4.12 Noise

This section describes the existing noise conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed project.

Methods for Analysis

Information contained in this section is based on the Noise Technical Report for the proposed project prepared by Dudek in July 2019. This report is included as Appendix 4.12-1 of this environmental impact report (EIR). Please refer to this appendix for the methodology used to perform noise modeling and analysis.

Summary of Notice of Preparation Comments

A Notice of Preparation (NOP) was circulated from January 19, 2019, to February 19, 2019. Approximately 150 letters were received during this comment period. Comments received related to noise included concerns regarding increased project noise impacting Serra Mesa residents due to the proximity of the proposed stadium, noise diffusion impacts in Serra Mesa from the architectural design of the stadium, and noise impacts from special events at the proposed stadium. Please see Appendix 1-1, NOP Scoping Comments, for a complete compilation of comments received on the NOP.

Project Design Features

The following project design features (PDF) are anticipated as representing both best construction practices and assumptions that support the value of construction noise level predictions herein.

PDF-N-1 California State University/San Diego State University, or its designee, will take steps necessary to ensure that all construction equipment is properly maintained and equipped with noise-reducing air intakes, exhaust mufflers, and engine shrouds in accordance with manufacturers' recommendations. Equipment engine shrouds will be closed during equipment operation.

PDF-N-2 Electrical power will be used to run air compressors and similar power tools.

PDF-N-3 All equipment staging areas will be located as far as feasible from occupied residences or schools.

PDF-N-4 Noise attenuation techniques will be employed as practical for all construction activity on and off the project site. Such techniques to achieve received noise levels below 75 A-weighted decibels (dBA) 12-hour noise equivalent level (L_{eq12h}) at potentially affected land uses will include, but are not limited to, the use of sound blankets on noise-generating equipment and the insertion of field-erected temporary sound barriers to occlude source-to-receiver sound paths.

PDF-N-5 On-site crushing facilities will be located a minimum of 600 feet from existing residences, future on-site residences, and other nonresidential noise-sensitive receivers (e.g., seasonal avian nesting areas as identified by appropriate biological surveys).

PDF-N-6 When facility design details are sufficiently complete, California State University/San Diego State University, or its designee will prepare an acoustical study(s) of sound emission from proposed stationary noise sources. Best engineering practices will be implemented in the design and selection of these systems and their noise-producing components, as well as means for noise control or sound abatement that would be expected to help noise from such stationary sources comply with applicable standards at project property lines or sensitive receptor locations, as appropriate.

PDF-N-7 To help minimize occurrence of annoying impulse noise and ground vibration, California State University/San Diego State University, or its designee will consider usage of pavement saws and other equipment in lieu of impact-generating devices such as jackhammers, pavement breakers, and hoe rams for tasks such as concrete or asphalt demolition and removal.

PDF-N-8 Where impact-type equipment are anticipated on site, California State University/San Diego State University, or its designee will consider application of noise-attenuating shields, shrouds, or portable barriers or enclosures, to reduce the magnitudes of impulse noise.

PDF-N-9 California State University/San Diego State University, or its designee will consider lining the interior surfaces of hoppers, storage bins, and chutes with sound-deadening material (i. e., apply wood or rubber sheet liners to metal bin surfaces and thus help reduce impact-type noise due to dropped hard materials on these otherwise hard surfaces).

4.12.1 Existing Conditions

The project site is located in the northeast portion of the Mission Valley community within the City of San Diego (City). Specifically, the project site is situated south of Friars Road, west of Interstate (I) 15, north of the San Diego River, and east of the existing Fenton Marketplace shopping center. It is approximately 5 miles from downtown San Diego and approximately 2.5 miles west of the existing San Diego State University (SDSU) main campus situated along I-8 within the College Area Community of the City of San Diego. The project site is in a developed area surrounded by major freeways, roadways, existing development, and the San Diego River. Higher density multifamily residential land uses are located to the northwest, southwest, and east, across I-15. Friars Road, Mission Village Road, and San Diego Mission Road are located to the north. The San Diego River, which flows east to west, is located south of the project site; and south of the river are additional office uses and I-8. To the north of Friars Road is San Diego Fire-Rescue Department Fire Station 45, undeveloped hillsides, and single-family residences situated atop the mesa. To the west are office and large commercial retail uses. Murphy Canyon Creek, a partially earthen and concrete-lined channel that conveys flow into the river, is located within the eastern project boundary, and I-15 is located east of Murphy Canyon Creek.

Sound pressure level measurements were conducted around the project site vicinity to determine the existing noise levels. The daytime, short-term (i.e., measurement duration of 1 hour or less) investigator-attended sound level measurements were taken with a Rion NL-52 sound-level meter. This sound-level meter meets the current American National Standards Institute standard for a Type 1 precision sound-level meter. The calibration of the sound-level meter was verified before and after the measurements were taken, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground.

The existing or "baseline" outdoor noise level measurements were conducted on three separate occasions:

- Monday, December 31, 2018, during the Holiday Bowl NCAA collegiate football bowl game event in progress at the existing SDCCU Stadium; and,
- Thursday, January 24, 2019, as part of a multi-day, field survey during "typical" conditions that include non-holiday roadway traffic and no event at the existing San Diego County Credit Union (SDCCU) Stadium.
- Thursday, May 23, 2019, to measure representative outdoor ambient sound levels in the riparian area immediately south of the existing stadium southern fenceline.

The noise measurement locations are depicted as Sites ST1 through ST10 in Figure 4.12-1, Noise Measurement Locations. These field survey sites were selected on the basis of providing samples of typical outdoor ambient noise levels at existing and potential future representative noise-sensitive land uses (NSLUs) in the project vicinity. The two riparian area sites are distinguished from the previous set as ST-R1 and ST-R2. As shown in Table 4.12-1 below, the measured energy-averaged noise level (L_{eq}) ranged from 50 dBA at ST10 to 76 dBA at ST1 during the December 31, 2018, field survey, and 52 dBA at ST9 to 77 dBA at ST1 during the January 24, 2019, field survey.

Table 4.12-1. Measured Noise Level and Traffic Volumes

Site	Location/ Description	Holiday Bowl (holiday roadway traffic, major event at existing Stadium)			Typical Weekday (non-holiday roadway traffic, no major event at existing Stadium)		
		Date/Time	L_{eq}	L_{max}	*Date/Time*	L_{eq}	L_{max}
ST1	Bella Posta Apartments, east of I-15	12/31/2018, 1:00 p.m. to 1:10 p.m.	76	80.9	1/24/2019, 11:30 a.m. to 11:40 a.m.	77	81.3
ST2	West of Rancho Mission Villas, east of I-15: *no event fireworks*	12/31/2018, 5:51 p.m. to 5:53 p.m.	68	72.8	1/24/2019, 11:45 a.m. to 11:55 a.m.	72	74.3
ST2	West of Rancho Mission Villas, east of I-15: *during event fireworks*	12/31/2018, 5:54 p.m. to 6:00 p.m.	85	95.3	n/a	n/a	n/a
ST3	South of Friars Road, entrance to Qualcomm Way	n/a	n/a	n/a	1/24/2019, 12:35 p.m. to 12:45 p.m.	70	82
ST4	Cul-de-sac at the northern end of Cromwell Court	12/31/2018, 7:49 p.m. to 7:58 p.m.	57	68.3	n/a	n/a	n/a
ST5	South of 2385 Northside Drive San Diego, CA 92108	12/31/2018, 5:19 p.m. to 5:28 p.m.	60	76.9	1/24/2019, 12:27 p.m. to 12:37 p.m.	54	59.4
ST6 (at LT5)	Southern Stadium fenceline (across from trolley station)	12/31/2018, 11:54 a.m. to 12:08 p.m.	63	68.6	n/a	n/a	n/a

Table 4.12-1. Measured Noise Level and Traffic Volumes

Site	Location/ Description	Holiday Bowl (holiday roadway traffic, major event at existing Stadium)			Typical Weekday (non-holiday roadway traffic, no major event at existing Stadium)		
		Date/Time	L_{eq}	L_{max}	*Date/Time*	L_{eq}	L_{max}
ST6A (at LT5a)	South of San Diego River, east of Mission City Parkway	n/a	n/a	n/a	1/24/2019, 12:05 p.m. to 12:15 p.m.	65	66.4
ST7	Mission Valley Public Library, north of Fenton Parkway	12/31/2018, 5:00 p.m. to 5:09 p.m.	60	68	1/24/2019, 11:34 a.m. to 11:40 a.m.	59	63.6
ST8	Backyard of 5399 Wilshire Drive	12/31/2018, 1:55 p.m. to 2:04 p.m.	72	74.6	n/a	n/a	n/a
ST8	Southeast corner of Caminito Cascara and Rancho Mission Road	n/a	n/a	n/a	1/24/2019, 11:52 a.m. to 12:02 p.m.	67	77.8
ST9	South stairs of Juarez Elementary School	12/31/2018, 4:06 p.m. to 4:15 p.m.	55	65.3	1/24/2019, 10:35 a.m. to 10:40 a.m.	52	63.5
ST10	East of 2340 Harcourt Drive San Diego, California 92123	12/31/2018, 4:36 p.m. to 4:45 p.m.	50	64.8	1/24/2019, 10:48 a.m. to 10:53 a.m.	53	59.6
ST-R1	San Diego River riparian area, north of ST6A	n/a	n/a	n/a	5/23/2019, 9:30 a.m. to 9:40 a.m.	64	68.6
ST-R2	San Diego River riparian area, north of ST6	n/a	n/a	n/a	5/23/2019, 10:00 a.m. to 10:10 a.m.	59	66.2

Notes: L_{eq} = Equivalent Continuous Sound Level (Time-Average Sound Level); L_{max} = Maximum Noise Level.

In general, at survey positions ST1, ST2, ST5, ST7, ST9, and ST10, where attended sound pressure level (SPL) measurements were performed during both the Holiday Bowl event day (December 31, 2018) and a subsequent weekday without an event taking place at the existing Stadium, L_{eq} values from the sampling periods were comparable and no more than 3 dBA apart. The SPL measurement at ST5 during the Holiday Bowl event was 6 dBA higher than that of the subsequent survey result, but it included event-attributed intermittent sounds as suggested by the much higher maximum noise level (L_{max}) value during the measurement period.

Unattended long-term (“LT”, for several consecutive hours or consecutive diurnal cycles) SPL measurements were also performed during the two aforesaid field surveys to yield empirical data to exhibit how project vicinity outdoor ambient noise levels may vary over a sample 24-hour period, and over successive days, due nearby roadway traffic flows and other observed environmental factors. Appendix 4.12-1 presents plots of L_{eq} values collected at a variety of surveyed positions identified geographically in Figure 4.12-1. Key findings from study of these LT plots are as follows:

- As measured at LT1, a survey location on the edge of the western Bella Posta Apartments parking lot that adjoins the I-15 northbound easement, SPL dominated by highway traffic noise was generally higher during the 1:00 p.m. to 8:00 p.m. period on December 31, 2018, when compared with the same 7-hour time period on January 24, 2019. A pronounced "spike" of approximately 10 minutes in duration is consistent with the observed fireworks performed over the Stadium as part of the Holiday Bowl festivities.

- As measured at LT4A, a survey location on northern edge of a residential property overlooking the Stadium and the I-15/I-8 interchange, SPL dominated by highway traffic noise was generally higher during a measured 19-hour period (beginning at 2:00 p.m. on December 31, 2018, and continuing to 11:00 a.m. on January 1, 2019) when compared with the same consecutive hours from January 24–25, 2019. A noise level spike occurs during the aforementioned Holiday Bowl fireworks. Further, although apparent highway traffic noise appears to drop significantly before midnight and the onset of New Year's Day, apparent traffic noise rises sharply and then tapers gradually to lower levels as the early morning hours of New Year's Day transpire—suggesting that many motorists were driving back home after attending New Year's Eve festivities. In contrast, the pattern of noise level rise and decline for the January 24–25, 2019, period appears representative of typical expected conditions: during the day, there is prominence associated with usual commuter traffic peaks in the morning, afternoon, and evening. At night, SPL during the January 24–25, 2019, period dips down from daytime highs in the mid-70s to nearly 60 dBA.

4.12.2 Relevant Plans, Policies, and Ordinances

Federal

The Noise Control Act of 1972

The Noise Control Act of 1972 recognized the role of the federal government in dealing with major commercial noise sources, which require uniform treatment. Since Congress has the authority to regulate interstate and foreign commerce, regulation of noise generated by such commerce also falls under congressional authority. The federal government specifically preempts local control of noise from aircraft, railroads, and interstate highways. The U.S. Environmental Protection Agency has identified acceptable noise levels for various land uses to protect the public, with an adequate margin of safety, and establish noise emission standards for interstate commerce.

The Department of Housing and Urban Development standards define day–night average sound (L_{dn}) levels below 65 dBA outdoors as acceptable for residential areas. Outdoor levels up to 75 dBA L_{dn} may be made acceptable through the use of insulation in buildings.

