



April 2026
Nevada Cement Company LLC Stockton Terminal Modernization Project



Appendix H1

Noise and Vibration Assessment

Prepared for Port of Stockton

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Appendix H

Noise and Vibration Assessment

Prepared for

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TABLE OF CONTENTS

1 Introduction 1

2 Construction Noise Assessment.....2

2.1 Methodology 2

2.2 Impact Criteria 3

2.3 Results 4

3 Construction Vibration Assessment.....5

3.1 Methodology 5

3.2 Impact Criteria 5

3.3 Results 5

4 References 6

TABLES

Table 1 Background Noise Data

Table 2 Construction Equipment Matching

Table 3 Construction Equipment Noise Calculations, Unmitigated

Table 4 Construction Daytime Noise Summary, Unmitigated

Table 5 Construction Equipment Noise Calculations, Mitigated

Table 6 Construction Daytime Noise Summary, Mitigated

Table 7 Vibration Source Levels for Construction Equipment

ABBREVIATIONS

Caltrans	California Department of Transportation
DEIR	Draft Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Leq	equivalent sound level
Lmax	maximum sound level
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model

1 Introduction

This appendix provides detailed documentation of the construction noise and vibration assessment methodology and results supporting the impact analysis presented in Section 3.12 (Noise) of the Draft Environmental Impact Report (DEIR). It focuses on the quantitative methods used to estimate construction-related noise and groundborne vibration levels and summarizes the corresponding results. Background information regarding noise and vibration fundamentals, regulatory context, and significance thresholds is provided in the DEIR and not repeated here.

The assessment evaluates temporary noise and groundborne vibration generated by construction activities under conservative, worst-case conditions at the nearest and most affected noise- and vibration-sensitive receptors. Operational noise is not evaluated in this appendix because the analysis focuses on temporary construction-related noise and vibration associated with short-term activities; operational noise is addressed separately in the DEIR.

Background noise measurements representative of existing conditions are summarized in Table 1. These data indicate that ambient noise levels in the vicinity of the project may occasionally approach or exceed the reference noise criteria used in this analysis, reflecting the active industrial and transportation setting of the Port of Stockton.

2 Construction Noise Assessment

2.1 Methodology

Construction noise levels were estimated using calculation procedures consistent with the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). Because the construction equipment inventory for the proposed project exceeds the capacity of the standard RCNM software tool, a spreadsheet-based calculation model was developed to implement RCNM equations and acoustical propagation formulas. This approach allows for expanded equipment inventories while maintaining consistency with RCNM assumptions and represents a conservative, worst-case analysis.

The construction noise analysis was conducted on a phase-by-phase basis to reflect differences in equipment types, quantities, and operating characteristics throughout construction. Construction activities were modeled based on the anticipated schedule and sequencing described in the project description, which identifies a multiphase construction program over approximately 5 years. Construction would occur in two primary phases and include demolition, site preparation, foundation work (including pile driving), structural construction, equipment installation, and commissioning.

Construction activities would occur in multiple areas of the project site and may proceed concurrently in some cases, depending on construction sequencing and coordination with ongoing terminal operations. To account for this distributed and overlapping work program, each modeled construction phase represents a conservative worst-case condition in which the maximum number of equipment pieces is assumed to operate simultaneously during a representative peak construction day. Pile driving is expected to occur intermittently during both landside and marine construction phases and would be limited in duration relative to the overall construction schedule.

Construction activities are assumed to occur during allowable daytime hours consistent with local regulations and the project description. Although municipal code allows construction between 7:00 a.m. and 10:00 p.m., noisier activities like pile driving are assumed to occur during daytime weekday hours (approximately 9:00 a.m. to 5:00 p.m.). Construction noise modeling assumes that no construction activities would occur during evening (7:00 p.m. to 10:00 p.m.) or nighttime (10:00 p.m. to 7:00 a.m.) hours. Therefore, these periods were not evaluated.

Each modeled construction phase represents a conservative worst-case day during which the maximum number of equipment pieces is assumed to operate concurrently within the allowable daytime construction window. This approach ensures that predicted noise levels reflect peak construction activity under the assumed construction schedule.

Construction equipment inventories were developed based on the proposed project design and anticipated construction methods. Equipment types were matched to representative RCNM

equipment profiles, as summarized in Table 2. Equipment noise emission levels were obtained from RCNM reference data and published acoustical sources. Usage factors were applied to each piece of equipment to account for intermittent operation during the modeled hour, and assumptions regarding simultaneous equipment operation reflect conservative worst-case conditions.

The analysis evaluated hourly equivalent and maximum sound levels. Hourly equivalent sound level (Leq) values were calculated by logarithmically summing noise contributions from all equipment assumed to operate concurrently during a given hour. Maximum sound level (Lmax) values were calculated based on the loudest single piece of equipment operating during each construction phase, with pile driving identified as the dominant source of maximum noise levels.

Sound propagation from construction equipment to receptors was calculated using geometric spreading to account for distance attenuation, consistent with RCNM guidance (FHWA 2006). Shielding is included for existing terrain obstructions between the Port boundary and nearby receptors (approximately 3 A-weighted decibels [dBA]).

To evaluate the effects of noise-reduction measures, the analysis includes both unmitigated and mitigated scenarios. For all equipment, temporary shielding and construction best management practices were assumed to reduce noise levels by up to approximately 8 dBA, consistent with Appendix A of the RCNM User Guide (FHWA 2006). For pile-driving activities, feasible source attenuation measures (e.g., quieter installation methods where feasible, cushion blocks, and noise shrouds) are qualitatively considered but not explicitly modeled as a fixed dBA reduction within the RCNM framework. As such, modeled pile driving noise levels represent a conservative estimate of worst-case conditions.

Construction noise levels were modeled at the locations of the background sampling shown in Table 1. Distances to sensitive receptors were based on the approximate distance to the center of the construction site in recognition that construction activities would occur over a large area and that noise generation would not be limited to a single fixed location. Detailed noise calculations for individual equipment and construction phases are presented in Table 3 (unmitigated) and Table 5 (mitigated).

2.2 Impact Criteria

Although nearby sensitive receptors may experience temporary increases in construction-related noise, the City of Stockton has not set numeric limits for daytime construction noise. Instead, construction noise is regulated through restrictions on allowable hours of operation to limit noise during more sensitive periods.

For this analysis, modeled noise levels were compared to representative daytime noise criteria derived from applicable planning documents and local standards. These include a daytime Leq of

60 dBA, representing the maximum level considered “normally acceptable” for residential land uses in the General Plan, and an Lmax of 75 dBA at a residential property line, consistent with the City Municipal Code (CMC 16.60, Table 3-7, Part II).

These criteria are used as reference levels to evaluate potential increases in construction noise relative to typical community noise expectations.

2.3 Results

Modeled construction noise levels, including hourly Leq and Lmax values, are summarized in Table 4 (unmitigated) and Table 6 (mitigated) for each construction phase and sensitive receptor. Noise levels vary by phase based on equipment types, quantities, and distances to receptors. Results indicate that certain construction phases would result in temporary increases in noise levels relative to the reference criteria described in Section 2.2. The highest construction noise levels are associated with pile driving because of the impulsive nature of the equipment.

