ACOUSTICAL ANALYSIS REPORT

32nd & Broadway
32nd Street and Broadway
San Diego, California 92102

City of San Diego Project No: 637438

Prepared For

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1.0 EXECUTIVE SUMMARY

The proposed project, 32nd & Broadway, consists of the construction of six multifamily dwelling buildings, consisting of 42 residential units, on a currently vacant lot. The project site is located at the northeast corner of 32nd Street and the existing right-of-way of Broadway in the City of San Diego, California.

The current and future noise environment consists primarily of traffic noise from C Street, 32nd Street, Broadway, and State Route 94 (and associated ramps), as well as noise from aircraft overflight associated with San Diego International Airport. Worst-case combined noise levels at building facades are expected to range from approximately 67 CNEL to 75 CNEL.

As this project will be required to provide an avigation easement to the San Diego County Regional Airport Authority, aircraft noise levels can exceed 65 CNEL at outdoor use areas, provided interior noise levels are reduced to below 45 CNEL in residential spaces. However, worst-case impacts from traffic noise sources were calculated at common outdoor use areas and private balconies considering shielding from proposed buildings on site. Calculations show that traffic noise impacts at several private outdoor use areas will exceed the 65 CNEL limit as designed; however, with the sound attenuation barriers shown in Table 7 incorporated as project design features, and the provision of an avigation easement, all public and private outdoor use areas are expected to comply with the noise requirements of the City of San Diego Noise Element to the General Plan.

Due to high exterior noise levels at building facades, an exterior-to-interior analysis was performed to determine building features necessary to reduce interior noise levels in residential units to 45 CNEL or less, as required by the City of San Diego and State of California. Calculations show that, with the acoustical recommendations shown herein, interior noise level requirements of the City of San Diego and State of California are expected to be met in all residential spaces.

Noise levels from temporary construction activities associated with this project are expected to comply with the applicable City of San Diego construction noise limits at all surrounding property lines, with activity limited to the daytime hours of 7 a.m. to 7 p.m. during all phases of construction. Construction is prohibited between the hours of 7 p.m. and 7 a.m. and on Sundays or legal holidays. Though it is not required by regulations, the general good practice construction noise control methods listed herein should be followed, as a courtesy to surrounding properties.

2.0 INTRODUCTION

This acoustical analysis report is submitted to satisfy the acoustical requirements of the City of San Diego Noise Element to the General Plan and Municipal Code and California Building Code. Its purpose is to assess noise impacts from nearby roadway traffic and aircraft overflight to identify project features or requirements necessary to achieve exterior traffic noise levels of 65 CNEL or less at outdoor use areas and interior noise levels of 45 CNEL or less in habitable residential spaces, in compliance with the City of San Diego and State of California noise regulations. Additionally, temporary construction noise impacts on nearby noise-sensitive properties were analyzed.

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. 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. Further explanation can be provided upon request.

2.1 Project Description

The proposed project, 32nd & Broadway, consists of the construction of six multi-family dwelling buildings, consisting of 42 residential units, on a currently vacant lot. Each residential unit contains an individual parking garage. Additional information is provided in the project plans, included as Appendix A.

2.2 Project Location

The project site is located at the northeast corner of 32nd Street and existing right-of-way of Broadway in the City of San Diego, California. The project site is located on a rectangular lot with an overall site area of approximately one acre. The Assessor's Parcel Numbers (APN) for the property is 539-563-10-00, 07-00, 06-00. The existing right-of-way of Broadway is proposed to be vacated and incorporated into the project site.

The project location is shown on the Vicinity Map, Figure 1, following this report. An Assessor's Parcel Map, Satellite Aerial Photograph, and Topographic Map of this area are also provided as Figures 2 through 4, respectively.

2.3 Applicable Noise Standards

This acoustical report is submitted to satisfy the acoustical requirements of the City of San Diego Noise Element to the General Plan and Municipal Code and the State of California Building Code.

The City of San Diego Noise Element to the General Plan and California Building Code require interior noise levels not exceeding 45 CNEL in habitable residential space. The City of San Diego requires that noise levels at residential outdoor use areas do not exceed 65 CNEL.

Additionally, Section 59.5.0404 of the City of San Diego Municipal Code states that construction activity is prohibited between the hours of 7 p.m. and 7 a.m. and on Sundays or legal holidays. During permissible hours of operation, noise levels from construction activity must be limited to a twelve-hour average of no greater than 75 dBA at any property line zoned for residential use. As this project is not anticipated to generate any significant vibration due to construction equipment, no significant vibration impacts are expected.

Please refer to Appendix B for pertinent sections of the City of San Diego Noise Element to the General Plan, City of San Diego Municipal Code, and California Building Code.

3.0 ENVIRONMENTAL SETTING

3.1 Existing Noise Environment

The primary noise sources in the vicinity of the project site include automobile and truck traffic noise from C Street, 32nd Street, Broadway, and State Route 94 (and associated ramps), as well as noise contribution from aircraft overflight from the San Diego International Airport. No other noise source is considered significant.

3.1.1 Aircraft Overflight Noise Sources

San Diego International Airport is located approximately three miles to the northwest of the proposed project site. According to the most current Airport Influence Area for San Diego International Airport, the project site lies within the 65-70 dB CNEL contour. Based on the location within the contour, the aircraft noise impact at the project site is estimated to be approximately 67 CNEL. Please refer to Figure 5 for a graphical representation of these contours.

3.1.2 Roadway Traffic Noise

Current traffic volumes are given based on information from the San Diego Association of Governments (SANDAG) Transportation Data and Caltrans Traffic Census Program (see references).

C Street is a two-lane, two-way Light Collector running east-west along the north boundary of the project site. The posted speed limit is 30 mph. According to SANDAG, the current (2015) traffic volume of C Street is approximately 4,700 Average Daily Trips (ADT) in the vicinity of the project site.

32nd Street is a two-lane, two-way roadway running north-south along the west boundary of the project site. There is no posted speed limit; however, as 32nd Street is a residential roadway that comes to a dead-end both to the north as well as to the south of the proposed project site, a speed limit of 25 mph was used. No current or future traffic information was available for 32nd Street. Based on surrounding roadways, a conservative estimate of 500 ADT was applied to 32nd Street in the vicinity of the project site for the current traffic environment.

Broadway is a four-lane, two-way Major Arterial running north-south to the west of the project site. The posted speed limit is 30 mph. According to SANDAG, the current (2015) traffic volume of Broadway is approximately 14,100 ADT in the vicinity of the project site.

State Route 94 (SR-94) is an eight-lane, two-way Freeway running generally east-west to the south of the project site. The posted speed limit is 65 mph. According to Caltrans, the current (2016) traffic volume of SR-94 is approximately 159,000 ADT in the vicinity of the project site.

SR-94 Westbound Off-Ramp is a one-lane, one-way Freeway Ramp running generally west to the southwest of the project site. The posted speed limit is 55 mph. According to Caltrans, the current (2016) traffic volume of SR-94 Westbound Off-Ramp is approximately 9,000 ADT.

SR-94 Westbound On-Ramp is a one-lane, one-way Freeway Ramp running generally west to the southwest of the project site. The posted speed limit is 30 mph. According to Caltrans, the current (2016) traffic volume of SR-94 Westbound On-Ramp is approximately 1,900 ADT.

No current or future truck percentages were available for C Street, 32nd Street, or Broadway 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 0.5% medium and 0.5% heavy trucks was used for C Street and 32nd Street, and a truck percentage mix of 2.0% medium and 1.0% heavy trucks was used for Broadway. According to Caltrans truck traffic volumes, SR-94 and associated ramps have a truck percentage of 3.4% medium and 0.8% heavy trucks.

Current and future traffic volumes and vehicle mixes for roadway sections near the project site are shown in Table 1. For more information, please refer to Appendix C: Cadna Analysis Data and Results.

Table 1. Overall Roadway Traffic Information

Roadway Name	Speed Limit (mph)	Vehicle Mix (%)		Current Traffic (Year)	Future Traffic (2035)
		Medium Trucks	Heavy Trucks		
C Street	30	0.5	0.5	4,700 (2015)	8,500
32nd Street	25	0.5	0.5	500[1]	1,000[1]
Broadway	30	2.0	1.0	14,100 (2015)	13,000
State Route 94	65	3.4	0.8	159,000 (2016)	81,600 / 94,700[2]
SR-94 Westbound Off-Ramp	55	3.4	0.8	9,000 (2016)	6,000
SR-94 Westbound On-Ramp	30	3.4	0.8	1,900 (2016)	2,700

[1]Current traffic volumes were not available from SANDAG; therefore current and future traffic volumes are based on a conservative estimate.
[2]Future traffic volumes for SR-94 are given for segments running westbound and eastbound, respectively.

Without proposed on-site structures, the current traffic noise contours calculated at ground level, without considering shielding from existing off-site structures, show that traffic noise impacts to the project site are expected to be between 67 and 73 CNEL. Additional information is provided in Appendix C: Cadna Analysis Data and Results. For a graphical representation of these contours, please refer to Figure 6: Site Plan Showing Current Traffic CNEL Contours.

3.1.3 Measured Noise Level

An on-site inspection and traffic noise measurement were made on the morning of Wednesday, March 13, 2019. The noise measurement was made using the methodology described in Section 4.1, approximately 32 feet south of the C Street centerline and approximately 20 feet east of the 32nd Street centerline. The microphone was placed at approximately five feet above the road grade. Traffic volumes for C Street were recorded for automobiles, medium-size trucks, and large trucks during the measurement period. After a 15-minute sound level measurement, paused for aircraft noise, no changes in the L_{EQ} were observable and results were recorded. The measured noise level and related weather conditions are found in Table 2. Additional information is provided in Appendix C: Cadna Analysis Data and Results. Please refer to Figure 3 for a graphical representation of the noise measurement location.

Table 2. On-Site Noise Measurement Conditions and Results	
Date	Wednesday, March 13, 2019
Time	9:33 a.m. – 9:55 a.m.
Conditions	Mostly sunny skies, 7 mph winds, temperature in the low 60s with moderate humidity
Measured Noise Level	62.0 dBA L_{EQ}

3.1.4 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 62.0 dBA L_{EQ} was compared to the calculated (modeled) noise level of 61.6 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 noise model as the difference between the measured and calculated levels was found to be less than three decibels. The Cadna traffic noise model is assumed to be representative of actual traffic noise that is experienced on site. This information is presented in Table 3. Additional information is provided in Appendix C.

Table 3. Calculated versus Measured Traffic Noise Data				
Calibration Receiver Position	**Calculated**	**Measured**	**Difference**	**Correction**
32' south of C Street C.L. and 20' east of 32nd Street C.L.	61.6 dBA L_{EQ}	62.0 dBA L_{EQ}	0.4 dB	None applied

3.2 Future Noise Environment

3.2.1 Transportation Noise Sources

The future on-site noise environment is expected to be the result of the same noise sources. Future aircraft noise is not expected to change significantly, and therefore, was modeled as described above.

Unless otherwise noted, the future (year 2035) traffic volumes for surrounding roadways were provided by the SANDAG Series 12 Transportation Forecast Information Center (see reference).

By the year 2035, the traffic volume of C Street is expected to increase to 8,500 ADT in the vicinity of the project site. As future traffic information was not available for 32nd Street, a conservative estimate of 1,000 ADT in the vicinity of the project site was used to account for growth by the year 2035. The traffic volume of the existing portion of Broadway is expected to decrease to 13,000 ADT by the year 2035. By the year 2035, the traffic volume of SR-94 (including future HOV lanes) is expected to

increase to 81,600 ADT westbound and 94,700 ADT eastbound in the vicinity of the project site. The traffic volume of SR-94 Westbound Off-Ramp is expected to decrease to 6,000 ADT in the vicinity of the project site by the year 2035. By the year 2035, the traffic volume of SR-94 Westbound On-Ramp is expected to increase to 2,700 ADT in the vicinity of the project site.

The same truck percentages of 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 C: Cadna Analysis Data and Results.

Future traffic noise contours were calculated at ground level, without considering shielding from existing off-site buildings, and show that traffic noise impacts to the project site are expected to be between 68 and 73 CNEL. Additional information is provided in Appendix C. For a graphical representation of these contours, please refer to Figure 7: Site Plan Showing Future Traffic CNEL Contours.

3.2.2 Temporary Construction Equipment

Detailed construction equipment information for the project was not available at the time of this analysis; however, typical construction equipment noise levels were used. Please refer to Table 4 for typical noise levels of construction equipment expected to be used on site. Unless otherwise noted, construction equipment noise levels were obtained from the Department for Environment, Food & Rural Affairs (DEFRA) and duty cycles were obtained from the Federal Highway Administration (see references).

Table 4. Typical Construction Equipment Noise Levels

Noise Source	Duty Cycle (%)	Noise Level at 50 feet (dBA)
Excavator	40	72
Front End Loader	40	72
Dump Truck	40	75
Air Compressor	40	61
Telescopic Forklift	40	67
Concrete Mixer Truck	40	72
Concrete Pump Truck	20	71
Paver	50	71
Roller[1]	20	80

[1]The equipment noise level of the roller was obtained from the Federal Highway Administration.

These noise levels were incorporated into the temporary construction noise analysis for the site, provided in Section 5.3.

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 applying an appropriate factor. Other field data gathered include measuring or estimating distances, angles-of-view, slopes, elevations, roadway grades, and vehicle speeds. This information is subsequently verified using available maps and records.

4.1.2 Roadway Noise Calculation

The Traffic Noise Model (TNM) calculation protocol in Cadna Version 2019 (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 0.092 times the ADT for surrounding roadways, based on the studies made by Wyle Laboratories (see reference). CNEL is calculated for desired receptor locations using road alignment, elevations, lane configurations, projected traffic volumes, estimated truck mixes, and vehicle speeds. Noise attenuation methods may be analyzed, tested, and planned with Cadna, 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 have been established in a study performed by Katz-Okitsu and Associates, Traffic Engineers (see reference). For purposes of calibrating the Cadna TNM, 4.9% 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 9 a.m. and 10 a.m. in the vicinity of the project site. Further explanation can be supplied on request.

4.1.3 Exterior-to-Interior Analysis

The City of San Diego and the State of California require buildings to be designed in order to attenuate, control, and maintain average interior noise levels not greater than 45 CNEL in residential space. 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. EPA (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 in residential space, 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.

Modeling of exterior wall assemblies, roof/ceiling assemblies, and glazing units are accomplished using INSUL Version 9.0, which is a model-based computer program, developed by Marshall Day Acoustics for predicting the sound insulation of walls, floors, ceilings and windows. It is acoustically based on theoretical models that require only minimal material information that can make reasonable estimates of the sound transmission loss (TL) for use in sound insulation calculations. INSUL can be used to quickly evaluate new materials or systems or investigate the effects of changes to existing designs. It models individual materials using the simple mass law and coincidence frequency approach and can model more complex assembly partitions, as well. It has evolved over several versions into an easy to use tool and has refined the theoretical models by continued comparison with laboratory tests to provide acceptable accuracy for a wide range of constructions. INSUL model performance comparisons with laboratory test data show that the model generally predicts the performance of a given assembly within 3 STC points.

4.1.4 Acoustical Formulas and Calculations

The following acoustical formulas and calculations have also been used in the preparation of this report.

Decibel Addition

To determine the combined logarithmic noise level of two known noise source levels, the values are converted to the base values, added together, and then converted back to the final logarithmic value, using the following formula:

$$L_C = 10\log(10^{L1/10} + 10^{L2/10} + 10^{LN/10})$$

where L_C = the combined noise level (dB), and
L_N = the individual noise sources (dB).

This procedure is also valid when used successively for each added noise source beyond the first two. The reverse procedure can be used to estimate the contribution of one source when the contribution of another concurrent source is known and the combined noise level is known. These methods can be used for L_{EQ} or other metrics (such as L_{DN} or CNEL), as long as the same metric is used for all components.

Attenuation Due To Distance

Attenuation due to distance is calculated by the equation:

$$SPL_2 = SPL_1 - 20\log(\frac{D_2}{D_1})$$

where SPL_1 = Known sound pressure level at known distance,
SPL_2 = Calculated sound pressure level at distance,
D_1 = Distance from source to location of known sound pressure level, and
D_2 = Distance from source to location of calculated sound pressure level.

This is identical to the more commonly used reference of 6 dB reduction for every doubling of distance. This equation does not take into account reduction in noise due to atmospheric absorption.

Hourly L_{EQ} Summation

To determine the hourly average noise levels (L_{EQ}) when the noise is created for less than the full hour, convert the logarithm values to the base energy value, multiply by the percentage of the hour that the noise occurs, and then convert the sum back to a logarithmic value. This is done with the following formula:

$$L_{EQ} = 10\log(P_H \times 10^{L_P/10})$$

where P_H = the percent or fraction of the hour noise is created, and
L_P = the partial hour noise level (dB).

Barrier Insertion Loss

When a barrier is placed between a source and receiver, sound attenuation can be achieved. The amount of attenuation is dependent on the height of the barrier, the wavelength of the sound, and the distance between source and receiver, source and barrier, and barrier and receiver. The amount of attenuation achieved is known as "insertion loss." The maximum amount of sound attenuation that can be achieved by a barrier is usually between 15 and 20 dB. Further information can be provided upon request.

4.2 Measurement Equipment

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 CA250 Type 1 Calibrator, Serial #2106
- Tripod, microphone windscreen, measuring tape

The sound level meter was field-calibrated prior to and following the noise measurement to ensure accuracy. All sound level measurements conducted and presented in this report, in accordance with the regulations, were made with 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 Bureau of Standards traceable calibrations, per the manufacturers' standards.

5.0 NOISE IMPACTS

The future noise environment of this project site is primarily composed of vehicle traffic noise on surrounding roadways, as well as noise contribution from aircraft overflight from the San Diego International Airport. Exterior and interior noise levels must be evaluated to ensure their compliance with City of San Diego regulations. As some current traffic volumes exceed those projected for the future noise environment, the higher of the two values have been used for a worst-case analysis of traffic noise at the project site.

5.1 Exterior

5.1.1 Noise Impacts to Outdoor Use Areas

As per the City of San Diego Noise Element to the General Plan, outdoor use areas of multi-family land uses that are affected by aircraft noise greater than 65 CNEL are allowed, provided an avigation easement for the project has been provided to the San Diego County Regional Airport Authority. Worst-case combined noise impacts at private residential balconies were calculated and show that noise levels will range from approximately 67 CNEL to approximately 75 CNEL. While combined traffic and aircraft noise levels exceed a noise level of 65 CNEL at all receivers, worst-case noise impacts from traffic noise sources alone were calculated to range from 51 CNEL to approximately 74 CNEL.

Worst-case traffic noise impacts at common outdoor use areas are shown in Table 5, and receiver locations are shown in Figure 8. Please refer to Appendix C for more information.

Table 5. Worst-Case Traffic Noise Levels at Common Outdoor Use Areas

Receiver	Description	Exterior Noise Level (CNEL)
OU43	Building 5 Common Area	62
OU44	Building 3 Common Area, West	61
OU45	Building 3 Common Area, East	52
OU46	Building 4 Common Area	51

As shown in Table 5, exterior traffic noise levels at the common areas are not expected to exceed the 65 CNEL noise limit set by the City of San Diego. For this reason, no additional project design features are required for the proposed common areas, with the provision of an avigation easement. The common outdoor use areas are therefore expected to comply with the City of San Diego Noise Element to the General Plan as designed.

Private balconies are located at the second floor of all units along the inner facades of Buildings 1 through 4, and the southern facades of Buildings 5 and 6. Worst-case traffic noise levels at private outdoor balconies are shown in Table 6. Building numbers have been arbitrarily assigned to buildings on site for ease of reference herein. Receiver locations and building numbers are shown in Figure 8.

Table 6. Worst-Case Traffic Noise Levels at Private Outdoor Use Areas – As Designed					
Receiver	**Building Number**	**Exterior Noise Level (CNEL)**	**Receiver**	**Building Number**	**Exterior Noise Level (CNEL)**
OU1	1	63	OU22	3 (South Side)	**66**
OU2	1	56	OU23	4 (North Side)	54
OU3	1	54	OU24	4 (North Side)	53
OU4	1	57	OU25	4 (North Side)	52
OU5	1	59	OU26	4 (North Side)	53
OU6	1	61	OU27	4 (North Side)	**70**
OU7	2	60	OU28	4 (South Side)	**72**
OU8	2	60	OU29	4 (South Side)	**70**
OU9	2	63	OU30	4 (South Side)	**67**
OU10	2	64	OU31	4 (South Side)	**67**
OU11	2	**67**	OU32	4 (South Side)	63
OU12	2	**70**	OU33	5	**71**
OU13	3 (North Side)	64	OU34	5	**72**
OU14	3 (North Side)	51	OU35	5	**72**
OU15	3 (North Side)	51	OU36	5	**72**
OU16	3 (North Side)	51	OU37	5	**73**
OU17	3 (North Side)	55	OU38	6	**73**
OU18	3 (South Side)	62	OU39	6	**74**
OU19	3 (South Side)	59	OU40	6	**73**
OU20	3 (South Side)	57	OU41	6	**73**
OU21	3 (South Side)	64	OU42	6	**74**

As shown above, several outdoor use areas are expected to be exposed to traffic noise levels that exceed 65 CNEL in the worst-case noise environment, and therefore, sound attenuation barriers are required in those areas. Please refer to Table 7 for worst-case traffic noise levels at outdoor use areas and required project design features. Receiver locations and building numbers are shown in Figure 8.

Table 7. Worst-Case Traffic Noise Levels at Outdoor Use Areas – with Barriers			
Receiver	**Building Number**	**Barrier Height (ft)[1]**	**Exterior Noise Level (CNEL)**
OU11	1	4.0	60
OU12	1	4.5	61
OU22	3 (South Side)	4.0	61
OU27	4 (North Side)	4.0	63
OU28	4 (South Side)	4.5	63
OU29	4 (South Side)	4.0	63
OU30	4 (South Side)	4.0	60
OU31	4 (South Side)	4.0	59
OU33	5	4.0	65
OU34	5	4.5	63
OU35	5	4.5	63
OU36	5	4.5	63
OU37	5	4.5	64
OU38	6	4.5	63
OU39	6	4.5	64
OU40	6	4.5	64
OU41	6	4.5	64
OU42	6	4.5	65

[1]The barrier height shown is relative to the floor height.

As shown in Table 7, the barriers at the specified receivers should be either four feet or 4.5 feet high relative to floor height around the perimeter of the corresponding balconies. With the incorporation of the sound attenuation barriers shown above, and the provision of an avigation easement, the outdoor use areas are expected to comply with the City of San Diego Noise Element to the General Plan.

A sound wall should be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least 7/8-inch thick or have a surface density of at least 3½ pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic may be used on the upper portion, if it is desirable to preserve a view. A glass or plexiglass railing wall at specified balconies should be sufficient.

5.1.2 Noise Impacts at Building Facades

Worst-case combined (aircraft and traffic) noise impacts were calculated at building facades to determine noise levels to be implemented in interior noise calculations. Calculations show that noise levels are expected to range from 67 CNEL (at several facades on the north side of the property) to 75 CNEL (at the southeast building). Worst-case combined noise levels at building facades are shown in Table 8, and receiver locations are shown graphically in Figure 9.

Table 8. Worst-Case Combined Exterior Noise Levels at Building Facades							
Receiver	Building Number	Exterior Noise Level (CNEL)					
		Second Floor			Third Floor		
		Traffic	Aircraft	Combined	Traffic	Aircraft	Combined
F1	1	62	67	**68**	64	67	**69**
F2	1	50	67	**67**	51	67	**67**
F3	1	50	67	**67**	50	67	**67**
F4	1	57	67	**67**	57	67	**67**
F5	1	56	67	**67**	58	67	**67**
F6	1	54	67	**67**	58	67	**68**
F7	2	56	67	**67**	56	67	**67**
F8	2	50	67	**67**	52	67	**67**
F9	2	50	67	**67**	53	67	**67**
F10	2	70	67	**72**	70	67	**72**
F11	2	66	67	**70**	66	67	**70**
F12	2	61	67	**68**	62	67	**68**
F13	3	64	67	**69**	66	67	**69**
F14	3	51	67	**67**	53	67	**67**
F15	3	51	67	**67**	53	67	**67**
F16	3	52	67	**67**	60	67	**68**
F17	3	56	67	**67**	57	67	**67**
F18	3	60	67	**68**	61	67	**68**
F19	3	63	67	**68**	65	67	**69**
F20	3	62	67	**68**	66	67	**70**
F21	4	49	67	**67**	54	67	**67**
F22	4	53	67	**67**	56	67	**67**
F23	4	53	67	**67**	56	67	**67**
F24	4	71	67	**72**	71	67	**72**
F25	4	71	67	**72**	71	67	**72**
F26	4	70	67	**72**	70	67	**72**
F27	4	67	67	**70**	67	67	**70**
F28	4	38	67	**67**	45	67	**67**
F29	5	68	67	**70**	68	67	**70**
F30	5	55	67	**67**	54	67	**67**
F31	5	56	67	**67**	55	67	**67**
F32	5	67	67	**70**	67	67	**70**
F33	5	73	67	**74**	74	67	**74**
F34	5	74	67	**74**	73	67	**74**
F35	6	67	67	**70**	67	67	**70**
F36	6	55	67	**67**	55	67	**67**
F37	6	56	67	**67**	56	67	**67**
F38	6	72	67	**73**	72	67	**73**
F39	6	74	67	**75**	74	67	**75**
F40	6	74	67	**75**	74	67	**75**

5.2 Interior

The City of San Diego and State of California require buildings to be designed in order to attenuate, control, and maintain interior noise levels to below 45 CNEL in habitable residential space. Contemporary exterior building construction is generally expected to achieve at least 15 decibels of exterior-to-interior noise attenuation, with windows opened, according to the U.S. EPA (see reference). 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 shown in Table 8, worst-case combined noise levels exceed 60 CNEL at all residential building facade locations. For this reason, an exterior-to-interior noise analysis was conducted for the residential spaces to evaluate the sound reduction properties of proposed exterior wall assembly, window, and door construction designs in the building. As aircraft overflight is a significant noise source, the roof assembly was included in this evaluation.

