

DOCKETED

Docket Number:	24-OPT-02
Project Title:	Compass Battery Energy Storage
TN #:	255561-2
Document Title:	Appendix 4-7B_Construction Noise Modeling
Description:	Contains the noise modeling worksheets used to predict construction noise for the Project.
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Submitter Role:	Applicant Consultant
Submission Date:	4/5/2024 6:28:35 PM
Docketed Date:	4/8/2024

Appendix 4.7B

Construction Noise Model

Roadway Construction Noise Model Emulator Worksheets for Compass BESS

Appendix 4.7-B

To User: bordered cells are inputs, unbordered cells have formulae
 enter "0" to turn off air or grd absorption terms, "1" to turn on

air abs? 1
 grd abs? 1

magnitude of threshold (dBA) = 80
 allowable hours over which Leq is to be averaged = 8

Source, receptor, and barrier all share same reference grade elevation, unless otherwise noted
 = Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Level @ 50 ft	Source to NSR Distance (ft)	Temporary Barrier Insertion Loss (dB)	Additional Noise Reduction	Distance-Adjusted Leq	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Source	Receiver	Barrier	Source to Barr. ("A")	Recv. to Barr. ("B")	Source to Recv. ("C")	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	ASRR (dB)	Heff (with barrier)	Heff (w/out barrier)	G (with barrier)	G (without barrier)	LBarr (dB)
													Elevation (ft)	Elevation (ft)	Height (ft)	Barr. Height (ft)	Barr. Height (ft)	Horiz. (ft)	Horiz. (ft)	Horiz. (ft)								
1	Access road site preparation, grading and paving	Grader	1	40	85	1210	0		51.4	8	480	47	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	1	40	84	1210	0		50.4	8	480	46	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front end loader	1	40	79	1210	0		45.4	8	480	41	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front end loader	1	40	79	1210	0		45.4	8	480	41	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		Total Aggregate Noise Exposure from Access road site preparation, grading and paving Phase												51.1														
2	Site preparation	grader	2	40	85	1210	0		51.4	8	480	50	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	1	40	84	1210	0		50.4	8	480	46	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		backhoe	1	40	78	1210	0		44.4	8	480	40	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	1210	0		48.4	8	480	47	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front end loader	2	40	79	1210	0		45.4	8	480	44	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Site preparation Phase												54.0																
3	Switchyard site preparation	front end loader	2	40	79	1210	0		45.4	7	420	44	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	1210	0		48.4	8	480	47	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Switchyard site preparation Phase												49.1																
4	Grading	grader	4	40	85	1210	0		51.4	8	480	53	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	1210	0		48.4	8	480	47	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	2	40	84	1210	0		50.4	8	480	49	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		compactor (ground)	2	20	80	1210	0		46.4	8	480	42	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		roller	2	20	80	1210	0		46.4	8	480	42	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front end loader	2	40	79	1210	0		45.4	8	480	44	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Grading Phase												56.3																
5	Switchyard grading	roller	2	20	80	1210	0		46.4	8	480	42	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	1210	0		48.4	8	480	47	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	2	40	84	1210	0		50.4	8	480	49	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Switchyard grading Phase												52.1																
6	Wall earthwork and installation	excavator	2	40	81	1210	0		47.4	8	480	46	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		rock drill	2	20	81	1210	0		47.4	8	480	43	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	2	40	84	1210	0		50.4	8	480	49	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		man lift	2	20	75	1210	0		41.4	8	480	37	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Wall earthwork and installation Phase												52.1																
7	Battery/container installation	compressor (air)	4	40	78	1210	0		44.4	8	480	46	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		crane	2	16	81	1210	0		47.4	8	480	42	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		excavator	2	40	81	1210	0		47.4	8	480	46	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		generator	4	50	72	1210	0		38.4	8	480	34	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		roller	2	20	80	1210	0		46.4	8	480	42	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		man lift	2	20	75	1210	0		41.4	8	480	37	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front end loader	2	40	79	1210	0		45.4	8	480	44	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		compactor (ground)	2	20	80	1210	0		46.4	8	480	42	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		Total Aggregate Noise Exposure from Battery/container installation Phase												52.8														
8	Switchyard installation	man lift	4	20	75	1210	0		41.4	8	480	40	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		compressor (air)	2	40	78	1210	0		44.4	8	480	43	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		drill rig truck	2	20	79	1210	0		45.4	8	480	41	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		crane	1	16	81	1210	0		47.4	8	480	39	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		excavator	1	40	81	1210	0		47.4	8	480	43	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		generator	2	50	72	1210	0		38.4	8	480	38	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		roller	2	20	80	1210	0		46.4	8	480	42	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		man lift	2	20	75	1210	0		41.4	8	480	37	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	1210	0		48.4	8	480	47	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front end loader	2	40	79	1210	0		45.4	8	480	44	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	4	40	84	1210	0		50.4	8	480	52	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		rock drill	2	20	81	1210	0		47.4	8	480	43	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		Total Aggregate Noise Exposure from Switchyard installation Phase												55.9														
		9	Loop-in transmission foundation and tower erection	compressor (air)	2	40	78	1210	0		44.4	8	480	43	5	8	0	10	1200	1210	11.2	1200.0	1210.0	0.00	0.1	6.5	6.5	0.6
crane	1			16																								