Unmitigated results presented in Table 4 reflect conservative worst-case conditions without implementation of noise-reduction measures. Mitigated results presented in Table 6 incorporate the effects of shielding, equipment controls, and other noise-attenuation measures applied to activities other than pile driving, resulting in reduced noise levels relative to the unmitigated scenario. For non-pile-driving construction activities, predicted noise levels are generally lower and reflect typical equipment operation under the modeled conditions. For pile-driving activities, noise levels remain elevated relative to other construction phases because of the characteristics of impact equipment.

These results provide the quantitative basis for the construction noise impact assessment presented in the DEIR.

3 Construction Vibration Assessment

3.1 Methodology

A quantitative construction vibration assessment was conducted using the prediction methodology outlined in Section 7.2 of the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). The assessment evaluated potential groundborne vibration generated by vibration-intensive construction activities and compared predicted vibration levels to applicable criteria for structural damage.

Predicted vibration levels were calculated using the FTA-recommended vibration propagation equation, which estimates peak particle velocity (PPV) at a receptor as a function of reference source vibration levels, source-to-receptor distance, and geometric spreading. Construction equipment expected to generate notable vibration levels was identified for the duration of construction. Reference vibration source levels summarized in Table 7 were obtained from FTA (2018). Modeled distances include the nearest structure to the construction location.

3.2 Impact Criteria

The construction vibration damage criterion for structures that are extremely susceptible to vibration damage is 0.08 inch per second PPV (Caltrans 2020). This is the most conservative threshold established by the California Department of Transportation (Caltrans) and is more stringent than FTA guidance.

3.3 Results

Predicted PPVs of construction equipment are summarized in Table 7. Results represent worst-case vibration exposure conditions based on vibration-intensive equipment and minimum source-to-receptor distances. As shown in Table 7, predicted construction-related vibration levels at the distance of the closest structure are below the applicable vibration criteria for structural damage.

4 References

- Caltrans (California Department of Transportation), 2020. *Transportation and Construction Vibration Guidance Manual*. April 2020. <https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf>.
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Tables

Table 1
Background Noise Data

Measurement Location	Approximate Distance to Center of Construction (feet)	Decibels		Observations
		Leq	Lmax	
Location 1: Located on West Main Street and North Ventura Avenue	1,100	57.4	65.4	Closest residence to the Port along Main Street. No auto traffic. Port material handling activity is the most influential noise source (mid-50s dB).
Location 2: Located on South Los Angeles Avenue South of Washington Street	1,800	57.8	72.4	Residential uses predominate on streets south of Port Road/Harbor Street Light auto traffic (no heavy trucks) on Los Angeles Avenue. When no autos pass, Port material handling activity (i.e., conveyor belts, loading equipment) is just audible (low 50s dB).
Location 3: Located along Washington Street, between Del Norte Street and South Los Angeles Avenue	2,200	71.5	87.7	Washington Street is a main access route to the Port. Heavy trucks are the main noise source for the facing residential. Frequent heavy truck passbys with peak noise of 75 to 85 dB.

Notes:

Background noise measurements were taken near the project site for the Lehigh Southwest Stockton Terminal Project Draft EIR on January 9, 2020, in the neighborhoods south of the facility.

Approximate distance to construction was estimated using Google Earth.

dB: decibel

Leq: equivalent continuous sound level

Lmax: maximum sound level

Table 2
Construction Equipment Matching

Equipment Name		Noise Profile ^{1,2}				
Equipment	Equipment Noise Match ^{1,2}	Impact Device?	Default Usage Factor (%)	Reference Sound Level at 50 feet (dBA)	Actual Measured Lmax (dBA)	Lmax ³ (dBA)
100-ton cranes	Crane	No	16	85	80.6	80.6
200-ton crane	Crane	No	16	85	80.6	80.6
Air Compressors	Compressor (air)	No	40	80	77.7	77.7
Asphalt paver	Paver	No	50	85	77.2	77.2
Cement silos, pumps, etc.	Concrete Batch Plant	No	15	83	-- N/A --	83
Crane for Land/Berth 3/4 Piles and/or ADP Installation	Crane	No	16	85	80.6	80.6
Dewatering Pumps	Pumps	No	50	77	80.9	80.9
Dozers	Dozer	No	40	85	81.7	81.7
Excavators	Excavator	No	40	85	80.7	80.7
Floating 200-ton barge mounted crane, winches, and ancillary equipment	Crane	No	16	85	80.6	80.6
Forklifts	All Other Equipment > 5 hp	No	50	85	-- N/A --	85
Front End Loaders	Front End Loader	No	40	80	79.1	79.1
Graders	Grader	No	40	85	-- N/A --	85
Haul/Dump Trucks	Dump Truck	No	40	84	76.5	76.5
Light Towers	Generator (<25kva, VMS signs)	No	50	70	72.8	72.8
Marine Tug/Work Barges	Tugboat	No	50	87	-- N/A --	87
Miscellaneous Generators	Generator	No	50	82	80.6	80.6
Personnel Lifts	Man Lift	No	20	85	74.7	74.7
Pile Driving Rig with an Impact Hammer	Impact Pile Driver	Yes	20	95	101.3	101.3
Power Pole Bucket Truck	Pickup Truck	No	40	55	75	75
Rail tamper	Ballast Tamper	Yes	50	83	-- N/A --	83

Table 2
Construction Equipment Matching

Equipment Name		Noise Profile ^{1,2}				
Equipment	Equipment Noise Match ^{1,2}	Impact Device?	Default Usage Factor (%)	Reference Sound Level at 50 feet (dBA)	Actual Measured Lmax (dBA)	Lmax ³ (dBA)
Roller or compactor	Roller	No	20	85	80	80
Trencher	Slurry Trenching Machine	No	50	82	80.4	80.4
Water Trucks	Vacuum Excavator (Vac-truck)	No	40	85	85.3	85.3
Welding Machines	Welder / Torch	No	40	73	74	74

Notes:

1. Equipment list was provided by the Applicant. Equipment types were matched with the RCNM Equipment list for closest noise profile. Default parameters were used based on RCNM equipment.
2. Noise parameters for a tugboat/work barge are from the Port of Los Angeles Channel Deepening Project. Noise parameters for a ballast tamper came from FTA's Transit Noise and Vibration Impact Assessment Manual. The default usage factor is conservatively estimated to be 50% for both.
3. The Lmax used in the analysis is equal to the actual measured Lmax when available, consistent with RCNM methodology.

