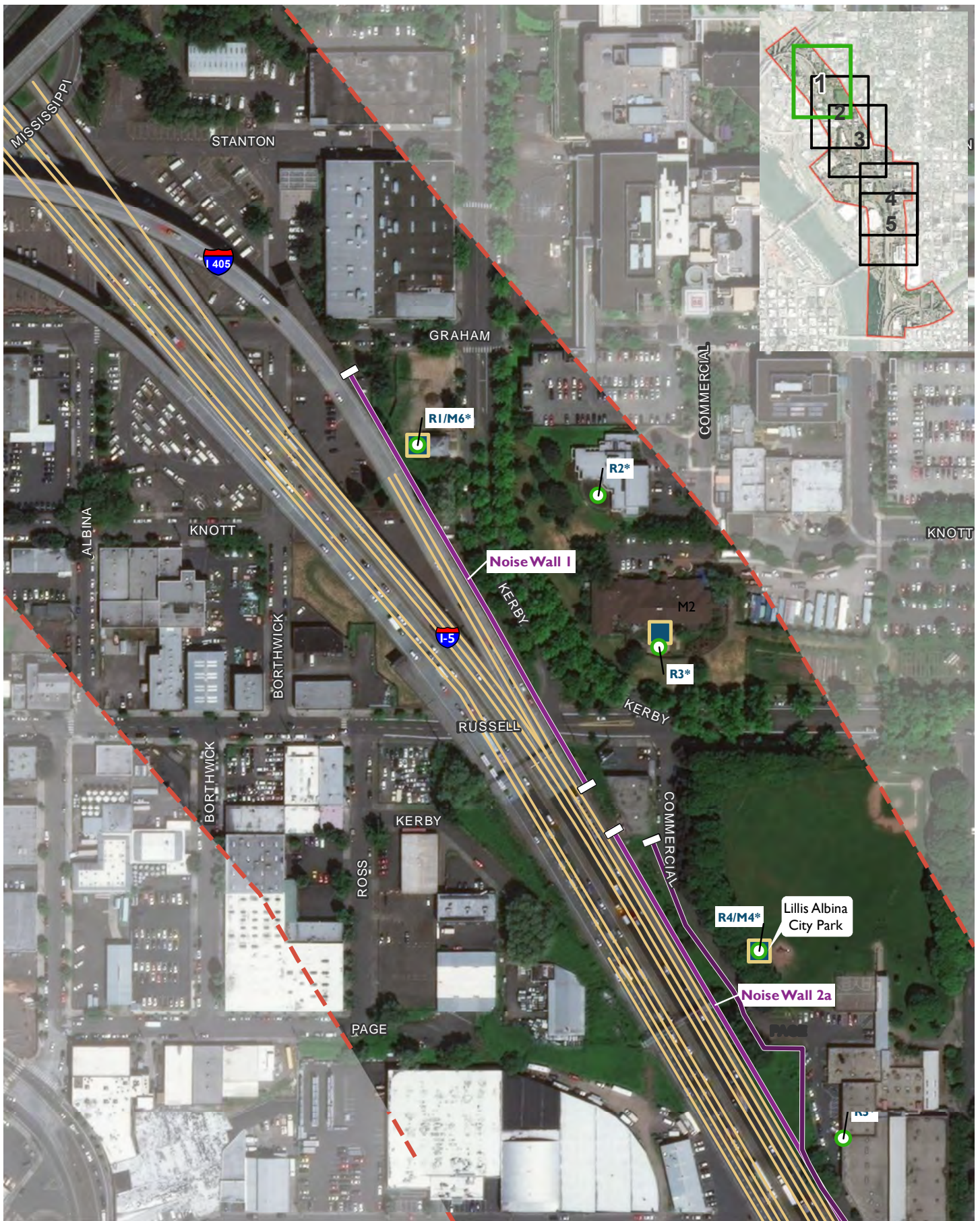




# Appendix G. Mitigation Analysis

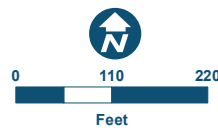
Figure descriptions for the images in this appendix have been provided as alternative text usable by accessibility software. If needed, additional figure interpretation for this appendix is available from the ODOT Senior Environmental Project Manager at (503) 731-4804.



**I-5 ROSE QUARTER IMPROVEMENT PROJECT**

Data Source: Project Features - HDR; Basemap - ODOT, ESRI; Zoning - City of Portland  
 \* Noise levels predicted at receptor meet or exceed the NAAC under some conditions. See Table 7 of the Noise Study Technical Memorandum for predicted peak hour noise levels.

- Noise Receptor\*
- Noise monitoring locations
- Future Design Centerline
- Noise Wall
- Noise Report Study Area
- Cover



**I-5 ROSE QUARTER NOISE STUDY**

**NOISE WALL MITIGATION ANALYSIS**

NOISE WALL I

FIGURE I2.I

**ODOT I-5 Broadway Weidler Project**  
**MITIGATION ANALYSIS SUMMARY, December 2018**

Key:

	Impacted Receiver (under the Future Build Condition)
	Benefitted Receiver (>= 5 dBA)
	Receiver achieves design goal (>= 7 dBA)
	Recommended Wall Height

**Table G1a: Wall 1**

Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 11 ft High Wall					
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL >=7dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted	
R1	B	73	62	11	61	12	61	12	61	12	61	12	61	12	60	13	1	1	1	1	0	
R2	C	70	66	4	65	5	65	5	65	5	64	6	64	6	64	6	1	0	1	1	0	
R3	C	69	67	2	66	3	66	3	66	3	66	3	66	3	66	3	1	0	0	0	1	
<b>Total Receptors</b>																	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	
<b>Recommended Wall Height (ft)</b>																	11					
<b>Length of Wall (ft)</b>																	825					
<b>Wall Area (sq.ft)</b>																	9,075					
<b>Wall Cost (\$/sq.ft)</b>																	\$20					
<b>Total Cost of Selected Wall(\$)</b>																	\$181,500					
<b>Cost Effectiveness (\$/Benefitted Residence)</b>																	\$90,750					
<b>Cost Reasonableness Criteria (\$/Benefitted Residence)</b>																	\$25,000					
<b>Cost Effectiveness &lt; Cost Reasonableness? (yes/no)</b>																	No					
<b>Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)</b>																	Yes					
																	<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>					
																	<b>% receiving 5 dBA IL</b>					67
																	<b>Feasible (&gt;50%)?</b>					Yes

