APPENDIX 6.A

38594 Cedar Boulevard

Newark, CA

ENVIRONMENTAL NOISE STUDY

5 May 2021

Prepared for: Robson Homes
Attn: Dominic Boitano
2185 The Alameda, Suite 150
San Jose, CA 95126
dboitano@robsonhomes.com

Prepared by: Salter
Alex Salter, PE – Vice President asalter@salter-inc.com
Nathan Sistek – Senior Consultant nsistek@salter-inc.com

Salter Project 19-0529

INTRODUCTION

This report summarizes our environmental noise study for the 38594 Cedar Boulevard residential project in Newark, California. The project is planned to include 130 three-story residences, with a mix of single-family detached and duets, along Interstate 880. The site is bordered by Cedar Boulevard to the southwest and existing commercial use to the northwest (storage facility) and southeast (construction equipment sales and service). The purpose of the study is to quantify the noise environment at the site, compare the measured data with applicable City standards, and propose noise reduction measures as necessary.

In summary, sound-rated windows and exterior doors with sound insulation ratings of up to STC[1] 43 will be required to meet the City interior noise level criteria. In order to meet the City's L_{dn} [2] 65 dB exterior noise goal at the central outdoor-use area, an 18-ft tall sound wall will be required along I-880.

PROJECT CRITERIA

The following criteria would apply to the project.

City of Newark Noise Standards

The Environmental Hazards section of the Newark General Plan includes land-use compatibility guidelines for environmental noise in the community. Noise levels are characterized in terms of Day/Night Average Sound Level (L_{dn}). The guidelines for single-family residences are summarized in below.

In addition, the General Plan includes specific policies for interior and exterior noise as follows summarized as follows:

POLICY EH-7.4	**Residential Noise Standard – Exterior.** Plan for and implement strategies to maintain exterior noise levels that are consistent with the noise compatibility guidelines in Table EH-2. For residential areas, this limit is 60 dBA L_{dn} for outdoor living areas. Where this level is exceeded due to freeways, arterials, and/or railroads, the construction of berms, walls, buffer zones, and other noise-reduction measures to reduce noise to the greatest extent feasible will be required.
POLICY EH-7.5	**Residential Noise Standard – Interior.** Use site planning and architectural design to protect occupants of new buildings from excessive noise, per California State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Uniform Building Code (UBC). For example, site planning should place bedrooms and other noise-sensitive rooms away from exterior noise sources and architectural design should use double-paned windows and other insulating measures to reduce interior noise.

1 STC (Sound Transmission Class) – A single-number rating defined in ASTM E90 that quantifies the airborne sound insulating performance of a partition under laboratory conditions. Increasing STC ratings correspond to improved airborne sound insulation.

2 L_{dn} (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. L_{dn} accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. L_{dn} penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. L_{dn} is sometimes written as DNL.

TABLE EH-2 NOISE COMPATIBILITY GUIDELINES FOR NEWARK

Land Uses	Interior CNEL or L_{dn} (dBA)	Exterior Noise Exposure, CNEL or L_{dn} (dBA) 55 60 65 70 75 80
Residential-Low Density Single-Family, Duplex, Mobile Homes	45*	
Residential-Multiple Family	45*	
Transient Lodging, Motels, Hotels	45*	
Schools, Libraries, Churches, Hospitals, Nursing Homes	45*	
Auditoriums, Concert Halls, Amphitheaters	--	
Sports Arena, Outdoor Spectator Sports	--	
Playgrounds, Neighborhood Parks	--	
Golf Courses, Riding Stables, Water Recreation, Cemeteries	--	
Office Buildings, Businesses, Commercial and Professional	50	
Industrial, Manufacturing, Utilities, Agricultural	--	

Normally Acceptable:
Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

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

Conditionally Acceptable:
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Clearly Unacceptable:
New construction or development generally should not be undertaken.

* Noise level requirement with closed windows, mechanical ventilation, or other means of ventilation shall be provided per Chapter 12 Section 1205 of the Building Code.

Source: State of California General Plan Guidelines, 2003.

State of California

The California Building Code (CBC) regulates exterior noise insulation for residential uses. Part 1 of the Supplement to the California Building Code, effective 1 July 2015, requires that the indoor noise level in residential units of multi-family dwellings not exceed DNL 45 dB where the exterior noise level is greater than DNL 60 dB.

While this CBC requirement does not directly apply to the project's single-family dwellings, the Newark General Plan refers to the CBC as the standard as includes single-family dwellings in Table EH-2 (shown above).

NOISE ENVIRONMENT

The noise environment at the site is influenced mostly by traffic on I-880, bordering the project to the northeast. Cedar Boulevard also contributes to the noise environment on the southwest side of the project.

