ATTACHMENT G

UDSP EIR 2025 ADDENDUM - APPENDIX H - NOISE STUDY

APPENDIX H

Noise

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January 15, 2025

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Subject: CubeSmart Noise Assessment - City of San Marcos

The firm of Ldn Consulting is pleased to submit the following noise analysis for the proposed CubeSmart in the City of San Marcos. The purpose of the noise evaluation is to determine the estimated exterior and interior noise levels from the proposed self-storage facility and recommend reduction measures, if needed, for compliance with the City of San Marcos Noise standards, plans and policy goals for noise.

Project Location/Description

The proposed project is generally located south of State Route 78 (SR-78), south along Carmel Street, and north of Enterprise Street between Industrial Avenue and Venture Street within the University District Specific Plan (UDSP) in the City of San Marcos CA. The San Diego Northern Railroad (SDNR) consisting of Sprinter service operated by the North County Transit District is located adjacent to the Project to the west. The primary noise source that affects the site is vehicular traffic from SR-78 to the north. The project vicinity can be seen in Figure 1.

The proposed CubeSmart project includes the construction of a new self-storage facility on approximately 3-acres. The storage facility would provide 104,600 square-feet of storage space within a 3-story building (Building A) and 6,600 square-feet of storage space within a 1-story building (Building B) for a combined size of 111,200 square feet. An office is proposed within the 3-story building. The project site configuration is provided in Figure 2 and shows the proposed site configuration.

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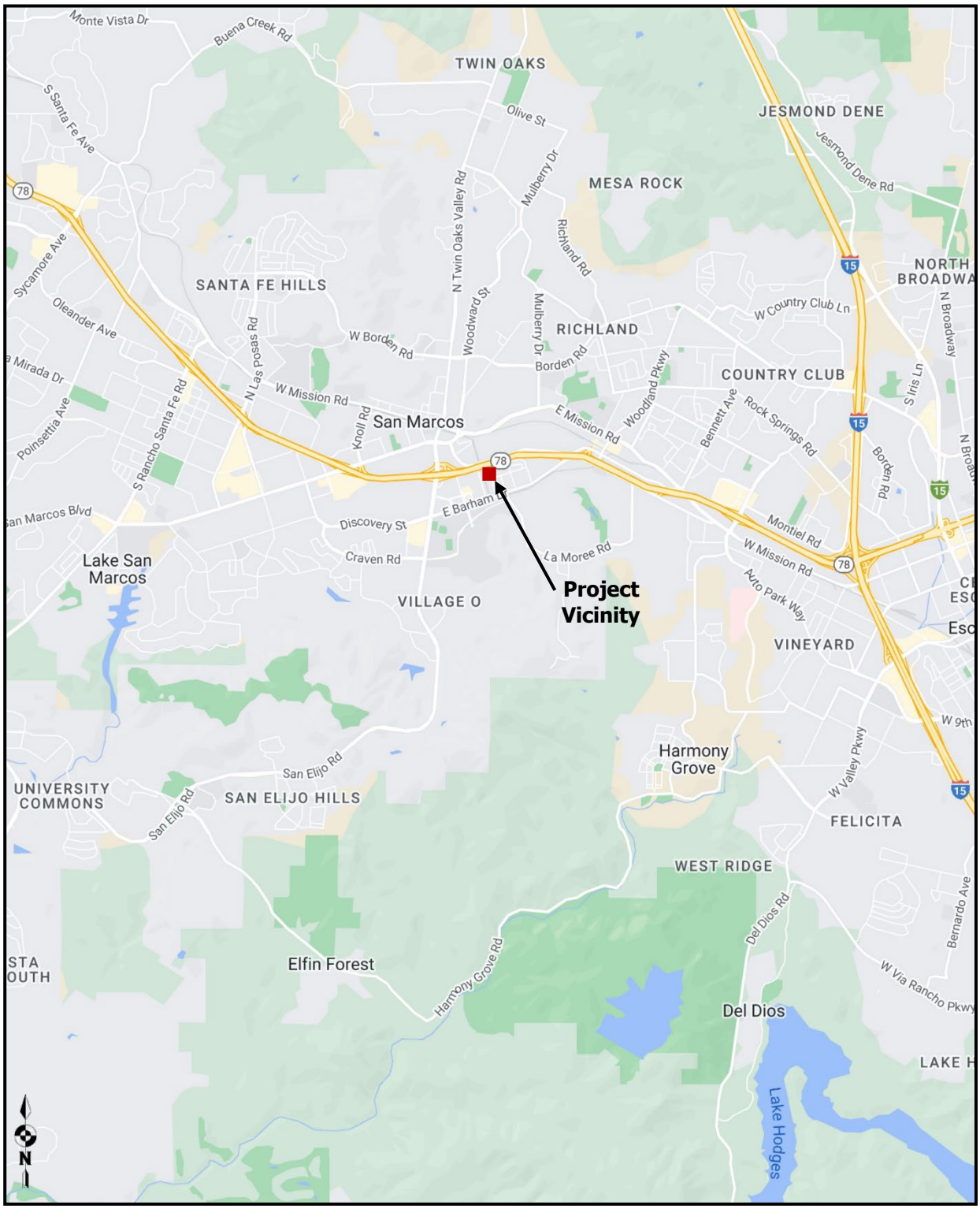
Figure 1: Project Vicinity



