ATTACHMENT 7

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Acoustical Analysis Report for 1540 Superior Avenue Live/Work

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Job # S220904

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1.0 Executive Summary

The proposed project, 1540 Superior Avenue Live/Work, consists of the demolition of existing structures and the construction of a multi-family development to contain nine residential units. The project site is located at 1540 Superior Avenue in the City of Costa Mesa, California.

The current and future noise environment primarily consists of traffic noise from Superior Avenue, Industrial Way, and Newport Boulevard. Future traffic noise levels at building facades are expected to range from 58 CNEL at the east facade of Building 2 to 72 CNEL at the west facades of Buildings 1 and 2.

The City of Costa Mesa Noise Ordinance states that exterior noise level limits do not apply at private balconies or patios of any size or any private or community roof decks/roof terraces of multi-family developments or live/work units located within a Mixed-Use Overlay District, approved pursuant to a Master Plan, and subject to the land use regulations of an Urban Plan. The proposed project is located within the 19 West Urban Plan, and as such, is not subject to meeting the specified exterior noise limits at outdoor use areas.

The City of Costa Mesa and the State of California require interior noise levels not exceeding 45 CNEL in habitable space. Calculations show that future noise levels on site are expected to exceed 60 CNEL at most building facades; therefore, interior noise levels may exceed 45 CNEL within units without appropriate design features in place. Calculations show that with typical exterior wall assemblies, exterior glazing with an STC rating of 28, and mechanical ventilation in all units, all interior live/work and residential space is expected to comply with City of Costa Mesa and State of California noise requirements.

According to the City of Costa Mesa, commercial uses must be designed and operate, and hours of operation limited, where appropriate, so that neighboring residents are not exposed to offensive noise, especially from traffic, routine deliveries, or late night activity. No use must produce continual loading or unloading or heavy trucks at the site. Uses should be appropriately restricted, as detailed herein.

2.0 Introduction

This acoustical analysis report is submitted to satisfy the acoustical requirements of the City of Costa Mesa and the State of California. Its purpose is to assess noise impacts from nearby roadway traffic to identify project features or requirements necessary to achieve interior noise levels of 45 CNEL or less in interior residential space, in compliance with the noise regulations of the City of Costa Mesa Noise Ordinance.

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

2.1 Project Description

The proposed project, 1540 Superior Avenue Live/Work, consists of the demolition of existing structures and the construction of a multi-family development to contain nine residential units. All units will include live/work

spaces on the ground floor, living space on the second floor, and two or three bedrooms on the third floor. Private balconies and roof decks are also proposed for units. For further details, please refer to the project plans, provided as Appendix A.

2.2 Project Location

The project site is located at 1540 Superior Avenue in the City of Costa Mesa, California. The Assessor's Parcel Number (APN) for the property is 425-351-06. The project location is shown on the Vicinity Map, provided as Figure 1. An Assessor's Parcel Map and Satellite Aerial Photograph of this area are also provided as Figures 2 and 3, respectively.

2.3 Applicable Noise Regulations

The proposed project must meet the acoustical requirements of the City of Costa Mesa in order to obtain approval. The City of Costa Mesa Noise Ordinance states that exterior noise levels at outdoor use areas of multi-family residential properties should not exceed 65 CNEL; however, the Noise Ordinance also states that exterior noise level limits do not apply at private balconies or patios of any size or any private or community roof decks/roof terraces of multi-family developments or live/work units located within a Mixed-Use Overlay District, approved pursuant to a Master Plan, and subject to the land use regulations of an Urban Plan. The proposed project is located within the 19 West Urban Plan, and as such, is not subject to meeting the specified exterior noise limits at outdoor use areas.

Additionally, the City of Costa Mesa and State of California Building Code require interior noise levels not exceeding 45 CNEL in habitable space. The City of Costa Mesa describes the indoor environment as inclusive of bathrooms, closets, corridors, and living/sleeping areas of the dwelling unit. The residential area of a live/work unit is subject to the interior residential noise requirements.

3.0 Environmental Setting

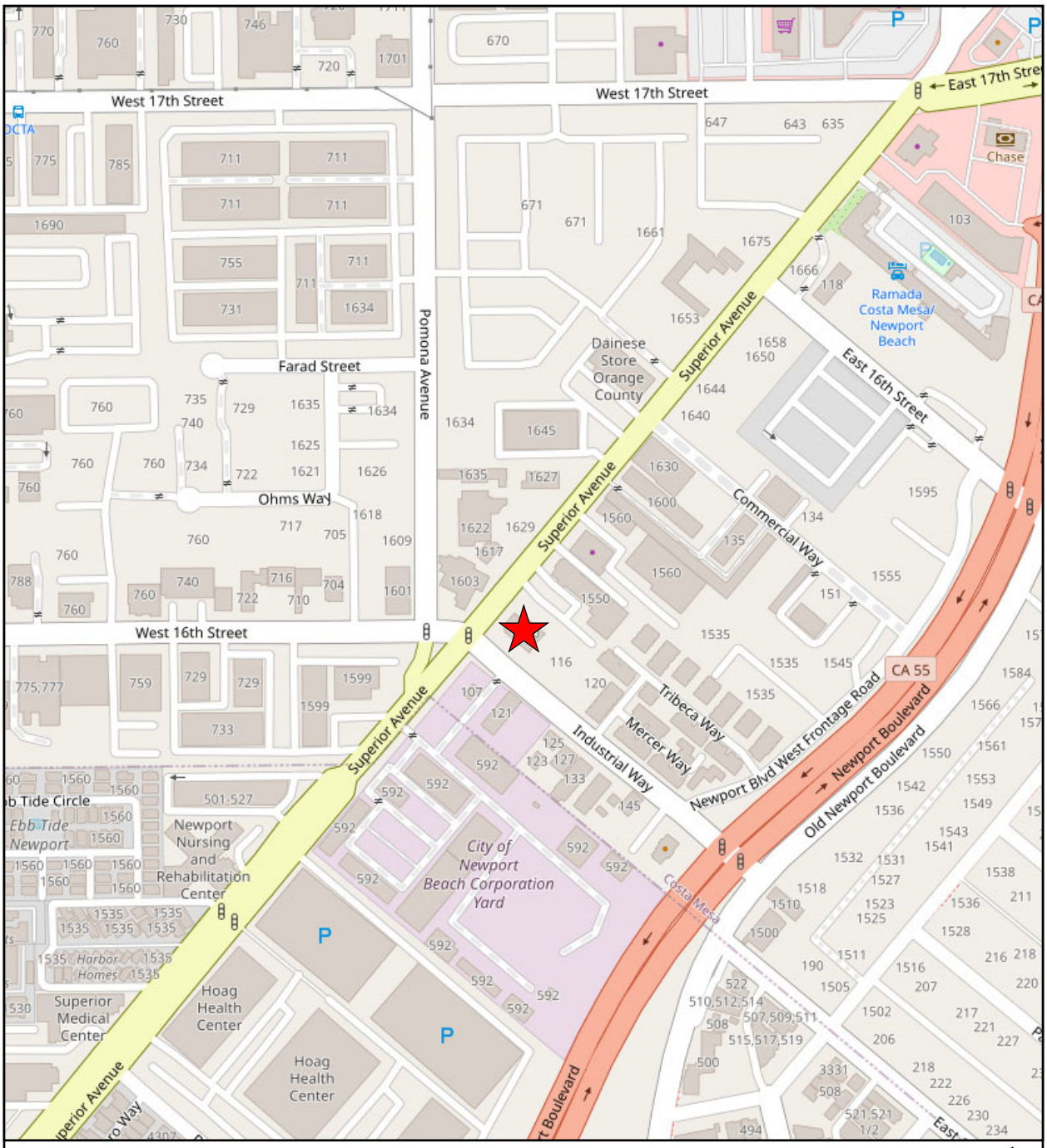
3.1 Existing Noise Environment

3.1.1 Roadway Noise Sources

The primary noise sources in the vicinity of the project site are traffic noise from Superior Avenue, Industrial Way, and Newport Boulevard. No other noise source is considered significant. Current traffic volumes are given based on information provided in the City of Costa Mesa General Plan Update Traffic Analysis (see reference).

Superior Avenue is a four-lane, two-way Primary Arterial running generally north-south along the western boundary of the project site. The posted speed limit is 35 mph. According to the General Plan Update Traffic Analysis, Superior Avenue currently carries a traffic volume of approximately 23,000 Average Daily Trips (ADT) in the vicinity of the project site, as of the year 2016.

Industrial Way is a two-lane, two-way Collector Arterial running generally east-west along the southern boundary of the project site. No speed limit was observed to be posted in the vicinity of the project site; however, based on neighboring and surrounding land use, roadway classification, professional experience, and on-site observations, a speed limit of 30 mph was assumed. According to the General Plan Update Traffic Analysis, Industrial Way currently carries a traffic volume of approximately 5,000 ADT in the vicinity of the project site, as of the year 2016.



Source: Open Street Map, 2022.

Project Location

Figure 1.

Vicinity Map

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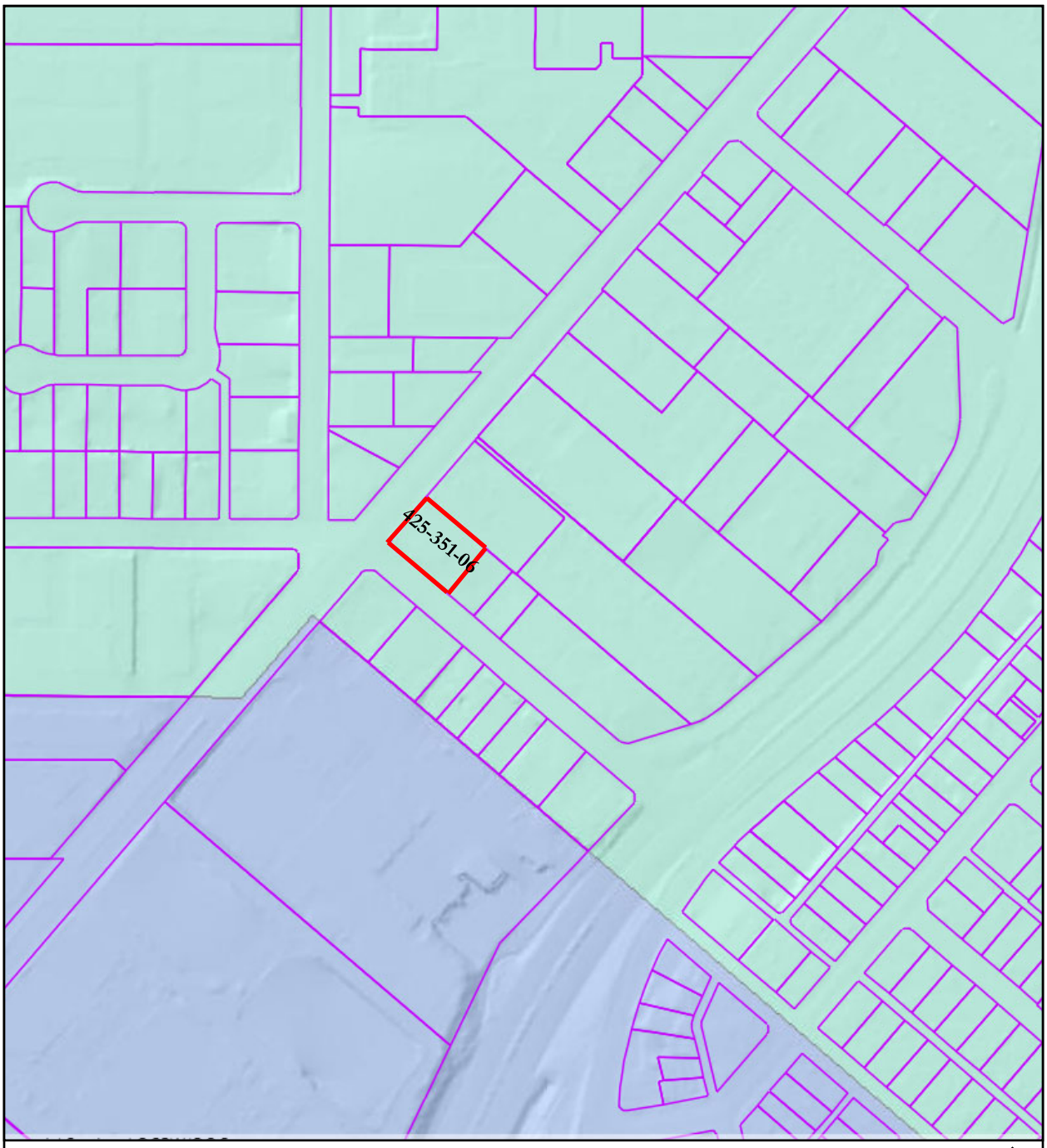

Source: OCGIS, 2022.

Project Location

Figure 2.

