

COUNTY OF SAN DIEGO
REPORT FORMAT AND CONTENT REQUIREMENTS

NOISE



LAND USE AND ENVIRONMENT GROUP

Department of Planning and Land Use
Department of Public Works

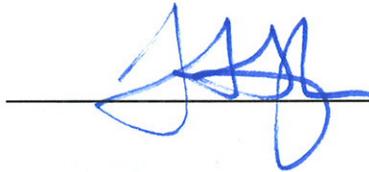
First Revision
January 27, 2009

APPROVAL

I hereby certify that these **Guidelines for Determining Significance and Report Format and Content Requirements for Noise** are a part of the County of San Diego, Land Use and Environment Group's Guidelines for Determining Significance and Technical Report Format and Content Requirements and were considered by the Director of Planning and Land Use, in coordination with the Director of Public Works on the 27th day of January, 2009.



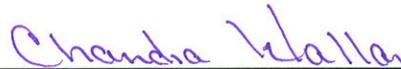
ERIC GIBSON
Director of Planning and Land Use



JOHN SNYDER
Director of Public Works

I hereby certify that these **Guidelines for Determining Significance and Report Format and Content Requirements for Noise** are a part of the County of San Diego, Land Use and Environment Group's Guidelines for Determining Significance and Technical Report Format and Content Requirements and have hereby been approved by the Deputy Chief Administrative Officer (DCAO) of the Land Use and Environment Group on the 27th day of January, 2009. The Director of Planning and Land Use is authorized to approve revisions to these Guidelines for Determining Significance and Report Format and Content Requirements for Noise except any revisions to the Guidelines for Determining Significance presented in Chapter 4.0 must be approved by the Deputy CAO.

Approved, January 27, 2009



CHANDRA WALLAR
Deputy CAO

PURPOSE

The Noise Report Format and Content Requirements provide guidance on conducting noise assessment and preparing reports for discretionary projects being processed by the Land Use and Environment Group. These guidelines are designed to:

1. Ensure the quality, accuracy and completeness of noise impact reports.
2. Aid in staff's efficient and consistent review of maps and documents from different consultants.
3. Provide adequate information to make appropriate planning decisions and to make determinations regarding conformance with applicable regulations.
4. Increase the efficiency of the environmental review process and avoid unnecessary time delays.

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1.0 INTRODUCTION

All noise assessment shall follow the requirements in this document. The overall length of reports and amount of information to include will vary depending on the size and scope of the project, the regional setting, and the degree of impacts proposed.

1.1 Acoustical Analysis Report

An Acoustical Analysis Report is required for projects with potential significant noise impacts.

2.0 REPORT FORMAT AND REQUIREMENTS

2.1 General Report Guidelines

All written reports shall follow these general guidelines:

- Reports should be technical in nature and should avoid anecdotal or extraneous information.
- Reports should be concise and written in a professional manner suitable for peer review. Staff may reject reports based on inadequate quality if the report is written in such a manner that a timely and accurate review cannot be completed.
- Acoustical reports should be bound such that staff may easily review the document. Shorter reports may be stapled, but longer documents should be bound by other methods, such as comb binding.
- Attached plot plans must be to scale and contain a north arrow and both number and bar scales. When maps are reduced, adjust the scale, or mark the map "Reduced/Use Bar Scale".
- For Full Acoustical Analysis Reports, each chapter and subsection of the report should be clearly delineated with bold print and/or underlining and will use the numerical headings contained in these report requirements.
- Draft copies of the report shall have all changes made in response to staff comments in strikeout/underline form. Final copies of the report shall be clean, with all editing marks removed.

All acoustical reports will be reviewed for technical accuracy and completeness by a staff noise specialist. Reports are considered draft until staff determines the report to be complete. Each submittal and review of a draft noise report is considered an "iteration". During each iteration, staff will either determine the report to be complete or respond with comments for necessary changes. The County expects that the first iteration will be as complete and comprehensive as possible to address issues in the scoping letter. However, each report may have up to three iterations, after which project denial may be recommended due to inadequate environmental progress.