Source: (Google, 2024)

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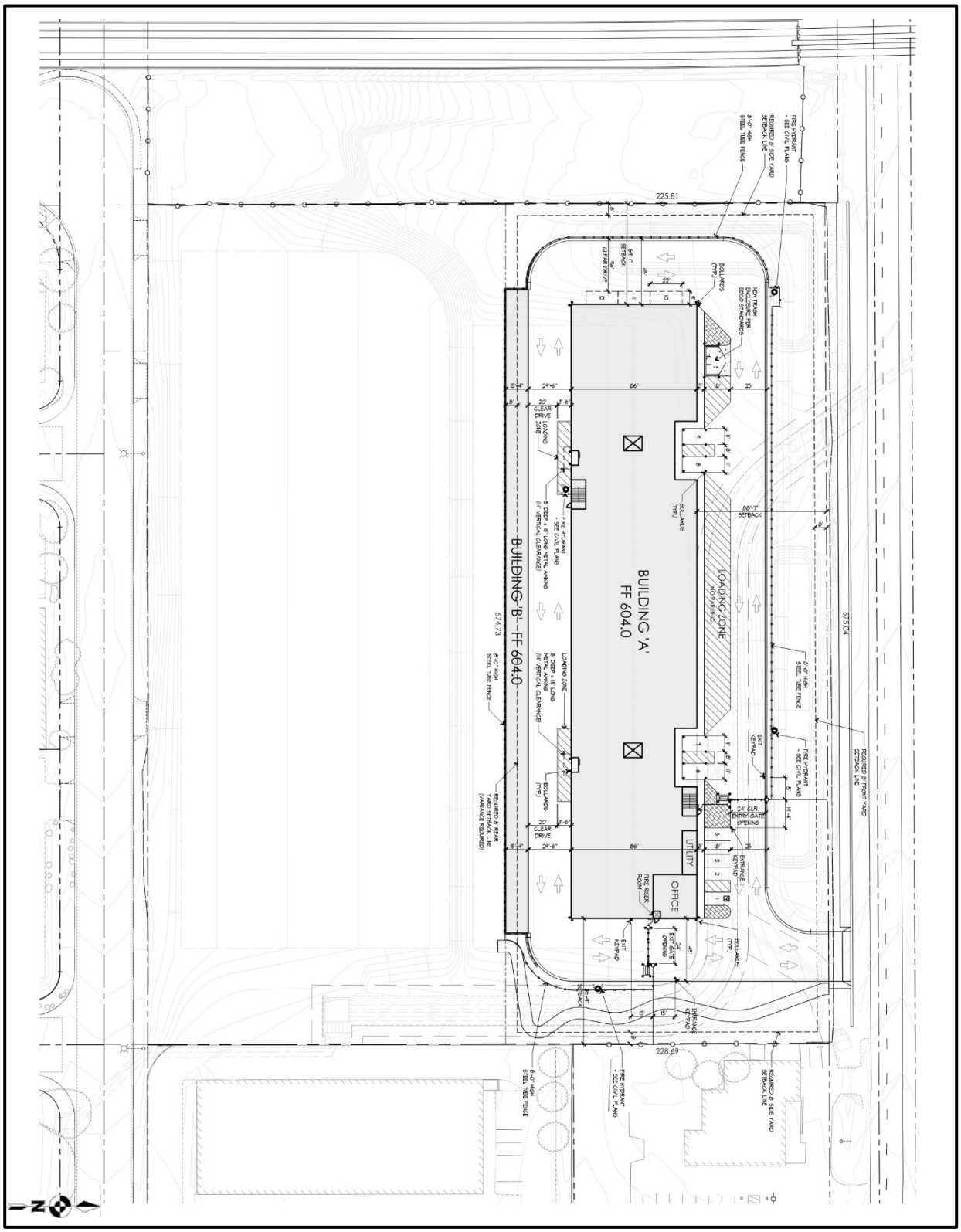
Figure 2: Proposed Project Configuration



