4.4 NOISE

The analysis presented in this section of the Draft EIR summarizes the findings and recommendations of the "Environmental Noise Study for the construction of the Proposed Carnation Cove Dock Replacement Project in the City of Newport Beach," prepared by Wieland Acoustics, Inc. (February 29,2009) as well as the "Construction and Noise Vibration Study for: Aerie Residential Development," prepared by The Planning Center (March 2009). These studies are includes in Appendix E and Appendix F, respectively.

4.4.1 Existing Conditions

Noise

Newport Beach Noise Element

The City's Noise Element identifies four zone categories: Zone A, "Clearly Compatible;" Zone B, "Normally Compatible;" Zone C, "Normally Incompatible;" and Zone D, "Clearly Incompatible." These standards, identified in Table 4.4-1, are for the assessment of long-term vehicular traffic noise impacts. For residential uses, the City considers exterior noise levels up to 65 dBA CNEL as Clearly Compatible and Normally Compatible; noise levels over 65 dBA CNEL are characterized as Normally Incompatible and Clearly Incompatible. Under the Normally Compatible category, new construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice. Interior noise levels up to 45 dBA CNEL are considered normally acceptable for residential uses.

Table 4.4-1
Land Use Compatibility for Exterior Community Noise

Land Use Categories		**Community Noise Equivalent Level (CNEL)**						
Categories	**Uses**	**<55**	**55–60**	**60–65**	**65–70**	**70–75**	**75–80**	**>80**
Residential	Single Family, Two Family, Multiple Family	A	A	B	C	C	D	D
Residential	Mixed Use	A	A	A	C	C	C	D
Residential	Mobile Home	A	A	B	C	C	D	D
Commercial Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial **Industrial** **Institutional**	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial Recreational **Institutional** Civic Center	Amphitheatre, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial General, Special **Industrial,**	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B

Land Use Categories		Community Noise Equivalent Level (CNEL)						
Categories	**Uses**	**<55**	**55–60**	**60–65**	**65–70**	**70–75**	**75–80**	**>80**
Institutional								
Institutional	Hospital, Church, Library, Schools' Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
Open Space	Golf Course, Cemeteries, Nature Centers Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

Zone A: Clearly Compatible—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B: Normally Compatible—New construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Zone C: Normally Incompatible—New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Zone D: Clearly Incompatible—New construction or development should generally not be undertaken.

SOURCE: Newport Beach General Plan (Noise Element); 2006.

The City also enforces the interior and exterior noise standards associated with stationary or non-transportation sources. Other noise impacts are regulated by the Noise Control Ordinance of the Newport Beach Municipal Code, specifically in Chapter 10.26. These noise standards are summarized in Table 4.4-2.

Table 4.4-2
City of Newport Beach Noise Standards

Land Use Categories		Allowable Noise Level (dBA L_{eq})			
		Interior[1,2]		Exterior[1,2]	
Categories	**Uses**	**7 AM–10 PM**	**10 PM–7 AM**	**7 AM–10 PM**	**10 PM–7 AM**
Residential	Single Family, Two Family, Multiple Family (Zone I)	45	40	55	50
	Residential Portions of Mixed Use Developments (Zone III)	45	40	60	50
Commercial or Industrial	Commercial (Zone II)	N/A	N/A	65	60
	Industrial or Manufacturing Zone IV	N/A	N/A	70	70
Institutional	Schools, Day Care Centers, Churches, Libraries, Museums, Health Care Institutions (Zone I)	45	40	55	50

[1]If the ambient noise level exceeds the resulting standard, the ambient shall be the standard.

[2]It shall be unlawful for any person at any location within the incorporated area of the City to create any noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such a person which causes the noise level when measured on any other property, to exceed the following:

- The noise standard for the applicable zone for any 15-minute period;
- A maximum instantaneous noise level equal to the value of the noise standard plus 20 dBA for any period of time (measured using A-weighted slow response).
- In the event the ambient noise level exceeds the noise standard, the noise standard applicable to said category shall be increased to reflect the maximum ambient noise level.
- The noise standard for the residential portions of the residential property falling within 100 feet of a commercial property, if the intruding noise originates from that commercial property.
- If the measurement location is on a boundary between two different noise zones, the lower noise level standard applicable to the noise zone shall apply.

SOURCE: City of Newport Beach Noise Element

Section 10.28 of the Noise Control Ordinance regulates noise associated with both construction activities and property maintenance. The City expressly prohibits noise-generating construction activities or property maintenance between the hours of 6:30 p.m. and 7;00 a.m. on weekdays and between the hours of 6:00 p.m. and 8:00 a.m. on Saturday; such activities are prohibited on Sunday and federal holidays (Section 10.28.040, Construction Activity – Noise Regulations).

Ambient Noise Levels

Noise sources in the study area include traffic on the local streets, aircraft operations at John Wayne Airport, activities on boats in the channel, and general residential activities in the area. Ambient average daytime (i.e., 7:00 a.m. to 7:00 p.m.) noise levels (L_{eq}) in the vicinity of the project site range from 50.5 dB(A) to 59.9 dB(A) L_{eq}; ambient average daytime noise levels in the residential area directly across the channel from the project site range from 48.5 dB(A) to 59.3 dB(A) L_{eq}. The maximum noise levels (L_{max}) range from 63.1 dB(A) to 80.9 dB(A) L_{max} in the immediate vicinity of the subject property and from 63.6 dB(A) to 85.9 dB(A) L_{max} directly across the channel. The average and maximum ambient noise levels in the project environs are summarized in Table 4.4-3.

Table 4.4-3
Ambient Noise Levels

Location Description	Range of Average Daytime Noise Levels (L_{eq}) (7:00 a.m. to 7:00 p.m.)	Range of Maximum Daytime Noise Levels (L_{eq}) (7:00 a.m. to 7:00 p.m.)
Rear Patio, 101 Bayside Place	50.5 – 57.4 dB(A)	63.1 – 80.9 dB(A)
Pool Area, 2495 Ocean Boulevard	52.9 – 59.9 dB(A)	68.3 – 79.0 dB(A)
Rear Patio, 2282 Channel Road	48.5 – 55.0 dB(A)	63.6 – 77.0 dB(A)
Rear Patio, 2222 Channel Road	50.7 – 59.3 dB(A)	63.4 – 85.9 dB(A)
SOURCE: Wieland Acoustics (February 27, 2009)		

Vibration

Vibration is an oscillatory motion (i.e., back and forth movement) through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration and is normally associated with activities such as railroads or industrial equipment but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is described as the velocity and the rate of change of the speed is described as acceleration. These descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During project construction, the operation of construction equipment can cause groundborne vibration. Similarly, during the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated form vibration of a structure or items within a structure. For this reason, potential groundborne vibration is best measured in terms of velocity and acceleration.

Construction operations generally include a wide range of activities that can generate groundborne vibration, including blasting and demolition of structures, which generate the highest vibration values. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at distances within 200 feet of the source. In addition, heavy trucks can also generate groundborne vibrations, which vary depending on vehicle type, weight, and pavement conditions. Trains generate substantial quantities of vibration due to their engineers, steel wheels, and heavy loads.

The City of Newport Beach General Plan does not set specific limits or thresholds for vibration. The Federal Transit Administration (FTA) provides groundborne vibration criteria for various types of special buildings that are sensitive to vibration for both vibration annoyance and cosmetic damage. Cosmetic damage includes, but is not limited to, damage to fences, property lines fences and walls, flatwork (e.g., paved areas.) The human reaction to various levels of vibration is highly subjective and variable. As noted in the FTA manual, "although PPV is appropriate for evaluating the potential of building damage, it is not suitable for evaluating human response" (FTA 2006). This is because it takes time for the human body to respond to vibration signals. Table 4.4-4 lists the FTA human annoyance criteria for groundborne vibration based on the relative perception of a vibration event for various types of vibration-sensitive land uses.

Table 4.4-4
Groundborne Vibration and Noise Impact Criteria (Human Annoyance)

Land Use Category	Max Lv (VdB)[1]	Description
Workshop	90	Distinctly felt vibration. Appropriate to workshops and non sensitive areas.
Office	84	Felt vibration. Appropriate to offices and non sensitive areas.
Residential – Daytime	78	Barely felt vibration. Adequate for computer equipment.
Residential - Nighttime	72	Vibration not felt, but goundborne noise may be audible inside quiet rooms.

[1]As measured in 1/3 octave bands of frequency over the frequency ranges of 8 to 80 Hz.

SOURCE: Federal Transit Administration (2006)
The Planning Center (March 2009)

The level at which groundborne vibration is strong enough to cause cosmetic damage has not been determined conclusively. The most conservative estimates are also reflected in the FTA criteria, summarized in Table 4.4-5. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings.

Table 4.4-5
Groundborne Vibration and Noise Impact Criteria (Cosmetic Damage)

Building Category	PPV (in/sec)	VdB
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

NOTE: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

SOURCE: Federal Transit Administration (2006)
The Planning Center (March 2009)

Noise- and Vibration-Sensitive Land Receptors

Certain land uses are particularly sensitive to noise and vibration, including residential, schools, and open space/recreation areas, where quiet environments are necessary for enjoyment, public health, and safety. Off-site sensitive receptors in the vicinity of the project site include the existing single- and multiple-family homes surrounding the project site. These noise-sensitive uses are affected by the existing noise levels and would be potentially affected by noise from the project site during construction of the project and from on-site operations.

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the "threshold of feeling." As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear and is called the "threshold of pain." A sound level of 160 to 165 dBA will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying less developed areas.

4.4.2 Significance Thresholds

Based on Appendix G of the State CEQA Guidelines a project would have a potentially significant noise and/or vibration impact if it would result in:

- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use or, where such a plan has not been adopted, within two miles of a public airport or public use or private airport, would the project expose people residing or working in the project area to excessive noise levels.