2.2 Acoustical Analysis Report

2.2.1 Outline

The required sections of the Full Acoustical Report are provided in the outline below:

ACOUSTICAL ANALYSIS REPORT OUTLINE	
COVER PAGE	
TABLE OF CONTENTS	
GLOSSARY OF TERMS AND ACRONYMS	
EXECUTIVE SUMMARY (REPORT SUMMARY)	
1.0	INTRODUCTION
1.1	<u>Project Description</u>
1.2	<u>Environmental Settings & Existing Conditions</u> a. Settings & Location b. Existing Noise Conditions
1.3	<u>Methodology & Equipment</u> a. Noise Measuring Methodology & Procedures b. Noise Modeling Software c. Noise Formulas and Calculations
2.0	NOISE SENSITIVE LAND USES (NSLU) AFFECTED BY AIRBORNE NOISE
2.1	<u>Guidelines for the Determination of Significance</u>
2.2	<u>Potential Noise Impacts</u> a. Potential Build-out Noise Conditions & Impacts i. Exterior Locations ii. Interior Locations b. Design Considerations & Mitigation Measures i. Exterior Locations ii. Interior Locations
2.3	<u>Off-site Direct & Cumulative Noise Impacts(If applicable)</u> a. Direct Noise Impacts b. Cumulatively Significant Noise Impacts c. Design Considerations & Mitigation Measure Calculations

- 3.0 PROJECT-GENERATED AIRBORNE NOISE**
 - 3.1 Guidelines for the Determination of Significance**
 - 3.2 Potential Operational Noise Impacts (Non-Construction Noise)**
 - a. Potential Build-out Noise Conditions without Mitigation**
 - b. Design Considerations and Mitigation Measures**
 - 3.3 Potential General Construction Noise Impacts**
 - a. Potential Temporary Construction Noise Impacts without Mitigation**
 - b. Design Considerations & Temporary Mitigation Measures**
 - 3.4 Potential Impulsive Noise Impacts (If Applicable)**
 - a. Potential Impulsive Noise Impacts without Mitigation**
 - b. Design Considerations & Mitigation Measures**
 - 3.5 Cumulative or Combined Noise Impacts (If Applicable)**
 - a. Potential Combined Noise Impacts**
 - b. Design Considerations & Mitigation Measures**
- 4.0 GROUND-BORNE VIBRATION AND NOISE IMPACTS (If Applicable)**
 - 4.1 Guidelines for the Determination of Significance**
 - 4.2 Potential & Mitigated Noise Impacts**
- 5.0 SUMMARY OF PROJECT IMPACTS, DESIGN CONSIDERATIONS, MITIGATION & CONCLUSION**
- 6.0 CERTIFICATION**

FIGURE, EXHIBITS & ILLUSTRATIONS

- Identify project location
- Identify all NSLUs & receptor locations
- Identify all noise sources
- Identify all design considerations and recommended mitigation measures
- Identify CNEL noise contours (If applicable)
- (11"x17" sized sheet shall be utilized if 8"x 11" illustrations are unclear)

APPENDICES

- References
- Sound Modeling Application Input/Output Data
- Mechanical Equipment Manufacturer Specifications

2.2.2 Content

Note: The numbering identified below should be used when preparing technical studies. The numbers and titles are shown in italics only for purposes of this document and are not required to be formatted in italics for the technical study.

COVER PAGE

The cover page shall include the following information:

- Project common name
- Project numbers (i.e. TM, ZAP, MUP, etc.) including the environmental log number (ER)
- Date (original report date plus all revisions) must be revised during each iteration of the draft report
- Name of County Approved CEQA Consultant preparing document, firm name (if applicable) and address
- Project proponent's name and address
- The following statement: Prepared for The County of San Diego

TABLE OF CONTENTS

The table of contents must follow the order and format outlined in this document. Page number should be assigned when possible. Titles of each Appendix or Attachment should be listed in the order in which they are found in the document.

GLOSSARY OF TERMS AND ACRONYMS

Provide a list of terms and acronyms used in the report.

EXECUTIVE SUMMARY

Provide a brief summary of the project, the noise sources present on the site, potential impacts and proposed mitigation. No information should be provided in the summary that is not further explained elsewhere in the document. The purpose of the summary is to provide a quick reference for the public and decision makers. Therefore, the language should be less technical than that used in the remainder of the document.