The proposed exterior wall construction was unknown at the time of this report. The exterior wall was evaluated assuming typical construction to consist of a stucco exterior mounted on 2-inch by 4-inch timber studs, with 5/8-inch Type X gypsum board installed on the interior, and batt insulation in the cavity. This assembly was evaluated using INSUL and was shown to achieve an STC rating of 38. Due to high noise levels on site, some spaces may require an exterior wall assembly with a higher STC rating (see Table 9 below for more information). Where this occurs, the proposed assembly can be improved by attaching the layer of gypsum board to the wood studs using resilient channels. With a single row of studs and the gypsum board mounted to the studs using resilient channels (on the interior side), the assembly was evaluated using INSUL, and was shown to achieve an STC rating of 59. Please refer to Appendix D for more information.

The proposed roof construction was unknown at the time of this report. The roof was evaluated assuming typical construction of built up roofing over 3/4-inch plywood, on wood joists (evaluated as 12-inches deep), with 5/8-inch Type X gypsum board installed on the interior, and batt insulation in the cavity. This assembly was evaluated using INSUL and was shown to achieve an STC rating of 34 Please refer to Appendix D for more information.

Calculations have been performed using the assemblies detailed above to determine whether worst-case combined interior noise levels of 45 CNEL can be achieved. Table 9 shows interior noise levels for worst-case and representative spaces. Please refer to Appendix E for additional information.

Table 9. Future Interior Noise Levels of Worst-Case/Representative Units							
Unit Type	**Room**	**Maximum Exterior Facade Impact (CNEL)**	**Resilient Channel Upgrade**	**Minimum STC Rating for Glazing**	**Interior Noise Level (CNEL)**		**Mechanical Ventilation**
					Windows Open	**Windows Closed**	
1	Living Room (Building 6 – Worst Case)	75	No	28	52	45	Required
	Master Bedroom (Building 6 – Worst Case)	75	No	28	64	45	Required
2	Living Room (Building 6 – Worst Case)	75	No	28	63	45	Required
	Master Bedroom (Building 6 – Worst Case)	75	No	28	64	45	Required
	Bedroom 2 (Building 6 – Worst Case)	75	No	31	64	45	Required
	Bedroom 2 (Building 4 – Typical)	70	No	28	60	44	Required
3	Living Room (Building 6 – Worst Case)	75	No	35	64	45	Required
	Master Bedroom (Building 6 – Worst Case)	73	No	31	63	45	Required
	Bedroom 2 (Building 6 – Worst Case)	75	No	35	64	45	Required
	Bedroom 3 (Building 6 – Worst Case)	75	No	37	66	45	Required
			Yes	31	66	45	Required
	Living Room (Building 4 – Typical)	72	No	28	63	45	Required
	Master Bedroom (Building 2 – Typical)	72	No	28	62	45	Required
	Bedroom 2 (Building 2 – Typical)	70	No	28	59	43	Required
	Bedroom 3 (Building 2 – Typical)	72	No	28	61	45	Required

As shown above, with the acoustical recommendations given in Table 9 in place, interior noise levels are expected to remain at or below 45 CNEL in residential units with windows closed. Please refer to Figure 10 for a graphical representation of where specific interior noise design features are required.

As there are no residential units that meet the 45 CNEL interior noise level requirement with windows open, mechanical ventilation is required for all units on site. The 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. A Forced Air Unit (FAU) or its equivalent meeting the criterion described must be installed in these required spaces to satisfy code requirements.

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 would apply to any other penetrations through the assembly. The OSI Green Series Draft and Acoustical Sound Sealant and the Pecora AC-20 FTR Sealant are products specifically designed for this purpose. Please see Appendix F: Recommended Products.

The proposed residential units were analyzed for worst-case exterior noise impacts from roadway traffic and aircraft noise. With mechanical ventilation installed in residential units and the acoustical recommendations given in Table 9 incorporated into the project design, all interior residential space is expected to comply with City of San Diego and California Building Code interior noise requirements. No additional project design features are deemed necessary.

5.3 Temporary Project-Related Noise Impacts on Surrounding Property Lines

According to the City of San Diego Municipal Code, construction activity is prohibited between the hours of 7 p.m. and 7 a.m. and on Sundays or legal holidays. During permissible hours of operation, noise levels from construction activity must be limited to a twelve-hour average of no greater than 75 dBA at any property line zoned for residential use.

No construction schedule was available at the time of this report. An anticipated construction schedule was formulated using professional experience. It is expected that the Framing / Construction and Landscaping / Paving / Site Concrete phases are to be constructed simultaneously; therefore these phases were calculated together (Phase 2) for a worst-case analysis. These considerations were taken into account when making typical equipment assumptions. The anticipated construction activities are shown in Table 10.

Table 10. Anticipated Construction Activity	
Phase	**Anticipated Large Equipment**
1. Grading / Utilities	Excavator, Front End Loader, Dump Truck
2. Framing / Construction and Landscaping / Paving / Site Concrete	Air Compressor, Telescopic Forklift, Concrete Mixer Truck, Concrete Pump Truck, Paver, Roller

As the site covers an overall area of approximately one acre, it is expected that the construction equipment will be concentrated in smaller areas to develop them, and then moved around the entire site during development. Therefore, the construction activity has been evaluated in halves of the buildable area of the site, to show anticipated noise impacts as construction equipment is centered at different locations on site. Construction noise calculations were performed using Cadna noise modeling software.

Construction equipment noise sources were placed at the center of each half in order to account for the varying distance from source to receiver as equipment moves around the site. Receivers on property lines to the north, east, and west were calculated for the phases of construction listed above considering construction activity centered on each half of the project site. As residential buildings at the receiver locations have two floors, receivers have been placed at first and second floors to ensure compliant noise levels at the second floor elevation along the property line. All other noise-sensitive receivers are located at a greater distance from potential construction activity and are expected to have lower noise levels. Noise calculations consider typical duty cycles of equipment, to account for periods of activity and inactivity on the site.

Noise levels for each phase of construction are shown in Table 11. Detailed calculations can be found in Appendix C. Graphical representations of the construction noise contours and receiver locations can be found in Figures 11 through 14, respectively.

Table 11. Temporary Construction Noise Levels at Nearby Residential Properties						
Phase	**Equipment Used**	**Source Area**	**Receiver Name**	**Receiver Location**	**12-Hour Average Noise Level of Equipment (dBA)**	
					Floor 1	**Floor 2**
1. Grading / Utilities	Excavator, Front End Loader, Dump Truck	East	R1	Northeast	60	64
			R2	West	56	58
			R3	North	63	64
			R4	East	58	62
		West	R1	Northeast	50	55
			R2	West	65	66
			R3	North	64	65
			R4	East	48	53
2. Framing / Construction and Landscaping / Paving / Site Concrete	Air Compressor, Telescopic Forklift, Concrete Mixer Truck, Concrete Pump Truck, Paver, Roller	East	R1	Northeast	62	65
			R2	West	57	59
			R3	North	64	65
			R4	East	60	64
		West	R1	Northeast	52	57
			R2	West	66	68
			R3	North	65	66
			R4	East	50	55

As shown above, temporary construction noise impacts are not expected to exceed 75 dBA any noise-sensitive receivers during any phases of construction. Therefore, it has been determined that noise levels from construction activities associated with this project are expected to comply with the applicable City of San Diego construction noise limits at all surrounding property lines, as designed, with activity limited to the daytime hours of 7 a.m. to 7 p.m. during all phases of construction.

Although noise levels are shown to be in compliance with the construction noise limit of 75 dBA, the following good-practice noise control measures should still be practiced as a courtesy to surrounding properties.

1. Staging areas should be placed as far from occupied receivers as possible on the project site to limit any additional unnecessary noise exposure at sensitive receivers.

2. Place stationary equipment in locations that will have a lesser noise impact on nearby sensitive receivers.

3. Turn off equipment when not in use.

4. Limit the use of enunciators or public address systems, except for emergency notifications.

5. Equipment used in construction should be maintained in proper operating condition, and all loads should be properly secured, to prevent rattling and banging.

6. Schedule work to avoid simultaneous construction activities that both generate high noise levels.

7. Use equipment with effective mufflers.

8. Minimize the use of backup alarms.

With work limited to daytime hours permissible by the City of San Diego and adherence to the general good practice construction noise control techniques listed above, temporary construction noise is expected to remain in compliance with City of San Diego noise limits as designed. No additional project design features are necessary.

6.0 CONCLUSION

As this project will be required to provide an avigation easement to the San Diego County Regional Airport Authority, aircraft noise levels can exceed 65 CNEL at outdoor use areas, provided interior noise levels are reduced to below 45 CNEL in residential spaces. However, worst-case impacts from traffic noise sources were calculated at common outdoor use areas and private balconies considering shielding from proposed buildings on site. Calculations show that traffic noise impacts at several private outdoor use areas will exceed the 65 CNEL limit as designed; however, with the sound attenuation barriers shown in Table 7 incorporated as project design features, and the provision of an avigation easement, all public and private outdoor use areas are expected to comply with the noise requirements of the City of San Diego Noise Element to the General Plan.

Due to high exterior noise levels at building facades, an exterior-to-interior analysis was performed to determine building features necessary to reduce interior noise levels in residential units to 45 CNEL or less, as required by the City of San Diego and State of California. Calculations show that, with the acoustical recommendations shown herein, interior noise level requirements of the City of San Diego and State of California are expected to be met in all residential spaces.

Noise levels from temporary construction activities associated with this project are expected to comply with the applicable City of San Diego construction noise limits at all surrounding property lines, with activity limited to the daytime hours of 7 a.m. to 7 p.m. during all phases of construction. Construction is prohibited between the hours of 7 p.m. and 7 a.m. and on Sundays or legal holidays. Though it is not required by regulations, the general good-practice construction noise control methods listed herein should be followed, as a courtesy to surrounding properties.

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 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 32nd and Broadway project, to be located at the northeast corner of 32nd Street and the existing right-of-way of Broadway, in the City of San Diego, California. This report was prepared by Rachael Cowell and Amy Hool.

Rachael Cowell, Staff Consultant

Amy Hool, Senior Acoustical Consultant

8.0 REFERENCES

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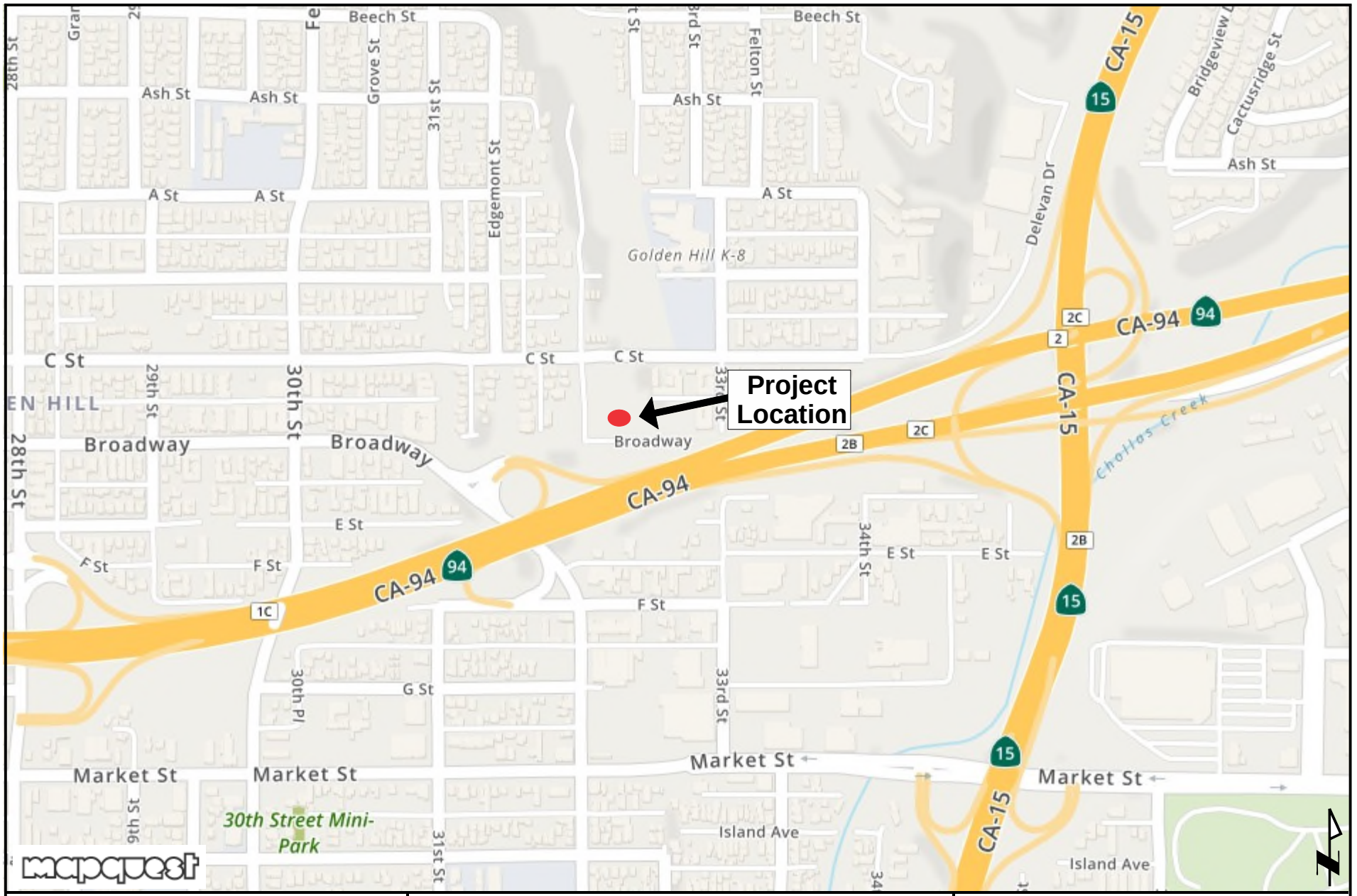
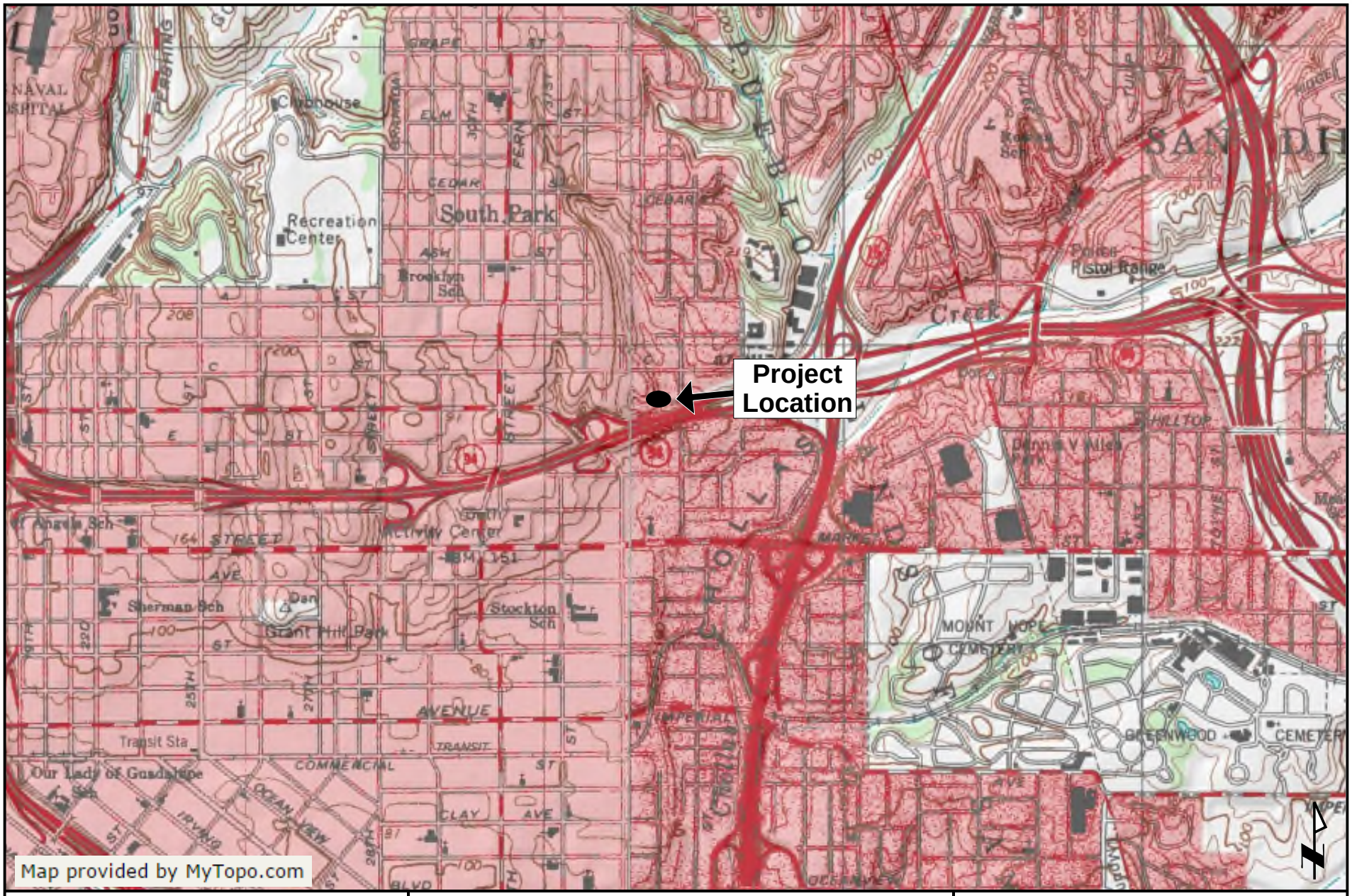
FIGURES



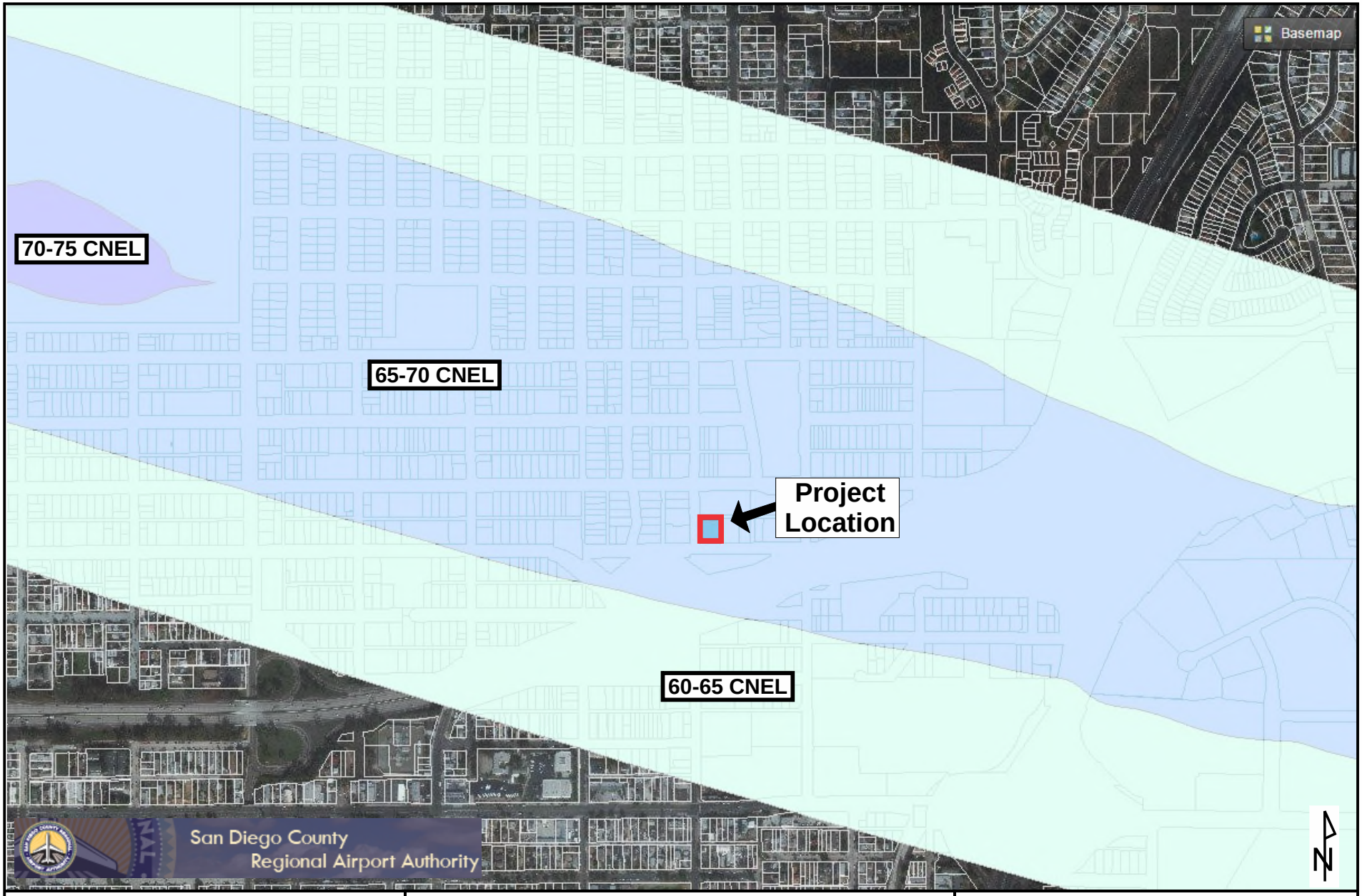
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Vicinity Map** **Job # S190303.2**	**Figure 1**

Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Assessor's Parcel Map** **Job # S190303.2**	**Figure 2**

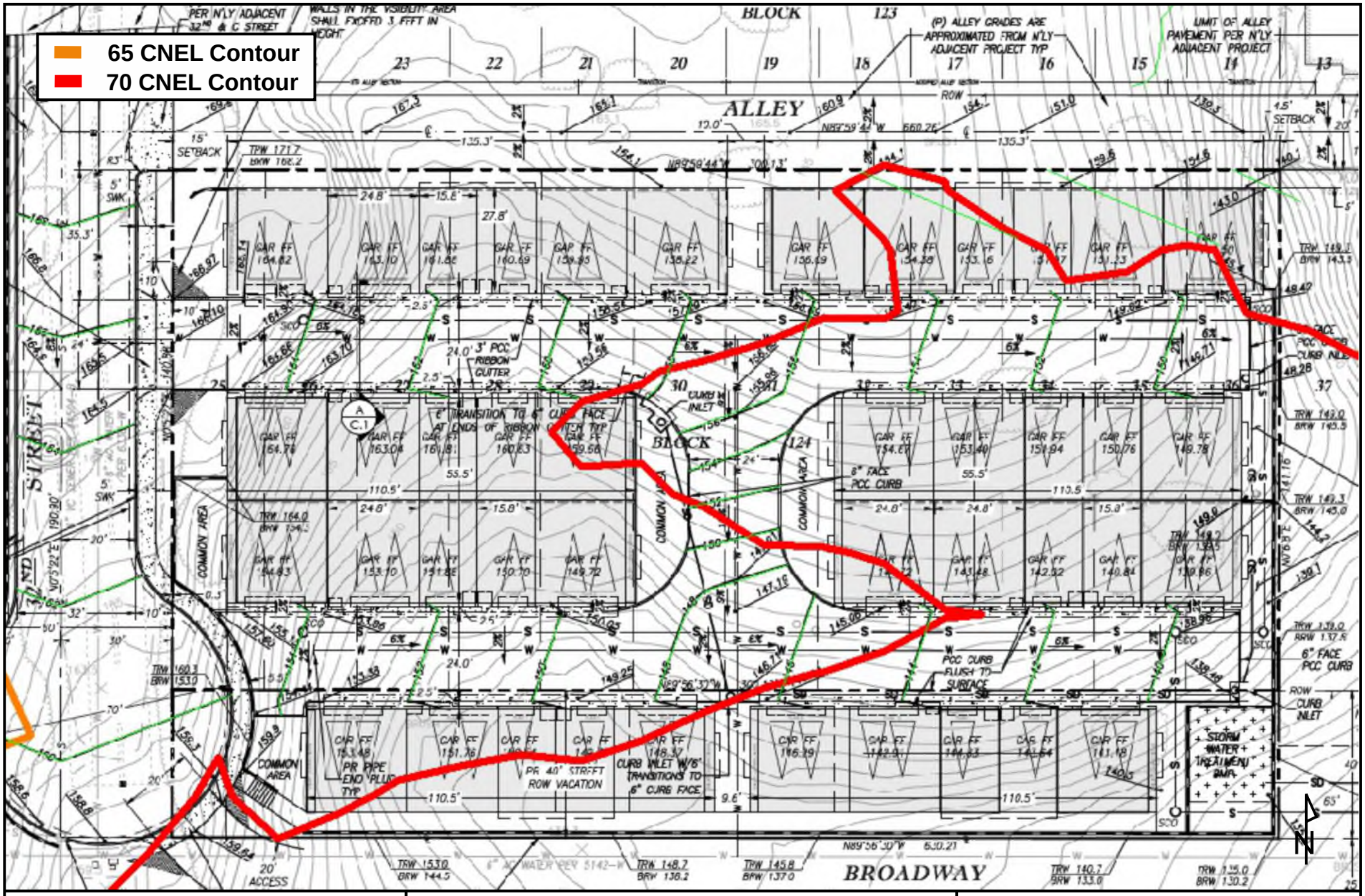
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Satellite Aerial Photograph Showing Noise Measurement Location** **Job # S190303.2**	**Figure 3**