State

California Code of Regulations

Title 24, California Code of Regulations, Noise Insulation Standards, establishes the acceptable interior environmental noise level (45 dBA L_{dn}) for multifamily dwellings (may be extended by local legislative action to include single-family dwellings). California Code of Regulation Section 65302(f) requires local land use planning jurisdictions to prepare a general plan. The Noise Element is a mandatory component of the general plan. It may include general community noise guidelines developed by the Governor's Office of Planning and Research and specific planning guidelines for noise/land use compatibility developed by the local jurisdiction. The state guidelines also recommend that the local jurisdiction should consider adopting a local noise control ordinance. The Governor's Office of Planning and Research has developed guidelines (OPR 2017) for community noise acceptability for use by local agencies. Selected relevant levels are as follows (L_{dn}/DNL may be considered approximately equivalent to Community Noise Equivalent Level [CNEL]):

- CNEL below 60 dBA—normally acceptable for low-density residential use;
- CNEL of 55 to 70 dBA—conditionally acceptable for low-density residential use;
- CNEL below 65 dBA—normally acceptable for multifamily residential use;
- CNEL of 60 to 70 dBA—conditionally acceptable for multifamily residential use, transient lodging, churches, educational and medical facilities; and
- CNEL below 70 dBA—normally acceptable for playgrounds and neighborhood parks.

"Normally acceptable" is defined as satisfactory for the specified land use, assuming that normal conventional construction is used in buildings. "Conditionally acceptable" may require some additional noise attenuation or special study. Under most of these land use categories, overlapping ranges of acceptability and unacceptability are presented, leaving some ambiguity in areas where noise levels fall within the overlapping range.

The State of California additionally regulates the noise emission levels of licensed motor vehicles traveling on public thoroughfares, sets noise emission limits for certain off-road vehicles and watercraft, and sets required sound levels for light-rail transit vehicle warning signals. The extensive state regulations pertaining to worker noise exposure are, for the most part, applicable only to the construction phase of any project (e.g., the Cal-OSHA Occupational Noise Exposure Regulations [8 CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, Section 5095, et seq.]) or workers in a central plant and/or a maintenance facility or involved in the use of landscape maintenance equipment or heavy machinery.

Local

Because SDSU is a component of the California State University, which is a state agency, the proposed project is not subject to local government planning and land use plans, policies, or regulations. However, for informational purposes, SDSU has considered the following planning documents and the project's site location within, and relationship to, each. The proposed project would be subject to federal and state agency planning documents described above, but would not be subject to regional or local planning documents such as the City's General Plan, Mission Valley Community Plan, or City municipal zoning code.

City of San Diego Municipal Code 59.5.0401

The City's Noise Ordinance limits property line noise levels for various land uses by time of day for noise generated by on-site sources associated with project operation (Table 4.12-2), such as the following for multifamily residential land uses: 55 dBA L_{eq} from 7:00 a.m. to 7:00 p.m., 50 dBA L_{eq} from 7:00 p.m. to 10:00 p.m., and 45 dBA L_{eq} from 10:00 p.m. to 7:00 a.m. A project that would generate noise levels at the property line that exceed the City's Noise Ordinance Standards is considered potentially significant (such as potentially a carwash or projects operating generators or noisy equipment). If a nonresidential use, such as a commercial, industrial, or school use, is proposed to abut an existing residential use, the decibel level at the property line should be the arithmetic mean of the decibel levels allowed for each use as set forth in San Diego Municipal Code Section 59.5.0401 (Table 4.12-2).

Table 4.12-2. Applicable Noise Limits

Land Use	Time of Day	One-Hour Average Sound Level (dB)
Single-family residential	7:00 a.m. to 7:00 p.m.	50
	7:00 p.m. to 10:00 p.m.	45
	10:00 p.m. to 7:00 a.m.	40
Multifamily residential (up to a maximum density of 1/2,000)	7:00 a.m. to 7:00 p.m.	55
	7:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
All other residential	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial	7:00 a.m. to 7:00 p.m.	65
	7:00 p.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	60
Industrial or agricultural	Any time	75

Note: dB = decibels

City of San Diego Municipal Code 59.5.0404 (Noise Ordinance), Construction Noise

Aside from emergency work, temporary construction noise is limited to 75 dBA L_{eq} over a 12-hour period at a residentially-zoned receptor. In addition, construction activity is prohibited between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with the exception of Columbus Day and Washington's Birthday, or on Sundays, that would create disturbing, excessive, or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator, in conformance with San Diego Municipal Code Section 59.5.0404.

City of San Diego General Plan

The City's General Plan Noise Element identifies compatible exterior noise levels for various land use types (City of San Diego 2008). The maximum allowable noise exposure varies depending on the land use. The maximum acceptable exterior noise level for residential uses and other noise-sensitive uses (including kindergarten through 12th grade schools, libraries, hospitals, daycare facilities, hotels, motels) is 65 dBA CNEL. However, exterior noise levels are considered compatible up to 75 dBA CNEL at higher education institutions.

Significance Determination Thresholds

The City of San Diego's California Environmental Quality Act (CEQA) Significance Determination Thresholds outline the criteria and thresholds used to determine whether project impacts are significant (City of San Diego 2011). The following three categories of thresholds have been used in this analysis for identifying potentially significant noise impacts as a result of implementation of the proposed project.

<u>Interior and Exterior Noise Impacts from Traffic-Generated Noise</u>

The City's CEQA Significance Determination Thresholds provide guidance on implementing the City's noise policies and ordinances, including the general thresholds of significance for uses affected by traffic noise included in Table 4.12-3. As shown in Table 4.12-3, the noise level at exterior usable open space for single- and multifamily residences should not exceed 65 dBA.

Operational noise is typically considered permanent, in the sense of the duration of the operation of the constructed facility, while not continuous in nature and occurring only when the Stadium is hosting an event (in progress). A significant permanent increase is defined as a direct project-related permanent ambient increase of 3 dBA or greater, where exterior noise levels would already exceed the City's significance thresholds (City of San Diego 2011) (e.g., 65 dBA daytime for single-family residential land uses). An increase of 3 dBA is perceived by the human ear as a barely perceptible increase.

Table 4.12-3. Traffic Noise Significance Thresholds

Structure of Proposed Use That Would Be Impacted by Traffic Noise	Interior Space	Exterior Useable Space[1]	General Indication of Potential Significance
Single-family detached	45 dB	65 dB	Structure or outdoor useable area[2] is <50 feet from the center of the closest (outside) lane on a street with existing or future average daily traffic >7,500
Multifamily, school, library, hospital, day care center, hotel, motel, park, convalescent home	Development Services Department ensures 45 dB pursuant to Title 24	65 dB	
Office, church, business, Professional uses	n/a	70 dB	Structure or outdoor useable area is <50 feet from the center of the closest lane on a street with existing or future average daily traffic >20,000
Commercial, retail, industrial, outdoor sports uses	n/a	75 dB	Structure or outdoor useable area is <50 feet from the center of the closest lane on a street with existing or future average daily traffic >40,000

Source: City of San Diego 2011.

Notes:

1 If a project is currently at or exceeds the significance thresholds for traffic noise described above and noise levels would result in less than a 3-dB increase, then the impact is not considered significant.

2 Exterior useable areas do not include residential front yards or balconies unless the areas such as balconies are part of the required useable open space calculation for multifamily units.

Impacts to Sensitive Wildlife

Noise mitigation may be required for significant noise impacts to certain avian species during their breeding season depending upon the location of the slope (such as adjacent to an Multi-Habitat Planning Area) and what birds may be present in the area such as the California gnatcatcher (*Polioptila californica*), least Bell's vireo (*Vireo bellii)*, southwestern willow flycatcher (*Empidonax traillii extimus)*, least tern (*Sternula antillarum*), cactus wren (*Campylorhynchus brunneicapillus*), tricolored blackbird (*Agelaius tricolor*), western snowy plover (*Charadrius nivosus*), or burrowing owl (*Athene cunicularia*). If these avian species (except for the California gnatcatcher) are present, then mitigation will be required if construction or operational noise levels would exceed 60 dBA or the existing ambient noise level if already above 60 dBA during the breeding season. For California gnatcatcher habitat within the Multi-Habitat Planning Area and occupied, construction or operational noise levels exceeding 60 dBA (or exceeding the existing ambient noise level if already above 60 dBA) during the breeding season is considered significant. There are no restrictions for the gnatcatcher outside the Multi-Habitat Planning Area anytime of the year.

Noise/Land Use Compatibility

Table NE-3 from the City's General Plan Noise Element indicates the City's exterior unconditional "compatible" noise level standard for noise-sensitive areas is 60 dBA CNEL. The City assumes that standard construction design techniques would provide a 15-dB reduction of exterior noise levels to interior noise levels of 45 dBA CNEL or less when exterior sources are 60 dBA CNEL or less. When exterior noise levels are greater than 60 dBA CNEL and the interior threshold is 45 dBA CNEL, consideration of specific construction techniques is required. Areas with exterior noise levels of up to 70 dBA CNEL are “conditionally compatible” provided that the building structure attenuates interior noise levels to 45 dBA CNEL.

4.12.3 Significance Criteria

The significance criteria used to evaluate the project impacts related to noise are based on CEQA Guidelines Appendix G. According to Appendix G, a significant impact related to noise would occur if the project would:

1. Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Result in generation of excessive groundborne vibration or groundborne noise levels.
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

In analyzing impacts related to these significance criteria, pertinent noise regulations and other standards, introduced in Section 4.12.2, are considered and utilized as addressed below.

Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

For temporary construction activities associated with the proposed project, which are anticipated to be carried out as sequential phases (but as appropriate may have concurrent activities across the project site), generated noise that exceeds 75 dBA L_{eq} over a 12-hour period at the property line of a residentially zoned receptor would be considered significant per Section 59.5.0404(b) of the City’s Noise Ordinance.

For stationary sound sources attributed to the proposed project, exceedance of the City’s 1-hour average sound level limits would constitute a significant impact. For example, at the multifamily residential properties (Monte Vista) to the northwest of the proposed project, the daytime, evening, and nighttime noise limits would be 55 dBA 1-hour A-weighted equivalent sound level (L_{eq1h}), 50 dBA L_{eq1h}, and 45 dBA L_{eq1h}, respectively.

For project-attributed increases to local roadway traffic volumes, a significant permanent increase to the outdoor sound environment would be defined as an increase of 3 dBA or greater, where exterior noise levels would already exceed the City’s significance thresholds (City of San Diego 2011) (e.g., 65 dBA daytime for single-family residential land uses). An increase of 3 dBA is perceived by the average healthy human ear as barely perceptible.

Generation of excessive groundborne vibration or groundborne noise levels.

Due to a lack of vibration level regulation or policy guidance at the local level, this impact analysis will apply Federal Transit Administration (FTA) and California Department of Transportation guidance that suggests 0.2 inches per second (ips) peak particle velocity (PPV) (or 94 vibration velocity decibels [VdB]) as both an annoyance-based criterion for occupants of inhabited buildings and a risk level for minor cosmetic damage to typical residential buildings featuring non-engineered timber and masonry (Caltrans 2013).

For a project located within the vicinity of a private airstrip or an airport land use plan or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

The project site is not located within the vicinity of a private airstrip, public airport, or otherwise exposed to excessive noise levels due to normal aviation traffic.

4.12.4 Impacts Analysis

Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Temporary Increase (Construction)

Conventional Equipment

Development activities for project construction would generally involve the following sequence for all three defined phases of construction of the proposed project: (1) site grading, (2) trenching, (3) building construction, (4) architectural coating, and (5) paving.

The following are typical types of construction equipment that would be expected:

- Concrete/industrial saws
- Excavators
- Dozers
- Tractors/loaders/backhoes
- Forklifts
- Welders
- Cement and mortar mixers
- Paving equipment
- Trenching equipment
- Off-highway water trucks
- Pile drivers (and comparable equipment or activities, such as dynamic compactors)
- Asphalt trucks
- Materials delivery trucks
- Pneumatic tools
- Graders
- Cranes
- Generator sets
- Air compressors
- Pavers
- Scrapers
- Rollers
- Concrete trucks

As demonstrated by this list, construction equipment anticipated for all phases of project development would include standard equipment that would be employed for any routine construction project of this scale. The proposed project would also include demolition of the existing stadium structure. While controlled detonation is not anticipated to be used, demolition may include controlled detonation in lieu of a mechanical means of rendering the structure into materials that can be re-used on site or transported off site, or to supplement a mechanical means of demolition.

Construction noise is difficult to quantify because of the many variables involved, including the specific equipment types, size of equipment used, percentage of time, condition of each piece of equipment, and number of pieces of equipment that will actually operate on the site. The range of maximum noise levels for various types of construction equipment at a distance of 50 feet is depicted in Table 4.12-4.

The noise values represent maximum noise generation, or full-power operation of the equipment. As an example, a loader and two dozers, all operating at full power and relatively close together, would generate a maximum sound level of approximately 86 dBA at 50 feet from their operations. As one increases the distance between equipment, or separation of areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of separate noise sources added together. In addition, typical operating cycles may involve 2 minutes of full-power operation, followed by 3 or 4 minutes at lower levels. The average noise level during construction activities is thus generally lower than the aggregate of maximum sound levels, since maximum noise generation may only occur up to 50% of the time.