1.0 INTRODUCTION

1.1 Project Description

Project Description: Provide a very detailed description of the project, including all on-site and off-site components and any design alternatives. An 8.5" x 11" or 11" x 17" copy of the plot plan/map must be attached to the report as (a) numbered figure(s). The project description should be as detailed as possible, including details such as but not limited to the following:

- Size of project site and area proposed for development.
- Description of all adjoining land uses.
- Purpose and scale of proposed uses associated with the project, such as residential development or recreational camping.
- Proposed structures (size, location, purpose, etc.).
- Location of all easements relevant to the noise assessment.
- Proposed Noise Sensitive Land Uses (NSLUs), exposed to noise sources.
- Construction equipment activities and staging areas.

1.2 Environmental Settings & Existing Conditions

a. Settings & Locations

Describe the physical characteristics, such as topography, elevation, etc. Briefly describe the general vicinity in terms of type and density of development and infrastructure. In addition, address the existing land uses on site, on surrounding lands and activities.

Project Location: Discuss the project location in the regional and local context. Include Global Positioning System (GPS), San Diego Association of Governments (SANDAG) or most current mapping coordinates used by San Diego Geographic Information System (SANGIS) with the site and APN clearly identified as numbered figure(s).

For SANDAG GIS Projection/Coordinate System information, refer to SANDAG website:
<http://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome>

b. Existing Noise Conditions

Discuss existing noise conditions. Describe the location of the project site, identifying existing noise associated with project related to the following:

- Existing noise from all sources, particularly roads, highways, railroads, airports, heliports, extractive industries or any significant on- and off-site noise impacts.
- Existing operation activities including but not limited to: mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, generators, pneumatic equipment and outdoor human activities.
- Existing construction activities including but not limited to: site grading, truck/construction equipment movement, engine noise, rock excavation, crushing, and blasting.

1.3 Methodology and Equipment

a. Noise Measuring Methodology and Procedures

Identify and list all types of noise measuring and project related equipment involved in the analysis. Receptor locations will be located at any point on and/or beyond the boundaries of the property line (section 36.404). Existing and proposed NSLUs shall be identified and modeled (Policy 4B). Exterior locations shall be identified as contiguous areas to the building structure, with related accessibility. The outdoor living area shall be adjoined, on the same lot as the dwelling unit, and will conform to setbacks and relevant ordinances. Receptors shall be located at the most optimal location based on access, privacy and relevant County Standards. This section will also discuss field calibration. Document any calibration calculations that were necessary to validate noise model. Ground-borne vibration assessment is to be identified in inches per second rms.

In addition, noise measurements and analysis shall be documented to the effect that all procedures are in compliance with the most current American Society for Testing and Materials (ASTM) standards or other applicable standards.

SOUND LEVEL MEASUREMENT (Excerpt from Section 36.403)

- (a) A sound level measurement made pursuant to this chapter shall be measured with a sound level meter using the A-weighting and "slow" response.
- (b) Each measurement shall be conducted a the boundary line of the property on which the noise source is located or any place on the affected property, but no closer than five feet from the noise source.

- (c) The sound level meter shall be calibrated and adjusted by means of an acoustical calibrator of the coupler-type to assure meter accuracy within the tolerances in American National Standards Institute specifications for sound level meters, ANSI-S1.4-1983 or its the latest revision. The sound level meter shall be used as provided in the manufacture’s instructions.

b. Noise Modeling Software

Discuss the noise modeling application in the report. Input data and results shall be submitted in a form in which Staff is able to verify with in-house programs. Noise assessment utilizing proprietary noise models and propriety software will only be acceptable when accompanied by theoretical calculations. Provide a discussion of the two methods of analysis, addressing and comparing the results. For more proprietary model information refer to the “Proprietary Models” Section below.

Traffic Noise Prediction Model-Sound 32, Traffic Noise Model-TNM 2.5 and the most current transportation noise modeling software that is available to the County are considered acceptable noise modeling applications. Other proprietary models are considered additional, supplemental information supporting actual and theoretical noise assessment and calculations. Staff may request additional information such as noise assessment in a certain form, visual illustrations, etc.

Proprietary Models

In order for the County of San Diego to allow the use of noise models which are not open source or provided by a public agency, such as “Cadna”, certain criteria must be met. Since proprietary models are not made available to the County for use, the County must rely on certain assumptions regarding the model, its application, and the validity of the modeling results. It will be necessary for staff to run its own analysis for a given project. This analysis allows staff to verify that the project complies with applicable noise ordinance and noise element requirements based on the unmitigated noise levels of all noise generators on the property site. This analysis may also eliminate the need to examine the proprietary model results since the available source information for this project (the unmitigated case) can be used to demonstrate compliance. In order to perform this preliminary evaluation, staff will need sufficient noise source specifications and location information including property line distances.