**Table G1b: Legacy Emanuel Medical Facility Abatement Cost Factors**

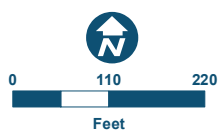
	Criteria	Input (English units)	19th Street Parameter	Comment
1	Enter length of proposed barrier	ft	825	
2	Enter height of proposed barrier	ft	11	
3	Multiply item 1 by item 2	ft <sup>2</sup>	9,075	
4	Enter the average amount of time that a person stays at the site per visit	hours	2	
5	Enter the average number of people that use this site per day that will receive at least 5 dB(A) benefit from abatement at the site	people	25	Assumptions: Max use during working/open hours.
6	Multiply item 4 by item 5	person-hr	50	
7	Divide item 3 by item 6	ft <sup>2</sup> /person-hr	181.5	
8	Multiply \$25,000 by item 7	\$/person-hr/ft <sup>2</sup>	\$4,537,500	
9	Does item 8 exceed the "abatement cost factor" of: English units = \$518,758/person-hr/ft <sup>2</sup> ?		Yes	
10	If item 9 is no, abatement meets reasonable criteria			
11	If item 9 is yes, abatement does not meet reasonable criteria		<b>Does not meet</b>	



**I-5 ROSE QUARTER IMPROVEMENT PROJECT**

Data Source: Project Features - HDR; Basemap - ODOT, ESRI; Zoning - City of Portland  
 \* Noise levels predicted at receptor meet or exceed the NAAC under some conditions. See Table 7 of the Noise Study Technical Memorandum for predicted peak hour noise levels.

- Noise Receptor\*
- Noise monitoring locations
- Future Design Centerline
- Noise Wall
- - - Noise Report Study Area
- Cover



**I-5 ROSE QUARTER NOISE STUDY**  
**NOISE WALL MITIGATION ANALYSIS**

NOISE WALL 2  
 FIGURE I2.2

Key:	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Impacted Receiver (under the Future Build Condition)
	<span style="background-color: green; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Benefitted Receiver ( $\geq 5$ dBA)
	<span style="background-color: cyan; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Receiver achieves design goal ( $\geq 7$ dBA)
	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Recommended Wall Height

**Table G2a: Wall 2a**

Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 16 ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL $\geq 7$ dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R4	C	73	72	1	72	1	72	1	71	2	71	2	70	3	69	4	1	0	0	0	1
R5	D	50	49	1	49	1	49	1	48	2	48	2	48	2	48	2	1	0	0	0	1
R6	B	67	66	1	65	2	65	2	65	2	65	2	65	2	64	3	1	0	0	0	1
<b>Total Receptors</b>																	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Recommended Wall Height (ft)</b>																	16				
<b>Length of Wall (ft)</b>																	1,150				
<b>Wall Area (sq.ft)</b>																	18,400				
<b>Wall Cost (\$/sq.ft)</b>																	\$20				
<b>Total Cost of Selected Wall(\$)</b>																	\$368,000				
<b>Cost Effectiveness (\$/Benefitted Residence)</b>																	#DIV/0!				
<b>Cost Reasonableness Criteria (\$/Benefitted Residence)</b>																	\$25,000				
<b>Cost Effectiveness &lt; Cost Reasonableness? (yes/no)</b>																	No				
<b>Feasible (&gt;50%)?</b>																	No				
<b>Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)</b>																	No				
<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>																					
<b>% receiving 5 dBA IL</b>																	0				
<b>Feasible (&gt;50%)?</b>																	No				

Key:	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Impacted Receiver (under the Future Build Condition)
	<span style="background-color: green; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Benefitted Receiver ( $\geq 5$ dBA)
	<span style="background-color: blue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Receiver achieves design goal ( $\geq 7$ dBA)
	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Recommended Wall Height

**Table G2b: Wall 2b**

Rec	Activity Category	Build Leq (dBA)	17ft - Wall		18ft - Wall		19ft - Wall		20ft - Wall		21ft - Wall		22ft - Wall		23ft - Wall		Based on Noise Data for a 16 ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL $\geq 7$ dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R4	C	73	70	3	69	4	68	5	67	6	66	7	65	8	65	8	1	1	1	1	0
R5	D	50	49	1	49	1	48	2	47	3	46	4	45	5	44	6	1	0	1	1	0
R6	B	67	67	0	67	0	67	0	67	0	67	0	67	0	67	0	1	0	0	0	1
<b>Total Receptors</b>																	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>
<b>Recommended Wall Height (ft)</b>																	22				
<b>Length of Wall (ft)</b>																	1,011				
<b>Wall Area (sq.ft)</b>																	24,222				
<b>Wall Cost (\$/sq.ft)</b>																	\$20				
<b>Total Cost of Selected Wall(\$)</b>																	\$484,440				
<b>Cost Effectiveness (\$/Benefitted Residence)</b>																	\$242,220				
<b>Cost Reasonableness Criteria (\$/Benefitted Residence)</b>																	\$25,000				
<b>Cost Effectiveness &lt; Cost Reasonableness? (yes/no)</b>																	No				
<b>Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)</b>																	Yes				
<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>																					
<b>% receiving 5 dBA IL</b>																	66				
<b>Feasible (&gt;50%)?</b>																	Yes				



**Table G2c: Harriet Tubman Middle School Abatement Cost Factors**

	Criteria	Input (English units)	19th Street Parameter	Comment
1	Enter length of proposed barrier	ft	1,011	
2	Enter height of proposed barrier	ft	22	
3	Multiply item 1 by item 2	ft <sup>2</sup>	24,222	
4	Enter the average amount of time that a person stays at the site per visit	hours	7	
5	Enter the average number of people that use this site per day that will receive at least 5 dB(A) benefit from abatement at the site	people	525	Assumptions: Reported student population of 491 students at Harriet Tubman Middle School, plus an assumed 34 additional staff.
6	Multiply item 4 by item 5	person-hr	3675	
7	Divide item 3 by item 6	ft <sup>2</sup> /person-hr	6.59	
8	Multiply \$25,000 by item 7	\$/person-hr/ft <sup>2</sup>	\$164,776	
9	Does item 8 exceed the "abatement cost factor" of: English units = \$518,758/person-hr/ft <sup>2</sup> ?		No	
10	If item 9 is no, abatement meets reasonable criteria		<b>Meets the reasonable criteria</b>	
11	If item 9 is yes, abatement does not meet reasonable criteria			