Source: (Valli Architectural Group, 2024)

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University District Specific Plan Background

The vision for the approved, mixed-use UDSP (City of San Marcos) is to develop a vibrant new town center for the City of San Marcos that provides the vitality and richness characteristic of successful downtowns that have grown and evolved over time. UDSP will be an attractive, pedestrian- and transit-oriented, urban mixed-use neighborhood where residents and visitors interact and engage in a variety of social, cultural, and commercial activities. The UDSP will be a hub for surrounding communities, a destination for social and cultural events, recreation, and commercial activity. Fundamental to the success of the UDSP is the strategic distribution of land uses where retail, entertainment, services, employment, public transit, parks, and housing are all conveniently located within walking distance of each other. A truly mixed-use district allows those who live and work in the district to be able to walk from their homes or workplaces to nearby parks and businesses for recreation, dining, retail, and services . A continuous level of activity throughout the day and night is also fundamental to the success of the UDSP. It is necessary to balance dining, entertainment, and retail uses with residential, office, and services to ensure the economic viability of the UDSP commercial core. (UDSP, Land Uses, pg. III-6.)

Construction Noise Standards

The City of San Marcos Municipal Code (City of San Marcos Municipal Code, 2019) addresses the limits of grading, extraction and construction activities between 7:00 a.m. and 4:30 p.m. Monday through Friday and no grading, extraction or construction is allowed on the weekends or holidays. The Municipal code does not set noise limits on construction activities. Commonly, the City has utilized Section 36.409 of the County of San Diego's Noise Ordinance (County of San Diego Municipal Code, 2005) noise limit of 75 dBA Leq (8-hour) for other projects.

Transportation Noise Standards

The City of San Marcos as part of its noise guidelines states (City of San Marcos General Plan, 2012), consistent with Title 24 of the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. For noise sensitive commercial land uses, the City has adopted an interior noise level of less than 50 dBA CNEL for offices.

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Operational Noise Standards

The City noise regulations that apply to the Project are found in Chapter 20.300 Site Planning and General Development Standards of the City Municipal Code. These regulations aim to prohibit unnecessary, excessive, and annoying noises from all sources, as certain noise levels are detrimental to the health and welfare of individuals. The standards of this section and of Chapter 10.24 Noise of the Municipal Code apply to all land uses in all Zones unless otherwise specified. No person shall create or allow the creation of exterior noise that causes the noise level to exceed the noise standards established by Table 20.300-4 (provided below in Table 1).

Table 1: Sound Level Limits

Zone	Allowable Noise Level (dBA Leq) Measured from the Property Line
Single-Family Residential (A, R-1, R-2) [1, 2]	
7 a.m. to 10 p.m. (daytime)	60
10 p.m. to 7 a.m. (overnight)	50
Multifamily Residential (R-3) [1, 2]	
7 a.m. to 10 p.m. (daytime)	65
10 p.m. to 7 a.m. (overnight)	55
Commercial (C, O-P, SR) [3]	
7 a.m. to 10 p.m. (daytime)	65
10 p.m. to 7 a.m. (overnight)	55
Industrial	
7 a.m. to 10 p.m. (daytime)	65
10 p.m. to 7 a.m. (overnight)	60

1. For single-family detached dwelling units, the "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
2. For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
3. For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.

