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October 5, 2022 00321.00026.001

Ryley Webb
H.G. Fenton Company
7577 Mission Valley Road
San Diego, CA 92108

Subject: FPC Residential Complex Project Noise Analysis

Dear Mr. Webb:

HELIX Environmental Planning, Inc. (HELIX) has performed an analysis of noise impacts related to the construction and operation associated with the proposed FPC Residential Complex Project (project). Vibration exposure was analyzed in a separate report. This letter summarizes the methodology and results of the noise analysis.

ENVIRONMENTAL SETTING AND PROJECT DESCRIPTION

The proposed project consists of a multi-family residential development in the City of Carlsbad; refer to Figure 1, *Regional Location*. The project site is located northeast of the intersection of Ponto Road and Ponto Drive and is currently developed with storage units and two small unoccupied buildings. Surrounding land uses include a parking garage to the north; a North County Transit District (NCTD) railway adjacent to the east, with mobile homes and single-family residences further eastward beyond the rail line; undeveloped open space to the south; and single-family residences and a hotel to the west (see Figure 2, *Aerial Photograph*).

The project would replace the existing structures with 86 multi-family residential units on an approximately 4.54-acre site (approximately 19 dwelling units/acre). The proposed units would consist of seven different layouts that include between two to four bedrooms and two to three bathrooms. The proposed buildings would be either two-stories or three-stories in height, with a maximum height of 35 feet. The project would include 172 garage parking spaces and 34 open parking spaces, for a total of 216 parking spaces. The project would also include approximately 20,000 square feet (sf) of open space throughout the site. Shared open space would include a 5,000-sf area in the northeast corner of the site, a 2,000-sf area in the northern portion of the site, and a 3,000-sf area in the southern portion of the site. Access to the project site would be via an entrance off of Ponto Drive (see Figure 3, *Site Plan*).

FUNDAMENTALS OF NOISE/SOUND AND VIBRATION

Noise/Sound

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is approximately 0 dBA, which corresponds to 20 micro Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.

NOISE SENSITIVE LAND USES

Noise sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise and generally include residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. The nearest NSLUs to the project site are the single-family residences located as close as 60 feet to west of the project site across Ponto Road. The proposed residences would also be considered to be NSLUs.

EXISTING NOISE SETTING

The proposed project site is in a partially developed area surrounded by residential land uses, undeveloped land, and a hotel. Existing noise sources in the vicinity of the project site include vehicular traffic along nearby roadways and periodic train pass-bys on the railway to the east of the site. An ambient noise measurement survey was conducted on February 11, 2022 at the project site and included three short-term measurements (refer to Attachment A, *Site Survey Measurement Sheets*). Specifically, the survey included two 15-minute ambient noise measurements and one noise measurement of the train passing by. Noise measurement locations and results are shown in Table 1, *Ambient Noise Measurement Survey*. Additionally, the noise measurement locations are shown on Figure 4, *Noise Measurement Locations*.

Table 1
AMBIENT NOISE MEASUREMENT SURVEY

Measurement	Location/Notes	Time	Noise Level (dBA L_{EQ})
1	Northern boundary of project site, at adjacent parking garage. Noise sources include ambient nature sounds and distant traffic.	11:03 a.m. – 11:18 a.m.	55.2
2	Northwest corner of the intersection of Ponto Road and Ponto Drive. Noise sources include ambient nature sounds and traffic at nearby roadways.	11:30 a.m. – 11:45 a.m.	55.2
3	Dirt path southeast of project site. Train pass-by measurement lasting one minute.	12:10 p.m.	72.9

Source: HELIX site visit conducted on February 11, 2022

EQUIPMENT AND METHODOLOGY

Ambient Noise Survey

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis 831 Sound Level Meter
- Larson Davis Model CAL250 Calibrator
- Microphone windscreen
- Tripod for the Larson Davis 831 Sound Level Meter

The sound-level meters were field-calibrated immediately prior to the noise measurement to ensure accuracy. All measurements were made with meters that conform to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

Noise Modeling Software

Project construction noise was analyzed using the U.S. Department of Transportation (USDOT) Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

Noise modeling was accomplished using the Computer Aided Noise Abatement (CadnaA) model version 2021. CadnaA is a program developed by DataKustik™ for predicting noise impacts in a wide variety of conditions. It allows for the input of project-related information, such as noise source data, barriers, structures, and topography to create a detailed model, and uses the methodology from the U.S. Department of Transportation Federal Highway Administration (FHWA) Traffic Noise Model TNM version 2.5 (USDOT 2004). The noise models used in this analysis were developed using Google Earth and site plans provided by the project architect. Input variables included building mechanical equipment reference noise levels, road alignment, elevation, lane configuration, projected traffic volumes, estimated truck composition percentages, and vehicle speeds.

The one-hour L_{EQ} traffic noise level is calculated utilizing peak-hour traffic. The model-calculated one-hour L_{EQ} noise output is the equivalent to the L_{DN} (Caltrans 2013a). This is shown in the following equation: $L_{DN} = L_{EQ}(h)_{pk} + 10\log_{10}(4.17/P) + 10\log_{10}(D+10N)$, where $L_{EQ}(h)_{pk}$ is peak hour L_{EQ}, P is the peak hour volume percentage of ADT, D is the daytime fraction of ADT, N is the nighttime fraction of ADT, and D+N=1. The modeling includes the project building, the rooftop-mounted heating, ventilation, and air conditioning (HVAC) units, and the traffic on Ponto Road and Carlsbad Boulevard.

Railway noise was analyzed using the Federal Transit Administration (FTA) Noise Impact Assessment Spreadsheet (FTA 2007).

Assumptions and Model Input

Construction

Construction would require the use of equipment throughout the site for the full term of construction. Typical construction activities include demolition, excavating, grading, construction of the building, and paving. Standard equipment used on the site is assumed to include an excavator, scraper, front-end loader, compactor, compressor, crane, dump truck, dozer, grader, backhoe, tractor, skid steer, ready-mix truck, concrete pump, water truck, forklift, scissor lift, loader, and roller. Blasting or the use of pile drivers is not anticipated to be required.

Operation

According to the project site plan and information proved by the project applicant, anticipated operational noise sources would include HVAC systems and vehicular traffic.