Table 4.12-4. Construction Equipment Noise Emission Levels

Equipment	Typical Sound Level (L_{max}, dBA) 50 Feet from Source
All Other Equipment > 5 HP	85
Backhoe	78
Compressor (air)	78
Concrete Saw	90
Crane	81
Dozer	82
Excavator	81
Front-End Loader	79
Generator	72
Grader	85
Man Lift	75
Mounted Impact Hammer (hoe ram)	90
Paver	77
Roller	80
Scraper	84
Tractor	84
Welder/Torch	73

Source: FTA 2018.
Notes: L_{max} = Maximum Noise Level; dBA = A-weighted decibels; HP = horsepower.

Off-Site Noise Impacts from Daytime Construction

The nearest off-site sensitive receptors to the on-site project site construction work would be the multifamily homes (i.e., Monte Vista Apartment Homes [MVAH]) to the northwest, on the north side of Friars Road. Noise levels generated by construction equipment (or by any point source) decrease at a rate of approximately 6 dBA per doubling of distance from the source (Beranek & Ver 1992). Therefore, if a particular construction activity generated average noise levels of 88 dBA at 50 feet, the L_{eq} would be 82 dBA at 100 feet, 76 dBA at 200 feet, 70 dBA at 400 feet, and so on. Intervening structures that block the line of sight, such as buildings, would further decrease the resultant noise level by a minimum of 5 dBA. The effects of molecular air absorption provide an additional source of attenuation that is often approximated for "standard air" (10° Centigrade, 70% relative humidity) at a rate of 1 dBA per 1,000 feet.

The closest point of construction activities to the nearest noise-sensitive receivers would be approximately 175 feet during off-site improvements to Friars Road and San Diego Mission Road.

The noise levels from the construction equipment to nearby sensitive receptors would be nominal given the distance between the construction activity area and high existing ambient noise level. The estimated construction noise levels (expressed as 12-hour L_{eq} values) at nearby NSLUs are summarized in Table 4.12-5.

Table 4.12-5. Construction Noise Modeling Summary Results

Construction Phase	Distance to Nearest Receiver (feet)	Predicted 12-hour L_{eq} (dBA)
Grading Phase A	450	70.9
Site Preparation Phase A	600	65.1
Building Construction Stadium (Phase A)	600	63.5
Grading Phase A (cont'd)	450	70.6
Grading Phase B (Rough Residential Pad & Initial River Parks)	475	71.5
Site Preparation Phase B (utilities)	1,200	58.1
Paving Stadium (Phase A)	200	72.9
Demolition of SDCCU Stadium (Phase A)	1,200	69.9
Architectural Coating Stadium (Phase A)	600	58.5
Demolition of SDCCU Stadium (Phase B)	1,200	68.0
Finish Phase B (Finish Residential Pad and River Park)	450	67.9
Grading Phase C	450	71.9
Building Construction Phase C1	450	65.9
Site Preparation - Off-Site Improvements	175	73.1
Paving Phase C1	450	65.2
Architectural Coating Phase C1	600	55.4
Building Construction Phase C2	450	66.4
Paving Phase C2	450	66.1
Architectural Coating Phase C2	600	55.4
Building Construction Phase C3	800	58.0
Paving Phase C3	450	65.2
Architectural Coating Phase C3	450	57.9

Notes: L_{eq} = Noise Equivalent Level; dBA = A-weighted decibels

As shown in Table 4.12-5, the noise levels during on-site construction-related activities would be below the City's 75 dBA 12-hour average noise level criterion at the nearest off-site NSLUs. Thus, temporary off-site construction noise impacts from construction on the project site would be **less than significant.**

Nighttime Construction

It is anticipated that nighttime construction would be necessary during some portions of project development. Between approximately January 1, 2022, and August 31, 2022, in order to complete the Stadium, a 16-hour work day may be required (roughly 6:00 a.m. to 10:00 p.m.); however, the final work schedule is not available. Therefore, around-the-clock construction activities (i.e., 24 hours per day) have been assumed. Under such circumstances, nighttime construction activity would occur outside of the City's allowable 7:00 a.m. to 7:00 p.m. daytime period and potentially expose nearby noise-sensitive receptors to sound levels that, depending on activity location, intensity, and equipment type and quantities that are not clearly defined at the time of this writing, could exceed City hourly L_{eq} thresholds during evening and nighttime periods (i.e., 7:00 p.m. to 7:00 a.m.), and therefore result in **potentially significant impacts** (**Impact NOI-1**).

Off-Site Improvements

It is anticipated that there will be off-site construction for utility connections and/or road improvements. Depending on factors that include the proximity of construction activity to NSLU, activity location, intensity, timing, and equipment type and quantities that are not known at this time, noise emissions attributed to implementation of these off-site improvements could occur within or external to the City's typically allowable 7:00 a.m. to 7:00 p.m. daytime period and thus potentially expose nearby noise-sensitive receptors to sound levels that exceed either the 12-hour City threshold of 75 dBA L_{eq} allowable between 7:00 a.m. and 7:00 p.m. or the appropriate City hourly L_{eq} thresholds during evening and nighttime periods (i.e., 7:00 p.m. to 7:00 a.m.), and therefore result in **potentially significant impacts** (**Impact NOI-2**).

On-Site Construction Noise Impacts

Because the development of the proposed project would be a multiyear endeavor, portions of the development would be completed and occupied during the construction of subsequent portions (phases). Therefore, the occupied proposed project phases have the potential to be impacted by noise from ongoing construction activities. Location-specific phasing schedules for vertical construction beyond the stadium are not available at this time; it is therefore possible that construction of a new phase of the proposed project could take place as near as 50 feet of an occupied phase. In such an instance, short-term construction levels as high as 81 dBA could occur. This impact would be **potentially significant.** (**Impact NOI-3**)

Portable Rock-Crushing/Processing Facility

A portable crushing/processing facility may be used on site during construction activities to crush and re-use existing concrete and asphalt associated with the parking lot and existing SDCCU Stadium. These materials would be recycled on site into future fill material to avoid off-site import of fill material.

Typically, crushing operations would begin with a front-end loader picking up material and dumping the material into a primary crusher. The material would then be crushed, screened, and stacked in product piles. The material would be stockpiled adjacent to the crushing equipment. All material would be used on site. Electric power would most likely be provided by a diesel engine generator. Based on noise measurements that have been conducted for portable crushing operations (Ldn Consulting 2011), the crushing activity would generate a 3-hour average noise level of approximately 80 dBA at a distance of 100 feet from the combination of a jaw crusher and cone crusher.

At a distance of 250 feet, the average noise level from this studied rock crushing operation would be reduced to 72 dBA L_{eq} and could, therefore, combine with non-crusher construction noise at the same intensity (72 dBA L_{eq}) but still comply with the City standard due to the principles of logarithmic addition (i.e., the log-sum of 72 dB and 72 dB is 75 dB). Therefore, where possible and practical, rock-crushing equipment should be located further than 250 feet to minimize annoyance to nearby NSLUs.

The closest existing off-site residence property line or NSLU could be located within approximately 175 feet of the project site. At this distance, the noise level associated with the rock crushing activities—were they to be located as close as the project property line—would be approximately 75 dBA L_{eq} (hourly) and approximately 83 dBA L_{max}. While this rock crusher noise level does not individually exceed the City's construction noise threshold, it could combine with noise propagation from other on-site construction activities and therefore result in an aggregate construction noise impact that would be **potentially significant.** (**Impact NOI-4**)

Construction Noise Impacts to Sensitive Wildlife

Noise mitigation may be required for significant noise impacts to certain avian species during their breeding season located in or adjacent to a Multi-Habitat Planning Area south of the project site. Temporary construction noise could reach up to 79 dBA during construction near the southern boundary. Significance of impacts are discussed in Section 4.3, Biological Resource, and the Biological Resources Technical Report (Appendix 4.3-1).

Stadium Implosion Scenario

While not anticipated as part of the proposed project, due to the presence of the existing SDCCU Stadium structure and the project construction schedule, implosion of the existing Stadium or portions thereof may be determined to be the most efficient and preferred method for demolition to implement the proposed project. At the current stage of the proposed project design, a blasting study has not been completed, and no specific blasting timelines, or blast parameters are available. However, in order to address and evaluate this potential scenario, the following is based on the potential (based upon other implosion events) that one large implosion may occur.

Blasting typically involves drilling a series of boreholes, placing explosives ("charge") in each hole, then topping the charge with fill material to help confine the blast. These multiple holes are typically arranged so as to yield optimal fracturing of the structure and thus allow gravity to subsequently collapse or "implode" the structure in as safe and controlled manner as possible after detonation. Post-detonation material can then be further broken down to manageable size and hauled away with conventional construction equipment and vehicles. By limiting the amount of charge in each hole, and detonating each charge successively with a time delay, the blasting contractor can limit the total energy released at any single time, which in turn reduces the airborne noise L_{max} and groundborne vibration energy associated with each individual detonated charge.

By way of example, using mathematical expressions provided by the Blasting and Explosives Quick Reference Guide (Dyno Nobel 2010), up to an 8-kilogram (17.6 pounds) charge per detonation would result in 85 dBA L_{max} at a distance of 1,200 feet. Due to the impulsive nature of the blast, the sound lasts no more than a second, which means the hourly L_{eq} for a single detonation would be less than 50 dBA L_{eq}. Hence, many detonations could occur in succession as part of a single "implosion" event per a well-designed blasting plan and still result in potential compliance with the City's noise standards. Until such blasting details are known, this assessment shall assume that blasting noise is **potentially significant.** (**Impact NOI-5**)

Permanent Noise Increase (Operations)

Off-Site Traffic Noise

Operational noise is typically considered permanent, in the sense of duration for operation of the constructed facility. The character of operation noise would include relatively continuous sources such as heating, ventilating, and air conditioning (HVAC) systems associated with newly constructed buildings, above which noise due to an in-progress stadium event (of limited duration) would likely dominate the outdoor sound environment. As shown in Table 4.12-2, the noise level at exterior usable open space for single- and multifamily residences should not exceed 65 dBA.

A significant permanent increase is defined as a direct project-related permanent ambient increase of 3 dBA or greater, where exterior noise levels would already exceed the City's significance thresholds (City of San Diego 2011) (e.g., 65 dBA daytime for single-family residential land uses). An increase of 3 dBA is perceived by the human ear as a barely perceptible increase.

The proposed project would generate a net traffic volume increase as overall daily trips from the project site would increase compared to the existing use. To be conservative, the proposed project traffic volumes without implementation of Transportation Demand Management measures were used for noise modeling purposes. The largest anticipated gains in roadway traffic volumes, in terms of percentage growth, would be along Friars Road and Ward Road (Appendix 4.15-1). Using the Federal Highway Administration's Traffic Noise Model (FHWA 2004), the noise level increase associated with the additional traffic volume was calculated. The results are summarized in Table 4.12-6. The Traffic Noise Model input and output data files are provided in Appendix 4.12-1.

Table 4.12-6. Traffic Noise Modeling Results Summary (Typical Day, No Stadium Event)

Site	Existing (CNEL (dBA))	Existing Plus Project (CNEL (dBA))	Increase (dB)	Horizon Year without Project (CNEL (dBA))	Horizon Year Plus Project (CNEL (dBA))	Increase (dB)
ST1	78.1	78.1	0	79	79.1	0.1
ST2	74.8	74.8	0	75.7	75.8	0.1
ST3	62.7	63.9	1.2	63.5	64.5	1
ST4	70.4	70.4	0	71.2	71.4	0.2
ST5	56.2	57	0.8	57	57.7	0.7
ST6	68	68.1	0.1	68.9	68.9	0
ST7	59.4	59.7	0.3	60.2	60.5	0.3
ST8	67.1	68.4	1.3	68	69.1	1.1
ST9	55.5	55.7	0.2	56.4	56.6	0.2
ST10	55.3	55.8	0.5	56.2	56.7	0.5

Notes: CNEL = Community Noise Equivalent Level; dBA = A-weighted decibel; dB = decibel.

As shown in Table 4.12-6, the additional traffic associated with the proposed project would increase the noise at receptor locations by 1 dB CNEL or less (rounded to whole numbers). Thus, the additional project-generated traffic volume along the roads would not substantially increase the ambient noise level.

The existing plus project plus Stadium event traffic noise would generate a noise level increase of 2 dB CNEL or less (rounded to whole numbers) along the studied roads in the vicinity of the project site. The noise level increases associated with the additional traffic volume associated with a Stadium event in progress are depicted in Table 4.12-7.

Table 4.12-7. Traffic Noise Modeling Results Summary (Stadium Event Day)

Site	Existing (CNEL (dBA))	Existing Plus Project Plus Event (CNEL (dBA))	Increase (dB)	Horizon Year without Project (CNEL (dBA))	Horizon Year Plus Project Plus Event (CNEL (dBA))	Increase (dB)
ST1	78.1	78.1	0	79	79.1	0.1
ST2	74.8	74.8	0	75.7	75.8	0.1
ST3	62.7	64.4	1.7	63.5	65	1.5
ST4	70.4	70.4	0	71.2	71.4	0.2
ST5	56.2	57.3	1.1	57	58	1
ST6	68	68	0	68.9	68.9	0
ST7	59.4	59.7	0.3	60.2	60.6	0.4
ST8	67.1	68.5	1.4	68	69.2	1.2
ST9	55.5	55.8	0.3	56.4	56.7	0.3
ST10	55.3	55.9	0.6	56.2	56.7	0.5

Notes: CNEL = Community Noise Equivalent Level; dBA = A-weighted decibel; dB = decibel.