Roadway Construction Noise Model Emulator Worksheets for Compass BESS

Appendix 4.7-B

To User: bordered cells are inputs, unbordered cells have formulas
 enter "0" to turn off air or ground absorption terms, "1" to turn on

air abs? 1
 ground abs? 1

magnitude of threshold (dBA) = 80
 allowable hours over which Leq is to be averaged = 8

Source, receptor, and barrier all share same reference grade elevation, unless otherwise noted
 = Barrier of input height inserted between source and receptor

Project Phase No.	Project Phase Description	Comparable FHWA RCNM Construction Equipment Type	Quantity	AUF % (from FHWA RCNM)	Reference Level @ 50 ft from FHWA RCNM	Source to NSR Distance (ft)	Temporary Barrier Insertion Loss (dB)	Additional Noise Reduction	Distance-Adjusted Leq	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq	Source	Receiver	Barrier	Source to	Recv. to	Source to	"A" (ft)	"B" (ft)	"C" (ft)	Path Length	ASRR (dB)	Heff (with barrier)	Heff (w/out barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
													Elevation (ft)	Elevation (ft)	Height (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)	Barr. (ft)
1	Access road site preparation, grading and paving	Grader	1	40	85	860	0		54.8	8	480	51	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	1	40	84	860	0		53.8	8	480	50	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front-end loader	1	40	79	860	0		48.8	8	480	45	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front-end loader	1	40	79	860	0		48.8	8	480	45	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Access road site preparation, grading and paving Phase												54.5																
2	Site preparation	grader	2	40	85	860	0		54.8	8	480	54	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	1	40	84	860	0		53.8	8	480	50	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		backhoe	1	40	78	860	0		47.8	8	480	44	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	860	0		51.8	8	480	51	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Site preparation Phase												57.4																
3	Switchyard site preparation	front-end loader	2	40	79	860	0		48.8	8	420	47	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	860	0		51.8	8	480	51	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Switchyard site preparation Phase												52.4																
4	Grading	grader	4	40	85	860	0		54.8	8	480	57	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	860	0		51.8	8	480	51	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	2	40	84	860	0		53.8	8	480	53	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		compactor (ground)	2	20	80	860	0		49.8	8	480	46	10	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		roller	2	20	80	860	0		49.8	8	480	46	10	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front-end loader	2	40	79	860	0		48.8	8	480	48	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Grading Phase												59.7																
5	Switchyard grading	roller	2	20	80	860	0		49.8	8	480	46	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	860	0		51.8	8	480	51	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	2	40	84	860	0		53.8	8	480	53	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Switchyard grading Phase												55.5																
6	Wall earthwork and installation	excavator	2	40	81	860	0		50.8	8	480	50	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		rock drill	2	20	81	860	0		50.8	8	480	47	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	2	40	84	860	0		53.8	8	480	53	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		man lift	2	20	75	860	0		44.8	8	480	41	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
Total Aggregate Noise Exposure from Wall earthwork and installation Phase												55.5																
7	Battery/container installation	compressor (air)	4	40	78	860	0		47.8	8	480	50	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		crane	2	16	81	860	0		50.8	8	480	46	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		excavator	2	40	81	860	0		50.8	8	480	50	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		generator	4	40	72	860	0		41.8	8	480	45	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		roller	2	20	80	860	0		49.8	8	480	46	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		man lift	2	20	75	860	0		44.8	8	480	41	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front-end loader	2	40	79	860	0		48.8	8	480	48	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		compactor (ground)	2	20	80	860	0		49.8	8	480	46	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		Total Aggregate Noise Exposure from Battery/container installation Phase												56.2														
8	Switchyard installation	man lift	4	20	75	860	0		44.8	8	480	44	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		compressor (air)	2	40	78	860	0		47.8	8	480	47	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		drill rig truck	2	20	79	860	0		48.8	8	480	45	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		crane	1	16	81	860	0		50.8	8	480	43	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		excavator	1	40	81	860	0		50.8	8	480	47	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		generator	2	50	72	860	0		41.8	8	480	42	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		roller	2	20	80	860	0		49.8	8	480	46	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		man lift	2	20	75	860	0		44.8	8	480	41	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		dozer	2	40	82	860	0		51.8	8	480	51	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		front-end loader	2	40	79	860	0		48.8	8	480	48	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		tractor	4	40	84	860	0		53.8	8	480	56	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		rock drill	2	20	81	860	0		50.8	8	480	47	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		Total Aggregate Noise Exposure from Switchyard installation Phase												59.3														
9	Loop-in transmission foundation and tower erection	compressor (air)	2	40	78	860	0		47.8	8	480	47	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		crane	1	16	81	860	0		50.8	8	480	43	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5	6.5	0.6	0.6	0.1
		man lift	2	20	75	860	0		44.8	8	480	41	5	8	0	10	850	860	11.2	850.0	860.0	0.00	0.1	6.5				