The submitted data should be presented as a comma-delimited (or Tab-Delimited) data set for each noise source, relevant noise barrier, and model receptor. The standardized data format for this information is as follows:

1. All project locations must be described using State plane coordinates, or with a Cartesian reference frame using a stated origin location;
2. All project locations must be described using State plane coordinates, or with a Cartesian reference frame using a stated origin location;
3. All noise sources or generators shall require two files for describing their noise performance information and their location information. Each source will be linked in these files with a unique integer identification number. The noise performance file shall list each generator beginning with the ID number followed by its octave band information in a comma-delimited format starting with the 63 Hertz band and extending up to at least the 8000 Hertz band (16K is preferred). Unless it is otherwise specified, the decibel values shall be stated for each band with A-weighting included. A separate header/line entry or explanation would be required for an alternate format such as one-third octave bands or raw sound level values. The noise generator or source location file must use a matching integer identification number for each source in a comma-delimited format: generator1 _id, x_coordinate, y_coordinate, z_coordinate (elevation of the source). One generator per line (entry);
4. The noise barrier or feature file must use a unique integer identification number for each feature in a comma-delimited format for vertices: barrier1 _id, x_coordinate, y_coordinate, z0_coordinate (base of feature elevation), z1_coordinate (top of feature elevation). One vertex or node per line (entry); and
5. The model receptor file with a unique integer identification number must be given to each receptor in a comma-delimited format: receptor1_id, x_coordinate, y_coordinate, z_coordinate (elevation of the receptor), with one receptor per line (entry). Please note that an expanded receptor file may be required at complex sites.

c. Noise Formulas and Calculations

Demonstrate the calculations and procedures used in the noise assessment. Discuss theoretical and measured calculations that may apply. This section will discuss calculations such as barrier attenuation loss, attenuation by distance, etc.

2.0 NOISE SENSITIVE LAND USES (NSLU) AFFECTED BY AIRBORNE NOISE

2.1 Guidelines for the Determination of Significance (Excerpt from Section 4.1)

Project implementation will result in the exposure of any on- or off-site, existing or reasonably foreseeable future NSLU to exterior or interior noise (including noise generated from the project, together with noise from roads [existing and planned], railroads, airports, heliports and all other noise sources) in excess of any of the following:

A. Exterior Locations:

- i. 60 dB (CNEL); or**
- ii. An increase of 10 dB (CNEL) over pre-existing noise.**

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

- | | |
|--|----------------------------|
| (1) Net lot area up to 4,000 square feet: | 400 square feet |
| (2) Net lot area 4,000 square feet to 10 acres: | 10% of net lot area |
| (3) Net lot area over 10 acres : | 1 acre |

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations:

45 dB (CNEL) except for the following cases:

- i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior one-hour average sound level due to noise outside should not exceed 50 decibels (A).**
- ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.**

2.2 Potential Noise Impacts

Discuss the exposure of NSLU receptors to potential noise from all sources particularly roads, highways, railroads, airports, heliports or extractive industries (Transportation and Non-transportation). This includes noise caused by new development impacting existing or foreseeable future NSLUs.

It also includes new development which creates or locates NSLUs in such a place that they are impacted by noise (a typical example being a new residential project locating residences in close proximity to a highway).

a. Potential Build-out Noise Conditions & Impacts

Discuss potential buildout noise conditions for interior and exterior NSLU. Noise-related adverse effects associated with new development projects fall into the following category:

- Noise Sensitive Land Uses (NSLU) – Exposure of NSLU to potential noise from all sources, particularly roads, highways, railroads, airports, heliports or extractive industries. This includes noise caused by new development, impacting existing or foreseeable future NSLU. It also includes new development which creates or locates NSLU in such a place that they are impacted by noise (a typical example being a new residential project locating residences in close proximity to a highway). A table shall include potential noise sources that are modeled in the analysis:

Table X.X Sample Roadway Potential ADTs

Roadway / Highway/ Noise Source Name	Potential Speed Limit	Potential ADTs

- Potential Noise Impact Identification - Model noise sensitive receptors at strategic NSLU locations to help determine the worse-case scenario for exterior and interior locations. Identify all receptor locations and their values.