The City Ordinance limits noise generation in commercial/and multi-family zones to 65 dB Leq (one-hour average) between the hours of 7 am and 10 pm and 55 dB Leq between the hours of 10 pm and 7 am as measured at the project property line as shown above in Table 1. Per the City of San Marcos General Plan Noise Element (GPNE), noise standards for commercial, multi-family, and mixed-use land uses are the same, and are higher than single-family residential areas because they reflect a more urban environment (GPNE, pg. 7-10). Higher thresholds are permitted due to the integrated mix of residential and commercial activity and their usual location near major arterials (GPNE, pg. 7-9). The project site is designated as part of the Office/Commercial District in the UDSP and is within the 70 CNEL noise contours of SR-78 (GPNE, Figure 7-1). Properties surrounding the project site are all designated as Office/Commercial and Commercial/Retail Core in the UDSP. The property immediately to the south within the UDSP has a pending application for construction of a multi-family residential project (Carmel Enterprise affordable housing). Beyond that are areas designated as light industrial and industrial in the General Plan. Therefore a 65 dBA hourly noise standard during the daytime hours between 7 a.m. and 10 p.m., a 55 dBA standard during the overnight hours between 10 p.m. and 7 a.m. would apply.

Vibration Standards

The City of San Marcos has not yet adopted vibration criteria for construction. The United States Department of Transportation Federal Transit Administration (FTA) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration (FTA, 2018). For purposes of identifying potential project-related vibration impacts, the FTA criteria will be used. The human reaction to various levels of vibration is highly subjective. The upper end of the range shown for the threshold of perception, or roughly 65 VdB, may be considered annoying by some people. Vibration below 65 VdB may also cause secondary audible effects, such as a slight rattling of doors, suspended ceilings/fixtures, windows, and dishes, any of which may result in additional annoyance. Table 2 shows the FTA groundborne vibration and noise impact criteria for human annoyance.

In addition to the vibration annoyance standards presented above, the FTA also applies the following standards for construction vibration damage. Table 3 on the following page, structural damage is possible for typical residential construction when the peak particle velocity (PPV) exceeds 0.2 inch per second (in/sec). This criterion is the threshold at which there is a risk of damage to normal dwellings.

In the context of this analysis, the noise and vibration impacts associated with the construction operations will be conditioned to comply with the thresholds stated above. The potential noise and vibration impacts are analyzed separately below.

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Table 2: Groundborne Vibration and Noise Impact Criteria (Human Annoyance)

	Groundborne Vibration Impact Levels (VdB re 1 microinch/second)			Groundborne Noise Impact Levels (dB re 20 micropascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: United States Department of Transportation Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* 2018 (FTA, 2018).

[1] "Frequent Events" are defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day. Most commuter truck lines have this many operations.

[3] "Infrequent Events" are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

[5] Vibration-sensitive equipment is not sensitive to groundborne noise.

Table 3: Groundborne Vibration Impact Criteria (Structural Damage)

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

Source: United States Department of Transportation Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* 2018 (FTA, 2018).

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

Findings

Construction Noise Levels

Using a point-source noise prediction model, calculations of the expected construction noise impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative source to receiver horizontal and vertical

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separations, the amount of time the equipment is operating in a given day, also referred to as the duty-cycle and any transmission loss from topography or barriers.

The nearest existing residential uses are the single-family residences located across SR-78 to the north over 300-feet from the center of the proposed construction. Existing multi-family residences are located over 900-feet to the west. However, the future Carmel Enterprise affordable housing development is located adjacent to the project to the south and could be constructed prior to the proposed project. Therefore, the future residences to the south would be the nearest sensitive uses.

Based empirical data and the amount of equipment needed, worst case noise impacts from this construction equipment would occur during the fine grading and building footprint preparations. In order to determine the worst-case scenario for the construction activities all the equipment was placed in a common location, which is not physically possible. As can be seen in Table 4, even if all the equipment were placed together the cumulative construction activities noise levels would be 78.5 dBA and would attenuate 3.5 dBA at a distance of 75-feet from the point source noise and would be at or below the 75 dBA threshold.

The construction equipment will be spread out over the project site from distances near the occupied property to distances of over 100-feet away. Additionally, the project site is depressed below the future residential property to the south and the slope would help reduce the noise levels further. At average distances over 75-feet, the construction activities would be expected to comply with the City's 75 dBA Leq 8-hour standard at the future residential land uses to the south and no impacts are anticipated. Additionally, no offsite construction is proposed.

