

March 10, 2021

Mr. Frank Amendola  
 Lilburn Corporation  
 1905 Business Center Drive  
 San Bernardino, CA 92408

**SUBJECT: MISSION NEW TOWN HOUSE NOISE ASSESSMENT**

Dear Mr. Frank Amendola:

Urban Crossroads, Inc. is pleased to provide the following Noise Assessment for the Mission New Town House development (referred to as "Project") located at the southwest corner of Benson Drive and West Mission Boulevard in the County of San Bernardino. The Project is to consist of up to 56 residential dwelling units as shown on Exhibit A. The purpose of this Noise Assessment is to describe the potential Project-related construction noise impacts.

**EXHIBIT A: SITE PLAN**



## **RECEIVER LOCATIONS**

To assess the potential for construction noise impacts, the following receiver locations, as shown on Exhibit B, were identified as representative locations for analysis. Sensitive uses or receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. To describe the potential off-site Project noise levels, five receiver locations in the vicinity of the Project site were identified, including the location of the nearest noise sensitive residential receiver (R3) located approximately 11 feet south of the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

## **NOISE PREDICTION MODEL**

To fully describe the construction noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.






Using the ISO 9613 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level ( $L_w$ ) to describe individual noise sources. While sound pressure levels (e.g.,  $L_{eq}$ ) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels ( $L_w$ ) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.0 was used in the CadnaA noise analysis to account for hard site conditions.

**EXHIBIT B: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS**



**LEGEND:**

-  Receiver Locations
-  Construction Activity
-  Distance from receiver to construction activity (in feet)
-  Existing Barrier Height (in feet)
-  Existing Barrier

### **CONSTRUCTION NOISE STANDARDS**

To analyze noise impacts originating from the construction of the Project, noise from construction activities is typically limited to the hours of operation established under a jurisdiction's Municipal Code. Section 83.01.080(g)(3) of the County of San Bernardino Development Code, provided in Appendix A, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00 a.m. to 7:00 p.m. except on Sundays and Federal holidays. (1) However, neither the County of San Bernardino General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below. According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA  $L_{eq}$  as a reasonable threshold for noise sensitive land use. (2 p. 179)

### **CONSTRUCTION NOISE SOURCES**

Using reference construction equipment noise levels level measurements published in the *Update of Noise Database for Prediction of Noise on Construction and Open Sites* by the Department for Environment, Food and Rural Affairs (DEFRA). (3) and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearest sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level of 77 dBA  $L_{eq}$  is operating at the closest point from the edge of primary construction activity (Project site boundary) to each receiver location. The analyzed construction noise activity includes the demolition of an existing mobile home park on the west side of the site, site preparation, building construction, paving, and architectural coating. Appendix B includes the detailed CadnaA construction noise model inputs and calculations.

### **CONSTRUCTION NOISE LEVEL COMPLIANCE**

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA  $L_{eq}$  is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA  $L_{eq}$  significance threshold during Project construction activities as shown on Table 1. Therefore, the noise impacts due to Project construction noise is considered *less than significant* at all receiver locations.

**TABLE 1: TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY**

Receiver Location <sup>1</sup>	Construction Noise Levels (dBA $L_{eq}$ )		
	Highest Construction Noise Levels <sup>2</sup>	Threshold <sup>3</sup>	Threshold Exceeded? <sup>4</sup>
R1	72.3	80	No
R2	71.8	80	No
R3	73.6	80	No
R4	77.6	80	No

<sup>1</sup> Noise receiver locations are shown on Exhibit B.

<sup>2</sup> Highest construction noise level operating at the Project site boundary to nearby receiver locations.

<sup>3</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.

<sup>4</sup> Do the estimated Project construction noise levels exceed the construction noise level threshold?

### **CONCLUSIONS**

This Noise Assessment demonstrates that the construction noise levels associated with Mission New Town House Project will satisfy the County of San Bernardino exterior noise level standards at all nearby receiver locations. Therefore, the construction noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations. If you have any questions, please contact me directly at (949) 584-3148.

Respectfully submitted,

URBAN CROSSROADS, INC.



Bill Lawson, P.E., INCE  
Principal



Mr. Frank Amendola  
Lilburn Corporation  
March 10, 2021  
Page 6

## REFERENCES

1. **County of San Bernardino.** *Code of Ordinances, Title 8 Development Code, Chapter 83.01 General Performance Standards.*
2. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
3. **Department of Environment, Food and Rural Affairs (Defra).** *Update of Noise Database for Prediction of Noise on Construction and Open Sites.* 2004.
4. **FHWA.** *Roadway Construction Noise Model.* January 2006.

**APPENDIX A**

**COUNTY OF SAN BERNARDINO DEVELOPMENT CODE**

*This page intentionally left blank*



## § 83.01.080 Noise.

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses.