dBA: A-weighted decibel

hp: horsepower

kva: kilovolt-ampere

Lmax: maximum sound level

N/A: not applicable

Table 3
Construction Equipment Noise Calculations, Unmitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Noise Profile			Shielding (dBA)	LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
1	CC-01 Demolition	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	CC-01 Demolition	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	CC-01 Demolition	Excavators	Excavator	3	No	40	80.7	3	50.9	46.6	44.8	46.9	42.6	40.9
1	CC-01 Demolition	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	CC-01 Demolition	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	CC-01 Demolition	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	CC-01 Demolition	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	CC-01 Demolition	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	CC-01 Demolition	Front End Loaders	Front End Loader	2	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3
1	CC-01 Demolition	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	CC-01 Demolition	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	3	55.5	51.2	49.4	51.5	47.2	45.5
1	CC-01 Demolition	Power Pole Bucket Truck	Pickup Truck	1	No	40	75	3	45.2	40.9	39.1	41.2	36.9	35.2
1	CC-02 Preconstruction & Site Preparation	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	CC-02 Preconstruction & Site Preparation	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	CC-02 Preconstruction & Site Preparation	Dozers	Dozer	2	No	40	81.7	3	51.9	47.6	45.8	47.9	43.6	41.9
1	CC-02 Preconstruction & Site Preparation	Graders	Grader	1	No	40	85	3	55.2	50.9	49.1	51.2	46.9	45.2
1	CC-02 Preconstruction & Site Preparation	Excavators	Excavator	1	No	40	80.7	3	50.9	46.6	44.8	46.9	42.6	40.9
1	CC-02 Preconstruction & Site Preparation	Dewatering Pumps	Pumps	1	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0
1	CC-02 Preconstruction & Site Preparation	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	CC-02 Preconstruction & Site Preparation	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	CC-02 Preconstruction & Site Preparation	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	CC-02 Preconstruction & Site Preparation	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	CC-02 Preconstruction & Site Preparation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	CC-02 Preconstruction & Site Preparation	Front End Loaders	Front End Loader	2	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3
1	CC-02 Preconstruction & Site Preparation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	CC-02 Preconstruction & Site Preparation	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	3	55.5	51.2	49.4	51.5	47.2	45.5
1	CC-02 Preconstruction & Site Preparation	Power Pole Bucket Truck	Pickup Truck	1	No	40	75	3	45.2	40.9	39.1	41.2	36.9	35.2
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Marine Tug/Work Barges	Tugboat	1	No	50	87	3	57.2	52.9	51.1	54.1	49.9	48.1
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Floating 200-ton barge mounted crane, winches, and ancillary equipment	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Pile driving rig with an impact hammer	Impact Pile Driver	1	Yes	20	101.3	3	71.5	67.2	65.4	64.5	60.2	58.4
1	CC-05 Landside Piling / Ground Improvements	Excavators	Excavator	1	No	40	80.7	3	50.9	46.6	44.8	46.9	42.6	40.9
1	CC-05 Landside Piling / Ground Improvements	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	CC-05 Landside Piling / Ground Improvements	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9

Table 3
Construction Equipment Noise Calculations, Unmitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):			Shielding (dBA)	1,100	1,800	2,200	Leq		
					Noise Profile				LmaxCalc					
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
1	CC-05 Landside Piling / Ground Improvements	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	CC-05 Landside Piling / Ground Improvements	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	CC-05 Landside Piling / Ground Improvements	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	CC-05 Landside Piling / Ground Improvements	Crane for Land/Berth 3/4 Piles and/or ADP Installation	Crane	3	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	CC-05 Landside Piling / Ground Improvements	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	CC-05 Landside Piling / Ground Improvements	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	3	55.5	51.2	49.4	51.5	47.2	45.5
1	CC-05 Landside Piling / Ground Improvements	Cement silos, pumps, etc.	Concrete Batch Plant	3	No	15	83	3	53.2	48.9	47.1	44.9	40.6	38.9
1	CC-05 Landside Piling / Ground Improvements	Pile driving rig with an impact hammer	Impact Pile Driver	1	Yes	20	101.3	3	71.5	67.2	65.4	64.5	60.2	58.4
1	CC-06 Landside Foundations & Paving	100-ton cranes	Crane	2	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	CC-06 Landside Foundations & Paving	Dozers	Dozer	1	No	40	81.7	3	51.9	47.6	45.8	47.9	43.6	41.9
1	CC-06 Landside Foundations & Paving	Excavators	Excavator	2	No	40	80.7	3	50.9	46.6	44.8	46.9	42.6	40.9
1	CC-06 Landside Foundations & Paving	Dewatering Pumps	Pumps	2	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0
1	CC-06 Landside Foundations & Paving	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	CC-06 Landside Foundations & Paving	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	CC-06 Landside Foundations & Paving	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	CC-06 Landside Foundations & Paving	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	CC-06 Landside Foundations & Paving	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	CC-06 Landside Foundations & Paving	Front End Loaders	Front End Loader	1	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3
1	CC-06 Landside Foundations & Paving	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	CC-06 Landside Foundations & Paving	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	3	55.5	51.2	49.4	51.5	47.2	45.5
1	CC-06 Landside Foundations & Paving	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	3	53.2	48.9	47.1	44.9	40.6	38.9
1	CC-06 Landside Foundations & Paving	Trencher	Slurry Trenching Machine	1	No	50	80.4	3	50.6	46.3	44.5	47.5	43.3	41.5
1	CC-06 Landside Foundations & Paving	Asphalt paver	Paver	1	No	50	77.2	3	47.4	43.1	41.3	44.3	40.1	38.3
1	CC-06 Landside Foundations & Paving	Roller or compactor	Roller	2	No	20	80	3	50.2	45.9	44.1	43.2	38.9	37.1
1	CC-07 Structural Mechanical Installation	100-ton cranes	Crane	2	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	CC-07 Structural Mechanical Installation	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	CC-07 Structural Mechanical Installation	Dewatering Pumps	Pumps	2	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0
1	CC-07 Structural Mechanical Installation	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	CC-07 Structural Mechanical Installation	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	CC-07 Structural Mechanical Installation	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	CC-07 Structural Mechanical Installation	Welding Machines	Welder / Torch	3	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	CC-07 Structural Mechanical Installation	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	CC-07 Structural Mechanical Installation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	CC-07 Structural Mechanical Installation	200-ton crane	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Personnel Lifts	Man Lift	3	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Miscellaneous Generators	Generator	3	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Air Compressors	Compressor (air)	3	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1