Table 4: Construction Noise Levels

Construction Equipment	Quantity	Source Level @ 50-Feet (dBA)[1]	Duty Cycle (Hours/Day)	Cumulative Noise Level @ 50-Feet (dBA)
Tractor/Backhoe	1	72	8	72.0
Loader/Grader	1	73	8	73.0
Roller/Compactor	1	74	8	74.0
Water Truck	1	70	8	70.0
			Cumulative Levels @ 50 Feet	78.5
			Distance To Property Line (Feet)	75
			Noise Reduction Due to Distance	-3.5
			NEAREST PROPERTY LINE NOISE LEVEL	**75.0**

[1] Source: U.S. Environmental Protection Agency (U.S. EPA), 1971 and Empirical Data

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Construction Vibration

The nearest vibration-sensitive uses are the future multi-family residences which would be located 75 feet or more from the center of the proposed construction. Table 5 lists the average vibration levels that would be experienced at the nearest vibration sensitive land uses from the temporary construction activities.

The FTA has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for vibration induced structural damage is 0.20 in/sec for the peak particle velocity (PPV). Project construction activities would result in PPV levels below the FTA's criteria for vibration induced structural damage. Therefore, project construction activities would not result in vibration induced structural damage to residential buildings near the construction areas. The FTA criterion for infrequent vibration induced annoyance is 80 Vibration Velocity (VdB) for residential uses. Construction activities would generate levels of vibration that would not exceed the FTA criteria for nuisance for nearby residential uses. Therefore, vibration impacts would be less than significant.

Table 5: Vibration Levels from Construction Activities (Residential Receptors)

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate PPV Level at 25 Feet (in/sec)	Approximate Velocity Level at 75 Feet (VdB)	Approximate PPV Level at 75 Feet (in/sec)
Small bulldozer	58	0.003	43.7	0.0006
Jackhammer	79	0.035	64.7	0.0067
Loaded trucks	86	0.076	71.7	0.0146
Bulldozer/Excavator	87	0.089	72.7	0.0171
FTA Criteria			80	0.2
		Significant Impact?	**No**	**No**

[1] PPV at Distance D = PPVref x $(25/D)^{1.5}$

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Transportation Noise Levels

Exterior Noise Levels

To determine the future noise environment, the roadway segment noise levels projected in this report were calculated using the methods in the Highway Noise Model published by the Federal Highway Administration (FHWA, 1978). The FHWA Model uses the traffic volume, vehicle mix, speed, and roadway geometry to compute the equivalent noise level. The peak hour traffic volumes range between 6-12% of the average daily traffic (ADT) and 10% is generally acceptable for noise modeling.

Table 6 presents the roadway parameters used in the analysis including the peak traffic volumes, vehicle speeds and the hourly traffic flow distribution (vehicle mix). The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks and heavy trucks for input into the FHWA Model. The vehicle mix for SR-78 was obtained from the latest Caltrans Truck Traffic report. The Buildout conditions for SR-78 were calculated from lane capacity guidelines by Caltrans of 2,100 peak vehicles per hour. Future year 2035 traffic along E Carmel Street is expected to have 3,300 average daily trips (ADT) according to the SANDAG Traffic Prediction Model for the year 2035. The speed limit along E Carmel Street is 35 MPH.

Table 6: Future Traffic Parameters

Roadway	Peak Hour Volumes	Modeled Speeds (MPH)	Vehicle Mix %		
			Auto	Medium Trucks	Heavy Trucks
SR-78	12,600[1]	65	95.5[2]	2.1[2]	2.4[2]
E Carmel Street	3,300[3]	35	96.0	2.0	2.0

[1] Source: Caltrans Lane Capacity Guidelines
[2] Source: Caltrans Truck Traffic Report
[3] Source: SANDAG Series ABM2+/2021 RP Traffic Prediction Model, Forecast Year 2035

Based on the exterior noise model for the roadway the worst-case exterior noise level is 77.6 dBA CNEL at the proposed office located at the northeast corner of the building. The model does not take into account any noise reductions for existing or proposed structures, barriers or topographic features. The modeling results are provided in Figure 3.

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Figure 3: Future Noise Levels

Traffic Volumes, Mix and Speeds

	Autos	Med. Trucks	Heavy Trucks
Mix Ratio by Percent	95.5	2.1	2.4
	96.0	2.0	2.0
Propagation Rule	Hard		

Roadway	**ADT**	**Speed MPH**	**Distance**	**CNEL**
SR-78	12,600	65	50	84.2
E Carmel Street	3,300	35	50	62.1

Noise Reduction due to Distance

	Distance	**Reduction**	**Resultant Level**	
SR-78	230	-6.63	77.5	
E Carmel Street	130	-4.15	57.9	
Cumulative Noise Level			**77.6**	**dBA CNEL**

Interior Noise Levels

The methodology used to determine the resultant interior noise levels is based upon the exterior noise level minus the sound transmission loss as identified in the American Society of Testing and Materials (ASTM) guidelines: E413 &E90. Standard building construction will provide a noise reduction of approximately 15 dBA with a windows open condition and a minimum 20 dBA noise reduction with the windows closed. The exterior noise levels at the proposed office calculated in terms of dBA are converted to the six-octave band sound pressure levels between: 125 - 4000 Hertz.