4.4.3 Standard Conditions

SC 4.4-1 In accordance with Section 10.28.040 of the Newport Beach Municipal Code Section 10.28.040 (Construction Activity – Noise Regulations), noise-generating construction and/or maintenance activities may be permitted only between the hours of 7:00 a.m. and 6:30 p.m. on weekdays and 8:00 a.m. to 6.00 p.m. on Saturdays. No noise-generating construction activities may occur at any time on Sundays or on federal holidays. These days and hours shall also apply any servicing of equipment and to the delivery of materials to or from the site.

4.4.4 Potential Impacts

4.4.4.1 Short-Term Construction Impacts

Construction Noise

Short-term noise impacts associated with project implementation are typically associated with excavation, grading, and erecting of buildings on site during construction of the proposed project. Construction related short-term noise levels would be higher than existing ambient noise levels in the project area; however, construction noise would end upon completion of the construction activities for each of the development and/or improvement phases.

Noise levels from grading and other construction activities for the proposed project may range up to 84 dBA L_{max} at the closest residential uses adjacent to the project site for very limited times when construction occurs near the project's boundary. Although compliance with the construction hours mandated by the City in Section 10.28.040 of the Municipal Code, it is anticipated that construction related noise impacts from the proposed project would be potentially significant even with compliance with the ordinance.

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. Trucks accessing the project site would generate noise levels on the order of 72.5 dBA at a distance of 50 feet[1]. A truck traveling a 20 mph would cover a distance of 500 feet in 17 seconds, thereby increasing noise levels briefly as the truck passes. Project-related trucks would travel to the site and be required to shut down unnecessary idling while loading and unloading, after which it would take approximately 30 seconds to startup and then depart. Due to the size constraints of the project site, it is anticipated that generally only one truck would be delivering or hauling material to the site at any one time

The second type of short-term noise impact is related to noise generated during excavation, grading, and erection of the new building on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction related noise ranges to be categorized by work phase.

As noted in Table 3-2 (Proposed Construction Phasing), certain phases of project construction would occur simultaneously. Typically, the estimated construction noise levels are governed primarily by the piece of equipment that produces the highest noise levels. The character of the noise levels surrounding the construction site will change as work progresses, depending on the noise levels of the loudest piece of construction equipment in use. A combination of construction vehicles and handheld power tools would be used depending on the construction phase. Construction noise levels are based on those reported by the Federal Highway Administration (FHWA) using the Roadway Construction Noise Model (RCNM version 1.1, 2008). Table 4.4-4 lists noise levels for construction equipment from the RCNM. A noise monitoring program was initiated to collect noise data from the metal stud framing and concrete formwork. This monitoring data, which primarily involves hand tools, was necessary to supplement the noise data for construction vehicles from the RCNM. As indicated in Table 4.4-6, typical noise levels range up to 83.3 dBA L_{eq} at 50 feet during the noisiest construction phases. The site preparation phase, which includes excavation and grading of the site, tends to generate the highest noise levels, because the noisiest construction equipment is typically earthmoving equipment.

[1]Based on the Federal Highway Roadway Construction Noise Model for dump trucks.

Table 4.4-6
Typical Construction Equipment Noise Levels

Type of Equipment	Average Sound Levels (dBA L_{eq} at 50 feet)
Backhoe	73.6
Concrete Mixer Truck	74.8
Concrete Pump Truck	74.4
Excavator	76.7
Front End Loader	75.1
Jackhammer	81.7
Drill Rig Truck	72.2
Hydra Break Ram	80.0
Tractor	80.0
Vibratory Concrete Mixer	73.0
Flat Bed Truck	70.3
Auger Drill Rig	77.4
Mounted Impact Hammer (Hoe Ram)	83.3
Dozer	77.7

SOURCE: Roadway Construction Noise Model (version 1.1)
The Planning Center (March 2009)

Short-term (construction) noise level increases will occur from the use of construction equipment associated with demolition of existing structures, grading and excavation, and building and construction activities. Earthmoving equipment includes excavating machinery such as backhoes, bulldozers, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Potential noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. The exposure of persons to the periodic increase in noise levels will be short-term and will cease after construction is completed. Short-term construction noise impacts tend to occur in discrete phases dominated initially by earthmoving sources, then by foundation construction, and, finally, for building construction. Heavy equipment noise can average about 80 dB(A) at 50 feet from the source when the equipment is operating at typical loads.

A variety of noise sources and noise levels would occur on and in the immediate vicinity of the project site, over the estimated 32-month construction program associated with the proposed project. Noise levels would vary, depending upon the type and number of construction machinery and vehicles in use and their location within the project site. The types of machinery to be active will vary with the construction phases, which would include:

- Demolition of existing buildings and site improvements
- Demolition and replacement of the existing landing and boat dock
- Drill shoring caissons
- Excavation and installation of lagging
- Shotcrete shoring walls
- Install foundations
- Build concrete structure
- Install plumbing, electrical, mechanical, finish exterior/interior, etc.
- Hardscape and landscape

It is important to note that all equipment is not generally operated continuously or used simultaneously. The number, type, distribution, and usage of construction equipment will differ from phase to phase. The noise generated is both temporary in nature and limited in hours by the City's Noise Ordinance (Section 10.28.040). In order to reduce potential construction noise, the following noise control factors were considered in the preparation of the CMP.

- During Phases 1 and 2 of the project, the caisson drilling process will progress at the rate of 3 to 4 caissons per day, including drilling, steel placement, and filling with concrete. The grading during Segments No. 1, 2, and 3 will consist of excavators with a ramp out or an electrical conveyor belt for dirt removal and with dump trucks at the rate of approximately 28 trucks per day removing the soil. There will be no pile driving during the entire construction process. The ram hoe may be required during the later part of the excavation process for approximately 10 percent of the grading operation at the lower elevations of the site.

- For Phases 3 and 4, small hand tools and compressors will be used within the concrete structure. Nose will also be generated by daily deliveries of materials to the site. The construction valet will manage the time of such deliveries so that they do not occur at the same time.

In order to adequately evaluate the potential construction noise impacts for various construction activities anticipated from the proposed project, a noise monitoring program was undertaken that characterized noise levels associated with concrete formwork, metal stud framing, and installation of interior walls with cast-in-place concrete (refer to Appendix F). Noise modeling was then completed for each phase of the proposed project utilizing, where applicable, the data collected from the construction monitoring program based on the specific project equipment and phasing schedule identified in the Construction Management Program prepared for the project.

Phase 1 – Demolition and Excavation

Phase 1 consists of project-related demolition and excavation activities. Phase 1 would last approximately six months and would involve varying quantities of construction vehicles. The most noise intensive activities would occur when construction vehicles are working at-grade with the surface streets because no noise attenuation would be provided by the walls of excavated pits as would occur during the excavation phases.

Demolition

Demolition of the existing residential structures is anticipated to take six days and would utilize a backhoe, excavator, and loader during each of the six days. The potential noise impacts resulting from demolition are based on the types, numbers and hours of operation each day during the demolition activities (refer to Table 10 in Appendix F). Based on the six-day demolition schedule, noise contours were developed and are illustrated in Exhibit 4.4-1, which illustrates that noise from demolition equipment would result in noise levels of 75–80 dBA L_{eq} at the adjacent residence to the north of the site and 70–75 dBA L_{eq} at the residences in the immediate vicinity of the project site, before diminishing with distance, for the six-day demolition. As shown in the Exhibit 4.4-1, remnants of the existing buildings would provide some noise attenuation for the residences to the northwest of the project site until they were demolished.

Noise Level LD, eq
in dB(A)

85<
80< <=85
75< <=80
70< <=75
65< <=70
60< <=65
55< <=60
50< <=55
45< <=50
<=45

---- Site Boundary

0 190
Scale (Feet)

Exhibit 4.4-1
Demolition Noise Contours

SOURCE: The Planning Center

Caisson Installation

Caisson placement, which would occur for up to 21 days, would occur after the buildings are demolished and the pad is graded level. Three to four caissons would be drilled per day. This activity includes drilling, steel placement, and filling with concrete. Construction equipment utilized for caisson emplacement includes a drill rig, backhoe loader, concrete pump truck and concrete trucks. In addition, an air compressor and mobile welding machine would be used when needed to splice the steel casings together. It is anticipated that 10 concrete truck loads would be necessary on a daily basis. As prescribed in the CMP, the concrete trucks would be sequenced so that a single truck would be unloading at a time. Exhibit 4.4-2 illustrates that noise from caisson drilling would result in noise levels of 80 to 85 dBA L_{eq} within the immediate vicinity of the project site before diminishing with increasing distance during the 13 to 21 day duration of this activity. Noise levels during this phase would be substantial due to the multiple concurrent construction vehicles operating at grade.

Excavation

The noise analysis evaluated potential noise impacts anticipated during the three grading operations at three levels: 50 feet, 40 feet and 28 feet. The equipment that would be used for excavating the site includes a dozer, excavator and loader at each elevation. In addition, at the 40- and 28-foot elevations, a ram hoe may also be employed to facilitate excavation and grading. Exhibit 4.4-3 illustrates the potential noise impacts. As indicated in that exhibit, noise levels from excavation equipment would be partially attenuated due to being partially below grade where the ridgeline of the excavated area acts as a sound barrier. Noise levels of 80 to 85 dBA L_{eq} are expected to occur at the nearest residence to the project site, (215 Carnation Avenue). Noise levels at the other residential uses near to the project site would experience attenuated noise levels in the 55–65 dB range, due to the construction vehicles operating within the excavated area. At the 40 foot elevation (refer to Exhibit 4.4-4), noise levels are generally confined within the excavation area during this excavation phase. The nearest residential use adjacent to the project site to the north would experience noise levels in excess of 85 dBA L_{eq} because this residence overlooks the excavated area and would not benefit from the noise attenuation from excavated walls. The other surrounding residential uses would benefit from equipment working within an excavated area and would experience noise levels of between 55 and 60 dBA L_{eq}. Exhibit 4.4-5 illustrates the potential noise impacts during the grading that would occur at the 28 foot elevation. As indicated in that exhibit, noise levels are generally confined within the excavation area. The nearest residential use adjacent to the project site to the north would experience noise levels in excess of 85 dBA L_{eq} because this residence overlooks the excavated area and would not benefit from the noise attenuation from excavated walls. The other surrounding residential uses would benefit from equipment working within an excavated area and would experience noise levels of between 55 and 60 dBA L_{eq}.

