	-8.6	
Speaker Level 1	Point	2.0	
Speaker Level 1	Point	18.9	
Speaker Level 1	Point	15.6	
Speaker Level 1	Point	4.8	
Speaker Level 1	Point	-8.8	
Speaker Level 1	Point	-9.1	
Speaker Level 1	Point	7.0	
Speaker Level 1	Point	9.5	
Speaker Level 1	Point	4.2	

2159 Bay Street
Contribution level - Speakers (2021)

Source	Source type	Leq,d dB(A)	
Speaker Level Penthouse	Point	35.6	
Speaker Level Penthouse	Point	11.7	
Speaker Level Penthouse	Point	38.7	
Speaker Level Penthouse	Point	38.3	
Speaker Level Penthouse	Point	16.9	
Speaker Level Penthouse	Point	12.9	
Speaker Level Penthouse	Point	11.6	
Speaker Level Penthouse	Point	11.9	

2159 Bay Street
Source Levels in dB(A) - Loading (2021)

Name	Source type	Lw dB(A)	
Loading 1	Point	101.9	
Loading 2	Point	101.9	

2159 Bay Street
Contribution level - Loading (2021)

Source	Source type	Leq,d dB(A)	
Receiver R1 Ld 45.5 dB(A)			
Loading 1	Point	42.2	
Loading 2	Point	42.7	
Receiver R2 Ld 30.4 dB(A)			
Loading 1	Point	24.8	
Loading 2	Point	28.9	
Receiver R3 Ld 33.8 dB(A)			
Loading 1	Point	26.8	
Loading 2	Point	32.8	
Receiver R4 Ld 30.8 dB(A)			
Loading 1	Point	22.7	
Loading 2	Point	30.0	

2159 Bay Street
Source Levels in dB(A) - Trash (2021)

Name	Source type	Lw dB(A)	
Trash Compactor 1	Point	97.7	
Trash Compactor 2	Point	97.7	

2159 Bay Street
Contribution level - Trash (2021)

Source	Source type	Leq,d dB(A)	
Receiver R1 Ld 49.9 dB(A)			
Trash Compactor 1	Point	45.5	
Trash Compactor 2	Point	48.0	
Receiver R2 Ld 32.4 dB(A)			
Trash Compactor 1	Point	28.9	
Trash Compactor 2	Point	29.9	
Receiver R3 Ld 33.8 dB(A)			
Trash Compactor 1	Point	30.2	
Trash Compactor 2	Point	31.4	
Receiver R4 Ld 30.5 dB(A)			
Trash Compactor 1	Point	30.2	
Trash Compactor 2	Point	18.0	

AES
ACOUSTICAL ENGINEERING SERVICES

Off-Site Traffic Noise Calculations
Project: 2159 Bay Street Project

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

EXISTING CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	24-Hour CNEL
Mateo Street										
- Between 7th St. and Violet St.	40	10	30	35	843	8,430	10%	0	0	69.5
- Between Violet St. and Sacramento St.	40	10	30	35	843	8,430	10%	0	0	69.5
- Between Sacramento St. and 8th St.	40	10	30	35	1,049	10,490	10%	0	0	70.5
Santa Fe Avenue										
- Between 7th St. and Violet St.	50	10	35	35	1,405	14,050	10%	0	0	70.9
- Between Violet St. and Sacramento St.	50	10	35	35	1,376	13,760	10%	0	0	70.8
- Between Sacramento St. and 8th St.	50	10	35	35	1,368	13,680	10%	0	0	70.8
Violet Street										
- Between Wilson and Mateo St.	40	10	30	35	98	980	10%	0	0	60.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	126	1,260	10%	0	0	61.3
- East of Santa Fe Ave.	40	10	30	35	54	540	10%	0	0	57.6
Bay Street										
- East of Santa Fe Ave.	40	10	30	35	63	630	10%	0	0	58.2
Sacramento Street										
- Between Wilson and Mateo St.	40	10	30	35	247	2,470	10%	0	0	64.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	89	890	10%	0	0	59.7
- East of Santa Fe Ave.	40	10	30	35	92	920	10%	0	0	59.9

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 11/16/2021

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ACOUSTICAL ENGINEERING SERVICES