Table 3
Construction Equipment Noise Calculations, Unmitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):				Shielding (dBA)	1,100			1,800		2,200		
					Noise Profile			LmaxCalc						Leq			
					Impact Device?	Usage (%)	Lmax (dBA)	Location 1 (dBA)		Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)			
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Welding Machines	Welder / Torch	3	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2			
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9			
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7			
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Power Pole Bucket Truck	Pickup Truck	1	No	40	75	3	45.2	40.9	39.1	41.2	36.9	35.2			
1	CC-10 Unattended Truck Self-Loading Kiosk	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8			
1	CC-10 Unattended Truck Self-Loading Kiosk	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8			
1	CC-10 Unattended Truck Self-Loading Kiosk	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7			
1	CC-10 Unattended Truck Self-Loading Kiosk	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9			
1	CC-10 Unattended Truck Self-Loading Kiosk	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1			
1	CC-10 Unattended Truck Self-Loading Kiosk	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2			
1	CC-10 Unattended Truck Self-Loading Kiosk	Light Towers	Generator (<25kva, VMS signs)	1	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9			
1	CC-10 Unattended Truck Self-Loading Kiosk	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7			
1	CC-11 Dome Construction (Design Build)	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8			
1	CC-11 Dome Construction (Design Build)	Personnel Lifts	Man Lift	3	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8			
1	CC-11 Dome Construction (Design Build)	Dewatering Pumps	Pumps	1	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0			
1	CC-11 Dome Construction (Design Build)	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7			
1	CC-11 Dome Construction (Design Build)	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9			
1	CC-11 Dome Construction (Design Build)	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1			
1	CC-11 Dome Construction (Design Build)	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2			
1	CC-11 Dome Construction (Design Build)	Light Towers	Generator (<25kva, VMS signs)	4	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9			
1	CC-11 Dome Construction (Design Build)	Front End Loaders	Front End Loader	1	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3			
1	CC-11 Dome Construction (Design Build)	Haul/Dump Trucks	Dump Truck	6	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7			
1	CC-11 Dome Construction (Design Build)	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	3	53.2	48.9	47.1	44.9	40.6	38.9			
1	CC-11 Dome Construction (Design Build)	Roller or compactor	Roller	1	No	20	80	3	50.2	45.9	44.1	43.2	38.9	37.1			
1	CC-12 Rail Track Installation (Supply & Installation)	Dozers	Dozer	1	No	40	81.7	3	51.9	47.6	45.8	47.9	43.6	41.9			
1	CC-12 Rail Track Installation (Supply & Installation)	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7			
1	CC-12 Rail Track Installation (Supply & Installation)	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9			
1	CC-12 Rail Track Installation (Supply & Installation)	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1			
1	CC-12 Rail Track Installation (Supply & Installation)	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2			
1	CC-12 Rail Track Installation (Supply & Installation)	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9			
1	CC-12 Rail Track Installation (Supply & Installation)	Front End Loaders	Front End Loader	1	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3			
1	CC-12 Rail Track Installation (Supply & Installation)	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7			
1	CC-12 Rail Track Installation (Supply & Installation)	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	3	55.5	51.2	49.4	51.5	47.2	45.5			
1	CC-12 Rail Track Installation (Supply & Installation)	Rail tamper	Ballast Tamper	1	Yes	50	83	3	53.2	48.9	47.1	50.1	45.9	44.1			
1	CC-12 Rail Track Installation (Supply & Installation)	Roller or compactor	Roller	2	No	20	80	3	50.2	45.9	44.1	43.2	38.9	37.1			
1	Ship Unloader Installation	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8			
1	Ship Unloader Installation	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8			
1	Ship Unloader Installation	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7			
1	Ship Unloader Installation	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9			
1	Ship Unloader Installation	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1			
1	Ship Unloader Installation	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2			

Table 3
Construction Equipment Noise Calculations, Unmitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Noise Profile			Shielding (dBA)	LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
1	Ship Unloader Installation	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	Ship Unloader Installation	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	Ship Unloader Installation	200-ton crane	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	Startup & Checkout	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	Startup & Checkout	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	Startup & Checkout	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	Startup & Checkout	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	Startup & Checkout	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	Startup & Checkout	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	Dry Commissioning	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	Dry Commissioning	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	Dry Commissioning	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	Dry Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	Dry Commissioning	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	Dry Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	Wet Commissioning	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	Wet Commissioning	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	Wet Commissioning	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	Wet Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	Wet Commissioning	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	Wet Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	Float	100-ton cranes	Crane	2	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
1	Float	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
1	Float	Dewatering Pumps	Pumps	2	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0
1	Float	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
1	Float	Air Compressors	Compressor (air)	3	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
1	Float	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
1	Float	Welding Machines	Welder / Torch	3	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
1	Float	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
1	Float	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
1	Float	200-ton crane	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
2	P.II CC-01 Demo: Bunker #6	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
2	P.II CC-01 Demo: Bunker #6	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
2	P.II CC-01 Demo: Bunker #6	Excavators	Excavator	2	No	40	80.7	3	50.9	46.6	44.8	46.9	42.6	40.9
2	P.II CC-01 Demo: Bunker #6	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II CC-01 Demo: Bunker #6	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II CC-01 Demo: Bunker #6	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II CC-01 Demo: Bunker #6	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II CC-01 Demo: Bunker #6	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
2	P.II CC-01 Demo: Bunker #6	Front End Loaders	Front End Loader	2	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3
2	P.II CC-01 Demo: Bunker #6	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Excavators	Excavator	1	No	40	80.7	3	50.9	46.6	44.8	46.9	42.6	40.9

Table 3
Construction Equipment Noise Calculations, Unmitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):			Shielding (dBA)	1,100	1,800	2,200			
					Noise Profile				LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Dewatering Pumps	Pumps	2	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Forklifts	All Other Equipment > 5 hp	2	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Front End Loaders	Front End Loader	1	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Crane for Land/Berth 3/4 Piles and/or ADP Installation	Crane	2	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	3	55.5	51.2	49.4	51.5	47.2	45.5
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	3	53.2	48.9	47.1	44.9	40.6	38.9
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Trencher	Slurry Trenching Machine	1	No	50	80.4	3	50.6	46.3	44.5	47.5	43.3	41.5
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Roller or compactor	Roller	1	No	20	80	3	50.2	45.9	44.1	43.2	38.9	37.1
2	P.II CC-07 Structural & Mechanical Installation	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
2	P.II CC-07 Structural & Mechanical Installation	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
2	P.II CC-07 Structural & Mechanical Installation	Dewatering Pumps	Pumps	1	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0
2	P.II CC-07 Structural & Mechanical Installation	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II CC-07 Structural & Mechanical Installation	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II CC-07 Structural & Mechanical Installation	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II CC-07 Structural & Mechanical Installation	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II CC-07 Structural & Mechanical Installation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
2	P.II CC-07 Structural & Mechanical Installation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II CC-08 Electrical and Instrumentation Installation	Personnel Lifts	Man Lift	2	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
2	P.II CC-08 Electrical and Instrumentation Installation	Miscellaneous Generators	Generator	2	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II CC-08 Electrical and Instrumentation Installation	Air Compressors	Compressor (air)	2	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II CC-08 Electrical and Instrumentation Installation	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II CC-08 Electrical and Instrumentation Installation	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II CC-08 Electrical and Instrumentation Installation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
2	P.II CC-08 Electrical and Instrumentation Installation	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Personnel Lifts	Man Lift	3	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8

Table 3
Construction Equipment Noise Calculations, Unmitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Noise Profile			Shielding (dBA)	LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Dewatering Pumps	Pumps	1	No	50	80.9	3	51.1	46.8	45.0	48.0	43.8	42.0
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Welding Machines	Welder / Torch	2	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Light Towers	Generator (<25kva, VMS signs)	4	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Front End Loaders	Front End Loader	1	No	40	79.1	3	49.3	45.0	43.2	45.3	41.0	39.3
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Haul/Dump Trucks	Dump Truck	6	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	3	53.2	48.9	47.1	44.9	40.6	38.9
2	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	Roller or compactor	Roller	1	No	20	80	3	50.2	45.9	44.1	43.2	38.9	37.1
2	P.II Checkout	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
2	P.II Checkout	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II Checkout	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II Checkout	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II Checkout	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II Checkout	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II Dry Commissioning	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
2	P.II Dry Commissioning	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II Dry Commissioning	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II Dry Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II Dry Commissioning	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II Dry Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II Wet Commissioning	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
2	P.II Wet Commissioning	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II Wet Commissioning	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9
2	P.II Wet Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II Wet Commissioning	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II Wet Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II Float	100-ton cranes	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8
2	P.II Float	Personnel Lifts	Man Lift	1	No	20	74.7	3	44.9	40.6	38.8	37.9	33.6	31.8
2	P.II Float	Miscellaneous Generators	Generator	1	No	50	80.6	3	50.8	46.5	44.7	47.7	43.5	41.7
2	P.II Float	Air Compressors	Compressor (air)	1	No	40	77.7	3	47.9	43.6	41.8	43.9	39.6	37.9

