Appendix 6

Noise Model Worksheets

Curtis School Project

Noise Calculation Worksheets

Provided by Acoustical Engineering Services

Ambient Noise Measurements

Project: **Curtis School**
Site Ambient Noise Measurements

AES
Acoustical Engineering Services

Location: R1
Date: 2/27/2020

Time	Overload	Leq	Lmax	L10	L90
9:47:27 AM	No	53.1	64.3	56.8	48
9:48:27 AM	No	48.4	55.7	49.7	46.5
9:49:27 AM	No	47.3	49.3	48.4	46.3
9:50:27 AM	No	47.5	49.2	48.2	46.6
9:51:27 AM	No	48	52.3	49.3	46.3
9:52:27 AM	No	52.1	58.6	56.4	47.9
9:53:27 AM	No	53.2	58.5	56.7	48.5
9:54:27 AM	No	53	58	56.5	48.4
9:55:27 AM	No	52.5	59	56.3	48.4
9:56:27 AM	No	51.6	56.7	54.9	48.5
9:57:27 AM	No	50.1	55.1	52.9	47.6
9:58:27 AM	No	47	50.6	47.7	46.1
9:59:27 AM	No	51	58.2	53.9	46.7
10:00:27 AM	No	61.5	67	65.9	52
10:01:27 AM	No	52.2	56.6	55	48.3
		53.3			

Project: **Curtis School**
Site Ambient Noise Measurements

AES
Acoustical Engineering Services

Location: R2
Date: 2/27/2020

Time	Overload	Leq	Lmax	L10	L90
10:15:17 AM	No	65.9	73	69.3	55.5
10:16:17 AM	No	63.6	71	67.6	46.9
10:17:17 AM	No	64.3	72.2	68.8	50.4
10:18:17 AM	No	65.6	75.4	67.8	56.1
10:19:17 AM	No	61.7	69	67.2	50.5
10:20:17 AM	No	64.8	71.2	69	49.8
10:21:17 AM	No	67.1	79.9	69.1	56.9
10:22:17 AM	No	65.2	72	68.8	54.1
10:23:17 AM	No	64.2	71.6	68.5	51.4
10:24:17 AM	No	63.1	68.7	66.8	54.2
10:25:17 AM	No	63.9	72	68.2	49.9
10:26:17 AM	No	63.5	70.4	67.4	48.5
10:27:17 AM	No	62.7	73.8	67.8	43.4
10:28:17 AM	No	63.9	69.8	67.8	55.3
10:29:17 AM	No	62.2	71.7	66.1	50.2
		64.3			

Project: **Curtis School**
Site Ambient Noise Measurements

AES
Acoustical Engineering Services

Location: R3
Date: 2/27/2020

Time	Overload	Leq	Lmax	L10	L90
10:49:41 AM	No	67.2	72.5	70.7	61.9
10:50:41 AM	No	69	74.5	71.1	66.2
10:51:41 AM	No	67	73	70	63.9
10:52:41 AM	No	65.4	71.4	68.6	62.6
10:53:41 AM	No	67.2	73.9	70.2	62.8
10:54:41 AM	No	64.7	70.7	67.2	61.7
10:55:41 AM	No	68.4	74.6	71.2	63.8
10:56:41 AM	No	66.8	71.1	68.9	64
10:57:41 AM	No	67.3	71.3	69.9	61.7
10:58:41 AM	No	68.3	77.2	71.4	62.1
10:59:41 AM	No	68.4	75.3	72.2	62.5
11:00:41 AM	No	67	73.9	69.1	63.5
11:01:41 AM	No	67.3	74.9	69.9	63.1
11:02:41 AM	No	66.8	75.6	69.7	60.6
11:03:41 AM	No	68.7	73.4	71.2	62.9
		67.5			