Phases 2 and 3 – Concrete Pouring/Concrete Formwork, and Metal Stud Framing

Phase 2 involves shotcrete shoring, concrete placement for the foundation slab, structural decks and construction of retaining walls following excavation activities. Phase 3 would consist mainly of metal stud framing and installation of mechanical electrical and plumbing equipment. Portions of Phases 2 and 3 would occur concurrently and, together, they would last approximately 18 months. During Phase 3, the vehicle elevators will be installed, allowing additional storage of construction materials. As previously discussed, data from noise monitoring of concrete formwork and metal stud framing were used as the basis for the modeling conducted for the proposed project.

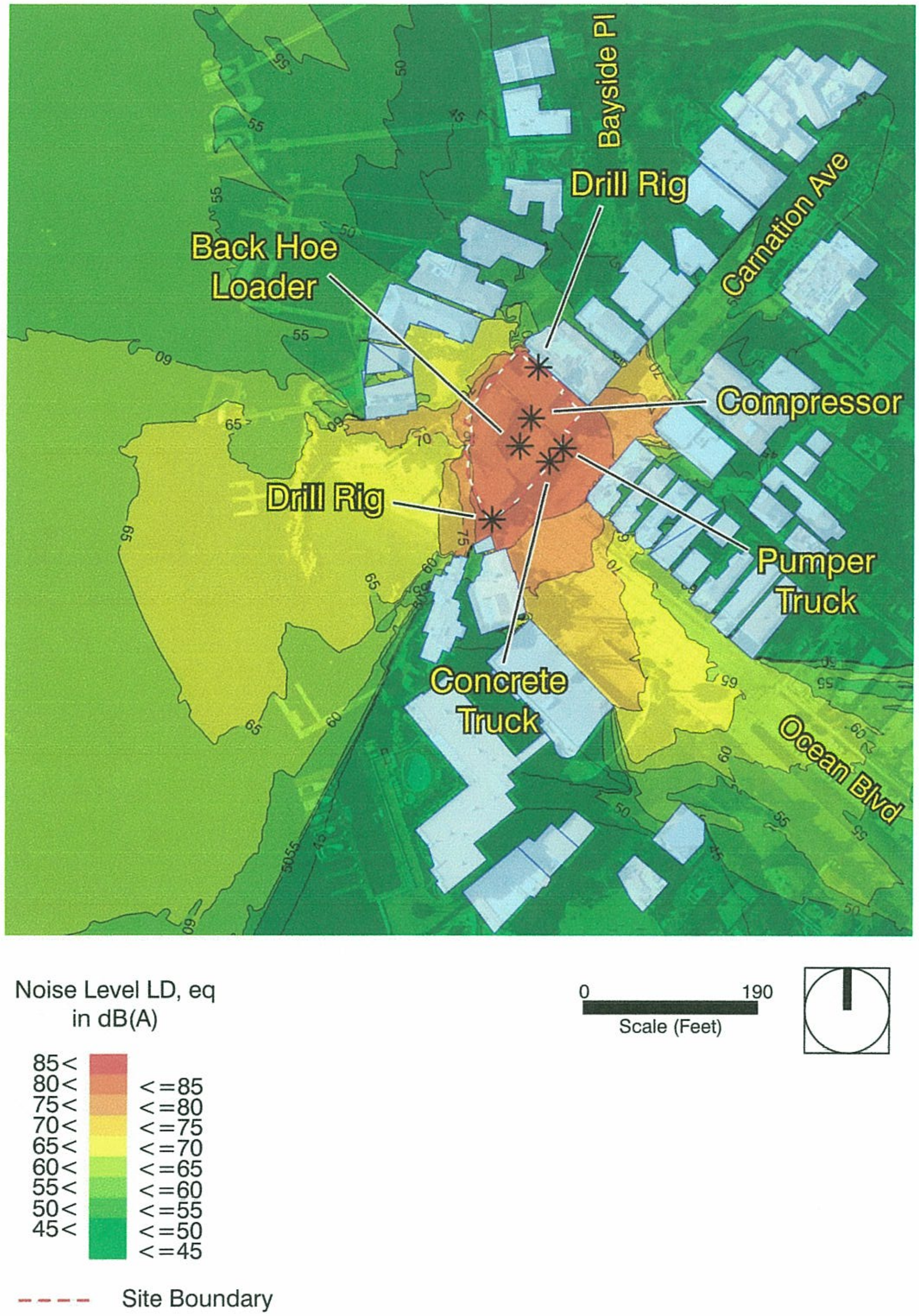


Exhibit 4.4-2
Caisson Drilling Noise Contours

SOURCE: The Planning Center

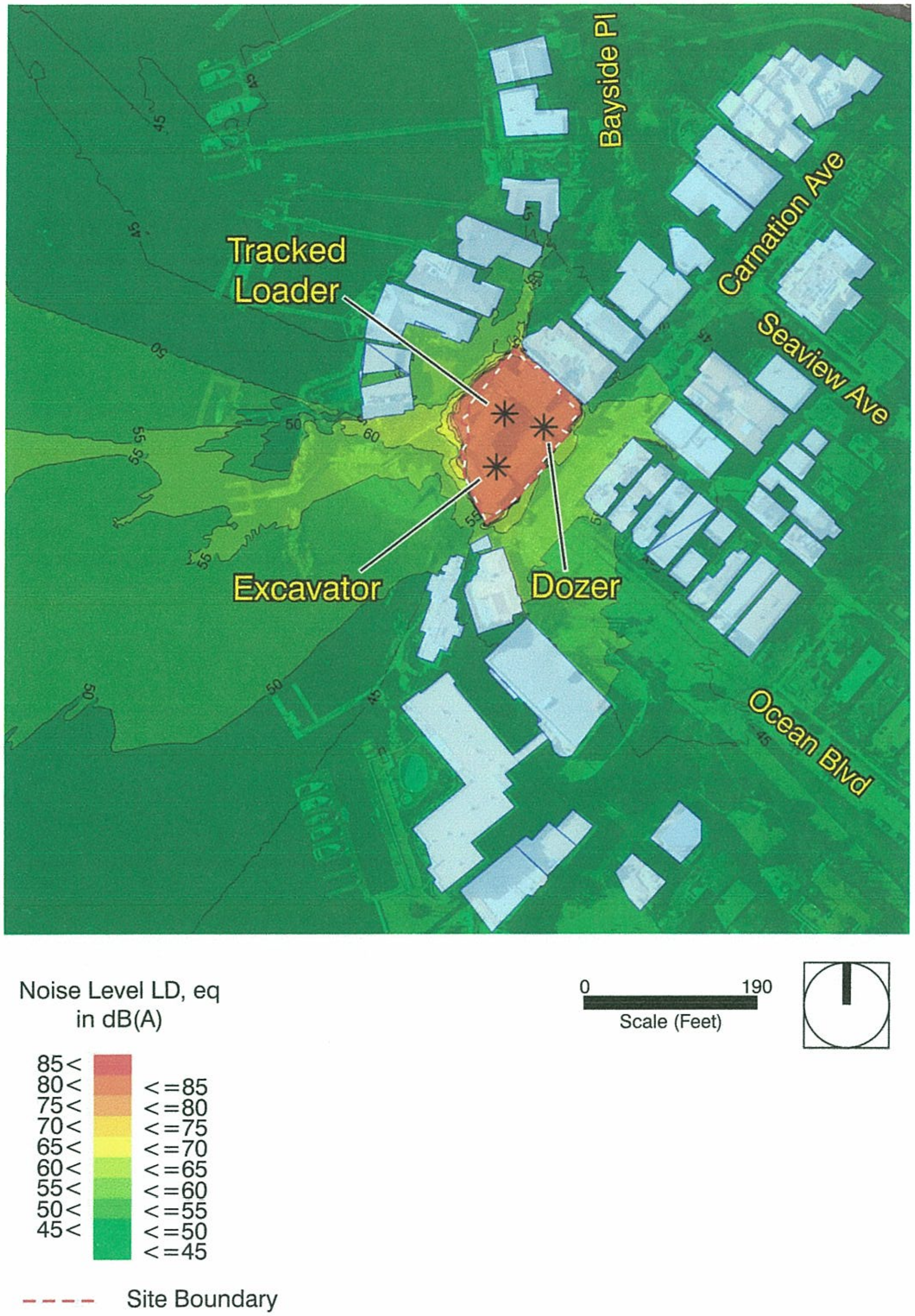
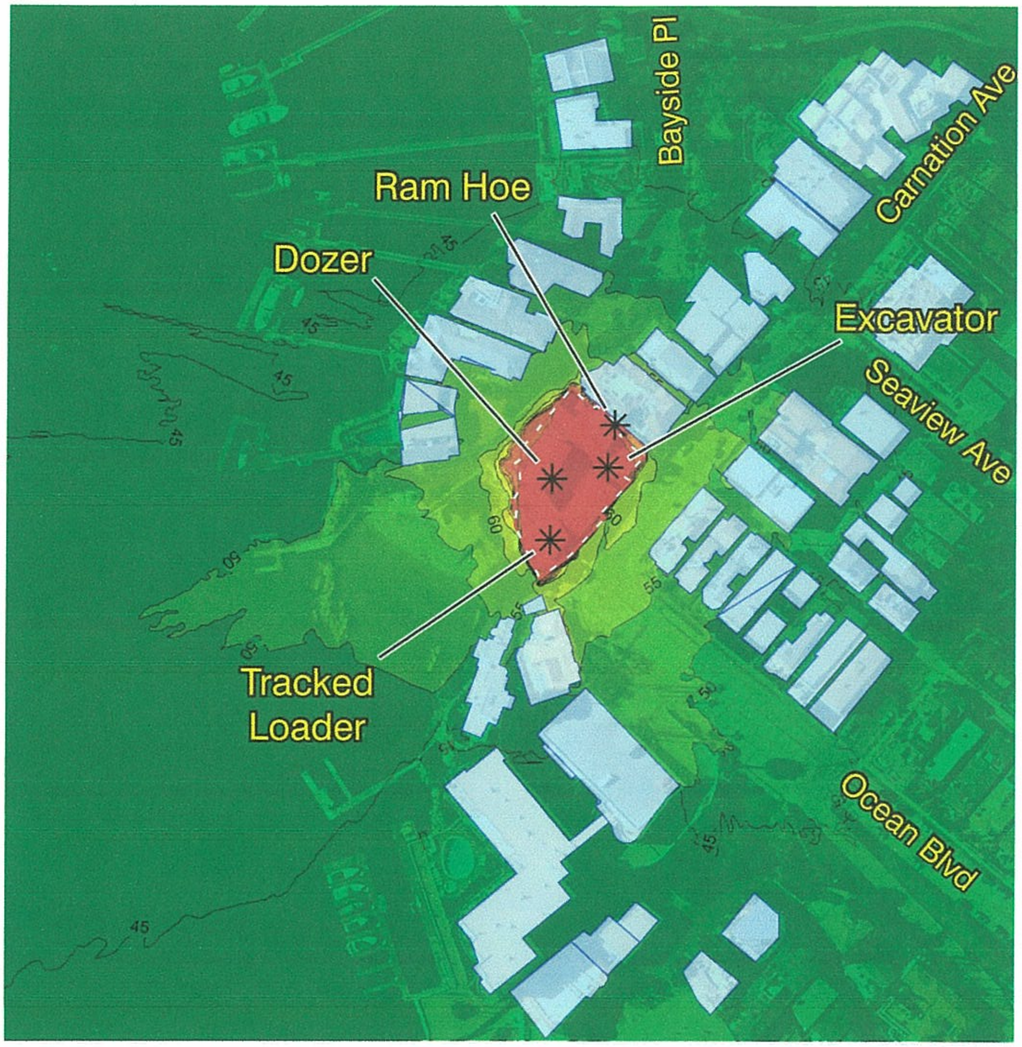