HVAC Units

The project would use typical to larger-sized HVAC units located on the rooftop of the proposed buildings or on the internal patios. Standard HVAC planning assumes one HVAC unit per proposed residential unit; therefore, the project would require 86 units. The exact HVAC model has not been determined as of this analysis. For the purposes of this analysis, a Carrier 38HDR060 split system

condenser HVAC unit was used to model the noise impacts from the proposed project's HVAC system (see Attachment B, *Carrier 38HDR060 Split System Condenser*). The manufacturer's noise data for the HVAC units is provided below in Table 2, *Carrier HDR060 Condenser Noise.*

Table 2
CARRIER HDR060 CONDENSER NOISE

Noise Levels in Decibels[1] (dB) Measured at Octave Frequencies							Overall Noise Level in A-weighted Scale (dBA)[1]
125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	
63.0	61.5	64.0	66.5	66.0	64.5	55.5	72.0

[1] Sound Power Level (S_{WL})
Hz = Hertz; KHz = kilohertz

Vehicular Traffic

Traffic modeling for the project was based on the Institute of Transportation Engineers (ITE) common trip generation rates (ITE 2017), and the average daily trips on nearby roadways provided by the San Diego Association of Government's (SANDAG) Transportation Forecast Information Center (TFIC). Streets to be modeled were chosen based on proximity to nearby NSLUs. Existing traffic volumes are based on the SANDAG TFIC volumes for 2025 (SANDAG 2022). Using ITE's trip generation rate of 0.56 trips per dwelling unit for low-rise multi-family housing units, the project is anticipated to generate 51 peak hour trips. A conservative traffic distribution of 97 percent automobiles, 2 percent medium trucks, and 1 percent heavy trucks was used in this analysis for the existing traffic. Posted traffic speeds are 25 miles per hour along Ponto Road and 50 miles per hour along Carlsbad Boulevard. Table 3, *Existing Plus Project Traffic Volumes*, summarizes the peak hour data for nearby roadways, both with and without the project.

Table 3
EXISTING PLUS PROJECT TRAFFIC VOLUMES

Roadway Segment	Peak Hour Trips		
	Existing	Project[1]	Existing Plus Project
Ponto Road[2]			
North of Ponto Drive	120	51	171
Carlsbad Boulevard			
North of Avenida Encinas (northbound)	540	51	591
North of Avenida Encinas (southbound)	630	51	681

Source: SANDAG 2022; ITE 2017
[1] The project is anticipated to generate 51 peak hour trips using ITE's trip generation rate of 0.56 trips per dwelling unit for low-rise multi-family housing units.
[2] TFIC lists the roadway as "zone connector."

Rail Traffic Noise

Rail noise sources include commuter trains (such as the Amtrak Pacific Surfliner, NCTD Coaster, and Metrolink) and freight trains.

Commuter train modeling is based on a single (in operation) locomotive and five cars traveling at 50 mph, and freight train modeling is based on five locomotives and 80 cars traveling at 50 mph. Commuter and freight train trips are shown in Table 4, *Commuter and Freight Train Trips*.

Table 4
COMMUTER AND FREIGHT TRAIN TRIPS

Time	Commuter[1]	Freight
Day (7:00 a.m. to 10:00 p.m.)	46	0
Night (10:00 p.m. to 7:00 a.m.)	10	2

Source: Los Angeles-San Diego-San Luis Obispo (LOSSAN) 2012

[1] The LOSSAN report lists 56 commuter trains (Coaster, Amtrak, and Metrolink) from Oceanside to San Diego per day. Train splits between day and nighttime of approximately 85 percent day trains and 15 percent nighttime trains were determined based upon the NCTD Coaster schedule effective October 14, 2019.

NOISE REGULATIONS

City of Carlsbad Noise Guidelines Manual

According to the City Noise Guidelines Manual (City of Carlsbad 2013), residential lots and dwellings are to be sound attenuated against present and projected roadway noise, so as not to exceed an exterior standard of 60 Community Noise Equivalent Level (CNEL), except that for areas impacted by McClellan-Palomar Airport shall be mitigated at 65 dB(A) CNEL and an interior standard of 45 CNEL in all habitable rooms.

City of Carlsbad General Plan Noise Element

The Carlsbad General Plan Noise Element (City of Carlsbad 2015) establishes noise standards and allowable noise exposure. Table 5, *Performance Standards for Non-Transportation Sources*, provides standards for noise from non-transportation noise sources. These standards apply to the noise sources as measured at the edge of the property line.

Table 5
PERFORMANCE STANDARDS FOR NON-TRANSPORTATION SOURCES[1]

Noise Level Descriptor	Daytime (7:00 a.m. to 10:00 p.m.)[2]	Nighttime (10:00 p.m. to 7:00 a.m.)[2]
Hourly L_{EQ}, dBA	55	45
Maximum Level, dBA	75	65

Source: City of Carlsbad 2015

[1] Performance standards are measured at the property line of source/sensitive use – where is footnote in table?

[2] Each of the noise levels specified shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.

L_{EQ} = equivalent noise level; dBA = A-weighted decibels

The General Plan's Noise Element provides noise land use compatibility standards. For residential multi-family uses, exterior noise limits are considered acceptable up to 60 CNEL (65 CNEL for airport noise impacts), with a transition of 65 to 70 CNEL being conditionally acceptable.

The Noise Element also sets standards that developments shall attain through noise attenuation measures. The allowable noise exposure limits for outdoor activity areas are set at 60 CNEL for residential land uses. Indoor limits are set at 45 CNEL.

City of Carlsbad Municipal Code, Chapter 8.48, Noise

It shall be unlawful to operate equipment or perform any construction in the erection, demolition, alteration, or repair of any building or structure or the grading or excavation of land during the following hours, except as hereinafter provided:

> After 6:00 p.m. on any day, and before 7:00 a.m., Monday through Friday, and before 8:00 a.m. on Saturday; all day on Sunday; and on any federal holiday.

ANALYSIS AND IMPACTS

Construction Noise Levels

Construction of the proposed project would involve demolition of the existing structures and construction of 86 multi-family residential units. The magnitude of the impact would depend on the type of construction activity, equipment, duration of each construction phase, distance between the noise source and receiver, and intervening structures. Construction would generate elevated noise levels that may by audible at nearby residential uses in the vicinity of the project site.

Construction equipment would not all operate at the same time or location. Furthermore, construction equipment would not be in constant use during a typical 8-hour operating day. The closest NSLUs are the residences to the west. While these residences are approximately 60 feet from the project boundary, construction noise is mobile and would occur throughout the project site. An average distance of 150 feet was used to assess noise levels. Table 6, *Construction Equipment Noise Levels*, provides the 150-foot distance noise levels for expected construction equipment.

Table 6
CONSTRUCTION EQUIPMENT NOISE LEVELS

Unit	Percent Operating Time	dBA L_{EQ} at 150 feet
Backhoe	40	64.0
Compactor	20	66.7
Compressor	40	64.1
Crane	16	63.0
Dozer	40	68.1
Dump Truck	40	62.9
Excavator	40	67.2
Front-End Loader	40	65.6
Generator	50	71.1
Grader	40	75.5
Paver	50	64.7
Pumps	50	68.4
Roller	20	63.5
Scraper	40	70.1
Tractor	40	70.5

Source: USDOT 2008

As shown in Table 6, the loudest piece of individual equipment operated during construction would be the grader, which would generate 75.5 dBA L_{EQ} at 150 feet. Additionally, an excavator, loader, and dump truck were analyzed together for construction noise impacts due to their likelihood of being used in conjunction with one another. Operation of an excavator, loader, and dump truck would generate a noise level of 70.3 dBA L_{EQ} at 150 feet. The City does not provide a numerical threshold for construction noise levels, and construction would occur within the hours allowed by the municipal code. However, noise levels may exceed the existing ambient noise levels of the project area, which would be approximately 55.2 dBA, as measured by the ambient noise measurements.