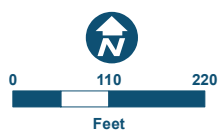


**I-5 ROSE QUARTER IMPROVEMENT PROJECT**

Data Source: Project Features - HDR; Basemap - ODOT, ESRI; Zoning - City of Portland

\* Noise levels predicted at receptor meet or exceed the NAAC under some conditions. See Table 7 of the Noise Study Technical Memorandum for predicted peak hour noise levels.

- Noise Receptor\*
- Noise monitoring locations
- Future Design Centerline
- Noise Wall
- Noise Report Study Area
- Cover



**I-5 ROSE QUARTER NOISE STUDY**

**NOISE WALL MITIGATION ANALYSIS**

NOISE WALL 3 & 5

FIGURE I2.3

Key:  Impacted Receiver (under the Future Build Condition)  
 Benefitted Receiver ( $\geq 5$  dBA)  
 Receiver achieves design goal ( $\geq 7$  dBA)  
 Recommended Wall Height

Table G3:Wall 3

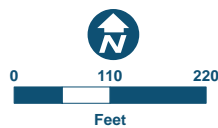
Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 16 ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL $\geq 7$ dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R6	B	67	66	-66	65	-65	65	-65	65	-65	65	-65	65	-65	64	-64	1	0	0	0	1
R7	B	63	62	-62	62	-62	62	-62	62	-62	62	-62	62	-62	62	-62	2	0	0	0	0
R8	B	73	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	1	0	0	0	1
R9	B	73	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	1	0	0	0	1
R10	B	74	73	-73	73	-73	73	-73	72	-72	72	-72	72	-72	72	-72	1	0	0	0	1
R11	B	74	73	-73	73	-73	73	-73	73	-73	73	-73	73	-73	73	-73	1	0	0	0	1
R12	B	74	74	-74	74	-74	74	-74	74	-74	74	-74	74	-74	74	-74	1	0	0	0	1
R13	B	75	74	-74	74	-74	74	-74	74	-74	74	-74	74	-74	74	-74	1	0	0	0	1
R14a	B	71	70	-70	70	-70	70	-70	70	-70	69	-69	69	-69	69	-69	1	0	0	0	1
R14b	B	73	72	-72	71	-71	71	-71	71	-71	71	-71	71	-71	71	-71	1	0	0	0	1
R14c	B	73	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	1	0	0	0	1
R14d	B	73	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	1	0	0	0	1
R14e	B	73	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	72	-72	1	0	0	0	1
<b>Total Receptors</b>																	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>
<b>Recommended Wall Height (ft)</b>																	16				
<b>Length of Wall (ft)</b>																	975				
<b>Wall Area (sq.ft)</b>																	15,600				
<b>Wall Cost (\$/sq.ft)</b>																	\$20				
<b>Total Cost of Selected Wall(\$)</b>																	\$312,000				
<b>Cost Effectiveness (\$/Benefitted Residence)</b>																	N/A				
<b>Cost Reasonableness Criteria (\$/Benefitted Residence)</b>																	\$25,000				
<b>Cost Effectiveness &lt; Cost Reasonableness? (yes/no)</b>																	No				
<b>Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)</b>																	No				
<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>																	% receiving 5 dBA IL		0		
<b>Feasible (&gt;50%)?</b>																	No				



**I-5 ROSE QUARTER IMPROVEMENT PROJECT**

Data Source: Project Features - HDR; Basemap - ODOT, ESRI; Zoning - City of Portland  
 \* Noise levels predicted at receptor meet or exceed the NAAC under some conditions. See Table 7 of the Noise Study Technical Memorandum for predicted peak hour noise levels.

- Noise Receptor\*
- Noise monitoring locations
- Future Design Centerline
- Noise Wall
- Noise Report Study Area
- Cover