Exhibit 4.4-3
Noise Contours from Excavation (50 Feet msl)

SOURCE: The Planning Center



Noise Level LD, eq
in dB(A)

85<
80< <=85
75< <=80
70< <=75
65< <=70
60< <=65
55< <=60
50< <=55
45< <=50
<=45

---- Site Boundary

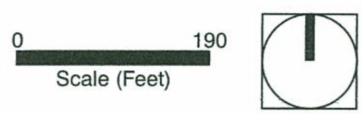


Exhibit 4.4-4
Noise contours from Excavation (40 Feet msl)

SOURCE: The Planning Center

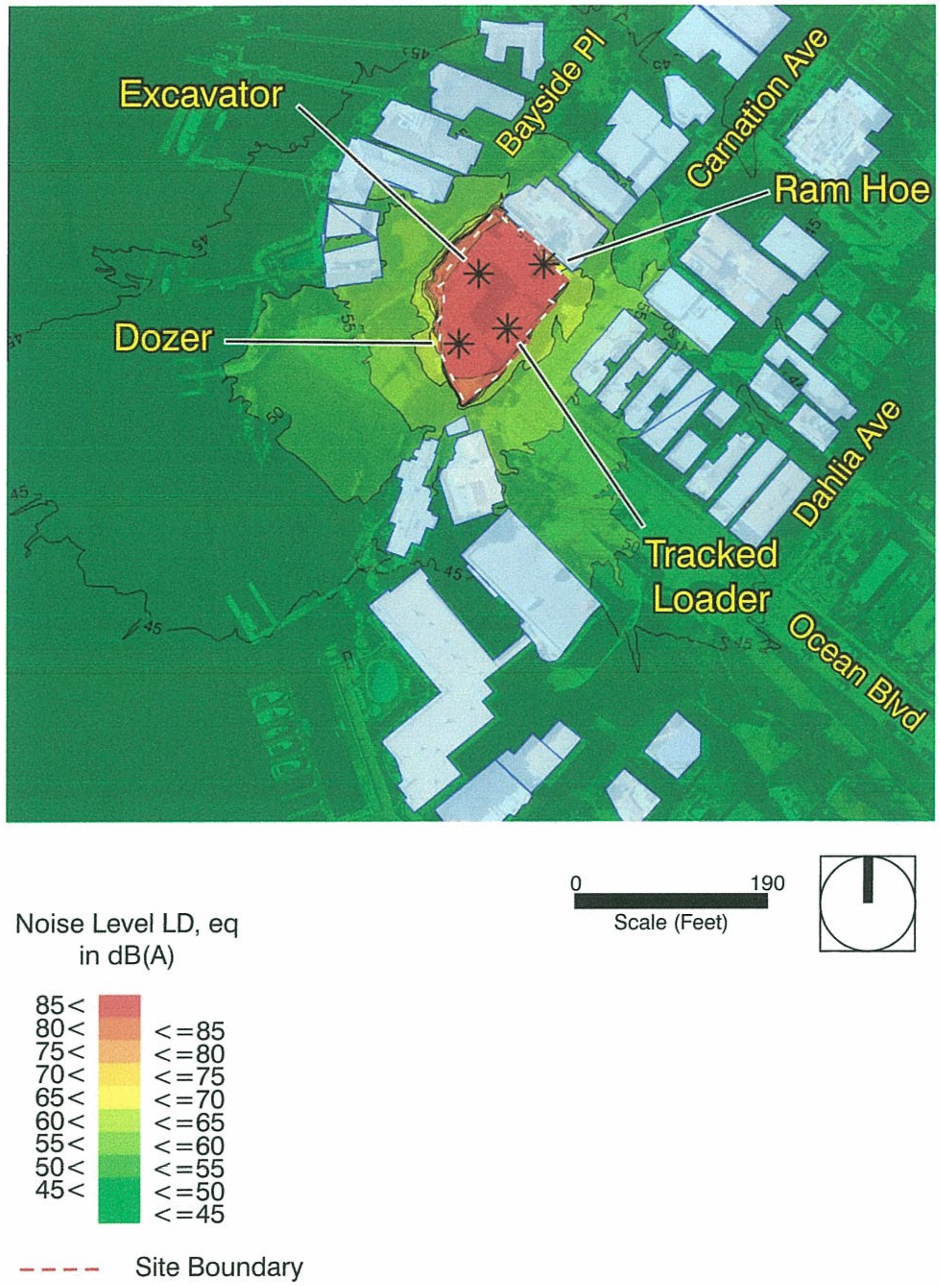


Exhibit 4.4-5
Noise Contours from Excavation (28 Feet msl)

SOURCE: The Planning Center

Concrete Pouring

Concrete pouring is required to construct the exterior walls and floors of the proposed structure and would occur for approximately three to five days during the construction process. Approximately 20 to 25 cement trucks would come to the site each day during the 12 concrete pouring events; however, no more than one truck at a time would be permitted on Carnation Avenue. In addition to the concrete trucks, this activity would also require the use of a concrete pumper and concrete vibrator (hand tool). The concrete pour work could occur concurrently with the metal stud work. Noise generated from metal stud work was included with the noise generated with equipment associated with the concrete pouring. As shown Exhibit 4.4-6, noise would occur primarily from the concrete truck and the concrete pumper truck along Carnation Avenue. Noise levels at the closest residences to these two trucks would be exposed to noise levels of 75 to 80 dBA L_{eq} during each day of concrete pouring.

Concrete Formwork and Metal Study Framing

Building construction would commence after the excavation/grading phase. The construction of the building for each floor is initiated by developing the form and then pouring the concrete floor first. After the concrete floor has cured, the exterior walls would be formed and also cast in place with concrete. At the time the forms for the exterior walls are being erected, metal stud framing for the interior walls would be constructed concurrently on the floor below where the forms are being constructed. Noise generated by the metal stud framing would be attenuated by the concrete exterior walls. The concrete formwork and metal stud framing would occur for approximately a year and a half. Integration of the mechanical, electrical, and plumbing systems and interior walls would start from the lowest level and continue on to the upper levels. SoundPlan modeling graphics were prepared showing interior wall construction occurring concurrently with preparation of the forms prior to pouring concrete. Equipment that would be utilized during these construction activities includes compressors, hand tools, plasma cutters, roto hammers, shot pin applicators, and small stationary power tools.

Exhibit 4.4-7 shows interior wall construction and form work below grade. As indicated in that exhibit, noise levels associated with the concrete formwork and metal stud framing for the first and second floors, respectively would result in noise levels of 55-60 dBA L_{eq} at the nearest residences to the south of the projects site and 70-75 dBA L_{eq} at the nearest residence to the north of the site. The highest noise levels experienced at residential uses further away would be 60-65 dBA L_{eq} or less. Exhibit 4.4-8 shows the same type of work occurring above grade so that noise levels could be depicted with and without the noise attenuation provided by the excavated walls. Concrete formwork for the fourth floor and metal stud framing for the third floor would occur for approximately 30 days. Construction activities for this stage are similar to the above for the formwork and interior metal framing for the first floor with the exception that the activities would occur roughly 10 feet above Carnation Avenue and the building footprint is smaller. It is estimated that the same number of workers and tools, and hours of operation would occur for this activity as shown in Table 16. Noise levels associated with the concrete formwork and metal stud framing for the fourth and third floors, respectively, would result in noise levels of 75 to 80 dBA L_{eq} at the nearest residences to the north and 60 to 65 dBA L_{eq} south of the projects site. The highest noise levels experienced at residential uses further away would be 60-65 dBA L_{eq} or less and would diminish with distance and intervening structures.