Off-Site Traffic Noise Calculations
Project: 2159 Bay Street Project

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

EXISTING + PROJECT CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	24-Hour CNEL
Mateo Street										
- Between 7th St. and Violet St.	40	10	30	35	858	8,580	10%	0	0	69.6
- Between Violet St. and Sacramento St.	40	10	30	35	843	8,430	10%	0	0	69.5
- Between Sacramento St. and 8th St.	40	10	30	35	1,074	10,740	10%	0	0	70.6
Santa Fe Avenue										
- Between 7th St. and Violet St.	50	10	35	35	1,454	14,540	10%	0	0	71.1
- Between Violet St. and Sacramento St.	50	10	35	35	1,452	14,520	10%	0	0	71.1
- Between Sacramento St. and 8th St.	50	10	35	35	1,439	14,390	10%	0	0	71.0
Violet Street										
- Between Wilson and Mateo St.	40	10	30	35	98	980	10%	0	0	60.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	144	1,440	10%	0	0	61.8
- East of Santa Fe Ave.	40	10	30	35	54	540	10%	0	0	57.6
Bay Street										
- East of Santa Fe Ave.	40	10	30	35	71	710	10%	0	0	58.8
Sacramento Street										
- Between Wilson and Mateo St.	40	10	30	35	247	2,470	10%	0	0	64.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	114	1,140	10%	0	0	60.8
- East of Santa Fe Ave.	40	10	30	35	253	2,530	10%	0	0	64.3

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 11/16/2021

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Off-Site Traffic Noise Calculations
Project: 2159 Bay Street Project

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

FUTURE NO PROJECT CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	24-Hour CNEL
Mateo Street										
- Between 7th St. and Violet St.	40	10	30	35	1,110	11,100	10%	0	0	70.7
- Between Violet St. and Sacramento St.	40	10	30	35	1,131	11,310	10%	0	0	70.8
- Between Sacramento St. and 8th St.	40	10	30	35	1,335	13,350	10%	0	0	71.5
Santa Fe Avenue										
- Between 7th St. and Violet St.	50	10	35	35	2,450	24,500	10%	0	0	73.3
- Between Violet St. and Sacramento St.	50	10	35	35	2,482	24,820	10%	0	0	73.4
- Between Sacramento St. and 8th St.	50	10	35	35	2,561	25,610	10%	0	0	73.5
Violet Street										
- Between Wilson and Mateo St.	40	10	30	35	98	980	10%	0	0	60.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	126	1,260	10%	0	0	61.3
- East of Santa Fe Ave.	40	10	30	35	605	6,050	10%	0	0	68.1
Bay Street										
- East of Santa Fe Ave.	40	10	30	35	147	1,470	10%	0	0	61.9
Sacramento Street										
- Between Wilson and Mateo St.	40	10	30	35	250	2,500	10%	0	0	64.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	89	890	10%	0	0	59.7
- East of Santa Fe Ave.	40	10	30	35	314	3,140	10%	0	0	65.2

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 11/16/2021

AES
ACOUSTICAL ENGINEERING SERVICES

Off-Site Traffic Noise Calculations
Project: 2159 Bay Street Project

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

FUTURE + PROJECT CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	24-Hour CNEL
Mateo Street										
- Between 7th St. and Violet St.	40	10	30	35	1,125	11,250	10%	0	0	70.8
- Between Violet St. and Sacramento St.	40	10	30	35	1,131	11,310	10%	0	0	70.8
- Between Sacramento St. and 8th St.	40	10	30	35	1,360	13,600	10%	0	0	71.6
Santa Fe Avenue										
- Between 7th St. and Violet St.	50	10	35	35	2,541	25,410	10%	0	0	73.5
- Between Violet St. and Sacramento St.	50	10	35	35	2,573	25,730	10%	0	0	73.6
- Between Sacramento St. and 8th St.	50	10	35	35	2,635	26,350	10%	0	0	73.7
Violet Street										
- Between Wilson and Mateo St.	40	10	30	35	98	980	10%	0	0	60.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	145	1,450	10%	0	0	61.9
- East of Santa Fe Ave.	40	10	30	35	605	6,050	10%	0	0	68.1
Bay Street										
- East of Santa Fe Ave.	40	10	30	35	160	1,600	10%	0	0	62.3
Sacramento Street										
- Between Wilson and Mateo St.	40	10	30	35	250	2,500	10%	0	0	64.2
- Between Mateo St. and Santa Fe Ave.	40	10	30	35	114	1,140	10%	0	0	60.8
- East of Santa Fe Ave.	40	10	30	35	475	4,750	10%	0	0	67.0

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 11/16/2021

Alternatives Analysis

AES
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Project: 2159 Bay Street Project

Off-Site Haul Trucks - Alternatives Analysis (50% Reduction)

	Maximum Number of Truck One Way Trips (delivery/haul)		Worker Trips		Estimated Project Noise (from TNM Outputs)	
Phase	Per Day	Per Hour (8-hr day)	Daily Trips	Trips during Pk Hr.	Bay Street	Santa Fe Ave.
2. Grading/Excavation	130	22	13	6	66.8	65.9
Hauls: 6 hours, applicable to Demolition and Grading phases				Ambient, dBA	58.6	76.1
Other Phases: 8 hours				Significance Criteria, dBA	63.6	81.1