Construction Vibration

Construction of the project would occur near single-family residences, with the nearest houses occurring as close as 60 feet from the edge of the proposed project, and approximately 230 feet from the center of the proposed project. A possible source of vibration during general project construction activities would be a vibratory roller, which may be used for compaction of soil beneath building foundations and would be used within 60 feet of off-site residences. A vibratory roller would create approximately 0.210 inch per second PPV at a distance of 25 feet (Caltrans 2013b). A 0.210 inch per second PPV vibration level would equal 0.069 inch per second PPV at a distance of 60 feet.[1] This would be lower than the structural damage impact to older structures of 0.5 inches per second PPV and the "strongly perceptible" impact for humans of 0.1 inches per second PPV. Additionally, off-site exposure to such ground-borne vibration would be temporary. Therefore, even though vibration may be perceptible at

[1] Equipment PPV = Reference PPV * $(25/D)^n$ (in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receiver in feet, and n = 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2013.

nearby residences, temporary impacts associated with the roller (and other potential equipment) would be less than significant.

Operation Noise Levels

On-site Noise Generation

As previously discussed, modeling assumed that the HVAC units would be Carrier 38HDR060 split system condenser units, and that one unit would be mounted on the rooftop of each unit, resulting in a total of 86 HVAC units included in the project. According to the CadnaA modeling, operation of the proposed HVAC units would generate a noise level of 33.3 dBA L_{EQ} at the property line of the single-family residence to the west. Therefore, the project would not exceed the non-transportation nighttime operational noise limit of 45 dBA L_{EQ}. Impacts would be less than significant.

Off-site Transportation Noise

As noted in the assumptions, Existing and Existing Plus Project traffic noise levels presented in this analysis are based on traffic data provided by SANDAG's TFIC and traffic calculated using ITE's trip generation rates. Refer to Table 3 for the forecasted peak hour traffic data for existing and project-added traffic volumes.

CadnaA software was used to calculate the noise levels for Existing and Existing Plus Project conditions. The off-site roadway modeling represents a conservative analysis that does not consider topography or attenuation provided by structures such as existing noise walls. The results of this analysis for the noise levels at the nearest NSLUs to the roadway centerline are shown below in Table 7, *Off-site Traffic Noise Levels at Nearest NSLU*.

Table 7
OFF-SITE TRAFFIC NOISE LEVELS AT NEAREST NSLU (dBA)

Roadway Segment	Distance to Nearest NSLU	Existing Traffic	Existing + Project	Change from Existing	Direct Impact
Ponto Road	15 feet[1]	57.7	58.9	+1.2	No
Carlsbad Boulevard	75 feet[2]	58.9	59.3	+0.4	No

[1] Receiver placed at the eastern property boundary of the residence at 7270 Ponto Drive.

[2] Receiver placed at the western property boundary of the residence at 7258 Ponto Drive.

Implementation would result in a minimal increase in traffic noise at the nearest NSLUs to the impacted roadways. With implementation of the project, the noise levels at the nearest NSLUs to the impacted roadways would not exceed the noise level threshold of 60 dBA. Therefore, impacts from project-generated traffic would be less than significant.

Operation Vibration Levels

As a residential development, the project would not generate excessive ground-borne vibration during operation. Therefore, no impacts would occur.

Land Use Compatibility

Exterior Use Areas

The noise levels associated with traffic (including project-added trips) were modeled using CadnaA at the project's western boundary, which would be the portion of the project closest to local roadways. The project's western boundary would be located as close as 35 feet from the centerline of Ponto Road and 230 feet from the northbound lane centerline of Carlsbad Boulevard. Future residential uses would be exposed to noise from vehicular traffic along Carlsbad Boulevard and Ponto Road. Impacts related to exterior noise would be significant if future exterior use areas are exposed to noise levels in excess of 65 dBA. The modeled roadway noise level at exterior use areas, assuming no topographic attenuation, was modeled at 56.1 dBA. Noise levels at common exterior use area locations would not exceed the 65 CNEL standard.

The closest residences would have rear yards within approximately 100 feet from the centerline of the NCTD railroad tracks. Noise levels were modeled using the FTA's Noise Impact Assessment Spreadsheet (Attachment C). At this distance, noise associated with commuter and freight trains would be approximately 58.9 dBA average during the daytime hours and 58.6 dBA average during the nighttime hours. This level of noise would equate to a 70.7 CNEL. Noise levels at these exterior use area locations would not exceed the 60 CNEL standard.

NOI-1 **Exterior Noise Standard Compliance**.The project shall be required to include an exterior use area noise control barrier of 7.5-feet above the finished pad elevation for the residences adjacent the rail with a clear view of the rail.

The sound attenuation fence or wall must be solid. It can be constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one-inch total thickness or have a density of at least 3½ pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic ⅜ of an inch thick or thicker may be used on the upper portion, if it is desirable to preserve a view. Sheet metal of 18 gauge (minimum) may be used, if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Any door(s) or gate(s) must be designed with overlapping closures on the bottom and sides and meet the minimum specifications of the wall materials described above. The gate(s) may be of one-inch thick or better wood, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated doorjambs.

Tall walls may create an impact to locations opposite the wall. However, low level walls such as the planned 7.5-foot wall at a distance of 160 feet from the opposite side residential land use would not normally be expected to create a measurable change in noise level due to sound reflection. It should be further noted that during the time noise is occurring from the tracks, the train has a physical noise blocking presence between the wall and the far side properties further reducing any reflected noise.

Interior Spaces

Traditional architectural materials are conservatively estimated to attenuate noise levels by 15 dBA; therefore, if noise levels exceed 60 dBA, interior noise levels may exceed the Title 24 interior noise standard of 45 dBA (California Building Standards Commission 2010).

As described above, noise levels from Carlsbad Boulevard and Ponto Road would not exceed 60 dBA at the exterior use areas along the project's western edge. Noise levels at building façades facing that roadway would therefore not exceed 60 dBA, and interior noise levels would not exceed 45 dBA.

Train noise at the project's eastern-facing façades was modeled using the FTA's Noise Impact Assessment Spreadsheet (Attachment C). The project buildings would be as close as approximately 100 feet from the centerline of the NCTD railroad tracks. At this distance, noise associated with commuter and freight trains would be approximately 70.7 CNEL. These noise levels would exceed 60 CNEL, and interior noise levels may therefore exceed the Title 24 interior noise standard of 45 CNEL. For receptors that have a clear line-of-sight and are within 425 feet of the railroad tracks, train noise would exceed 60 CNEL. Because interior spaces may exceed 45 CNEL, north-facing, east-facing, and south-facing units would require attenuation. NOI-2 would be required to reduce interior spaces to less-than-significant levels.