Assessor's Parcel Map

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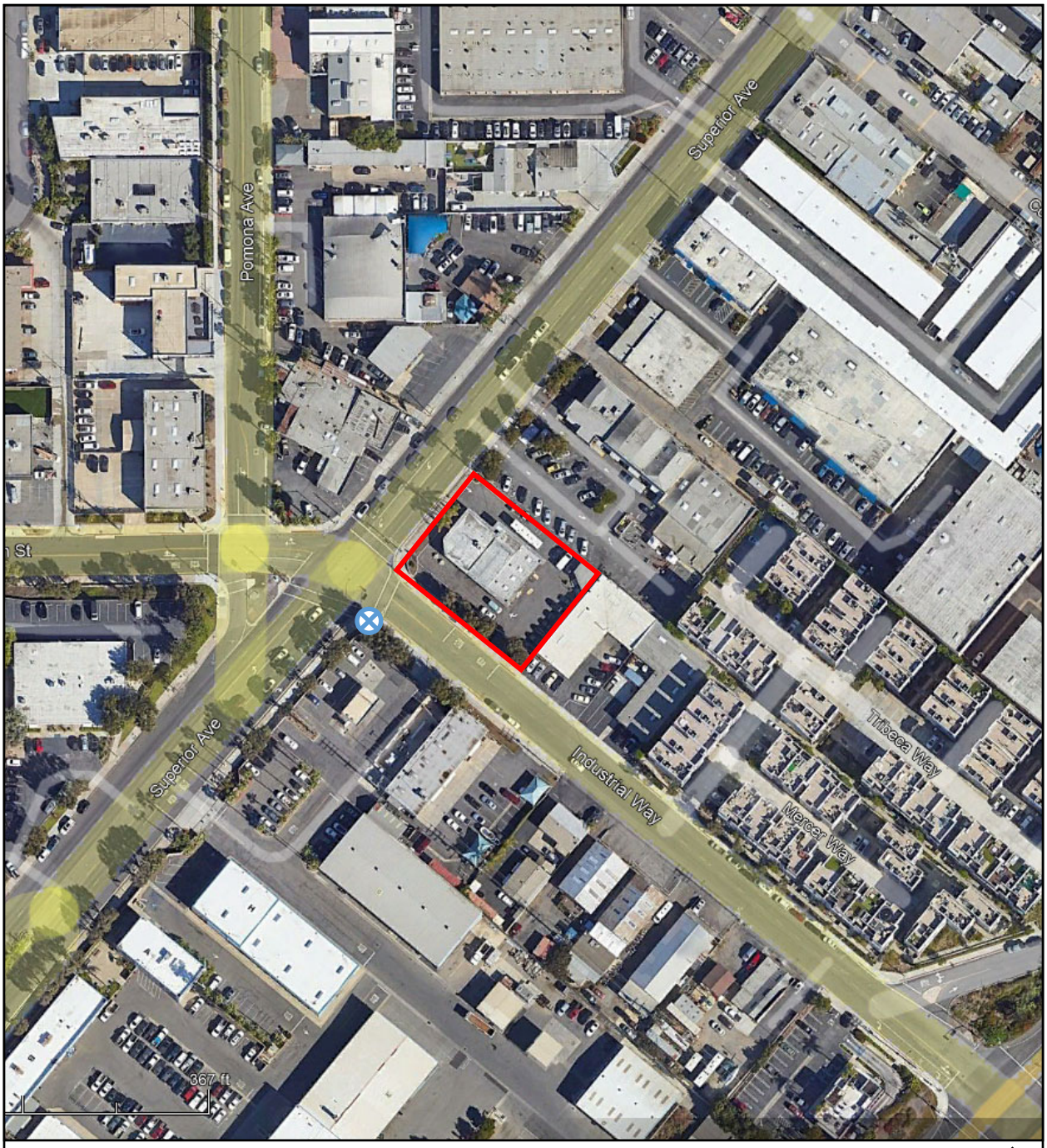

Source: Google Earth Pro, 2022.

N

Noise Measurement Location

Project Location

Figure 3.

Satellite Aerial Photograph

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Newport Boulevard is a six-lane, two-way Major Arterial (Augmented) running generally north-south to the east of the project site. The posted speed limit is 50 mph. According to the General Plan Update Traffic Analysis, Newport Boulevard currently carries a traffic volume of approximately 51,000 ADT in the vicinity of the project site, as of the year 2016.

No current or future truck percentages were available for roadways in the vicinity of the project site. However, based on neighboring and surrounding land use, roadway classification, professional experience, and on-site observations, a truck percentage mix of 2.0% medium and 1.0% heavy trucks was used for all roadways.

Current and future (See Section 3.2) traffic volumes and vehicle mixes for roadway sections near the project site are shown in Table 1. For more information, please refer to Appendix B: CadnaA Analysis Data and Results.

Table 1. Overall Roadway Traffic Information

Roadway Name	Speed Limit (mph)	Vehicle Mix (%)		Current ADT (2016)	Future ADT (Capacity)
		Medium Trucks	Heavy Trucks		
Superior Avenue	35	2.0	1.0	23,000	38,000
Industrial Way	30	2.0	1.0	5,000	12,500
Newport Boulevard	50	2.0	1.0	51,000	68,000

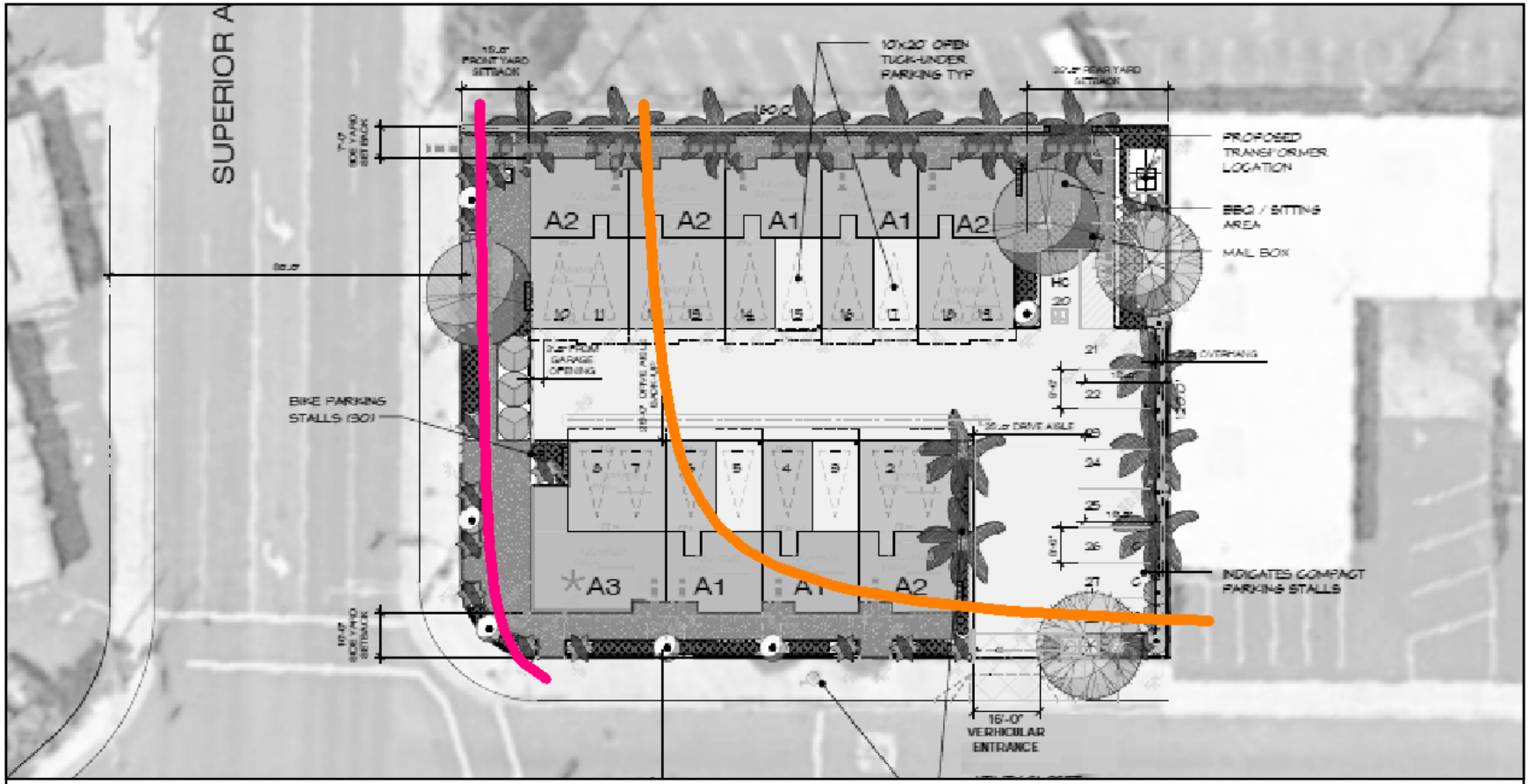
Current traffic noise contours were calculated at ground level and show that traffic noise impacts to the entire project site are between approximately 61 and 71 CNEL. For a graphical representation of these contours, please refer to Figure 4.

3.1.2 Measured Noise Level

An on-site inspection and traffic noise measurement were made on the morning of Thursday, September 22, 2022. The noise measurement was made near the project site using the methodology described in Section 4.1, at approximately 45 feet east of the Superior Avenue centerline and approximately 50 feet south of the Industrial Way centerline. The noise measurement location is shown in Figure 3. Traffic volumes were recorded for automobiles, medium-size trucks, and large trucks on Superior Avenue during the measurement period. After a 15-minute sound level measurement paused for extraneous, non-traffic sources, there was no change in the L_{EQ} and results were then recorded. The measured noise level and related weather conditions are shown in Table 2.

Table 2. On-Site Noise Measurement Conditions and Results

Date	Thursday, September 22, 2022
Time	10:54 a.m. – 11:09 a.m.
Conditions	Sunny skies, winds at 4 mph, temperature in the mid 70s, with moderate humidity
Measured Noise Level	68.3 dBA L_{EQ}



Source: Withee Malcolm Architects, LLP, 2022.

65 CNEL Contour

70 CNEL Contour

75 CNEL Contour

Figure 4.

Current Traffic Noise Contours

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3.1.3 Calculated Noise Level

Noise levels were calculated for the site using the methodology described in Section 4.1 for the location, conditions, and traffic volumes counted during the noise measurements. The calculated noise levels (L_{EQ}) were compared with the measured on-site noise level to determine if adjustments or corrections (calibration) should be applied to the traffic noise prediction model. Adjustments are intended to account for site-specific differences, such as reflection and absorption, which may be greater or lesser than accounted for in the model.

The measured noise level of 68.3 dBA L_{EQ} at approximately 45 feet east of the Superior Avenue centerline and approximately 50 feet south of the Industrial Way centerline was compared to the calculated (modeled) noise level of 68.5 dBA L_{EQ} for the same conditions and traffic flow. According to the Federal Highway Administration's Highway Traffic Noise: Analysis and Abatement Guide (see reference), a traffic noise model is considered validated if the measured and calculated noise impacts differ by three decibels or less. No adjustment was deemed necessary to model future noise levels for this location as the difference between the measured and calculated levels was found to be less than three decibels. The traffic noise model is assumed to be representative of actual traffic noise that is experienced on site. This information is shown in Table 3.

Table 3. Calculated versus Measured Traffic Noise Data

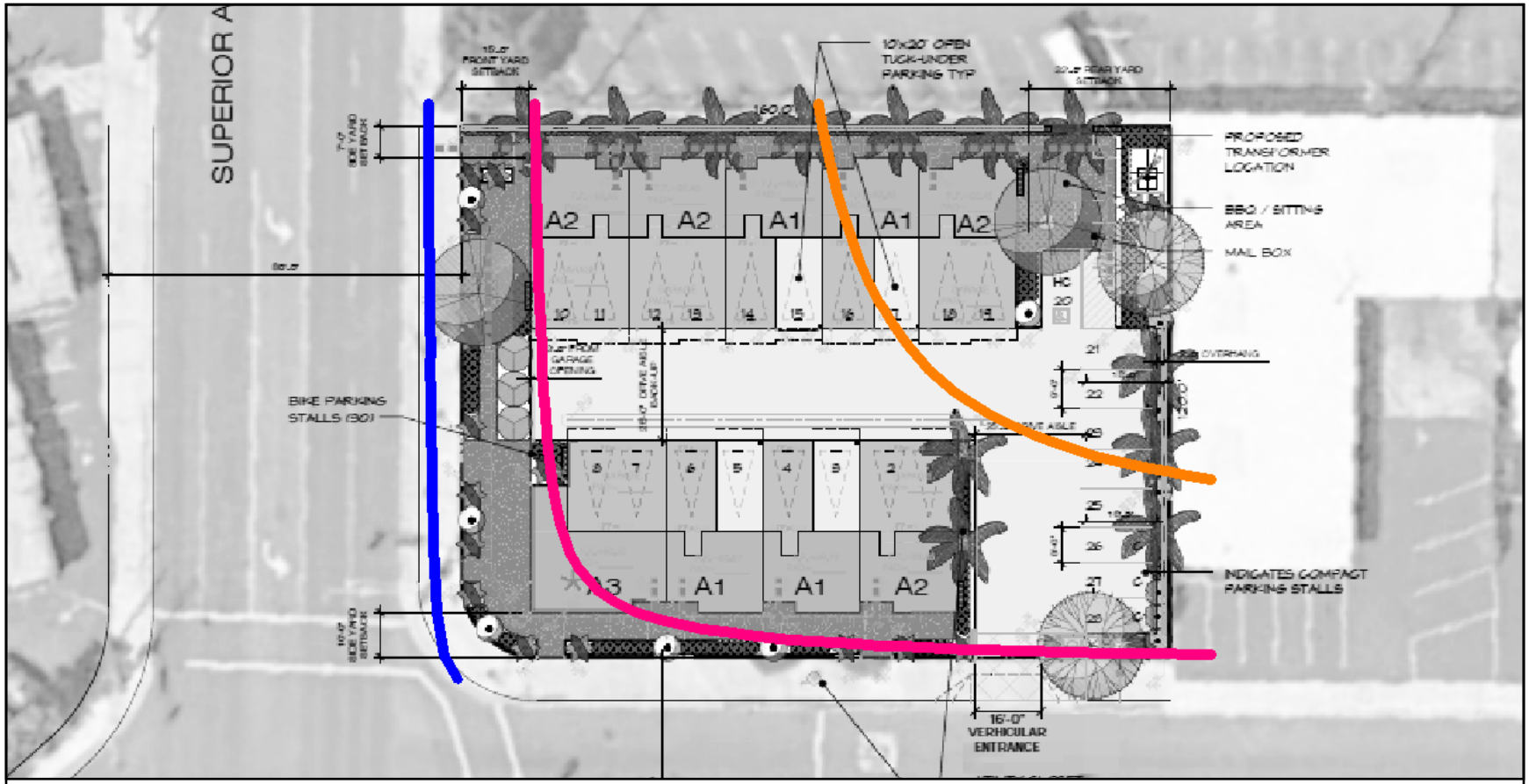
Location	Calculated	Measured	Difference	Correction
45' east of Superior Avenue centerline and 50' south of Industrial Way centerline	68.5 dBA L_{EQ}	68.3 dBA L_{EQ}	0.2 dB	None Applied

3.2 Future Noise Environment

The General Plan Update Traffic Analysis provides anticipated maximum capacities of roadways based on their classification. These values have been used to determine anticipated future noise impacts in the vicinity of the project site. The traffic volumes of Superior Avenue and Industrial Way are expected to increase to 38,000 ADT and 12,500 ADT, respectively. The traffic volume of Newport Boulevard is expected to increase to 68,000 ADT.

The same truck percentages from the current traffic volumes were used for future traffic volume modeling. For further roadway details and projected future ADT traffic volumes, please refer to Appendix B: CadnaA Analysis Data and Results.

Future traffic noise contours were calculated at ground level and show that future traffic noise impacts to the entire project site are expected to be between approximately 63 and 74 CNEL. For a graphical representation of these contours, please refer to Figure 5.



Source: Withee Malcolm Architects, LLP, 2022.

65 CNEL Contour

70 CNEL Contour

75 CNEL Contour

Figure 5.