The additional traffic volume along the adjacent roads would not substantially increase the existing noise level in the project vicinity, and the traffic noise level increase is considered **less than significant**; no mitigation measures are necessary.

Trolley Noise

The Metropolitan Transit System Green Line Trolley bisects the project site. For informational purposes, the following description of potential noise levels from continued operations of the Green Line is reproduced from Appendix J (Noise Analysis) of the Mission Valley Community Plan Update (RECON 2019). Future Green Line Trolley operations are anticipated to continue similar to the existing schedule. The 60, 65, and 70 CNEL contour distances for the Green Line Trolley are summarized in Table 4.12-8. As shown, the 60 CNEL contour extends up to approximately 272 feet from the center of the trolley tracks between the Stadium and Fenton Parkway trolley stations, and the 65 CNEL contour extends up to approximately 86 feet from the trolley tracks.

Table 4.12-8. Green Line Trolley Noise Contour Distances

Stations	Noise Level at 50 feet (CNEL)	Distance to Noise Contour (feet)		
		70 CNEL	*65 CNEL*	*60 CNEL*
Mission San Diego to Stadium	58	3	10	32
Stadium to Fenton Parkway	67	27	86	272

Source: RECON 2018.
Note: CNEL = community noise equivalent level.

The nearest NSLUs would be located on the north side of the trolley alignment, with some uses abutting the right-of-way at distances as close as 25 feet from the centerline. These land uses would potentially experience temporary noise exceedances while the trolley passes by; however, these would be very short in duration. Nevertheless, per the California Building Code, design and construction of the exterior shell (including fenestration) for proposed project residential buildings in proximity to the existing trolley route will include adequate sound insulation so that interior sound levels due to exterior-to-interior noise intrusion would not exceed 45 dBA CNEL. Impacts would be **less than significant**.

Parks and Open Space Maintenance Activities

For guidance purposes, Section 59.5.0502(g)(4) of the City of San Diego Noise Ordinance restricts noise from the operation of leaf blowers to 65 dB at a distance of 50 feet. Adjusted to this 50-foot distance, a typical riding-style lawn mower has a comparable noise level (Berger et al. 2015). When such equipment would operate as part of usual maintenance activities at parks and open spaces that are proximate to the nearest future NLSU resulting from development of the proposed project, outdoor ambient noise levels would temporarily rise. However, assuming such activities involve one mower or blower, limited to no more than an hour per day at a distance no closer than 20 feet to the exterior of an NSLU, the resulting predicted sound level would be 60 dBA CNEL and thus compliant with what the City considers "compatible" with the exterior of an NSLU. On this basis, impacts related to noise from park and open space maintenance activities would be considered **less than significant.**

Stationary Noise Sources

As presented in Table 4.12-2, the City of San Diego Noise Ordinance limits property line noise levels for various land uses by time of day for noise generated by on-site sources associated with project operation (e.g., for multifamily residential, 55 dBA L_{eq} from 7:00 a.m. to 7:00 p.m., 50 dBA L_{eq} from 7:00 p.m. to 10:00 p.m., and 45 dBA L_{eq} from 10:00 p.m. to 7:00 a.m.). A project that would generate noise levels at the property line that exceed the City's Noise Ordinance Standards is considered potentially significant (such as potentially a carwash or projects operating generators or noisy equipment). If a nonresidential use, such as a commercial, industrial, or school use, is proposed to abut an existing residential use, the decibel level at the property line should be the arithmetic mean of the decibel levels allowed for each use as set forth in San Diego Municipal Code Section 59.5.0401 (Table 4.12-2).

Emergency Generators

The proposed project may include stand-by generators that would operate during emergencies and provide mission-critical power to on-site medical facilities (e.g., urgent care) and telecommunication infrastructure. While operation of such systems during actual emergencies would normally be exempt from City noise standards, short-duration operation during testing at required intervals (e.g., once per month) may produce localized high levels of noise. Therefore, generators would feature sound-insulating enclosures, sound attenuated air intakes (e.g., acoustical louvers or baffled sound traps), and combustion exhaust silencers of sufficient noise-reducing performance or "grade" so as to minimize the potential noise impact from such testing procedures. By way of example, Cummins offers three distinct levels of sound attenuation for a packaged generator, resulting in operating sound levels at a distance of 23 feet ranging from 89 dBA to 70 dBA (Diesel Service & Supply 2019). Given this range of noise emission from an operating enclosed unit during a daytime test, and depending on the level of sound attenuation selected, the project could locate one outdoors at a distance of 40 to 400 feet from the exterior of an occupied on-site residence or commercial use (e.g., retail) and avoid potentially significant noise impact by minimizing outdoor noise exposure and corresponding exterior-to-interior noise intrusion to the occupied new residence or commercial use.

HVAC Systems

Anticipated new on-site stationary operating mechanical equipment that are typical major producers of relatively continuous or "steady-state" outdoor noise include rooftop air-handling units that supply air conditioning to the occupied structures and the potential for parking garage exhaust fans to supplement natural ventilation techniques. Although final project design details are still under development, the rooftop air-handling units would likely be located on the top of the proposed buildings and surrounded by rooftop parapet walls; thus, it is unlikely that most noise-sensitive receivers in the community would have a direct view of them. Specific details (sizes, manufacturers, and models) of these and other equipment have not been finalized; however, and for purposes of this analysis, Appendix 4.12-1 provides a table that helps show how available information on gross square footage and expected function or usage of the proposed project buildings supported noise emission estimates. Table 4.12-9 provides a summary of the anticipated major stationary producers of outdoor noise for each identified operational phase of the proposed project as contemplated by this noise analysis, summarized as follows:

- Campus Stadium and Park Built: The new SDSU Stadium is completed, but campus residential, educational/office, and hotel structures are not constructed yet.
- Campus Residential Buildout: The new SDSU Stadium and campus residential buildings are built and operational, but the campus educational/office and hotel structures are not fully constructed yet. Below-grade parking for the new Stadium and residential buildings is built and operating.
- Full Buildout: The new Stadium and all buildings (campus residential, educational/office, and hotel) are completed and operational.

Stadium

The proposed Stadium would host SDSU football games and other events attended by several thousands of visitors with capacity of up to 35,000. Aside from intermittent sounds due to music or speech reinforcement and public address systems, which can be controlled as part of the Stadium design and operations (and as emphasized by mitigation measure MM-NOI-1), this analysis assumes that the combined noise from these crowds of cheering and shouting event spectators would be a significant (and likely dominant) Stadium-attributed acoustical contributor to the outdoor sound environment on event days.

Stadium event noise was predicted with CadnaA (version 2018 MR1), a commercially available software program that uses algorithms compatible with International Organization of Standardization 9613 standards for outdoor sound propagation calculation (ISO 1996). The noise prediction model accepts user inputs for sources of sound emission and calculates sound pressure level in a 3D model space by accounting for geometric divergence and other sound attenuation physics including air absorption, ground effects, and linear occlusion due to natural or man-made terrain features.

For this operational noise analysis, the Stadium has been modeled as a set of seating areas that reasonably reflect the current design and would contain spectators that, on average, are contributing (via speech, shouts, or cheers) approximately 87 dBA sound power per person at a seating density of one spectator per square meter (about 10 square feet). This individual sound power level is consistent with "very loud speech" per research by Lazarus (Hayne et al. 2006). In total, this analysis conservatively assumes that all 35,000 spectators that may be filling the seats are engaged in loud speech and thus contributing to the aggregate sound emission level from the Stadium. These seating areas are bounded by barrier elements that simulate the solid structures of the Stadium on which the seating areas rest.

Table 4.12-9. Anticipated Major Stationary Operating Sources of Outdoor Noise by Project Phase

Project Feature	Operating during Phase(s)	Description of Sound Source	Estimated Noise Level (dBA L_{eq}) [1]	Height above Grade (feet)
Rooftop Air-Handling Units	Residential Buildout and Full Buildout	Plenum-type centrifugal fan drawing outside air into the building	75 to 95[2]	6 feet above top of roof
Parking Garage Exhaust Fan	Residential Buildout and Full Buildout	Tube-axial fan ventilating below-grade garage	95 to 102[3]	5 feet above grade
New Stadium Seating Areas (when event in progress)	Stadium Built, Residential Buildout, and Full Buildout	Aggregate sound from as many as 35,000 spectators	79 dBA per person[4]	On average, 49 feet above grade

Notes:
1 Sound pressure level (SPL) distance-adjusted to a reference distance of 1 meter (approximately 3 feet).
2 SPL depends on the equipment airflow capacity as suggested by building gross square footage and function or usage.
3 SPL depends on the equipment airflow capacity, determined by 0.75 cubic feet per minute per parking gross square foot (INTEC 2015).
4 Based on sound level associated with "very loud speaking" voice effort per Lazarus (Hayne et al. 2006).

Stationary Noise Predictions

Using the aforementioned CadnaA software program, noise levels due to stationary sources shown in Table 4.12-9 were predicted at a set of representative noise-sensitive receiver locations presented in Table 4.12-10. These receiver locations (aside from Broadview) also appear in graphical depictions, presented as Figures 4.12-2 through 4.12-6, of the predicted sound propagation for each of the five studied operation scenarios.

CadnaA-based modeling for the Broadview receptor location in Table 4.12-10 (i.e., just south of Broadview Avenue on the top of the mesa) considers its position approximately 600 feet due north of the northern edge of the parking lot adjoining Fire Station 45 on Friars Road. Over the first 300 feet of this horizontal distance, in the direction of sound travel from the proposed new Stadium, is a steep slope where the grade gains 200 feet of elevation; then there is an additional but much more gradual rise of about 30 feet over the remaining 300 feet of distance. The effect of this topography and distance helps explain the lower predicted levels of the Broadview in comparison with those of receptor MVAH.

Table 4.12-10. Predicted Noise Emission from On-Site Major Stationary Sound Sources

Receiver Identification Tag	Receiver Location Description	Stadium Built, with Event in progress dBA L_{eq}	Residential Buildout, with Stadium Event dBA L_{eq}	Residential Buildout, without Stadium Event dBA L_{eq}	Full Buildout, with Stadium Event dBA L_{eq}	Full Buildout, without Stadium Event dBA L_{eq}
ST3/LT3A	Adjoining Friars Road near northwest corner of project site	64.7	64.7	34.4	64.7	34.2
ST7	South of Mission Valley Public Library (on Fenton Parkway)	61.3	61.3	31.6	56.4	29.9
LT5	Southern fenceline of current Stadium, across from Trolley Station	63.2	62.9	37.5	58.0	35.0

Table 4.12-10. Predicted Noise Emission from On-Site Major Stationary Sound Sources

Receiver Identification Tag	Receiver Location Description	Stadium Built, with Event in progress dBA L_{eq}	Residential Buildout, with Stadium Event dBA L_{eq}	Residential Buildout, without Stadium Event dBA L_{eq}	Full Buildout, with Stadium Event dBA L_{eq}	Full Buildout, without Stadium Event dBA L_{eq}
ST6/LT5A	Northern edge of San Diego River Garden	59.5	59.5	31.4	57.7	29.2
ST2A	Southwestern corner of Rancho Mission Villas	54.3	51.3	32.4	51.5	32.4
ST1/LT1	Western edge of Bella Posta Apartments	56.6	48.2	35.3	48.6	35.3
MVAH	Southeastern edge of Monte Vista Apartment Homes (on Northside Drive, overlooking project)	66.0	66.0	32.8	66.0	33.1
ST5	2365 Mission City Corporate Center (west of project)	64.1	64.2	37.0	64.2	36.9
Broadview	Backyard of residence on south side of Broadview Avenue	60.6	60.6	29.9	57.3	30.4

Note: dBA = A-weighted decibels; L_{eq} = Noise Equivalent Level.

Table 4.12-10 shows that for each of the three studied proposed project operation phases, aggregate noise emission from only the major stationary operating HVAC equipment (and without a Stadium event in progress) should be compliant with the City's nighttime noise thresholds as received by nearby commercial (ST5, ST7), multifamily residential properties (ST1, ST2A, MVAH), and single-family residences (Broadview). When a well-attended Stadium event occurs, however, predicted noise levels would exceed these thresholds at indicated time frames as follows:

- At ST5 (commercial land use), from 7:00 p.m. to 7:00 a.m.;
- At MVAH (nearest Monte Vista Apartment Homes), all day and night;
- At ST1/LT1 (nearest Bella Posta Apartments), all day and night before the residential buildings are constructed;
- At ST2A (nearest Rancho Mission Villas), from 7:00 p.m. to 7:00 a.m. before the residential buildings are constructed; and
- At Broadview (nearest single-family home), all day and night.

Accordingly, impacts at these locations during the indicated times of day, evening, and night are considered **potentially significant** with respect to the City's noise ordinance hourly limits. (**Impact NOI-6**)

Final design features, capacity, and function of the new Stadium and their effects on noise emission performance are important. This Stadium noise analysis models aggregate spectator crowd noise and assesses its potential impact. Due to the variety of potential events and activities that the new Stadium may host, the analysis herein assumes proper implementation of Stadium design features, both structural and pertaining to the audio/visual systems, to adequately control amplified speech, music, and public address messaging. Public address messages during emergency situations would be exempt from such acoustical controls.