Table X.X Sample Potential Traffic Noise Impacts

Receptor Number	Receptor Location	Elevation	Potential Traffic Noise Level (CNEL)

b. Design Considerations and Mitigation Measures

If potential noise level impacts to exterior and interior NSLU are determined to be significant, please see the following:

Design Consideration Calculations

For exterior and interior locations:

- Identify all existing topographic and structural elements that are modeled in noise analysis.
- Discuss modifications to the development that have been made or will be made which reduce the exterior and interior noise level below CNEL equal to 60 decibels
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

Mitigation Calculations

For exterior and interior locations:

- Discuss modifications to the development that have been made or will be made which reduce the noise sensitive receptors to a noise level below CNEL equal to 60 decibels
- Provide mitigation measures to reduce potential noise impacts. Determine whether the potential noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended mitigation.
- Determine whether mitigation or design is feasible to adequately reduce noise levels to meet County Standards.

Table X.X Sample Potential Mitigated Traffic Noise Impacts

Receptor Number	Receptor Location	Elevation	Mitigation	Mitigated Traffic Noise Level (CNEL)

2.3 Off-site Direct & Cumulative Noise Impacts (If applicable)

a. Direct Noise Impacts

(Existing vs. Existing + Project)

Direct noise impacts occur in discretionary applications where existing noise conditions and the project related noise contributions will combine to exceed the standards of the County Noise Element at exterior noise sensitive land uses (NSLU). It is more likely to occur in locations where existing noise levels are elevated or approach the applicable criterion of 60 decibels CNEL for an exterior NSLU. It is considered a significant direct impact when:

“New projects combine to generate more than double the existing sound energy of a documented noisy site.”

b. Cumulatively Significant Noise Impacts

(Existing vs. Existing + Cumulative [Near-term] + Project)

Cumulative noise impacts may occur in discretionary applications where other permitted or planned projects will combine to exceed the standards of the Noise Element. It is more likely to occur in locations where existing noise levels are elevated or approach the applicable criterion of 60 decibels CNEL for an exterior noise sensitive land use (NSLU). Two examples of cumulative effects are (1) major residential developments in a region generate sufficient project-related traffic to affect significantly existing or planned NSLU and (2) extractive industries or long-term construction activities from several projects are in close proximity to existing or planned NSLU with future conditions exceeding 60 decibels CNEL. With an identified significant cumulative impact (doubling the existing noise conditions), the analysis also needs to determine whether the project's contribution is "cumulatively considerable" before addressing the issue of feasible mitigation measures.

- **Cumulatively Considerable**

(Existing + Cumulative vs. Existing + Cumulative + Project)

Mitigation measures are required to reduce potential "Cumulatively Considerable" impacts. Evaluation of mitigation feasibility and limitations shall be addressed in association with their implementation. A "cumulatively considerable" contribution requiring mitigation or design measures is identified whenever:

"A more than a one decibel increase from the project was identified in the model analysis."

A major project issue for cumulative noise effects can be identified whenever there is no supporting evidence that (1) the surrounding community would consent to a proposed off-site mitigation scheme or (2) the feasible measures (on or off-site) are not sufficient to comply with the Noise Element.

c. Design Considerations & Mitigation Measure Calculations

This section shall discuss and identify all design considerations and noise mitigation measures to reduce significant impacts to noise sensitive land uses to less than significant. For each significant impact and mitigation measure, determine if the proposed mitigation have reduced the significance level to an acceptable and feasible level in accordance with the stated Significance Guidelines.

3.0 PROJECT-GENERATED AIRBORNE NOISE

3.1 Guidelines for the Determination of Significance

~Table 1 from Section 4.2

It shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property exceeds the applicable limits on Table 1.

The project will generate airborne noise which, together with noise from all sources, will be in excess of either of the following:

**Table 1
San Diego County Code Section 36.404,
SOUND LEVEL LIMITS IN DECIBELS (dBA)**

ZONE	TIME	ONE-HOUR AVERAGE SOUND LEVEL LIMITS (dBA)
(1) R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-90, S-92 and R-V and R-U with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) R-RO, R-C, R-M, S-86, V5 and R-V and R-U with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S-94, V4 and all other commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2	7 a.m. to 7 p.m.	60
V1, V2	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M-50, M-52 and M-54	Anytime	70
(6) S-82, M-56 and M-58	Anytime	75
(7) S88 (see subsection (c) below)		

(a) If the measured ambient level exceeds the applicable limit noted above, the allowable one hour average sound level shall be the ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(b) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones; provided however, that the one-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone which the extractive industry is actually located.