Table 3
Construction Equipment Noise Calculations, Unmitigated

Receptor distances (feet): 1,1001,8002,200														
Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Noise Profile			Shielding (dBA)	LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
2	P.II Float	Forklifts	All Other Equipment > 5 hp	1	No	50	85	3	55.2	50.9	49.1	52.1	47.9	46.1
2	P.II Float	Welding Machines	Welder / Torch	1	No	40	74	3	44.2	39.9	38.1	40.2	35.9	34.2
2	P.II Float	Light Towers	Generator (<25kva, VMS signs)	1	No	50	72.8	3	43.0	38.7	36.9	39.9	35.7	33.9
2	P.II Float	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	3	46.7	42.4	40.6	42.7	38.4	36.7
2	P.II Float	200-ton crane	Crane	1	No	16	80.6	3	50.8	46.5	44.7	42.8	38.5	36.8

Notes:

1. Equipment list was provided by Applicant and equipment was matched to a standard RCNM equipment based on the closest noise profile. Defaults were pulled in from RCNM for usage and Lmax where available. See Table 2 for additional sources.

2. Lmax and Leq were calculated for each equipment type using RCNM methodology. Lmaxcalc incorporates the distance from source, the utilization, and any shielding. The equipment quantity is incorporated when summing the noise profiles for the overall noise levels for the phase.

3. A shielding value of 3 dBA was used for the existing plant wall between the Port and Ponomo St, consistent with Appendix A of the RCNM User Guide.

dBA: A-weighted decibel

hp: horsepower

kva: kilovolt-ampere

Leq: equivalent continuous sound level

Lmax: maximum sound level

Lmaxcalc: calculated Lmax at receptor distance including shielding

N/A: not applicable

RCNM: Roadway Construction Noise Model

Table 4
Construction Daytime Noise Summary, Unmitigated

Sensitive Receptor Location	Location 1: Closest Residential Area		Location 2: Residential Area South of Washington Street		Location 3: Residential Area Facing Washington Street	
	Lmax	Leq	Lmax	Leq	Lmax	Leq
Noise Limits ^{1,2}	75	60	75	60	75	60

1. The Lmax noise limit, 75 dBA, is representative of the maximum volume permitted by the City at a residential property line in City Municipal Code 16.60, Table 3-7, Part II.

2. The Leq noise limit, 60 dBA, is representative of the maximum volume considered “normally acceptable” in the 2040 General Plan for a residential area.

Phase	Activity	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq
1	CC-01 Demolition	55.5	59.1	51.2	54.8	49.4	53.1
	CC-02 Preconstruction and Site Preparation	55.5	61.1	51.2	56.8	49.4	55.1
	CC-03 BERTH 3/4 Marine Piling and Dock Upgrade	57.2	59.5	52.9	55.3	51.1	53.5
	* During Pile Driving	71.5	65.7	67.2	61.4	65.4	59.7
	CC-05 Landside Piling / Ground Improvements	55.5	60.1	51.2	55.8	49.4	54.1
	* During Pile Driving	71.5	65.8	67.2	61.5	65.4	59.8
	CC-06 Landside Foundations and Paving	55.5	61.4	51.2	57.1	49.4	55.3
	CC-07 Structural Mechanical Installation	55.2	59.5	50.9	55.3	49.1	53.5
	CC-08 Utility Connection, Metering and Transformer Installation and Electrical Power and Controls	55.2	58.7	50.9	54.4	49.1	52.7
	CC-10 Unattended Truck Self-Loading Kiosk	55.2	55.2	50.9	50.9	49.1	49.2
	CC-11 Dome Construction (Design Build)	55.2	58.0	50.9	53.8	49.1	52.0
	CC-12 Rail Track Installation (Supply and Installation)	55.5	59.5	51.2	55.2	49.4	53.5
	Ship Unloader Installation	55.2	57.0	50.9	52.8	49.1	51.0

Table 4
Construction Daytime Noise Summary, Unmitigated

Phase	Activity	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq
1 (cont.)	Startup and Checkout	55.2	56.0	50.9	51.8	49.1	50.0
	Dry Commissioning	55.2	56.0	50.9	51.8	49.1	50.0
	Wet Commissioning	55.2	56.0	50.9	51.8	49.1	50.0
	Float	55.2	59.7	50.9	55.4	49.1	53.6
2	P.II CC-01 Demo: Bunker No. 6	55.2	57.9	50.9	53.6	49.1	51.9
	P.II CC-05 Landside Piling or ADP and CC-06 Foundation	55.5	60.8	51.2	56.6	49.4	54.8
	P.II CC-07 Structural and Mechanical Installation	55.2	57.7	50.9	53.4	49.1	51.7
	P.II CC-08 Electrical and Instrumentation Installation	55.2	56.6	50.9	52.3	49.1	50.6
	P.II CC-11 Dome No. 6 Construction (Design, Build and Erection)	55.2	58.0	50.9	53.8	49.1	52.0
	P.II Checkout	55.2	54.8	50.9	50.5	49.1	48.8
	P.II Dry Commissioning	55.2	54.8	50.9	50.5	49.1	48.8
	P.II Wet Commissioning	55.2	54.8	50.9	50.5	49.1	48.8
	P.II Float	55.2	55.9	50.9	51.6	49.1	49.8

Notes:

1. Lmax is equal to the equipment with the highest Lmax in the phase.
2. Leq was calculated using RCNM methodology for all equipment in the construction phase.
3. A shielding value of 3 dBA was used for the existing plant wall between the Port and Ponoma St, consistent with Appendix A of the RCNM User Guide.
4. For phases with pile driving, noise levels are shown with and without pile driving activities.