Future Traffic Noise Contours

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4.0 Methodology and Equipment

4.1 Methodology

4.1.1 Field Measurement

Typically, a "one-hour" equivalent sound level measurement (L_{EQ}, A-Weighted) is recorded for at least one noise-sensitive location on the site. During the on-site noise measurement, start and end times are recorded, vehicle counts are made for cars, medium trucks (double-tires/two axles), and heavy trucks (three or more axles) for the corresponding road segment(s). Supplemental sound measurements of one hour or less in duration are often made to further describe the noise environment of the site.

For measurements of less than one hour in duration, the measurement time is long enough for a representative traffic volume to occur and the noise level (L_{EQ}) to stabilize. The vehicle counts are then converted to one-hour equivalent volumes by using the appropriate multiplier. Other field data gathered includes measuring or estimating distances, angles-of-view, slopes, elevations, roadway grades, and vehicle speeds. This data is checked against the available maps and records.

4.1.2 Roadway Noise Calculation

The Traffic Noise Model (TNM) calculation protocol in CadnaA Version 2022 (based on the methodology used in TNM Version 2.5, released in February 2004 by the U.S. Department of Transportation) was used for all traffic modeling in the preparation of this report. Using the TNM protocol, the CNEL is calculated as 9.2% of the ADT for surrounding roadways, based on the studies made by Wyle Laboratories (see reference). Future CNEL is calculated for desired receptor locations using future road alignment, elevations, lane configurations, projected traffic volumes, estimated truck mixes, and vehicle speeds. Noise attenuation methods may be analyzed, tested, and planned with TNM, as required.

In order to determine the estimated traffic volumes of roadways during the traffic noise measurement made on site for model calibration, the approximate percentage of the Average Daily Trips (ADT) value for the time period in which the measurement is made is incorporated into the traffic model. These percentages were established in a study performed by Katz-Okitsu and Associates, Traffic Engineers (see reference). For purposes of calibrating the CadnaA TNM, 6.2% of the ADT values for the current environment were used in calculations (for roadways that were not manually counted) to account for traffic between the hours of 11 a.m. and 12 p.m. in the vicinity of the project site.

4.1.3 Exterior-to-Interior Noise Analysis

The State of California and the City of Costa Mesa require buildings to be designed in order to attenuate, control, and maintain average interior noise levels not greater than 45 CNEL in residential space, as formulated in the California Building Code, Section 1206.4 and the City of Costa Mesa Noise Ordinance. Contemporary exterior building construction is expected to achieve at least 15 decibels of exterior-to-interior noise attenuation with windows opened, according to the U.S. Environmental Protection Agency Office of Noise Abatement and Control (see reference). As a result, exterior noise levels of more than 60 CNEL often result in interior conditions that fail to meet the 45 CNEL requirements for habitable space.

Analysis for the interior noise levels requires consideration of:

- Number of unique assemblies in the wall (doors, window/wall mount air conditioners, sliding glass doors, and windows)
- Size, number of units, and sound transmission data for each assembly type

- Length of sound impacted wall(s)
- Depth of sound impacted room
- Height of exterior wall of sound impacted room
- Exterior noise level at wall assembly or assemblies of sound impacted room

The Composite Sound Transmission data is developed for the exterior wall(s), and the calculated noise exposure is converted to octave band sound pressure levels (SPL) for a typical traffic type noise. The reduction in room noise due to absorption is calculated and subtracted from the interior octave noise levels, and the octave band noise levels are logarithmically summed to yield the overall interior room noise level. When interior noise levels exceed 45 CNEL, the noise reduction achieved by each element is reviewed to determine which changes will achieve the most cost-effective compliance. Windows are usually the first to be reviewed, followed by exterior doors, and then exterior walls.

4.2 Measurement Equipment

Some or all of the following equipment was used at the site to measure existing noise levels:

- Larson Davis Model LxT Type 1 Sound Level Meter, Serial # 4084
- Larson Davis Model CAL200 Type 1 Calibrator, Serial # 19178

The sound level meter was field-calibrated immediately prior to the noise measurement and checked afterward to ensure accuracy. All sound level measurements presented in this report, in accordance with the regulations, were conducted using a sound level meter that conforms to the American National Standards Institute specifications for sound level meters (ANSI S1.4). All instruments are maintained with National Institute of Standards and Technology (NIST) traceable calibration, per the manufacturers' standards.

5.0 Noise Impacts

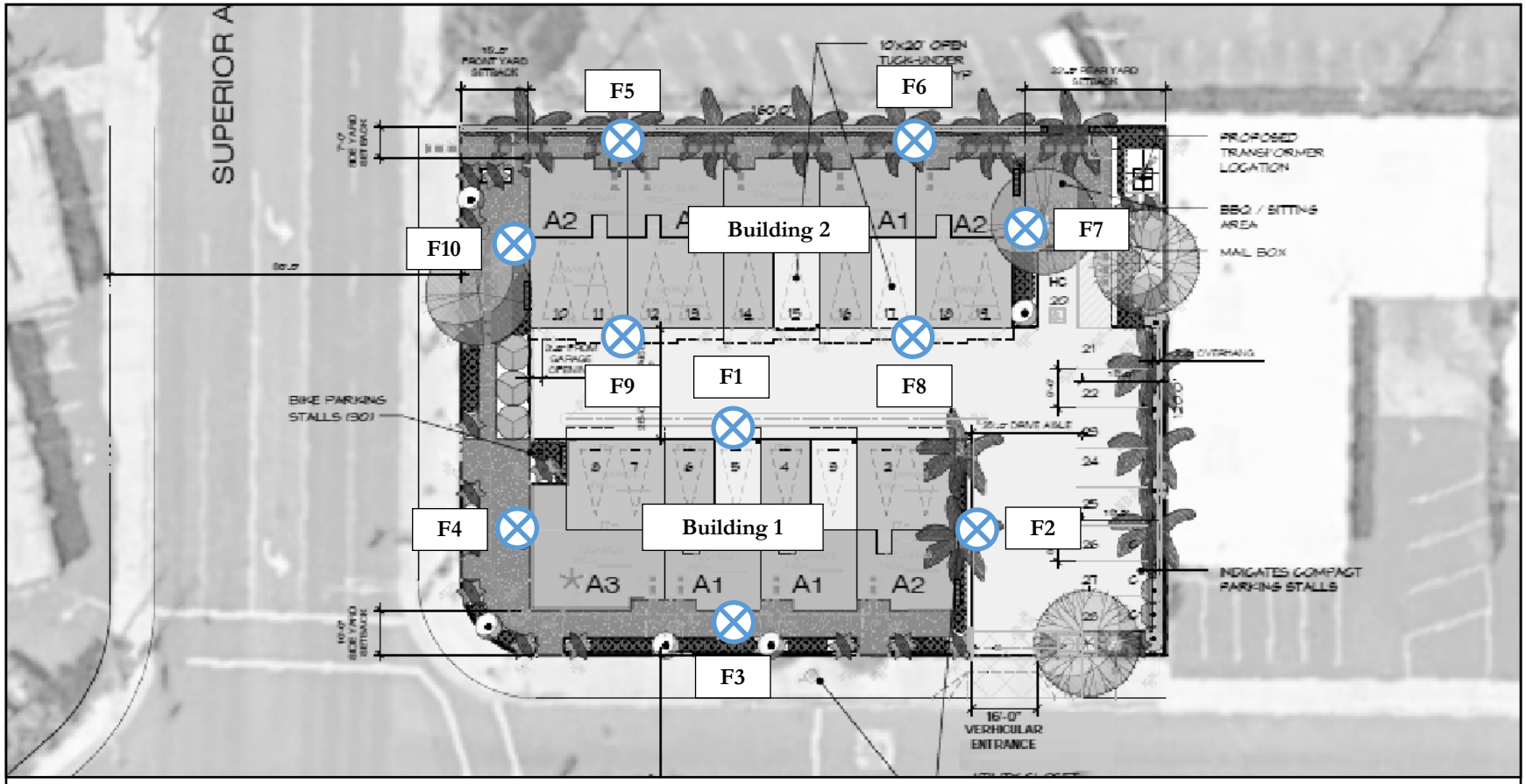
5.1 Exterior

5.1.1 Outdoor Use Areas

The City of Costa Mesa Noise Ordinance states that exterior noise levels at outdoor use areas of multi-family residential properties should not exceed 65 CNEL; however, the Noise Ordinance also states that exterior noise level limits do not apply at private balconies or patios of any size or any private or community roof decks/roof terraces of multi-family developments or live/work units located within a Mixed-Use Overlay District, approved pursuant to a Master Plan, and subject to the land use regulations of an Urban Plan. The proposed project is located within the 19 West Urban Plan, and as such, is not subject to meeting the specified exterior noise limits at outdoor use areas.

5.1.2 Building Facades

Future traffic noise impacts were calculated for all project building facades. Future noise levels at the building facades are expected to range from 58 CNEL at the east facade of Building 2 to 72 CNEL at the west facades of Buildings 1 and 2. Calculation results are shown in Table 4, and receiver locations are shown graphically in Figure 6.



Source: Withee Malcolm Architects, LLP, 2022.

Facade Receiver Location

Figure 6.

Building Facade Receiver Locations

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Table 4. Future Exterior Noise Levels at Building Facades					
Building	**Receiver**	**Direction**	**Future Exterior Noise Level (CNEL)**		
			Floor 1	**Floor 2**	**Floor 3**
1	F1	North	N/A	61.0	61.4
	F2	East	62.8	64.3	64.7
	F3	South	68.8	69.6	69.9
	F4	West	70.6	71.7	71.8
2	F5	North	64.8	66.6	67.0
	F6	North	60.5	62.0	63.3
	F7	East	58.2	59.9	61.2
	F8	South	N/A	60.4	61.5
	F9	South	N/A	64.9	65.3
	F10	West	70.3	71.5	71.6

5.2 Interior

5.2.1 Transportation Noise Sources

The State of California and the City of Costa Mesa require buildings to be designed in order to attenuate, control, and maintain average interior noise levels not greater than 45 CNEL in residential space, as formulated in the California Building Code, Section 1206.4 and the City of Costa Mesa Noise Ordinance. The City of Costa Mesa describes the indoor environment as inclusive of bathrooms, closets, corridors, and living/sleeping areas of the dwelling unit. The residential area of a live/work unit is subject to the interior residential noise requirements. According to the U.S. EPA (see reference), current exterior building construction is generally expected to achieve at least 15 decibels of exterior-to-interior noise attenuation with windows opened. Therefore, proposed project building structures exposed to exterior noise levels greater than 60 CNEL could be subject to interior noise levels exceeding the 45 CNEL noise limit for residential habitable space.

As exterior noise levels at most building facades exceed 60 CNEL, an exterior-to-interior analysis was performed for a representative unit to determine design considerations required to maintain compliant interior noise levels. A typical, wood-framed exterior wall was assumed, and calculations were performed to determine appropriate sound ratings for glazing.

The results of the exterior-to-interior noise analysis for interior spaces are shown in Table 5, with acoustical recommendations made therein. For more information, please refer to Appendix C: Exterior-to-Interior Noise Analysis.

Table 5. Interior Noise Levels of Representative Unit				
Room Type	Maximum Exterior Facade Impact (CNEL)	STC Rating for Glazing	Interior Noise Level (CNEL)	
			Windows/ Doors Open	Windows/ Doors Closed
Work Space	70.6	28	65.6	42.5
Living/Dining/Kitchen	71.7	28	61.2	40.6
Powder	71.7	28	62.4	44.7
Master Bedroom/Bathroom/Closet	71.8	28	55.2	39.5
Bedroom 2/Closet	71.8	28	64.4	41.9
Bedroom 3/Closet	71.8	28	63.8	43.7
Bathroom	71.8	28	42.3	42.3
3rd Floor Landing	71.8	28	64.3	40.9

As shown above, with typical exterior walls and exterior glazing with a minimum STC rating of 28, interior noise levels will remain below 45 CNEL in all habitable space with windows and exterior doors closed. The sound rating of exterior glazing should be confirmed with the manufacturer prior to installation to confirm these STC rating requirements will be met. An STC 28 rating is fairly easily achievable with dual pane glass.

In instances where interior habitable space is exposed to noise levels greater than 45 CNEL with windows in the open position, appropriate means of air circulation and provision of fresh air must be present to allow windows to remain closed for extended intervals of time so that acceptable levels of noise can be maintained on the interior. As exterior noise levels are expected to exceed limits with windows and doors open at all units, mechanical ventilation will be required in all units. The proposed mechanical ventilation system shall meet the criteria of the California Mechanical Code, including the capability to provide appropriate ventilation rates. The ventilation system shall not compromise the sound insulation capability of the exterior wall or be dependent on ventilation through windows.

Exterior door installation should include all-around weather-tight door stop seals and an improved threshold closure system. The additional hardware will improve the doors' overall sound reduction properties. The transmission loss (TL) of an exterior door without weather-tight seals is largely a factor of sound leakage, particularly at the bottom of the door if excessive clearance is allowed for air transfer. By equipping exterior doors with all-around weather-tight seals and an airtight threshold closure at the bottom, a loss of up to 10 STC points can be prevented.

Additionally, it is imperative to seal and caulk between the rough opening and the finished door frame for all doors by applying an acoustically resilient, non-skinning, butyl caulking compound. Sealant application should be as generous as needed to ensure effective sound barrier isolation. The same recommendation applies to any other penetrations, cracks, or gaps through the assembly. The OSI SC175 and the Pecora AC-20 FTR acoustic sound sealants are products specifically designed for this purpose. For additional information on these products, please refer to Appendix D: Recommended Products.

The proposed habitable spaces were analyzed for interior noise impacts. With typical exterior walls and exterior glazing with a minimum STC rating of 28 in place, interior noise levels will remain below 45 CNEL in all habitable space with windows and exterior doors closed. As exterior noise levels are expected to exceed limits

with windows and doors open in all units, mechanical ventilation will be required for all units. With these project design features in place, all interior residential space will comply with City of Costa Mesa and California Building Code noise requirements.

5.2.2 Internal Use Compatibility

According to the City of Costa Mesa, commercial uses must be designed and operate, and hours of operation limited, where appropriate, so that neighboring residents are not exposed to offensive noise, especially from traffic, routine deliveries, or late night activity. No use must produce continual loading or unloading or heavy trucks at the site. In any mixed-use building, consideration should be given to the types of commercial uses that are allowable within live/work spaces. Uses that generate significant levels of noise and/or vibration should be strongly discouraged and permitted only after the preparation of a site-specific noise analysis to determine site modifications or applicable conditions that would assist in controlling impacts at adjacent residential and/or commercial uses. Examples of such incompatible uses include, but are not limited to, gyms/fitness centers, nightclubs, live music venues, and animal grooming/kennel facilities. It is important to note that, even when suites/units are not directly adjacent to one another, vibration and noise-induced vibration can transmit through a structure and would potentially impact residents and occupants of adjacent commercial spaces.