To quantify the existing noise environment, we conducted multi-day noise measurements at the site between 8 and 13 August 2019. A summary of the measurement locations and noise levels are shown in attached Figure 1.

Projected future traffic volumes for the roadways is not available, so a 1 dB increase in environmental noise has been assumed in the estimated future noise levels outlined below.

ANALYSIS AND RECOMMENDATIONS

Indoor Noise

In order to meet the L_{dn} 45 dB requirement, sound rated assemblies will be required, as shown in Figures 2 through 7. Assuming an 18-ft tall sound wall along I-880 providing shielding for the residences, we estimate window and exterior door sound insulation ratings of up to STC 43 will be needed to reduce exterior noise levels to the L_{dn} 45 dB interior noise requirement.

These estimates are based on the following:

- Site Plan dated 30 March 2021
- Preliminary Planning Submittal Drawings dated 2 April 2021
- Tract Map dated 5 April 2021
- Barrier Line of Sight Exhibit dated 22 September 2020
- 8-ft to 9-ft tall ceilings
- Bedrooms will have hard-surfaced flooring
- Exterior walls will be a single stud assembly with the surface density of the exterior finish at least 4 psf (e.g., a 3-coat stucco system)

The recommended sound insulation ratings are for full window assemblies (glass and frame). Ratings should be based on laboratory test reports of similarly sized samples from an NVLAP accredited lab. We understand that depending on the window manufacturer selected, a base sound-rated window and a second jockey sash window installed inboard of the base window may be incorporated to achieve the higher STC ratings required (e.g., above 38).

In order to achieve the required interior noise levels, windows would need to remain closed. An alternative method of supplying fresh air (e.g., mechanical ventilation) may be required and should be coordinated with the project mechanical engineer during the design. Outside air intake should be ducted back to the fan coil/furnace units with openings along the façade or roof that is opposite the highway.

A construction equipment sales and service company borders the project on the southeast side. Future residents should be made aware through disclosure documents of the potential for noise along this property line.

Outdoor Noise

The project includes centralized outdoor use areas, indicated as Lots E and G on the site plan. Estimated future noise levels at Lots E and G would be up to L_{dn} 65 dB due to noise from I-880, based on the calculated noise reduction from the 18-ft barrier. Based on the current measured noise levels, a barrier height of 30-ft plus would be required to reduce noise levels to an L_{dn} of 60 dB per Policy EH-7.4, which is not practical. Therefore, an L_{dn} of 65 dB could be considered acceptable by the City.

38594 CEDAR BOULEVARD
MEASUREMENT LOCATIONS AND MEASURED NOISE LEVELS

FIGURE 1

Salter #	NNS/AKS
19-0529	05.05.21

Salter
San Francisco
San Jose
Honolulu
Seattle
www.salter-inc.com

NOTES:
1. WHERE WINDOW STC RATINGS ARE 40 OR GREATER , DOORS TO BE STC 35; WHERE WINDOW STC RATINGS ARE BELOW 40, DOORS TO HAVE SAME STC RATING AS WINDOWS
2. STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

38594 CEDAR BOULEVARD
MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 1)

FIGURE 2

Salter # 19–0529

NNS/AKS
05.05.21

NOTES:
1. WHERE WINDOW STC RATINGS ARE 40 OR GREATER , DOORS TO BE STC 35; WHERE WINDOW STC RATINGS ARE BELOW 40, DOORS TO HAVE SAME STC RATING AS WINDOWS
2. STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

38594 CEDAR BOULEVARD
MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 1)

FIGURE 3

Salter # 19–0529

NNS/AKS
05.05.21

Salter
San Francisco
San Jose
Honolulu
Seattle
www.salter-inc.com

NOTES:
1. WHERE WINDOW STC RATINGS ARE 40 OR GREATER , DOORS TO BE STC 35; WHERE WINDOW STC RATINGS ARE BELOW 40, DOORS TO HAVE SAME STC RATING AS WINDOWS
2. STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

38594 CEDAR BOULEVARD
MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 2)

FIGURE 4

Salter # 19–0529

NNS/AKS
05.05.21

Salter

San Francisco

San Jose

Honolulu

Seattle

www.salter-inc.com

NOTES:
1. WHERE WINDOW STC RATINGS ARE 40 OR GREATER , DOORS TO BE STC 35; WHERE WINDOW STC RATINGS ARE BELOW 40, DOORS TO HAVE SAME STC RATING AS WINDOWS
2. STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

38594 CEDAR BOULEVARD
MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 2)

FIGURE 5

Salter # 19–0529

NNS/AKS
05.05.21

Salter
San Francisco
San Jose
Honolulu
Seattle
www.salter-inc.com

NOTES:
1. WHERE WINDOW STC RATINGS ARE 40 OR GREATER , DOORS TO BE STC 35; WHERE WINDOW STC RATINGS ARE BELOW 40, DOORS TO HAVE SAME STC RATING AS WINDOWS
2. STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