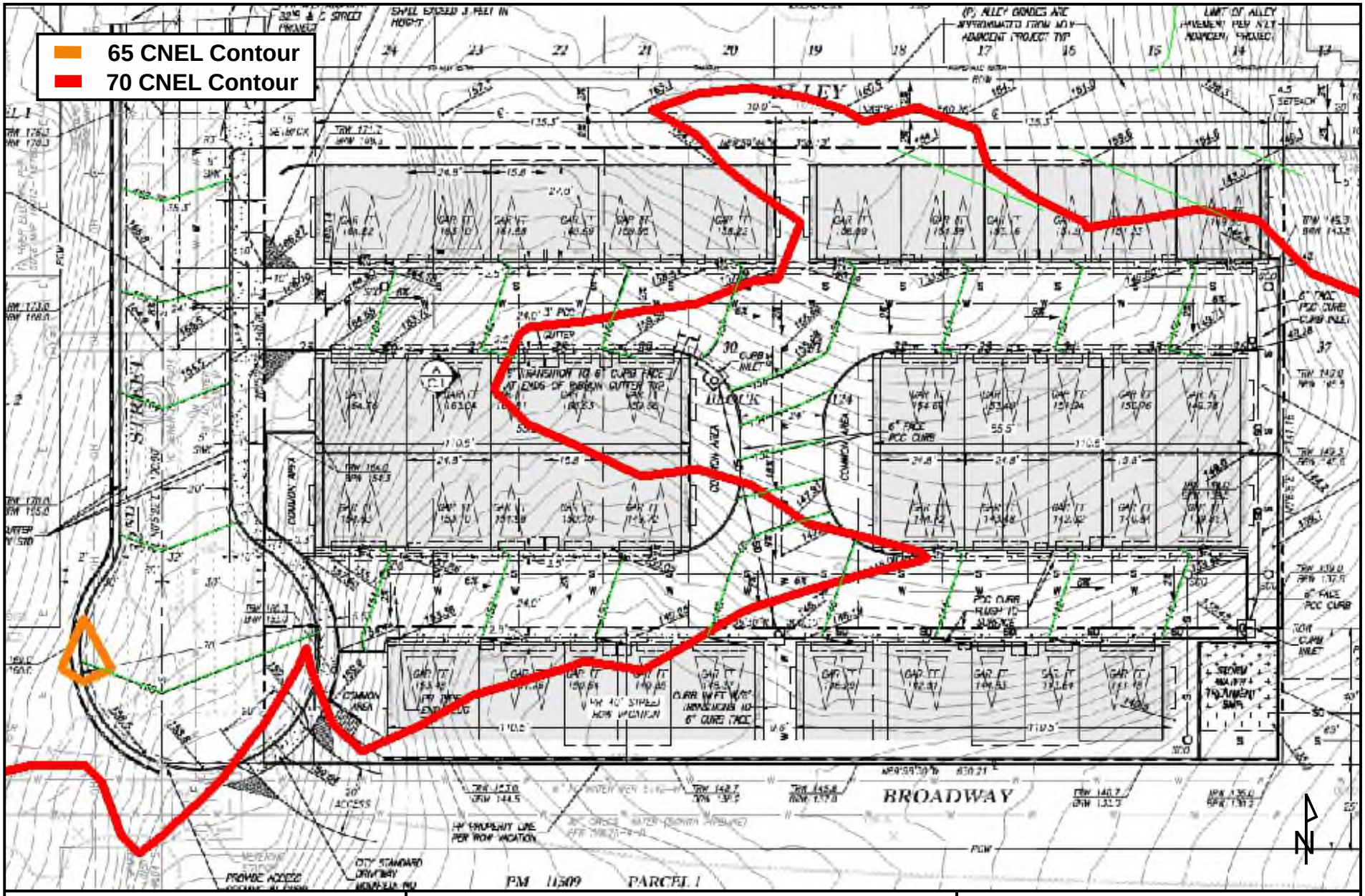
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Topographic Map** **Job # S190303.2**	**Figure 4**



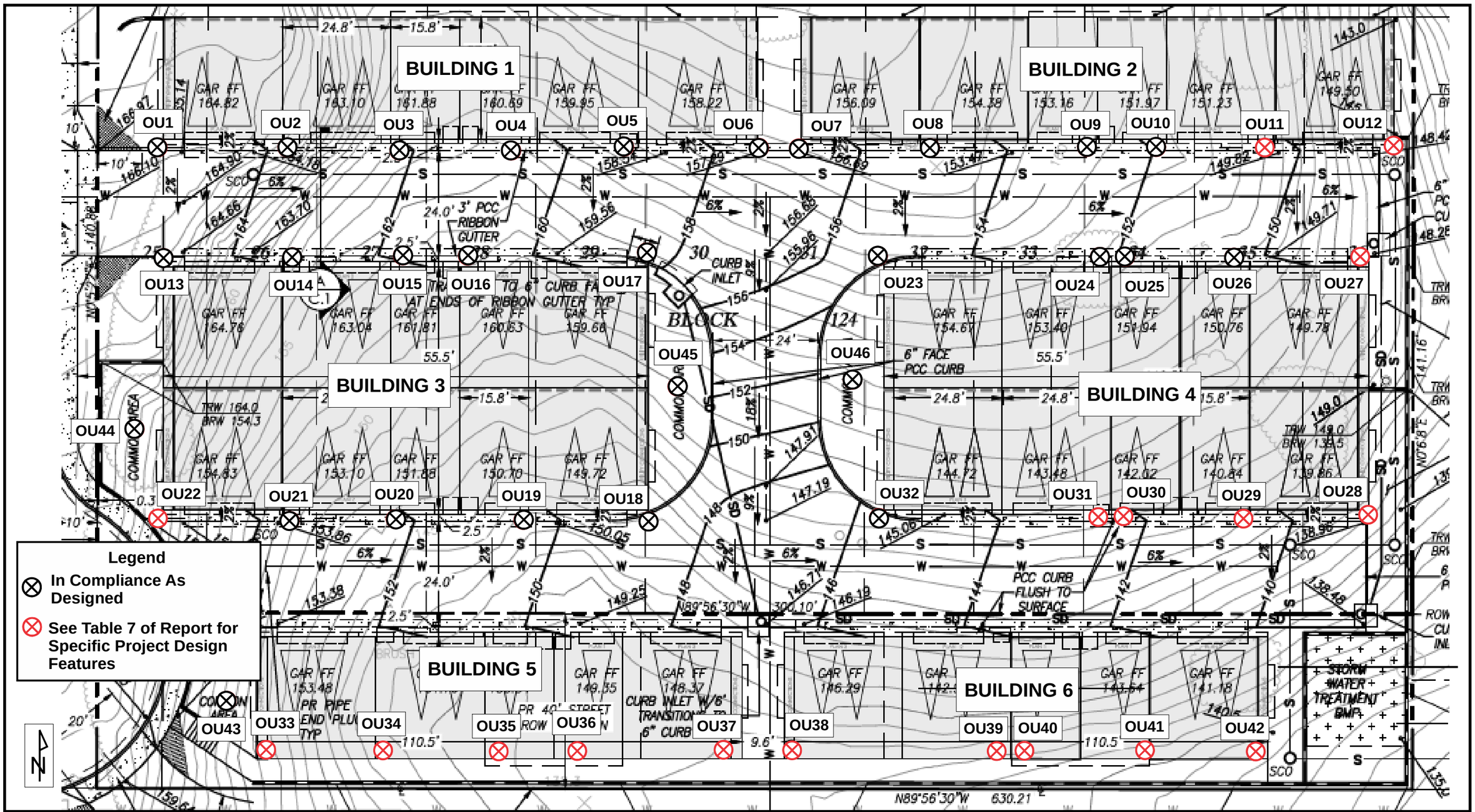
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**San Diego International Airport** **CNEL Contours and Project Location** **Job # S190303.2**	**Figure 5**



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing Current Traffic CNEL Contours** **Job # S190303.2**	**Figure 6**



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing Future Traffic CNEL Contours** **Job # S190303.2**	**Figure 7**



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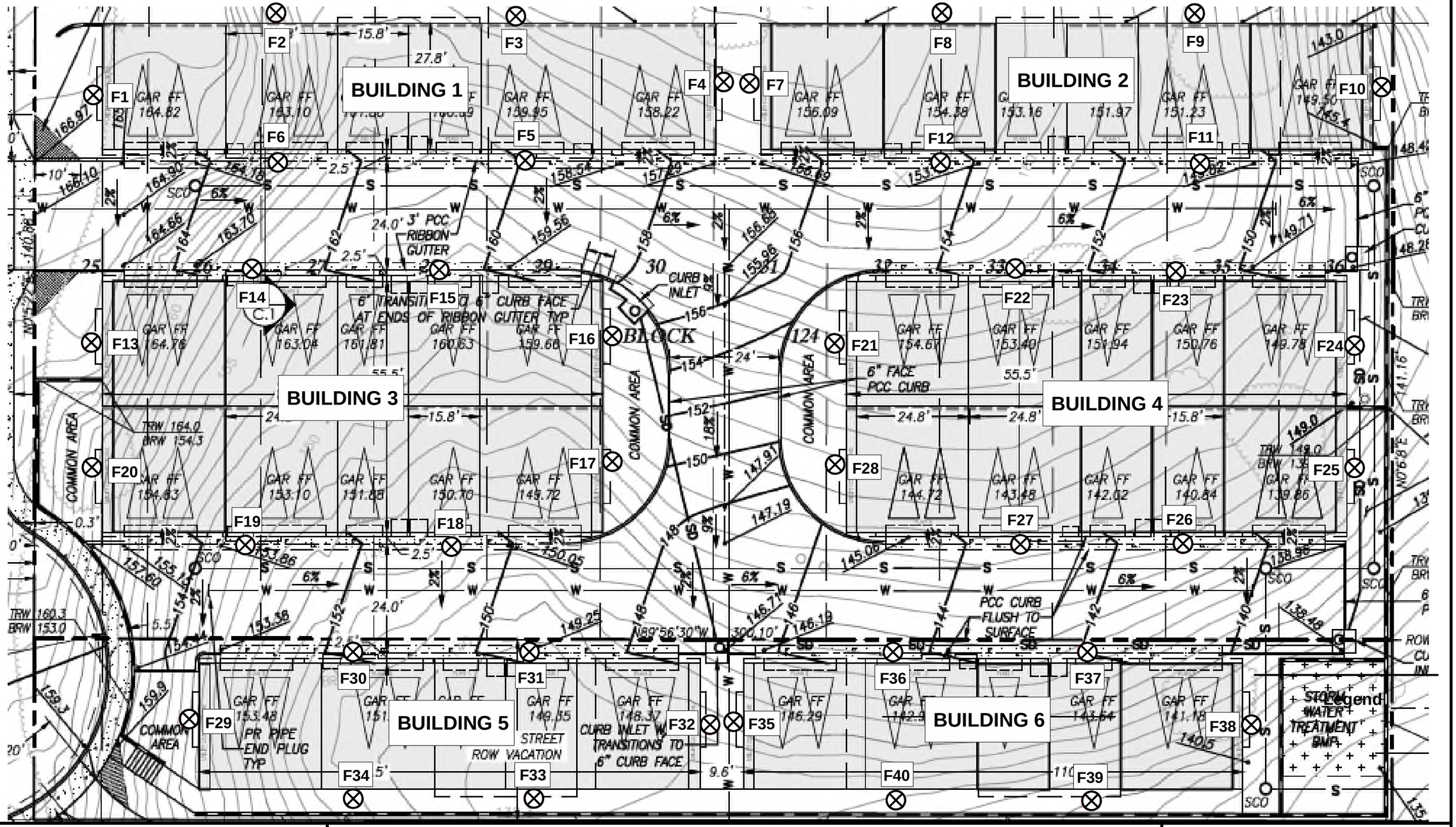
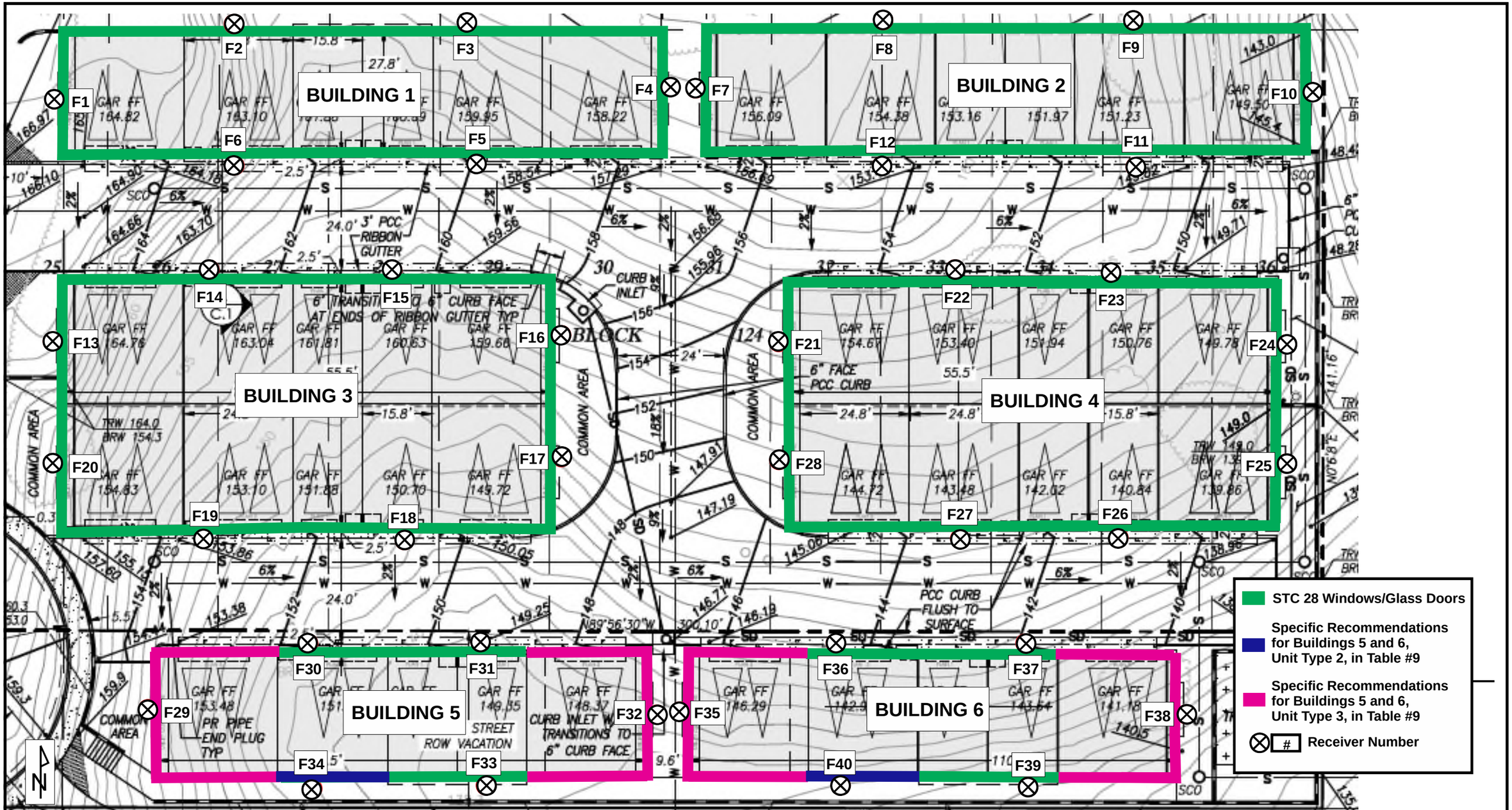
Site Plan Showing Outdoor Use Area Receiver Locations
Job # S190303.2

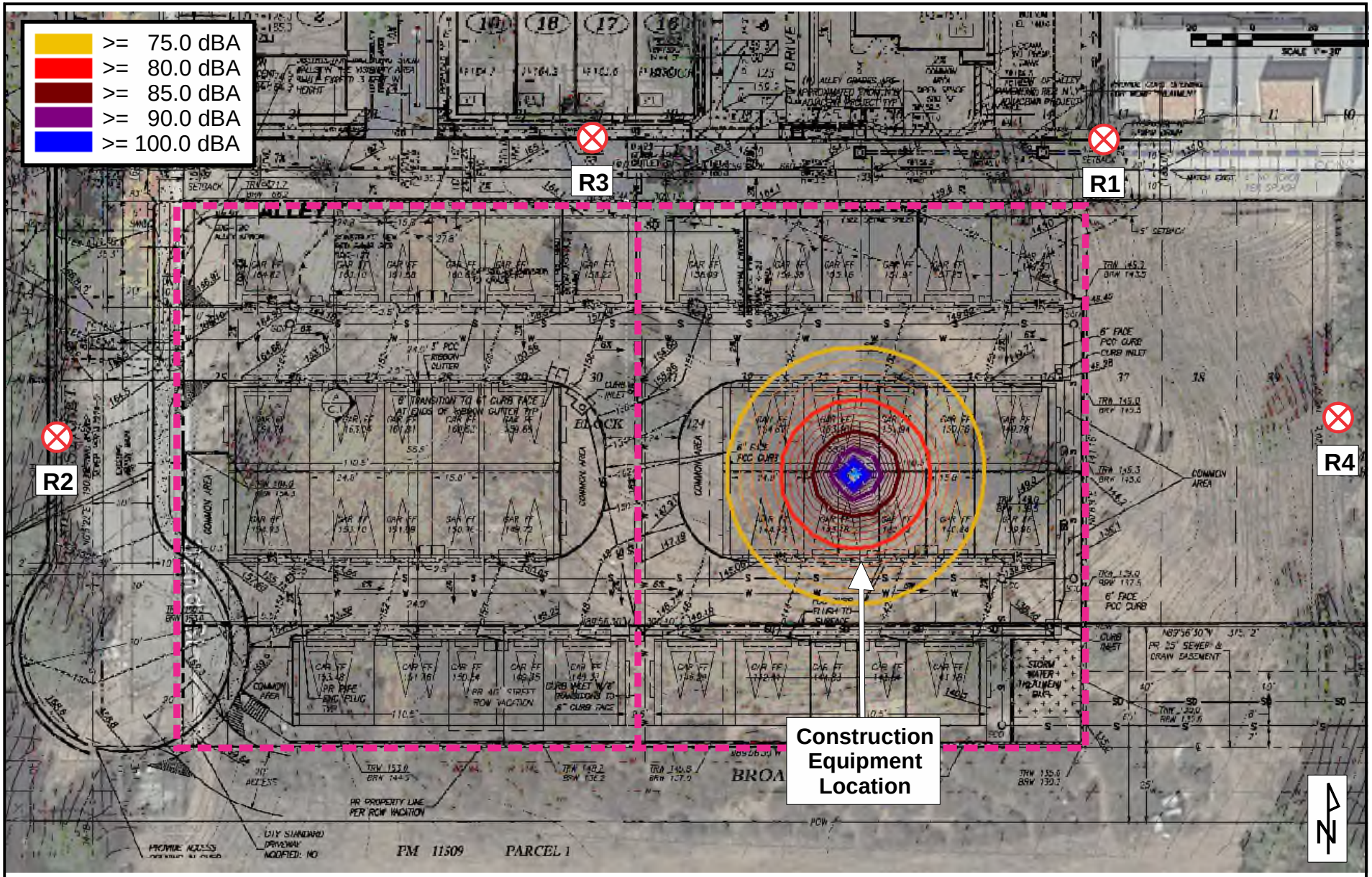
Figure 8



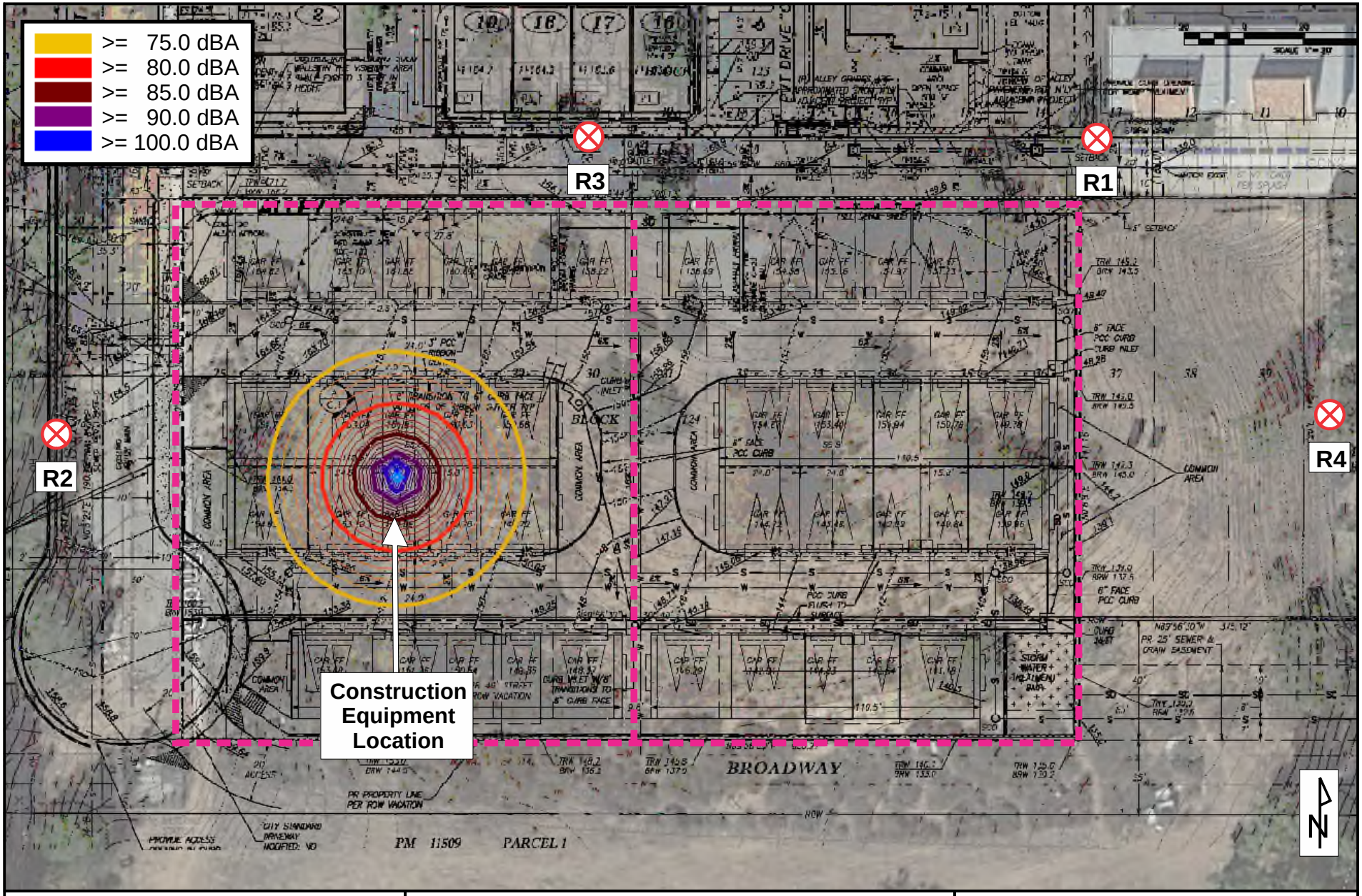
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing** **Facade Receiver Locations** **Job # S190303.2**	**Figure 9**



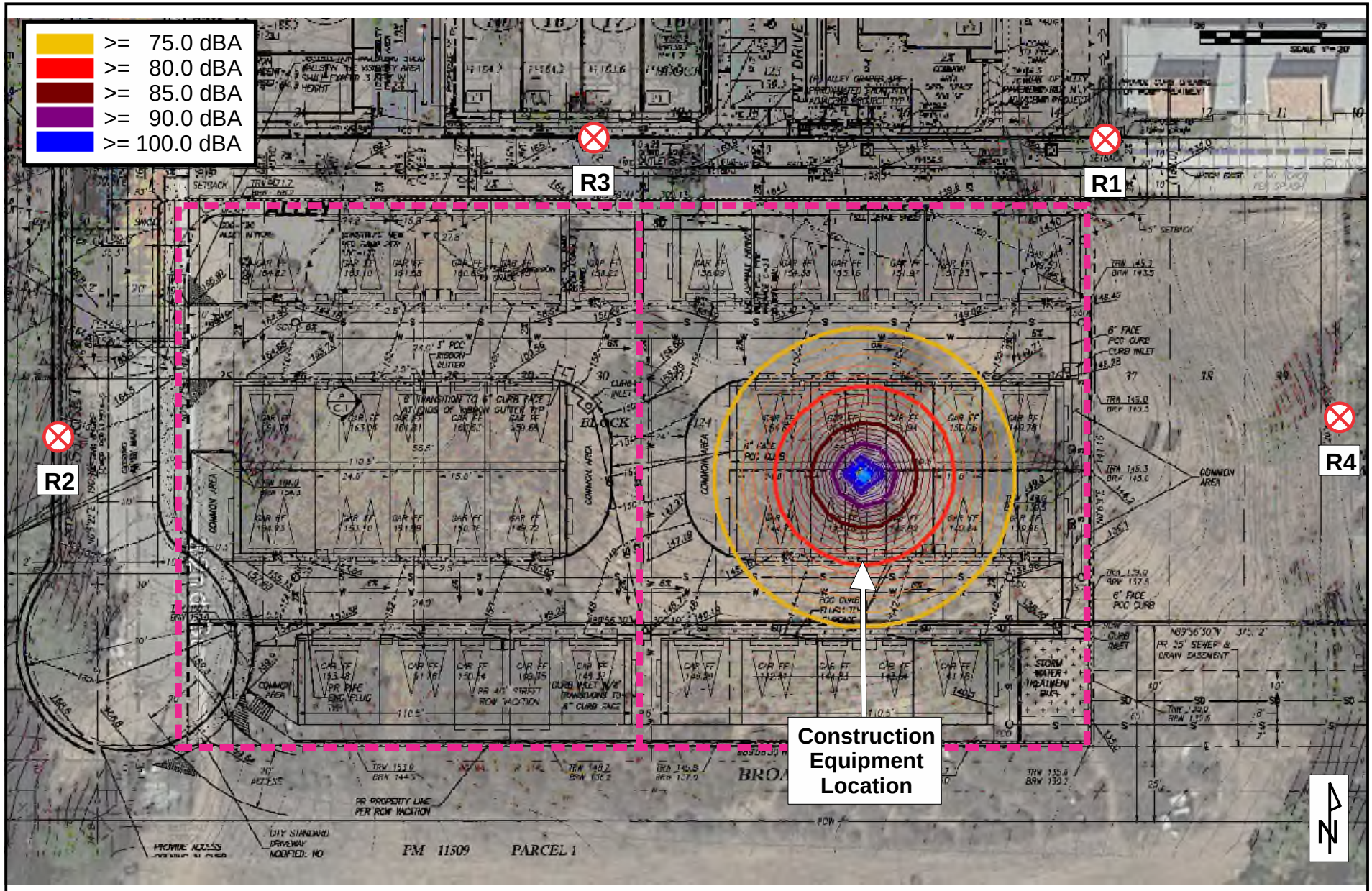
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing** **Interior Noise Requirements** **Job # S190303.2**	**Figure 10**