NOI-2 **Interior Noise Standard Compliance**. Once specific building plan information is available, an exterior-to-interior analysis shall be performed for habitable rooms with both a direct line-of-sight and within 425 feet of the railroad tracks. The exterior-to-interior analysis shall demonstrate that interior noise levels do not exceed 45 CNEL.

The information in the analysis shall include wall heights and lengths, room volumes, window and door tables typical for a building plan, as well as information on any other openings in the building shell. With this specific building plan information, the analysis shall determine the predicted interior noise levels at the planned on-site buildings. If predicted noise levels are found to exceed 45 CNEL, the report shall identify architectural materials or techniques that could be included to reduce noise levels to 45 CNEL in habitable rooms. Standard measures such as glazing with appropriate Sound Transmission Class (STC) ratings, as well as walls with appropriate STC ratings, should be considered.

Appropriate means of air circulation and provision of fresh air would be provided to allow windows to remain closed for extended intervals of time so that acceptable interior noise levels can be maintained. The mechanical ventilation system would meet the criteria of all applicable codes.

CONCLUSIONS

Construction of the proposed project would result in less than significant impacts related to vibration but would result in impacts related to construction noise. Implementation of measure NOI-1 would require a noise control barrier adjacent the railroad tracks to reduce impacts to less than significant levels. Operation of the project would result in less than significant noise impacts to off-site NSLUs resulting from traffic and HVAC units. Operation of the project would not generate vibration. The proposed project would be compatible with existing noise levels related to vehicular traffic. However, interior noise levels would exceed the 45 CNEL requirements due to nearby train noise. Implementation of measure NOI-2 would ensure compliance of interior noise levels with the 45 CNEL standard.

Sincerely,

Charles Terry
Principal Specialist Noise, Acoustics & Vibration

Kristen Garcia
Noise Analyst

Attachments:

Figure 1 – Regional Location
Figure 2 – Aerial Photograph
Figure 3 – Site Plan
Figure 4 – Noise Measurement Locations
Attachment A – Site Survey Measurement Sheets
Attachment B – Carrier 38HDR060 Split System Condenser
Attachment C – Noise Impact Assessment Spreadsheet

REFERENCES

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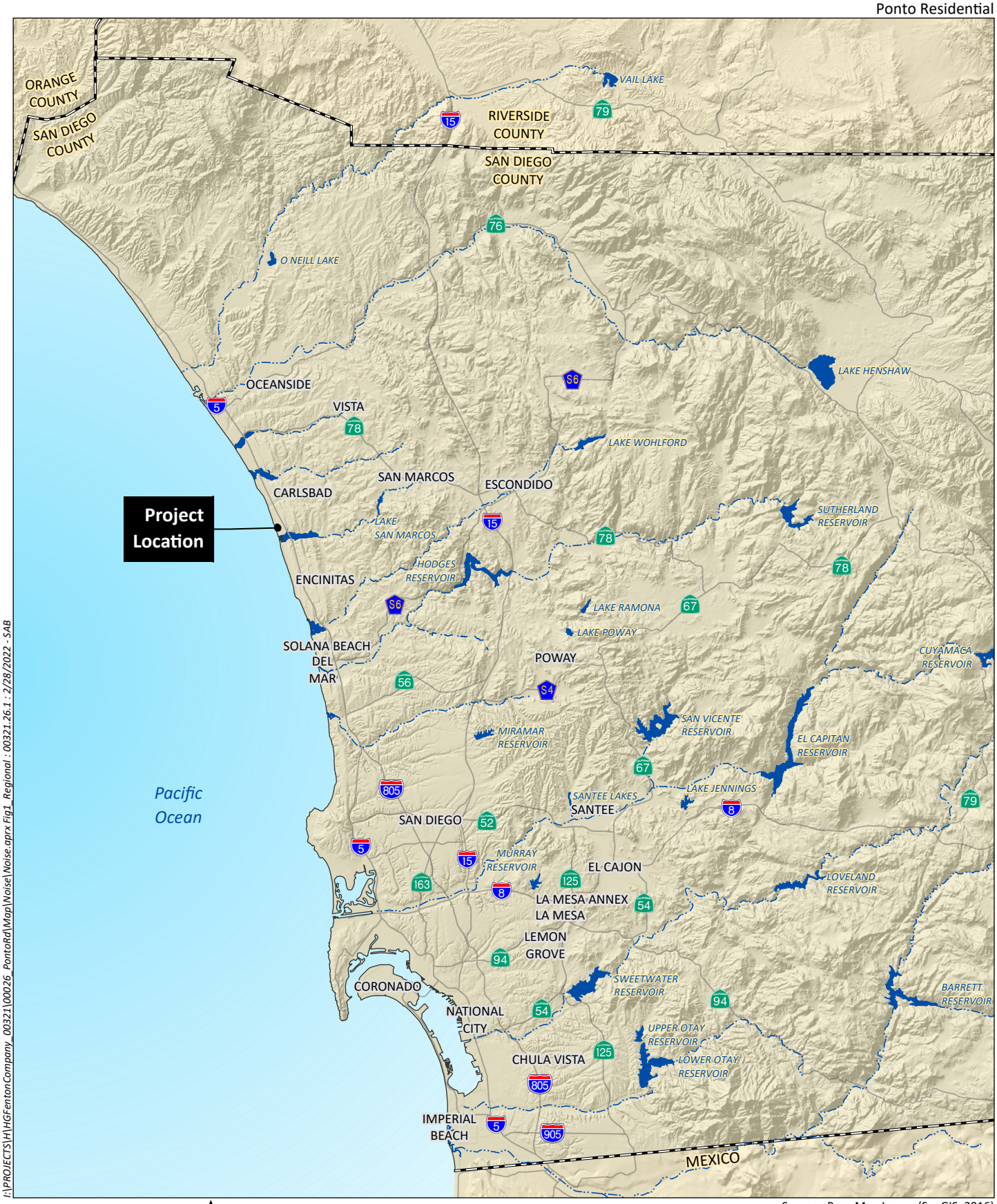

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0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