6.0 Conclusion

The City of Costa Mesa Noise Ordinance states that exterior noise level limits do not apply at private balconies or patios of any size or any private or community roof decks/roof terraces of multi-family developments or live/work units located within a Mixed-Use Overlay District, approved pursuant to a Master Plan, and subject to the land use regulations of an Urban Plan. The proposed project is located within the 19 West Urban Plan, and as such, is not subject to meeting the specified exterior noise limits at outdoor use areas.

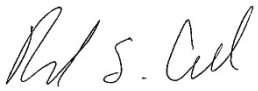
The City of Costa Mesa and the State of California require interior noise levels not exceeding 45 CNEL in habitable space. Calculations show that future noise levels on site are expected to exceed 60 CNEL at most building facades; therefore, interior noise levels may exceed 45 CNEL within units without appropriate design features in place. Calculations show that with typical exterior wall assemblies, exterior glazing with an STC rating of 28, and mechanical ventilation in all units, all interior live/work and residential space is expected to comply with City of Costa Mesa and State of California noise requirements.

According to the City of Costa Mesa, commercial uses must be designed and operate, and hours of operation limited, where appropriate, so that neighboring residents are not exposed to offensive noise, especially from traffic, routine deliveries, or late night activity. No use must produce continual loading or unloading or heavy trucks at the site. Uses should be appropriately restricted, as detailed herein.

7.0 Certification

All recommendations for noise control are based on the best information available at the time our consulting services are provided. However, as there are many factors involved in sound and impact transmission, and Eilar Associates has no control over the construction, workmanship, or materials, Eilar Associates is specifically not liable for final results of any recommendations or implementation of the recommendations.

The findings and recommendations of this acoustical analysis report are based on the information available and are a true and factual analysis of the potential acoustical issues associated with the 1540 Superior Avenue Live/Work project, to be located at 1540 Superior Avenue in the City of Costa Mesa, California. This report was prepared by Amy Hool and Rachael Cowell.



Rachael S. Cowell, INCE
Acoustical Consultant

Amy Hool, INCE
President/CEO

8.0 References

City of Costa Mesa Zoning Code, Chapter XIII Noise Control, Revised 04/06.

City of Costa Mesa, 19 West Urban Plan, Amended April 5, 2016.

2019 California Building Code, Based on the International Building Code, Chapter 12, Section 1206 – Sound Transmission Control.

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U.S. Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety, March 1974.

Appendix A
Project Plans

PROJECT SUMMARY

ZONING SUMMARY

PROJECT SITE INFORMATION

	APN #	ADDRESS	ZONING	LOT AREA (SF)	LOT AREA (ACRE)
			EXISTING / PROPOSED	19,149 SF	.44 ACRES
	425-351-06	1540 SUPERIOR AVE. COSTA MESA	19 WEST URBAN PLAN / MESA WEST BLUFFS URBAN PLAN	19,149 SF	
PROJECT CONSTRUCTION TYPE	3 STORY TYPE V-B 13D (R3 OCCUPANCY)				

SETBACKS		ALLOWED	PROPOSED	NOTES
	SUPERIOR AVE. (WEST)	15'-0" FRONT YARD	15'-0" FRONTYARD	MESA WEST BLUFFS URBAN PLAN
	INDUSTRIAL WAY (SOUTH)	10'-0" SIDE YARD	10'-0" SIDE YARD	
	EAST	0'-0" REAR YARD	32'-0" REAR YARD	
	NORTH	0'-0" SIDE YARD	7'-0" SIDE YARD	

DENSITY				
	22 DU. / AC. = 10 DU.		9 UNITS	MESA WEST BLUFFS URBAN PLAN
			GROSS DENSITY = 20 DU./AC.	

FLOOR AREA RATIO			
1.0		0.93	MESA WEST BLUFFS URBAN PLAN

LOT COVERAGE				
	90% MAX.	8,136 SF	42%	MESA WEST BLUFFS URBAN PLAN TABLE A2

FLOOR AREA		
	TOTAL =	17,744 SF
	RESIDENTIAL =	14,694 SF
	HOME OFFICE =	3,050 SF

BUILDING HEIGHT			
4 STORIES	60'-0" MAX.	3 STORIES / 41'-0" T.O.P.	MESA WEST BLUFFS URBAN PLAN TABLE A1

PARKING SUMMARY

		REQUIRED		PROPOSED		PARKING BREAK DOWN	
						GARAGE =	14 SPACES
	MESA WEST BLUFFS URBAN PLAN TABLE A2	UNIT 1	1.5 SPACES PER UNIT 6 SPACES	PRIVATE GARAGE =	14 SPACES	TUCK-UNDER=	4 SPACES
		UNIT 2	1.5 SPACES PER UNIT 6 SPACES	OPEN PARKING =	9 SPACES	ACCESSIBLE =	1 SPACE
		UNIT 3	2.0 SPACES PER UNIT 2 SPACES	TUCK-UNDER PARKING =	4 SPACES	STANDARD =	5 SPACES
		GUEST	1.5 SPACES PER UNIT 14 SPACES	BICYCLE SPACE =	1 SPACE	COMPACT =	3 SPACES
						BICYCLE =	1 SPACE
			TOTAL = 28 SPACES		TOTAL = 28 SPACES	TOTAL =	28 SPACES

UNIT SUMMARY

PLAN	DESCRIPTION	QUANTITY	NET AREA	NET AREA SUBTOTAL	GROSS AREA	GROSS AREA SUBTOTAL	ROOF DECK / DECK	TOTAL DECK
UNIT 1	2 BR + OFFICE / 2 & 2-HALF BATH TOWNHOME	4 UNITS	1,705 SF	6,820 SF	1,826 SF	7,304 SF	222 SF	888 SF
UNIT 2	3 BR + OFFICE / 2 & 2-HALF BATH TOWNHOME	4 UNITS	1,879 SF	7,516 SF	1,999 SF	7,996 SF	279 SF	1,116 SF
UNIT 3	2 BR + OFFICE / 2 & 2-HALF BATH TOWNHOME	1 UNITS	2,290 SF	2,290 SF	2,444 SF	2,444 SF	334 SF	334 SF
PROJECT UNIT TOTAL		**9 UNITS**		**16,626 SF**		**17,744 SF**		**2,338 SF**

BUILDING SUMMARY

	RESIDENTIAL	UTILITY / MECHANICAL / GARAGE	HOME OFFICE	FAR BUILDING FLOOR AREA (F.A.R.)	TOTAL GROSS BUILDING FLOOR AREA
BUILDING 1	6,620 SF	1,470 SF	1,475 SF	8,095 SF	9,565 SF
BUILDING 2	8,074 SF	1,950 SF	1,575 SF	9,649 SF	11,599 SF
TOTAL	**14,694 SF**		**3,050 SF**	**17,744 SF**	**21,164 SF**

OPEN SPACE / AMMENITY SUMMARY

	REQUIRED	MESA WEST BLUFFS URBAN PLAN TABLE A2		PROPOSED	
COMMON OPEN SPACE		OPEN SPACE - 30% OF LOT AREA	5,745 SF	PRIVATE DECK =	2,338 SF
				COMMON AREA =	5,171 SF
			TOTAL = 5,745 SF	TOTAL =	7,509 SF

VICINITY MAP

SHEET INDEX

1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

PROJECT INFORMATION

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

N

scale: 1/16" = 1'-0"
0 16 32 64

WITHEE MALCOLM ARCHITECTS, LLP
2251 West 190th Street Torrance, CA 90504
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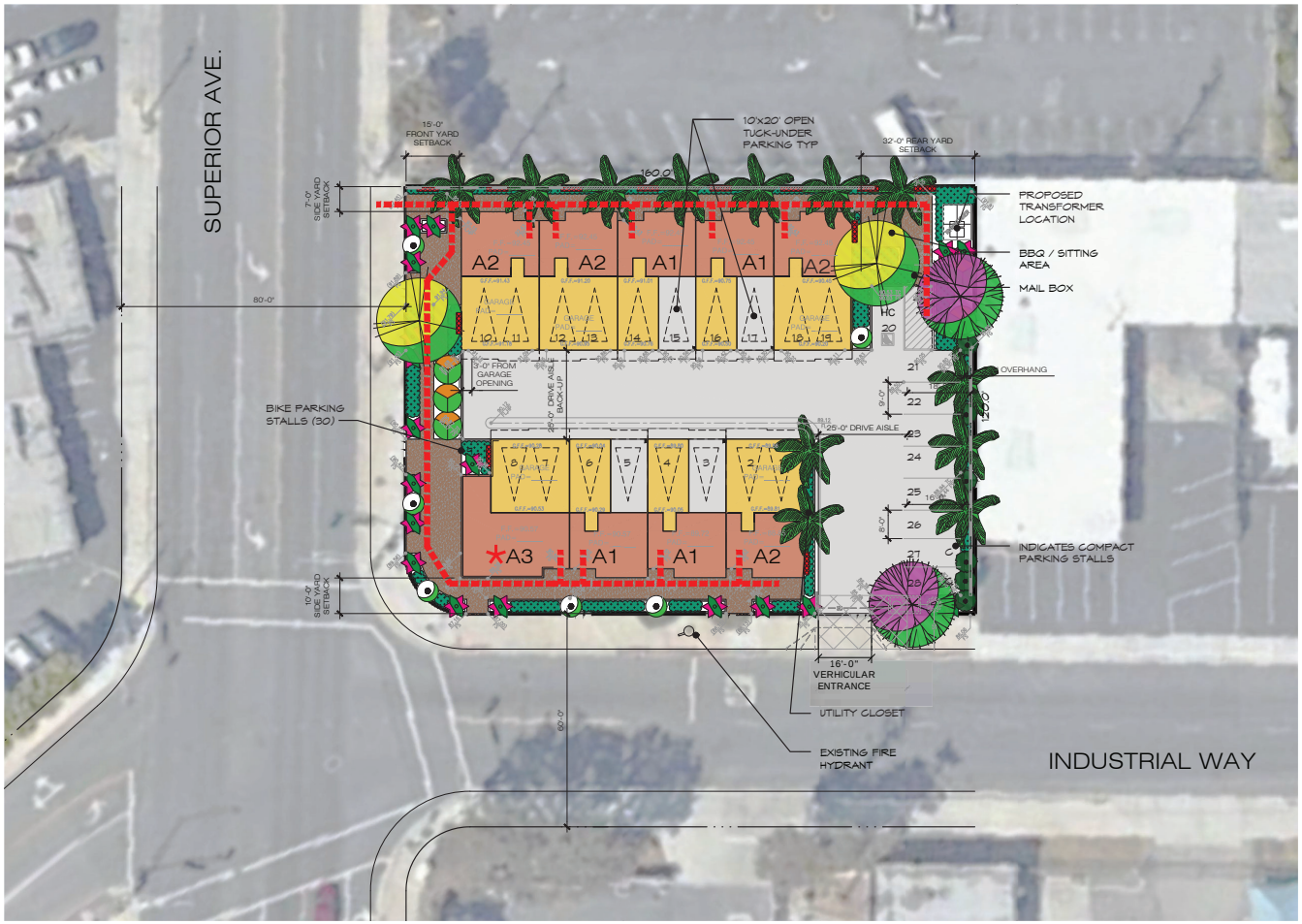
JOB. C1049
PRINTED: May 11, 2022

1.0



LEGEND

RESIDENTIAL UNITS	PROPOSED TRANSFORMER
LIVE / WORK	EXISTING FIRE HYDRANT
UTILITY AREA	ACCESSIBLE ROUTE
COLORED STAMPED CONCRETE DRIVE	ADAPTABLE UNITS AT GRADE LEVEL

PROJECT SUMMARY

SITE SUMMARY

ZONING:	MESA WEST BLUFFS URBAN PLAN
APN:	425-351-06
GROSS SITE AREA:	0.44 ACRES (19,149 SF)
DWELLING UNITS:	9 UNITS
GROSS DENSITY:	20.5 DU/AC
BUILDING HEIGHT:	3 STORY / 60'-0" MAX.

DEVELOPMENT STANDARD

SETBACK	REQUIRED	PROVIDED
FRONT SETBACK	15'-0"	15'-0"
SIDE SETBACK	0'-0"	7'-0"
SIDE SETBACK(STREET)	10'-0"	10'-0"
REAR SETBACK	0'-0"	58'-0"

FF.A.R. (LIVE / WORK)	0.19 (0.175 MIN.) - 3,611 SF
TOTAL F.A.R.	0.94 (1.0 MAX.) - 17,915 SF
LOT COVERAGE	7,963 SF - 42% (90 % MAX.)
ON-GRADE OPEN SPACE	5,745 SF - *30% (30% MIN.)
*INCLUSIVE OF PARTIAL ROOF DECK AREA	
DRIVE-WAY / PARKING	5,774 SF - 30%

UNIT SUMMARY

PLAN	TYPE	AREA	COUNT
A1	(2 BR / 2 & 2(0.5) BATH)	1,869 SF	4 UNITS
A2	(3 BR / 2 & 2(0.5) BATH)	1,999 SF	4 UNITS
A3	(3 BR / 2 & 2(0.5) BATH)	2,443 SF	1 UNITS
TOTAL GROSS UNIT AREA		17,915 SF	9 UNITS

AREA SUMMARY

RESIDENTIAL AREA TOTAL	14,304 SF
LIVE / WORK AREA TOTAL	3,611 SF
PROJECT TOTAL	17,915 SF

PARKING SUMMARY

REQUIRED:		
UNIT 1&2	(8 X 1.5 spaces / unit)	12.0 SPACES
UNIT 3	(1 X 2.0 spaces / unit)	2.0 SPACES
GUEST	(9 X 1.5 spaces / unit)	13.5 SPACES
TOTAL REQUIRED:		28 SPACES

PARKING PROVIDED

UNITS:	14 SPACES
TUCK-UNDER :	4 SPACES
BIKE PARKING:	1 SPACE
ON-GRADE STANDARD:	5 SPACES
ON-GRADE COMPACT:	3 SPACES
ON-GRADE ACCESSIBLE:	1 SPACE
TOTAL PROVIDED	28 SPACES