dBA: A-weighted decibel

Leq: equivalent continuous sound level

Lmax: maximum sound level

Table 5
Construction Equipment Noise Calculations, Mitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):				1,100	1,800	2,200			
					Noise Profile			Shielding (dBA)	LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
1	CC-01 Demolition	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-01 Demolition	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	CC-01 Demolition	Excavators	Excavator	3	No	40	80.7	11	42.9	38.6	36.8	38.9	34.6	32.9
1	CC-01 Demolition	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-01 Demolition	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-01 Demolition	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-01 Demolition	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-01 Demolition	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-01 Demolition	Front End Loaders	Front End Loader	2	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3
1	CC-01 Demolition	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-01 Demolition	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	11	47.5	43.2	41.4	43.5	39.2	37.5
1	CC-01 Demolition	Power Pole Bucket Truck	Pickup Truck	1	No	40	75	11	37.2	32.9	31.1	33.2	28.9	27.2
1	CC-02 Preconstruction & Site Preparation	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-02 Preconstruction & Site Preparation	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	CC-02 Preconstruction & Site Preparation	Dozers	Dozer	2	No	40	81.7	11	43.9	39.6	37.8	39.9	35.6	33.9
1	CC-02 Preconstruction & Site Preparation	Graders	Grader	1	No	40	85	11	47.2	42.9	41.1	43.2	38.9	37.2
1	CC-02 Preconstruction & Site Preparation	Excavators	Excavator	1	No	40	80.7	11	42.9	38.6	36.8	38.9	34.6	32.9
1	CC-02 Preconstruction & Site Preparation	Dewatering Pumps	Pumps	1	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
1	CC-02 Preconstruction & Site Preparation	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-02 Preconstruction & Site Preparation	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-02 Preconstruction & Site Preparation	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-02 Preconstruction & Site Preparation	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-02 Preconstruction & Site Preparation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-02 Preconstruction & Site Preparation	Front End Loaders	Front End Loader	2	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3
1	CC-02 Preconstruction & Site Preparation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-02 Preconstruction & Site Preparation	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	11	47.5	43.2	41.4	43.5	39.2	37.5
1	CC-02 Preconstruction & Site Preparation	Power Pole Bucket Truck	Pickup Truck	1	No	40	75	11	37.2	32.9	31.1	33.2	28.9	27.2
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Marine Tug/Work Barges	Tugboat	1	No	50	87	11	49.2	44.9	43.1	46.1	41.9	40.1
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Floating 200-ton barge mounted crane, winches, and ancillary equipment	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	Pile driving rig with an impact hammer	Impact Pile Driver	1	Yes	20	101.3	11	63.5	59.2	57.4	56.5	52.2	50.4
1	CC-05 Landside Piling / Ground Improvements	Excavators	Excavator	1	No	40	80.7	11	42.9	38.6	36.8	38.9	34.6	32.9

Table 5
Construction Equipment Noise Calculations, Mitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):			Shielding (dBA)	1,100	1,800	2,200	Leq		
					Noise Profile				LmaxCalc			Location 1, Location 2, Location 3		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
1	CC-05 Landside Piling / Ground Improvements	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-05 Landside Piling / Ground Improvements	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-05 Landside Piling / Ground Improvements	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-05 Landside Piling / Ground Improvements	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-05 Landside Piling / Ground Improvements	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-05 Landside Piling / Ground Improvements	Crane for Land/Berth 3/4 Piles and/or ADP Installation	Crane	3	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-05 Landside Piling / Ground Improvements	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-05 Landside Piling / Ground Improvements	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	11	47.5	43.2	41.4	43.5	39.2	37.5
1	CC-05 Landside Piling / Ground Improvements	Cement silos, pumps, etc.	Concrete Batch Plant	3	No	15	83	11	45.2	40.9	39.1	36.9	32.6	30.9
1	CC-05 Landside Piling / Ground Improvements	Pile driving rig with an impact hammer	Impact Pile Driver	1	Yes	20	101.3	11	63.5	59.2	57.4	56.5	52.2	50.4
1	CC-06 Landside Foundations & Paving	100-ton cranes	Crane	2	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-06 Landside Foundations & Paving	Dozers	Dozer	1	No	40	81.7	11	43.9	39.6	37.8	39.9	35.6	33.9
1	CC-06 Landside Foundations & Paving	Excavators	Excavator	2	No	40	80.7	11	42.9	38.6	36.8	38.9	34.6	32.9
1	CC-06 Landside Foundations & Paving	Dewatering Pumps	Pumps	2	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
1	CC-06 Landside Foundations & Paving	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-06 Landside Foundations & Paving	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-06 Landside Foundations & Paving	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-06 Landside Foundations & Paving	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-06 Landside Foundations & Paving	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-06 Landside Foundations & Paving	Front End Loaders	Front End Loader	1	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3
1	CC-06 Landside Foundations & Paving	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-06 Landside Foundations & Paving	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	11	47.5	43.2	41.4	43.5	39.2	37.5
1	CC-06 Landside Foundations & Paving	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	11	45.2	40.9	39.1	36.9	32.6	30.9
1	CC-06 Landside Foundations & Paving	Trencher	Slurry Trenching Machine	1	No	50	80.4	11	42.6	38.3	36.5	39.5	35.3	33.5
1	CC-06 Landside Foundations & Paving	Asphalt paver	Paver	1	No	50	77.2	11	39.4	35.1	33.3	36.3	32.1	30.3
1	CC-06 Landside Foundations & Paving	Roller or compactor	Roller	2	No	20	80	11	42.2	37.9	36.1	35.2	30.9	29.1
1	CC-07 Structural Mechanical Installation	100-ton cranes	Crane	2	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-07 Structural Mechanical Installation	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	CC-07 Structural Mechanical Installation	Dewatering Pumps	Pumps	2	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
1	CC-07 Structural Mechanical Installation	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-07 Structural Mechanical Installation	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-07 Structural Mechanical Installation	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-07 Structural Mechanical Installation	Welding Machines	Welder / Torch	3	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-07 Structural Mechanical Installation	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-07 Structural Mechanical Installation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-07 Structural Mechanical Installation	200-ton crane	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Personnel Lifts	Man Lift	3	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8

Table 5
Construction Equipment Noise Calculations, Mitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):			Shielding (dBA)	1,100	1,800	2,200			
					Noise Profile				LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Miscellaneous Generators	Generator	3	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Air Compressors	Compressor (air)	3	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Welding Machines	Welder / Torch	3	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	Power Pole Bucket Truck	Pickup Truck	1	No	40	75	11	37.2	32.9	31.1	33.2	28.9	27.2
1	CC-10 Unattended Truck Self-Loading Kiosk	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-10 Unattended Truck Self-Loading Kiosk	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	CC-10 Unattended Truck Self-Loading Kiosk	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-10 Unattended Truck Self-Loading Kiosk	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-10 Unattended Truck Self-Loading Kiosk	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-10 Unattended Truck Self-Loading Kiosk	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-10 Unattended Truck Self-Loading Kiosk	Light Towers	Generator (<25kva, VMS signs)	1	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-10 Unattended Truck Self-Loading Kiosk	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-11 Dome Construction (Design Build)	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	CC-11 Dome Construction (Design Build)	Personnel Lifts	Man Lift	3	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	CC-11 Dome Construction (Design Build)	Dewatering Pumps	Pumps	1	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
1	CC-11 Dome Construction (Design Build)	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-11 Dome Construction (Design Build)	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-11 Dome Construction (Design Build)	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-11 Dome Construction (Design Build)	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-11 Dome Construction (Design Build)	Light Towers	Generator (<25kva, VMS signs)	4	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-11 Dome Construction (Design Build)	Front End Loaders	Front End Loader	1	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3
1	CC-11 Dome Construction (Design Build)	Haul/Dump Trucks	Dump Truck	6	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-11 Dome Construction (Design Build)	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	11	45.2	40.9	39.1	36.9	32.6	30.9
1	CC-11 Dome Construction (Design Build)	Roller or compactor	Roller	1	No	20	80	11	42.2	37.9	36.1	35.2	30.9	29.1
1	CC-12 Rail Track Installation (Supply & Installation)	Dozers	Dozer	1	No	40	81.7	11	43.9	39.6	37.8	39.9	35.6	33.9
1	CC-12 Rail Track Installation (Supply & Installation)	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	CC-12 Rail Track Installation (Supply & Installation)	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	CC-12 Rail Track Installation (Supply & Installation)	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	CC-12 Rail Track Installation (Supply & Installation)	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	CC-12 Rail Track Installation (Supply & Installation)	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	CC-12 Rail Track Installation (Supply & Installation)	Front End Loaders	Front End Loader	1	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3