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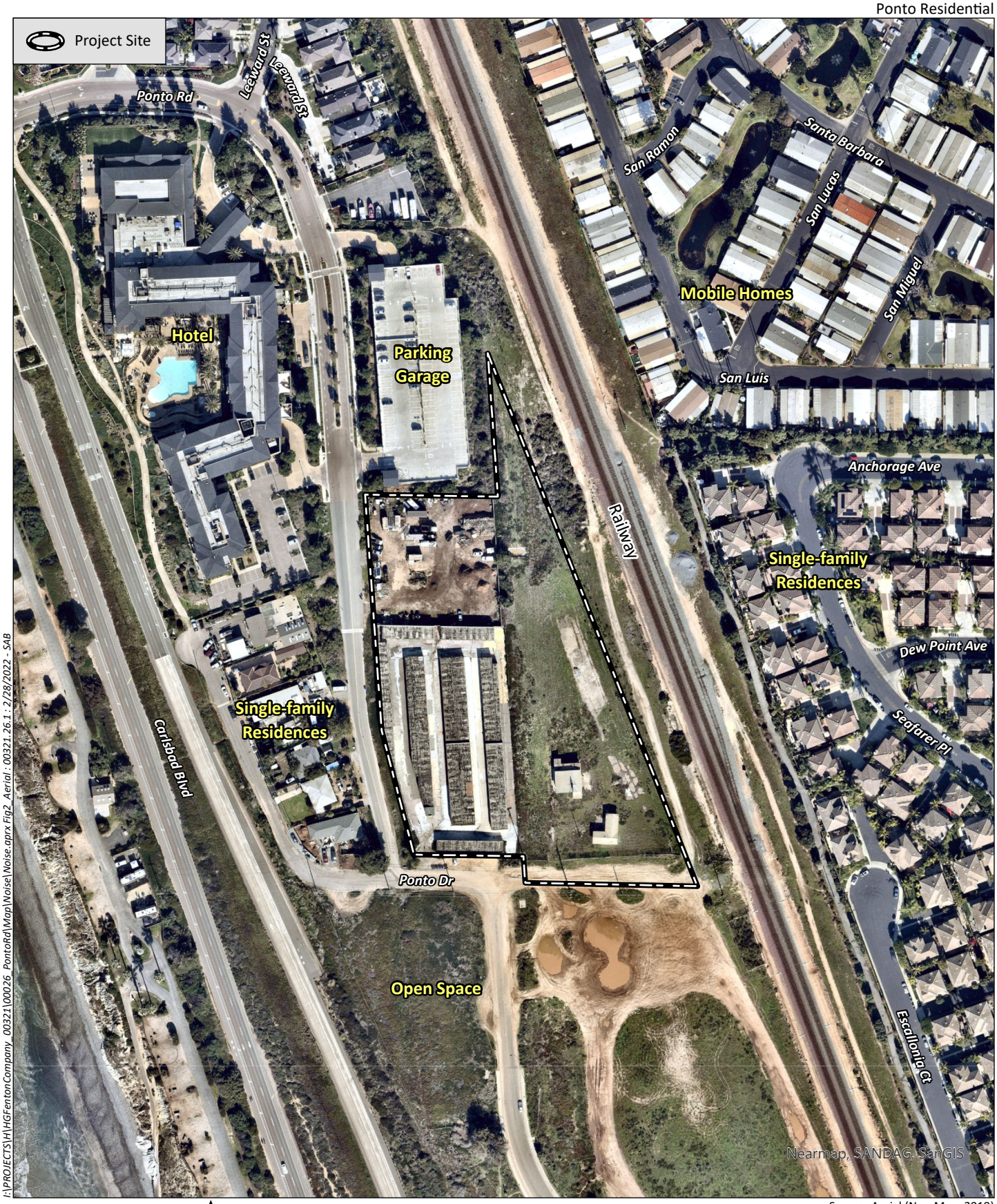
Regional Location

Figure 1



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0 200 Feet

Source: Aerial (NearMap, 2019)

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Aerial Photograph

Figure 2

PROJECT SUMMARY

PARCEL 1 GROSS ACRES: 4.64 ACRES OR 202,221 SF
NET DENSITY: 18.3 DU/AC

F CLUSTER PRODUCT

ROW TOWN 3-PLEX (4) = 12 UNITS
ROW TOWN 4-PLEX (5) = 20 UNITS

R CLUSTER PRODUCT

ROW TOWN 4-PLEX (1) = 4 UNITS
ROW TOWN 5-PLEX (3) = 15 UNITS
ROW TOWN 5.1-PLEX (1) = 5 UNITS
ROW TOWN 6-PLEX (1) = 6 UNITS

T CLUSTER PRODUCT

TRIPLEX (8) = 24 UNITS

TOTAL UNITS = 86 UNITS

PARKING

PROVIDED:
GARAGES: 86 X 2 = 172 GARAGE STALLS
SURFACE PARKING: 19 (INCL. 1 ACCESSIBLE)
TOTAL SPACES = 191 SPACES

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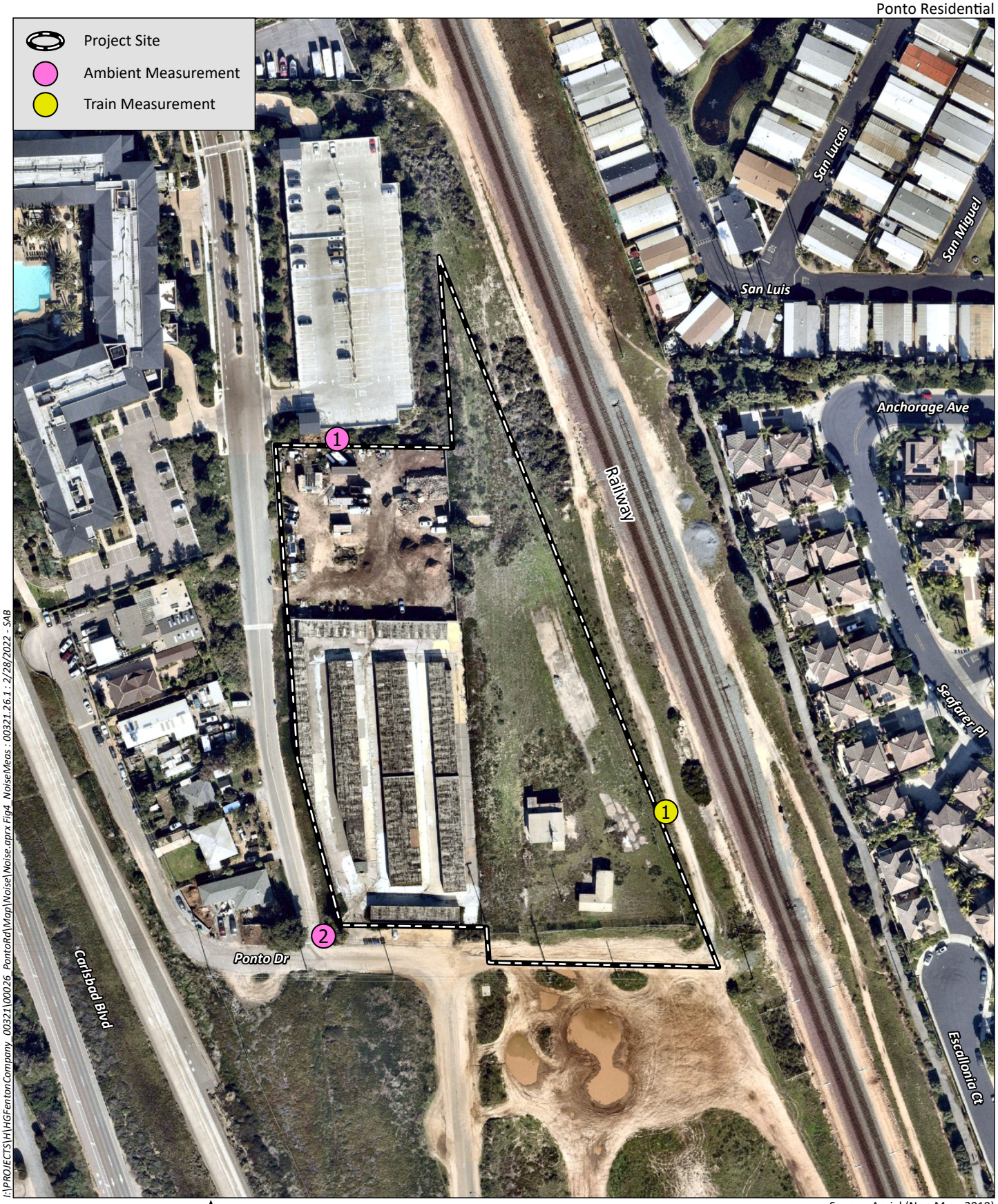
Source:Hunsaker and Associates, 2022