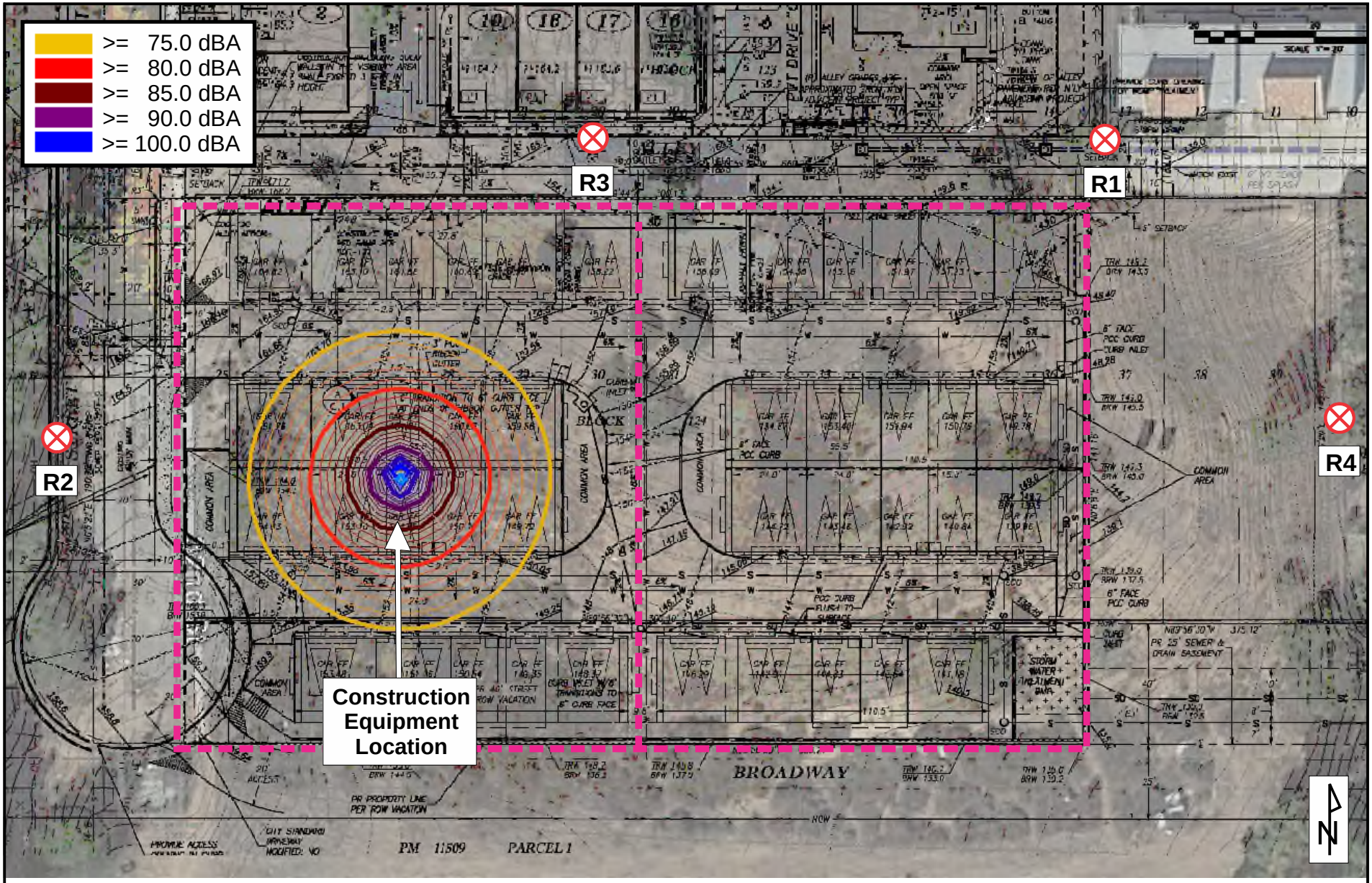
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Satellite Aerial Photograph Showing Site Plan, Construction Noise Contours, and Source and Receiver Locations - Phase 1, East** **Job # S190303.2**	**Figure 11**



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Satellite Aerial Photograph Showing Site Plan, Construction Noise Contours, and Source and Receiver Locations - Phase 1, West** **Job # S190303.2**	**Figure 12**



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Satellite Aerial Photograph Showing Site Plan, Construction Noise Contours, and Source and Receiver Locations - Phase 2, East** **Job # S190303.2**	**Figure 13**



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Satellite Aerial Photograph Showing Site Plan, Construction Noise Contours, and Source and Receiver Locations - Phase 2, West** **Job # S190303.2**	**Figure 14**

APPENDIX A

Project Plans

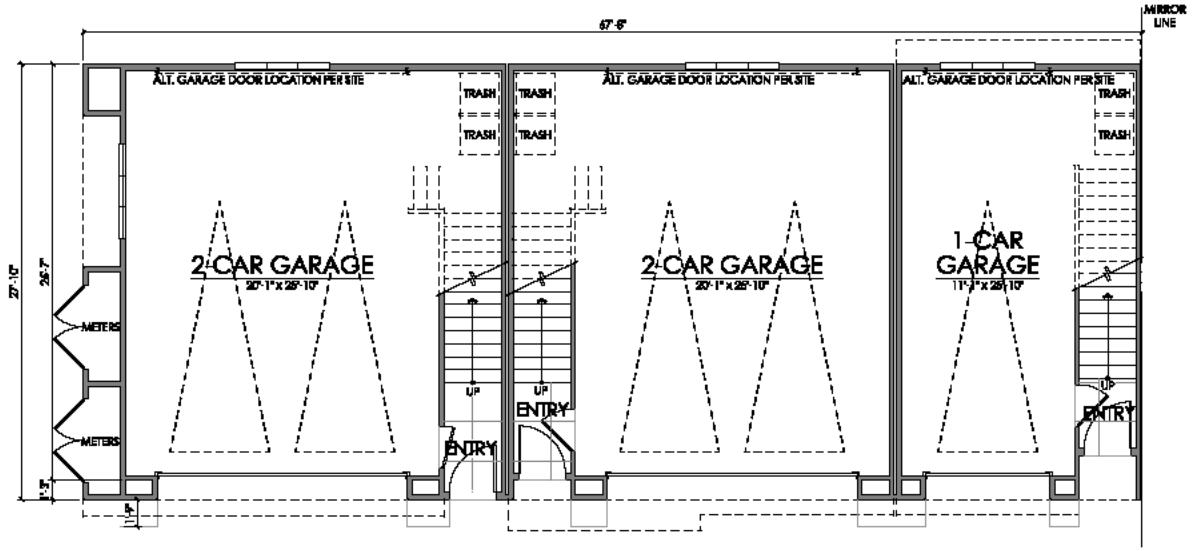
03.06.19

CONCEPT ELEVATION

32ND STREET | BCA DEVELOPMENT

SAN DIEGO , CALIFORNIA

woodley architectural group,inc
colorado // 731 southpark cr. suite B
littleton, co 80120 / 303.683.7231
california // 2943 pullman st suite A
santa ana, ca 92705 / 949.553.8819



PLAN THREE		PLAN TWO		PLAN ONE	
FIRST FLOOR	100 SQ. FT.	FIRST FLOOR	95 SQ. FT.	FIRST FLOOR	78 SQ. FT.
SECOND FLOOR	702 SQ. FT.	SECOND FLOOR	650 SQ. FT.	SECOND FLOOR	384 SQ. FT.
THIRD FLOOR	721 SQ. FT.	THIRD FLOOR	663 SQ. FT.	THIRD FLOOR	389 SQ. FT.
TOTAL LIVING	**1523 SQ. FT.**	**TOTAL LIVING**	**1408 SQ. FT.**	**TOTAL LIVING**	**851 SQ. FT.**

03.06.19

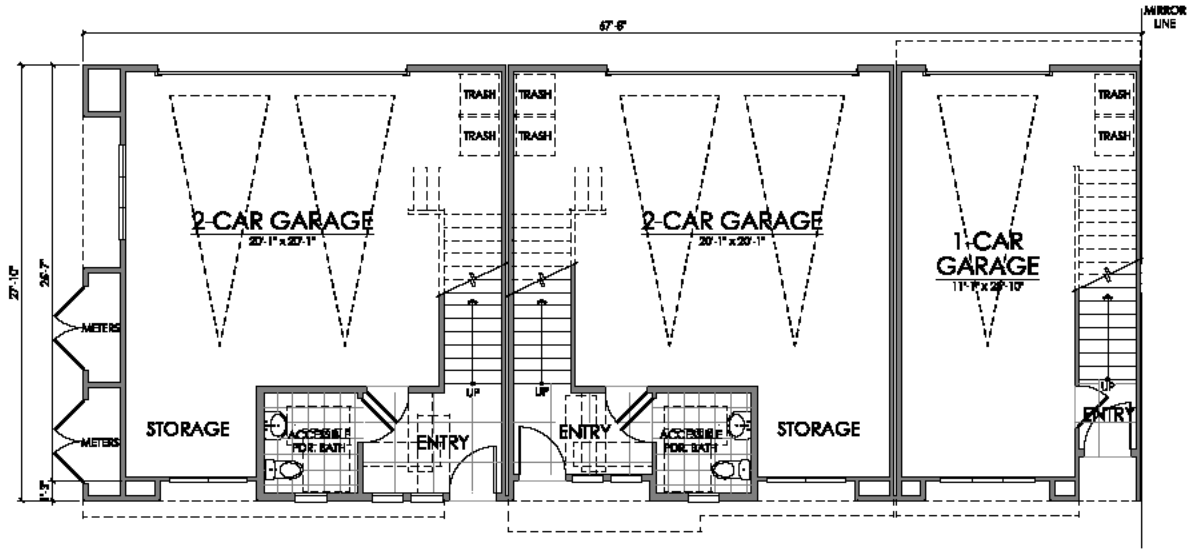
6 UNIT BUILDING | FIRST FLOOR

32ND & BROADWAY | BCA DEVELOPMENT

SAN DIEGO, CALIFORNIA

NOTE: SQUARE FOOTAGE MAY VARY BASED ON CALCULATION METHODS

woodley architectural group, inc
colorado // 731 southpark dr. suite b
littleton, co 80120 / 303.683.7581
california // 2943 putnam st. suite A
santa ana, ca 92705 / 949.863.8919



PLAN THREE		PLAN TWO		PLAN ONE	
FIRST FLOOR	185 SQ. FT.	FIRST FLOOR	174 SQ. FT.	FIRST FLOOR	78 SQ. FT.
SECOND FLOOR	702 SQ. FT.	SECOND FLOOR	650 SQ. FT.	SECOND FLOOR	384 SQ. FT.
THIRD FLOOR	721 SQ. FT.	THIRD FLOOR	663 SQ. FT.	THIRD FLOOR	389 SQ. FT.
TOTAL LIVING	**1608 SQ. FT.**	**TOTAL LIVING**	**1487 SQ. FT.**	**TOTAL LIVING**	**851 SQ. FT.**

ACCESSIBLE BATH UNIT | FIRST FLOOR

6 UNIT BUILDING | ROWTOWNS

03.06.19

32ND & BROADWAY | BCA DEVELOPMENT

SAN DIEGO, CALIFORNIA

NOTE: SQUARE FOOTAGE MAY VARY BASED ON CALCULATION METHODS

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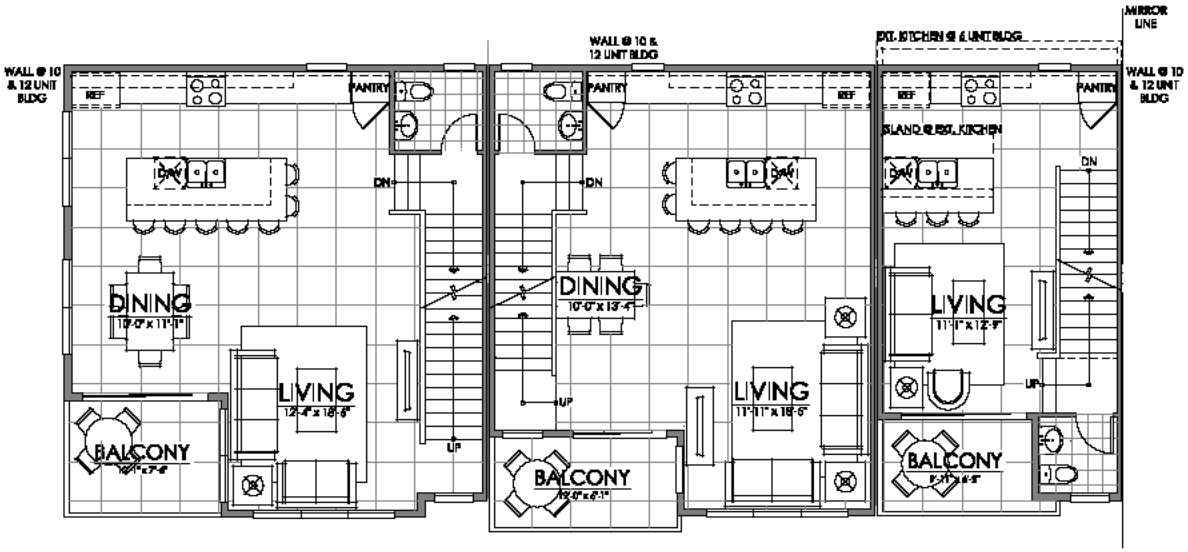
colorado // 731 southpark dr. suite b
littleton, co 80120 / 303.683.7581
california // 2943 putnam st. suite A
santa ana, ca 92705 / 949.863.8919



PLAN THREE		PLAN TWO		PLAN ONE	
FIRST FLOOR	100 SQ. FT.	FIRST FLOOR	95 SQ. FT.	FIRST FLOOR	78 SQ. FT.
SECOND FLOOR	702 SQ. FT.	SECOND FLOOR	650 SQ. FT.	SECOND FLOOR	384 SQ. FT.
THIRD FLOOR	721 SQ. FT.	THIRD FLOOR	663 SQ. FT.	THIRD FLOOR	389 SQ. FT.
TOTAL LIVING	**1523 SQ. FT.**	**TOTAL LIVING**	**1408 SQ. FT.**	**TOTAL LIVING**	**851 SQ. FT.**

03.06.19

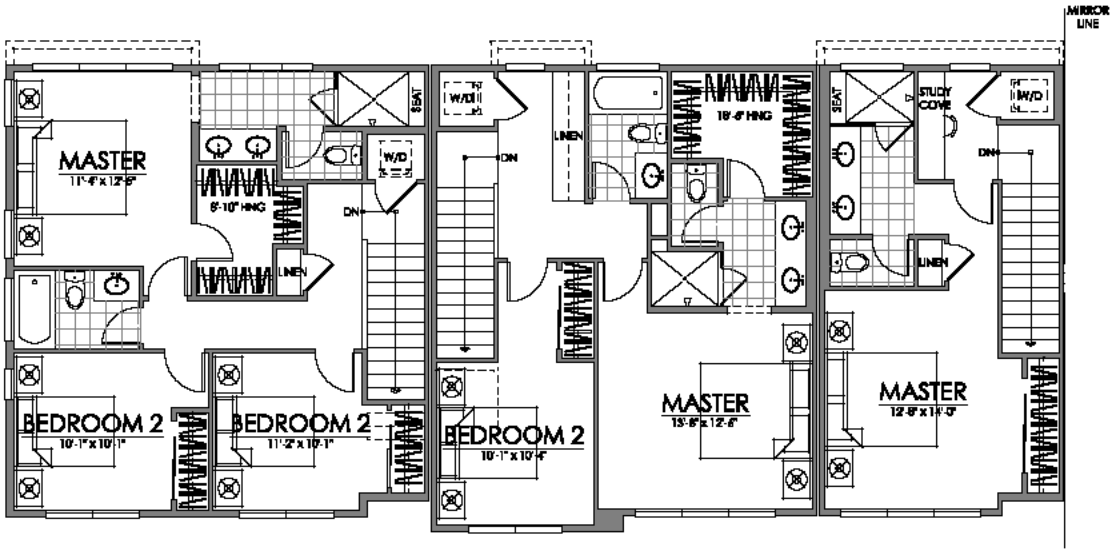
6 UNIT BUILDING | SECOND FLOOR

32ND & BROADWAY | BCA DEVELOPMENT

SAN DIEGO, CALIFORNIA

NOTE: SQUARE FOOTAGE MAY VARY BASED ON CALCULATION METHODS

woodley architectural group, inc
colorado // 731 southpark dr. suite b
littleton, co 80120 / 303.683.7581
california // 2943 putnam st. suite A
santa ana, ca 92705 / 949.863.8919



PLAN THREE		PLAN TWO		PLAN ONE	
FIRST FLOOR	100 SQ. FT.	FIRST FLOOR	95 SQ. FT.	FIRST FLOOR	78 SQ. FT.
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THIRD FLOOR	721 SQ. FT.	THIRD FLOOR	663 SQ. FT.	THIRD FLOOR	389 SQ. FT.
TOTAL LIVING	**1523 SQ. FT.**	**TOTAL LIVING**	**1408 SQ. FT.**	**TOTAL LIVING**	**851 SQ. FT.**

03.06.19

6 UNIT BUILDING | THIRD FLOOR

32ND & BROADWAY | BCA DEVELOPMENT

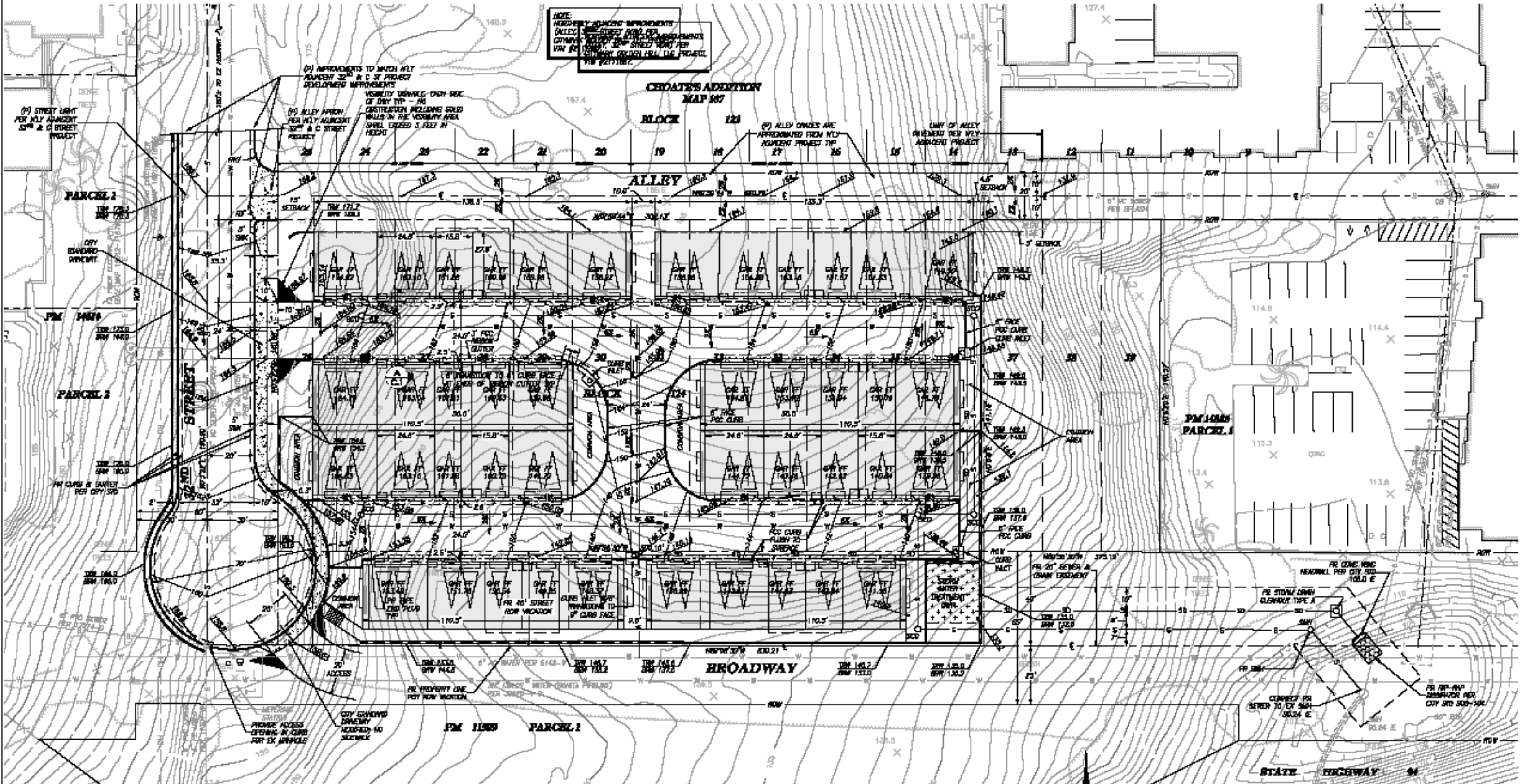
SAN DIEGO, CALIFORNIA

NOTE: SQUARE FOOTAGE MAY VARY BASED ON CALCULATION METHODS

woodley architectural group, inc
colorado // 731 southpark dr. suite b
littleton, co 80120 / 303.683.7581
california // 2943 pullman st. suite A
santa ana, ca 92705 / 949.863.8919

TENTATIVE MAP

PROJECT (PTS) NO. ____
1000 Block 32nd Street
San Diego, CA 92102
TENTATIVE MAP No. ____



LEGEND

DESCRIPTION	STD DWG
PROPERTY LINE	
STREET CENTERLINE	
(E) CONTOUR	
(E) SPOT ELEVATION	
(E) WATER LINE	
(E) SEWER LINE	
(E) ELECTRIC CONDUIT	UNDERGROUND/OVERHEAD
(E) WATER SERVICE	
(E) SEWER SERVICE	
(E) FIRE HYDRANT	
(E) PLANTINGS (TREE, SHRUB, PALM)	
(E) BUILDING FOOTPRINT	
(P) CONTOUR	
(P) SPOT ELEVATION	
(P) DRAINAGE SWALE OR DIRECTION OF FLOW	
(P) PVC DRAIN LINE	SDR-35 SCH 40
(P) LANDSCAPE DRAIN	(NDS OR EQ)
(P) CURB INLET – TYPE A	SDD-115
(P) CURB INLET – TYPE B	SDD-116
(P) ROOF DOWNSPOUTS	
(P) WATER SERVICE MAIN	
(P) SEWER MAIN	
(P) SEWER MANHOLE / CLEANOUT	SDS-106 OR -107 / SC-01
(P) CMU STEMWALL	
(P) FREESTANDING WALL	
(P) BUILDING FOOTPRINT	
(P) BUILDING OVERHEAD	
(P) CONCRETE SIDEWALK	SDG-155
(P) PCC DRIVEWAY	SDG-159
(P) 3" PCC CURB & GUTTER	
(P) PCC CURB – 8" FACE	SDG-160
(P) PCC RIBBON GUTTER	
(P) WATER SERVICE W/RP DEVICE	
(P) SEWER LATERAL	
(P) FIRE SERVICE W/RP DEVICE	
EX SURVEY MONUMENT	
PR SURVEY MONUMENT	(SET PER FINAL MAP)

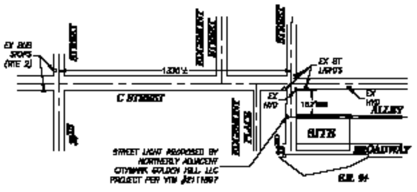
ABBREVIATIONS:

AC	ASPHALTIC CONCRETE
BRW	BOTTOM OF RETAINING WALL GRADE
CB	CATCH BASIN
CO	CLEANOUT
CONC	CONCRETE
EL	ELEVATION
(E); EX	EXISTING
FH	FIRE HYDRANT
FF	FINISH FLOOR
FL; ℄	FLOWLINE
FS	FINISH SURFACE/SLAB
GAR	GARAGE
HP	HIGH POINT
IE	INVERT ELEVATION
MAX; MIN	MAXIMUM; MINIMUM
PA	PLANTING AREA
PCC	PORTLAND CEMENT CONCRETE
(P); PR	PROPOSED
PVC	POLYVINYLCHLORIDE
PVMT	PAVEMENT
RCP	REINFORCED CONCRETE PIPE
RP	REDUCED PRESSURE
SWR	SEWER
STD	STANDARD
SMH	SEWER MANHOLE
SWK	SIDEWALK
TC	TOP OF CURB
TRW	TOP OF RETAINING WALL GRADE
TW	TOP OF WALL
VC; VCES	VITRIFIED CLAY; VC EXTRA STRENGTH
W/; W/O	WITH; WITHOUT
WM	WATER METER

CIVIL ENGINEER / LAND SURVEYOR:

JOHN S. COFFEY, PE, PLS
COFFEY ENGINEERING, INC.
[illegible] AVENUE, SUITE 370
SAN DIEGO, CA 92131
([illegible]) 831-0111
FAX: ([illegible]) 831-0179

JOHN S. COFFEY DATE
RCE C62716 EXP. 6/30/20



EXISTING BUS STOP, STREET LIGHT, & FIRE HYDRANT LOCATION MAP
SCALE: 1"=300'

OWNER:

32ND AND BROADWAY, LLC
[illegible] AIRWAY AVENUE, SUITE B
COSTA MESA, CA 92626

BRENT C. ANDERSON, MANAGING MEMBER DATE

OWNER REP:
LA JOLLA CONSTRUCTION
717 ELM STREET, SUITE 320
SAN DIEGO, CA 92101
(619) 238-1900

PROJECT DATA:

SITE ADDRESS: 1000 BLK 32ND STREET, SAN DIEGO, CA 92102

APN	539-563-10-00
EXISTING BUILDING	NONE
CONSTRUCTION DATE	N/A
CALIFORNIA/ LAMBERT COORDINATES	207-1732
NAD83 COORDINATES	1841-6282

SITE DATA:

EX LOT SIZE =	42,322 SF (0.972 AC)
VACATED AREA =	12,024 SF (0.276 AC)
32 ND ROW DEDICATE=	580 SF (0.014 AC)
TOTAL LOT=	53,426 SF (1.231 AC)

PROPOSED USE:

CPIOO-CN-1.300

CONDOMINIUM STATEMENT:

THIS IS A RESIDENTIAL CONDOMINIUM PROJECT AS DEFINED IN SECTION 4125 OF THE CIVIL CODE OF THE STATE OF CALIFORNIA AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT. TOTAL NUMBER OF RESIDENTIAL UNITS IS 42.