Table 5
Construction Equipment Noise Calculations, Mitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):			Shielding (dBA)	1,100	1,800	2,200			
					Noise Profile				LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
1	CC-12 Rail Track Installation (Supply & Installation)	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	CC-12 Rail Track Installation (Supply & Installation)	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	11	47.5	43.2	41.4	43.5	39.2	37.5
1	CC-12 Rail Track Installation (Supply & Installation)	Rail tamper	Ballast Tamper	1	Yes	50	83	11	45.2	40.9	39.1	42.1	37.9	36.1
1	CC-12 Rail Track Installation (Supply & Installation)	Roller or compactor	Roller	2	No	20	80	11	42.2	37.9	36.1	35.2	30.9	29.1
1	Ship Unloader Installation	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	Ship Unloader Installation	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	Ship Unloader Installation	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	Ship Unloader Installation	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	Ship Unloader Installation	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	Ship Unloader Installation	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	Ship Unloader Installation	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	Ship Unloader Installation	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	Ship Unloader Installation	200-ton crane	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	Startup & Checkout	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	Startup & Checkout	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	Startup & Checkout	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	Startup & Checkout	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	Startup & Checkout	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	Startup & Checkout	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	Dry Commissioning	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	Dry Commissioning	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	Dry Commissioning	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	Dry Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	Dry Commissioning	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	Dry Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	Wet Commissioning	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	Wet Commissioning	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	Wet Commissioning	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	Wet Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	Wet Commissioning	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	Wet Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	Float	100-ton cranes	Crane	2	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
1	Float	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
1	Float	Dewatering Pumps	Pumps	2	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
1	Float	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
1	Float	Air Compressors	Compressor (air)	3	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
1	Float	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
1	Float	Welding Machines	Welder / Torch	3	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
1	Float	Light Towers	Generator (<25kva, VMS signs)	3	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
1	Float	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
1	Float	200-ton crane	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
2	P.II CC-01 Demo: Bunker #6	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8

Table 5
Construction Equipment Noise Calculations, Mitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):				1,100	1,800	2,200			
					Noise Profile			Shielding (dBA)	LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
2	P.II CC-01 Demo: Bunker #6	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
2	P.II CC-01 Demo: Bunker #6	Excavators	Excavator	2	No	40	80.7	11	42.9	38.6	36.8	38.9	34.6	32.9
2	P.II CC-01 Demo: Bunker #6	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II CC-01 Demo: Bunker #6	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II CC-01 Demo: Bunker #6	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II CC-01 Demo: Bunker #6	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II CC-01 Demo: Bunker #6	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
2	P.II CC-01 Demo: Bunker #6	Front End Loaders	Front End Loader	2	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3
2	P.II CC-01 Demo: Bunker #6	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Excavators	Excavator	1	No	40	80.7	11	42.9	38.6	36.8	38.9	34.6	32.9
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Dewatering Pumps	Pumps	2	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Forklifts	All Other Equipment > 5 hp	2	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Front End Loaders	Front End Loader	1	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Crane for Land/Berth 3/4 Piles and/or ADP Installation	Crane	2	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Water Trucks	Vacuum Excavator (Vac-truck)	1	No	40	85.3	11	47.5	43.2	41.4	43.5	39.2	37.5
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	11	45.2	40.9	39.1	36.9	32.6	30.9
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Trencher	Slurry Trenching Machine	1	No	50	80.4	11	42.6	38.3	36.5	39.5	35.3	33.5
2	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	Roller or compactor	Roller	1	No	20	80	11	42.2	37.9	36.1	35.2	30.9	29.1
2	P.II CC-07 Structural & Mechanical Installation	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
2	P.II CC-07 Structural & Mechanical Installation	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
2	P.II CC-07 Structural & Mechanical Installation	Dewatering Pumps	Pumps	1	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
2	P.II CC-07 Structural & Mechanical Installation	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II CC-07 Structural & Mechanical Installation	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II CC-07 Structural & Mechanical Installation	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II CC-07 Structural & Mechanical Installation	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2

Table 5
Construction Equipment Noise Calculations, Mitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):			Shielding (dBA)	1,100	1,800	2,200	Leq		
					Noise Profile				LmaxCalc			Location 1, 2, 3		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
2	P.II CC-07 Structural & Mechanical Installation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
2	P.II CC-07 Structural & Mechanical Installation	Haul/Dump Trucks	Dump Truck	8	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II CC-08 Electrical and Instrumentation Installation	Personnel Lifts	Man Lift	2	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
2	P.II CC-08 Electrical and Instrumentation Installation	Miscellaneous Generators	Generator	2	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II CC-08 Electrical and Instrumentation Installation	Air Compressors	Compressor (air)	2	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II CC-08 Electrical and Instrumentation Installation	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II CC-08 Electrical and Instrumentation Installation	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II CC-08 Electrical and Instrumentation Installation	Light Towers	Generator (<25kva, VMS signs)	2	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
2	P.II CC-08 Electrical and Instrumentation Installation	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II CC-11 Dome #6 Construction (Design, Build and	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
2	P.II CC-11 Dome #6 Construction (Design, Build and	Personnel Lifts	Man Lift	3	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
2	P.II CC-11 Dome #6 Construction (Design, Build and	Dewatering Pumps	Pumps	1	No	50	80.9	11	43.1	38.8	37.0	40.0	35.8	34.0
2	P.II CC-11 Dome #6 Construction (Design, Build and	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II CC-11 Dome #6 Construction (Design, Build and	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II CC-11 Dome #6 Construction (Design, Build and	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II CC-11 Dome #6 Construction (Design, Build and	Welding Machines	Welder / Torch	2	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II CC-11 Dome #6 Construction (Design, Build and	Light Towers	Generator (<25kva, VMS signs)	4	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
2	P.II CC-11 Dome #6 Construction (Design, Build and	Front End Loaders	Front End Loader	1	No	40	79.1	11	41.3	37.0	35.2	37.3	33.0	31.3
2	P.II CC-11 Dome #6 Construction (Design, Build and	Haul/Dump Trucks	Dump Truck	6	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II CC-11 Dome #6 Construction (Design, Build and	Cement silos, pumps, etc.	Concrete Batch Plant	2	No	15	83	11	45.2	40.9	39.1	36.9	32.6	30.9
2	P.II CC-11 Dome #6 Construction (Design, Build and	Roller or compactor	Roller	1	No	20	80	11	42.2	37.9	36.1	35.2	30.9	29.1
2	P.II Checkout	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
2	P.II Checkout	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II Checkout	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II Checkout	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II Checkout	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II Checkout	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II Dry Commissioning	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
2	P.II Dry Commissioning	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II Dry Commissioning	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II Dry Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II Dry Commissioning	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II Dry Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II Wet Commissioning	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8
2	P.II Wet Commissioning	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II Wet Commissioning	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II Wet Commissioning	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II Wet Commissioning	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II Wet Commissioning	Haul/Dump Trucks	Dump Truck	2	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II Float	100-ton cranes	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8
2	P.II Float	Personnel Lifts	Man Lift	1	No	20	74.7	11	36.9	32.6	30.8	29.9	25.6	23.8