By way of example, Figure 4.12-7 depicts an alternative stadium-only scenario, in which there are no large horizontal or vertical physical gaps in the two east and west “bowl” sides of the Stadium structure containing the seating areas. To the north and south, however, gaps remain. Closing such gaps in the Stadium structural design would help lower noise exposure at the MVAH representative receptor.

Scheduling Stadium events to avoid nighttime (between 10:00 p.m. and 7:00 a.m.) operation would reduce the time period during which these above-noted exceedances would occur.

While predicted stationary operation noise would exceed City standards at representative receptor locations at MVAH, ST1, and ST2A, the existing ambient sound level at these locations—even during nighttime hours—is dominated by roadway traffic and already exceeds the City standards. In fact, and as shown in the plots of long-term baseline data collection in Appendix 4.12-1, the SPL measured at position ST1/LT1 always exceeded 60 dBA L_{eq}. The ST2A measurement location is similarly proximate to I-15 and would be expected to have comparable sound levels at night. And at LT3A, which was located a comparable distance from Friars Road as is MVAH, the measured nighttime sound level never dipped below 52 dBA L_{eq}, and daytime and evening sound levels range from 58 dBA L_{eq} to 62 dBA L_{eq}. Hence, stationary operation noise impacts from the proposed project’s HVAC sources and new Stadium events during daytime and evening hours would be considered **less than significant** with respect to an anticipated increase over existing outdoor ambient sound level.

For the Broadview representative receptor north of the project site, existing sound levels are expected to be comparable to the daytime measurements of 50 dBA L_{eq} to 53 dBA L_{eq} shown in Table 4.12-1 for the ST-10 location, which is also atop a mesa. Compared to the predicted levels that exceed 60 dBA L_{eq} when a Stadium event is in progress, the estimated increase in outdoor of ambient sound level of 7 dB under such conditions would be clearly noticeable and therefore a potentially significant impact.

Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Heavier pieces of construction equipment used at the project site could include dozers, graders, cranes, loaded trucks, water trucks, and pavers. But aside from these vehicles, on-site construction activities that would likely cause the most groundborne vibration and noise would be associated with impact-type equipment: pile-driving for building foundations.

During grading, the largest groundborne vibration levels are anticipated to be generated by large bulldozers and loaded trucks used for earthmoving. According to the FTA, vibration levels associated with the use of bulldozers (based on size) range from approximately 0.003 to 0.089 ips PPV and 58 to 87 VdB at 25 feet, as shown in Table 4.12-11. Additionally, loaded trucks used for soil hauling during grading could generate vibration levels of approximately 0.076 ips PPV and 86 VdB at 25 feet.

Table 4.12-11. Typical Construction Equipment Vibration Levels

Equipment	PPV (inches per second) at 25 feet	L_v (rms vibration velocity dB [VdB]) at 25 feet	PPV (inches per second) at 175 feet
Pile Drive (impact) – typical	0.644	104	0.03
Pile Drive (sonic) – typical	0.170	93	0.009
Vibratory Rroller	0.210	94	0.01
Jackhammer	0.035	79	0.002
Large Bulldozer	0.089	87	0.005
Loaded Trucks	0.076	86	0.004
Small Bulldozer	0.003	58	0.0002

Sources: FTA 2018; Caltrans 2013.
Notes: PPV = peak particle velocity; L_v = vibration level; rms = root mean square; dB = decibel.

Off-Site Groundborne Vibration Impacts

The closest off-site homes would be approximately 175 feet or more from the construction area. As presented in the right-most column of Table 4.12-11, at this distance for the listed anticipated construction equipment, the PPV at the receptor would be 0.03 ips for a typical impact-type pile driver and 0.005 ips PPV for a large bulldozer or grader. Therefore, conventional construction activities are not anticipated to result in continuous vibration levels that typically annoy people or risk damage to residential structures; therefore, the vibration impact would be considered **less than significant,** and no off-site mitigation is required.

On-Site Groundborne Vibration Impacts

Because the development of the proposed project would be a multiyear endeavor, portions of the development would be completed and occupied during the construction of subsequent portions (phases). Therefore, the occupied proposed project phases have the potential to be impacted by vibration from ongoing construction activities. Location-specific phasing schedules are not available at this time; it is therefore possible that construction of a new phase of the proposed project could take place as near as 50 feet of an occupied phase. In such an instance, short-term vibration levels as high as 0.03 ips PPV could result from nearby heavy front-end loaders or bulldozers. If pile-driving were to occur at this distance, the reference level of 0.644 ips PPV would translate to 0.23 ips PPV at the receptor and thus be considered an impactful level. Therefore, vibration levels would be **potentially significant** depending on the on-site activities and equipment or processes involved. (**Impact NOI-7**)

Trolley

Based on vibration level screening distances predicted in Appendix J (Noise Analysis) of the Mission Valley Community Plan Update (RECON 2019) and reproduced in Table 4.12-12, potential ground-borne vibration exposures at sufficiently proximate occupied project buildings could result from existing railway operations. FTA guidance describes three categories of VdB thresholds for acceptable levels of vibration velocity (FTA 2018) that include as follows:

- Category 1 – up to 65 VdB or less at buildings where vibration would interfere with interior operations;
- Category 2 – 72 VdB or less at residential uses and places where people normally sleep; and,
- Category 3 – 75 VdB or less at institutional uses with primarily daytime use.

Because the majority of the Green Line Trolley tracks within the project site are on elevated structures, the resulting vibration transmission path from the source (moving trolley) to a nearby occupied receiving structure is not straightforward energy propagation through adjoining soils and thus would not be expected to cause significant vibration impacts to adjacent project-attributed development. Further, areas where noise- and vibration-sensitive uses are located the closest to the tracks (as close as 25 feet) are at the existing Stadium Trolley Station. Since trolleys decelerate and stop at each station upon approach, or accelerate from a stationary position up to track design speeds during station departure, they require considerable lengths of rail near the station to accomplish these velocity changes safely and comfortably for trolley riders. Consequently, the average trolley speeds in the vicinity of trolley stations would be low and would therefore not cause significant vibration over existing levels or exceed the applicable Category-specific FTA guidance-based threshold for potential impact.

Table 4.12-12. Trolley Vibration Screening Distances

Trolley Speed (mph)	Predicted Vibration Velocity Level at 25 Feet (rms VdB)	Distance between Vibration Source and Indicated Threshold (feet)		
		75 VdB (Category 3)	*72 VdB (Category 2)*	*65 VdB (Category 1)*
15	67	1	9	33
20	70	6	14	48
25	72	11	21	63
30	73	16	28	77
35	74	21	35	90
40	76	26	42	102
45	77	31	49	114
50	78	36	55	125
55	78	41	62	136
60	79	45	68	147

Source: RECON 2019.
Notes: rms = root mean square; VdB = vibration velocity decibel.

The only portion of the project site where the trolley line is at-grade and therefore would generate the maximum vibration level is in the very southwest corner and again in the southeast corner. The trolley route begins to rise in elevation approximately 400 feet east of Fenton Parkway/Street I. At this location, the nearest on-site building would be approximately 800 feet from the trolley line, well in excess of the distances presented in Table 4.12-12. The existing trolley line would be as close as 25 feet to future occupied campus buildings west of the current Stadium Station, but is elevated by supporting structures. Similarly, Figure 2-3, Surrounding Land Uses, in Chapter 2, Project Description, suggests that the southern-most newly built campus residential buildings associated with the proposed project might be as close as 150 feet to the trolley line, but here too the route is elevated and (in combination with the horizontal distance) would not be expected to result in vibration velocity levels that exceed the 72 VdB threshold for occupied residences. Impacts would be **less than significant.**

Stadium Implosion Scenario

While not anticipated at this time, due to the presence of the existing SDCCU Stadium structure and the project construction schedule, implosion of the existing stadium or portions thereof may be determined to be the most efficient and preferred method for demolition to implement the proposed project. Thus, construction activities may result in significant ground-borne vibration impacts. At the current stage of the proposed project design, a blasting study has not been completed, and no specific blasting timelines, or blast parameters are available. However, it is anticipated (based upon other implosion events) that one large implosion may occur.

When explosive charges detonate, almost all of the available energy from the explosion is used in breaking and displacing the mass. However, a small portion of the energy is released in the form of vibration waves that radiate away from the charge location. The strength, or amplitude, of the waves reduces as the distance from the charge increases. The rate of amplitude decay can be estimated with a reasonable degree of consistency, which allows regulatory agencies to control blasting operations by means of relationships between distance and explosive quantity.

Using the previous example of an 8-kilogram charge weight studied for potential noise emission, mathematical expressions (Dyno Nobel 2010) suggest that for a "heavily confined" charge, the PPV from its detonation would be 0.082 ips at a distance of 1,200 feet—the apparent closest distance to a residential receptor. While the predicted vibration level for this hypothetical per-charge scenario is below a threshold of 0.5 ips PPV for a single-event source (as opposed to the aforementioned 0.2 ips PPV guidance limit for continuous vibration sources received by the same residential-type structure), the detailed parameters for the SDCCU Stadium demolition plan are not known at this time. Therefore, it is not possible to conduct a meaningful vibration analysis of proposed blasting events. Until such information is available, and for purposes of this analysis, vibration impacts from such a structure implosion are considered **potentially significant** (**Impact NOI-8**).

For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project is located approximately 1.8 miles south-southeast of Montgomery Field, and approximately 5 miles northeast of San Diego International Airport (ALUC 2010). Based upon the noise contours contained in the airports' land use compatibility plans, the project site is located outside the 60 dB CNEL noise contours for both Montgomery Field and San Diego International Airport as shown in Figure 4.12-8. Thus, the proposed project would not expose people to excessive noise levels from aircraft. Noise impacts would be **less than significant**.

Would the project result in a cumulative impact to noise?

The proposed project, along with other projects in the area, have the potential to result in cumulative impacts to noise during construction and operation. The proposed project would produce noise associated with construction activities during daytime and potentially during nighttime that would result in significant impacts even after implementation of noise mitigation measures such as those listed in Section 4.12.6. Off-site construction noise could also potentially occur within or external to the City's typically allowable 7:00 a.m. to 7:00 p.m. daytime period and thus potentially expose nearby noise-sensitive receptors to sound levels that exceed either the 12-hour City threshold of 75 dBA L_{eq} allowable between 7:00 a.m. and 7:00 p.m. or the appropriate City hourly L_{eq} thresholds during evening and nighttime periods (i.e., 7:00 p.m. to 7:00 a.m.) and thereby result in significant and potentially unavoidable impacts even after implementation of practical noise mitigation measures such as those listed in Section 4.12.6. Other project construction activities, such as rock crushing activities and potential blasting, could also produce significant noise impacts. Although mitigation measures would be implemented as described in Section 4.12.6, cumulative noise impacts would remain **significant and unavoidable** (**Impact NOI-9**).

4.12.5 Summary of Impacts Prior to Mitigation

The proposed project would result in the following potentially significant noise impacts.

Impact NOI-1 The project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies if construction occurs between 7:00 p.m. and 7:00 a.m.

Impact NOI-2 The project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies due to construction of off-site improvements.

Impact NOI-3 The project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies to on-site residents due to on-going construction as a result of project phasing.

Impact NOI-4 The project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies as a result of on-site rock crushing and processing.

Impact NOI-5 The project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies as a result of implosion of SDCCU Stadium.

Impact NOI-6 The project would result in generation of a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies as a result of well attended events at the new stadium.

Impact NOI-7 The project would result in generation of excessive groundborne vibration during construction.

Impact NOI-8 The project would result in a temporary generation of excessive groundborne vibration during implosion of SDCCU Stadium.

Impact NOI-9 The project would result in a cumulative impact to noise.

4.12.6 Mitigation Measures

The following mitigation measures are proposed to help reduce construction- and operation-related noise and vibration levels created by the proposed project.

MM-NOI-1 The project (via construction contractor) shall establish a telephone hot-line for use by the public to report any significant adverse noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the contractor shall be required to include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This hot-line telephone number shall be posted at the project site during construction in a manner visible to passersby and on the project website sdsu.edu/missionvalley. This telephone number shall be maintained until the project has been considered commissioned and ready for operation.

Throughout the construction of the project, the contractor shall be required to document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The contractor or its authorized agent shall be required to:

- Use a Noise Complaint Resolution Form to document and respond to each noise complaint.
- Contact the person(s) making the noise complaint within 24 hours.
- Conduct an investigation to attempt to determine the source of noise related to the complaint.
- Take all reasonable measures to reduce the noise at its source.

MM-NOI-2 The project shall implement project design features **PDF-N-1** through **PDF-N-9.**

MM-NOI-3 **Implement Sound Amplification Controls.** Incorporate electronic controls or limits into the final design of the new Stadium's audio/visual sound system, as well as tie-ins from hosted performers to control amplified speech and music noise at the source, and thus offer some degree of expected sound-level reduction at the potentially affected noise-sensitive receiver positions.

To help mitigate this potentially significant impact due to demolition activities involving blasting events, **MM-NOI-2** would require preparation of a blasting plan requiring compliance with applicable standards.