	Project + Ambient	
Phase	Bay Street	Santa Fe Ave.
2. Grading/Excavation	67.4	76.5

	Noise Exceedance	
Phase	Bay Street	Santa Fe Ave.
2. Grading/Excavation	3.8	0.0
Maximum Exceedance, dBA (Leq)	3.8	0.0

AES
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Project: 2159 Bay Street Project

Construction Phase: ***Demolition - Alternatives Analysis (50% Reduction)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	10	0
Excavator	0	81	40%		
Rubber Tired Dozer	1	82	40%	50	0
Rubber Tired Loader	0	79	40%		
Air Compressor	1	78	40%	75	0
Crushing/Proc. Equip	0	85	50%		
Generator Set	1	81	50%	100	0
Water Truck	0	82	10%		
Tractor/Loader/Backhoe	1	79	40%	125	0
Trencher	1	80	50%	125	0
	6				

Receptor: ***R1***

Results:

1-hour Leq: 97.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Demolition - Alternatives Analysis (50% Reduction)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	365	5
Excavator	0	81	40%		
Rubber Tired Dozer	1	82	40%	385	5
Rubber Tired Loader	0	79	40%		
Air Compressor	1	78	40%	405	5
Crushing/Proc. Equip	0	85	50%		
Generator Set	1	81	50%	425	5
Water Truck	0	82	10%		
Tractor/Loader/Backhoe	1	79	40%	445	5
Trencher	1	80	50%	445	5
	6				

Receptor: ***R2***

Results:

1-hour Leq: 63.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Demolition - Alternatives Analysis (50% Reduction)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	250	10
Excavator	0	81	40%		
Rubber Tired Dozer	1	82	40%	270	10
Rubber Tired Loader	0	79	40%		
Air Compressor	1	78	40%	290	10
Crushing/Proc. Equip	0	85	50%		
Generator Set	1	81	50%	310	10
Water Truck	0	82	10%		
Tractor/Loader/Backhoe	1	79	40%	330	10
Trencher	1	80	50%	330	10
	6				

Receptor: ***R3***

Results:

1-hour Leq: 61.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Demolition - Alternatives Analysis (50% Reduction)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	1	90	20%	500	10
Excavator	0	81	40%		
Rubber Tired Dozer	1	82	40%	520	10
Rubber Tired Loader	0	79	40%		
Air Compressor	1	78	40%	540	10
Crushing/Proc. Equip	0	85	50%		
Generator Set	1	81	50%	560	10
Water Truck	0	82	10%		
Tractor/Loader/Backhoe	1	79	40%	580	10
Trencher	1	80	50%	580	10
	6				

Receptor: ***R4***

Results:

1-hour Leq: 55.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 2159 Bay Street Project

Construction Phase: ***Demolition - Alternatives Analysis (Single Equipment)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete Saw	0	90	20%		
Excavator	0	81	40%		
Rubber Tired Dozer	1	82	40%	10	0
Rubber Tired Loader	0	79	40%		
Air Compressor	0	78	40%		
Crushing/Proc. Equip	0	85	50%		
Generator Set	0	81	50%		
Water Truck	0	82	10%		
Tractor/Loader/Backhoe	0	79	40%		
Trencher	0	80	50%		

1

Receptor: ***R1***

Results:

1-hour Leq: 92.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

2159 Bay Street

Off-Site Traffic - Alternatives Analysis

Santa Fe (between Violet St. and Sacramento St.)

Scenario	Project	Alternative 4
Existing, ADT	13760	
Existing SPL, dBA CNEL	70.8	
Existing With Project, ADT	14520	
EWP SPL, dBA CNEL	71.1	
% Increased	5.5%	
Noise increase, dBA	0.3	
Project Total Trips, ADT	2119	2914
Project Trip along Roadway, ADT	760	
% to roadway	35.9%	35.9%
Project Alt, ADT (roadway)		1045
Existing With Project Alt, ADT		14805
% Increase relative to Project		*2.0%*
Increased Relative to Project		*0.1*

Sacramento Street (East of Santa Fe Ave.)

Scenario	Project	Alternative 2
Existing, ADT	920	
Existing SPL, dBA CNEL	59.9	
Existing With Project, ADT	2530	
EWP SPL, dBA CNEL	64.3	
% Increased	175.0%	
Noise increase, dBA	4.4	
Project Total Trips, ADT	2119	2914
Project Trip along Roadway, ADT	1610	
% to roadway	76.0%	76.0%
Project Alt, ADT (roadway)		2214
Existing With Project Alt, ADT		3134
% Increased relative to Project		*23.9%*
Increased Relative to Project		*0.9*