Acoustical modeling of the proposed office was performed in accordance with the above guidelines and included combining the transmission loss for each of the building components that will reduce the interior noise levels. Building components typically include the windows, exterior doors, and exterior walls. The total noise reduction is dependent upon the transmission loss of each building component, their subsequent surface area, quality of the building/construction materials, a building façade and angle correction.

The interior noise level is also dependent on the acoustical energy absorbed within the room based upon the Noise Reduction Coefficients (NRC). NRC is a scalar representation of the

amount of sound energy absorbed upon striking a particular surface and the arithmetic value average of sound absorption coefficients indicating a material's ability to absorb sound. The absorption coefficients for individual surface areas such as carpet, drywall and furnishings are used to calculate the interior room effects. The calculated building noise reduction includes both the room absorption and the transmission loss from the exterior wall assembly.

The interior noise reduction calculations were performed using Ldn's interior noise model. The model converts the exterior sound level to octave band frequencies and accounts for the transmission loss, correction factors and room absorption. The floor plans used for this analysis were provided by Valli Architectural Group, 2024.

The exterior noise levels were determined to be as high as 77.6 dBA CNEL at the building facade. Basic calculations show that a windows open condition will typically reduce the interior noise levels 12-15 dBA CNEL and not provide adequate interior noise mitigation. To meet the 50 dBA CNEL interior noise standard, an overall minimum interior noise level reduction of 27.6 dBA CNEL is needed for the proposed project. Therefore, a closed window condition is required to reduce interior noise levels to comply with CCR Title 24 and City of San Marcos requirements. The windows/doors closed condition does not require the windows or doors to be non-operable but does require that mechanical ventilation be installed, which is proposed, to move air within the structure and control temperatures when the windows are closed. The mechanical ventilation must meet the jurisdictional requirements for these dwelling units.

It was determined that an STC rating of 30 will be sufficient for all glass assemblies to reduce the interior noise levels below 50 dBA CNEL. The necessary Sound Transmission Class and transmission losses for the glass assemblies are provided in Table 7. The modeled results with an anticipated interior noise level of 50 dBA CNEL or less are provided as an ***Attachment***.

Table 7: Sound Transmission Class Ratings

Assembly	STC Rating[1]	Octave Band Transmission Loss (Hz)					
		125	250	500	1000	2000	4000
Windows	**30**	21	19	26	36	41	32
Glass Doors	**30**	22	15	26	35	40	29
[1] *STC Ratings used in Model*							

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Operational Noise Levels

The Project operations of the self-storage facility will occur during the daytime and overnight hours. To be conservative, the most restrictive overnight noise thresholds were applied. Based on similar operational uses for self-storage facilities, on-site operational noise sources for this proposed project will be anticipated to include vehicle movements to bring or remove storage items. To be conservative a moving truck was utilized daily that is equipped with a backup beeper and would create the loudest noise level. Additionally, rooftop mechanical ventilation units (HVAC) would be required to provide climate control for the office and storage units.

Sound from a small, localized source (a "point" source) radiates uniformly outward as it travels away from the source. The sound level attenuates or drops-off at a rate of 6 dBA for each doubling of distance. A drop-off rate of 6 dBA per doubling of distance was used for this piece of equipment. Based on similar equipment that is utilized at a Tractor Supply facility in Lakeside, the anticipated project related noise sources are provided in Table 8.

Table 8: Project Related Operational Noise Sources

Quantity	Equipment Description	Manufacturer	Frequency	Related Sound Level Distance (ft)	Noise Level (dBA)
1	Moving Trucks "reverse signal"	ECCO	Daily for 2.5 minutes each for unloading	4	87.0
14	3-ton rooftop HVAC unit	York (Model: ZJ037N07B4MAD5)	100%	3	67.0
Source: Tractor Supply Company Community of Lakeside Acoustical Analysis Report, Arcadis 2014.					