PARKING:

TOTAL NUMBER OF PARKING SPACES PROVIDED = 72
TOTAL NUMBER OF UNITS = 42
18 – (3) BEDROOM
10 – (2) BEDROOM
14 – (1) BEDROOM
__x__ = __ PARKING SPACES REQUIRED

LEGAL DESCRIPTION:

LOTS 25 THROUGH 32, BLOCK 124 OF CHOATE'S ADDITION, MAP 187 AND FRACTIONAL LOT 25, BLOCK 124, E.W. MORSE'S SUBDIVISION, MAP 547 LOCATED IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, AND FILED IN THE OFFICE OF THE SAN DIEGO COUNTY RECORDER.

BENCHMARK:

SSBP AT CORNER OF 32ND STREET AND C STREET.
ELEV = 170.000 MSL, NGVD 29
CITY OF SAN DIEGO VERTICAL BENCHMARK BOOK.

MAPPING AND MONUMENTATION:

SEE PARCEL MAP (NO. PENDING). A DETAILED PROCEDURE OF SURVEY IS SHOWN ON THE PARCEL MAP. MONUMENTS SET AFTER IMPROVEMENTS CONSTRUCTED. NO CORNER RECORD NEEDED.

BASIS OF BEARING:

THE BASIS OF BEARINGS FOR THIS TENTATIVE MAP IS THE CENTER LINE OF 32ND STREET AS SHOWN ON PM 14465, FILE NO 87-339626, FILED JULY 16, 1987, IN THE COUNTY RECORDER'S OFFICE OF THE COUNTY OF SAN DIEGO, I.E. N 0°05'22" E.

EASEMENTS:

THIS MAP WAS PREPARED UTILIZING THE PRELIMINARY TITLE REPORT FROM FIRST AMERICAN TITLE COMPANY, ORDER NO. [illegible] (DS), DATED JANUARY 2, 2018, WHICH INDICATES NO EASEMENTS AFFECTING THE SUBJECT PROPERTY.

SOURCE OF TOPOGRAPHY:

ON THE GROUND FIELD SURVEY PERFORMED BY COFFEY ENGINEERING, INC., JOHN S. COFFEY, LS 8233 (EXPIRATION 12/20), ON SEPTEMBER 17, 2018.

ZONING:

DESIGNATION:	RM-1-1
PLANNED DISTRICT:	(NONE)
NUMBER OF PROPOSED LOTS:	1
T.M. ACREAGE:	1.231 ACRES

OVERLAY ZONES:

- AIRPORT INFLUENCE AREA
- FIRE BRUSH ZONES 300' BUFFER
- FIRE HAZARD SEVERITY ZONE

ENVIRONMENTALLY SENSITIVE LANDS:	YES
STEEP HILLSIDES:	NO
HISTORIC DISTRICT:	NO
DESIGNATED HISTORIC:	NO
GEO. HAZARD CATEGORIES:	52
EARTHQUAKE FAULT BUFFER:	NO
FAA PART 77 NOTIFICATION AREA:	YES

UTILITY NOTES:

EXISTING EDGE, CATV, AND PHONE LINES IN THE 32ND STREET AND ALLEY RIGHT OF WAYS ARE OVERHEAD.

THERE ARE NO EXISTING STREET LIGHTS ALONG THE PORTION OF 32ND STREET SOUTHERLY OF C STREET AND NORTHERLY OF BROADWAY. (SEE "EXISTING BUS STOP, STREET LIGHT, & FIRE HYDRANT PLAN" ON THIS SHEET.)

THERE IS AN EXISTING FIRE HYDRANT APPROXIMATELY [illegible] FEET NORTHERLY OF THE PROPERTY, ON THE SOUTHEAST CORNER OF 32ND STREET AND C STREET.

PER CITY RECORDS, THERE ARE NO POTABLE WATER SERVICES OR SANITARY SEWER LATERALS SERVING THE SUBJECT SITE. IF THERE ARE ANY PRESENT WHICH ARE NOT RECORDED, THE WATER SERVICES ARE TO BE KILLED AT THE MAIN AND THE SEWER LATERALS ARE TO BE ABANDONED (PLUGGED) AT THE PROPERTY LINE.

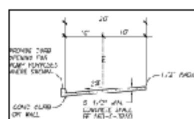
NO TREES OR SHRUBS WHOSE HEIGHT WILL BE 3' OR GREATER AT MATURITY SHALL BE INSTALLED OR RETAINED WITHIN 10' OF ANY PUBLICLY MAINTAINED WATER FACILITIES OR WITHIN 10' OF ANY PUBLICLY MAINTAINED SEWER FACILITIES.

GENERAL NOTES:

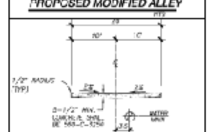
1. THERE ARE NO BUS STOP ADJACENT TO THE PROJECT SITE. THE CLOSEST BUS STOPS ARE AT THE CORNER OF POLK AVENUE & PARK BLVD.
2. TRASH CONTAINERS TO BE STORED WITHIN PRIVATE GARAGES ON-SITE.
3. NO OBSTRUCTION INCLUDING SOLID WALLS WITHIN THE VISIBILITY AREA SHALL EXCEED 3 FEET IN HEIGHT.
4. PLANT MATERIAL, OTHER THAN TREES WITHIN THE PUBLIC RIGHT-OF-WAY THAT IS LOCATED WITHIN THE VISIBILITY AREAS SHALL NOT EXCEED 24 INCHES IN HEIGHT MEASURED FROM THE TOP OF THE ADJACENT CURB.

N

SCALE: 1"=10'

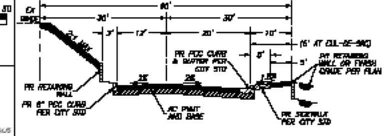


PROPOSED MODIFIED ALLEY

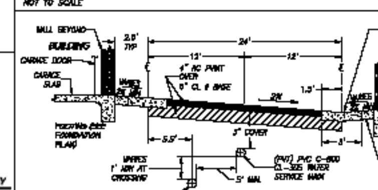


PROPOSED STANDARD ALLEY

NOTE:
ALLEY SECTIONS SHOWN PER NORTHERLY ADJACENT CITYMARK GOLDEN HILL, LLC PROJECT, VTM #211697.

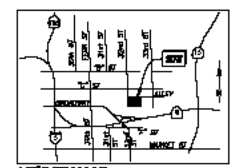


32ND STREET TYPICAL SECTION
NOT TO SCALE



SECTION A
NOT TO SCALE

NOTE:
SECTION TYPICAL FOR ALL BUILDINGS



VICINITY MAP
THOMAS BROS. MAP 1289-F3
NO SCALE

DRY UTILITIES

UTILITY	PRE- DEVELOPMENT STATUS	POST DEVELOPMENT STATUS
ELECTRIC	ABOVE GROUND– ALLEY AND STREET	UNDER GROUND (SERVICE ONLY)
CABLE TV	ABOVE GROUND– ALLEY AND STREET	UNDER GROUND (SERVICE ONLY)
TELEPHONE	ABOVE GROUND– ALLEY AND STREET	UNDER GROUND (SERVICE ONLY)

COFFEY ENGINEERING, INC.

TENTATIVE MAP NO. ____ I.O. ____

CITY OF SAN DIEGO, CALIFORNIA

TENTATIVE MAP

32nd & Broadway Rowhomes

1000 Block 32nd Street
San Diego, CA 92103

ORIGINAL 2/_/19

REVISIONS

TENTATIVE MAP DRAWING — C.1

DRAWN BY: DK
CHECKED BY: JC
SHEET 1 OF 1

APPENDIX B

Pertinent Sections of the City of San Diego Noise Element to the General Plan, City of San Diego Municipal Code, and California Building Code

NE-A.2. Assure the appropriateness of proposed developments relative to existing and future noise levels by consulting the guidelines for noise-compatible land use (shown on Table NE-3) to minimize the effects on noise-sensitive land uses.

NE-A.3. Limit future residential and other noise-sensitive land uses in areas exposed to high levels of noise.

NE-A.4. Require an acoustical study consistent with Acoustical Study Guidelines (Table NE-4) for proposed developments in areas where the existing or future noise level exceeds or would exceed the "compatible" noise level thresholds as indicated on the Land Use - Noise Compatibility Guidelines (Table NE-3), so that noise mitigation measures can be included in the project design to meet the noise guidelines.

NE-A.5. Prepare noise studies to address existing and future noise levels from noise sources that are specific to a community when updating community plans.

TABLE NE-3 Land Use - Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	60	65	70	75	
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		**45**			
Multiple Dwelling Units **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.*		**45**	**45***		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12Educational Facilities; Libraries; Museums; Child Care Facilities		**45**			
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities		**45**	**45**		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries, Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories			**50**	**50**	

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	60	65	70	75	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			**50**	**50**	
Visitor Accommodations		**45**	**45**	**45**	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters			**50**	**50**	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries					
Research & Development				**50**	

	Compatible	**Indoor Uses**	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	**Conditionally Compatible**	**Indoor Uses**	Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated t make the outdoor activities acceptable. Refer to Section I.
	Incompatible	**Indoor Uses**	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

§59.5.0404 Construction Noise

(a) It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; whether proposed night work is in the general public interest; and he shall prescribe such conditions, working times, types of construction equipment to be used, and permissible noise levels as he deems to be required in the public interest.

(b) Except as provided in subsection C. hereof, it shall be unlawful for any person, including The City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12–hour period from 7:00 a.m. to 7:00 p.m.

(c) The provisions of subsection B. of this section shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.

(Amended 1–3–1984 by O–16100 N.S.)

§59.5.0406 Refuse Vehicles and Parking Lot Sweepers

No person shall operate or permit to be operated a refuse compacting, processing, or collection vehicle between the hours of 7:00 p.m. to 6:00 a.m. or a parking lot sweeper between the hours of 7:00 p.m. to 7:00 a.m. in any residential area unless a permit has been applied for and granted by the Administrator.

("Refuse Vehicles" added 9–18–1973 by O–11122 N.S.; amended 9–22–1976 by O–11916 N.S.)

(Amended 6-9-2010 by O-19960 N.S.; effective 7-9-2010.)

1206.3 Courts. Courts shall be not less than 3 feet (914 mm) in width. Courts having windows opening on opposite sides shall be not less than 6 feet (1829 mm) in width. Courts shall be not less than 10 feet (3048 mm) in length unless bounded on one end by a public way or yard. For buildings more than two stories above grade plane, the court shall be increased 1 foot (305 mm) in width and 2 feet (610 mm) in length for each additional story. For buildings exceeding 14 stories above grade plane, the required dimensions shall be computed on the basis of 14 stories above grade plane.

1206.3.1 Court access. Access shall be provided to the bottom of courts for cleaning purposes.

1206.3.2 Air intake. Courts more than two stories in height shall be provided with a horizontal air intake at the bottom not less than 10 square feet (0.93 m^2) in area and leading to the exterior of the building unless abutting a yard or public way.

1206.3.3 Court drainage. The bottom of every court shall be properly graded and drained to a public sewer or other approved disposal system complying with the *California Plumbing Code*.

SECTION 1207
SOUND TRANSMISSION

1207.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent dwelling units and sleeping units or between dwelling units and sleeping units and adjacent public areas such as halls, corridors, stairways or service areas.

1207.2 Air-borne sound. Walls, partitions and floor/ceiling assemblies separating dwelling units and sleeping units from each other or from public or service areas shall have a sound transmission class of not less than 50, or not less than 45 if field tested, for air-borne noise when tested in accordance with ASTM E90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

1207.2.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined through testing in accordance with ASTM E90.

1207.3 Structure-borne sound. Floor/ceiling assemblies between dwelling units and sleeping units or between a dwelling unit or sleeping unit and a public or service area within the structure shall have an impact insulation class rating of not less than 50, or not less than 45 if field tested, when tested in accordance with ASTM E492.

Exception: *Impact sound insulation is not required for floor-ceiling assemblies over nonhabitable rooms or spaces not designed to be occupied, such as garages, mechanical rooms or storage areas.*

1207.4 Allowable interior noise levels. *Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.*

1207.5 Acoustical control. [BSC-CG] *See California Green Building Standards Code, Chapter 5, Division 5.5 for additional sound transmission requirements.*

SECTION 1208
INTERIOR SPACE DIMENSIONS

1208.1 Minimum room widths. Habitable spaces, other than a kitchen, shall be not less than 7 feet (2134 mm) in any plan dimension. Kitchens shall have a clear passageway of not less than 3 feet (914 mm) between counter fronts and appliances or counter fronts and walls.

[HCD 1] *For limited-density owner-built rural dwellings, there shall be no requirements for room dimensions, provided there is adequate light and ventilation and adequate means of egress.*

1208.2 Minimum ceiling heights. Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall have a ceiling height of not less than 7 feet (2134 mm).

Exceptions:

1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center shall be permitted to project not more than 6 inches (152 mm) below the required ceiling height.
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof.
3. The height of mezzanines and spaces below mezzanines shall be in accordance with Section 505.1.
4. Corridors contained within a dwelling unit or sleeping unit in a Group R occupancy shall have a ceiling height of not less than 7 feet (2134 mm).
5. ***[OSHPD 1, 2 & 3]*** *Minimum ceiling heights shall comply with Section 1224.4.10.*
6. ***[OSHPD 4]*** *Minimum ceiling heights shall comply with Section 1227.8*

1208.2.1 Furred ceiling. Any room with a furred ceiling shall be required to have the minimum ceiling height in two-thirds of the area thereof, but in no case shall the height of the furred ceiling be less than 7 feet (2134 mm).

1208.3 Room area. Every dwelling unit shall have no fewer than one room that shall have not less than 120 square feet (13.9 m^2) of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet (6.5 m^2).

Exception: Kitchens are not required to be of a minimum floor area.

APPENDIX C

Cadna Analysis Data and Results

Cadna Noise Model - Roadway Source Input - Calibration									
Name	ID	Lme Day (dBA)	Exact Traffic Count Data			Speed Limit (km/h)	SCS Distance (m)	Surface Type	Throttle
			Total (hourly)	Total% Medium /Heavy Trucks	%Heavy Trucks				
C Street	R_1	53.8	236	6.8	0.0	48	6.10	1	No
32nd Street	R_2	0.0	0	0.0	0.0	40	4.88	1	No
SR-94 WB	R_3	75.2	3896	4.2	19.0	105	15.85	1	No
SR-94 EB	R_4	75.2	3896	4.2	19.0	105	20.57	1	No
SR-94 WB Off Ramp	R_5	63.5	441	4.2	19.0	89	7.32	1	No
SR-94 WB On Ramp	R_6	49.5	93	4.2	19.0	48	4.27	1	No
Broadway	R_7	58.0	691	3.0	33.3	48	14.63	1	No

Cadna Noise Model - Roadway Source Input - Current Model									
Name	ID	Lme Day (dBA)	Exact Traffic Count Data			Speed Limit (km/h)	SCS Distance (m)	Surface Type	Throttle
			Total (hourly)	Total% Medium /Heavy Trucks	%Heavy Trucks				
C Street	R_1	55.1	432	1.0	50.0	48	6.10	1	No
32nd Street	R_2	43.5	46	1.0	50.0	40	4.88	1	No
SR-94 WB	R_3	77.9	7314	4.2	19.0	105	15.85	1	No
SR-94 EB	R_4	77.9	7314	4.2	19.0	105	20.57	1	No
SR-94 WB Off Ramp	R_5	66.2	828	4.2	19.0	89	7.32	1	No
SR-94 WB On Ramp	R_6	52.3	175	4.2	19.0	48	4.27	1	No
Broadway	R_7	60.7	1297	3.0	33.3	48	14.63	1	No

Cadna Noise Model - Roadway Source Input - Future Model									
Name	ID	Lme Day (dBA)	Exact Traffic Count Data			Speed Limit (km/h)	SCS Distance (m)	Surface Type	Throttle
			Total (hourly)	Total% Medium /Heavy Trucks	%Heavy Trucks				
C St	R_1	57.6	782	1.0	50.0	48	6.10	1	No
32nd Street	R_2	46.5	92	1.0	50.0	40	6.10	1	No
SR-94 WB	R_3	78.0	7507	4.2	19.0	105	15.85	1	No
SR-94 EB	R_4	78.7	8712	4.2	19.0	105	20.57	1	No
SR-94 WB Off Ramp	R_5	64.5	552	4.2	19.0	89	7.32	1	No
SR-94 WB On Ramp	R_6	53.8	248	4.2	19.0	48	4.27	1	No
Broadway	R_7	60.4	1196	3.0	33.3	48	14.63	1	No

Cadna Noise Model - Roadway Source Input - Worst-Case Model									
Name	ID	Lme Day (dBA)	Exact Traffic Count Data			Speed Limit (km/h)	SCS Distance (m)	Surface Type	Throttle
			Total (hourly)	Total% Medium /Heavy Trucks	%Heavy Trucks				
C Street	R_1	57.6	782	1.0	50.0	48	6.10	1	No
32nd Street	R_2	46.5	92	1.0	50.0	40	6.10	1	No
SR-94 WB	R_3	78.0	7507	4.2	19.0	105	15.85	1	No
SR-94 EB	R_4	78.7	8712	4.2	19.0	105	20.57	1	No
SR-94 WB Off Ramp	R_5	66.2	828	4.2	19.0	89	7.32	1	No
SR-94 WB On Ramp	R_6	53.8	248	4.2	19.0	48	4.27	1	No
Broadway	R_7	60.7	1297	3.0	33.3	48	14.63	1	No

Cadna Noise Model - Roadway Source Geometry (All Models)					
Name	ID	Coordinates			
		X	Y	Z	Ground
		(m)	(m)	(m)	(m)
C Street	R_1	299.87	481.79	61.10	60.96
		386.34	482.48	61.10	60.96
		434.39	483.00	61.10	60.96
		512.41	484.27	61.10	60.96
		563.17	484.46	55.00	54.86
		607.98	484.55	49.00	48.77
		654.77	485.10	42.80	42.67
		720.50	484.74	38.50	38.00
		786.49	485.08	42.80	42.67
		942.90	485.43	42.80	42.67
32nd Street (Calibration and Current Models Only)	R_2	552.15	370.98	50.00	49.90
		549.79	424.72	51.00	50.90
		548.83	473.14	55.00	54.90
		549.39	600.15	57.00	56.90
SR-94 WB	R_3	1028.54	452.56	31.00	30.90
		863.75	390.13	34.00	33.90
		785.88	359.50	36.00	35.90
		707.02	329.40	38.00	37.90
		575.36	282.16	43.00	42.90
		460.09	239.25	46.00	35.00
		309.92	184.97	49.00	47.90
SR-94 EB	R_4	318.49	165.86	49.00	48.90
		474.45	221.91	43.00	41.90
		545.04	246.95	44.00	43.90
		714.54	309.36	40.00	39.90
		793.20	329.84	36.00	35.90
		875.89	348.51	33.00	32.90
		1064.81	382.52	25.00	24.90
SR-94 WB Off Ramp	R_5	653.04	321.57	40.00	39.90
		596.12	307.50	41.00	40.90
		559.36	308.55	43.00	42.90
		521.49	321.05	44.00	43.90
		490.04	332.07	45.00	44.90
		464.84	338.37	45.00	44.90
		442.78	333.96	45.00	44.90
		425.77	324.93	44.00	43.90
		402.24	311.91	44.00	43.90
		370.73	313.17	46.00	45.90
SR-94 WB On Ramp	R_6	408.77	285.06	43.00	42.90
		449.31	327.28	44.00	43.90
		467.37	329.17	44.00	43.90
		482.70	322.66	44.00	43.90
		496.78	309.64	44.00	43.90
		499.51	297.66	44.00	43.90
		500.98	284.22	44.00	43.90
		496.15	272.67	44.00	43.90
		483.54	257.75	45.00	44.90
Broadway	R_7	553.49	133.88	30.00	29.90
		538.40	166.57	31.00	30.90
		504.89	200.34	33.00	32.90
		490.77	215.53	35.00	34.90
		437.52	260.79	40.00	39.90
		369.24	313.59	46.00	45.90
		325.57	348.92	51.00	50.90
		299.90	360.43	53.00	52.90

Cadna Noise Model - Roadway Source Geometry (Future and Worst-Case Only)					
Name	ID	Coordinates			
		X	Y	Z	Ground
		(m)	(m)	(m)	(m)
32nd Street	R_2	548.78	370.98	50.00	49.90
		548.33	424.23	51.00	50.90
		548.83	473.14	55.00	54.90
		549.39	600.15	57.00	56.90

Cadna Noise Model - Buildings - Worst-Case Façade Model					
Name	ID	Coordinates			
		X	Y	Z	Ground
		(m)	(m)	(m)	(m)
Building 1	B1	560.80	411.61	60.24	50.24
		560.85	420.16	60.24	50.24
		568.98	420.11	60.24	50.24
		569.11	420.11	59.71	49.74
		576.54	420.11	59.71	49.74
		576.67	420.11	59.34	49.34
		581.36	420.12	59.34	49.34
		581.44	420.13	58.98	48.98
		586.24	420.13	58.98	48.98
		586.32	420.13	58.75	48.75
		593.69	420.14	58.75	48.75
		593.82	420.13	58.23	48.23
		602.02	420.16	58.23	48.23
		602.06	411.69	58.23	48.23
		593.82	411.66	58.23	48.23
		593.76	411.66	58.75	48.75
		586.36	411.64	58.75	48.75
		586.25	411.64	58.98	48.98
		581.44	411.66	58.98	48.98
		581.36	411.67	59.34	49.34
		576.65	411.64	59.34	49.34
		576.58	411.63	59.71	49.71
		569.21	411.62	59.71	49.71
		569.11	411.62	60.24	50.24
Building 2	B2	605.00	420.21	57.10	47.10
		625.62	420.21	57.10	47.10
		625.73	420.18	55.99	45.99
		646.31	420.18	55.99	45.99
		646.25	411.65	55.99	45.99
		625.80	411.62	55.99	45.99
		625.65	411.62	57.10	47.10
		605.12	411.67	57.10	47.10
Building 3	B3-1	560.78	394.39	59.96	49.96
		560.77	402.84	59.96	49.96
		576.57	402.83	59.96	49.96
		576.62	394.42	59.96	49.96
	B3-2	576.62	394.42	58.98	48.98
		576.57	402.83	58.98	48.98
		594.44	402.85	58.98	48.98
		594.42	394.41	58.98	48.98
	B3-3	576.62	385.94	55.95	45.95
		576.62	394.42	55.95	45.95
		594.42	394.41	55.95	45.95
		594.42	385.96	55.95	45.95
	B3-4	560.79	385.93	56.72	46.72
		560.78	394.39	56.72	46.72
		576.62	394.42	56.72	46.72
		576.62	385.94	56.72	46.72

Cadna Noise Model - Buildings - Worst-Case Façade Model					
Name	ID	Coordinates			
		X	Y	Z	Ground
		(m)	(m)	(m)	(m)
Building 4	B4-1	610.88	402.79	56.95	46.95
		626.60	402.79	56.95	46.95
		626.65	394.39	56.95	46.95
		610.82	394.39	56.95	46.95
	B4-2	626.65	394.39	55.97	45.97
		626.60	402.79	55.97	45.97
		644.40	402.87	55.97	45.97
		644.46	394.37	55.97	45.97
	B4-3	644.46	394.37	52.95	42.95
		644.42	385.96	52.95	42.95
		626.66	385.83	52.95	42.95
		626.65	394.39	52.95	42.95
	B4-4	610.79	394.36	53.92	43.92
		626.65	394.39	53.92	43.92
		626.66	385.86	53.92	43.92
		610.81	385.90	53.92	43.92
Building 5	B5	567.33	377.12	56.52	46.52
		583.08	377.08	56.52	46.52
		583.19	377.08	55.54	45.54
		601.03	377.08	55.54	45.54
		601.07	368.65	55.54	45.54
		583.21	368.64	55.54	45.54
		583.10	368.62	56.52	46.52
		567.30	368.65	56.52	46.52
Building 6	B6	603.93	377.1	54.59	44.59
		612.01	377.14	54.59	44.59
		612.16	377.13	53.83	43.83
		629.19	377.08	53.83	43.83
		629.42	377.04	53.03	43.03
		637.43	377.13	53.03	43.03
		637.53	368.60	53.03	43.03
		629.39	368.60	53.03	43.03
		629.31	368.58	53.83	43.83
		612.14	368.61	53.83	43.83
		612.08	368.62	54.59	44.59
		603.93	368.66	54.59	44.59