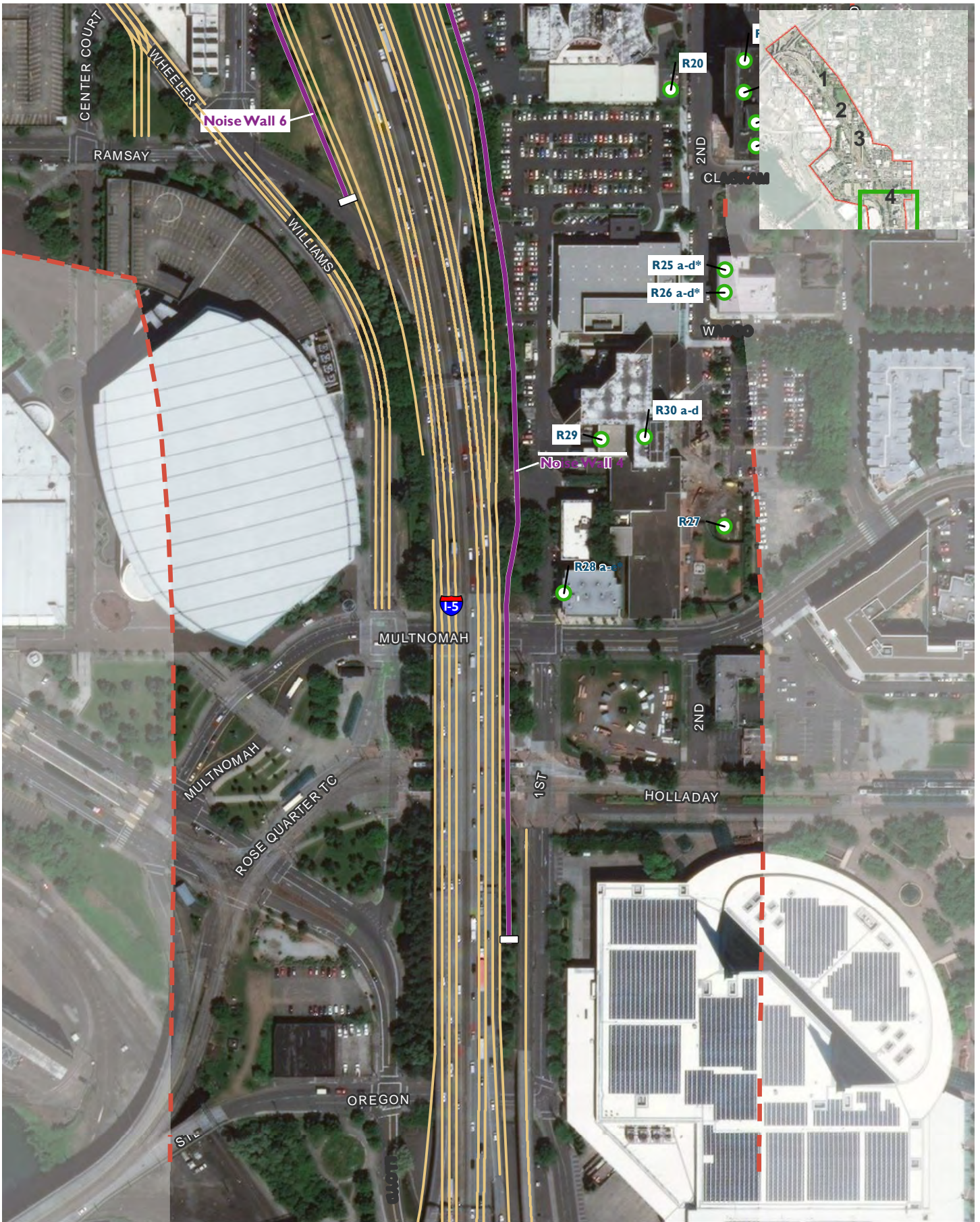


**I-5 ROSE QUARTER NOISE STUDY**

**NOISE WALL MITIGATION ANALYSIS**

NOISE WALL 4 & 6

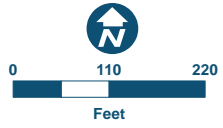
FIGURE I2.4



**I-5 ROSE QUARTER IMPROVEMENT PROJECT**

Data Source: Project Features - HDR; Basemap - ODOT, ESRI; Zoning - City of Portland  
 \* Noise levels predicted at receptor meet or exceed the NAAC under some conditions. See Table 7 of the Noise Study Technical Memorandum for predicted peak hour noise levels.

- Noise Receptor\*
- Noise monitoring locations
- Future Design Centerline
- Noise Wall
- Noise Report Study Area
- Cover



**I-5 ROSE QUARTER NOISE STUDY**  
**NOISE WALL MITIGATION ANALYSIS**

NOISE WALL 4  
 FIGURE 12.5

Key:  Impacted Receiver (under the Future Build Condition)  
 Benefitted Receiver ( $\geq 5$  dBA)  
 Receiver achieves design goal ( $\geq 7$  dBA)  
 Recommended Wall Height

Table G4a:Wall 4a

Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 16ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL $\geq 7$ dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R20	C	62	60	2	60	2	59	3	59	3	58	4	58	4	57	5	1	0	1	0	0
R21a	B	64	63	1	62	2	62	2	62	2	61	3	61	3	61	3	2	0	0	0	0
R21b	B	65	64	1	63	2	63	2	63	2	62	3	62	3	62	3	2	0	0	0	2
R21c	B	65	65	0	64	1	64	1	64	1	64	1	63	2	63	2	2	0	0	0	2
R21d	B	66	65	1	65	1	65	1	65	1	64	2	64	2	64	2	2	0	0	0	2
R21e	B	66	66	0	66	0	66	0	65	1	65	1	65	1	65	1	2	0	0	0	2
R21f	B	66	66	0	66	0	66	0	66	0	66	0	66	0	66	0	2	0	0	0	2
R21g	B	67	67	0	66	1	66	1	66	1	66	1	66	1	66	1	2	0	0	0	2
R21h	B	67	67	0	67	0	67	0	67	0	67	0	67	0	66	1	2	0	0	0	2
R21i	B	67	67	0	67	0	67	0	67	0	67	0	67	0	67	0	2	0	0	0	2
R21j	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R21k	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R21l	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R21m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R22a	B	65	62	3	62	3	61	4	61	4	61	4	61	4	60	5	2	0	2	2	2
R22b	B	65	64	1	63	2	63	2	62	3	62	3	62	3	61	4	2	0	0	0	2
R22c	B	66	65	1	64	2	64	2	64	2	63	3	63	3	62	4	2	0	0	0	2
R22d	B	66	65	1	65	1	65	1	65	1	64	2	64	2	64	2	2	0	0	0	2
R22e	B	66	66	0	66	0	66	0	65	1	65	1	65	1	65	1	2	0	0	0	2
R22f	B	67	66	1	66	1	66	1	66	1	66	1	66	1	66	1	2	0	0	0	2
R22g	B	67	67	0	67	0	67	0	67	0	67	0	67	0	66	1	2	0	0	0	2
R22h	B	67	67	0	67	0	67	0	67	0	67	0	67	0	67	0	2	0	0	0	2
R22i	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R22j	B	68	68	0	68	0	68	0	68	0	68	0	67	1	67	1	2	0	0	0	2
R22k	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R22l	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R22m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R23a	B	64	62	2	61	3	61	3	61	3	60	4	60	4	60	4	2	0	0	0	0
R23b	B	65	63	2	63	2	62	3	62	3	61	4	61	4	61	4	2	0	0	0	2
R23c	B	66	65	1	64	2	64	2	63	3	63	3	62	4	62	4	2	0	0	0	2
R23d	B	66	65	1	65	1	65	1	65	1	64	2	64	2	64	2	2	0	0	0	2
R23e	B	66	66	0	66	0	66	0	65	1	65	1	65	1	65	1	2	0	0	0	2
R23f	B	67	66	1	66	1	66	1	66	1	66	1	66	1	66	1	2	0	0	0	2
R23g	B	67	67	0	67	0	67	0	67	0	67	0	67	0	66	1	2	0	0	0	2
R23h	B	67	67	0	67	0	67	0	67	0	67	0	67	0	67	0	2	0	0	0	2
R23i	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2

Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 16ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL >=7dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R23j	B	68	68	0	68	0	68	0	68	0	67	1	67	1	67	1	2	0	0	0	2
R23k	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R23l	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R23m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R24a	B	64	62	2	61	3	61	3	61	3	60	4	60	4	60	4	2	0	0	0	0
R24b	B	65	63	2	63	2	62	3	62	3	62	3	61	4	61	4	2	0	0	0	2
R24c	B	66	65	1	64	2	64	2	64	2	63	3	63	3	62	4	2	0	0	0	2
R24d	B	66	66	0	66	0	65	1	65	1	65	1	64	2	64	2	2	0	0	0	2
R24e	B	67	66	1	66	1	66	1	66	1	66	1	65	2	65	2	2	0	0	0	2
R24f	B	67	67	0	67	0	67	0	67	0	67	0	66	1	66	1	2	0	0	0	2
R24g	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R24h	B	68	68	0	68	0	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R24i	B	68	68	0	68	0	68	0	68	0	68	0	68	0	67	1	2	0	0	0	2
R24j	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R24k	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R24l	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R24m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R25a	B	58	57	1	56	2	56	2	56	2	56	2	56	2	56	2	2	0	0	0	0
R25b	B	60	59	1	59	1	59	1	58	2	58	2	58	2	58	2	2	0	0	0	0
R25c	B	64	64	0	64	0	64	0	63	1	63	1	62	2	62	2	2	0	0	0	0
R25d	B	68	68	0	68	0	67	1	67	1	67	1	67	1	66	2	2	0	0	0	2
R26a	B	56	55	1	55	1	55	1	55	1	55	1	55	1	55	1	1	0	0	0	0
R26b	B	58	58	0	58	0	58	0	58	0	58	0	57	1	57	1	1	0	0	0	0
R26c	B	62	62	0	62	0	62	0	62	0	61	1	61	1	61	1	1	0	0	0	0
R26d	B	68	68	0	67	1	67	1	67	1	67	1	66	2	66	2	1	0	0	0	1
R27	C	64	61	3	61	3	61	3	60	4	59	5	59	5	59	5	1	0	1	0	0
R28a	B	75	70	5	69	6	69	6	69	6	69	6	69	6	69	6	1	0	1	1	0
R28b	B	76	72	4	71	5	70	6	70	6	69	7	69	7	69	7	1	1	1	1	0
R28c	B	76	74	2	74	2	73	3	73	3	72	4	71	5	71	5	1	0	1	1	0
R28d	B	75	75	0	74	1	74	1	74	1	74	1	74	1	73	2	1	0	0	0	1
R28e	B	75	75	0	75	0	75	0	75	0	74	1	74	1	74	1	1	0	0	0	1
R29	D	48	47	1	47	1	46	2	46	2	46	2	45	3	44	4	1	0	0	0	1
R30a	D	46	45	1	45	1	45	1	44	2	44	2	44	2	43	3	1	0	0	0	1
R30b	D	46	46	0	46	0	46	0	46	0	45	1	45	1	45	1	1	0	0	0	1
R30c	D	46	46	0	46	0	46	0	46	0	46	0	46	0	46	0	1	0	0	0	1
R30d	D	47	47	0	47	0	46	1	46	1	46	1	46	1	46	1	1	0	0	0	1
<b>Total Receptors</b>																	<b>128</b>	<b>1</b>	<b>7</b>	<b>5</b>	<b>107</b>
<b>Recommended Wall Height (ft)</b>																	16				
<b>Length of Wall (ft)</b>																	1,715				
<b>Wall Area (sq.ft)</b>																	27,440				

Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 16ft High Wall					
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL >=7dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted	
Wall Cost (\$/sq.ft)																\$20		<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>				
Total Cost of Selected Wall(\$)																\$548,800						
Cost Effectiveness (\$/Benefitted Residence)																\$78,400						
Cost Reasonableness Criteria (\$/Benefitted Residence)																\$25,000					% receiving 5 dBA IL	5%
Cost Effectiveness < Cost Reasonableness? (yes/no)																No					Feasible (>50%)?	No
Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)																Yes						



Key:  Impacted Receiver (under the Future Build Condition)  
 Benefitted Receiver ( $\geq 5$  dBA)  
 Receiver achieves design goal ( $\geq 7$  dBA)  
 Recommended Wall Height

