

# Appendix G

## Noise Data





**Table G-1. Project Related Construction Equipment**

Project Equipment <sup>1</sup>	FTA Equipment <sup>2</sup>	Construction Activities Requiring Equipment	Typical Noise Level (dBA)	
			50 Feet from Source <sup>3</sup>	100 Feet from Source <sup>4</sup>
Compactors	Compactor	Site Preparation, Building Construction, and Roadway Improvements	82	76
Cement Truck	Concrete Mixer	Building Construction	85	79
Pump Trucks	Concrete Pump	Building Construction, Roadway Improvements	82	76
Cranes	Crane, Mobile	Site Preparation, Building Construction, and Roadway Improvements	83	77
Dozers	Dozer	Site Preparation, Building Construction, and Roadway Improvements	85	79
Grader	Grader	Site Preparation, Building Construction, and Roadway Improvements	85	79
Pavement Crusher	Grader	Roadway Improvements	85	79
Soil stabilizer	Grader	Site Preparation, Building Construction, and Roadway Improvements	85	79
Loaders	Loader	Site Preparation, Building Construction, and Roadway Improvements	85	79
Excavators	Loader	Site Preparation, Building Construction, and Roadway Improvements	85	79
Rough Terrain Fork lift	Loader	Site Preparation and Building Construction	85	79
Asphalt Layer	Paver	Site Preparation, Building Construction, and Roadway Improvements	89	83
Pile Driver	Pile-driver (Impact)	Building Construction and Roadway Improvements	101	95
Drill Rig Truck	Drill Rig Truck <sup>5</sup>	Site Preparation (boreholes) and Roadway Improvements	79	73
Roller	Roller	Site Preparation, Building Construction, and Roadway Improvements	74	68
Man Lifts	Roller	Site Preparation and Building Construction	74	68
Bobcat	Roller	Site Preparation, Building Construction, and Roadway Improvements	74	68
Sweeper	Roller	Site Preparation and Building Construction	74	68
Scrapers	Scraper	Site Preparation and Building Construction	89	83
Dump Truck	Truck	Site Preparation	88	82
Off Road Dump Trucks	Truck	Site Preparation, Building Construction, and Roadway Improvements	88	82
Support Trucks	Truck	Site Preparation	88	82
Water Trucks	Truck	Site Preparation, Building Construction, and Roadway Improvements	88	82

SOURCE: Noise levels for FTA equipment from FTA, *Transit Noise and Vibration Guidance Handbook*, May 2006. Project equipment and activities from 2017 Modified Project Variant Construction Phasing, revised September 2017.

NOTES:

<sup>1</sup> Project equipment categories for 2017 Modified Project Variant construction.

<sup>2</sup> FTA equipment category with similar noise emissions to project equipment.

<sup>3</sup> Typical noise levels for Project equipment based on similar FTA equipment operating at 50 feet.

<sup>4</sup> Typical noise level at 100 feet calculated assuming 6 dBA reduction per doubling of distance.

<sup>5</sup> "Drill Rig Truck" noise level not found in FTA manual; sound level data from Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). Sound level data found online at [https://www.fhwa.dot.gov/Environment/noise/construction\\_noise/handbook/handbook09.cfm](https://www.fhwa.dot.gov/Environment/noise/construction_noise/handbook/handbook09.cfm).