Cadna Noise Model - Existing Noise Levels at Receivers - Traffic Calibration						
Name	ID	Level Lr	Height	Coordinates		
				X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
Calibration	Cal1	61.6	1.52	557.82	473.97	1.52

Cadna Noise Model - Noise Levels at Receivers - Worst-Case Facade					
Name	Level Traffic	Height	Coordinates		
			X	Y	Z
	CNEL	(m)	(m)	(m)	(m)
F1-2	62.0	55.09	560.64	415.88	55.09
F2-2	50.3	54.56	572.92	420.37	54.56
F3-2	49.8	53.50	590.10	420.35	53.50
F4-2	56.4	53.08	602.17	415.59	53.08
F5-2	55.6	53.08	590.00	411.55	53.08
F6-2	54.3	54.56	572.93	411.55	54.56
F7-2	56.2	51.65	604.88	415.50	51.65
F8-2	49.9	51.65	617.21	420.38	51.65
F9-2	50.4	50.84	634.05	420.42	50.84
F10-2	69.8	50.84	646.38	415.75	50.84
F11-2	66.1	50.84	634.01	411.38	50.84
F12-2	61.3	51.65	617.17	411.38	51.65
F13-2	64.2	54.81	560.68	399.10	54.81
F14-2	51.4	54.81	571.50	403.09	54.81
F15-2	51.3	53.83	584.50	403.12	53.83
F16-2	52.2	53.83	594.58	399.35	53.83
F17-2	55.8	50.80	594.52	389.73	50.80
F18-2	60.2	50.80	584.52	385.76	50.80
F19-2	62.4	51.57	571.15	385.73	51.57
F20-2	61.7	51.57	560.67	389.63	51.57
F21-2	48.8	51.80	610.67	399.06	51.80
F22-2	52.5	51.80	624.15	403.18	51.80
F23-2	53.0	50.82	634.72	403.19	50.82
F24-2	70.6	50.82	644.68	399.19	50.82
F25-2	70.9	47.80	644.65	389.76	47.80
F26-2	70.3	47.80	635.04	385.85	47.80
F27-2	66.5	48.77	624.52	385.83	48.77
F28-2	37.8	48.77	610.63	389.88	48.77
F29-2	67.0	51.37	567.19	373.42	51.37
F30-2	54.8	51.37	578.67	377.35	51.37
F31-2	54.4	50.39	589.91	377.46	50.39
F32-2	66.9	50.39	601.09	373.39	50.39
F33-2	73.4	50.39	589.88	368.51	50.39
F34-2	73.1	51.37	578.25	368.51	51.37
F35-2	67.2	49.44	603.76	373.43	49.44
F36-2	54.8	48.68	616.50	377.37	48.68
F37-2	55.9	48.68	627.15	377.34	48.68
F38-2	71.9	47.88	637.60	373.30	47.88
F39-2	74.1	48.68	627.21	368.54	48.68
F40-2	73.9	48.68	616.20	368.59	48.68

Cadna Noise Model - Noise Levels at Receivers - Worst-Case Facade					
Name	Level Traffic	Height	Coordinates		
			X	Y	Z
	CNEL	(m)	(m)	(m)	(m)
F1-3	64.1	58.42	560.64	415.88	58.42
F2-3	51.0	57.89	572.92	420.37	57.89
F3-3	50.4	56.83	590.10	420.35	56.83
F4-3	57.0	56.41	602.17	415.59	56.41
F5-3	57.5	56.41	590.00	411.55	56.41
F6-3	58.0	57.89	572.93	411.55	57.89
F7-3	56.3	54.98	604.88	415.50	54.98
F8-3	51.9	54.98	617.21	420.38	54.98
F9-3	53.2	54.17	634.05	420.42	54.17
F10-3	69.7	54.17	646.38	415.75	54.17
F11-3	66.0	54.17	634.01	411.38	54.17
F12-3	61.9	54.98	617.17	411.38	54.98
F13-3	65.6	58.14	560.68	399.10	58.14
F14-3	52.7	58.14	571.50	403.09	58.14
F15-3	52.6	57.16	584.50	403.12	57.16
F16-3	59.7	57.16	594.58	399.35	57.16
F17-3	57.2	54.13	594.52	389.73	54.13
F18-3	60.6	54.13	584.52	385.76	54.13
F19-3	64.3	54.90	571.15	385.73	54.90
F20-3	66.0	54.90	560.67	389.63	54.90
F21-3	53.7	55.13	610.67	399.06	55.13
F22-3	55.6	55.13	624.15	403.18	55.13
F23-3	56.1	54.15	634.72	403.19	54.15
F24-3	70.5	54.15	644.68	399.19	54.15
F25-3	71.0	51.13	644.65	389.76	51.13
F26-3	70.2	51.13	635.04	385.85	51.13
F27-3	66.6	52.10	624.52	385.83	52.10
F28-3	44.4	52.10	610.63	389.88	52.10
F29-3	67.9	54.70	567.19	373.42	54.70
F30-3	54.3	54.70	578.67	377.35	54.70
F31-3	55.0	53.72	589.91	377.46	53.72
F32-3	66.8	53.72	601.09	373.39	53.72
F33-3	73.3	53.72	589.88	368.51	53.72
F34-3	73.1	54.70	578.25	368.51	54.70
F35-3	67.0	52.77	603.76	373.43	52.77
F36-3	55.2	52.01	616.50	377.37	52.01
F37-3	56.1	52.01	627.15	377.34	52.01
F38-3	71.9	51.21	637.60	373.30	51.21
F39-3	74.0	52.01	627.21	368.54	52.01
F40-3	73.8	52.01	616.20	368.59	52.01

Cadna Noise Model - Noise Levels at Receivers - Worst-Case Outdoor Use					
Name	Level Traffic	Height	Coordinates		
			X	Y	Z
	CNEL	(m)	(m)	(m)	(m)
OU1	63.0	54.79	560.62	411.48	54.79
OU2	55.6	54.26	570.22	411.41	54.26
OU3	54.2	53.89	577.73	411.45	53.89
OU4	57.2	53.53	585.36	411.45	53.53
OU5	58.9	53.30	592.44	411.47	53.30
OU6	61.2	52.78	602.21	411.34	52.78
OU7	60.4	51.65	604.90	411.49	51.65
OU8	60.3	51.65	614.33	411.40	51.65
OU9	62.5	51.65	621.61	411.43	51.65
OU10	64.4	50.54	629.55	411.37	50.54
OU11	67.4	50.54	637.14	411.33	50.54
OU12	70.0	50.54	646.28	411.38	50.54
OU13	63.7	54.51	560.74	402.99	54.51
OU14	51.1	54.51	570.30	403.02	54.51
OU15	50.6	53.53	577.78	403.06	53.53
OU16	51.1	53.53	585.26	403.06	53.53
OU17	55.1	53.53	594.56	403.06	53.53
OU18	61.5	50.50	594.55	385.80	50.50
OU19	58.8	50.50	585.38	385.75	50.50
OU20	56.7	50.50	577.82	385.65	50.50
OU21	63.5	51.27	570.50	385.73	51.27
OU22	65.8	51.27	560.58	385.75	51.27
OU23	54.1	51.50	610.68	403.01	51.50
OU24	52.5	51.50	625.16	403.21	51.50
OU25	52.0	50.52	627.71	403.21	50.52
OU26	52.6	50.52	635.25	403.11	50.52
OU27	70.2	50.52	644.61	402.95	50.52
OU28	72.0	47.50	644.57	385.76	47.50
OU29	70.4	47.50	635.43	385.69	47.50
OU30	67.3	47.50	627.36	385.65	47.50
OU31	66.8	48.47	625.25	385.75	48.47
OU32	62.5	48.47	610.69	385.65	48.47
OU33	71.2	51.07	568.83	369.80	51.07
OU34	71.9	51.07	576.93	369.49	51.07
OU35	71.8	50.09	584.21	369.50	50.09
OU36	72.3	50.09	591.88	369.43	50.09
OU37	73.4	50.09	599.83	369.57	50.09
OU38	72.6	49.14	605.15	369.55	49.14
OU39	73.5	48.38	617.94	369.44	48.38
OU40	72.8	48.38	620.84	369.42	48.38
OU41	72.9	48.38	628.20	369.44	48.38
OU42	74.1	47.58	636.17	369.56	47.58
OU43	62.2	1.52	565.12	373.30	48.70
OU44	60.6	1.52	558.95	391.33	50.58
OU45	51.8	1.52	596.52	394.39	48.17
OU46	50.9	1.52	608.49	394.74	47.58

Cadna Noise Model - Worst-Case Noise Levels at Receivers - Outdoor Use Barrier							
Name	No Barrier	With Barrier	Barrier Height	Z-Extent	Barrier Coordinates		
					X	Y	Z
	CNEL	CNEL	(ft)	(m)	(m)	(m)	(m)
OU11	67.4	59.9	4.0	1.22	635.68	411.63	50.54
					635.73	410.00	50.54
					638.39	410.01	50.54
					638.37	411.62	50.54
OU12	70.0	60.8	4.5	1.37	645.27	411.73	50.68
					645.26	410.21	50.68
					647.29	410.21	50.68
					647.28	413.00	50.68
					646.13	412.99	50.68
OU22	65.8	60.6	4.0	1.22	560.80	387.00	51.27
					559.57	387.00	51.27
					559.58	384.75	51.27
					561.58	384.75	51.27
					561.58	385.93	51.27
OU27	70.2	63.0	4.0	1.22	643.60	402.87	50.52
					643.61	409.95	50.52
					645.61	403.95	50.52
					645.60	401.00	50.52
					644.43	400.98	50.52
OU28	72.0	63.1	4.5	1.37	643.58	386.08	47.64
					643.57	384.76	47.64
					645.57	384.76	47.64
					645.57	387.00	47.64
					644.24	387.00	47.64
OU29	70.4	63.7	4.0	1.22	634.43	387.00	47.50
					634.43	384.69	47.50
					636.43	384.69	47.50
					636.43	387.00	47.50
OU30	67.3	60.6	4.0	1.22	626.36	387.00	47.50
					626.36	384.65	47.50
					628.36	384.65	47.50
					628.36	387.00	47.50
OU31	66.8	60.2	4.0	1.22	624.25	387.00	48.47
					624.25	384.75	48.47
					626.25	384.75	48.47
					626.25	387.00	48.47
OU33	71.2	64.9	4.0	1.22	567.39	371.01	51.07
					567.34	368.66	51.07
					570.31	368.66	51.07
OU34	71.9	62.8	4.5	1.37	575.54	368.64	51.22
					578.47	368.59	51.22
OU35	71.8	62.7	4.5	1.37	582.58	368.61	50.24
					585.71	368.60	50.24
OU36	72.3	63.1	4.5	1.37	590.25	368.62	50.24
					593.66	368.61	50.24
OU37	73.4	64.2	4.5	1.37	598.30	368.61	50.24
					601.13	368.62	50.24
					601.04	370.89	50.24
OU38	72.6	63.4	4.5	1.37	603.94	370.72	49.29
					603.93	368.69	49.29
					606.72	368.65	49.29
OU39	73.5	63.8	4.5	1.37	616.50	368.60	48.53
					619.40	368.60	48.53
					619.40	370.59	48.53
OU40	72.8	63.6	4.5	1.37	619.40	368.60	48.53
					622.20	368.58	48.53
OU41	72.9	63.8	4.5	1.37	626.69	368.60	48.53
					629.59	368.61	48.53
OU42	74.1	65.0	4.5	1.37	634.58	368.62	47.73
					637.57	368.61	47.73
					637.63	370.95	47.73

Cadna Noise Model - Sound Levels - All Phases													
Name	ID	Type	Weight	Oktave Spectrum (dB)									Source
				63	125	250	500	1000	2000	4000	8000	A	lin	
Excavator	S1	Lw (c)		108.0	116.0	101.0	104.0	101.0	99.0	94.0	88.0	107.0	117.2	DEFRA
Front End Loader	S2	Lw (c)		113.0	113.0	102.0	104.0	100.0	98.0	97.0	89.0	106.5	116.6	DEFRA
Dump Truck	S3	Lw (c)		119.0	115.0	106.0	104.0	106.0	103.0	99.0	91.0	110.2	120.9	DEFRA
Air Compressor	S4	Lw (c)		115.0	104.0	95.0	90.0	88.0	86.0	89.0	78.0	96.5	115.4	DEFRA
Telescopic Forklift	S5	Lw (c)		116.0	110.0	100.0	98.0	95.0	93.0	87.0	78.0	101.5	117.2	DEFRA
Concrete Mixer Truck	S6	Lw (c)		103.0	104.0	110.0	103.0	100.0	98.0	94.0	91.0	106.7	112.7	DEFRA
Concrete Pump Truck	S7	Lw (c)		113.0	113.0	103.0	102.0	100.0	99.0	93.0	85.0	105.9	116.6	DEFRA
Paver	S8	Lw (c)		109.0	108.0	103.0	103.0	102.0	100.0	93.0	87.0	106.6	113.2	DEFRA
Roller	S9	Lw (c)		122.0	117.0	119.0	114.0	109.0	104.0	96.0	88.0	115.6	125.1	FHWA

Cadna Noise Model - Point Sources - Phase 1, West									
Name	ID	Result. PWL	Lw / Li		Operating Time (min)	Height	Coordinates		
		Day	Type	Value			X	Y	Z
		(dBA)				(m)	(m)	(m)	(m)
Excavator	S1	107.0	Lw	S1	24	1.52	578.12	393.15	47.64
Front End Loader	S2	106.5	Lw	S2	24	1.52	578.12	393.15	47.64
Dump Truck	S3	110.2	Lw	S3	24	1.52	578.12	393.15	47.64

Cadna Noise Model - Point Sources - Phase 1, East									
Name	ID	Result. PWL	Lw / Li		Operating Time (min)	Height	Coordinates		
		Day	Type	Value			X	Y	Z
		(dBA)				(m)	(m)	(m)	(m)
Excavator	S1	107.0	Lw	S1	24	1.52	624.24	394.08	44.98
Front End Loader	S2	106.5	Lw	S2	24	1.52	624.24	394.08	44.98
Dump Truck	S3	110.2	Lw	S3	24	1.52	624.24	394.08	44.98

Cadna Noise Model - Point Sources - Phase 2, West									
Name	ID	Result. PWL	Lw / Li		Operating Time (min)	Height	Coordinates		
		Day	Type	Value			X	Y	Z
		(dBA)				(m)	(m)	(m)	(m)
Air Compressor	S4	96.5	Lw	S4	24	1.52	578.12	393.28	49.20
Telescopic Forkilft	S5	101.5	Lw	S5	24	1.52	578.12	393.28	49.20
Concrete Mixer Truck	S6	106.7	Lw	S6	24	1.52	578.12	393.28	49.20
Concrete Pump Truck	S7	105.9	Lw	S7	12	1.52	578.12	393.28	49.20
Paver	S8	106.6	Lw	S8	30	1.52	578.12	393.28	49.20
Roller	S9	115.6	Lw	S9	12	1.52	578.12	393.28	49.20

Cadna Noise Model - Point Sources - Phase 2, West									
Name	ID	Result. PWL	Lw / Li		Operating Time (min)	Height	Coordinates		
		Day	Type	Value			X	Y	Z
		(dBA)				(m)	(m)	(m)	(m)
Air Compressor	S4	96.5	Lw	S4	24	1.52	624.41	393.72	46.43
Telescopic Forkilft	S5	101.5	Lw	S5	24	1.52	624.41	393.72	46.43
Concrete Mixer Truck	S6	106.7	Lw	S6	24	1.52	624.41	393.72	46.43
Concrete Pump Truck	S7	105.9	Lw	S7	12	1.52	624.41	393.72	46.43
Paver	S8	106.6	Lw	S8	30	1.52	624.41	393.72	46.43
Roller	S9	115.6	Lw	S9	12	1.52	624.41	393.72	46.43

Cadna Noise Model - Terrain Contours - All Phases			
Contour Line	Coordinates		
	X	Y	Z
	(m)	(m)	(m)
140	636.71	377.82	42.67
	639.19	385.12	42.67
	638.23	385.85	42.67
140	633.03	475.44	42.67
	633.03	472.08	42.67
140.0	643.70	421.59	42.67
	649.39	419.04	42.67
142.0	626.59	377.91	43.28
	629.00	385.16	43.28
	628.31	385.75	43.28
144.0	616.53	377.91	43.89
	618.91	385.16	43.89
	617.89	385.85	43.89
146.0	606.21	377.91	44.50
	609.29	386.65	44.50
148.0	596.03	377.91	45.11
	598.61	385.03	45.11
	600.16	386.88	45.11
	607.11	389.06	45.11
150.0	640.31	402.85	45.72
	637.27	403.68	45.72
	639.78	410.92	45.72
	638.99	411.52	45.72
150.0	598.71	390.28	45.72
	606.31	392.04	45.72
150.0	586.01	377.88	45.72
	588.29	384.86	45.72
150.0	628.35	421.59	45.72
	642.64	415.43	45.72
150.0	613.11	475.45	45.72
	612.97	472.49	45.72
150.0	635.01	471.76	45.72
	636.97	470.38	45.72
	637.85	469.11	45.72
	638.65	467.22	45.72
	638.81	465.72	45.72
	638.61	453.45	45.72
	638.65	447.32	45.72
	638.94	438.78	45.72
	638.94	435.41	45.72
	638.33	434.68	45.72
	637.88	434.17	45.72
	637.80	432.58	45.72
	637.59	430.87	45.72
	637.32	429.63	45.72
	636.62	428.83	45.72
	635.92	428.63	45.72
	635.43	428.59	45.72
152	628.04	403.28	46.33
	627.08	403.75	46.33
	629.56	410.92	46.33
	628.54	411.75	46.33
152	598.94	393.82	46.33
	606.54	395.54	46.33
152	575.78	377.91	46.33
	578.30	385.26	46.33
154	618.35	403.18	46.94
	616.86	403.65	46.94
	619.44	410.92	46.94
	618.45	411.78	46.94
154	598.90	396.83	46.94
	605.45	399.05	46.94
	607.37	400.17	46.94

Cadna Noise Model - Terrain Contours - All Phases			
Contour Line	Coordinates		
	X	Y	Z
	(m)	(m)	(m)
154	565.23	376.66	46.94
	565.07	377.95	46.94
	567.48	385.16	46.94
	566.52	385.82	46.94
156	597.91	399.94	47.55
	606.71	403.15	47.55
	609.32	410.82	47.55
	608.16	411.68	47.55
158	595.46	402.82	48.16
	596.95	404.54	48.16
	599.14	410.86	48.16
	598.14	411.68	48.16
160	589.74	402.79	48.77
	586.47	403.75	48.77
	588.92	410.66	48.77
	588.06	411.49	48.77
160	539.86	375.72	48.77
	546.97	372.90	48.77
	561.16	378.39	48.77
160	612.97	421.49	48.77
	626.14	416.00	48.77
160	593.36	475.60	48.77
	593.41	472.10	48.77
	613.83	469.45	48.77
	623.39	467.30	48.77
	629.76	467.23	48.77
	630.69	466.36	48.77
162	579.06	402.82	49.38
	575.75	403.61	49.38
	578.20	411.06	49.38
	577.24	411.75	49.38
162	543.37	387.06	49.38
	547.07	385.57	49.38
	553.79	388.15	49.38
164	543.43	399.73	49.99
	547.14	398.27	49.99
	553.16	400.69	49.99
166	543.37	408.86	50.60
	547.24	407.80	50.60
	553.19	409.35	50.60
168	543.40	417.99	51.21
	547.07	416.83	51.21
	553.29	418.85	51.21
168	572.27	466.54	51.21
	572.49	468.68	51.21
	574.00	470.26	51.21
	575.46	470.65	51.21
	577.85	472.03	51.21
	577.99	472.88	51.21
170	571.09	466.50	51.82
	571.43	469.10	51.82
	573.57	471.81	51.82
	573.76	472.72	51.82
172	569.73	466.46	52.43
	569.72	469.31	52.43
	570.65	472.71	52.43
174	568.51	466.48	53.04
	568.45	467.87	53.04
	565.05	472.57	53.04
176	564.96	466.61	53.64
	563.80	469.17	53.64
	561.32	472.63	53.64

Cadna Noise Model - Noise Levels at Receivers - Phase 1, West					
Name	Level Lr Day	Height	Coordinates		
			X	Y	Z
	(dBA)	(m)	(m)	(m)	(m)
R1-1	50	1.52	649.64	427.94	44.94
R2-1	65.1	1.52	543.59	398.00	51.43
R3-1	64.1	1.52	597.67	428.01	51.99
R4-1	48.4	1.52	673.08	399.50	39.80
R1-2	54.5	4.57	649.64	427.94	47.89
R2-2	66.1	4.57	543.59	398.00	54.48
R3-2	64.7	4.57	597.67	428.01	55.04
R4-2	53.1	4.57	673.08	399.50	42.85

Cadna Noise Model - Noise Levels at Receivers - Phase 1, East					
Name	Level Lr Day	Height	Coordinates		
			X	Y	Z
	(dBA)	(m)	(m)	(m)	(m)
R1-1	59.9	1.52	649.64	427.94	44.94
R2-1	56.2	1.52	543.59	398.00	51.43
R3-1	63.3	1.52	597.67	428.01	51.99
R4-1	57.7	1.52	673.08	399.50	39.80
R1-2	64	4.57	649.64	427.94	47.89
R2-2	58.1	4.57	543.59	398.00	54.48
R3-2	64	4.57	597.67	428.01	55.04
R4-2	62.2	4.57	673.08	399.50	42.85

Cadna Noise Model - Noise Levels at Receivers - Phase 2, West					
Name	Level Lr Day	Height	Coordinates		
			X	Y	Z
	(dBA)	(m)	(m)	(m)	(m)
R1-1	52.2	1.52	649.64	427.94	44.94
R2-1	66.3	1.52	543.59	398.00	51.43
R3-1	65.2	1.52	597.67	428.01	51.99
R4-1	50.3	1.52	673.08	399.50	39.80
R1-2	56.5	4.57	649.64	427.94	47.89
R2-2	67.6	4.57	543.59	398.00	54.48
R3-2	66.2	4.57	597.67	428.01	55.04
R-2	55	4.57	673.08	399.50	42.85

Cadna Noise Model - Noise Levels at Receivers - Phase 2, East					
Name	Level Lr Day	Height	Coordinates		
			X	Y	Z
	(dBA)	(m)	(m)	(m)	(m)
R1-1	61.6	1.52	649.64	427.94	44.94
R2-1	56.9	1.52	543.59	398.00	51.43
R3-1	64.2	1.52	597.67	428.01	51.99
R4-1	59.5	1.52	673.08	399.50	39.80
R1-2	65.4	4.57	649.64	427.94	47.89
R2-2	59.4	4.57	543.59	398.00	54.48
R3-2	65.3	4.57	597.67	428.01	55.04
R4-2	63.7	4.57	673.08	399.50	42.85

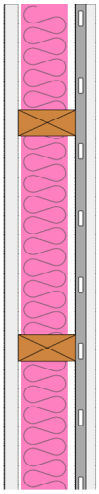
APPENDIX D

Sound Insulation Prediction Results

Sound Insulation Prediction (v9.0.16)

margin of error is generally within STC +/- 3 dB
- Key No. 1866
Job Name:32nd and Broadway
Job No.:S190303 Initials:rcowell
Date.:3/15/2019
File Name:exterior - resilient channels.ixl

Notes:Exterior Wall Assembly - Resilient Channels



STC 59
OITC 43

Mass-air-mass resonant frequency = =54 Hz

Panel Size = 8.9 ft x 13.1 ft

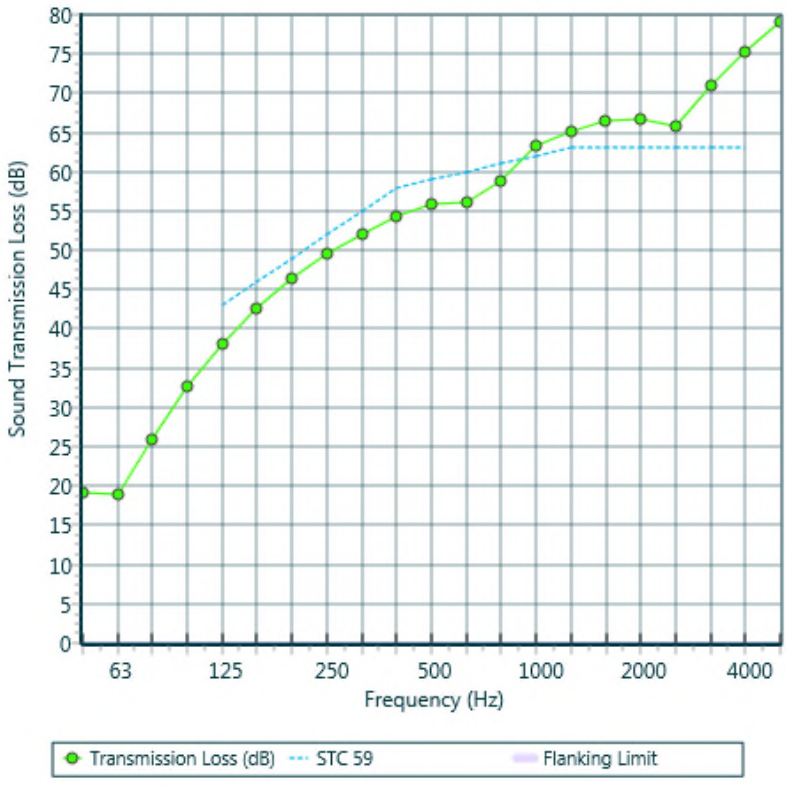
Partition surface mass = 12.4 lb/ft2

System description

Panel 1 : 1 x 0.87 in -Coat Plaster (sand:gypsum =3:1)