Fixed or point sources radiate outward uniformly as sound travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance. Using a point-source noise prediction model, calculations of the expected operational noise impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative source to receiver horizontal and vertical separations, the amount of time the equipment is operating in a given day (also referred to as the duty-cycle) and any transmission loss from topography or barriers. Noise levels drop 3 decibels each time the duration of the source is reduced in half. Therefore, hourly moving truck noise level over a 2.5-minute period would be reduced 13.8 decibels to 73.2 dBA at a distance of 4 feet based on the limited time of operation. Additionally, the proposed building would shield the trucks from the

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proposed residences to the south and would provide a minimum 5 dBA noise reduction. Therefore, a reference noise level of 68.2 dBA at a distance of 4 feet was utilized for the moving trucks.

The noise levels for each source along with the calculated hourly noise levels based upon individual operating times are shown below in Table 9 for the southern multi-family residential property line. The eastern property line, zoned commercial, is located farther from the operational activities. The proposed HVAC units will be shielded by a metal screen that would provide a minimum 5 dBA noise reduction for a reference noise level of 62 dBA at 3 feet. The combined noise levels at the southern property line based upon distance separation, shielding, and limited duty-cycles were projected to be below the City's 55 dBA noise threshold. Therefore, no impacts are anticipated and no mitigation is required.

Table 9: Operational Noise Levels (Southern Property Line)

Source	Reference Noise Level (dBA)	Reference Distance (Feet)	Quantity	Distance to Nearest Property Line (Feet)	Noise Reduction due to Distance (dBA)	Resultant Cumulative Noise Level (dBA Leq)
Moving Trucks	68.2	4	1	25	-15.9	**52**
3-ton HVAC	62.0	3	14	116	-31.7	**42**
CUMULATIVE NOISE LEVEL @ PROPERTY LINE (dBA)						**53**
Property Line Standard						**55**
Complies with Chapter 20.300						**Yes**

If you have any questions, please do not hesitate to contact me directly at (760) 473-1253 or by email at jlouden@ldnconsulting.net.

Sincerely, Ldn Consulting

Jeremy Louden, Principal

Attachment: Preliminary Interior Noise Model Calculations

References

City of San Marcos General Plan. (2012). *Noise Element of the General Plan.*

City of San Marcos Municipal Code. (2019). *City of San Marcos Municipal Code.*

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INTERIOR NOISE CALCULATIONS

Project Name:	CubeSmart		Ldn Consulting, Inc.
Building (s)	All		
Floor Level	1	Date:	1/8/25
Arch Plan:	1		
Room Type:	Office	Project #	24-82

Exterior Noise Levels

		Frequency (Hz.)					
	dBA CNEL*	***125***	***250***	***500***	***1000***	***2000***	***4000***
Exterior Noise Level (Traffic Spectrum)	77.6	63.6	68.3	71.1	73.4	70.3	64.6

Transmission Loss (TL)

				Transmission Loss (dB)					
				Frequency (Hz.)					
Exterior Assembly	***Source***	***Area***	***STC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Stucco	NBS W-50-71	540	46	27	42	44	46	49	54
Windows	Greenworld	0	30	21	19	26	36	41	32
Fixed Window	Greenworld	124	30	21	19	26	36	41	32
Glass Doors	Greenworld	24	30	22	15	26	35	40	29
Exterior Door	NBS Monograph 77	0	26	16	14	23	30	36	26

Room Absorption (RA)

				Absorption Coefficients					
				Frequency (Hz.)					
Interior Characteristics	***Source***		***NRC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Carpet	Army TM 5-805-4		0.28	0.15	0.17	0.12	0.32	0.52	0.30
Furnishings	Army TM 5-805-4		0.45	0.32	0.29	0.42	0.58	0.60	0.48
Drywall	Netwell		0.07	0.09	0.08	0.05	0.03	0.06	0.09
Overall Absorption Factor (Furnished Room)			0.8	0.56	0.54	0.59	0.93	1.18	0.87

Noise Reduction

	125	***250***	***500***	***1000***	***2000***	***4000***
Noise Reduction from Absorption based upon Floor Area	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4
Noise Level Increase for Defects and Exposed Surface Area	17.9	17.9	17.9	17.9	17.9	17.9
Overall Reduction from Tranmission Loss + Room Absorption - Surface Exposure						28.4
Building Façade Noise Level (dBA CNEL)						77.6
Resultant Interior Noise Level (dBA CNEL)						**49**

* Corrections for Façade Level was accounted for in the modeling.