MM-NOI-4 Prior to breaking ground on any portion of the proposed project, California State University/San Diego State University (CSU/SDSU) or its designee shall prepare, or cause to be prepared, a blasting/drilling monitoring plan. The plan shall include estimates of the drill noise levels, maximum noise levels (L_{max}), air-blast overpressure levels, and groundborne vibration levels at each residence within 1,000 feet of the blasting location. Where potential exceedances of the City of San Diego's Noise Ordinance are identified, the blasting/drilling monitoring plan shall identify mitigation measures shown to effectively reduce noise and vibration levels (e.g., altering orientation of blast progression, increased delay between charge detonations, pre-splitting) to be implemented in order to comply with the noise level limits of the City's Noise Ordinance, and a vibration-velocity limit of 0.5 inches per second (ips) peak particle velocity (PPV). The identified mitigation measures shall be implemented by CSU/SDSU, or its designee, prior to breaking ground. Additionally, all project phases involving blasting shall conform to the following requirements:

- All blasting shall be performed by a blast contractor and blasting personnel licensed to operate per appropriate regulatory agencies.
- Each blast shall be monitored and recorded with an air-blast overpressure monitor and groundborne vibration accelerometer that is located outside the closest residence to the blast. This data shall be recorded, and a post-blast summary report shall be prepared and be available for public review or distribution as necessary.
- Blasting shall not exceed 0.5 ips PPV at the nearest occupied residence, in accordance with the California Department of Transportation's *Transportation and Construction Vibration Guidance Manual* guidance.

MM-NOI-5 is proposed, which would require a vibration monitoring plan and require data be sent to a designated CSU/SDSU noise control officer who will take the steps necessary to ensure that future vibration levels do not exceed applicable limits, including suspending those further construction activities that would result in excessive vibration levels until either alternative equipment or alternative construction procedures have been identified to reduce vibration levels below applicable standards.

MM-NOI-5 Prior to beginning construction of any project component within 200 feet of an existing or future occupied residence, California State University/San Diego State University (CSU/SDSU), or its designee, shall require preparation of a vibration monitoring plan. At a minimum, the vibration monitoring plan shall require data be sent to a University noise control officer or designee on a weekly basis or more frequently as determined by the noise control officer. The data shall include vibration level measurements taken during the previous work period. In the event that there is reasonable probability that future measured vibration levels would exceed allowable limits, CSU/SDSU shall take the steps necessary to ensure that future vibration levels do not exceed such limits, including suspending further construction activities that would result in excessive vibration levels until either alternative equipment or alternative construction procedures can be used that generate vibration levels that do not exceed 0.2 inches per second (ips) peak particle velocity (PPV) at the nearest residential structure. Construction activities not associated with vibration generation could continue.

The vibration monitoring plan shall be prepared and administered by a state-approved (or approval delegated to appropriate county or municipal jurisdiction or agency) noise/vibration consultant. In addition to the data described previously, the vibration monitoring plan shall also include the location of vibration monitors, the vibration instrumentation used, a data acquisition and retention plan, and exceedance notification and reporting procedures. A description of these plan components is provided in the following text.

The vibration monitoring plan shall include a scaled plan indicating monitoring locations, including the location of measurements to be taken at construction site boundaries and at nearby residential properties.

Vibration monitors shall be capable of measuring maximum unweighted root-mean square and PPV levels triaxially (in three directions) over a frequency range of 1 to 100 Hertz. The vibration monitor shall be set to automatically record daily events during working hours and to record peak triaxial PPV values in 5-minute interval histogram plots. The method of coupling the geophones to the ground shall be described and included in the report. The vibration monitors shall be calibrated within 1 year of the measurement, and a certified laboratory conformance report shall be included in the report.

The information to be provided in the data reports shall include, at a minimum, daily histogram plots of PPV versus time of day for three triaxial directions, and maximum peak vector sum PPV and maximum frequency for each direction. The reports shall also identify the construction equipment operation during the monitoring period and their locations and distances to all vibration measurement locations.

A description of the notification of exceedance and reporting procedures shall be included, and the follow-up procedures taken to reduce vibration levels to below the allowable limits.

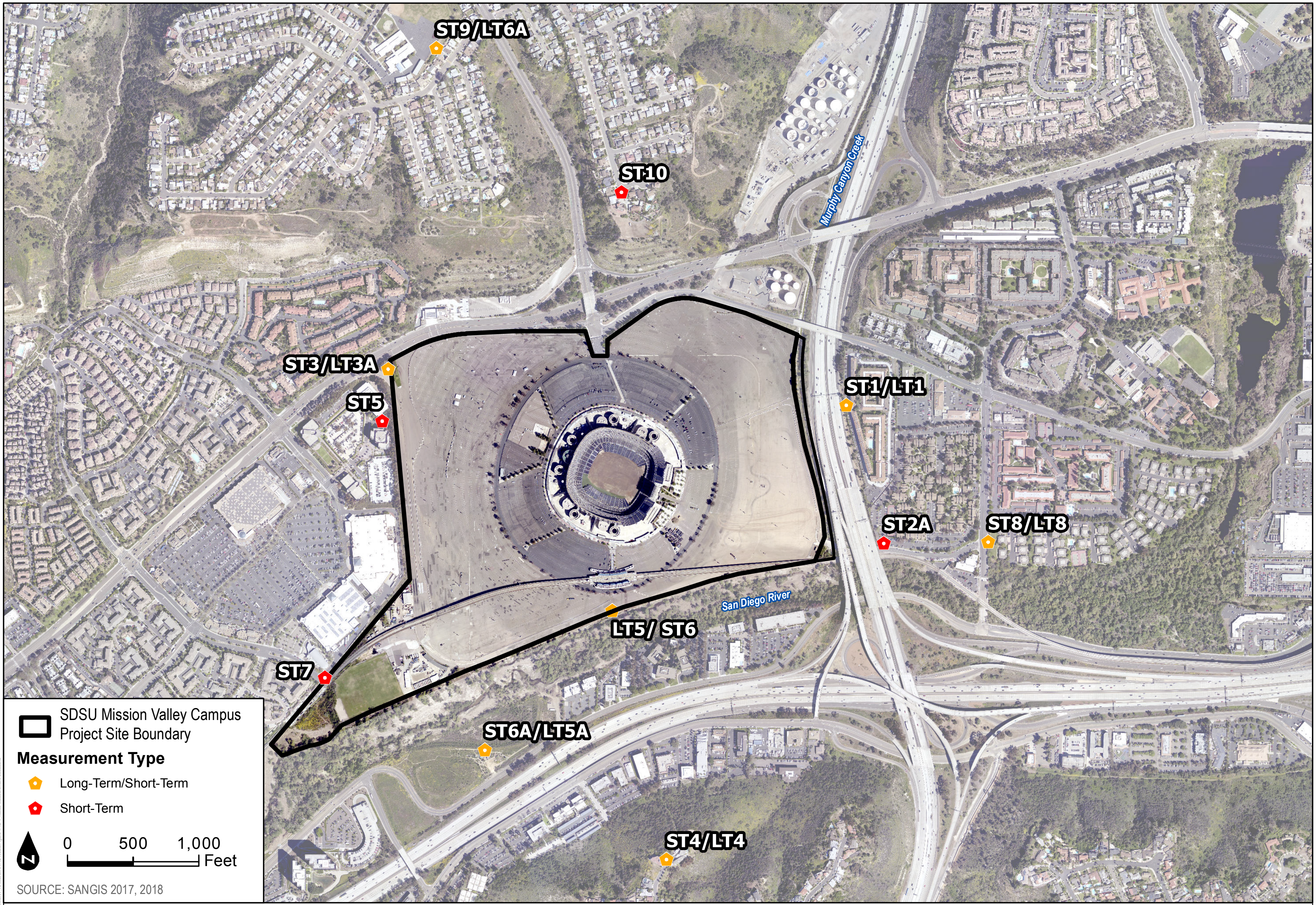
4.12.7 Level of Significance After Mitigation

Anticipated temporary noise impacts during project construction (**Impacts NOI-1 through NOI-5**) would be **potentially significant** because the proposed project would produce noise associated on-site and off-site construction activities, including rock crushing and potential blasting, which would exceed the City's noise thresholds. Furthermore, construction noise could potentially occur external to the City's typically allowable 7:00 a.m. to 7:00 p.m. daytime period. With implementation of **MM-NOI-1** and **MM-NOI-2,** temporary noise impacts from project-related construction would be **less than significant** during expected on-site daytime-only construction activities.

During nighttime construction activities (**Impact NOI-1**), even with proper implementation of **MM-NOI-1** and **MM-NOI-2**, predicted noise impacts may be potentially **significant and unavoidable** depending on the on-site location, intensity, and timing. Noise impacts resulting from off-site roadway and utility improvements (**Impact NOI-2**) may also be potentially **significant and unavoidable**, depending on receptor-to-activity distances, activity intensity, and timing.

Anticipated permanent noise impacts during project operation would be potentially significant because the proposed project would produce noise that could exceed the City's noise thresholds during Stadium events (**Impact NOI-6**). Proper implementation of **MM-NOI-3** during daytime and evening Stadium events would help result in a reduction of project operation noise emission to levels predicted to be comparable to existing outdoor ambient sound at the nearest multifamily residences to the northwest, and thus on the basis of increase over ambient sound would be considered **less than significant.** No further mitigation is required with respect to attended Stadium events during these time periods at these nearest receptors (e.g., MVAH). The single-family residences to the north, at the top of the mesa in the vicinity of Broadview Avenue that have lower existing outdoor ambient sound levels than those in the vicinity of MVAH closer to Friars Road, would likely experience a clearly noticeable increase in outdoor noise level due to aggregate daytime or evening stadium crowd noise and therefore experience a **potentially significant impact** even after implementation of **MM-NOI-3.** Additionally, at night (i.e., past 10:00 p.m.), potential noise impacts would be considered **potentially significant** even after implementation of mitigation measure **MM-NOI-3**, as detailed in Section 4.12.6, due to the possibility of aggregate spectator speech noise as modeled in this analysis. The proposed audio controls on hosted stadium events are independent of aggregate noise level from an excited and loud crowd of cheering spectators. Therefore, under such specific circumstances, operation-related noise impacts would be potentially **significant and unavoidable** at the nearest NSLU to the northwest of the Stadium site.

Anticipated on-site groundborne vibration impacts would be potentially significant because occupied proposed project phases have the potential to be impacted by vibration from ongoing construction activities. Furthermore, potentially significant groundborne vibration impacts could result from potential implosion of the existing Stadium or portions thereof. To help mitigate this potentially significant impact due to demolition activities involving blasting events, **MM-NOI-4** would require preparation of a blasting plan requiring compliance with applicable standards. In addition, **MM-NOI-5** would require a vibration monitoring plan and require data be sent to the CSU/SDSU noise control officer who will take the steps necessary to ensure that future vibration levels do not exceed applicable limits, including suspending those further construction activities that would result in excessive vibration levels until either alternative equipment or alternative construction procedures have been identified to reduce vibration levels below applicable standards. With implementation of these mitigation measures, vibration impacts would be **less than significant.**



SDSU Mission Valley Campus Master Plan EIR

SAN DIEGO STATE UNIVERSITY

Figure 4.12-1

Noise Measurement Locations

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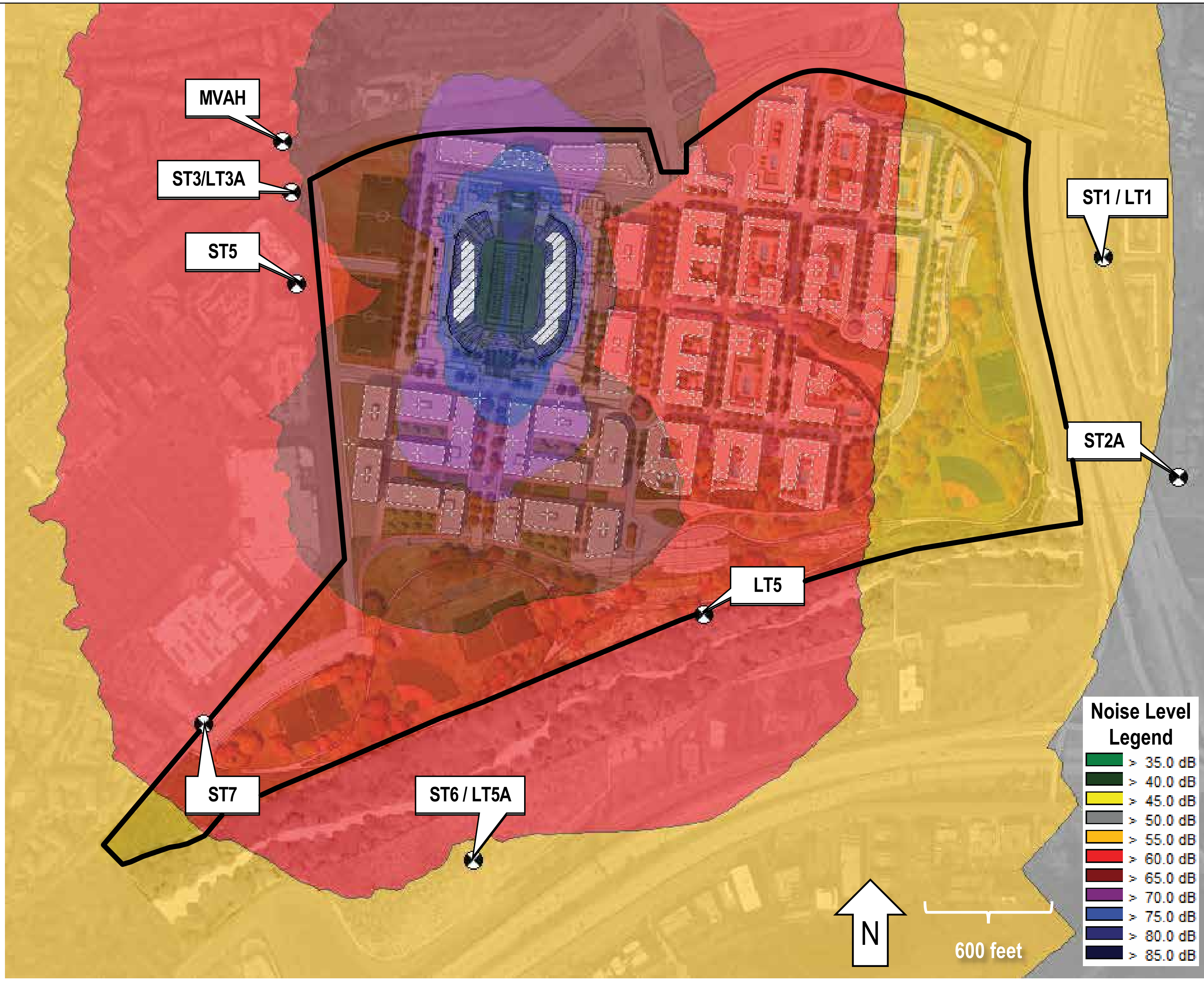