(a) *Noise Measurement.* Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI § S14 1979, Type 1 or Type 2);

(3) Using the “A” weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) *Noise Impacted Areas.* Areas within the County shall be designated as “noise-impacted” if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subdivision (d) (Noise Standards for Stationary Noise Sources) and Subdivision (e) (Noise Standards for Adjacent Mobile Noise Sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) *Noise Standards for Stationary Noise Sources.*

(1) *Noise Standards.* Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

<b>Table 83-2</b>		
<b>Noise Standards for Stationary Noise Sources</b>		
<b>Affected Land Uses (Receiving Noise)</b>	<b>7:00 a.m. - 10:00 p.m. Leq</b>	<b>10:00 p.m. - 7:00 a.m. Leq</b>
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)
Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.		
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.		
Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.		

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) *Noise Standards for Adjacent Mobile Noise Sources.* Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

<b>Table 83-3</b>			
<b>Noise Standards for Adjacent Mobile Noise Sources</b>			
<b>Land Use</b>		<b>Ldn (or CNEL) dB(A)</b>	
<b>Categories</b>	<b>Uses</b>	<b>Interior <sup>(1)</sup></b>	<b>Exterior <sup>(2)</sup></b>
Residential	Single and multi-family, duplex, mobile homes	45	60 <sup>(3)</sup>
Commercial	Hotel, motel, transient housing	45	60 <sup>(3)</sup>
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65
<b>Notes:</b>			
(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.			
(2) The outdoor environment shall be limited to: <ul style="list-style-type: none"> <li>· Hospital/office building patios</li> <li>· Hotel and motel recreation areas</li> <li>· Mobile home parks</li> </ul>			

- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

(e) *Increases in Allowable Noise Levels.* If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) *Reductions in Allowable Noise Levels.* If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by five dB(A).

(g) *Exempt Noise.* The following sources of noise shall be exempt from the regulations of this Section:

- (1) Motor vehicles not under the control of the commercial or industrial use.
- (2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) *Noise Standards for Other Structures.* All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

<b>Table 83-4</b>	
<b>Noise Standards for Other Structures</b>	
<b>Typical Uses</b>	<b>12-Hour Equivalent Sound Level (Interior) in dBA Ldn</b>
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

(Ord. 4011, passed - -2007; Am. Ord. 4245, passed - -2014)

## **APPENDIX B**

### **CONSTRUCTION NOISE LEVEL CALCULATIONS**

*This page intentionally left blank*

# 13584 - Mission New Town House

CadnaA Noise Prediction Model: 13584 -Construction.cna

Date: 03.03.21

Analyst: P. Mara

## Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	
	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

## Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height (ft)	Coordinates			
			Day (dBA)	Night (dBA)	CNEL (dBA)	Day (dBA)	Night (dBA)	CNEL (dBA)	Type	Auto	Noise Type		X (ft)	Y (ft)	Z (ft)	
RECEIVERS	R1		72.3	72.3	79.0	0.0	0.0	0.0		x	Total	5.00	a	20104167.30	7647423.01	5.00
RECEIVERS	R2		71.8	71.8	78.4	0.0	0.0	0.0		x	Total	5.00	a	20106171.85	7645991.86	5.00
RECEIVERS	R3		73.6	73.6	80.3	0.0	0.0	0.0		x	Total	5.00	a	20105361.61	7645869.40	5.00
RECEIVERS	R4		77.6	77.6	84.3	0.0	0.0	0.0		x	Total	5.00	a	20103697.84	7646474.25	5.00

## Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time			Height (ft)
			Day (dBA)	Evening (dBA)	Night (dBA)	Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value dB(A)	norm.	Day (min)	Special (min)	Night (min)	
SITEBOUNDARY		SITEBOUNDARY00001	129.7	129.7	129.7	77.0	77.0	77.0	Lw"	77					8

Name	Height		Coordinates			
	Begin (ft)	End (ft)	x (ft)	y (ft)	z (ft)	Ground (ft)
SITEBOUNDARY	8.00	a	20103740.07	7645921.08	8.00	0.00
			20103753.85	7646925.43	8.00	0.00
			20105744.00	7646899.23	8.00	0.00
			20105759.95	7646898.09	8.00	0.00
			20105771.91	7646900.37	8.00	0.00
			20105759.38	7645903.58	8.00	0.00

**Barrier(s)**

Name	M.	ID	Absorption		Z-Ext.	Cantilever			Height		Coordinates			
			left	right		horz.	vert.	Begin	End	x	y	z	Ground	
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
BARRIEREXISTING		0						6.00	a	20105759.30	7645898.68	6.00	0.00	
										20105179.45	7645896.40	6.00	0.00	