OPEN SPACE SUMMARY

COMMON OPEN SPACE REQUIRED

30% OF GROSS AREA MIN.	5,745 SF

OPEN SPACE PROVIDED

COMMON ON GRADE	5,171 SF
PRIVATE ROOF DECKS	1,512 SF
PRIVATE DECK	865 SF

1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

CONCEPTUAL SITE PLAN

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

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N

scale: 1/16" = 1'-0"
0 16 32 64

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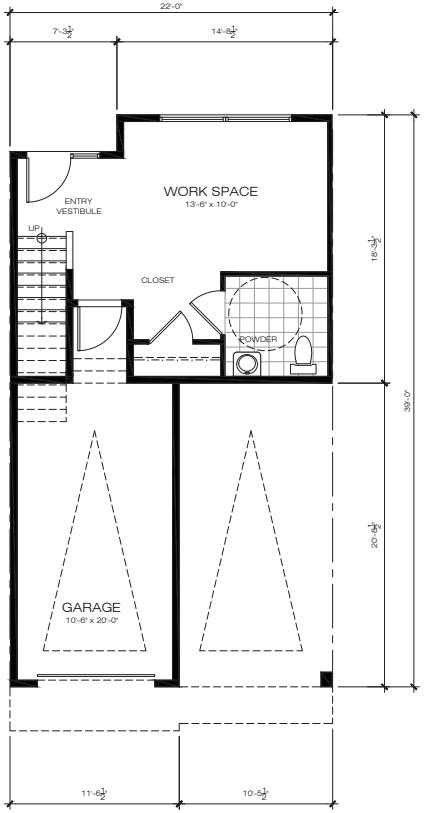
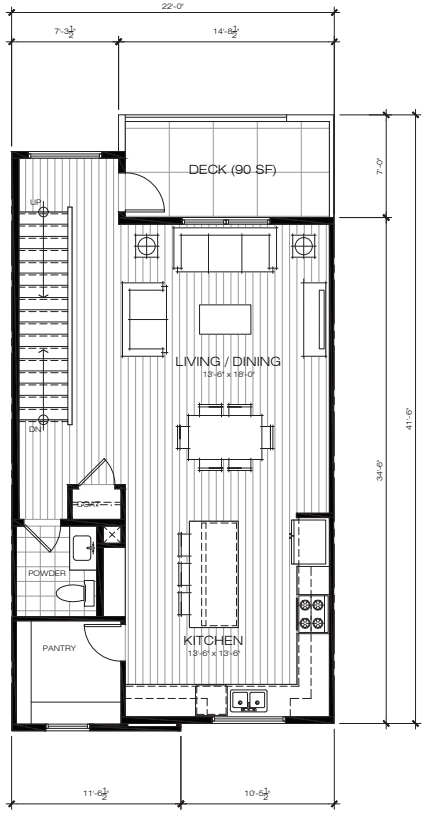
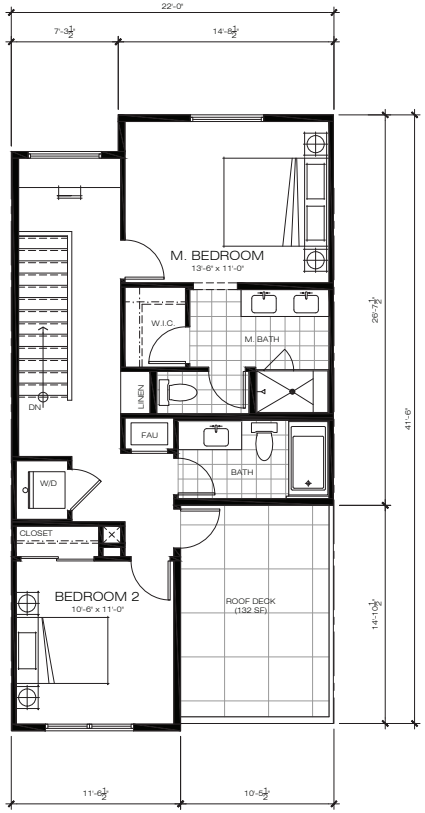
1.1



FIRST FLOOR
GROSS SF = 379 S.F.
LIVABLE SF = 350 S.F.



SECOND FLOOR
GROSS SF = 745 S.F.
LIVABLE SF = 700 S.F.



THIRD FLOOR
GROSS SF = 702 S.F.
LIVABLE SF = 655 S.F.

TH UNIT TYPE A1
2 BEDROOM + 2 & 2(1/2) BATH
GROSS UNIT SF = 1,826 S.F.
LIVABLE UNIT SF = 1,705 S.F.
DECK AREA = 90 S.F. / ROOF DECK = 132 S.F.
4 UNITS

1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

UNIT PLAN - TOWNHOME

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

scale: 1/4" = 1'-0"
0 4 8 12 16

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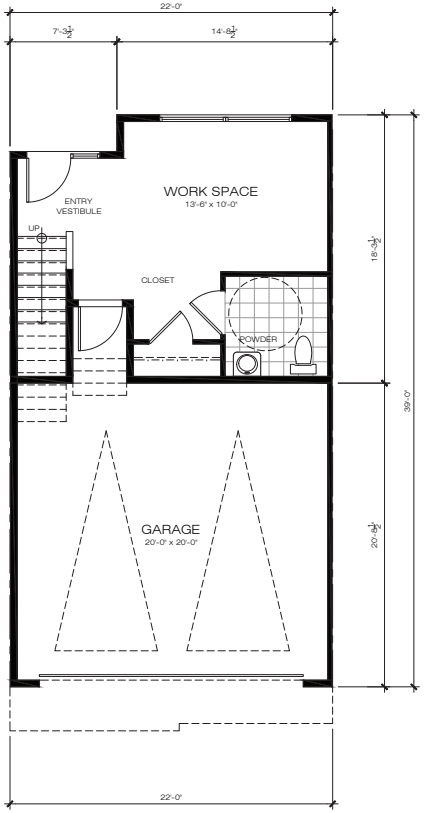
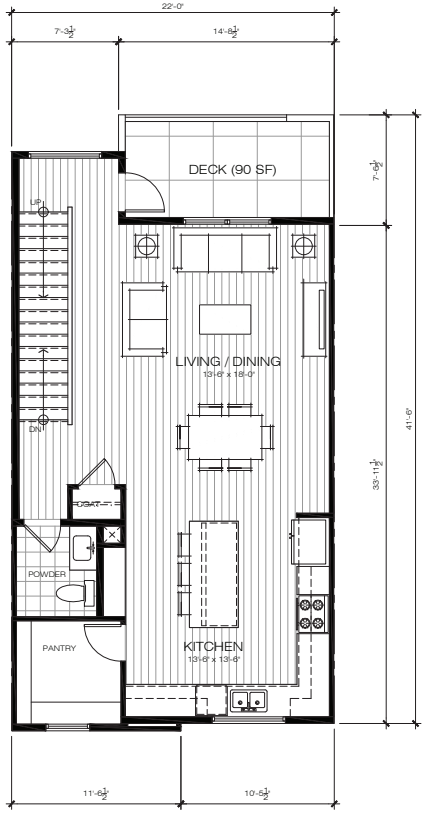
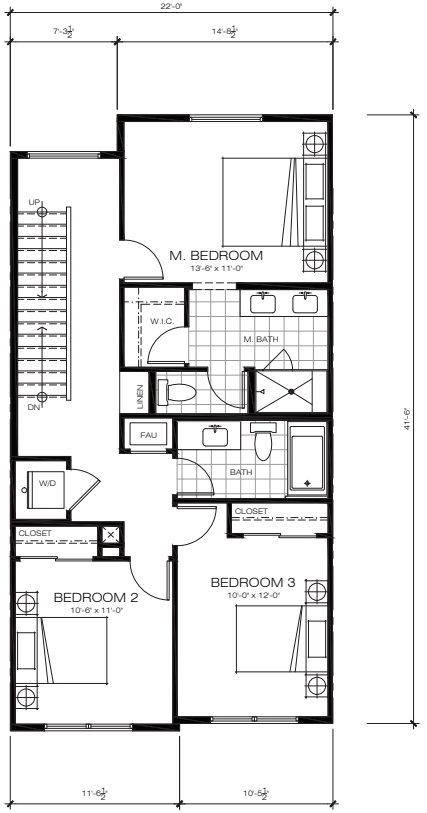
2.3



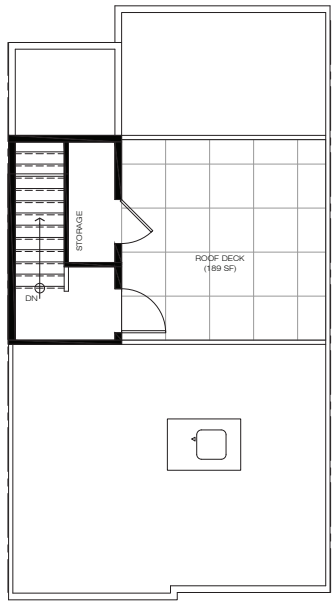
FIRST FLOOR
GROSS SF = 366 S.F.
LIVABLE SF = 343 S.F.



SECOND FLOOR
GROSS SF = 745 S.F.
LIVABLE SF = 700 S.F.



THIRD FLOOR
GROSS SF = 853 S.F.
LIVABLE SF = 808 S.F.



ROOF DECK
GROSS SF = 35 S.F.
LIVABLE SF = 28 S.F.

TH UNIT TYPE A2
3 BEDROOM + 2 & 2(1/2) BATH
GROSS UNIT SF = 1,999 S.F.
LIVABLE UNIT SF = 1,879 S.F.
DECK AREA = 90 S.F. / ROOF DECK = 189 S.F.
4 UNITS

1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

UNIT PLAN - TOWNHOME

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

scale: 1/4" = 1'-0"
0 4 8 12 16

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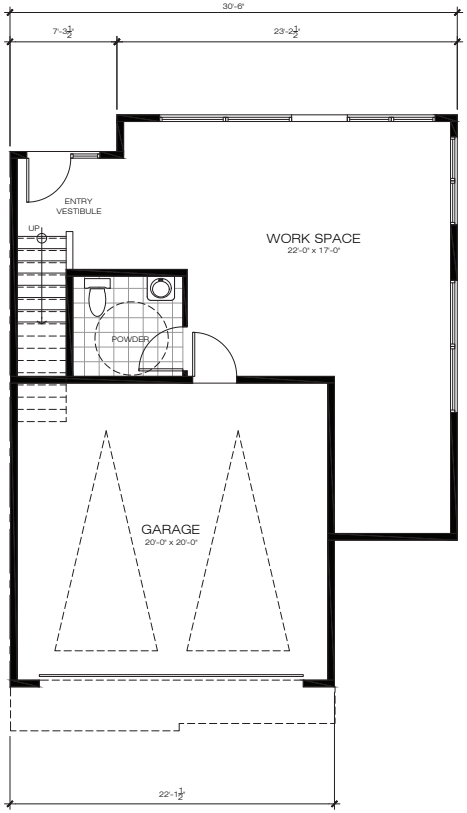
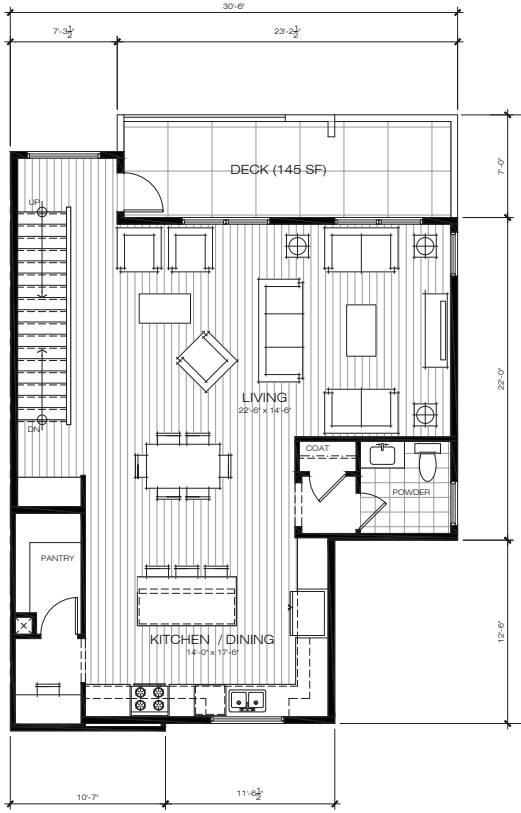
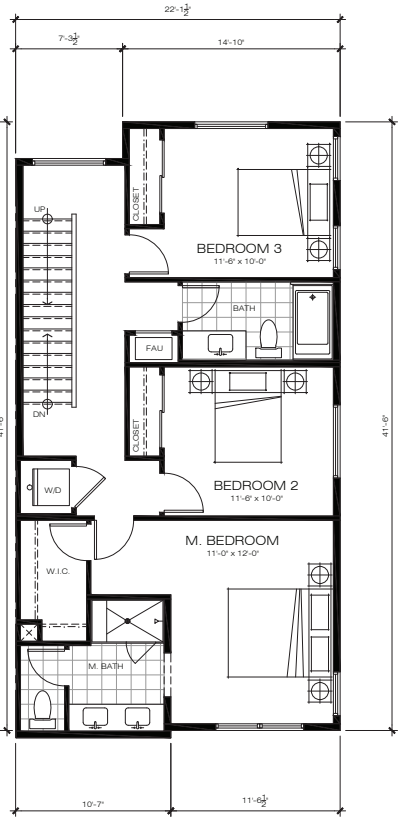
2.4



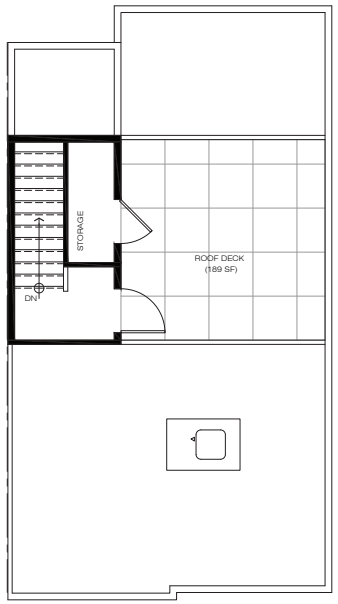
FIRST FLOOR
GROSS SF = 619 S.F.
LIVABLE SF = 580 S.F.



SECOND FLOOR
GROSS SF = 933 S.F.
LIVABLE SF = 875 S.F.



THIRD FLOOR
GROSS SF = 857 S.F.
LIVABLE SF = 807 S.F.



ROOF DECK
GROSS SF = 35 S.F.
LIVABLE SF = 28 S.F.