Source: Aerial (NearMap, 2019)

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Noise Measurement Locations

Figure 4

Attachment A

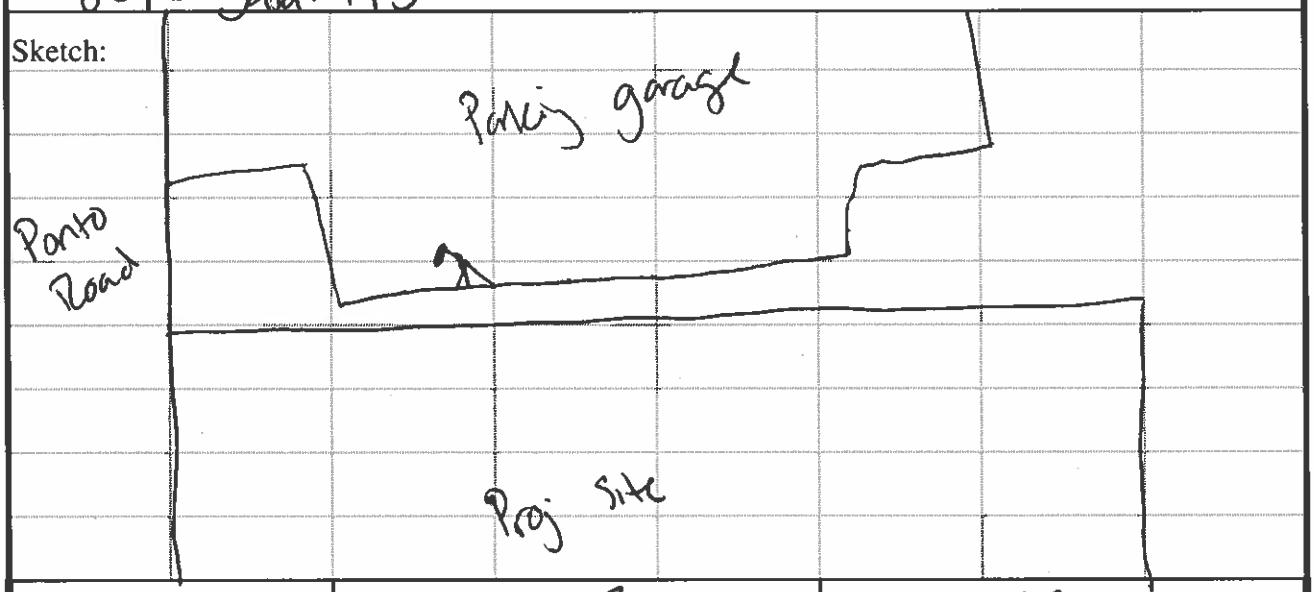
Site Survey Measurement Sheets

Site Survey

Job # 00321.00026.001	Project Name: Ponto Residential		
Date: 2/11/22	Site #: 1	Engineer: Kristen Garcia	
Address: Ponto Rd, Carlsbad, CA 92011			
Meter: LD831	Serial #: 1890	Calibrator: CA250	Serial #: 2621

Notes: Sunny. Ambient nature sounds. Distant traffic noise. Cars in parking garage.
831 - Data. 443

Sketch:



Temp: 71 °F	Wind Spd: 3 mph	Humidity: 38 %
Start of Measurement: 11:03 AM	End of Measurement: 11:18 AM	55.2 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

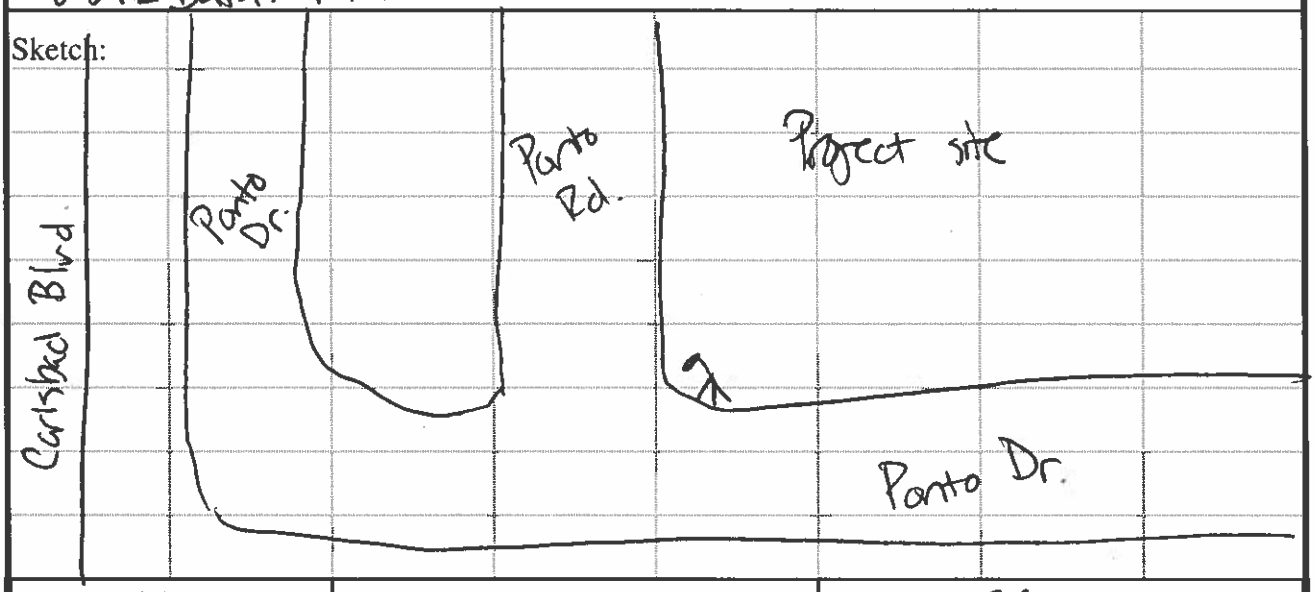
No Calibration Analysis Will Be Provided