Table 5
Construction Equipment Noise Calculations, Mitigated

Phase	Activity	Equipment Used	RCNM Matching	Equipment Quantity	Receptor distances (feet):			Shielding (dBA)	1,100	1,800	2,200			
					Noise Profile				LmaxCalc			Leq		
					Impact Device?	Usage (%)	Lmax (dBA)		Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)	Location 1 (dBA)	Location 2 (dBA)	Location 3 (dBA)
2	P.II Float	Miscellaneous Generators	Generator	1	No	50	80.6	11	42.8	38.5	36.7	39.7	35.5	33.7
2	P.II Float	Air Compressors	Compressor (air)	1	No	40	77.7	11	39.9	35.6	33.8	35.9	31.6	29.9
2	P.II Float	Forklifts	All Other Equipment > 5 hp	1	No	50	85	11	47.2	42.9	41.1	44.1	39.9	38.1
2	P.II Float	Welding Machines	Welder / Torch	1	No	40	74	11	36.2	31.9	30.1	32.2	27.9	26.2
2	P.II Float	Light Towers	Generator (<25kva, VMS signs)	1	No	50	72.8	11	35.0	30.7	28.9	31.9	27.7	25.9
2	P.II Float	Haul/Dump Trucks	Dump Truck	4	No	40	76.5	11	38.7	34.4	32.6	34.7	30.4	28.7
2	P.II Float	200-ton crane	Crane	1	No	16	80.6	11	42.8	38.5	36.7	34.8	30.5	28.8

Notes:

1. Equipment list was provided by Applicant and equipment was matched to a standard RCNM equipment based on the closest noise profile. Defaults were pulled in from RCNM for usage and Lmax where available. See Table 2 for additional sources.

2. Lmax and Leq were calculated for each equipment type using RCNM methodology. Lmaxcalc incorporates the distance from source, the utilization, and any shielding. The equipment quantity is incorporated when summing the noise profiles for the overall noise levels for the phase.

3. A shielding value of 3 dBA was used for the existing plant wall between the Port and Ponomo St, consistent with Appendix A of the RCNM User Guide. An additional 8 dBA was included due to the proposed mitigation.

dBA: A-weighted decibel

hp: horsepower

kva: kilovolt-ampere

Leq: equivalent continuous sound level

Lmax: maximum sound level

Lmaxcalc: calculated Lmax at receptor distance including shielding

N/A: not applicable

RCNM: Roadway Construction Noise Model

Table 6
Construction Daytime Noise Summary, Mitigated

Sensitive Receptor Location ^{1,2}	Location 1: Closest Residential Area		Location 2: Residential Area South of Washington Street		Location 3: Residential Area Facing Washington Street	
	Lmax	Leq	Lmax	Leq	Lmax	Leq
Noise Limits	75	60	75	60	75	60

1. The Lmax noise limit, 75 dBA, is representative of the maximum volume permitted by the City at a residential property line in City Municipal Code 16.60, Table 3-7, Part II.

2. The Leq noise limit, 60 dBA, is representative of the maximum volume considered “normally acceptable” in the 2040 General Plan for a residential area.

Phase	Activity	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq
1	CC-01 Demolition	47.5	51.1	43.2	46.8	41.4	45.1
	CC-02 Preconstruction & Site Preparation	47.5	53.1	43.2	48.8	41.4	47.1
	CC-03 BERTH 3/4 Marine Piling & Dock Upgrade	49.2	51.5	44.9	47.3	43.1	45.5
	* During Pile Driving	63.5	57.7	59.2	53.4	57.4	51.7
	CC-05 Landside Piling / Ground Improvements	47.5	52.1	43.2	47.8	41.4	46.1
	* During Pile Driving	63.5	57.8	59.2	53.5	57.4	51.8
	CC-06 Landside Foundations & Paving	47.5	53.4	43.2	49.1	41.4	47.3
	CC-07 Structural Mechanical Installation	47.2	51.5	42.9	47.3	41.1	45.5
	CC-08 Utility Connection, Metering & Transformer Installation & Electrical Power & Controls	47.2	50.7	42.9	46.4	41.1	44.7
	CC-10 Unattended Truck Self-Loading Kiosk	47.2	47.2	42.9	42.9	41.1	41.2
	CC-11 Dome Construction (Design Build)	47.2	50.0	42.9	45.8	41.1	44.0
	CC-12 Rail Track Installation (Supply & Installation)	47.5	51.5	43.2	47.2	41.4	45.5
	Ship Unloader installation includes tugs & other marine equipment & receiving equipment & fabricated items	47.2	49.0	42.9	44.8	41.1	43.0
	Startup & Checkout	47.2	48.0	42.9	43.8	41.1	42.0

Table 6
Construction Daytime Noise Summary, Mitigated

Phase	Activity	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq	RCNM Construction Lmax	RCNM Construction Leq
1 (cont.)	Dry Commissioning	47.2	48.0	42.9	43.8	41.1	42.0
	Wet Commissioning	47.2	48.0	42.9	43.8	41.1	42.0
	Float	47.2	51.7	42.9	47.4	41.1	45.6
2	P.II CC-01 Demo: Bunker #6	47.2	49.9	42.9	45.6	41.1	43.9
	P.II CC-05 Landside Piling or ADP & CC-06 Foundation	47.5	52.8	43.2	48.6	41.4	46.8
	P.II CC-07 Structural & Mechanical Installation	47.2	49.7	42.9	45.4	41.1	43.7
	P.II CC-08 Electrical and Instrumentation Installation	47.2	48.6	42.9	44.3	41.1	42.6
	P.II CC-11 Dome #6 Construction (Design, Build and Erection)	47.2	50.0	42.9	45.8	41.1	44.0
	P.II Checkout	47.2	46.8	42.9	42.5	41.1	40.8
	P.II Dry Commissioning	47.2	46.8	42.9	42.5	41.1	40.8
	P.II Wet Commissioning	47.2	46.8	42.9	42.5	41.1	40.8
	P.II Float	47.2	47.9	42.9	43.6	41.1	41.8

Notes:

1. Lmax is equal to the equipment with the highest Lmax in the phase.
2. Leq was calculated using RCNM methodology for all equipment in the construction phase.
3. A shielding value of 3 dBA was used for the existing plant wall between the Port and Ponoma St, consistent with Appendix A of the RCNM User Guide. An additional 8 dBA was included due to the proposed mitigation.
4. For phases with pile driving, noise levels are shown with and without pile driving activities.

dBA: A-weighted decibel

Leq: equivalent continuous sound level

Lmax: maximum sound level

Table 7
Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity		
	25 feet	50 feet	300 feet
	inches/second		
Loaded Trucks	0.076	0.027	0.0018
Jackhammer	0.035	0.012	8.4E-04
Small Bulldozer/Backhoe	0.003	0.0011	7.2E-05
Large Bulldozer	0.089	0.031	0.0021
Pile Driver (impact)	0.644	0.228	0.015

Notes:

1. PPV was calculated for a structure 50 and 300 feet from the source for typical equipment using the reference PPV at 25 feet and equation 7-2 from FTA's Transit Noise and Vibration Impact Assessment

Manual.

PPV: peak particle velocity