TH UNIT TYPE A3
3 BEDROOM + 2 & 2(1/2) BATH
GROSS UNIT SF = 2,444 S.F.
LIVABLE UNIT SF = 2,290 S.F.
DECK AREA = 145 S.F. / ROOF DECK = 189 S.F.
1 UNITS

1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

UNIT PLAN - TOWNHOME

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

scale: 1/4" = 1'-0"
0 4 8 12 16

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1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

CONCEPTUAL IMAGERY

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

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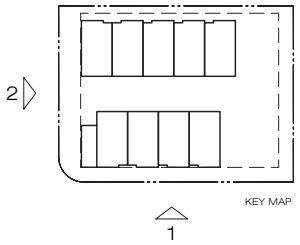
3.1



1. (INDUSTRIAL WAY) SIDE ELEVATION

MATERIAL LEGEND

1. EXTERIOR CEMENT STUCCO COLOR 1
2. EXTERIOR CEMENT STUCCO COLOR 2
3. SYNTHETIC EXTERIOR BOARD
4. ENHANCED EXTERIOR MATERIAL
5. EXTERIOR VENEER FINISH
6. DUAL GLAZED VINYL WINDOWS WHITE COLORED FRAME
7. PAINTED METAL GUARD RAIL
8. GLASS GUARD RAIL
9. METAL CANOPY
10. SCREED LINE
11. PAINTED EXTERIOR METAL DOOR
12. GARAGE DOOR

2. (SUPERIOR AVE.) FRONT ELEVATION

1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

BUILDING ELEVATIONS

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

scale: 1/8" = 1'-0"
0 4 8 16 32

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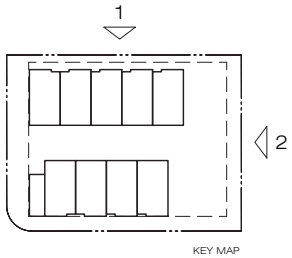
3.2



KEY MAP

1. (NORTH) SIDE ELEVATION

MATERIAL LEGEND

1. EXTERIOR CEMENT STUCCO COLOR 1
2. EXTERIOR CEMENT STUCCO COLOR 2
3. SYNTHETIC EXTERIOR BOARD
4. ENHANCED EXTERIOR MATERIAL
5. EXTERIOR VENEER FINISH
6. DUAL GLAZED VINYL WINDOWS WHITE COLORED FRAME
7. PAINTED METAL GUARD RAIL
8. GLASS GUARD RAIL
9. METAL CANOPY
10. SCREED LINE
11. PAINTED EXTERIOR METAL DOOR
12. GARAGE DOOR

2. (EAST) FRONT ELEVATION

1540 SUPERIOR AVE. LIVE / WORK - COSTA MESA, CA

BUILDING ELEVATIONS

APPLICANT / OWNER
BERK CUSTOM HOMES, INC.

scale: 1/8" = 1'-0"
0 4 8 16 32

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3.3

Appendix B

CadnaA Analysis Data and Results

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570
Date: 06 Oct 2022

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
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)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - 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	Excl. 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	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
Calibration			68.5	-63.4	0.0	0.0		x	Total	5.00	r	496.87	289.29	5.00

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
Superior		RO_1	65.3	0.0	0.0			1204.0	0.0	0.0	2.3	0.0	0.0	35		14.33	0.0	1	0.0	0.0		
Industrial		RO_2	59.4	0.0	0.0			310.0	0.0	0.0	3.0	0.0	0.0	30		6.71	0.0	1	0.0	0.0		
Newport		RO_3	71.8	0.0	0.0			3162.0	0.0	0.0	3.0	0.0	0.0	50		26.52	0.0	1	0.0	0.0		

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Superior	0.00	r			446.85	1095.72	0.00	0.00		
					455.53	-86.59	0.00	0.00		
Industrial	0.00	r			480.30	336.94	0.00	0.00		
					1257.39	339.17	0.00	0.00		
Newport	0.00	r			1323.61	-59.21	0.00	0.00		
					1306.24	327.95	0.00	0.00		
					1307.98	343.58	0.00	0.00		
					1360.07	732.47	0.00	0.00		
					1379.16	932.13	0.00	0.00		
					1377.43	1105.74	0.00	0.00		

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570
Date: 06 Oct 2022

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
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)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - 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	Excl. 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	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
Calibration			71.1	-63.4	0.0	0.0		x	Total	5.00	r	496.87	289.29	5.00

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
Superior		RO_1	68.0	0.0	0.0			2116.0	0.0	0.0	3.0	0.0	0.0	35		14.33	0.0	1	0.0	0.0		
Industrial		RO_2	61.2	0.0	0.0			460.0	0.0	0.0	3.0	0.0	0.0	30		6.71	0.0	1	0.0	0.0		
Newport		RO_3	73.5	0.0	0.0			4692.0	0.0	0.0	3.0	0.0	0.0	50		26.52	0.0	1	0.0	0.0		

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Superior	0.00	r			446.85	1095.72	0.00	0.00		
					455.53	-86.59	0.00	0.00		
Industrial	0.00	r			480.30	336.94	0.00	0.00		
					1257.39	339.17	0.00	0.00		
Newport	0.00	r			1323.61	-59.21	0.00	0.00		
					1306.24	327.95	0.00	0.00		
					1307.98	343.58	0.00	0.00		
					1360.07	732.47	0.00	0.00		
					1379.16	932.13	0.00	0.00		
					1377.43	1105.74	0.00	0.00		

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570
Date: 06 Oct 2022

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
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)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - 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	Excl. 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	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
Calibration			73.5	-63.4	0.0	0.0		x	Total	5.00	r	496.87	289.29	5.00

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
Superior		RO_1	70.2	0.0	0.0			3496.0	0.0	0.0	3.0	0.0	0.0	35		14.33	0.0	1	0.0	0.0		
Industrial		RO_2	65.1	0.0	0.0			1150.0	0.0	0.0	3.0	0.0	0.0	30		6.71	0.0	1	0.0	0.0		
Newport		RO_3	74.7	0.0	0.0			6256.0	0.0	0.0	3.0	0.0	0.0	50		26.52	0.0	1	0.0	0.0		

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Superior	0.00	r			446.85	1095.72	0.00	0.00		
					455.53	-86.59	0.00	0.00		
Industrial	0.00	r			480.30	336.94	0.00	0.00		
					1257.39	339.17	0.00	0.00		
Newport	0.00	r			1323.61	-59.21	0.00	0.00		
					1306.24	327.95	0.00	0.00		
					1307.98	343.58	0.00	0.00		
					1360.07	732.47	0.00	0.00		
					1379.16	932.13	0.00	0.00		
					1377.43	1105.74	0.00	0.00		

Eilar Associates, Inc.
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Phone: (760) 738-5570
Date: 06 Oct 2022

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
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)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - 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	Excl. 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	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
F1-2			61.0	-75.5	0.0	0.0		x	Total	15.00	r	556.94	416.40	15.00
F1-3			61.4	-75.5	0.0	0.0		x	Total	25.00	r	556.94	416.40	25.00
F2			62.8	-69.2	0.0	0.0		x	Total	5.00	r	613.00	393.16	5.00
F2-2			64.3	-69.2	0.0	0.0		x	Total	15.00	r	613.00	393.16	15.00
F2-3			64.7	-69.3	0.0	0.0		x	Total	25.00	r	613.00	393.16	25.00
F3			68.8	-64.8	0.0	0.0		x	Total	5.00	r	556.94	372.38	5.00
F3-2			69.6	-65.0	0.0	0.0		x	Total	15.00	r	556.94	372.38	15.00
F3-3			69.9	-65.1	0.0	0.0		x	Total	25.00	r	556.94	372.38	25.00
F4			70.6	-66.1	0.0	0.0		x	Total	5.00	r	509.37	390.97	5.00
F4-2			71.7	-66.1	0.0	0.0		x	Total	15.00	r	509.37	390.97	15.00
F4-3			71.8	-66.3	0.0	0.0		x	Total	25.00	r	509.37	390.97	25.00
F5			64.8	-71.1	0.0	0.0		x	Total	5.00	r	531.52	480.38	5.00
F5-2			66.6	-71.0	0.0	0.0		x	Total	15.00	r	531.52	480.38	15.00
F5-3			67.0	-70.9	0.0	0.0		x	Total	25.00	r	531.52	480.38	25.00
F6			60.5	-73.9	0.0	0.0		x	Total	5.00	r	598.50	480.93	5.00
F6-2			62.0	-73.9	0.0	0.0		x	Total	15.00	r	598.50	480.93	15.00
F6-3			63.3	-73.7	0.0	0.0		x	Total	25.00	r	598.50	480.93	25.00
F7			58.2	-72.8	0.0	0.0		x	Total	5.00	r	623.66	461.24	5.00
F7-2			59.9	-72.8	0.0	0.0		x	Total	15.00	r	623.66	461.24	15.00
F7-3			61.2	-72.6	0.0	0.0		x	Total	25.00	r	623.66	461.24	25.00
F8-2			60.4	-73.0	0.0	0.0		x	Total	15.00	r	597.96	437.46	15.00
F8-3			61.5	-72.9	0.0	0.0		x	Total	25.00	r	597.96	437.46	25.00
F9-2			64.9	-72.5	0.0	0.0		x	Total	15.00	r	532.61	436.36	15.00
F9-3			65.3	-72.5	0.0	0.0		x	Total	25.00	r	532.61	436.36	25.00
F10			70.3	-66.7	0.0	0.0		x	Total	5.00	r	509.10	457.69	5.00
F10-2			71.5	-66.7	0.0	0.0		x	Total	15.00	r	509.10	457.69	15.00
F10-3			71.6	-66.9	0.0	0.0		x	Total	25.00	r	509.10	457.69	25.00

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
Superior		RO_1	70.2	0.0	0.0			3496.0	0.0	0.0	3.0	0.0	0.0	35		14.33	0.0	1	0.0	0.0		
Industrial		RO_2	65.1	0.0	0.0			1150.0	0.0	0.0	3.0	0.0	0.0	30		6.71	0.0	1	0.0	0.0		
Newport		RO_3	74.7	0.0	0.0			6256.0	0.0	0.0	3.0	0.0	0.0	50		26.52	0.0	1	0.0	0.0		

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Superior	0.00	r			446.85	1095.72	0.00	0.00		
					455.53	-86.59	0.00	0.00		
Industrial	0.00	r			480.30	336.94	0.00	0.00		
					1257.39	339.17	0.00	0.00		
Newport	0.00	r			1323.61	-59.21	0.00	0.00		
					1306.24	327.95	0.00	0.00		
					1307.98	343.58	0.00	0.00		
					1360.07	732.47	0.00	0.00		
					1379.16	932.13	0.00	0.00		
					1377.43	1105.74	0.00	0.00		

Buildings

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(ft)	
Building 2		BL_2	x	0		30.00	r
Building 1		BL_1	x	0		30.00	r

Geometry - Buildings

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
Building 2		BL_2	x	0		30.00	r	511.56	477.65	30.00	0.00
								511.28	440.19	30.00	0.00
								620.10	439.92	30.00	0.00
								619.83	477.65	30.00	0.00
Building 1		BL_1	x	0		30.00	r	510.74	414.76	30.00	0.00
								511.01	375.66	30.00	0.00
								607.25	375.39	30.00	0.00
								606.98	413.94	30.00	0.00

Appendix C

Exterior-to-Interior Noise Analysis

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Work Space

Wall 1 of 2

Room Type : **Medium**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.8	0.8	0.8	0.8	0.7	0.7	: Fairly Absorptive Room
Room Absorption (Sabins) :	342	342	342	342	428	428	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**68.8**	**CNEL**	52.1	57.6	60.1	64.1	64.1	58.1	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**68.8**	**CNEL**	52.1	57.6	60.1	64.1	64.1	58.1	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	30.5	8.5	1	83.3	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	18	8	1	144.0	23	23	22	32	43	37
STC 28 French Door with seals	Y	3	8	1	24.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	Y	1	8	1	8.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **22** ft **Overall Area:** **259.25** ft²
Volume: **5704** ft³

Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**65.6**	**CNEL**
Windows Closed		
Interior Noise Level:	**42.5**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.1	57.6	60.1	64.1	64.1	58.1	: Exterior Wall Noise Exposure
4.5	4.7	4.7	4.7	4.7	4.7	: Transmission Loss
24.1	24.1	24.1	24.1	24.1	24.1	: Wall Surface Area Factor
25.3	25.3	25.3	25.3	26.3	26.3	: Absorption
46.4	51.7	54.2	58.2	57.2	51.2	: Noise Level

62.5 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.1	57.6	60.1	64.1	64.1	58.1	: Exterior Wall Noise Exposure
17.9	24.4	23.7	34.0	43.9	39.0	: Transmission Loss
24.1	24.1	24.1	24.1	24.1	24.1	: Wall Surface Area Factor
25.3	25.3	25.3	25.3	26.3	26.3	: Absorption
33.0	32.0	35.2	28.9	18.0	17.0	: Noise Level

38.9 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Work Space

Wall 2 of 2

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**70.6**	**CNEL**	53.9	59.4	61.9	65.9	65.9	59.9	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**70.6**	**CNEL**	53.9	59.4	61.9	65.9	65.9	59.9	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	28	8.5	1	118.0	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	6	8	1	48.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	Y	9	8	1	72.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **238** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.9	59.4	61.9	65.9	65.9	59.9	: Exterior Wall Noise Exposure
5.6	6.0	6.0	6.0	6.0	6.0	: Transmission Loss
23.8	23.8	23.8	23.8	23.8	23.8	: Wall Surface Area Factor
25.3	25.3	25.3	25.3	26.3	26.3	: Absorption
46.7	51.9	54.4	58.3	57.4	51.4	: Noise Level

62.7 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.9	59.4	61.9	65.9	65.9	59.9	: Exterior Wall Noise Exposure
16.5	25.5	25.0	35.2	44.9	40.2	: Transmission Loss
23.8	23.8	23.8	23.8	23.8	23.8	: Wall Surface Area Factor
25.3	25.3	25.3	25.3	26.3	26.3	: Absorption
35.8	32.4	35.3	29.1	18.5	17.2	: Noise Level

40.0 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Living/Dining/Kitchen

Wall 1 of 3

Room Type : **Medium Soft**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.6	0.6	0.6	0.6	0.5	0.5	: Moderately Absorptive Room
Room Absorption (Sabins) :	704	704	704	704	845	845	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.7**	**CNEL**	55.0	60.5	63.0	67.0	67.0	61.0	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.7**	**CNEL**	55.0	60.5	63.0	67.0	67.0	61.0	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	39	8.5	1	283.5	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	3	8	1	24.0	23	23	22	32	43	37
STC 28 French Door with seals	Y	3	8	1	24.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **26** ft **Overall Area:** **331.5** ft²
Volume: **8619** ft³