(c) S88 zones are Specific Planning Areas which allow for different uses. The sound level limits in Table 36.404 above that apply in an S88 zone depend on the use being made of the property. The limits in Table 36.404, subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section, measured at or beyond six feet from the boundary of the easement upon which the facility is located.

~Section B from Section 4.2

Section 36.409 states:

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

~Table 2 &3 from Section 4.2

Impulsive Noise: Noise generated by the project will exceed the standards listed in San Diego Code Section 36.410, Sound Level Limitations on Impulsive Noise.

Section 36.410 states:

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 2, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 2 are as described in the County Zoning Ordinance.

**Table 2.
San Diego County Code Section 36.410,
MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED
AT OCCUPIED PROPERTY IN DECIBELS (dBA)**

OCCUPIED PROPERTY USE	DECIBELS (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 3 are as described in the County Zoning Ordinance.

**Table 3.
San Diego County Code Section 36.410,
MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED
PROPERTY IN DECIBELS (dBA) FOR PUBLIC ROAD PROJECTS**

OCCUPIED PROPERTY USE	dB(A)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

(c) The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period.

If the sound level caused by construction equipment or the producer of the impulsive noise, exceeds the maximum sound level for any portion of any minute it will be deemed that the maximum sound level was exceeded during that minute.

3.2 Potential Operational Noise Impacts (Non-Construction Noise)

Discuss exposure of on- or off- site areas to increased noise associated with operation of projects including but not limited to: mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, pneumatic equipment, operation related traffic (vehicle movement, engine noise), outdoor human activity in defined limited areas, speakers, bells and chimes.

a. Potential Build Out Noise Conditions without Mitigation

Discuss potential buildout noise conditions. Noise-related adverse effects associated with new development projects fall into the following category:

- Operational Activities – Exposure of on- or off- site areas to increased noise associated with operation of projects including but not limited to; mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, pneumatic equipment, operation related traffic (vehicle movement, engine noise), outdoor human activity in defined limited areas, speakers, bells and chimes. Provide measured Leq and octave band data.

Note: No permanent loudspeaker or sound amplification system shall be used to produce sounds in violation of the County Noise Ordinance.

Table X.X Sample Noise Generating Equipment Measurement

Noise Source Name	Distance Measured	Octave Band Data					Leq Measurement

- Potential Noise Impact Identification
Model noise receptors relative to the project boundaries and property lines. Receptors shall be strategically located in areas that will determine worst-case noise impacts. Identify all noise sources, receptor locations, their distance to project property lines and their values.

Table X.X Sample Attenuation by Distance Measurement

Noise Source Name	Receptor Label	Receptor (Property Line) Location	Distance Measured	Noise Level (dBA)

b. Design Considerations and Mitigation Measures

If potential noise impacts at the project boundaries/property lines and beyond is determined to be significant:

Design Considerations

- Discuss modifications to the development that have been made or will be made which reduce noise impacts to the project boundaries and property lines.
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

Mitigation Calculations

- Discuss modifications to the development that have been made or will be made which will reduce noise impacts to the project boundaries and property line. Noise level limit thresholds at the property line will be determined by Section 4.2-Table 1.
- Provide mitigation measures to reduce potential noise impacts. Determine whether the potential noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended mitigation. Noise level limit thresholds at the property line will be determined by Section 4.2-Table 1.

Table X.X Sample Mitigated Noise Impacts

Noise Source Name	Receptor Label	Receptor (Property Line) Location	Noise Level (dBA)	Noise Mitigated Reduction

3.3 Potential General Construction Noise Impacts

Discuss exposure of on- or off- site areas to increased noise associated with temporary general construction operations and equipment including but not limited to: loaders, back hoes, graders, scrapers, water trucks, pneumatic equipment and operation related traffic (vehicle movement, engine noise), etc.

a. Potential Temporary Construction Noise Impacts Without Mitigation

Discuss potential temporary construction noise conditions. Noise-related adverse effects associated with new development projects fall into the following category:

Construction Activities - The exposure of on- or off- site areas to temporary construction noise associated with project-related activities including but not limited to; site grading, truck/construction equipment movement, engine noise, rock excavation and rock crushing, etc .