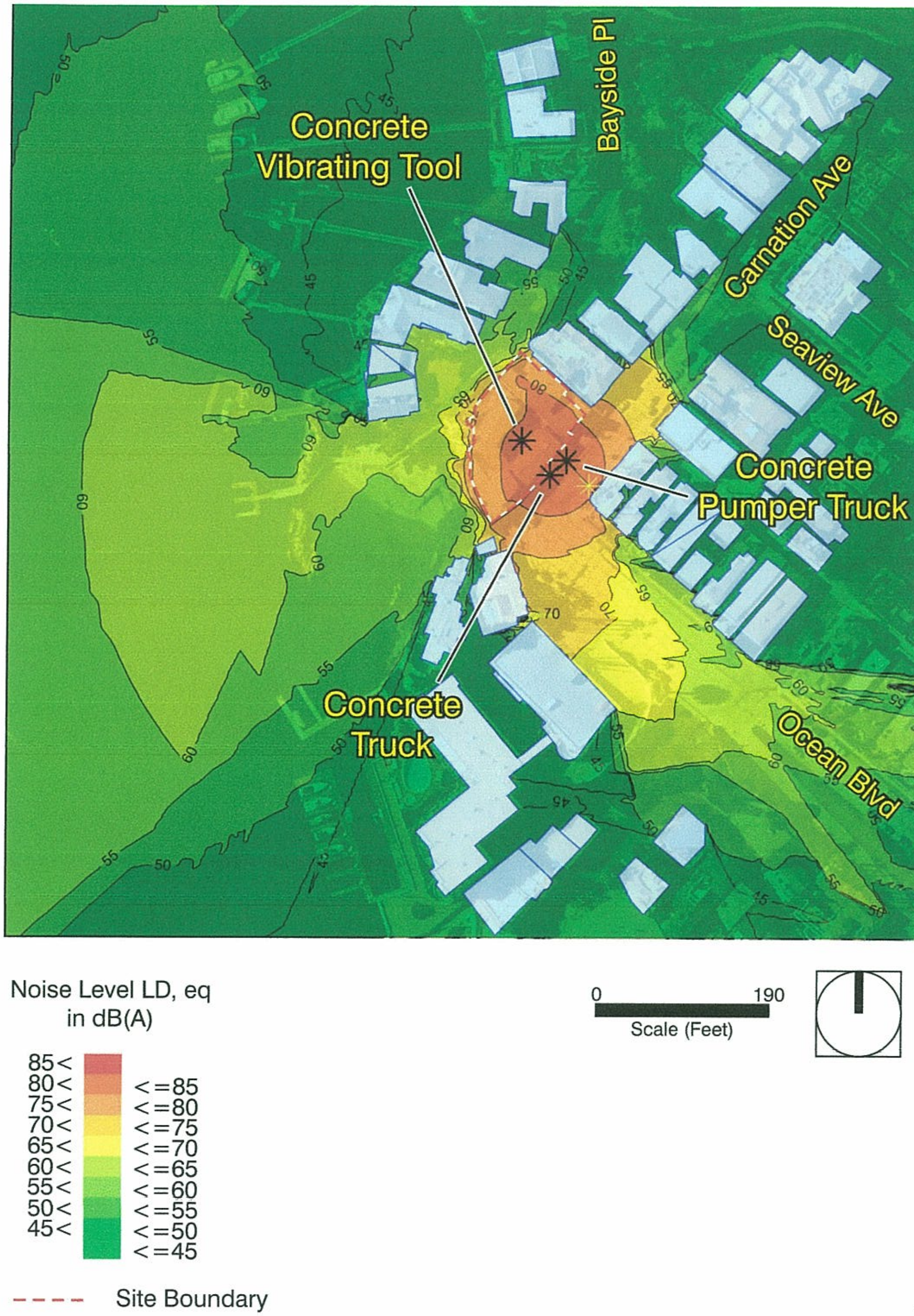


Exhibit 4.4-6
Concrete Pouring Noise Contours

SOURCE: The Planning Center

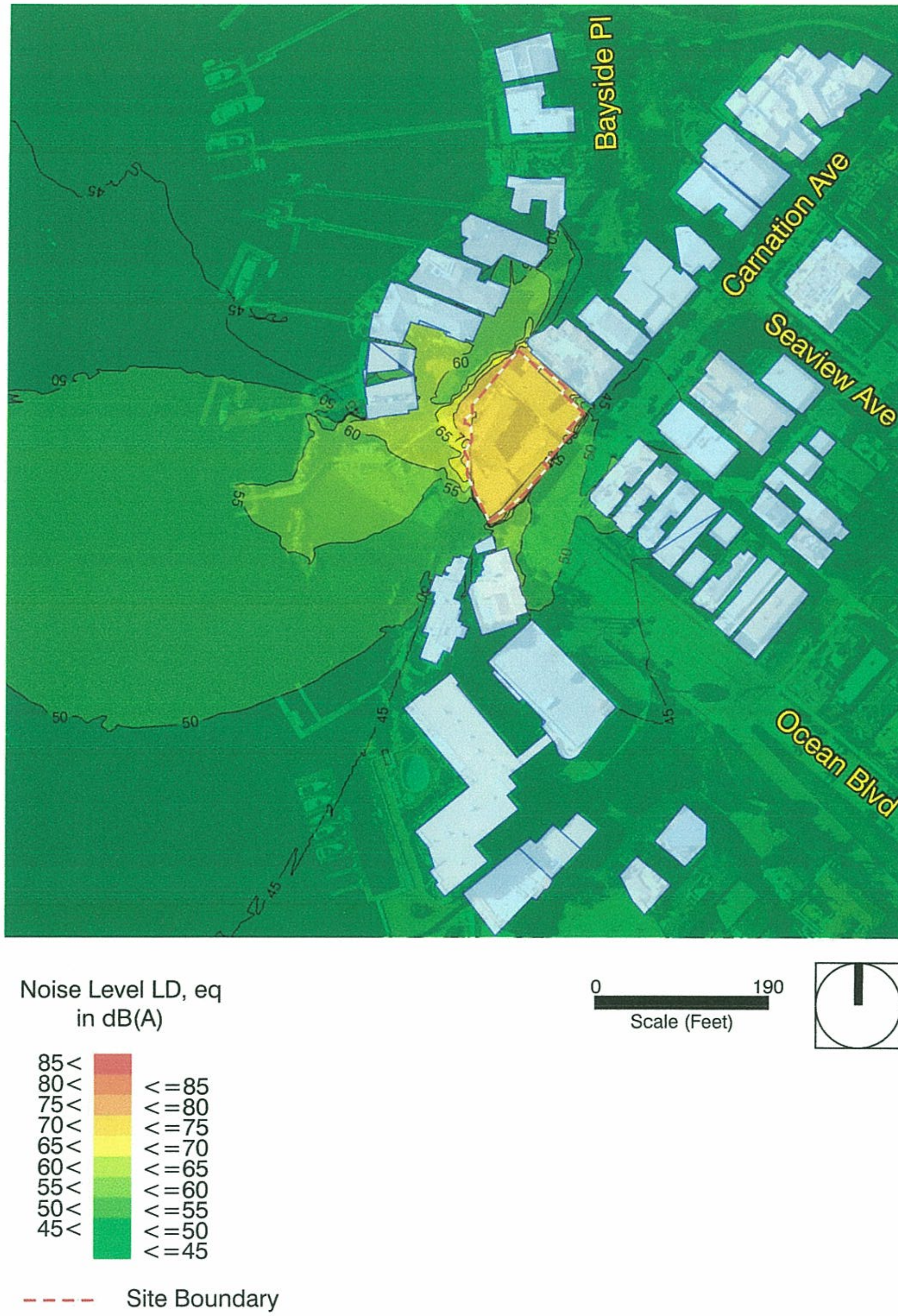
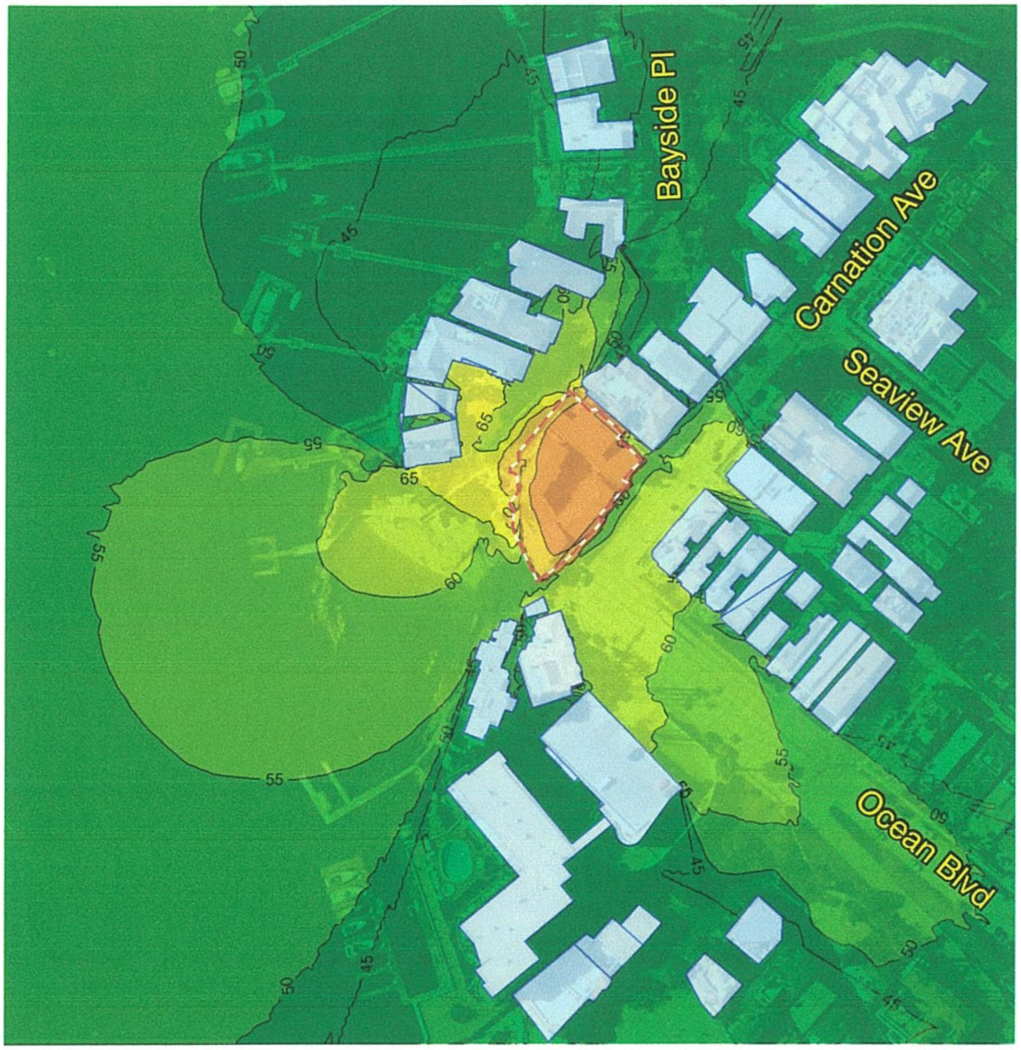