**Table G-2. Construction-related Noise Results, by Activity and Area**

Construction Activity <sup>1</sup>	Construction Project Area <sup>2</sup>	Max Construction-Related Noise Levels without Pile-Driving (dBA)		Max Construction-Related Noise Levels with Pile-Driving (dBA)	
		Off-site Receiver <sup>3</sup>	On-site Receiver <sup>4</sup>	Off-site Receiver <sup>3,5</sup>	On-site Receiver <sup>4,5</sup>
Abatement	HP-01	68	-	-	-
Abatement	HP-01 Parks	66	84	-	-
Abatement	Waste Water Treatment Plant	65	76	-	-
Abatement	HP-02	69	-	-	-
Abatement	HP-02 Parks	89	94	-	-
Abatement	HP-03	63	59	-	-
Abatement	HP-03 Parks	63	86	-	-
Abatement	HP-03 Roadway Improvements	79	60	-	-
Abatement	HP-04	60	64	-	-
Abatement	HP-04 Parks	61	87	-	-
Abatement	HP-05	59	65	-	-
Abatement	HP-06	67	76	-	-
Abatement	HP-06 Community SFC and Maintenance Yard	69	85	-	-
Abatement	HP-06 Grassland EP and Multiuse Open Space	71	87	-	-
Demolition	HP-01	68	-	-	-
Demolition	HP-01 Parks	66	84	-	-
Demolition	Waste Water Treatment Plant	65	76	-	-
Demolition	HP-02	69	-	-	-
Demolition	HP-02 Parks	89	94	-	-
Demolition	HP-03	63	60	-	-
Demolition	HP-03 Parks	63	86	-	-
Demolition	HP-03 Roadway Improvements	79	60	-	-
Demolition	HP-04	60	64	-	-
Demolition	HP-04 Parks	61	87	-	-
Demolition	HP-05	59	65	-	-
Demolition	HP-05 Parks	58	85	-	-
Demolition	HP-06	67	76	-	-
Demolition	HP-06 Community SFC and Maintenance Yard	69	85	-	-
Demolition	HP-06 Grassland EP and Multiuse Open Space	71	87	-	-
Foundation Piles/Structure/Rough-In	HP-01	71	51	-	-
Foundation Piles/Structure/Rough-In	HP-01 Parks	66	84	79	98
Foundation Piles/Structure/Rough-In	HP-02	69	61	82	75
Foundation Piles/Structure/Rough-In	HP-02 Parks	89	94	101	101
Foundation Piles/Structure/Rough-In	HP-03	63	79	76	92
Foundation Piles/Structure/Rough-In	HP-03 Parks	63	86	-	-
Foundation Piles/Structure/Rough-In	HP-04	60	76	73	89
Foundation Piles/Structure/Rough-In	HP-04 Bridges	56	77	70	90
Foundation Piles/Structure/Rough-In	HP-05	59	77	72	90
Foundation Piles/Structure/Rough-In	HP-06	69	79	-	-
Grading & Infrastructure	HP-01	71	49	-	-
Grading & Infrastructure	HP-01 Parks	69	87	-	-
Grading & Infrastructure	HP-01 Surcharge	64	14	-	-
Grading & Infrastructure	Waste Water Treatment Plant	67	79	-	-
Grading & Infrastructure	HP-02	72	-	-	-
Grading & Infrastructure	HP-02 Parks	91	96	-	-
Grading & Infrastructure	HP-03	66	62	-	-
Grading & Infrastructure	HP-03 Parks	63	86	-	-
Grading & Infrastructure	HP-03 Roadway Improvements	82	63	-	-
Grading & Infrastructure	HP-03 Surcharge	63	46	-	-
Grading & Infrastructure	HP-04	62	76	-	-
Grading & Infrastructure	HP-04 Geothermal	56	58	-	-
Grading & Infrastructure	HP-04 Parks	61	87	-	-
Grading & Infrastructure	HP-04 Surcharge	58	64	-	-
Grading & Infrastructure	HP-05	62	66	-	-
Grading & Infrastructure	HP-05 Parks	58	85	-	-
Grading & Infrastructure	HP-05 Surcharge	57	60	-	-
Grading & Infrastructure	HP-06	69	79	-	-
Grading & Infrastructure	HP-06 Community SFC and Maintenance Yard	69	85	-	-
Grading & Infrastructure	HP-06 Grassland EP and Multiuse Open Space	71	87	-	-

**Table G-2. Construction-related Noise Results, by Activity and Area**

Construction Activity <sup>1</sup>	Construction Project Area <sup>2</sup>	Max Construction-Related Noise Levels without Pile-Driving (dBA)		Max Construction-Related Noise Levels with Pile-Driving (dBA)	
		Off-site Receiver <sup>3</sup>	On-site Receiver <sup>4</sup>	Off-site Receiver <sup>3,5</sup>	On-site Receiver <sup>4,5</sup>
Grading & Infrastructure	HP-06 Surcharge	64	83	-	-
Grading & Infrastructure	HPS2 Site	86	58	-	-
Grading & Infrastructure	HP-06 Sports	51	57	-	-
Grading & Infrastructure	HPS-01A Geothermal	77	-	-	-
Roadway Improvements	HP-03 YS Bridge	56	71	69	85
Roadway Improvements	Innes Ave. Improvements	94	67	-	-
Roadway Improvements	Palou Ave. Improvements	91	55	-	-
Interior & Exterior Finishes	HP-01	68	71	81	84
Interior & Exterior Finishes	HP-01 Parks	66	84	-	-
Interior & Exterior Finishes	HP-02	69	61	-	-
Interior & Exterior Finishes	HP-02 Parks	89	94	-	-
Interior & Exterior Finishes	HP-03	63	79	-	-
Interior & Exterior Finishes	HP-03 Parks	63	86	-	-
Interior & Exterior Finishes	HP-04	60	76	73	89
Interior & Exterior Finishes	HP-04 Bridges	56	77	70	90
Interior & Exterior Finishes	HP-04 Parks	61	87	-	-
Interior & Exterior Finishes	HP-05	59	77	-	-
Interior & Exterior Finishes	HP-05 Parks	56	82	-	-
Interior & Exterior Finishes	HP-06	67	76	80	89
Interior & Exterior Finishes	HP-06 Community SFC and Maintenance Yard	69	85	-	-
Interior & Exterior Finishes	HP-06 Grassland EP and Multiuse Open Space	71	87	-	-