SOURCE: CARRIER JOHNSON SITE PLAN 2/9/19

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Figure 4.12-2

Predicted Project Stationary Operation Noise - Stadium Built, with Stadium Event

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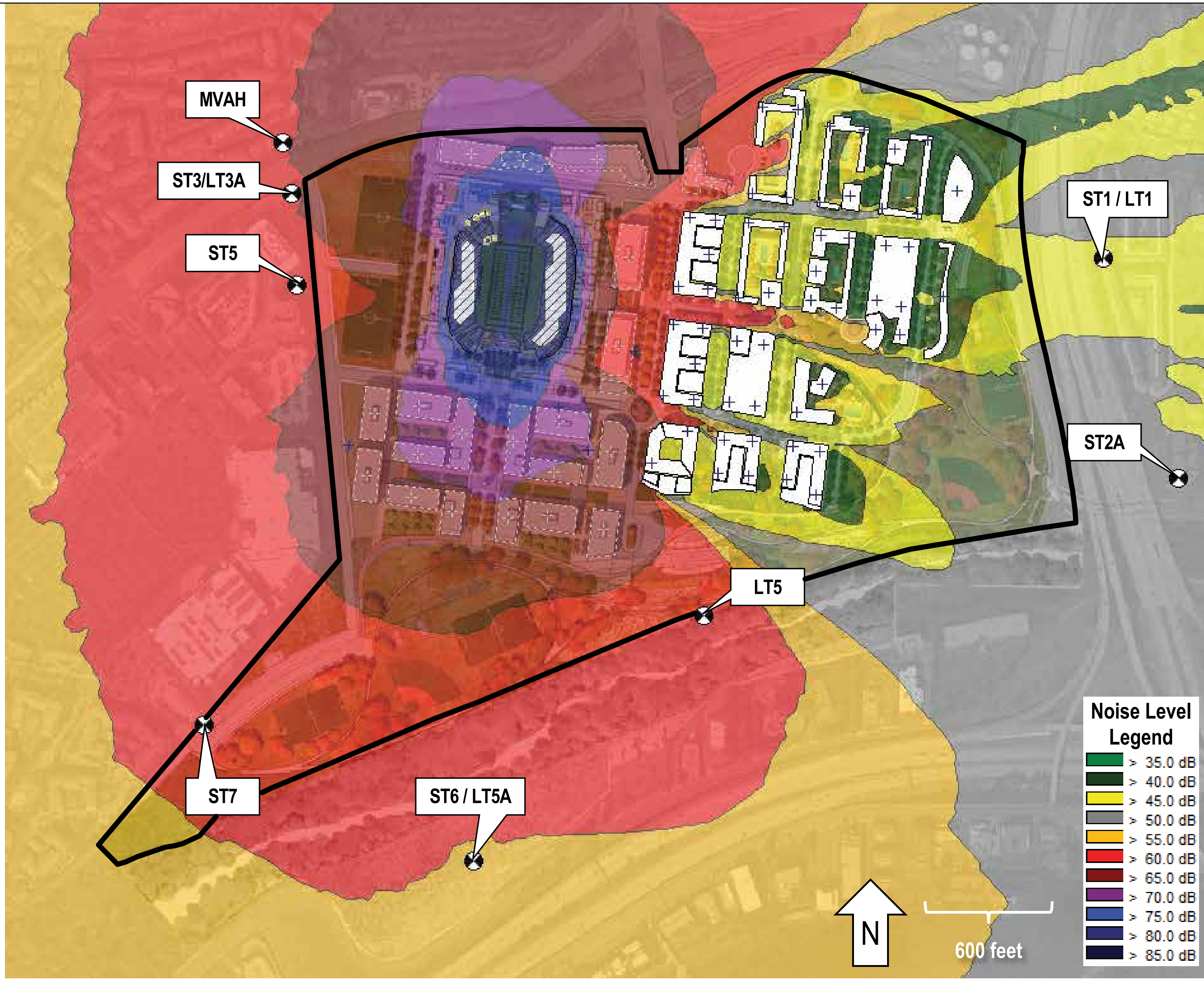

SOURCE: CARRIER JOHNSON SITE PLAN 2/9/19

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San Diego State University

Figure 4.12-3

Predicted Project Stationary Operation Noise - Residential Build-Out, with Stadium Event

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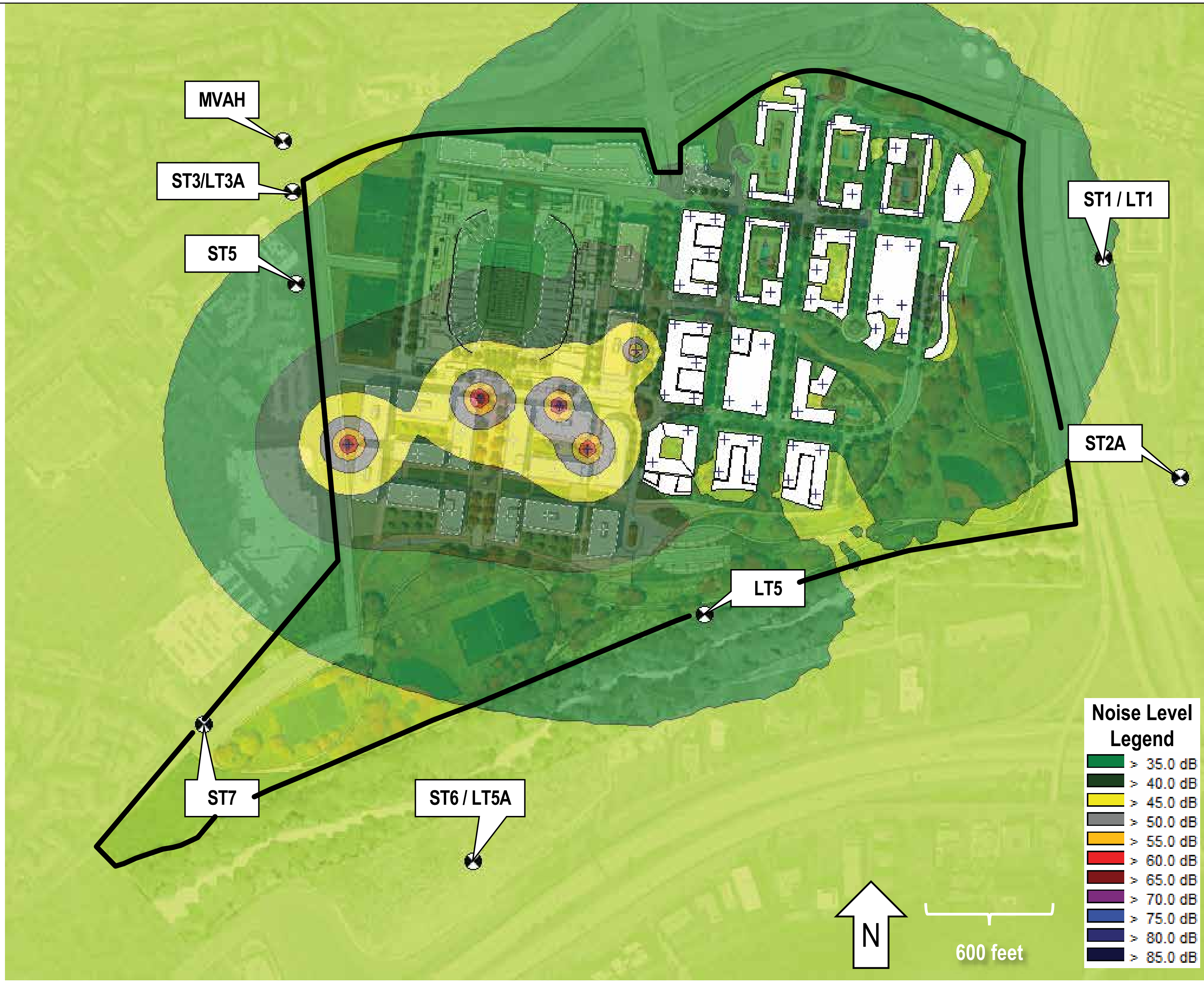

SOURCE: CARRIER JOHNSON SITE PLAN 2/9/19

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Figure 4.12-4

Predicted Project Stationary Operation Noise - Residential Build-Out, without Stadium Event

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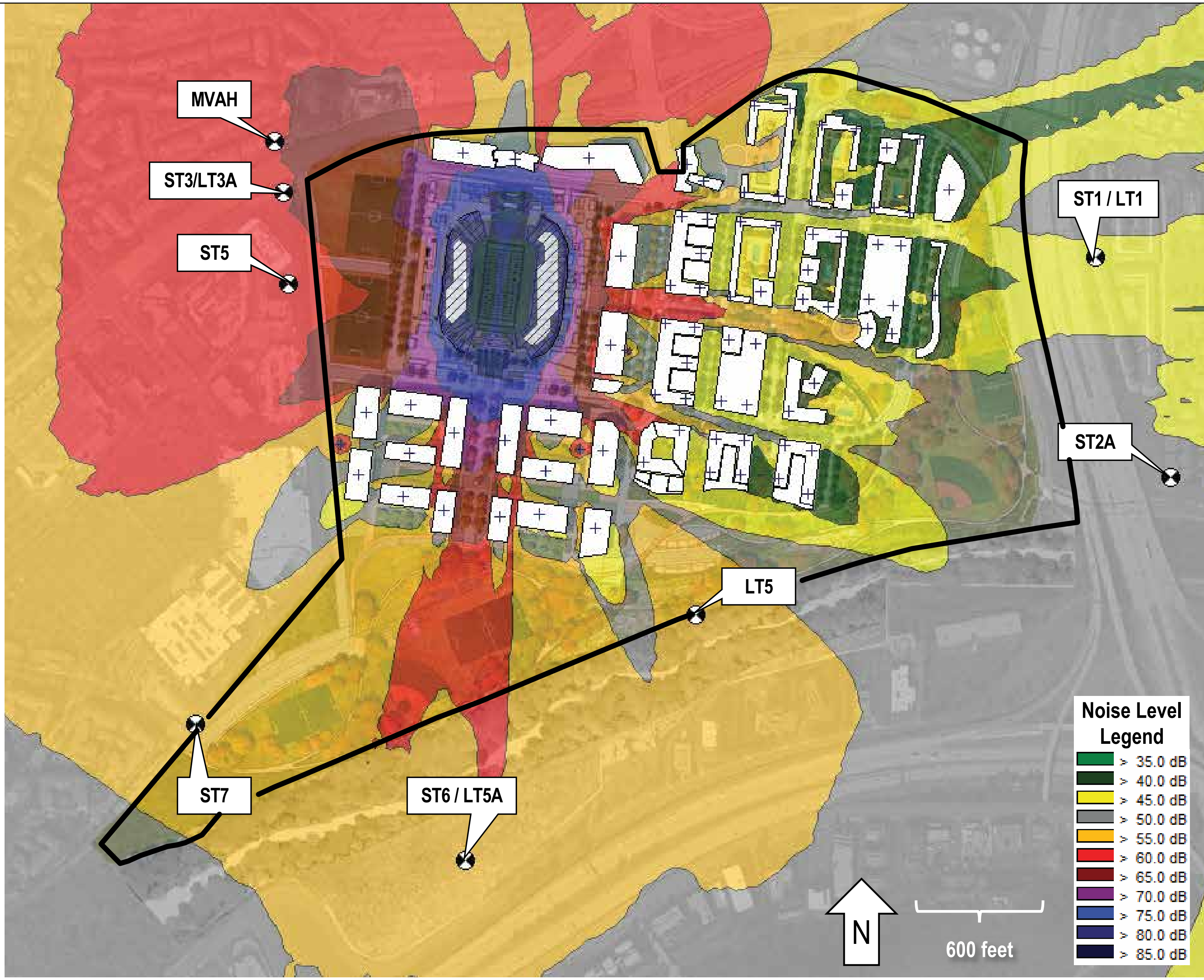