Exhibit 4.4-7
First Floor Metal Stud Framing/Second Floor concrete Formwork

SOURCE: The Planning Center



Noise Level LD, eq in dB(A)

85<
80< <=85
75< <=80
70< <=75
65< <=70
60< <=65
55< <=60
50< <=55
45< <=50
<=45

---- Site Boundary

0 190
Scale (Feet)

Exhibit 4.4-8
Third Floor Metal Stud Framing/Fourth Floor Concrete Formwork

SOURCE: The Planning Center

Phase 4 – Finishing Activities

The final construction phase would include the application of the interior and exterior finishes in window and door installation occurring for a period of seven months. Cabinetry built off-site, countertops, and finish materials would be delivered and installed in all units. Exterior finishes such as stone veneer, roof materials, photovoltaic array panels, and exterior plaster would begin. Landscaping and final fire suppression systems as well as passenger elevator installations would complete the structure. Noise levels for this phase were assumed to be comparable to noise generated during the metal stud framing phase. Noise generated during this phase would generally occur in the interior of the structure with interior and exterior walls providing noise attenuation from the activities. Noise would generally consist of use of electric screwdrivers, compressors and infrequent use of electric saws. Exterior work will involve tile cutting, which would occur indoors and brought to the exterior for installation as well as the use of a plaster sprayer for a period of a week.

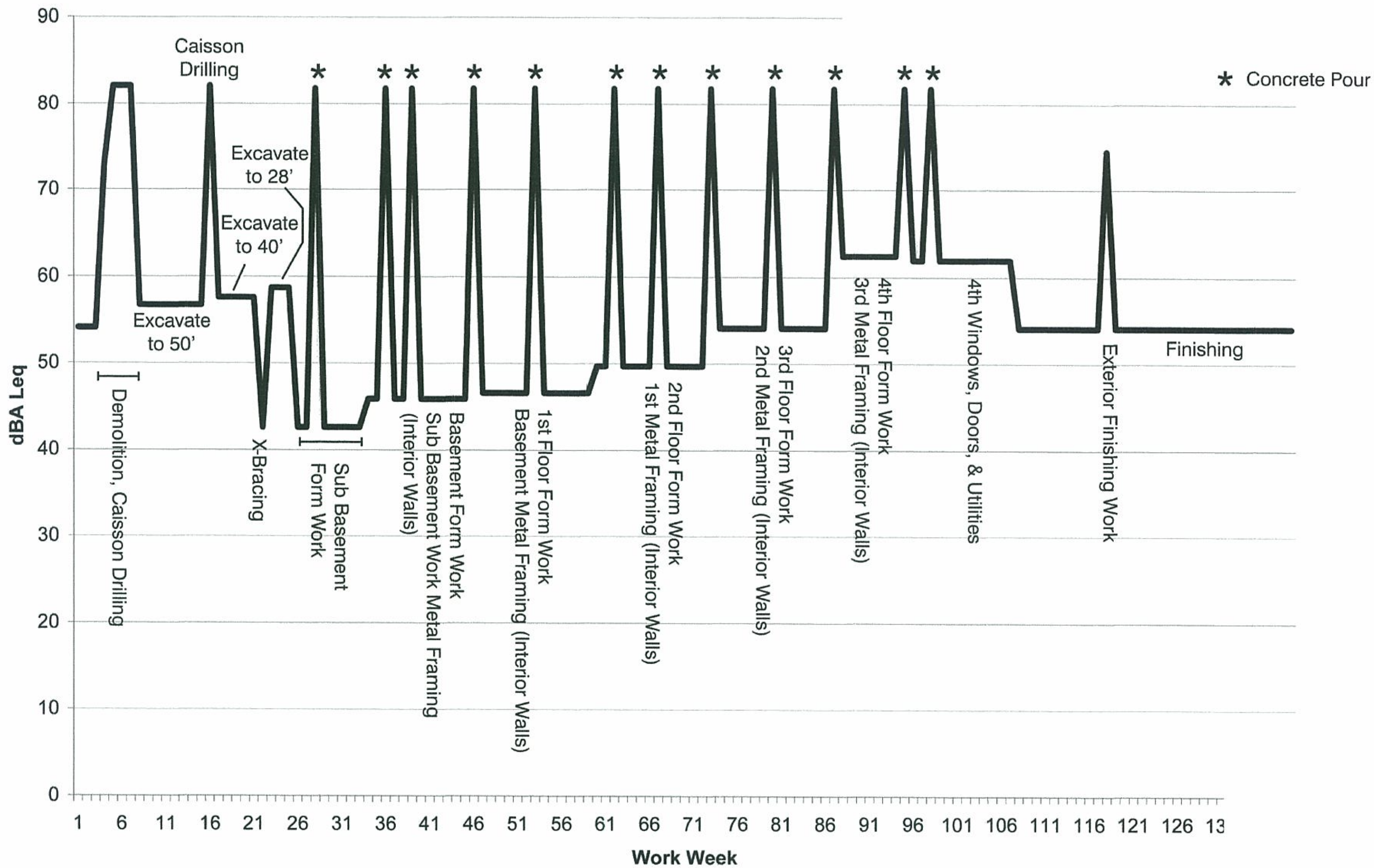
The proposed project involves the construction of the proposed Aerie residential building as well as the replacement of the existing docks. The noise and vibration generated by the construction of the docks was evaluated in a separate noise study conducted by Wieland Acoustics Incorporated. Construction of the docks is scheduled from May 2012 to July 2012 and is estimated to have a duration of 40 days. Dock construction is anticipated to occur concurrently with the construction of the 4th floor interior walls and roof. The highest noise level associated with dock work is associated with the drilling phase, which results in 88 dBA at a distance of 50 feet. The nearest noise sensitive uses to the docks are 101 Bayside Place and 2495 Ocean Boulevard. Table 4.4-7 summarizes the noise levels associated with each activity as well as the combined noise levels from both dock and building construction activities. The combined noise levels are logarithmically summed at the nearest noise sensitive uses. As shown in this Table 4.4-7, noise levels would increase by 1.5 dB at 101 Bayside Place and 0.5 dB at 2495 Ocean Boulevard.

Table 4.4-7
Combined Dock and Building Construction Noise (dBA)

Location	Dock Drilling Noise	Building Construction Noise	Combined Dock and Building Noise
101 Bayside Place	71	67	72.5
2495 Ocean Boulevard	68	59	68.5
SOURCE: The Planning Center (March 2009)			

Summary of Noise Impacts

As shown by the noise contours of the construction activities (refer to Exhibits 4.4-1 through 4.4-8, noise levels associated with the proposed project's construction would vary substantially depending on the number and types of construction vehicles, type of construction activity, and the location of occurrence. Noise levels for each of the construction phases were evaluated at a reference distance of 100 feet from the eastern edge of the project site on Carnation Avenue to produce a chart of noise levels over the entire construction period, as shown in Exhibit 4.4-9. Noise levels are expected to increase when receptors are closer than 100 feet and diminish beyond 100 feet. This exhibit illustrates the differences in noise levels over time based on the type of construction activity being performed. Noise levels are highest during the demolition, caisson drilling, and the concrete pouring when construction vehicles are at grade with Carnation Avenue. Noise levels subside substantially when construction equipment is working within the various depths of the excavated area due to the noise attenuation provided by the excavated walls.



SOURCE: The Planning Center

Exhibit 4.4-9
Construction Noise Over Time

These excavated walls have no effect when residences are overlooking the site and have direct view of the construction equipment. After excavation, construction of the formwork and interior metal framed walls would occur with hand tools. Noise levels from these hand tools are substantially lower than the levels generated by construction vehicles, based on noise monitoring and noise level data provided by the Federal Highway Administration's Road Construction Noise Model. Construction vehicles would not be used during these phases, with the exception of building material deliveries and concrete pouring when short periods of substantial noise exposure would occur. In addition, noise generated by metal framing would occur within the interior of the newly constructed floor and be attenuated by the presence of exterior concrete walls and a concrete ceiling. After all the exterior and interior walls are constructed, the finish work would commence. The finish work would also be done with hand tools and various electric saws and related equipment. As explained above, noise levels associated with the finish work were conservatively assumed to be comparable to those of metal stud framing. However, interior finish work would occur within the interior of the building and be substantially attenuated by both the interior and exterior walls of the residential structure. Exterior finish work would also be done with hand tools.