Site Survey

Job # 00321.00026.001	Project Name: Ponto Residential		
Date: 2/11/22	Site #: 2	Engineer: Kristen Garcia	
Address: Ponto Rd, Carlsbad, CA 92011			
Meter: LD831	Serial #: 1890	Calibrator: CA250	Serial #: 2621

Notes: Sunny. Ambient nature sounds. Noise primarily from traffic on Ponto Rd, Ponto Dr., & Carlsbad Blvd.
831_Data.444

Sketch:



Temp: 70°F	Wind Spd: 7 mph	Humidity: 36 %
Start of Measurement: 11:30 Am	End of Measurement: 11:45 Am	55.2 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
11 cars	1 MT	Ø

Noise Measurement for Information Only

No Through Roadways

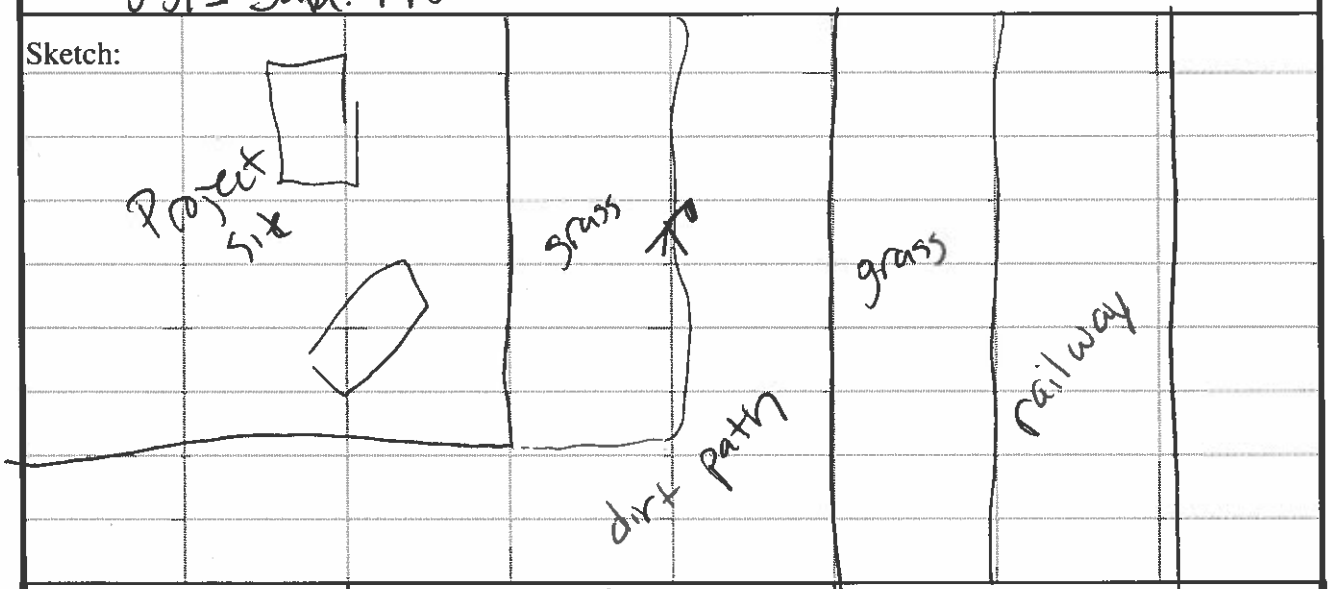
No Calibration Analysis Will Be Provided

Site Survey

Job # 00321.00026.001	Project Name: Ponto Residential		
Date: 2/11/22	Site #: 3	Engineer: Kristen Garcia	
Address: Ponto Rd, Carlsbad, CA 92011			
Meter: LD 831	Serial #: 1890	Calibrator: CA 250	Serial #: 2621

Notes: Sunny. (train noise measurement only)
northband train.
831_Data.445

Sketch:



Temp: 71° F	Wind Spd: 6	mph	Humidity: 33	%	
Start of Measurement: 12:10 pm	End of Measurement:		72.9	dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Attachment B

Carrier 38HDR060 Split System Condenser

ELECTRICAL DATA

38HDR UNIT SIZE	V–PH–Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/ HACR BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018	208/230–1–60	187	253	9.0	48.0	0.80	0.125	0.09	12.1	20
024	208/230–1–60	187	253	12.8	58.3	0.80	0.125	0.09	16.8	25
030	208/230–1–60	187	253	14.1	73.0	1.45	0.25	0.19	19.1	30
036	208/230–1–60	187	253	14.1	77.0	1.45	0.25	0.19	19.1	30
	208/230–3–60	187	253	9.0	71.0	1.45	0.25	0.19	12.7	20
	460–3–60	414	506	5.6	38.0	0.80	0.25	0.19	7.8	15
048	208/230–1–60	187	253	21.8	117.0	1.45	0.25	0.19	28.7	50
	208/230–3–60	187	253	13.7	83.1	1.45	0.25	0.19	18.6	30
	460–3–60	414	506	6.2	41.0	0.80	0.25	0.19	8.6	15
060	208/230–1–60	187	253	26.4	134.0	1.45	0.25	0.19	34.5	60
	208/230–3–60	187	253	16.0	110.0	1.45	0.25	0.19	21.5	35
	460–3–60	414	506	7.8	52.0	0.80	0.25	0.19	10.6	15

* Permissible limits of the voltage range at which the unit will operate satisfactorily

FLA – Full Load Amps
HACR – Heating, Air Conditininng, Refrigeration
LRA – Locked Rotor Amps
NEC – National Electrical Code
RLA – Rated Load Amps (compressor)

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit.
All motors/compressors contain internal overload protection.