Number of Impacted Walls: **3**

Windows Open		
Interior Noise Level:	**61.2**	**CNEL**
Windows Closed		
Interior Noise Level:	**40.6**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.0	60.5	63.0	67.0	67.0	61.0	: Exterior Wall Noise Exposure
9.7	11.4	11.4	11.4	11.4	11.4	: Transmission Loss
25.2	25.2	25.2	25.2	25.2	25.2	: Wall Surface Area Factor
28.5	28.5	28.5	28.5	29.3	29.3	: Absorption
42.0	45.9	48.4	52.3	51.5	45.5	: Noise Level

56.7 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.0	60.5	63.0	67.0	67.0	61.0	: Exterior Wall Noise Exposure
14.6	29.3	30.2	40.1	47.8	45.2	: Transmission Loss
25.2	25.2	25.2	25.2	25.2	25.2	: Wall Surface Area Factor
28.5	28.5	28.5	28.5	29.3	29.3	: Absorption
37.2	27.9	29.5	23.7	15.1	11.7	: Noise Level

38.4 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Living/Dining/Kitchen

Wall 2 of 3

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**69.6**	**CNEL**	52.9	58.4	60.9	64.9	64.9	58.9	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**69.6**	**CNEL**	52.9	58.4	60.9	64.9	64.9	58.9	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	30	8.5	1	119.0	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	6	8	2	96.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	Y	5	8	1	40.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **255** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.9	58.4	60.9	64.9	64.9	58.9	: Exterior Wall Noise Exposure
5.4	5.7	5.7	5.7	5.7	5.7	: Transmission Loss
24.1	24.1	24.1	24.1	24.1	24.1	: Wall Surface Area Factor
28.5	28.5	28.5	28.5	29.3	29.3	: Absorption
43.1	48.3	50.8	54.8	54.0	48.0	: Noise Level

59.1 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.9	58.4	60.9	64.9	64.9	58.9	: Exterior Wall Noise Exposure
16.7	25.3	24.8	35.0	44.7	40.0	: Transmission Loss
24.1	24.1	24.1	24.1	24.1	24.1	: Wall Surface Area Factor
28.5	28.5	28.5	28.5	29.3	29.3	: Absorption
31.8	28.7	31.7	25.5	15.0	13.7	: Noise Level

36.2 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Living/Dining/Kitchen

Wall 3 of 3

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**61.0**	**CNEL**	44.3	49.8	52.3	56.3	56.3	50.3	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**61.0**	**CNEL**	44.3	49.8	52.3	56.3	56.3	50.3	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	21	8.5	1	158.5	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	5	4	1	20.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **178.5** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
44.3	49.8	52.3	56.3	56.3	50.3	: Exterior Wall Noise Exposure
10.4	12.5	12.5	12.5	12.5	12.5	: Transmission Loss
22.5	22.5	22.5	22.5	22.5	22.5	: Wall Surface Area Factor
28.5	28.5	28.5	28.5	29.3	29.3	: Absorption
28.0	31.4	33.9	37.8	37.0	31.0	: Noise Level

42.3 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
44.3	49.8	52.3	56.3	56.3	50.3	: Exterior Wall Noise Exposure
14.4	29.9	31.3	41.0	48.2	46.1	: Transmission Loss
22.5	22.5	22.5	22.5	22.5	22.5	: Wall Surface Area Factor
28.5	28.5	28.5	28.5	29.3	29.3	: Absorption
23.9	13.9	15.1	9.4	1.3	-2.6	: Noise Level

25.0 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Powder

Wall 1 of 1

Room Type : **Medium Soft**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.6	0.6	0.6	0.6	0.5	0.5	: Moderately Absorptive Room
Room Absorption (Sabins) :	25	25	25	25	30	30	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.7**	**CNEL**	55.0	60.5	63.0	67.0	67.0	61.0	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.7**	**CNEL**	55.0	60.5	63.0	67.0	67.0	61.0	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	6	8.5	1	44.8	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	2.5	2.5	1	6.3	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **6** ft **Overall Area:** **51** ft²
Volume: **306** ft³

Number of Impacted Walls: **1**

Windows Open		
Interior Noise Level:	**62.4**	**CNEL**
Windows Closed		
Interior Noise Level:	**44.7**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.0	60.5	63.0	67.0	67.0	61.0	: Exterior Wall Noise Exposure
10.2	12.1	12.1	12.1	12.1	12.1	: Transmission Loss
17.1	17.1	17.1	17.1	17.1	17.1	: Wall Surface Area Factor
14.0	14.0	14.0	14.0	14.8	14.8	: Absorption
48.0	51.5	54.0	58.0	57.2	51.2	: Noise Level

62.4 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.0	60.5	63.0	67.0	67.0	61.0	: Exterior Wall Noise Exposure
14.5	29.7	30.9	40.7	48.1	45.8	: Transmission Loss
17.1	17.1	17.1	17.1	17.1	17.1	: Wall Surface Area Factor
14.0	14.0	14.0	14.0	14.8	14.8	: Absorption
43.6	33.9	35.2	29.4	21.2	17.5	: Noise Level

44.7 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Master Bed/Bath/Closet

Wall 1 of 2

Room Type : **Soft**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.5	0.5	0.5	0.5	0.4	0.4	: Highly Absorptive Room
Room Absorption (Sabins) :	222	222	222	222	277	277	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	14	8.5	1	113.0	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	3	2	1	6.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **19** ft **Overall Area:** **119** ft²
Volume: **2261** ft³

Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**55.2**	**CNEL**
Windows Closed		
Interior Noise Level:	**39.5**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
12.0	15.9	15.9	16.0	16.0	16.0	: Transmission Loss
20.8	20.8	20.8	20.8	20.8	20.8	: Wall Surface Area Factor
23.5	23.5	23.5	23.5	24.4	24.4	: Absorption
40.4	42.0	44.5	48.4	47.5	41.5	: Noise Level

52.9 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
14.2	31.3	34.3	43.5	49.1	48.8	: Transmission Loss
20.8	20.8	20.8	20.8	20.8	20.8	: Wall Surface Area Factor
23.5	23.5	23.5	23.5	24.4	24.4	: Absorption
38.2	26.6	26.1	20.9	14.3	8.6	: Noise Level

38.8 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Master Bed/Bath/Closet

Wall 2 of 2

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**61.4**	**CNEL**	44.7	50.2	52.7	56.7	56.7	50.7	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**61.4**	**CNEL**	44.7	50.2	52.7	56.7	56.7	50.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	21	8.5	1	130.5	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	6	8	1	48.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **178.5** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
44.7	50.2	52.7	56.7	56.7	50.7	: Exterior Wall Noise Exposure
7.8	8.7	8.7	8.7	8.7	8.7	: Transmission Loss
22.5	22.5	22.5	22.5	22.5	22.5	: Wall Surface Area Factor
23.5	23.5	23.5	23.5	24.4	24.4	: Absorption
35.9	40.6	43.1	47.1	46.1	40.1	: Noise Level

51.4 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
44.7	50.2	52.7	56.7	56.7	50.7	: Exterior Wall Noise Exposure
15.2	27.6	27.7	37.7	46.6	42.8	: Transmission Loss
22.5	22.5	22.5	22.5	22.5	22.5	: Wall Surface Area Factor
23.5	23.5	23.5	23.5	24.4	24.4	: Absorption
28.6	21.7	24.1	18.0	8.2	6.0	: Noise Level

30.8 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Bed 2/Closet

Wall 1 of 1

Room Type : **Soft**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.5	0.5	0.5	0.5	0.4	0.4	: Highly Absorptive Room
Room Absorption (Sabins) :	100	100	100	100	125	125	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	10	8.5	1	45.0	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	5	8	1	40.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **12** ft **Overall Area:** **85** ft²
Volume: **1020** ft³

Number of Impacted Walls: **1**

Windows Open		
Interior Noise Level:	**64.4**	**CNEL**
Windows Closed		
Interior Noise Level:	**41.9**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
5.9	6.3	6.3	6.3	6.3	6.3	: Transmission Loss
19.3	19.3	19.3	19.3	19.3	19.3	: Wall Surface Area Factor
20.0	20.0	20.0	20.0	21.0	21.0	: Absorption
48.5	53.6	56.1	60.1	59.2	53.2	: Noise Level

64.4 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
16.3	25.7	25.3	35.5	45.1	40.5	: Transmission Loss
19.3	19.3	19.3	19.3	19.3	19.3	: Wall Surface Area Factor
20.0	20.0	20.0	20.0	21.0	21.0	: Absorption
38.1	34.2	37.1	30.9	20.4	18.9	: Noise Level

41.9 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Bed 3/Closet

Wall 1 of 2

Room Type : **Soft**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.5	0.5	0.5	0.5	0.4	0.4	: Highly Absorptive Room
Room Absorption (Sabins) :	109	109	109	109	137	137	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	10.5	8.5	1	77.3	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	3	2	2	12.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **12.5** ft **Overall Area:** **89.25** ft²
Volume: **1116** ft³

Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**63.8**	**CNEL**
Windows Closed		
Interior Noise Level:	**43.7**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
9.9	11.7	11.7	11.7	11.7	11.7	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
20.4	20.4	20.4	20.4	21.4	21.4	: Absorption
44.3	48.1	50.5	54.5	53.5	47.5	: Noise Level

58.9 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
14.5	29.5	30.5	40.4	47.9	45.5	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
20.4	20.4	20.4	20.4	21.4	21.4	: Absorption
39.7	30.2	31.7	25.9	17.3	13.8	: Noise Level

40.9 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Bed 3/Closet

Wall 2 of 2

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**69.9**	**CNEL**	53.2	58.7	61.2	65.2	65.2	59.2	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**69.9**	**CNEL**	53.2	58.7	61.2	65.2	65.2	59.2	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	12.5	8.5	1	66.3	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	5	8	1	40.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **106.25** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.2	58.7	61.2	65.2	65.2	59.2	: Exterior Wall Noise Exposure
6.7	7.2	7.2	7.3	7.3	7.3	: Transmission Loss
20.3	20.3	20.3	20.3	20.3	20.3	: Wall Surface Area Factor
20.4	20.4	20.4	20.4	21.4	21.4	: Absorption
46.4	51.4	53.9	57.8	56.9	50.9	: Noise Level

62.1 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.2	58.7	61.2	65.2	65.2	59.2	: Exterior Wall Noise Exposure
15.7	26.5	26.3	36.4	45.7	41.4	: Transmission Loss
20.3	20.3	20.3	20.3	20.3	20.3	: Wall Surface Area Factor
20.4	20.4	20.4	20.4	21.4	21.4	: Absorption
37.4	32.1	34.8	28.7	18.4	16.7	: Noise Level

40.4 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: Bathroom

Wall 1 of 1

Room Type : **Medium Soft**	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.6	0.6	0.6	0.6	0.5	0.5	: Moderately Absorptive Room
Room Absorption (Sabins) :	42	42	42	42	50	50	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	6	8.5	1	51.0	14	33	42	48	50	54
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **10** ft **Overall Area:** **51** ft²
Volume: **510** ft³

Number of Impacted Walls: **1**

Windows Open		
Interior Noise Level:	**42.3**	**CNEL**
Windows Closed		
Interior Noise Level:	**42.3**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
14.0	33.0	42.0	48.0	50.0	54.0	: Transmission Loss
17.1	17.1	17.1	17.1	17.1	17.1	: Wall Surface Area Factor
16.2	16.2	16.2	16.2	17.0	17.0	: Absorption
42.0	28.5	22.0	20.0	17.2	7.2	: Noise Level

42.3 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
14.0	33.0	42.0	48.0	50.0	54.0	: Transmission Loss
17.1	17.1	17.1	17.1	17.1	17.1	: Wall Surface Area Factor
16.2	16.2	16.2	16.2	17.0	17.0	: Absorption
42.0	28.5	22.0	20.0	17.2	7.2	: Noise Level

42.3 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 1540 Superior Ave
Project # : S220904
Room Name: 3rd Floor Landing

Wall 1 of 1

Room Type : **Medium Soft**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.6	0.6	0.6	0.6	0.5	0.5	: Moderately Absorptive Room
Room Absorption (Sabins) :	104	104	104	104	125	125	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.8**	**CNEL**	55.1	60.6	63.1	67.1	67.1	61.1	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 39 Typical Exterior Wall	N	7.5	8.5	1	23.8	14	33	42	48	50	54
STC 28 1/2-inch Dual Insulating Window	Y	5	8	1	40.0	23	23	22	32	43	37
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **20** ft **Overall Area:** **63.75** ft²
Volume: **1275** ft³

Number of Impacted Walls: **1**

Windows Open		
Interior Noise Level:	**64.3**	**CNEL**
Windows Closed		
Interior Noise Level:	**40.9**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
4.8	5.0	5.0	5.0	5.0	5.0	: Transmission Loss
18.0	18.0	18.0	18.0	18.0	18.0	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
48.2	53.5	56.0	59.9	59.2	53.2	: Noise Level

64.3 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.1	60.6	63.1	67.1	67.1	61.1	: Exterior Wall Noise Exposure
17.4	24.7	24.1	34.3	44.2	39.3	: Transmission Loss
18.0	18.0	18.0	18.0	18.0	18.0	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
35.5	33.8	36.9	30.7	20.0	18.9	: Noise Level

40.9 **CNEL** WINDOWS CLOSED

Appendix D
Recommended Products

TECHNICAL DATA SHEET

Revision: August 7, 2018
Supersedes: November 13, 2015
Ref. #: 518327

DRAFT & ACOUSTICAL SOUND SEALANT

SC175

DESIGNED FOR USE ON SOUND-RATED WALL SYSTEMS

OSI SC175 Draft & Acoustical Sound Sealant is a non-flammable, latex-based sealant specially designed to reduce sound transmissions and drafts in all types of wall systems where a sound-rated assembly is required. Its primary function is to achieve and maintain the specific STC (Sound Transmission Class) value of the system designed. This paintable sealant remains flexible and adheres firmly to wood, metal studs, concrete, gypsum board and most other building materials. It is easy-to-use and cleans up easily with soap and water.