The ambient average daytime (i.e., 7:00 a.m. to 7:00 p.m.) noise levels (dBA L_{eq}) in the vicinity of the project site range from 50.5 dBA to 59.9 dBA. Construction noise from the phases that involve construction vehicles results in noise levels of 42.6 dBA to 82.1 dBA at 100 feet. For the worst case noise generating phase, this level of noise would be approximately 22-31 dBA L_{eq} above ambient background noise and would last approximately three to four months during the demolition, caisson drilling, and excavation phases before the noise from construction vehicles would be attenuated by excavated walls. Second story residences adjacent to the project site with a clear line of sight to the construction vehicles would experience these noise levels for a period of seven months during the demolition, caisson drilling, and excavation phases because the excavated walls provide less attenuation or no attenuation. For approximately one and a half years, noise levels would be, on average, between 42.6 dBA to 61.9 dBA L_{eq} at 100 feet from the construction of the interior and exterior walls. Noise levels would be approximately 2-11.5 dBA above the ambient background noise. As explained above, interior finish work was assumed to be equivalent to noise from interior metal stud work and would generate noise levels of 52.8 dBA at 100 feet. Exterior hardscape and landscape would last approximately four months. Noise levels would be approximately 0-2 dBA above the ambient background noise. Noise levels are most intensive when construction vehicles are necessary during the demolition, caisson drilling and excavation phases. The majority of the construction duration involves building construction that involves less noise intensive activities due to the use of hand tools (electric screw drivers, compressors, electric saws, etc.).

Due to the length of construction activities (approximately 32 months) and the periodic level of noise from the period of construction vehicle use, noise exposure from project-related construction activities at the nearby residential receivers would result in a short-term significant impact from project related construction activities.

Construction Vibration

Construction Vibration Annoyance

Structure

Construction activities can generate varying degrees of ground vibration, depending on the construction procedures, construction equipment used, and proximity to vibration-sensitive uses. The effect of vibration on buildings near a construction site varies depending on the magnitude of vibration, geology, and receptor building construction. The generation of vibration can range from no perceptible effects at the lowest vibration levels, to perceptible vibrations at moderate levels, to slight damage at the highest levels. Ground vibrations from construction activities rarely reach levels that can damage structures, but can achieve the perceptible ranges in buildings close to a construction site.

Project related construction activities were assessed for the potential to result in annoyance at the nearest vibration sensitive uses. Using the FTA criteria (Table 4.4-4 above), vibration which is "barely felt" is not deemed significant. Therefore, for the evaluation of human annoyance caused by vibration from construction activities, average daytime (there will be no nighttime construction) vibration measurements which are "felt" are considered potentially significant.

The analysis of potential short-term vibration impacts was evaluated at both the closest distance that would occur as well as the average distance. The average distance assumed the vibrations would emanate from the center of the project site at an average distance of 80 feet from the project site boundary. The impact on the nearest vibration sensitive use (215 Carnation Avenue) was conservatively assumed to occur at the 215 Carnation property line. As a result, this analysis provides the maximum levels of vibration occurring at the outdoor living space located on the 215 Carnation Avenue property line. However, because construction activities are typically distributed throughout the project site, construction vibration was also assessed at the center of the project site (80 feet from the 215 Carnation Avenue property boundary) to obtain the average vibration levels that would be experienced by sensitive receptors the majority of the time. Table 4.4-8 lists the maximum and average vibration source levels for construction equipment anticipated to be used at the project site for the off-site residential receptors and at the closest residential uses. As shown in this table, vibration levels generated by the construction vehicles during the caisson drilling and excavation with a ram hoe were found to exceed the FTA's perceptibility criteria for residential uses. Potential short-term impacts from vibration induced annoyance may occur at other residences within 50 feet of the most vibration intensive construction equipment. Those phases that do not involve heavy construction equipment use were not modeled because hand tools do not generate perceptible levels of ground vibration. The residential uses being affected include only those residences immediately to the northeast and south of the project site.

Project related construction activities were assessed for the potential to result in annoyance at the nearest vibration sensitive uses. The assessment of annoyance from vibration from construction activities is based on several criteria including perceptibility, frequency of occurrence, time of occurrence and duration. In terms of perceptibility, using the FTA criteria (Table 4.4-4 above) vibration which is "barely felt" is not deemed significant because it does not constitute "exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels" as per Appendix G of the CEQA guidelines. The word "excessive" is defined by the Merriam-Webster Dictionary as "exceeding what is usual, proper, necessary, or normal." If something is "barely felt," it cannot reasonably be considered "excessive." Therefore, for the evaluation of human annoyance caused by vibration from construction activities, the criteria for establishing potentially significant vibration induced annoyance impacts is average daytime (there will be no nighttime construction) vibration measurements that are "felt." The FTA has established 84 VdB as the level that is "felt" or readily perceived.

In addition to the perceptibility criterion, the frequency of occurrence of vibration generating activities must be considered in determining what constitutes "exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels" pursuant to Appendix G of the CEQA guidelines. Loaded trucks have the potential to generate vibration as they vehicles travel down the street. However, project related truck trips will only result in transient (1-2 second) exposures of perceptible vibration as they pass in front of residences. Based on this fleeting exposure, loaded trucks would not result in significant vibration impacts for annoyance.

A third criterion for vibration induced annoyance is the duration of vibration intensive construction activities. Construction activities that involve perceptible vibration or high frequency in a day may nevertheless be considered to have less than significant vibration generated annoyance impacts if the duration of construction is short. The project's demolition, caisson drilling and excavation phases have the most potential for generating vibration at vibration sensitive residential uses. Based on the Construction Schedule attached to the Construction Management Plan, it is anticipated that there are approximately 109 total work days associated with these activities. However, vibration intensive construction activities would not exceed the "felt" vibration level of 84 VdB when construction equipment is operated 35 feet or more feet away from sensitive uses. The following represents the time period for during which demolition, caisson drilling and excavation would occur within 35 feet of vibration sensitive uses.

Demolition – 1.5 days
Caisson Drilling – 6.5 days
Excavation – 17 days

The total days for which vibration from project related construction activities would exceed the "felt" level is therefore approximately 25 work days.

The last criterion considered in assessing vibration impacts is the time of occurrence. Residential uses are much more sensitive to vibrations occurring at night as compared to the day time. Construction activities that would generate perceptible levels of vibration are time-restricted by Municipal Code Section 10.28.040. Under Section 10.28.040, construction is permitted on weekdays between the hours of 7:00 AM and 6:30 PM, Saturdays between the hours of 8:00 AM and 6:00 PM, and is prohibited on Sundays and any federal holidays.

The assessment of the potential for project related construction vibration to cause annoyance includes the four criteria previously described above: perceptibility, frequency of occurrence, time of occurrence and duration. Although the maximum vibration levels associated with certain construction activities would, in some instances as indicated in Table 4.4-8, be "felt" under FTA criteria and could occur frequently in the days they do occur, because construction activity would be limited to the least vibration-sensitive times of the day, the duration of perceptible vibration would be relatively brief and intermittent, potential vibration impacts will not result in a significant vibration annoyance impact.

Table 4.4-8

Vibration Levels from Construction Equipment at Nearest Residences (Vibration Annoyance)

Construction Activity	Maximum Vibration Levels (VdB)[2]	Average Vibration Levels (VdB)[1,3]	Exceeds Perceptibility Criteria? ("Felt" per Table 7: 84(VdB)[2])
Demolition			
Excavator (Small bulldozer)[1]	65	43	No
Backhoe Loader(Small bulldozer)[1]	65	43	No
Loaded trucks	86	71	**Yes**
Caisson Drilling			
Caisson Drill	96	72	**Yes**
Back Hoe Loader (Small bulldozer)[1]	67	43	No
Pumper	47	43	No
Loaded trucks	86	71	**Yes**
Excavation to 50 Feet NAVD88			
Large bulldozer	96	72	**Yes**
Excavator (Small bulldozer)[1]	67	43	No
Loader (Small bulldozer)[1]	67	43	No
Loaded trucks	86	71	**Yes**

Construction Activity	Maximum Vibration Levels (VdB)[2]	Average Vibration Levels (VdB)[1,3]	Exceeds Perceptibility Criteria? ("Felt" per Table 7: 84(VdB)[2])
Excavation to 40 Feet NAVD88			
Large bulldozer	96	72	**Yes**
Ram Hoe	96	72	**Yes**
Loader (Small bulldozer) [1]	67	43	No
Excavator (Small bulldozer) [1]	67	43	No
Loaded trucks	86	71	**Yes**
Excavation to 28 Feet NAVD88			
Large bulldozer	93	72	**Yes**
Excavator (Small bulldozer) 1	64	43	No
Loader (Small bulldozer) [1]	64	43	No
Loaded trucks	86	71	**Yes**
Concrete Pours			
Pumper	75	71	No
Concrete Mixer	75	71	No

[1] Vibration levels from the listed off-road construction equipment are equivalent to vibration levels generated by a small bulldozer.
[2] At the closest distance from where any large or small off-road construction equipment is in operation to the nearest structure.
[3] At an average distance (center of site to nearest structure) from where any large or small off-road construction equipment is in operation to the nearest structure.

SOURCE: Based on methodology from FTA 2006.

Cosmetic Damage from Construction Vibration

The FTA criterion for vibration-induced cosmetic damage to wood-framed structures is 0.2 inch per second. The potential for cosmetic damage generally refers to the potential for cosmetic damage (superficial cracks) to fences, walls, and flatwork, not damage that compromises the integrity of the structure. Table 19 lists the maximum vibration source levels for construction equipment anticipated to be used at the project site at off-site receptors.

As noted above, a Construction Management Plan has been prepared for the proposed project, the components of which are considered to be included as a part of the project. The CMP requires, among other things, that the Applicant agree to indemnify the property owners in the immediately contiguous lots against any cosmetic damage to their homes resulting from vibration caused by construction activities necessary to complete the project as a condition to the issuance of demolition permits for the existing structure. This indemnify obligation is subject to those contiguous owners providing Applicant, if requested, with access to their structures to allow a pre-demolition inspection of the current condition of all structures on those properties. The CMP also requires that vibration probes will be placed at 215 Carnation Avenue to monitor construction activities. A vibration monitoring program will identify any construction activity which exceeds the criteria for cosmetic damage. If excessive vibration is found to occur, other construction methods will be employed, if possible, to eliminate any occurrence of cosmetic damage. Such alternative construction methods include, but are not limited to, use of different drill bits for the caisson drilling, use of less vibration-intensive construction vehicles, use of drilling and insertion of expansive grout to fracture rock, and/or use of lubricants for the caisson drilling. Because the CMP is part of the Project Description, the evaluation of potential cosmetic damage from vibration considers activities required by the CMP to be incorporated within the project itself.