Table X.X Sample Construction Noise Equipment Measurement

Noise Source Name	Distance Measured	Leq Measurement

Potential Noise Impact Identification

Model noise receptors relative to the project boundaries and property lines located on any occupied property where noise is being received. .

Receptors shall be strategically located in areas that will determine worst-case noise impacts. Identify all noise sources, receptor locations, their distance to project property lines and their values.

Table X.X Sample Construction Noise Attenuation by Distance Measurement

Noise Source Name	Receptor Label	Receptor (Property Line) Location	Distance Measured	Noise Level (dBA)

b. Design Considerations and Mitigation Measures

If temporary construction noise impacts at the project boundaries/property lines and beyond are determined to be significant:

Design Considerations

- Discuss modifications to the development that have been made or will be made which reduce construction noise impacts to the project boundaries and property lines.

- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

Mitigation Measures

- Discuss modifications to the development that have been made or will be made which will reduce noise impacts to the project boundaries and property line. Noise level limit thresholds at the property line on any occupied property where the noise is being received shall not exceed an average of 75 dB for an eight hour period, between 7a.m. and 7 p.m.
- Provide mitigation measures to reduce construction noise impacts to 75 dB or below. Determine whether the potential temporary noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended temporary construction noise mitigation. Construction noise level limit thresholds at the property line or on any occupied property where the noise is being received will be as high as 75 dBA.

Table X.X Sample Mitigated Noise Impacts

Noise Source Name	Receptor Label	Receptor (Property Line) Location	Noise Level (dBA)	Noise Mitigated Reduction

3.4 Potential Impulsive Noise Impacts (If Applicable)

Discuss exposure of on- or off- site areas to increased impulsive noise associated with any single noise event or series of single noise events, which causes a high peak noise level of short duration (one second or less), measured at a specific location. Examples include, but are not limited to: gun shots, explosions, blasting or a noise generated by impulsive construction equipments.

a. Potential Impulsive Noise Impacts without Mitigation

Discuss potential impulsive noise activities associated with the project.

Impulsive Noise Operations and Activities - The exposure of on- or off- site areas to noise associated with project-related activities include the following but are not limited to: rock excavation, rock crushing, hoe ram operations, blasting etc.

Potential Noise Impact Identification

Model noise receptors relative to the project boundaries and property lines located or any occupied property where noise is being received.

Receptors shall be strategically located in areas that will determine worst-case noise impacts. Identify all noise sources, receptor locations, their distance to project property lines and their values.

b. Design Considerations and Mitigation Measures

If potential impulsive noise impacts at the project boundaries/property lines and beyond are determined to be significant, provide the following if applicable:

Design Considerations

- Discuss modifications to the development that have been made or will be made which reduce impulsive noise impacts to the project boundaries and property lines.
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

Mitigation Measures

- Discuss modifications to the development that have been made or will be made which will reduce the project related impulsive noise impacts to the project boundaries and property line.
- Provide mitigation measures to reduce impulsive noise impacts to less than significant. Determine whether the impulsive noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigations. Compare noise impact results with and without the recommended noise mitigation measures.

3.5 Cumulative or Combined Noise Impacts (If applicable)

a. Potential Combined Noise Impacts

- Discuss co-location project exposure of on- or off- site areas to increased noise associated with operation of projects including but not limited to; mechanical equipment, pumps, rooftop equipment, condenser units, A/C units, pneumatic equipment, operation related traffic (vehicle movement, engine noise), outdoor human activity in defined limited areas, speakers, bells and chimes.
- Identify cumulative or combined noise impacts from both existing and potential noise impacts. Specify whether the project proposes significant contributions to the existing noise conditions.

Table X.X Sample of Cumulative or Combined Noise Impacts

Receptor Label	Receptor (Property Line) Location	Noise Source (name) & Leq	Noise Source (name) & Leq	Noise Source (name) & Leq	Cumulative or Combined Noise Level Impacts

b. Design Considerations & Mitigation Measures

Project Design Considerations

- Identify all existing topographic elements that are modeled in the noise analysis.
- Discuss modifications to the development that have been made or will be made which reduce noise impacts at the project boundaries and property lines.
- Identify all existing topographic elements that are modeled in the noise analysis. Provide a quantitative analysis of all topographic elements taken into calculations.

Mitigation Measurement Calculations

If the proposed potential noise impacts are determined to have a significant contribution to the existing noise conditions, mitigation measures shall be provided.