Frame: Timber stud + Resilient rail/bar (3.7 in x 1.8 in), Stud spacing 16 in ; Cavity Width 4.17 in , 1 x fiberglass (0.6 lb/ft3) Thickness 3.0 in
Panel 2 : 1 x 0.6299 in Type X Gypsum Board

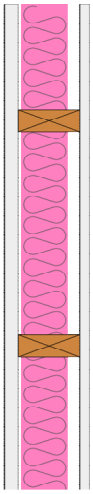
freq.(Hz)	TL(dB)	TL(dB)
50	19	
63	19	20
80	26	
100	33	
125	38	36
160	43	
200	46	
250	50	49
315	52	
400	54	
500	56	55
630	56	
800	59	
1000	63	62
1250	65	
1600	66	
2000	67	66
2500	66	
3150	71	
4000	75	74
5000	79	



Sound Insulation Prediction (v9.0.16)

margin of error is generally within STC +/- 3 dB
- Key No. 1866
Job Name:32nd and Broadway
Job No.:S190303 Initials:rcowell
Date.:3/15/2019
File Name:

Notes:Exterior Wall Assembly



STC 38
OITC 30

Mass-air-mass resonant frequency = =56 Hz

Panel Size = 8.9 ft x 13.1 ft

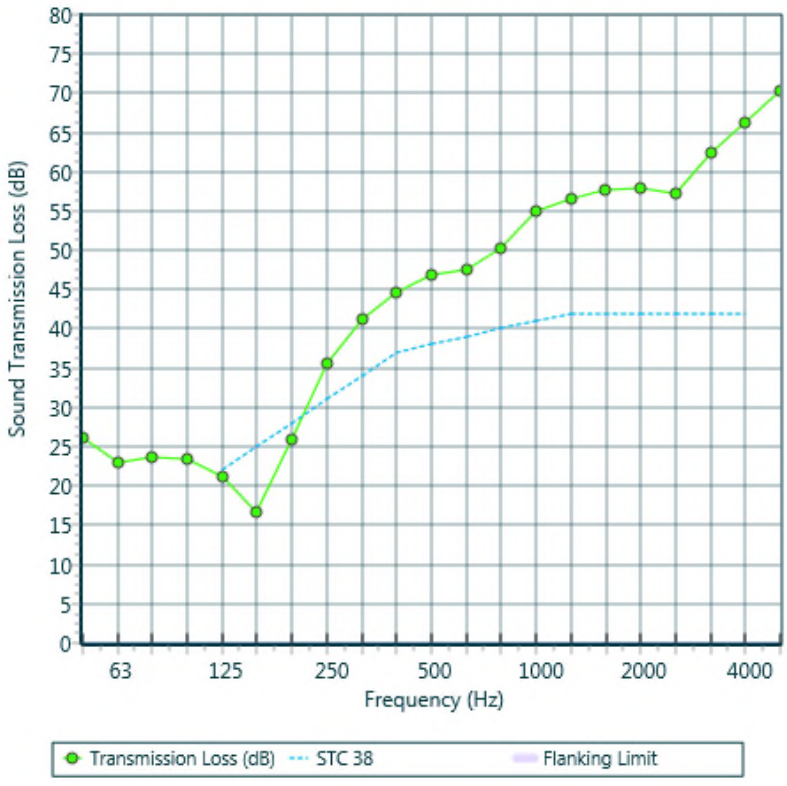
Partition surface mass = 12.4 lb/ft2

System description

Panel 1 : 1 x 0.87 in -Coat Plaster (sand:gypsum =3:1)

Frame: Timber stud (3.9 in x 1.6 in), Stud spacing 16 in ; Cavity Width 3.94 in , 1 x fiberglass (0.6 lb/ft3) Thickness 3.0 in
Panel 2 : 1 x 0.6299 in Type X Gypsum Board

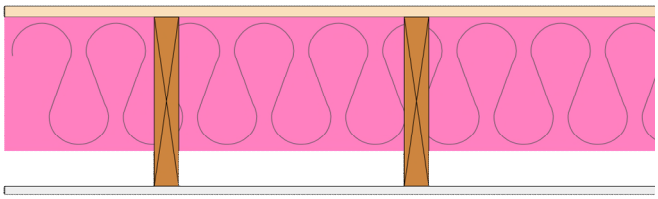
freq.(Hz)	TL(dB)	TL(dB)
50	26	
63	23	24
80	24	
100	23	
125	21	20
160	17	
200	26	
250	36	30
315	41	
400	45	
500	47	46
630	48	
800	50	
1000	55	53
1250	57	
1600	58	
2000	58	58
2500	57	
3150	62	
4000	66	65
5000	70	



Sound Insulation Prediction (v9.0.16)

margin of error is generally within STC +/- 3 dB
- Key No. 1866
Job Name:32nd & Broadway
Job No.:S190303 Initials:rcowell
Date.:3/15/2019
File Name:Roof.ixl

Notes:Typical Roof/Ceiling Assembly



STC 34
OITC 26

Mass-air-mass resonant frequency = =40 Hz

Panel Size = 8.9 ft x 13.1 ft

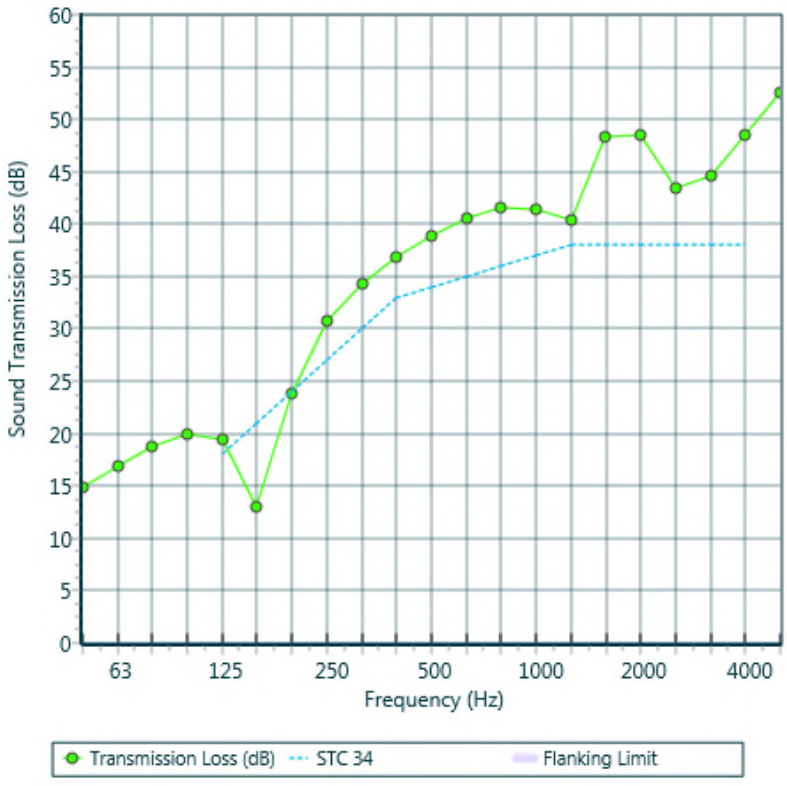
Partition surface mass = 5.53 lb/ft2

System description

Panel 1 : 1 x 0.75 in Plywood

Frame: Timber stud (12 in x 1.6 in), Stud spacing 16 in ; Cavity Width 12 in , 1 x fiberglass (1.4 lb/ft3) Thickness 9.5 in
Panel 2 : 1 x 0.6299 in Type X Gypsum Board

freq.(Hz)	TL(dB)	TL(dB)
50	15	
63	17	17
80	19	
100	20	
125	20	16
160	13	
200	24	
250	31	27
315	34	
400	37	
500	39	38
630	41	
800	42	
1000	41	41
1250	40	
1600	48	
2000	48	46
2500	43	
3150	45	
4000	49	47
5000	53	



APPENDIX E

Exterior-to-Interior Noise Analysis

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan One - Living Room/Kitchen

Wall 1 of 2

Room Type : **Medium Soft**

	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) :	122	122	122	122	152	152	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**55.9**	**CNEL**	39.2	44.7	47.2	51.2	51.2	45.2	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.3**	**CNEL**	52.0	60.4	62.9	61.2	58.6	52.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	15	9	1	125.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	2	2.5	1	5.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	2	2.5	1	5.0	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: **15** ft

Overall Area: **135** ft²
Volume: **2025** ft³

Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**51.5**	**CNEL**
Windows Closed		
Interior Noise Level:	**45.4**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
15.5	17.0	17.2	17.3	17.3	17.3	: Transmission Loss
21.3	21.3	21.3	21.3	21.3	21.3	: Wall Surface Area Factor
20.8	20.8	20.8	20.8	21.8	21.8	: Absorption
36.9	43.8	46.1	44.3	40.8	34.8	: Noise Level
50.5	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
20.2	28.8	33.2	43.2	52.6	48.5	: Transmission Loss
21.3	21.3	21.3	21.3	21.3	21.3	: Wall Surface Area Factor
20.8	20.8	20.8	20.8	21.8	21.8	: Absorption
32.3	32.0	30.1	18.5	5.5	3.6	: Noise Level
36.4	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 2**
Project # : S190303.2
Room Name: Plan One - Living Room/Kitchen

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**74.1**	**CNEL**	57.4	62.9	65.4	69.4	69.4	63.4	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.9**	**CNEL**	58.4	64.8	67.3	70.0	69.7	63.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	10	9	1	34.0	20	30	46	53	58	65
STC 28 1/2-inch Sliding Glass Door	N	8	7	1	56.0	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: **90** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.8	67.3	70.0	69.7	63.7	: Exterior Wall Noise Exposure
21.6	24.5	24.1	34.4	44.6	39.4	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
20.8	20.8	20.8	20.8	21.8	21.8	: Absorption
35.6	39.0	41.8	34.3	22.8	22.0	: Noise Level

44.8 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.8	67.3	70.0	69.7	63.7	: Exterior Wall Noise Exposure
21.6	24.5	24.1	34.4	44.6	39.4	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
20.8	20.8	20.8	20.8	21.8	21.8	: Absorption
35.6	39.0	41.8	34.3	22.8	22.0	: Noise Level

44.8 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan One - Master Bedroom

Wall 1 of 2

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	129	129	129	129	154	154	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**74.0**	**CNEL**	57.3	62.8	65.3	69.3	69.3	63.3	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.8**	**CNEL**	58.4	64.7	67.2	69.9	69.6	63.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	12.5	9	1	67.5	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	9	2.5	1	22.5	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	9	2.5	1	22.5	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: **14** ft **Overall Area:** **112.5** ft²
Volume: **1575** ft³
Number of Impacted Walls: **2**

Windows Open Interior Noise Level:	**64.0**	**CNEL**
Windows Closed Interior Noise Level:	**45.3**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.7	67.2	69.9	69.6	63.6	: Exterior Wall Noise Exposure
9.7	9.9	9.9	10.0	10.0	10.0	: Transmission Loss
20.5	20.5	20.5	20.5	20.5	20.5	: Wall Surface Area Factor
21.1	21.1	21.1	21.1	21.9	21.9	: Absorption
48.1	54.2	56.7	59.3	58.2	52.2	: Noise Level

63.9 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.7	67.2	69.9	69.6	63.6	: Exterior Wall Noise Exposure
20.9	25.7	26.0	36.3	46.4	41.3	: Transmission Loss
20.5	20.5	20.5	20.5	20.5	20.5	: Wall Surface Area Factor
21.1	21.1	21.1	21.1	21.9	21.9	: Absorption
36.9	38.4	40.6	33.0	21.8	20.9	: Noise Level

44.1 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 2**
Project # : S190303.2
Room Name: Plan One - Master Bedroom

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	12.5	14	1	175.0	16	27	38	41	46	47
<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

Overall Area: **175** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
22.4	22.4	22.4	22.4	22.4	22.4	: Wall Surface Area Factor
21.1	21.1	21.1	21.1	21.9	21.9	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
22.4	22.4	22.4	22.4	22.4	22.4	: Wall Surface Area Factor
21.1	21.1	21.1	21.1	21.9	21.9	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Two - Living Room/Kitchen

Wall 1 of 2

Room Type : **Medium Soft**	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) :	272	272	272	272	340	340	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**54.8**	**CNEL**	38.1	43.6	46.1	50.1	50.1	44.1	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.3**	**CNEL**	51.9	60.3	62.8	61.1	58.4	52.4	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	18	9	1	152.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	2	2.5	1	5.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	2	2.5	1	5.0	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: **28** ft
Overall Area: **162** ft²
Volume: **4536** ft³
Number of Impacted Walls: **2**

Windows Open
Interior Noise Level: **62.6** **CNEL**

Windows Closed
Interior Noise Level: **44.9** **CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.9	60.3	62.8	61.1	58.4	52.4	: Exterior Wall Noise Exposure
16.0	17.8	18.0	18.1	18.1	18.1	: Transmission Loss
22.1	22.1	22.1	22.1	22.1	22.1	: Wall Surface Area Factor
24.3	24.3	24.3	24.3	25.3	25.3	: Absorption
33.7	40.3	42.5	40.7	37.1	31.1	: Noise Level
46.9	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.9	60.3	62.8	61.1	58.4	52.4	: Exterior Wall Noise Exposure
20.1	29.0	33.9	43.9	53.1	49.3	: Transmission Loss
22.1	22.1	22.1	22.1	22.1	22.1	: Wall Surface Area Factor
24.3	24.3	24.3	24.3	25.3	25.3	: Absorption
29.5	29.1	26.7	14.9	2.1	-0.1	: Noise Level
33.4	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Two - Living Room/Kitchen

Wall 2 of 2

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**73.9**	**CNEL**	57.2	62.7	65.2	69.2	69.2	63.2	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.7**	**CNEL**	58.3	64.7	67.2	69.8	69.5	63.5	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	28	9	1	140.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	2.5	2.5	1	6.3	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	2.5	2.5	1	6.3	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	Y	3	2.5	1	7.5	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	3	2.5	1	7.5	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	Y	8.5	2.5	1	21.3	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	8.5	2.5	1	21.3	23	23	22	32	43	37
STC 28 1/2-inch Sliding Glass Door	N	6	7	1	42.0	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

Overall Area: **252** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.3	64.7	67.2	69.8	69.5	63.5	: Exterior Wall Noise Exposure
11.1	11.4	11.4	11.6	11.6	11.6	: Transmission Loss
24.0	24.0	24.0	24.0	24.0	24.0	: Wall Surface Area Factor
24.3	24.3	24.3	24.3	25.3	25.3	: Absorption
46.8	52.9	55.4	57.9	56.6	50.6	: Noise Level
62.5	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.3	64.7	67.2	69.8	69.5	63.5	: Exterior Wall Noise Exposure
21.1	25.5	25.6	35.8	46.0	40.8	: Transmission Loss
24.0	24.0	24.0	24.0	24.0	24.0	: Wall Surface Area Factor
24.3	24.3	24.3	24.3	25.3	25.3	: Absorption
36.9	38.9	41.2	33.6	22.2	21.4	: Noise Level
44.6	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Two - Master Bedroom

Wall 1 of 2

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	124	124	124	124	149	149	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**73.8**	**CNEL**	57.1	62.6	65.1	69.1	69.1	63.1	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.6**	**CNEL**	58.2	64.6	67.1	69.7	69.4	63.4	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	13.5	9	1	76.5	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	9	2.5	1	22.5	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	9	2.5	1	22.5	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: **12.5** ft

Overall Area: **121.5** ft²
Volume: **1519** ft³

Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**64.0**	**CNEL**
Windows Closed		
Interior Noise Level:	**45.4**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.2	64.6	67.1	69.7	69.4	63.4	: Exterior Wall Noise Exposure
10.0	10.2	10.3	10.3	10.3	10.3	: Transmission Loss
20.8	20.8	20.8	20.8	20.8	20.8	: Wall Surface Area Factor
20.9	20.9	20.9	20.9	21.7	21.7	: Absorption
48.1	54.3	56.7	59.3	58.2	52.2	: Noise Level
63.9	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.2	64.6	67.1	69.7	69.4	63.4	: Exterior Wall Noise Exposure
20.9	26.0	26.4	36.6	46.7	41.6	: Transmission Loss
20.8	20.8	20.8	20.8	20.8	20.8	: Wall Surface Area Factor
20.9	20.9	20.9	20.9	21.7	21.7	: Absorption
37.3	38.5	40.6	33.0	21.8	20.9	: Noise Level
44.2	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 2**
Project # : S190303.2
Room Name: Plan Two - Master Bedroom

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	13.5	12.5	1	168.8	16	27	38	41	46	47
<N/A>	Y	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

Overall Area: **168.75** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
22.3	22.3	22.3	22.3	22.3	22.3	: Wall Surface Area Factor
20.9	20.9	20.9	20.9	21.7	21.7	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
22.3	22.3	22.3	22.3	22.3	22.3	: Wall Surface Area Factor
20.9	20.9	20.9	20.9	21.7	21.7	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Two - Bedroom 2 (Building 6)

Wall 1 of 2

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	77	77	77	77	93	93	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**73.8**	**CNEL**	57.1	62.6	65.1	69.1	69.1	63.1	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.6**	**CNEL**	58.2	64.6	67.1	69.7	69.4	63.4	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	10	9	1	60.0	20	30	46	53	58	65
STC 31 5/8-inch Dual Insulating Window	Y	6	2.5	1	15.0	24	20	26	34	46	39
STC 31 5/8-inch Dual Insulating Window	N	6	2.5	1	15.0	24	20	26	34	46	39
<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: **10.5** ft

Overall Area: **90** ft²
Volume: **945** ft³

Number of Impacted Walls: **2**

Windows Open Interior Noise Level:	**64.3**	**CNEL**
Windows Closed Interior Noise Level:	**45.4**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.2	64.6	67.1	69.7	69.4	63.4	: Exterior Wall Noise Exposure
10.4	10.6	10.8	10.8	10.8	10.8	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
48.5	54.6	57.0	59.6	58.5	52.5	: Noise Level
64.2	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.2	64.6	67.1	69.7	69.4	63.4	: Exterior Wall Noise Exposure
20.9	24.3	30.3	39.1	50.2	43.7	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
37.9	41.0	37.5	31.2	19.0	19.6	: Noise Level
44.1	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303
Room Name: Plan Two - Bedroom 2

Wall 2 of 2

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	10	10.5	1	105.0	16	27	38	41	46	47
<N/A>	Y	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

Overall Area: **105** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.2	20.2	20.2	20.2	20.2	20.2	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level

39.3 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.2	20.2	20.2	20.2	20.2	20.2	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level

39.3 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Two - Bedroom 2 (Building 4)

Wall 1 of 2

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Room Type : **Soft**							
Reverberation Time (sec) :	0.6	0.6	0.6	0.6	0.5	0.5	: Highly Absorptive Room
Room Absorption (Sabins) :	77	77	77	77	93	93	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**66.6**	**CNEL**	49.9	55.4	57.9	61.9	61.9	55.9	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**69.8**	**CNEL**	53.9	61.5	64.0	64.4	63.3	57.3	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	10	9	1	60.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	6	2.5	1	15.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	6	2.5	1	15.0	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: **10.5** ft **Overall Area:** **90** ft²
Volume: **945** ft³
Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**59.6**	**CNEL**
Windows Closed		
Interior Noise Level:	**44.2**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.9	61.5	64.0	64.4	63.3	57.3	: Exterior Wall Noise Exposure
10.4	10.7	10.7	10.8	10.8	10.8	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
44.2	51.4	53.9	54.3	52.4	46.4	: Noise Level
59.5	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.9	61.5	64.0	64.4	63.3	57.3	: Exterior Wall Noise Exposure
20.8	26.2	26.8	37.0	47.1	42.1	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
33.8	35.9	37.8	28.0	16.1	15.1	: Noise Level
41.2	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 2**
Project # : S190303.2
Room Name: Plan Two - Bedroom 2 (Building 4)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**66.6**	**CNEL**	49.9	55.4	57.9	61.9	61.9	55.9	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**69.8**	**CNEL**	53.9	61.5	64.0	64.4	63.3	57.3	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	10	10.5	1	105.0	16	27	38	41	46	47
<N/A>	Y	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

Overall Area: **105** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.9	61.5	64.0	64.4	63.3	57.3	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.2	20.2	20.2	20.2	20.2	20.2	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
39.3	35.8	27.3	24.7	17.9	10.9	: Noise Level
41.2	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.9	61.5	64.0	64.4	63.3	57.3	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.2	20.2	20.2	20.2	20.2	20.2	: Wall Surface Area Factor
18.9	18.9	18.9	18.9	19.7	19.7	: Absorption
39.3	35.8	27.3	24.7	17.9	10.9	: Noise Level
41.2	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Living Room/Kitchen (Building 6)

Wall 1 of 3

Room Type : **Medium Soft**

	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) :	329	329	329	329	411	411	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**55.9**	**CNEL**	39.2	44.7	47.2	51.2	51.2	45.2	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.3**	**CNEL**	52.0	60.4	62.9	61.2	58.6	52.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	21	9	1	176.5	20	30	46	53	58	65
STC 35 1-inch Dual Insulating Window	Y	2.5	2.5	1	6.3	21	22	33	37	36	42
STC 35 1-inch Dual Insulating Window	N	2.5	2.5	1	6.3	21	22	33	37	36	42
<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: **29** ft

Overall Area: **189** ft²
Volume: **5481** ft³

Number of Impacted Walls: **3**

Windows Open
Interior Noise Level: **64.2** **CNEL**

Windows Closed
Interior Noise Level: **44.9** **CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
15.8	17.5	17.8	17.8	17.8	17.8	: Transmission Loss
22.8	22.8	22.8	22.8	22.8	22.8	: Wall Surface Area Factor
25.2	25.2	25.2	25.2	26.1	26.1	: Absorption
33.8	40.5	42.6	41.0	37.4	31.4	: Noise Level

47.1 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
20.1	28.7	42.5	47.5	47.4	53.5	: Transmission Loss
22.8	22.8	22.8	22.8	22.8	22.8	: Wall Surface Area Factor
25.2	25.2	25.2	25.2	26.1	26.1	: Absorption
29.5	29.3	18.0	11.3	7.8	-4.3	: Noise Level

32.6 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 3**
Project # : S190303.2
Room Name: Plan Three - Living Room/Kitchen (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.9**	**CNEL**	55.2	60.7	63.2	67.2	67.2	61.2	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**73.1**	**CNEL**	56.8	63.5	66.0	68.1	67.7	61.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	28	9	1	162.0	20	30	46	53	58	65
STC 35 1-inch Dual Insulating Window	Y	6	2.5	3	45.0	21	22	33	37	36	42
STC 35 1-inch Dual Insulating Window	N	6	2.5	3	45.0	21	22	33	37	36	42
<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: **252** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.8	63.5	66.0	68.1	67.7	61.7	: Exterior Wall Noise Exposure
10.1	10.4	10.5	10.5	10.5	10.5	: Transmission Loss
24.0	24.0	24.0	24.0	24.0	24.0	: Wall Surface Area Factor
25.2	25.2	25.2	25.2	26.1	26.1	: Absorption
45.6	52.0	54.3	56.4	55.1	49.1	: Noise Level
61.2	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.8	63.5	66.0	68.1	67.7	61.7	: Exterior Wall Noise Exposure
20.3	25.4	37.1	41.3	40.4	46.4	: Transmission Loss
24.0	24.0	24.0	24.0	24.0	24.0	: Wall Surface Area Factor
25.2	25.2	25.2	25.2	26.1	26.1	: Absorption
35.3	37.0	27.7	25.7	25.1	13.1	: Noise Level
39.9	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 3 of 3**
Project # : S190303.2
Room Name: Plan Three - Living Room/Kitchen (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**74.1**	**CNEL**	57.4	62.9	65.4	69.4	69.4	63.4	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.9**	**CNEL**	58.4	64.8	67.3	70.0	69.7	63.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	26	9	1	120.5	20	30	46	53	58	65
STC 28 1/2-inch Sliding Glass Door	N	8	7	1	56.0	23	23	22	32	43	37
STC 35 1-inch Dual Insulating Window	Y	9	2.5	1	22.5	21	22	33	37	36	42
STC 35 1-inch Dual Insulating Window	N	9	2.5	1	22.5	21	22	33	37	36	42
STC 35 1-inch Dual Insulating Window	Y	2.5	2.5	1	6.3	21	22	33	37	36	42
STC 35 1-inch Dual Insulating Window	N	2.5	2.5	1	6.3	21	22	33	37	36	42
<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: **234** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.8	67.3	70.0	69.7	63.7	: Exterior Wall Noise Exposure
11.6	11.9	12.0	12.1	12.1	12.1	: Transmission Loss
23.7	23.7	23.7	23.7	23.7	23.7	: Wall Surface Area Factor
25.2	25.2	25.2	25.2	26.1	26.1	: Absorption
45.4	51.4	53.8	56.4	55.1	49.1	: Noise Level
61.0	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.8	67.3	70.0	69.7	63.7	: Exterior Wall Noise Exposure
20.8	24.8	27.9	37.2	41.2	42.2	: Transmission Loss
23.7	23.7	23.7	23.7	23.7	23.7	: Wall Surface Area Factor
25.2	25.2	25.2	25.2	26.1	26.1	: Absorption
36.2	38.5	37.9	31.3	26.0	19.0	: Noise Level
42.8	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Master Bedroom (Building 6)