Available As:

Item #	Size	Color
1496542	28 fl oz (828 ml) cartridge	White

FEATURES & BENEFITS

- Designed for Use on Sound-Rated Wall Systems
- Reduces Draft & Sound Transmission
- Tested to UL 1479 and UL 2079 *
- Tested to ASTM E84
- Stays Permanently Flexible
- VOC Compliant

RECOMMENDED FOR

- Developed primarily for commercial construction utilizing light weight cavity walls and floor systems
- Used for exposed and unexposed applications at perimeter joints, floor and ceiling runners, cutouts in gypsum board, veneer plaster systems and other areas where a sound rated assembly is required
- Sealant can also be applied or buttered around all electrical boxes and outlets, cold air returns, heating and air conditioning ducts and other utility equipment penetrating wall surfaces for increased acoustical performance
- Works well for sealing sill and base plates in residential construction and non-fire rated systems

LIMITATIONS

- SC175 must be applied in accordance with ASTM C919 (Standard Practice for Use of Sealants in Acoustical Applications
- Non-fire rated and fire rated systems. Refer to UL Fire Resistance Directory for testing details *
- Not for use in underwater applications or permanent water immersion
- Do not use in applications requiring temperature resistance greater than 170°F
- Do not use on metals that will corrode
- Consult with manufacturer of adjoining materials for compatibility, including CPVC materials
- Not recommended for bonding two non-porous surfaces
- Not recommended for use with polyethylene, polypropylene, polytetrafluoroethylene (PTFE)/Teflon® or nylon

COVERAGE

For a 28 fl. oz. (825 ml) cartridge:	
▪ A 1/4” (6 mm) bead extrudes approximately 86 ft. (26 m)	▪ A 3/8” (9.5 mm) bead extrudes approximately 38 ft. (12 m)

TECHNICAL DATA

Typical Uncured Physical Properties:

Color:	White	**VOC Content:**	<1.0% by weight CARB 45 g/l SCAQMD rule 1168
Appearance:	Non-slumping paste		
Base:	Synthetic latex rubber	**Shelf Life:**	24 months from date of manufacture (unopened)
Odor:	Mild acrylic odor	**Lot Code Explanation**	**YYDDD** **YY=** Last two digits of year of manufacture **DDD=** Day of manufacture based on 365 days in a year
Specific Gravity:	1.59		
Flashpoint:	800.6° F (427°C)		
Freeze/Thaw Stability	3 Freeze/Thaw Cycles Unaffected by freezing once cured	**Example:**	18061 = 61st day of 2018 = March 2, 2018

Typical Application Properties:

Application Temperature:	Above 40°F (4°C)	
Open/Tooling Time	15 minutes*	
Tack-free Time:	30 minutes	
Cure Time:	2-7 days or longer*	* Cure time is dependent on temperature, humidity and depth of sealant applied
Sag or Slump:	0.10 inches	ASTM D2202

Typical Cured Performance Properties:

Color:	White	
Service Temperature:	-5°F (-21°C) to 170°F (77°C)	
Water Resistant:	Yes	
Paintable:	Yes, after 24 hours	
Surface Burning Characteristics:	Flame Spread Index: 0 Smoke Development: 0	ASTM E 84 Inorganic reinforced cement board
Sound Transmission Class:	Unsealed partition: STC = 15 Single bead of sealant used at top and bottom runners only – both sides of partition system: STC = 24 Single bead of sealant used at top, bottom and perimeter joints – both sides of system: STC = 45 Double Bead of Sealant used at top, bottom, and all perimeter edges - both sides of partition system: STC = 55	ASTM E 90
Low Temperature Flexibility After Artificial Weathering:	Pass with no cracking or adhesion loss	ASTM C734
Consistency Test:	300	ASTM D217
180° Peel Adhesion:		ASTM C794
Aluminum:	10.0 pli	7day cure @ 73°F & day cure @ 122°F
Wood:	8.0 pli	

TECHNICAL DATA

Specifications:

UL File Number R39256

FILL, VOID OR CAVITY MATERIAL
FOR USE IN THROUGH-PENETRATION FIRESTOP
SYSTEMS & JOINT SYSTEMS
SEE UL FIRE RESISTANCE DIRECTORY
Control No. # R39256

Tested to or conforms to:

- **ASTM C834** – Standard Specification for Latex Sealants
- **ASTM E84, Class A** – Standard Test Method for Surface Burning Characteristics of Building Materials (Tested at UL under research project)
- **ASTM E90** – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- **ASTM C919** – Standard Practice for Use of Sealants in Acoustical Applications
- **ASTM D217** – Standard Test Methods for Cone Penetration of Lubricating Grease
- * **UL 1479** (ASTM E814) – Standard for Fire Tests of Penetration Firestops
- * **UL 2079** (ASTM E1966) – Standard for Tests for Fire Resistance of Building Joint Systems
- GreenGuard® Certified

*** Refer to UL Fire Resistance Directory for design systems**

DIRECTIONS

Tools Typically Required:
Utility knife, caulking gun and tool to puncture inside seal of cartridge.

Safety Precautions:
Wear gloves.

Preparation:
The temperature of the product, the surfaces and the working area must be above 40°F (4°C). For best performance, apply sealant at 70°F (21°C). Ensure surfaces to be sealed are clean, dry, structurally sound and free of dust, grease, oil, and other foreign contaminants. Cut off tip of cartridge at a 45° angle to desired bead size (3/8" recommended). Puncture inside seal of cartridge.

Application:
Sealant should be applied as specified in the sound-rated system being installed (either wood or metal studs). Sealant must be applied in accordance with ASTM C 919. Maximum joint size should not exceed 5/8" (15.9 mm) width x ½" (12.7 mm) depth. If necessary, sealant can be painted as applicable to meet project requirements after 24 hours.

Bottom and Top Runners:
Apply a continuous 3/8" (9.5 mm) round bead of sealant on runners before setting gypsum board. Press gypsum board firmly into sealant, ensuring complete contact with adjacent materials. Fill joint on top runners to complete the seal. Repeat procedure for double-layer applications.

Cut-Outs and Perimeter Joints:
Backs of electrical boxes, pipes, duct systems and other types of utility equipment penetrating wall surfaces shall be buttered with sealant. Seal all joints at perimeter edges including abutting surfaces and corner joints.

For further application information, refer to ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.

Clean-up:
Clean tools and uncured adhesive residue immediately with warm water and soap. Cured sealant may be carefully cut away with a sharp-edged tool.

STORAGE & DISPOSAL

DAMAGED BY FREEZING. Store in a cool, dry location at room temperature. For maximum shelf life store at 75°F (24°C). Take unwanted product to an approved household hazardous waste transfer facility. Hardened material may be disposed of with

LABEL PRECAUTIONS

CAUTION! Contains ethylene glycol, mineral spirits, and crystalline silica. May cause skin, eye and respiratory irritation. Avoid contact with eyes and skin. Avoid breathing vapors. Use with adequate ventilation. Do not swallow. FIRST AID: If swallowed do not induce vomiting, call a physician or Poison Control center immediately. For eye contact, flush with water for 15 minutes, call a physician. For skin contact, wash thoroughly with soap and water. **KEEP OUT OF REACH OF CHILDREN.**

WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov.

Refer to the Safety Data Sheet (SDS) for further information.

LIMITED WARRANTY

This product is warranted to be free from defects in materials when used as directed. Henkel's sole obligation shall be, at its option, to replace or refund the purchase price of product proven to be defective. Henkel makes no other warranty, express or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE and will not be liable for consequential or incidental damages. This limited warranty gives you specific legal rights, which vary from state to state

DISCLAIMER

The information and recommendations contained herein are based on our research and are believed to be accurate, but no warranty, express or implied, is made or should be inferred. Henkel recommends purchasers/users should test the products to determine acceptable quality and suitability for the intended use. All adhesive/sealant applications should be tested under simulated or actual end use conditions to ensure the adhesive/sealant meets or exceeds all required project specifications. Since assembly conditions may be critical to adhesive/sealant performance, it is also recommended that testing be performed on specimens assembled under simulated or actual production conditions. Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

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For Technical Assistance call: 1-800-624-7767 – Mon-Fri - 9:00a – 4:00p ET
www.ositough.com

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Henkel Corporation - Professional & Consumer Adhesives Headquarters - Rocky Hill, CT 06067
www.henkelna.com

AC-20 FTR®

(Fire & Temperature Rated) Acoustical & Insulation Sealant

Specification Data Sheet

PECORA CORPORATION

BASIC USES

• AC-20 FTR® fire-rated systems are suitable for applications in schools, hospitals, churches, high-rise office buildings and hotels, prisons, sports arenas, and other public-use buildings to ensure a safe and orderly evacuation in the event of a fire.

2. MANUFACTURER

Pecora Corporation
165 Wambold Road
Harleysville, PA 19438

Phone: 215-723-6051
800-523-6688
Fax: 215-721-0286
Website: www.pecora.com

3. PRODUCT DESCRIPTION

AC-20 FTR® is a unique acrylic latex sealant that is UL® Classified in firestopping systems for expansion joints and through penetrations. When properly installed, these systems effectively contain fire, smoke, toxic fumes, and water within a given area surrounded by firewalls for a two, three, or four hour period, depending on the design specifications.

Other Uses: Excellent adhesive, flexibility and durability qualities make AC-20 FTR® ideal for insulating and weatherproofing around windows, doors, panels, siding, duct work, base plates, etc. It is compatible with all common building materials including specialties such as polystyrene, polyurethane, cork, vinyl, foamed and fibrous glass.

Used as an acoustical sealant, AC-20 FTR® reduces sound transmission in partition systems to achieve specific STC values by sealing spaces around cut-outs and at perimeters of partitions. The sealant cures to a tough rubber to form a long-lasting acoustical seal.

PACKAGING
• 30 fl. oz. (.887 liter) fiber cartridges
• 5-gallon (18.9 liter) pails

COLOR
• White, Beige-Gray
Special colors available in 250-gallon (946 liter) batches.

4. TECHNICAL DATA

Applicable Standards: ASTM C-834-86 specification for latex sealing compounds.

Fire Rated System: Two-hour Fire and Temperature Rated wall and floor joint systems up to 7" (178mm) wide and four-hour systems up to 4" wide can be designed with AC-20 FTR® in conjunction with Ultra Block fire blocking material in fire-rated walls and floors. Reference: ANSI/UL 263, ASTM E-119, NFPA No. 251.

UL CLASSIFIED

UNDERWRITERS LABORATORIES INC.® CLASSIFIED
JOINT TREATMENT MATERIALS
FIRE RESISTANCE CLASSIFICATION
DESIGNS J900H (FFS 0006) &U900 "O" (WWS 0010), J900Z (FFS 2002), U900Z-009 (WWS 2008), J900Z-007 (FFS 1010), U900Z-015 (WWS 1012)

AC-20 FTR® in conjunction with Ultra Block® achieves a 2-hour fire rating when sealing around steel or copper pipe and electrical metallic tubing or steel conduit in through penetration systems. Reference: ANSI/UL 1479, ASTM E-814.

FILL, VOID OR CAVITY MATERIALS
CLASSIFIED BY
UNDERWRITERS
LABORATORIES INC.
FOR USE IN
THROUGH-PENETRATION
FIRESTOP SYSTEM NO. CAJ 1093

In addition to its fire-blocking value, Ultra Block® is very efficient acoustically, having a noise reduction coefficient of .75 and sound transmission coefficient of .5 (Ultra Block® is a registered trademark of Backer Rod Mfg. and Supply Co., Denver, CO, USA.)

5. INSTALLATION

Surface Preparation: Surfaces must be free of all contamination. Sealant may be applied to damp, porous surfaces. No priming is required.

Application: Refer to Pecora Firestopping Manual 07270 and UL Fire Resistance Directory for installation details on fire-rated joint and through penetration systems. For insulating and weatherproofing purposes, fill all window, door, and panel perimeter joints using a resilient backer rod to control sealant depth to 1/2" (13mm) maximum. For best results, protect sealant from excessive low temperatures and apply above 40°F (4°C). For acoustical purposes, apply continuous

TYPICAL PHYSICAL PROPERTIES

Test Property	Value	Procedure
Modulus @ 100% (psi)	15-20	ASTM D412
Ultimate Tensile (psi)	30-40	ASTM D412
Ultimate Elongation (%)	400-500	ASTM D412
Movement Capability (%)	±7 1/2	ASTM D412
VOC Content	31 g/L	

Since Pecora architectural sealants are applied to varied substrates under diverse environmental conditions and construction situations it is recommended that substrate testing be conducted prior to application.

beads of sealant to seal perimeters of all sound-rated partitions. Apply sealant in the angles formed by metal components or base-layer panels and abutting surfaces. Apply sealant around all openings formed for outlets; electrical, telephone, light fixtures, etc.

Tooling: Tool material flush with surfaces to allow for expected shrinkage and insure good contact and adhesion to the substrate.

Cleaning: Remove excess material with water or a damp cloth before it cures. Sealant may be painted within 30 minutes after application with a good grade of latex paint.

Shelf Life: AC-20 FTR® has a shelf life well in excess of one year when stored in unopened containers below 80° F (27°C).

Precautions: AC-20 FTR® is non-flammable, non-toxic, non-irritating and environmentally safe. However, do not take internally. Refer to Material Safety Data Sheet for additional information.

Ultra Block® is a non-carcinogenic processed continuous filament textile glass fiber that may cause skin, eye and respiratory irritation. When applying, wear long sleeves, gloves, cap, goggles or safety glasses and NIOSH/MSHA-approved dust respirator. After use bathe with soap and warm water. Wash clothes separately and rinse after use. Refer to Material Safety Data Sheet for additional information.

FOR PROFESSIONAL USE ONLY.
KEEP OUT OF THE REACH OF CHILDREN.

6. AVAILABILITY AND COST

Pecora products are available from our stocking distributors in all major cities. For the name and telephone number of your nearest representative call one of our locations listed below or visit our website at www.pecora.com.

7. WARRANTY

Pecora Corporation warrants its products to be free of defects. Under this warranty, we will provide, at no charge, replacement materials for, or refund the purchase price of, any product proven to be defective when installed in accordance with our published recommendations and in applications considered by us as suitable from this product. This warranty in lieu of any and all other warranties expressed or implied, and in no case will Pecora be liable for incidental or consequential damages.

8. MAINTENANCE

If the sealant is damaged and the bond is intact, cut out the damaged area and recaulk. No primer is required. If the bond has been affected, remove the sealant, clean and prepare the joint in accordance with instructions under "Installation".

9. TECHNICAL SERVICES

Pecora representatives are available to assist you in selecting an appropriate product and to provide on-site application instructions or to conduct jobsite inspections. For further assistance call our Technical Service Department at 800-523-6688.

ISO 9001:2000
KEMA CERTIFICATE
Accredited by ANSI-RAB NAP

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