**Table G4b:Wall 4b**

Rec	Activity Category	Build Leq (dBA)	17ft - Wall		18ft - Wall		19ft - Wall		20ft - Wall		21ft - Wall		22ft - Wall		23ft - Wall		Based on Noise Data for a 23ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL $\geq 7$ dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R20	C	62	57	5	57	5	57	5	56	6	56	6	56	6	56	6	1	0	1	0	0
R21a	B	64	61	3	60	4	60	4	60	4	60	4	59	5	59	5	2	0	2	0	0
R21b	B	65	62	3	61	4	61	4	61	4	60	5	60	5	60	5	2	0	2	1	0
R21c	B	65	63	2	62	3	62	3	62	3	61	4	61	4	61	4	2	0	0	0	2
R21d	B	66	64	2	63	3	63	3	63	3	63	3	62	4	62	4	2	0	0	0	2
R21e	B	66	65	1	64	2	64	2	64	2	64	2	63	3	63	3	2	0	0	0	2
R21f	B	66	65	1	65	1	65	1	65	1	65	1	65	1	64	2	2	0	0	0	2
R21g	B	67	66	1	66	1	66	1	66	1	65	2	65	2	65	2	2	0	0	0	2
R21h	B	67	66	1	66	1	66	1	66	1	66	1	66	1	66	1	2	0	0	0	2
R21i	B	67	67	0	67	0	67	0	66	1	66	1	66	1	66	1	2	0	0	0	2
R21j	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R21k	B	68	68	0	68	0	68	0	68	0	67	1	67	1	67	1	2	0	0	0	2
R21l	B	68	68	0	68	0	68	0	68	0	68	0	68	0	67	1	2	0	0	0	2
R21m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R22a	B	65	60	5	59	6	59	6	59	6	59	6	58	7	58	7	2	2	2	2	0
R22b	B	65	61	4	61	4	60	5	60	5	60	5	59	6	59	6	2	0	2	2	0
R22c	B	66	62	4	62	4	61	5	61	5	61	5	60	6	60	6	2	0	2	2	0
R22d	B	66	63	3	63	3	63	3	62	4	62	4	62	4	61	5	2	0	2	2	0
R22e	B	66	65	1	64	2	64	2	64	2	63	3	63	3	63	3	2	0	0	0	2
R22f	B	67	65	2	65	2	65	2	65	2	65	2	64	3	64	3	2	0	0	0	2
R22g	B	67	66	1	66	1	66	1	66	1	66	1	65	2	65	2	2	0	0	0	2
R22h	B	67	67	0	67	0	66	1	66	1	66	1	66	1	66	1	2	0	0	0	2
R22i	B	68	67	1	67	1	67	1	67	1	67	1	66	2	66	2	2	0	0	0	2
R22j	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R22k	B	68	68	0	68	0	68	0	68	0	68	0	68	0	67	1	2	0	0	0	2
R22l	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R22m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R23a	B	64	59	5	59	5	58	6	58	6	58	6	58	6	58	6	2	0	2	0	0
R23b	B	65	61	4	60	5	60	5	59	6	59	6	59	6	58	7	2	2	2	2	0
R23c	B	66	62	4	61	5	61	5	60	6	60	6	60	6	59	7	2	2	2	2	0
R23d	B	66	63	3	63	3	62	4	62	4	62	4	61	5	61	5	2	0	2	2	2
R23e	B	66	65	1	64	2	64	2	63	3	63	3	62	4	62	4	2	0	0	0	2
R23f	B	67	65	2	65	2	65	2	65	2	64	3	64	3	64	3	2	0	0	0	2
R23g	B	67	66	1	66	1	66	1	66	1	65	2	65	2	65	2	2	0	0	0	2
R23h	B	67	67	0	67	0	66	1	66	1	66	1	66	1	66	1	2	0	0	0	2
R23i	B	68	67	1	67	1	67	1	67	1	67	1	66	2	66	2	2	0	0	0	2

Rec	Activity Category	Build Leq (dBA)	17ft - Wall		18ft - Wall		19ft - Wall		20ft - Wall		21ft - Wall		22ft - Wall		23ft - Wall		Based on Noise Data for a 23ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL >=7dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R23j	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R23k	B	68	68	0	68	0	68	0	67	1	67	1	67	1	67	1	2	0	0	0	2
R23l	B	68	68	0	68	0	68	0	68	0	68	0	67	1	67	1	2	0	0	0	2
R23m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	67	1	2	0	0	0	2
R24a	B	64	59	5	59	5	58	6	58	6	58	6	58	6	58	6	2	0	2	0	0
R24b	B	65	61	4	60	5	60	5	59	6	59	6	59	6	58	7	2	2	2	2	0
R24c	B	66	62	4	62	4	61	5	61	5	60	6	60	6	60	6	2	0	2	2	0
R24d	B	66	64	2	63	3	63	3	62	4	62	4	61	5	61	5	2	0	2	2	0
R24e	B	67	65	2	65	2	64	3	64	3	63	4	63	4	63	4	2	0	0	0	2
R24f	B	67	66	1	66	1	65	2	65	2	65	2	65	2	64	3	2	0	0	0	2
R24g	B	68	67	1	66	2	66	2	66	2	66	2	66	2	65	3	2	0	0	0	2
R24h	B	68	67	1	67	1	67	1	67	1	66	2	66	2	66	2	2	0	0	0	2
R24i	B	68	67	1	67	1	67	1	67	1	67	1	67	1	67	1	2	0	0	0	2
R24j	B	68	68	0	68	0	68	0	67	1	67	1	67	1	67	1	2	0	0	0	2
R24k	B	68	68	0	68	0	68	0	68	0	68	0	67	1	67	1	2	0	0	0	2
R24l	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R24m	B	68	68	0	68	0	68	0	68	0	68	0	68	0	68	0	2	0	0	0	2
R25a	B	58	56	2	56	2	55	3	55	3	55	3	55	3	55	3	2	0	0	0	0
R25b	B	60	58	2	58	2	57	3	57	3	57	3	57	3	57	3	2	0	0	0	0
R25c	B	64	62	2	61	3	61	3	61	3	60	4	60	4	60	4	2	0	0	0	0
R25d	B	68	66	2	66	2	65	3	65	3	64	4	64	4	63	5	2	0	2	2	0
R26a	B	56	55	1	55	1	55	1	55	1	55	1	55	1	55	1	1	0	0	0	0
R26b	B	58	57	1	57	1	57	1	57	1	57	1	57	1	57	1	1	0	0	0	0
R26c	B	62	60	2	60	2	60	2	60	2	59	3	59	3	59	3	1	0	0	0	0
R26d	B	68	66	2	66	2	65	3	65	3	64	4	64	4	63	5	1	0	1	1	0
R27	C	64	59	5	59	5	59	5	59	5	59	5	59	5	58	6	1	0	1	0	0
R28a	B	75	69	6	69	6	69	6	69	6	69	6	69	6	69	6	1	0	1	1	0
R28b	B	76	69	7	69	7	69	7	69	7	69	7	69	7	69	7	1	1	1	1	0
R28c	B	76	70	6	70	6	69	7	69	7	69	7	69	7	69	7	1	1	1	1	0
R28d	B	75	73	2	73	2	72	3	72	3	71	4	71	4	70	5	1	0	1	1	0
R28e	B	75	74	1	74	1	74	1	73	2	73	2	73	2	73	2	1	0	0	0	1
R29	D	48	44	4	43	5	42	6	41	7	40	8	39	9	38	10	1	1	1	1	0
R30a	D	46	43	3	42	4	42	4	41	5	40	6	40	6	39	7	1	1	1	1	0
R30b	D	46	45	1	44	2	44	2	44	2	43	3	43	3	42	4	1	0	0	0	1
R30c	D	46	46	0	45	1	45	1	45	1	45	1	45	1	44	2	1	0	0	0	1
R30d	D	47	46	1	46	1	46	1	46	1	45	2	45	2	45	2	1	0	0	0	1
<b>Total Receptors</b>																	<b>128</b>	<b>12</b>	<b>39</b>	<b>30</b>	<b>81</b>
<b>Recommended Wall Height (ft)</b>																	23				
<b>Length of Wall (ft)</b>																	1,715				
<b>Wall Area (sq.ft)</b>																	39,445				