38594 CEDAR BOULEVARD
MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 3)

FIGURE 6

Salter # 19–0529

NNS/AKS
05.05.21

Salter

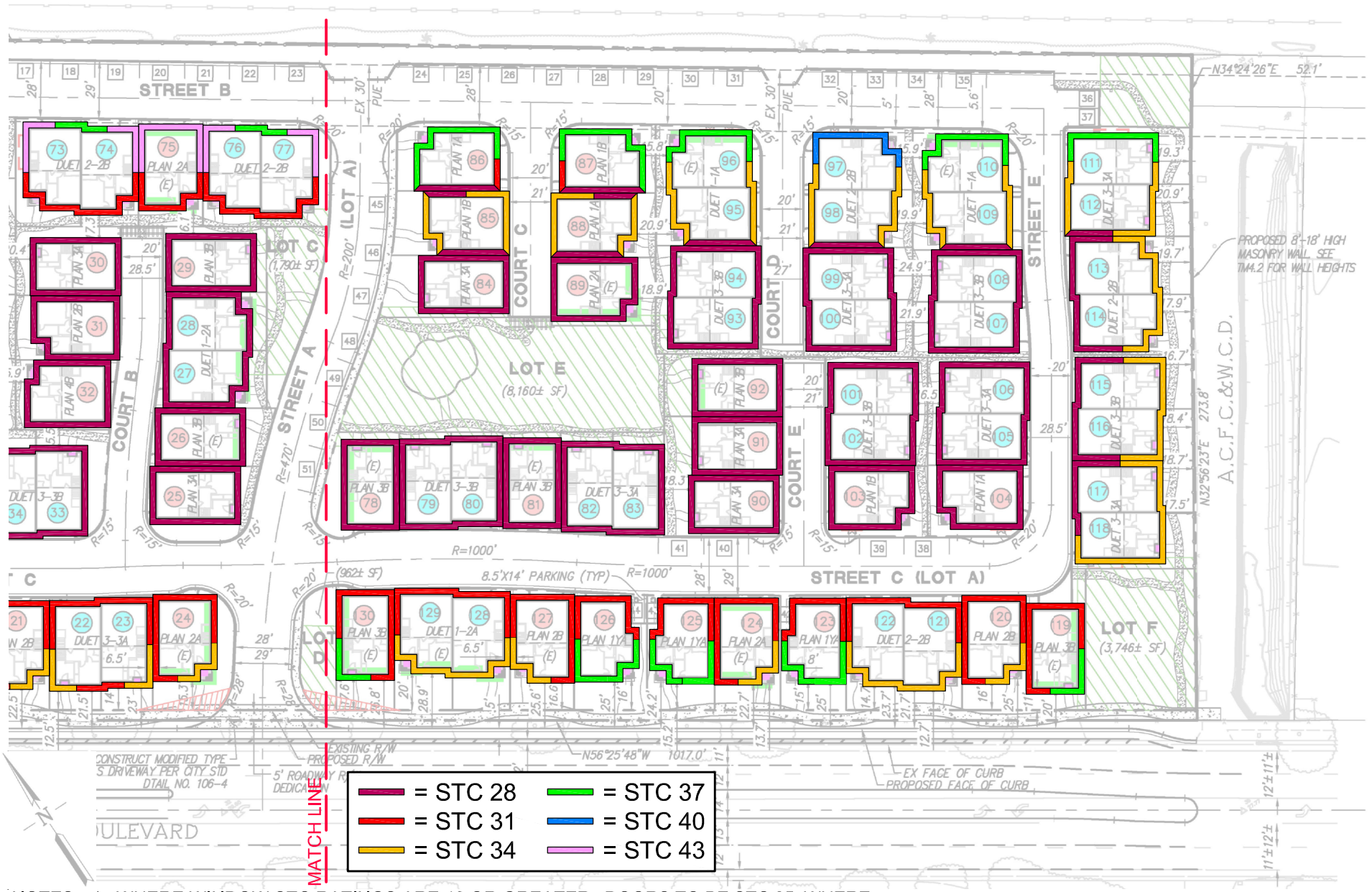
San Francisco

San Jose

Honolulu

Seattle

www.salter-inc.com



NOTES:
1. WHERE WINDOW STC RATINGS ARE 40 OR GREATER , DOORS TO BE STC 35; WHERE WINDOW STC RATINGS ARE BELOW 40, DOORS TO HAVE SAME STC RATING AS WINDOWS
2. STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB

38594 CEDAR BOULEVARD
MINIMUM CODE–REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 3)

FIGURE 7

Salter # 19–0529

NNS/AKS
05.05.21