SOURCE: CARRIER JOHNSON SITE PLAN 2/9/19

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Figure 4.12-5

Predicted Project Stationary Operation Noise - Full Build-Out, with Stadium Event

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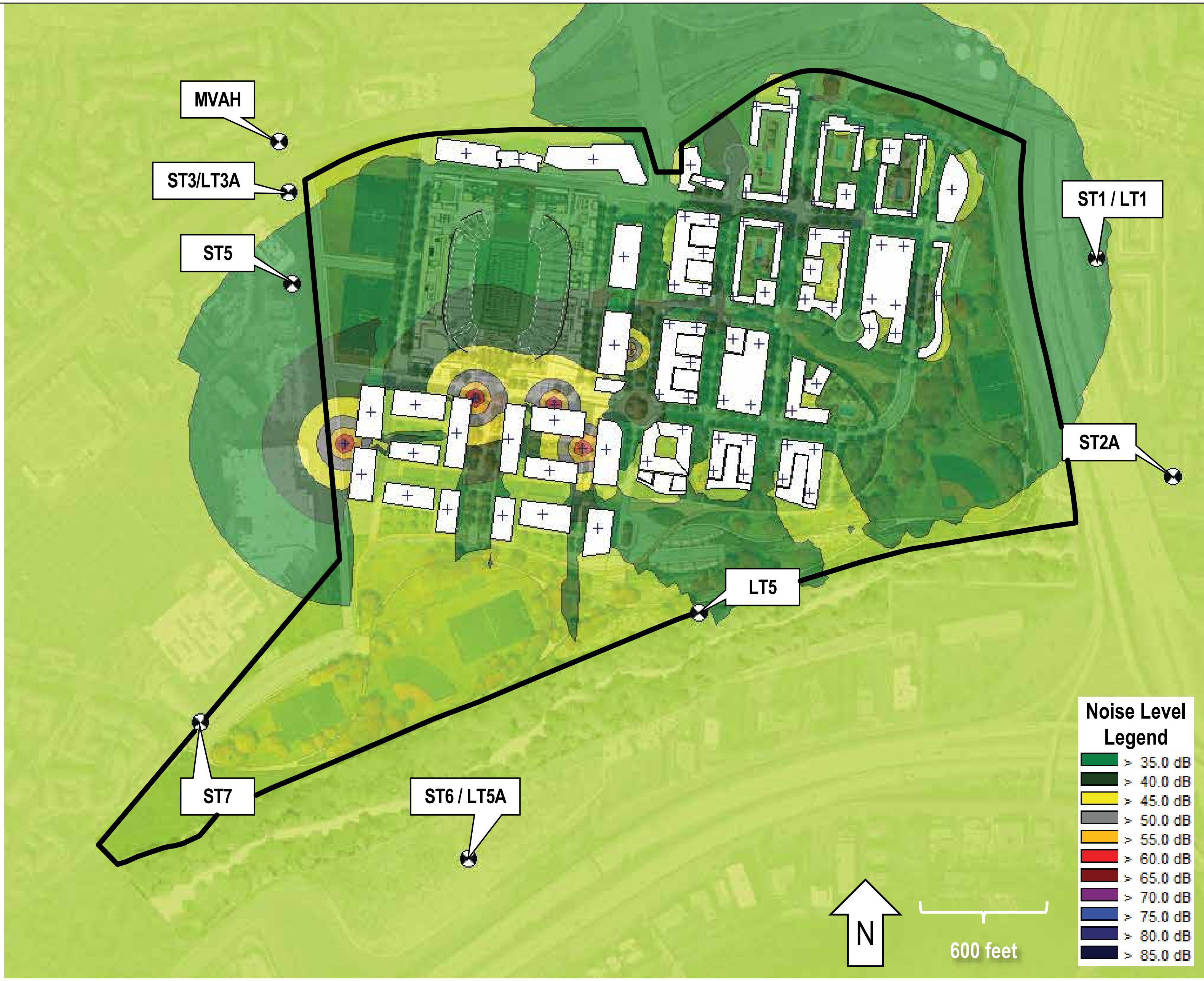

SOURCE: CARRIER JOHNSON SITE PLAN 2/9/19

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Figure 4.12-6

Predicted Project Stationary Operation Noise - Full Build-Out, without Stadium Event

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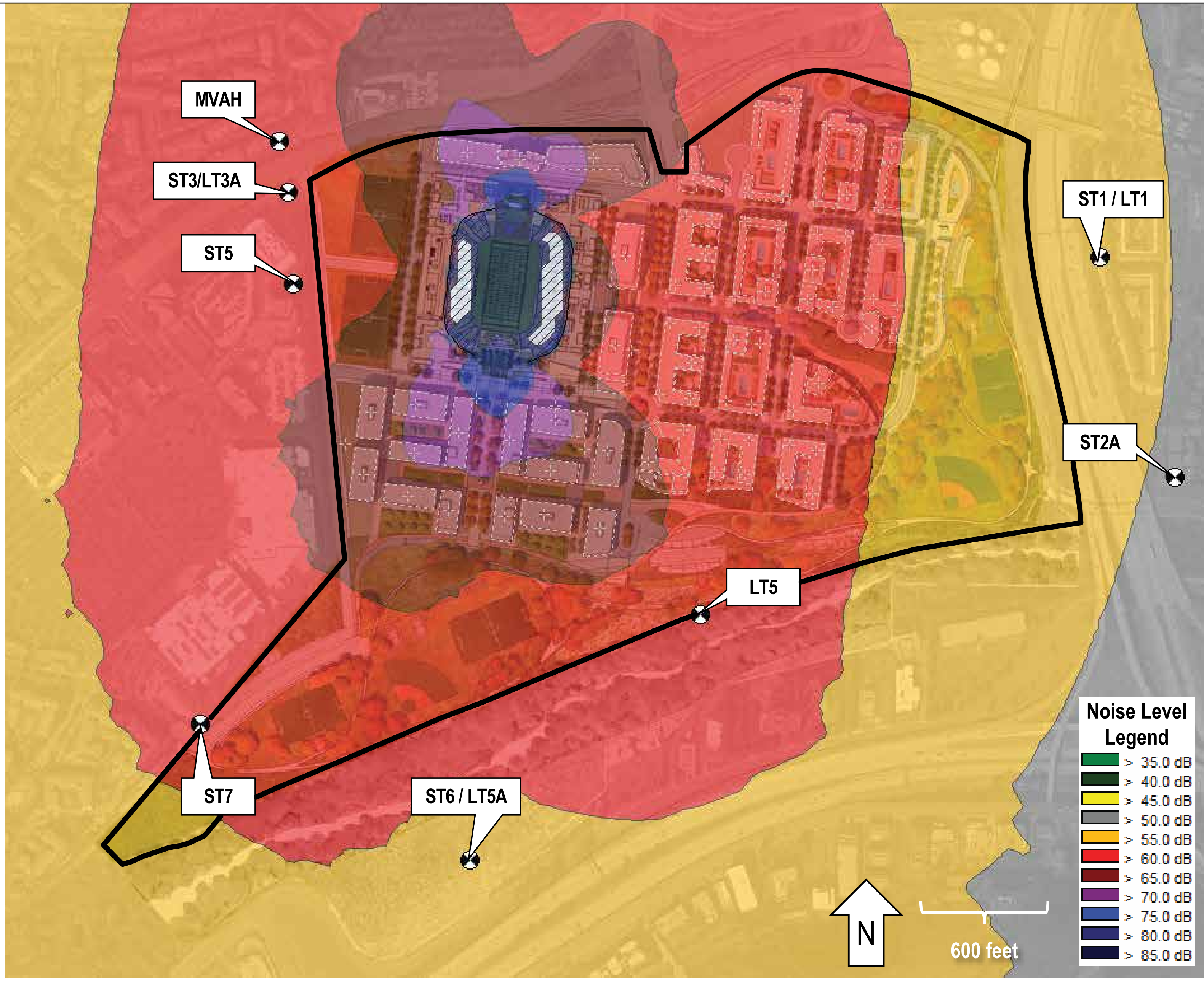

SOURCE: CARRIER JOHNSON SITE PLAN 2/9/19

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Figure 4.12-7

Predicted Project Stationary Operation Noise - Stadium Built (alternate design), with Stadium Event

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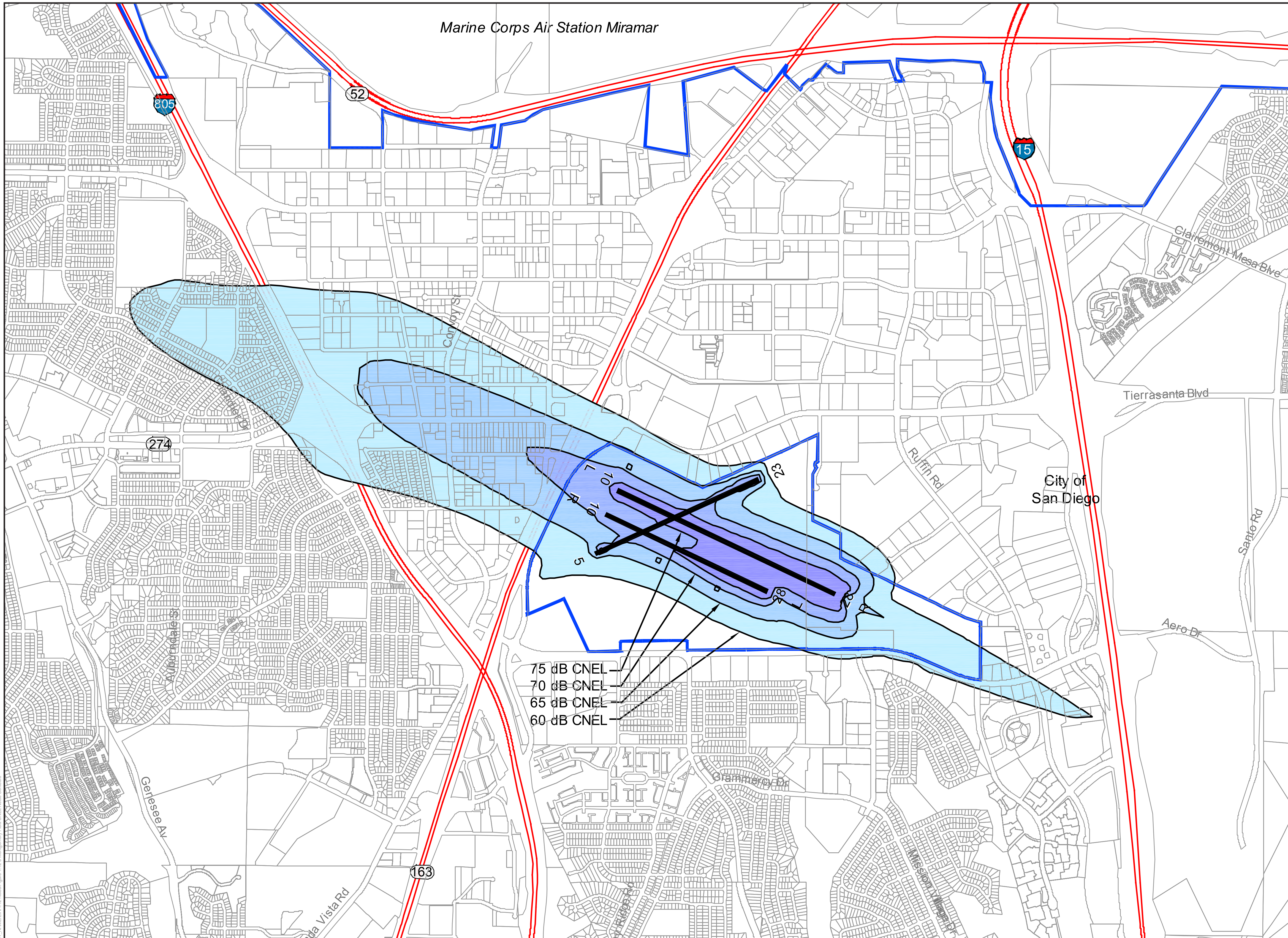

SOURCES: PARCELS - SAN DIEGO GEOGRAPHIC INFORMATION SOURCE (SANGIS), 2008; NOISE CONTOURS - CITY OF SAN DIEGO, MONTGOMERY FIELD AIRPORT MASTER PLAN UPDATE, AUGUST 2004; MONTGOMERY FIELD AIRPORT LAND USE COMPATIBILITY PLAN JANUARY 25, 2010 RICONDO & ASSOCIATES, INC., OCTOBER 2009.

AIRPORT LAND USE COMMISSION
SAN DIEGO COUNTY

LEGEND

- Airport Property Boundary
- Parcel Line
- Highways

Noise Exposure Range

- 60 - 65 dB CNEL
- 65 - 70 dB CNEL
- 70 - 75 dB CNEL
- 75 + dB CNEL

Future Average Annual Day (1,014 Operations)

north

0 2,000 ft.

Notes: 1. See Table III-1 for criteria applicable within each noise exposure range.
2. CNEL = Community Noise Equivalent Level.

Exhibit III-1

Compatibility Policy Map: Noise

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Figure 4.12-8

Montgomery Field CNEL Noise Contours

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