Wall 1 of 3

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	106	106	106	106	127	127	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.9**	**CNEL**	55.2	60.7	63.2	67.2	67.2	61.2	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**73.1**	**CNEL**	56.8	63.5	66.0	68.1	67.7	61.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	12.5	9	1	82.5	20	30	46	53	58	65
STC 31 5/8-inch Dual Insulating Window	Y	3	2.5	2	15.0	24	20	26	34	46	39
STC 31 5/8-inch Dual Insulating Window	N	3	2.5	2	15.0	24	20	26	34	46	39
<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: **11.5** ft

Overall Area: **112.5** ft²
Volume: **1294** ft³

Number of Impacted Walls: **3**

Windows Open Interior Noise Level:	**62.9**	**CNEL**
Windows Closed Interior Noise Level:	**45.2**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.8	63.5	66.0	68.1	67.7	61.7	: Exterior Wall Noise Exposure
11.3	11.6	11.7	11.8	11.8	11.8	: Transmission Loss
20.5	20.5	20.5	20.5	20.5	20.5	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
45.8	52.2	54.5	56.6	55.4	49.4	: Noise Level

61.4 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.8	63.5	66.0	68.1	67.7	61.7	: Exterior Wall Noise Exposure
20.7	25.0	31.2	40.0	51.0	44.7	: Transmission Loss
20.5	20.5	20.5	20.5	20.5	20.5	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
36.4	38.8	35.0	28.3	16.1	16.5	: Noise Level

42.0 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 3**
Project # : S190303.2
Room Name: Plan Three - Master Bedroom (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**56.1**	**CNEL**	39.4	44.9	47.4	51.4	51.4	45.4	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.3**	**CNEL**	52.0	60.4	62.9	61.2	58.6	52.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	11.5	9	1	58.5	20	30	46	53	58	65
STC 31 5/8-inch Dual Insulating Window	Y	9	2.5	1	22.5	24	20	26	34	46	39
STC 31 5/8-inch Dual Insulating Window	N	9	2.5	1	22.5	24	20	26	34	46	39
<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: **103.5** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
9.4	9.5	9.6	9.6	9.6	9.6	: Transmission Loss
20.1	20.1	20.1	20.1	20.1	20.1	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
42.5	50.8	53.2	51.5	48.1	42.1	: Noise Level
57.5	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
21.3	23.4	29.2	38.0	49.3	42.6	: Transmission Loss
20.1	20.1	20.1	20.1	20.1	20.1	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
30.6	36.9	33.6	23.1	8.5	9.2	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 3 of 3**
Project # : S190303.2
Room Name: Plan Three - Master Bedroom (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	11.5	12.5	1	143.8	16	27	38	41	46	47
<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

Overall Area: **143.75** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
21.6	21.6	21.6	21.6	21.6	21.6	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
21.6	21.6	21.6	21.6	21.6	21.6	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Bedroom 2 (Building 6)

Wall 1 of 2

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	81	81	81	81	97	97	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**74.0**	**CNEL**	57.3	62.8	65.3	69.3	69.3	63.3	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.8**	**CNEL**	58.4	64.7	67.2	69.9	69.6	63.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	11	9	1	69.0	20	30	46	53	58	65
STC 35 1-inch Dual Insulating Window	Y	6	2.5	1	15.0	21	22	33	37	36	42
STC 35 1-inch Dual Insulating Window	N	6	2.5	1	15.0	21	22	33	37	36	42
<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: **99** ft²
Volume: **990** ft³

Number of Impacted Walls: **2**

Windows Open
Interior Noise Level: **64.2** **CNEL**

Windows Closed
Interior Noise Level: **44.5** **CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.7	67.2	69.9	69.6	63.6	: Exterior Wall Noise Exposure
10.7	11.1	11.2	11.2	11.2	11.2	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
48.5	54.5	56.9	59.5	58.5	52.5	: Noise Level
64.2	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.7	67.2	69.9	69.6	63.6	: Exterior Wall Noise Exposure
20.3	25.8	37.7	41.9	41.1	47.1	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
39.0	39.8	30.4	28.8	28.6	16.6	: Noise Level
43.0	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 2**
Project # : S190303.2
Room Name: Plan Three - Bedroom 2 (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	11	10	1	110.0	16	27	38	41	46	47
<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

Overall Area: **110** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.4	20.4	20.4	20.4	20.4	20.4	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level

39.3 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.4	20.4	20.4	20.4	20.4	20.4	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level

39.3 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Building 6)

Wall 1 of 3

Room Type :	**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	: Highly Absorptive Room
Room Absorption (Sabins) :	74	74	74	74	88	88	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**72.0**	**CNEL**	55.3	60.8	63.3	67.3	67.3	61.3	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**73.2**	**CNEL**	56.9	63.5	66.0	68.2	67.8	61.8	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	10	9	1	80.0	20	30	46	53	58	65
STC 31 5/8-inch Dual Insulating Window	Y	2	2.5	1	5.0	24	20	26	34	46	39
STC 31 5/8-inch Dual Insulating Window	N	2	2.5	1	5.0	24	20	26	34	46	39
<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:**	**90**	ft²
			Volume:	**900**	ft³
Number of Impacted Walls:	**3**				

Windows Open **Interior Noise Level:**	**60.9**	**CNEL**
Windows Closed **Interior Noise Level:**	**44.8**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.9	63.5	66.0	68.2	67.8	61.8	: Exterior Wall Noise Exposure
14.3	15.3	15.5	15.6	15.6	15.6	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
43.5	49.1	51.4	53.5	52.3	46.3	: Noise Level
58.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.9	63.5	66.0	68.2	67.8	61.8	: Exterior Wall Noise Exposure
20.3	27.2	34.8	43.5	53.8	48.4	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
37.5	37.2	32.1	25.5	14.1	13.4	: Noise Level
41.1	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 3**
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**56.1**	**CNEL**	39.4	44.9	47.4	51.4	51.4	45.4	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.3**	**CNEL**	52.0	60.4	62.9	61.2	58.6	52.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	10	9	1	60.0	20	30	46	53	58	65
STC 31 5/8-inch Dual Insulating Window	Y	6	2.5	1	15.0	24	20	26	34	46	39
STC 31 5/8-inch Dual Insulating Window	N	6	2.5	1	15.0	24	20	26	34	46	39
<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: **90** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
10.4	10.6	10.8	10.8	10.8	10.8	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
42.5	50.6	53.0	51.3	47.9	41.9	: Noise Level
57.4	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
52.0	60.4	62.9	61.2	58.6	52.6	: Exterior Wall Noise Exposure
20.9	24.3	30.3	39.1	50.2	43.7	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
31.9	37.0	33.5	23.0	8.5	9.0	: Noise Level
39.5	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 3 of 3**
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	10	10	1	100.0	16	27	38	41	46	47
<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

Overall Area: **100** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Building 6)

Wall 1 of 3

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	74	74	74	74	88	88	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.9**	**CNEL**	55.2	60.7	63.2	67.2	67.2	61.2	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**73.1**	**CNEL**	56.8	63.5	66.0	68.1	67.7	61.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco w/RC)	N	10	9	1	80.0	36	49	55	62	66	74
STC 31 5/8-inch Dual Insulating Window	Y	2	2.5	1	5.0	24	20	26	34	46	39
STC 31 5/8-inch Dual Insulating Window	N	2	2.5	1	5.0	24	20	26	34	46	39
<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: **90** ft²
Volume: **900** ft³

Number of Impacted Walls: **3**

Windows Open
Interior Noise Level: **65.5** **CNEL**

Windows Closed
Interior Noise Level: **45.3** **CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.8	63.5	66.0	68.1	67.7	61.7	: Exterior Wall Noise Exposure
15.5	15.4	15.5	15.6	15.6	15.6	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
42.2	48.9	51.3	53.4	52.2	46.2	: Noise Level

58.2 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.8	63.5	66.0	68.1	67.7	61.7	: Exterior Wall Noise Exposure
31.6	29.9	35.1	43.9	55.2	48.5	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
26.1	34.5	31.8	25.0	12.6	13.3	: Noise Level

37.1 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Building 6)

Wall 2 of 3

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**74.0**	**CNEL**	57.3	62.8	65.3	69.3	69.3	63.3	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**74.8**	**CNEL**	58.4	64.7	67.2	69.9	69.6	63.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco w/RC)	N	10	9	1	60.0	36	49	55	62	66	74
STC 31 5/8-inch Dual Insulating Window	Y	6	2.5	1	15.0	24	20	26	34	46	39
STC 31 5/8-inch Dual Insulating Window	N	6	2.5	1	15.0	24	20	26	34	46	39
<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: **90** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.7	67.2	69.9	69.6	63.6	: Exterior Wall Noise Exposure
10.7	10.7	10.8	10.8	10.8	10.8	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
48.5	54.9	57.3	60.0	58.9	52.9	: Noise Level

64.6 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
58.4	64.7	67.2	69.9	69.6	63.6	: Exterior Wall Noise Exposure
28.1	25.1	30.4	39.2	50.7	43.7	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
31.2	40.5	37.7	31.5	19.0	20.0	: Noise Level

43.0 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 3 of 3**
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Building 6)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	10	10	1	100.0	16	27	38	41	46	47
<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

Overall Area: **100** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Living Room/Kitchen (Building 4)

Wall 1 of 2

Room Type : **Medium Soft**

	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) :	323	323	323	323	404	404	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**70.3**	**CNEL**	53.6	59.1	61.6	65.6	65.6	59.6	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**72.0**	**CNEL**	55.8	62.7	65.2	66.8	66.3	60.3	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	26	9	1	120.5	20	30	46	53	58	65
STC 28 1/2-inch Sliding Glass Door	N	8	7	1	56.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	Y	9	2.5	1	22.5	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	9	2.5	1	22.5	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	Y	2.5	2.5	1	6.3	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	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

Room Depth: **23** ft

Overall Area: **234** ft²
Volume: **5382** ft³

Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**62.5**	**CNEL**
Windows Closed		
Interior Noise Level:	**44.5**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.8	62.7	65.2	66.8	66.3	60.3	: Exterior Wall Noise Exposure
11.6	11.9	11.9	12.1	12.1	12.1	: Transmission Loss
23.7	23.7	23.7	23.7	23.7	23.7	: Wall Surface Area Factor
25.1	25.1	25.1	25.1	26.1	26.1	: Absorption
42.8	49.4	51.9	53.3	51.8	45.8	: Noise Level
58.2	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.8	62.7	65.2	66.8	66.3	60.3	: Exterior Wall Noise Exposure
21.2	25.2	25.2	35.4	45.6	40.5	: Transmission Loss
23.7	23.7	23.7	23.7	23.7	23.7	: Wall Surface Area Factor
25.1	25.1	25.1	25.1	26.1	26.1	: Absorption
33.2	36.1	38.6	30.0	18.3	17.4	: Noise Level
41.6	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 2**
Project # : S190303.2
Room Name: Plan Three - Living Room/Kitchen (Building 4)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**70.9**	**CNEL**	54.2	59.7	62.2	66.2	66.2	60.2	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**72.4**	**CNEL**	56.2	63.0	65.5	67.3	66.8	60.8	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	28	9	1	162.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	6	2.5	3	45.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	6	2.5	3	45.0	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: **252** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.2	63.0	65.5	67.3	66.8	60.8	: Exterior Wall Noise Exposure
10.1	10.4	10.4	10.5	10.5	10.5	: Transmission Loss
24.0	24.0	24.0	24.0	24.0	24.0	: Wall Surface Area Factor
25.1	25.1	25.1	25.1	26.1	26.1	: Absorption
45.0	51.5	54.0	55.7	54.2	48.2	: Noise Level
60.5	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
56.2	63.0	65.5	67.3	66.8	60.8	: Exterior Wall Noise Exposure
20.8	26.0	26.5	36.7	46.9	41.8	: Transmission Loss
24.0	24.0	24.0	24.0	24.0	24.0	: Wall Surface Area Factor
25.1	25.1	25.1	25.1	26.1	26.1	: Absorption
34.3	35.9	37.9	29.5	17.9	17.0	: Noise Level
41.4	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Master Bedroom (Building 2)

Wall 1 of 3

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	106	106	106	106	127	127	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**69.7**	**CNEL**	53.0	58.5	61.0	65.0	65.0	59.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**71.6**	**CNEL**	55.4	62.5	65.0	66.4	65.8	59.8	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	12.5	9	1	82.5	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	3	2.5	2	15.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	3	2.5	2	15.0	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: **11.5** ft

Overall Area: **112.5** ft²
Volume: **1294** ft³

Number of Impacted Walls: **3**

Windows Open		
Interior Noise Level:	**61.8**	**CNEL**
Windows Closed		
Interior Noise Level:	**45.0**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.4	62.5	65.0	66.4	65.8	59.8	: Exterior Wall Noise Exposure
11.2	11.6	11.7	11.8	11.8	11.8	: Transmission Loss
20.5	20.5	20.5	20.5	20.5	20.5	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
44.5	51.1	53.6	54.9	53.5	47.5	: Noise Level
59.9	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.4	62.5	65.0	66.4	65.8	59.8	: Exterior Wall Noise Exposure
20.6	26.8	27.8	38.0	48.0	43.0	: Transmission Loss
20.5	20.5	20.5	20.5	20.5	20.5	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
35.1	36.0	37.5	28.7	17.2	16.2	: Noise Level
41.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 3**
Project # : S190303.2
Room Name: Plan Three - Master Bedroom (Building 2)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**53.2**	**CNEL**	36.5	42.0	44.5	48.5	48.5	42.5	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.2**	**CNEL**	51.9	60.3	62.8	61.0	58.2	52.2	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	11.5	9	1	58.5	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	9	2.5	1	22.5	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	9	2.5	1	22.5	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: **103.5** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.9	60.3	62.8	61.0	58.2	52.2	: Exterior Wall Noise Exposure
9.4	9.5	9.6	9.6	9.6	9.6	: Transmission Loss
20.1	20.1	20.1	20.1	20.1	20.1	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
42.4	50.7	53.2	51.3	47.7	41.7	: Noise Level
57.4	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.9	60.3	62.8	61.0	58.2	52.2	: Exterior Wall Noise Exposure
21.0	25.5	25.7	35.9	46.1	40.9	: Transmission Loss
20.1	20.1	20.1	20.1	20.1	20.1	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
30.7	34.7	37.0	25.0	11.3	10.4	: Noise Level
39.8	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 3 of 3**
Project # : S190303.2
Room Name: Plan Three - Master Bedroom (Building 2)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	11.5	12.5	1	143.8	16	27	38	41	46	47
<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

Overall Area: **143.75** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
21.6	21.6	21.6	21.6	21.6	21.6	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
21.6	21.6	21.6	21.6	21.6	21.6	: Wall Surface Area Factor
20.2	20.2	20.2	20.2	21.0	21.0	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Bedroom 2 (Building 2)

Wall 1 of 2

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	81	81	81	81	97	97	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**66.0**	**CNEL**	49.3	54.8	57.3	61.3	61.3	55.3	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**69.5**	**CNEL**	53.7	61.3	63.8	64.0	62.9	56.9	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	11	9	1	69.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	6	2.5	1	15.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	6	2.5	1	15.0	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: **10** ft
Overall Area: **99** ft²
Volume: **990** ft³
Number of Impacted Walls: **2**

Windows Open		
Interior Noise Level:	**59.1**	**CNEL**
Windows Closed		
Interior Noise Level:	**43.2**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.7	61.3	63.8	64.0	62.9	56.9	: Exterior Wall Noise Exposure
10.8	11.1	11.1	11.2	11.2	11.2	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
43.8	51.1	53.6	53.7	51.8	45.8	: Noise Level

59.1 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.7	61.3	63.8	64.0	62.9	56.9	: Exterior Wall Noise Exposure
20.7	26.5	27.2	37.4	47.5	42.5	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
33.9	35.7	37.5	27.5	15.5	14.5	: Noise Level

40.9 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 2**
Project # : S190303.2
Room Name: Plan Three - Bedroom 2 (Building 2)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	11	10	1	110.0	16	27	38	41	46	47
<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

Overall Area: **110** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.4	20.4	20.4	20.4	20.4	20.4	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.4	20.4	20.4	20.4	20.4	20.4	: Wall Surface Area Factor
19.1	19.1	19.1	19.1	19.9	19.9	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level
39.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Typical)

Wall 1 of 3

Room Type : **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	: Highly Absorptive Room
Room Absorption (Sabins) :	74	74	74	74	88	88	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**69.7**	**CNEL**	53.0	58.5	61.0	65.0	65.0	59.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**71.6**	**CNEL**	55.4	62.5	65.0	66.4	65.8	59.8	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	10	9	1	80.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	2	2.5	1	5.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	2	2.5	1	5.0	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: **10** ft **Overall Area:** **90** ft²
Volume: **900** ft³

Number of Impacted Walls: **3**

Windows Open **Interior Noise Level:**	**61.3**	**CNEL**
Windows Closed **Interior Noise Level:**	**45.1**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.4	62.5	65.0	66.4	65.8	59.8	: Exterior Wall Noise Exposure
14.3	15.4	15.5	15.6	15.6	15.6	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
42.0	48.0	50.4	51.7	50.3	44.3	: Noise Level

56.7 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
55.4	62.5	65.0	66.4	65.8	59.8	: Exterior Wall Noise Exposure
20.2	28.4	31.5	41.6	51.2	46.8	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
36.1	35.0	34.4	25.7	14.6	13.0	: Noise Level

40.1 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway **Wall 2 of 3**
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Typical)

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**66.0**	**CNEL**	49.3	54.8	57.3	61.3	61.3	55.3	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**69.5**	**CNEL**	53.7	61.3	63.8	64.0	62.9	56.9	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Exterior Wall (Stucco)	N	10	9	1	60.0	20	30	46	53	58	65
STC 28 1/2-inch Dual Insulating Window	Y	6	2.5	1	15.0	23	23	22	32	43	37
STC 28 1/2-inch Dual Insulating Window	N	6	2.5	1	15.0	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: **90** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.7	61.3	63.8	64.0	62.9	56.9	: Exterior Wall Noise Exposure
10.4	10.7	10.7	10.8	10.8	10.8	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
44.2	51.5	54.0	54.1	52.2	46.2	: Noise Level

59.5 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
53.7	61.3	63.8	64.0	62.9	56.9	: Exterior Wall Noise Exposure
20.8	26.2	26.8	37.0	47.1	42.1	: Transmission Loss
19.5	19.5	19.5	19.5	19.5	19.5	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
33.8	36.0	37.9	27.9	15.9	14.9	: Noise Level

41.2 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: 32nd & Broadway
Project # : S190303.2
Room Name: Plan Three - Bedroom 3 (Typical)

Wall 3 of 3

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Aircraft Spectrum
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:		**67.0**	**CNEL**	51.7	60.2	62.7	60.7	57.7	51.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Roof	N	10	10	1	100.0	16	27	38	41	46	47
<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

Overall Area: **100** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level

39.3 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.7	60.2	62.7	60.7	57.7	51.7	: Exterior Wall Noise Exposure
16.0	27.0	38.0	41.0	46.0	47.0	: Transmission Loss
20.0	20.0	20.0	20.0	20.0	20.0	: Wall Surface Area Factor
18.7	18.7	18.7	18.7	19.5	19.5	: Absorption
37.1	34.6	26.1	21.1	12.3	5.3	: Noise Level

39.3 **CNEL** WINDOWS CLOSED

APPENDIX F

Recommended Products

TECHNICAL DATA

DRAFT & ACOUSTICAL
SOUND SEALANT

OSI® Greenseries™ 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.

The paintable sealant remains flexible and adheres firmly to wood, metal studs, concrete, gypsum board and most other building materials. The easy-to-use sealant cleans up easily with soap and water.

FEATURES
- Permanently flexible
- Easy application and cleanup
- UL Classification – R9732; UL 723
- Easy water cleanup
- Low VOC, compliant formula
- Will not harden, crack or separate
- Non-staining & non-migrating
- High degree of adhesive and cohesive strength.

USES
Greenseries™ Draft & Acoustical was developed primarily for commercial construction utilizing light weight cavity walls and floor systems. Draft & Acoustical Sealant is used successfully in office buildings, hotels, apartment complexes, and other types of commercial & residential construction.

PHYSICAL PROPERTIES

Type	Synthetic Latex Rubber
Color	White
Solids by weight	75%
Toxicity	Toxic only if swallowed. Refer to MSDS.
Flammability	Nonflammable
Flash Point	200°F. TCC (minimum amount of solvent present)
Tooling/Open Time	15 minutes
Tack Free Time	30 minutes
Cure Time	2-7 days
Application Temperature	40°F minimum
Service Temperature	-5°F - 170°F
Freeze-Thaw Stability	3 cycles. Unaffected by freezing after curing
Shelf Life	1 year from date made at 75°F
Sag or Slump	Nil (ASTM D2202)
VOC Level	22g/l or <1% by wt.
Shore "A" Hardness	45 +/-5 (Cured 30 days @ room temp.)
Clean-up	Water and soap before curing
Accelerated Weathering	No cracks, discoloration or chalking: 1000 hrs. in Xenon Arc Weatherometer

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The sealant is used for exposed and unexposed applications at perimeter joints, floor and ceiling runners, cut outs in gypsum board, veneer plaster systems and other areas where a sound rated assembly is required. The 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. Also works well for sealing sill and and base plates in residential construction.

SPECIFICATIONS
- UL Classified – 48S9 (R9732). Tested in accordance with and conforms to UL 723: U.B.C. Standard No. 42-1 Class I.
- ASTM E84: Surface Burning Characteristics of Building Materials.
- ASTM E90-85: Laboratory Measurement of Airborne-Sound Transmission Loss of Building Materials.
- ASTM D217: Testing Standard for Consistency.
- ASTM C919-79: Standard Practice for Use of Sealants in Acoustical Applications.
- SCAQMD Rule 1168 V.O.C.; CARB; and BAAQMD compliant
- GREENGUARD Certified
- Meets LEEDS requirements

LIMITATIONS
- Keep from freezing
- Do not use below 40°F. (5°C.).
- Not recommended for use on mirrors or underwater applications.
- Not recommended for exterior use.

PACKAGING
28 oz. cartridges – 12 per case (Item No. GS79928)

STORAGE
Store at 70°F. +/- 5° (21°C) for long shelf life and easy application. Do not store below 40°F. (5°C.).

COVERAGE
3/8" round bead size: approx. 40 lin. ft. per 28 oz. cartridge.
¼" round bead size: Approx. 89 lin. ft. / 28oz cartridge.

PERFORMANCE CHARACTERISTICS

1. Underwriters Laboratories Inc. Classified 48S9 (R9732) UL 723: Sealant tested for surface burning characteristics

	Applied to organic Reinforced Cement Board*
Flame Spread	5
Smoke Development	5

*Tested as applied in two 1/2in. beads, 8in. on center. The sealant covered 5.6 percent of the exposed sample area.

2. ASTM E90-85: STC Value – Effect of sealing the opening on a test wall partition.

APPLICATION PROCEEDURES

All surfaces must be clean and free of dust, dirt, oil, moisture and other foreign substances which could interfere with the bond of the sealant.

DIRECTIONS

1. Cut spout on tube to desired bead size (3/8" round bead recommended) and puncture seal inside spout.
2. Sealant should be applied as specified in the sound-rated system being installed (either wood or metal studs)

A. Bottom & Top Runners: Apply a continuous 3/8" round bead of sealant on runners before setting gypsum board. Gypsum board shall be set into sealant to form complete contact with adjacent materials. Fill joint on top runners to complete seal. Repeat procedure for double layer applications.

B. 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.

3. Maximum joint size should not exceed ⅝" x ½".
4. Clean tools and excess sealant immediately after application with soap and water.
5. If necessary, sealant can be painted as applicable to meet project requirements after 24 hours.

CAUTION! CONTAINS ETHYLENE GLYCOL , MINERAL SPIRITS and crystalline silica. Avoid eye contact. Do not take internally. If swallowed, may cause abdominal discomfort. Use with adequate ventilation. Refer to MSDS.

WARNING: This product contains a chemical known to the State of California to cause cancer.

KEEP OUT OF REACH OF CHILDREN

FIRST AID

Eye Contact: In case of eye contact, flush with clean water for at least 15 minutes. Skin Contact: Wash skin thoroughly with soap and water. Ingestion: DO NOT induce vomiting. Seek medical attention. If dizziness occurs, remove to fresh air.

NOTICE TO PURCHASER

Henkel Corporation warrants this product when used according to directions. If not satisfied with the product's performance when used as directed, return sales receipt and used container to Henkel Corporation, 32150 Just Imagine Drive, Avon OH, 44011 for product replacement or refund. User shall determine suitability of product for use and assumes all risk.

QUESTIONS?

For commercial use or other questions pertaining to this product, call Henkel Technical Service at 800-321-0253 M-F, 9am – 4pm. or visit our website at www.greenseries.com.

Test partition consisted of metal studs 24" O.C. with double layer gypsum board, Fire code "C" and attached with screws on both sides. Inside of partition was filled with sound insulation. Partition system was erected and shimmed out 4.75 mm (0.1875in.) at top, bottom and edges.

Results: Sound Transmission Class Value

1. Un-sealed partition – Arrows show sound travel around or through partitions.
   a. STC=15
2. Single bead of sealant used at top and bottom runners only – both sides of partition system.
   a. STC=24

Metal Stud Partition Door/Window frame in a hollow partition

3. Single bead of sealant used at top, bottom and perimeter joints – both sides of system.
   a. STC=45
4. Double bead of sealant used at top, bottom and perimeter joints – both sides of system.
   a. STC=55

OSI® GreenSeries™ Draft & Acoustical Sound Sealant is currently under going tested by GREENGUARD.
The GREENGUARD INDOOR AIR QUALITY CERTIFIED Mark is a registered certification mark used under license through the GREENGUARD Environmental Institute.

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Phone: (440) 937-7000
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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	

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

PECORA CORPORATION
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PEOPLE • PRODUCTS • PERFORMANCE

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