SOUND LEVEL

Unit Size	Standard Rating (dB)	Typical Octave Band Spectrum (dBA) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018	12 (6.7)
024	12 (6.7)
030	12 (6.7)
036	12 (6.7)
048	12 (6.7)
060	12 (6.7)

Attachment C

Noise Impact Assessment Spreadsheet

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	Ponto Residential

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	55 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	1
	Speed (mph)	70
	Avg. Number of Events/hr	3.06
Nighttime hrs	Avg. Number of Locos/train	1
	Speed (mph)	70
	Avg. Number of Events/hr	1.11
Distance	Distance from Source to Receiver (ft)	115
	Number of Intervening Rows of Buildings	0
Adjustments		

Noise Source Parameters		Source 2
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	5
	Speed (mph)	70
	Avg. Number of Events/hr	3.06
Nighttime hrs	Avg. Number of Rail Cars/train	5
	Speed (mph)	70
	Avg. Number of Events/hr	1.11
Distance	Distance from Source to Receiver (ft)	115
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 3
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	
	Speed	
	Avg. Number of Events/hr	
Nighttime hrs	Avg. Number of Locos/train	5
	Speed	50
	Avg. Number of Events/hr	0.666
Distance	Distance from Source to Receiver (ft)	115
	Number of Intervening Rows of Buildings	
Adjustments		

Noise Source Parameters		Source 4
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	
	Speed (mph)	
	Avg. Number of Events/hr	
Nighttime hrs	Avg. Number of Rail Cars/train	80
	Speed (mph)	50
	Avg. Number of Events/hr	0.666
Distance	Distance from Source to Receiver (ft)	115
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Project Results Summary

Existing Ldn:	55 dBA
Total Project Ldn:	67 dBA
Total Noise Exposure:	68 dBA
Increase:	13 dB
Impact?:	Severe

Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	54.4 dBA
Leq(night):	50.0 dBA
Ldn:	57.4 dBA

Source 2 Results

Leq(day):	55.7 dBA
Leq(night):	51.3 dBA
Ldn:	58.7 dBA
Incremental Ldn (Src 1-2):	61.1 dBA

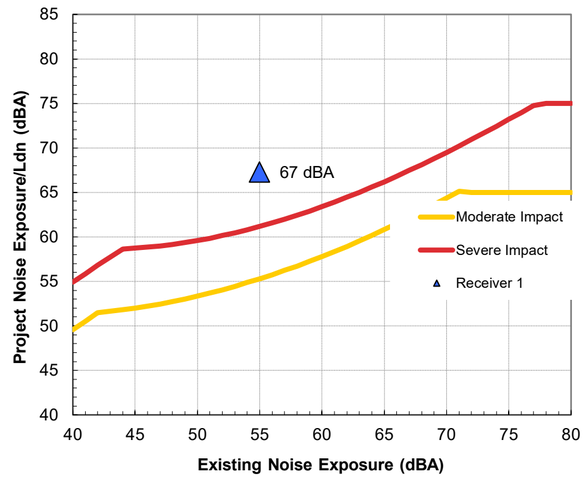
Source 3 Results

Leq(day):	0.0 dBA
Leq(night):	56.2 dBA
Ldn:	61.9 dBA
Incremental Ldn (Src 1-3):	64.6 dBA

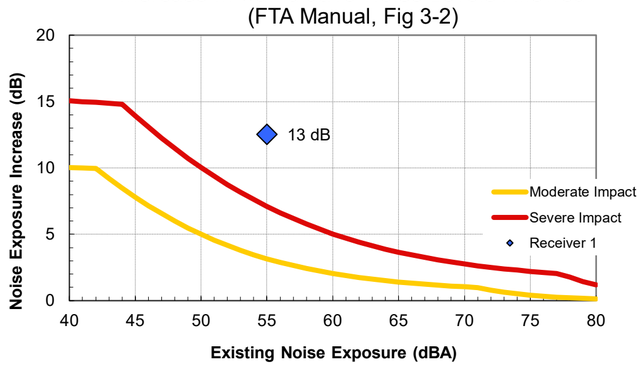
Source 4 Results

Leq(day):	0.0 dBA
Leq(night):	58.2 dBA
Ldn:	64.0 dBA
Incremental Ldn (Src 1-4):	67.3 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	Ponto Residential

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	55 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	1
	Speed (mph)	70
	Avg. Number of Events/hr	3.06
Nighttime hrs	Avg. Number of Locos/train	1
	Speed (mph)	70
	Avg. Number of Events/hr	1.11
Distance	Distance from Source to Receiver (ft)	240
	Number of Intervening Rows of Buildings	0
Adjustments		

Noise Source Parameters		Source 2
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	5
	Speed (mph)	70
	Avg. Number of Events/hr	3.06
Nighttime hrs	Avg. Number of Rail Cars/train	5
	Speed (mph)	70
	Avg. Number of Events/hr	1.11
Distance	Distance from Source to Receiver (ft)	240
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 3
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	
	Speed	
	Avg. Number of Events/hr	
Nighttime hrs	Avg. Number of Locos/train	5
	Speed	50
	Avg. Number of Events/hr	0.666
Distance	Distance from Source to Receiver (ft)	240
	Number of Intervening Rows of Buildings	
Adjustments		

Noise Source Parameters		Source 4
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	
	Speed (mph)	
	Avg. Number of Events/hr	
Nighttime hrs	Avg. Number of Rail Cars/train	80
	Speed (mph)	50
	Avg. Number of Events/hr	0.666
Distance	Distance from Source to Receiver (ft)	240
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Project Results Summary

Existing Ldn:	55 dBA
Total Project Ldn:	62 dBA
Total Noise Exposure:	63 dBA
Increase:	8 dB
Impact?:	Severe

Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	49.6 dBA
Leq(night):	45.2 dBA
Ldn:	52.6 dBA

Source 2 Results

Leq(day):	51.0 dBA
Leq(night):	46.5 dBA
Ldn:	53.9 dBA
Incremental Ldn (Src 1-2):	56.3 dBA

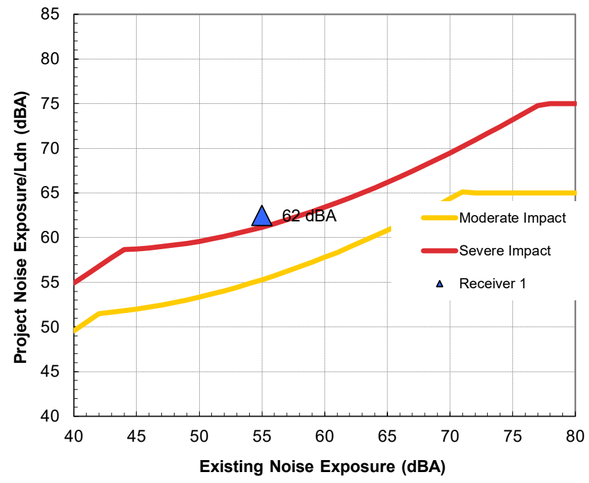
Source 3 Results

Leq(day):	0.0 dBA
Leq(night):	51.4 dBA
Ldn:	57.1 dBA
Incremental Ldn (Src 1-3):	59.8 dBA

Source 4 Results

Leq(day):	0.0 dBA
Leq(night):	53.4 dBA
Ldn:	59.2 dBA
Incremental Ldn (Src 1-4):	62.5 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)