Rec	Activity Category	Build Leq (dBA)	17ft - Wall		18ft - Wall		19ft - Wall		20ft - Wall		21ft - Wall		22ft - Wall		23ft - Wall		Based on Noise Data for a 23ft High Wall						
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL >=7dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted		
Wall Cost (\$/sq.ft)															\$20		<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>						
Total Cost of Selected Wall(\$)															\$788,900								
Cost Effectiveness (\$/Benefitted Residence)															\$20,228								
Cost Reasonableness Criteria (\$/Benefitted Residence)															\$25,000							% receiving 5 dBA IL	27%
Cost Effectiveness < Cost Reasonableness? (yes/no)															Yes							Feasible (>50%)?	No
Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)															Yes								

Key:  Impacted Receiver (under the Future Build Condition)  
 Benefitted Receiver ( $\geq 5$  dBA)  
 Receiver achieves design goal ( $\geq 7$  dBA)  
 Recommended Wall Height

**Table G4c:Wall 4b - REDUCED RECEIVER ANALYSIS**

Rec	Activity Category	Build Leq (dBA)	17ft - Wall		18ft - Wall		19ft - Wall		20ft - Wall		21ft - Wall		22ft - Wall		23ft - Wall		Based on Noise Data for a 23ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL $\geq 7$ dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R20	C	62	57	5	57	5	57	5	56	6	56	6	56	6	56	6	1	0	1	1	0
R21a	B	64	61	3	60	4	60	4	60	4	60	4	59	5	59	5	2	0	2	0	0
R21b	B	65	62	3	61	4	61	4	61	4	60	5	60	5	60	5	2	0	2	1	0
R21c	B	65	63	2	62	3	62	3	62	3	61	4	61	4	61	4	2	0	0	0	2
R21d	B	66	64	2	63	3	63	3	63	3	63	3	62	4	62	4	2	0	0	0	2
R22a	B	65	60	5	59	6	59	6	59	6	59	6	58	7	58	7	2	2	2	2	0
R22b	B	65	61	4	61	4	60	5	60	5	60	5	59	6	59	6	2	0	2	2	0
R22c	B	66	62	4	62	4	61	5	61	5	61	5	60	6	60	6	2	0	2	2	0
R22d	B	66	63	3	63	3	63	3	62	4	62	4	62	4	61	5	2	0	2	2	0
R23a	B	64	59	5	59	5	58	6	58	6	58	6	58	6	58	6	2	0	2	0	0
R23b	B	65	61	4	60	5	60	5	59	6	59	6	59	6	58	7	2	2	2	2	0
R23c	B	66	62	4	61	5	61	5	60	6	60	6	60	6	59	7	2	2	2	2	0
R23d	B	66	63	3	63	3	62	4	62	4	62	4	61	5	61	5	2	0	2	2	2
R24a	B	64	59	5	59	5	58	6	58	6	58	6	58	6	58	6	2	0	2	0	0
R24b	B	65	61	4	60	5	60	5	59	6	59	6	59	6	58	7	2	2	2	2	0
R24c	B	66	62	4	62	4	61	5	61	5	60	6	60	6	60	6	2	0	2	2	0
R24d	B	66	64	2	63	3	63	3	62	4	62	4	61	5	61	5	2	0	2	2	0
R25a	B	58	56	2	56	2	55	3	55	3	55	3	55	3	55	3	2	0	0	0	0
R25b	B	60	58	2	58	2	57	3	57	3	57	3	57	3	57	3	2	0	0	0	0
R25c	B	64	62	2	61	3	61	3	61	3	60	4	60	4	60	4	2	0	0	0	0
R25d	B	68	66	2	66	2	65	3	65	3	64	4	64	4	63	5	2	0	2	2	0
R26a	B	56	55	1	55	1	55	1	55	1	55	1	55	1	55	1	1	0	0	0	0
R26b	B	58	57	1	57	1	57	1	57	1	57	1	57	1	57	1	1	0	0	0	0
R26c	B	62	60	2	60	2	60	2	60	2	59	3	59	3	59	3	1	0	0	0	0
R26d	B	68	66	2	66	2	65	3	65	3	64	4	64	4	63	5	1	0	1	1	0
R27	C	64	59	5	59	5	59	5	59	5	59	5	59	5	58	6	1	0	1	0	0
R28a	B	75	69	6	69	6	69	6	69	6	69	6	69	6	69	6	1	0	1	1	0
R28b	B	76	69	7	69	7	69	7	69	7	69	7	69	7	69	7	1	1	1	1	0
R28c	B	76	70	6	70	6	69	7	69	7	69	7	69	7	69	7	1	1	1	1	0
R28d	B	75	73	2	73	2	72	3	72	3	71	4	71	4	70	5	1	0	1	1	0
R28e	B	75	74	1	74	1	74	1	73	2	73	2	73	2	73	2	1	0	0	0	1
R29	D	48	44	4	43	5	42	6	41	7	40	8	39	9	38	10	1	1	1	1	0
R30a	D	46	43	3	42	4	42	4	41	5	40	6	40	6	39	7	1	1	1	1	0
R30b	D	46	45	1	44	2	44	2	44	2	43	3	43	3	42	4	1	0	0	0	1
R30c	D	46	46	0	45	1	45	1	45	1	45	1	45	1	44	2	1	0	0	0	1
R30d	D	47	46	1	46	1	46	1	46	1	45	2	45	2	45	2	1	0	0	0	1