SOURCE: Noise levels for FTA equipment from FTA, *Transit Noise and Vibration Guidance Handbook*, May 2006. Project equipment activities and schedule from 2017 Modified Project Variant Construction Schedule and Resources, revised October 2017. Calculations by Ramboll, December 2017.

NOTES:

Noise levels were calculated at the nearest noise-sensitive receiving location assuming the top two loudest equipment (with and without pile driving) operate simultaneously.

<sup>1</sup> See Table G-1 for typical equipment associated with Site Preparation (Abatement, Demolition, and Grading), Building Construction (Foundation Piles/Structure/Rough-In and Interior & Exterior Finishes), and Roadway Improvements.

<sup>2</sup> Construction project areas based on the 2017 Modified Project Variant.

<sup>3</sup> Off-site noise-sensitive uses include existing residences and places of worship in the Bayview and Hunters Point neighborhoods.

<sup>4</sup> On-site noise-sensitive uses include future residential units, the hotel, and two schools proposed under the 2017 Modified Project Variant. A dash ( - ) indicates no on-site noise-sensitive use would be occupied during construction.

<sup>5</sup> Dashes ( - ) indicate sustained pile driving would not be utilized.

**Table G-3. Traffic Volumes, Composition, and Speeds Assumed for Operational Impact Assessment**

Roadway Segment	Model Scenario	Total PM-Peak Period Traffic Volume (vph)	Traffic Composition (vph) <sup>1</sup>				Speed Limit (mph) <sup>2</sup>
			LDV	MDV	HDV	Bus	
Palou Avenue east of 3rd Street	Existing	457	434	9	4	10	25
Gilman Avenue east of 3rd Street	Existing	431	412	9	4	6	25
Jamestown Ave north of Harney Way	Existing	204	198	4	2	0	35
Harney Way west of Jamestown Ave	Existing	146	142	3	1	0	40
Innes south of Earl Street	Existing	170	159	3	2	6	35
Palou Avenue east of 3rd Street	Existing + Project	1,483	1,423	29	15	16	25
Gilman Avenue east of 3rd Street	Existing + Project	2,353	2,277	47	23	6	25
Jamestown Ave north of Harney Way	Existing + Project	966	937	19	10	0	35
Harney Way west of Jamestown Ave	Existing + Project	2,607	2,529	52	26	0	40
Innes south of Earl Street	Existing + Project	2,057	1,982	41	20	14	35
Palou Avenue east of 3rd Street	Future Background	1,170	1,125	23	12	10	25
Gilman Avenue east of 3rd Street	Future Background	910	877	18	9	6	25
Jamestown Ave north of Harney Way	Future Background	940	912	19	9	0	35
Harney Way west of Jamestown Ave	Future Background	1,690	1,639	34	17	0	40
Innes south of Earl Street	Future Background	1,500	1,449	30	15	6	35
Palou Avenue east of 3rd Street	Future Background + Project	1,762	1,694	35	17	16	25
Gilman Avenue east of 3rd Street	Future Background + Project	2,247	2,174	45	22	6	25
Jamestown Ave north of Harney Way	Future Background + Project	1,392	1,350	28	14	0	35
Harney Way west of Jamestown Ave	Future Background + Project	3,197	3,101	64	32	0	40
Innes south of Earl Street	Future Background + Project	2,301	2,218	46	23	14	35
Onsite Bus Routes	Future Background + Project	0	0	0	0	14	30

SOURCE: Total Existing and Future Background PM-peak period traffic volumes from 2010 FEIR. Total Future Background + Project PM-peak period traffic volumes from 2017 Modified Project Variant Traffic Impact Analysis.

NOTES:

<sup>1</sup> Traffic composition assumes 97% light-duty vehicles (LDV), 2% medium duty vehicles (MDV), and 1% heavy duty vehicles (HDV). Buses based on existing and proposed transit revisions for the 2017 Modified Project Variant.

<sup>2</sup> Speed limits based on existing signage, assessed with Google Street View, December 2017.