- Provide mitigation measures to reduce potential noise impact contributions. Determine whether the potential noise impacts are significant by quantifying the anticipated changes to the noise environment with the recommended mitigation. Compare noise impact results with and without the recommended mitigation. Noise level limit thresholds at the property line will be determined by Section 4.1-Table 2.

4.0 4.0 GROUND-BORNE VIBRATION AND NOISE IMPACTS

4.1 Guidelines for the Determination of Significance

Project implementation will expose the uses listed in Table 4 and 5 to ground-borne vibration or noise levels equal to or in excess of the levels shown:

Table 4
Guideline for Determining the Significance of
Ground-borne Vibration and Noise Impacts

Land Use Category	Ground-Borne Vibration Impact Levels (inches/sec rms)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events ¹	Occasional or Infrequent Events ²	Frequent Events ¹	Occasional or Infrequent Events ²
Category 1: Buildings where low ambient vibration is essential for interior operations. (research & manufacturing facilities with special vibration constraints)	0.0018 ³	0.0018 ³	Not applicable ⁵	Not applicable ⁵
Category 2: Residences and buildings where people normally sleep. (hotels, hospitals, residences, & other sleeping facilities)	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use. (schools, churches, libraries, other institutions, & quiet offices)	0.0056	0.014	40 dBA	48 dBA

Source: U.S Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

Notes to Table 4:

1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Occasional or Infrequent Events" are defined as fewer than 70 vibration events per day. This combined category includes most commuter rail systems.
3. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
4. Vibration-sensitive equipment is not sensitive to ground-borne noise.
5. There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 5 gives criteria for acceptable levels of ground-borne vibration and noise for these various types of special uses.
6. For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the peak particle velocity (PPV) exceeds one inch per second. Non-transportation vibration sources such as impact pile drivers or hydraulic breakers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in San Diego County.

Table 5
Guideline for Determining the Significance of
Ground-Borne Vibration and Noise Impacts for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact Levels (inches/sec rms)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events ¹	Occasional or Infrequent Events ²	Frequent Events ¹	Occasional or Infrequent Events ²
Concert Halls, TV Studios, and Recording Studios	0.0018	0.0018	25dBA	25dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theaters	0.0040	0.010	35 dBA	43 dBA

Source: U.S Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

Notes to Table 5:

1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Occasional or Infrequent Events" are defined as fewer than 70 vibration events per day. This combined category includes most commuter rail systems.
3. If the building will rarely be occupied when the trains are operating, there is no need to consider impact.
4. For historic buildings and ruins, the allowable upper limit for continuous vibration to structures is identified to be 0.056 inches/second rms. Transient conditions (single-event) would be limited to approximately twice the continuous acceptable value.

4.2 Potential & Mitigated Noise Impacts

Determine worst case vibration and/or noise impacts to the proposed project. If impacts are considered significant, provide mitigation measures to ensure project is in compliance with County Standards.

This section shall discuss and identify significant impacts resulting from ground-borne vibration and noise impacts. For each significant impact, determine if the mitigation measures have reduced the significance level to an acceptable and feasible level in accordance with the stated Significance Guidelines.

5.0 SUMMARY OF PROJECT IMPACTS, DESIGN CONSIDERATIONS, NOISE MITIGATION & CONCLUSIONS

This section shall provide a brief text summary of project noise impacts and mitigation.

6.0 CERTIFICATION

This section shall provide a list of preparers, persons and organizations involved with the noise assessment. A signature from an approved County Consultant shall be provided as project certification.

FIGURES, EXHIBITS & ILLUSTRATIONS (11"x17" sized sheet shall be utilized if 8"x 11" illustrations are unclear)

Identify Project Location

Identify NSLUs & Receptor Locations

Identify All Noise Sources

Identify All Design Considerations and Recommended Mitigation Measures

(If Applicable) Identify Potential CNEL Noise contours without proposed project

APPENDICES

References

Sound Modeling Application Input/Output Data

Mechanical Equipment Manufacturer Specifications

[Attachment A]

[Noise Analysis Title] Report

Project Common Name
Permit Numbers/DPLU Environmental Log No.

Lead Agency:

County of San Diego
Department of Planning and Land Use
Contact: _____
5201 Ruffin Road, Suite B
San Diego, CA 92123
Phone Number

Preparer:

Name
Firm Name
Address
Phone Number

Signature

Project Proponent:

Name
Firm Name
Address

Date