Rec	Activity Category	Build Leq (dBA)	17ft - Wall		18ft - Wall		19ft - Wall		20ft - Wall		21ft - Wall		22ft - Wall		23ft - Wall		Based on Noise Data for a 23ft High Wall							
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL >=7dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted			
<b>Total Receptors</b>																56	12	39	31	9				
<b>Recommended Wall Height (ft)</b>																23		<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>						
<b>Length of Wall (ft)</b>																1,715								
<b>Wall Area (sq.ft)</b>																39,445								
<b>Wall Cost (\$/sq.ft)</b>																\$20								
<b>Total Cost of Selected Wall(\$)</b>																\$788,900								
<b>Cost Effectiveness (\$/Benefitted Residence)</b>																\$20,228								
<b>Cost Reasonableness Criteria (\$/Benefitted Residence)</b>																\$25,000							% receiving 5 dBA IL	79%
<b>Cost Effectiveness &lt; Cost Reasonableness? (yes/no)</b>																Yes							<b>Feasible (&gt;50%)?</b>	Yes
<b>Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)</b>																Yes								

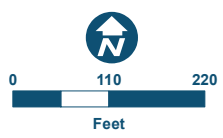


**I-5 ROSE QUARTER IMPROVEMENT PROJECT**

Data Source: Project Features - HDR; Basemap - ODOT, ESRI; Zoning - City of Portland

\* Noise levels predicted at receptor meet or exceed the NAAC under some conditions. See Table 7 of the Noise Study Technical Memorandum for predicted peak hour noise levels.

- Noise Receptor\*
- Noise monitoring locations
- Future Design Centerline
- Noise Wall
- Noise Report Study Area
- Cover



**I-5 ROSE QUARTER NOISE STUDY**

**NOISE WALL MITIGATION ANALYSIS**

NOISE WALL 3 & 5

FIGURE I2.3

Key:	<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Impacted Receiver (under the Future Build Condition)
	<span style="background-color: green; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Benefitted Receiver ( $\geq 5$ dBA)
	<span style="background-color: blue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Receiver achieves design goal ( $\geq 7$ dBA)
	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Recommended Wall Height

**Table G5: Wall 5**

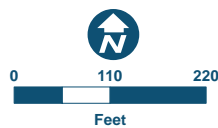
Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 13 ft High Wall									
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL $\geq 7$ dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted					
R17	C	66	62	4	62	4	61	5	61	5	61	5	61	5	60	6	1	0	1	1	0					
R18a	D	36	36	0	36	0	36	0	36	0	36	0	36	0	36	0	1	0	0	0	0					
R18b	D	38	38	0	38	0	38	0	38	0	38	0	38	0	38	0	1	0	0	0	0					
<b>Total Receptors</b>																	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>					
<b>Recommended Wall Height (ft)</b>																	<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>									
<b>Length of Wall (ft)</b>																						12				
<b>Wall Area (sq.ft)</b>																						475				
<b>Wall Cost (\$/sq.ft)</b>																						5,700				
<b>Total Cost of Selected Wall(\$)</b>																						\$20				
<b>Cost Effectiveness (\$/Benefitted Residence)</b>																						\$114,000				
<b>Cost Reasonableness Criteria (\$/Benefitted Residence)</b>																						\$114,000				
<b>Cost Effectiveness &lt; Cost Reasonableness? (yes/no)</b>																	No					% receiving 5 dBA IL		33%		
<b>Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)</b>																	No					Feasible (>50%)?		No		



**I-5 ROSE QUARTER IMPROVEMENT PROJECT**

Data Source: Project Features - HDR; Basemap - ODOT, ESRI; Zoning - City of Portland  
 \* Noise levels predicted at receptor meet or exceed the NAAC under some conditions. See Table 7 of the Noise Study Technical Memorandum for predicted peak hour noise levels.

- Noise Receptor\*
- Noise monitoring locations
- Future Design Centerline
- Noise Wall
- Noise Report Study Area
- Cover



**I-5 ROSE QUARTER NOISE STUDY**

**NOISE WALL MITIGATION ANALYSIS**

NOISE WALL 4 & 6

FIGURE I2.4



Key:	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Impacted Receiver (under the Future Build Condition)
	<span style="background-color: green; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Benefitted Receiver (>= 5 dBA)
	<span style="background-color: blue; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Receiver achieves design goal (>= 7 dBA)
	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Recommended Wall Height

**Table G6: Wall 6**

Rec	Activity Category	Build Leq (dBA)	10ft - Wall		11ft - Wall		12ft - Wall		13ft - Wall		14ft - Wall		15ft - Wall		16ft - Wall		Based on Noise Data for a 15 ft High Wall				
			Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Leq with Mitigation (dBA)	Insertion Loss (dBA)	Number of Units	Receptors with IL >=7dBA	Number of Benefitted Units	Impacted Receptors Receiving 5 dBA IL	Impacted Receptors Not Benefitted
R19a	D	46	41	5	41	5	40	6	40	6	40	6	40	6	40	6	1	0	1	0	0
R19b	D	49	45	4	44	5	44	5	44	5	43	6	43	6	43	6	22	0	22	0	0
R19c	D	50	49	1	48	2	48	2	48	2	48	2	47	3	47	3	22	0	0	0	22
R19d	D	50	49	1	49	1	49	1	49	1	49	1	49	1	49	1	22	0	0	0	22
R19e	D	51	49	2	49	2	49	2	49	2	49	2	49	2	49	2	22	0	0	0	22
<b>Total Receptors</b>																	<b>89</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>66</b>
<b>Recommended Wall Height (ft)</b>																	11				
<b>Length of Wall (ft)</b>																	655				
<b>Wall Area (sq.ft)</b>																	7,205				
<b>Wall Cost (\$/sq.ft)</b>																	\$20				
<b>Total Cost of Selected Wall(\$)</b>																	\$144,100				
<b>Cost Effectiveness (\$/Benefitted Residence)</b>																	\$6,265				
<b>Cost Reasonableness Criteria (\$/Benefitted Residence)</b>																	\$25,000				
<b>Cost Effectiveness &lt; Cost Reasonableness? (yes/no)</b>																	No				
<b>Noise reduction design goal - One receiver achieves the noise reduction design goal of 7 dBA? (yes/no)</b>																	No				
<b>Calculation of Feasible Abatement (majority of impacted receptors receive a minimum of 5 dBA IL?)</b>																	% receiving 5 dBA IL		0%		
<b>Feasible (&gt;50%)?</b>																			No		