Project: **Curtis School**
Site Ambient Noise Measurements

AES
Acoustical Engineering Services

Location: Project Site - Future Building Location
Date: 2/27/2020

Time	Overload	Leq	Lmax	L10	L90
9:24:59 AM	No	61.2	67.5	65.2	55
9:25:59 AM	No	55.1	56.3	55.7	54.5
9:26:59 AM	No	55.8	62	56.9	53.9
9:27:59 AM	No	55	58.9	56	54.3
9:28:59 AM	No	54.8	57.1	56.3	53.2
9:29:59 AM	No	54.8	56.3	55.9	54.1
9:30:59 AM	No	55.2	59.1	56.2	54.4
9:31:59 AM	No	56.5	60	58.9	54.5
9:32:59 AM	No	54.8	55.9	55.5	53.8
9:33:59 AM	No	54.5	56.5	55.5	53
9:34:59 AM	No	55.1	55.9	55.6	54.5
9:35:59 AM	No	54.1	55.7	54.9	52.9
9:36:59 AM	No	54.1	58.4	54.8	53.4
9:37:59 AM	No	55.1	55.9	55.6	54.4
9:38:59 AM	No	54.6	56	55.2	54
		55.9			

Construction Noise Calculations

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 1 (Arts Building)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	325	15
	1				

Receptor: ***R1***

Results:

1-hour Leq: **54.7**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2a (Additional Classroom)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	750	15
	1				

Receptor: ***R1***

Results:

1-hour Leq: **47.5**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2b (New Classroom Building and Science Building)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	900	15
	1				

Receptor: ***R1***

Results:

1-hour Leq: **45.9**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2c (Swapping Field and Parking Lot)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	650	15
	1				

Receptor: ***R1***

Results:

1-hour Leq: **48.7**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2d (Gymnasium and Athletic Buildings)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	1000	15
	1				

Receptor: ***R1***

Results:

1-hour Leq: 45.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 23 (Pavilion Back of House, Dining, and Library)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	350	15
	1				

Receptor: ***R1***

Results:

1-hour Leq: **54.1**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 1 (Arts Building)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	1400	15
	1				

Receptor: ***R2***

Results:

1-hour Leq: 42.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2a (Additional Classroom)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	950	15
	1				

Receptor: ***R2***

Results:

1-hour Leq: **45.4**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2b (New Classroom Building and Science Building)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	725	15
	1				

Receptor: ***R2***

Results:

1-hour Leq: **47.8**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2c (Swapping Field and Parking Lot)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	450	15
	1				

Receptor: ***R2***

Results:

1-hour Leq: **51.9**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2d (Gymnasium and Athletic Buildings)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	550	15
	1				

Receptor: ***R2***

Results:

1-hour Leq: 50.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 23 (Pavilion Back of House, Dining, and Library)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	1350	15
	1				

Receptor: ***R2***

Results:

1-hour Leq: 42.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 1 (Arts Building)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	930	15
	1				

Receptor: ***R3***

Results:

1-hour Leq: **45.6**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2a (Additional Classroom)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	1050	15
	1				

Receptor: ***R3***

Results:

1-hour Leq: **44.6**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2b (New Classroom Building and Science Building)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	800	15
	1				

Receptor: ***R3***

Results:

1-hour Leq: **46.9**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2c (Swapping Field and Parking Lot)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	275	15
	1				

Receptor: ***R3***

Results:

1-hour Leq: **56.2**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 2d (Gymnasium and Athletic Buildings)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	675	15
	1				

Receptor: ***R3***

Results:

1-hour Leq: **48.4**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: Curtis School Project

Construction Phase: ***Phase 23 (Pavilion Back of House, Dining, and Library)***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Leq	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Peak Construction	1	86	100%	925	15
	1				

Receptor: ***R3***

Results:

1-hour Leq: **45.7**

Source for Ref. Noise Levels: FHWA RCNM, 2006

Eyestone Environmental 2 September 2021
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Curtis School
RUN: Peak Construction

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				**2 September 2021**								
Sean Bui				**TNM 2.5**								
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	**Curtis School**											
RUN:	**Peak Construction**											
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	0	0	0	0	20	35	0	0	0	0
	point2	2										

Eyestone Environmental						**2 September 2021**					
Sean Bui						**TNM 2.5**					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	**Curtis School**										
RUN:	**Peak Construction**										
Receiver											
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**				**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**		**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**	**Goal**	**Calc.**
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Along Haul Route	11	1	500.0	65.0	0.00	4.92	0.00	66	10.0	8.0	Y

Eyestone Environmental
Sean Bui

2 September 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Curtis School
RUN: Peak Construction
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Along Haul Route	11	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0

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