Implementation of the measures cited in the CMP will ensure that vibration-induced cosmetic damage impacts from caisson drilling, use of a ram hoe, and/or use of a large tracked dozer are avoided ad reflected in Table 4.4-9. Therefore, no mitigation measures are required and significant unavoidable vibration-induced cosmetic damage impacts will not occur as a result of project implementation.

Table 4.4-9

Vibration Source Levels for Construction Equipment at Nearest Structure (Cosmetic Damage Assessment)

Off-Site Receptors	Maximum RMS Velocity (in/sec)[1,2]	FTA Criteria (in/sec)	Exceeds FTA Criteria?
Demolition			
Excavator (Small bulldozer) [1]	0.010	0.2	No
Backhoe Loader(Small bulldozer) [1]	0.010	0.2	No
Loaded trucks	0.076	0.2	No
Caisson Drilling			
Caisson Drill	0.412	0.2	Yes
Back Hoe Loader (Small bulldozer) [1]	0.008	0.2	No
Pumper	0.012	0.2	No
Loaded trucks	0.076	0.2	No
Excavation to 50 Feet NAVD88			
Large bulldozer	0.412	0.2	Yes
Excavator (Small bulldozer) [1]	0.014	0.2	No
Loader (Small bulldozer) [1]	0.003	0.2	No
Loaded trucks	0.076	0.2	No
Excavation to 40Feet NAVD88			
Large bulldozer	0.412	0.2	Yes
Ram Hoe	0.412	0.2	Yes
Loader (Small bulldozer) [1]	0.014	0.2	No
Excavator (Small bulldozer) [1]	0.014	0.2	No
Loaded trucks	0.076	0.2	No
Excavation to 28 Feet NAVD88			
Large bulldozer	0.008	0.2	No
Ram Hoe	0.008	0.2	No
Loader (Small bulldozer) [1]	0.008	0.2	No
Excavator (Small bulldozer) [1]	0.008	0.2	No
Loaded trucks	0.076	0.2	No
Concrete Pour			
Pumper	0.164	0.2	No
Concrete Mixer	0.076	0.2	No

NOTE: RMS velocity calculated from vibration level using the reference of one microinch/second.
NA: Not Applicable

[1] At a distance of 10 feet from construction area to nearest residences to the east.
[2] Vibration levels from the listed off-road construction equipment are equivalent to vibration levels generated by a small bulldozer.

SOURCE: Based on methodology from FTA 2006.

Dock

Based on published information, typical drilling produces the peak particle vibration (PPV) of 0.089 inches/second at a distance of 25 feet. Table 4.4-10 provides a comparison of the estimated construction vibration levels to the maximum ambient vibration levels monitored at the nearby properties.

Table 4.4-10
Comparison of Estimated Construction Vibration Levels to Ambient Levels

Location Description	Maximum Ambient Vibration Level	Estimated Construction Vibration Level	
		Cosmetic Damage (PPV)	Nuisance (VdB)
Rear Patio – 101 Bayside Place	0.00128 in/sec	0.02 in/sec	70 VdB @ 90'
Pool Area – 2495 Ocean Blvd	0.00086 in/sec	0.01 in/sec	62 VdB @ 175'
Rear Patio – 2282 Channel Rd	0.00298 in/sec	0.002 in/sec	42 VdB @ 785'
Rear Patio – 2222 Channel Rd	0.00121 in/sec	0.002 in/sec	44 VdB @ 675'
SOURCE: Wieland Acoustics (March 12, 2009)			

The human annoyance and cosmetic damage criteria for vibration developed by the FTA were summarized in Table 4.4-8 and Table 4.4-9, respectively. As indicated in Table 4.4-10, the anticipated vibration associated with the construction of the dock facilities would not exceed any of the damage criteria recognized by the Federal Transit Administration for either annoyance or cosmetic damage. As a result, no significant vibration impacts are anticipated as a result of dock construction.

4.4.4.2 Long-Term Operational Impacts

Based on the ambient noise levels identified in Table 4.4-3, noise levels in the nearby harbor area are considered to be compatible with residential uses in this area. Residents of the proposed luxury condominiums, therefore, would not be exposed to significant long-term noise sources. The proposed project replaces an existing residential use and, moreover, reduces the number of dwelling units on the site by nearly 50 percent. Although on-site noise levels associated with residential activities on the redeveloped site would increase compared to current conditions because the only the single-family residential dwelling unit and three units within the apartment building are occupied, it is anticipated that any increase in long-term noise associated with the residential uses would be those occurring as a result of outdoor activities. Passive recreational activities in and around the proposed pool, on the private decks and along the walkway and beach area at the bottom of the property are not expected to result in significant noise levels. If future residents and their guests should engage in activities that result in temporary, loud noise levels that exceed the limits set forth in Chapters 10.26 and 10.28 of the City's Municipal Code, the City is empowered to take actions to abate that activity. This project would not result in exposure of neighboring residents or future residents on site to noise levels that exceed City standards. Therefore, no significant long-term noise impacts are anticipated and no mitigation measures are required.

Noise Element

Table 4.1-1 In Section 4.1 (Land Use and Planning) summarizes the relationship of the proposed project with the applicable policies adopted with the Noise Element. As revealed in the analysis presented in that table, the proposed project is consistent with the relevant policies in the Noise Element.

Aircraft Noise

The proposed project is not located within the limits of the Airport Environs Land Use Plan (AELUP) for John Wayne Airport (JWA). Therefore, the residential use would not be exposed to significant noise levels associated with that commercial aviation facility. The County of Orange Airport Land Use Commission (ALUC) uses the current AELUP for JWA as the basis for determining potential aircraft noise impact from JWA. The project site is located outside the 60 dBA CNEL aircraft operation noise contours, where the AELUP defines the noise exposure to be "Moderate Noise Impact" (i.e., an impact that would require some kind of mitigation to reduce the aircraft noise) within Noise Impact Zone "2." The AELUP also recognizes that individual sensitivities to annoyance can vary from person to person. Because the project site is located outside of this noise impact zone, no significant noise impacts from aircraft activities would occur and no mitigation measures are required.

4.4.5 Mitigation Measures

Impact 4.4-1 ***Noise levels associated with construction equipment will result in periodic substantial increases above ambient noise levels during the construction phase anticipated for the proposed project.***

MM 4.4-1a All construction equipment, stationary and mobile, shall be equipped with properly operating and maintained muffling devices, intake silencers, and engine shrouds no less effective than as originally equipped by the manufacturer.

MM 4.4-1b The construction contractor shall properly maintain and tune all construction equipment to minimize noise emissions.

MM 4.4-1c The construction contractor shall locate all stationary noise sources (e.g., generators, compressors, staging areas) as far from residential receptor locations as feasible.

MM 4.4-1d The construction contractor shall post a contact name and telephone number of the owner's authorized representative on-site.

MM 4.4-1e The construction contractor shall install temporary sound blankets or plywood panels with a minimum Sound Transmission Class rating of 32 or higher and a density of 1.5 pounds per square foot or greater (e.g., SoundSeal BBC-13-2 or equivalent) along the perimeter of the construction area proximate to residential uses. This does not include the side facing the harbor channel due to the noise attenuation provided by the buffer distance between the construction noise and harbor residences. The temporary sound blankets or plywood panels shall have a minimum height of six feet. If plywood panels are selected, they must have a minimum density of four pounds per square foot and have no perforations or gaps between the panels.

MM 4.4-1f The construction contractor shall select quieter tools or construction methods whenever feasible. Examples of this include the use of plasma cutters, which produce less noise than power saws with abrasive blades and ordering precut materials to specifications to avoid on-site cutting.

MM 4.4-1g The construction contractor shall maximize the use of enclosures as feasible. This includes four-sided or full enclosures with a top for compressors and other stationary machinery. This also includes locating activities, such as metal stud and rebar cutting, within constructed walled structures to minimize noise propagation.

4.4.6 Level of Significance After Mitigation

Construction Noise

Implementation of the construction noise reduction measures prescribed in the CMP and the mitigation measures Section 4.4.5 would attenuate noise to the maximum extent feasible. Temporary sound blankets would reduce noise levels by 5 dBA from construction activities whose line of sight is blocked by the blankets (FTA 2006). Enclosures have the potential to reduce noise levels by up to 8 dB. Working within a walled structure provides 5 dB of attenuation. With the implementation of the noise mitigation measures, noise from construction activities would be reduced. However, construction activities would still result in substantial increases above the ambient noise environment. The project would need to be in compliance with City of Newport Beach Municipal Code Section 10.26.035, which limits construction-related noise levels to weekdays between the hours of 7:00 a.m. and 6:30 p.m. and Saturdays between the hours of 8:00 a.m. and 6:00 p.m. Compliance with the Municipal Code would limit noise from construction activities to the least sensitive portions of the day. However, because of the magnitude of noise generated during the phases that involve construction vehicle use, the proximity of the noise sensitive of uses, as well as the duration of the construction period, project-related construction noise would result in an unavoidable short-term significant impact.

Construction Vibration

Annoyance from vibration generated by project-related construction activities were found to result in less than significant impacts. Similarly, implementation of the measures cited in the CMP will ensure that vibration-induced cosmetic damage impacts from caisson drilling, use of a ram hoe, and/or use of a large tracked dozer are avoided. Therefore, no mitigation measures are required and significant unavoidable vibration-induced cosmetic damage impacts will not occur as a result of project implementation.