Standard Plan Issue Date: JANUARY 1, 2023
City of Newport Beach
Community Development/ Building Division
2022 CBC & CRC
2022.v1.1-1-2023

LIMITS OF APPLICABILITY
— USE OF THIS DOCUMENT SHALL NOT PERMIT THE APPLICANT TO MODIFY ANY PORTION(S) OF THIS PLAN OR THESE DETAILS.

BUILDING DIVISION

STANDARD A.C. CONDENSER NOISE ANALYSIS PLAN

Newport Beach Municipal Code section 10.26.045 limits the noise from sound-producing equipment to A-weighted sound pressure level of 50 dB measured to the nearest outdoor living area (OLA) or nearest window (NW), which ever is the least distance to the affected property.This number can be raised to 55 dB if a timer is installed on the equipment to shut off between 10 PM and 7 AM. Those limits can be further raised to 65 dB with a timer and written permission from the affected neighbor on our city standard form:
newportbeachca.gov/home/showdocument?id=17340

Before issuance of a mechanical permit to install an AC condenser, the applicant must show compliance with the noise ordinance by providing the following information on two copies of plans. See sheets 2 & 3.

(a) A copy of the condenser manufacturer's literature, listing the decibel (dB) level, model # and manufacturer of the equipment to be installed.
(b) A site plan showing the location of the AC equipment with the distance to the neighbor's nearest OLA or NW, which ever is the least distance.
(c) A scale drawing of any noise barrier, if the noise barrier credit is used.
(d) A calculation using 1984 or latest revision thereof for AHRI Standard 275 Tables, to demonstrate compliance.
(e) Plans and calculations must be ink or copy only.

The information, tables, and examples on this sheet are to assist in completing sheets 2 & 3.

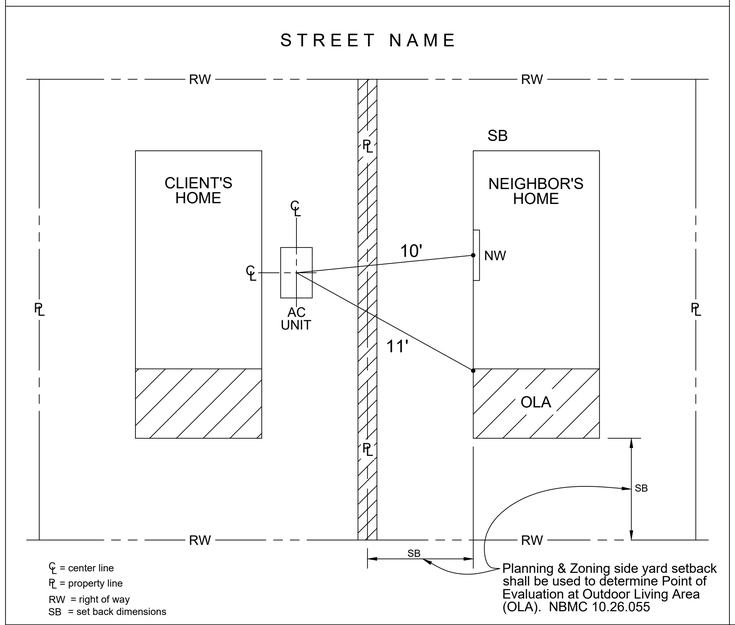
The example shown does not begin to cover all of the different possible field conditions. Speak with a Building Division Permit Specialist if you have questions.

Single Condenser Unit Calculation (AHRI Std 275)

The basic procedure for estimation of the sound level at a given point of evaluation consists of combining the sum of several factors with the Sound Rating Level for the equipment. This is done for an exterior condition at the nearest OLA or NW of the neighbor.

** For the Barrier Shield, L_2 and D must occur at not less than 5 ft. from finish surface for Point of Evaluation.

Sound Rating of Equipment (Decibel Level)	72	dB
+ Equipment Location Factor	+6	(see Table 1)
- Barrier Shielding Factor	- 7	(see Table 2)
- Distance Factor	- 17.5	(see Table 3)
= Estimated Sound Level of Equipment at the Point of Evaluation (Neighbor)	=53.5	dB < 55 dB O.K. w/ Timer NBMC 10.26.045

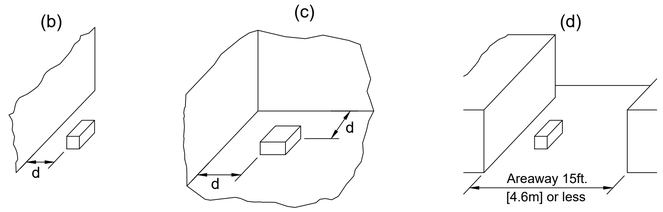


SAMPLE SITE PLAN

Equipment Location Factor

This factor takes into consideration the effect of walls and other reflective surfaces adjacent to the equipment. AHRI Std 275(4.1.1)

TABLE 1: EQUIPMENT LOCATION FACTOR	VALUE (dB)
(a) Equipment on the ground or roof or on side of building wall with no adjacent reflective surface within 10 ft. (3m) (d greater than 10 ft. [3m])	0
(b) Equipment on the ground or roof or on side of building wall with a single adjacent reflective surface within 10ft. (3m) (d less than 10ft. [3m])	3
(c) Equipment on the ground or roof or on side of building wall within 10 ft. [3m] of two adjacent walls forming an inside corner (d less than 10 ft. [3m] to both surfaces.)	6
(d) Equipment on the ground or roof or on side of building wall and between two opposite reflecting surfaces less than 15 ft. [4.6m] apart.	6



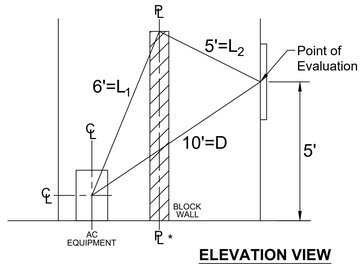
Barrier Shielding Factor

(See example sketches, below.)

Sound reduction benefits can be gained when a solid structure obstructs the sound path. These structures could be AHRI Std 275(4.1.2):

- Corner of building.
- Corner of flat roof and wall.
- Parapet around flat roof.
- Heavy continuous wall (AHRI 275 4.1.2)
  (Surface Density 4.0 psf min.
  Note: Typical wood fence not adequate.)
  FHWA Noise Barrier Design Handbook 3.4.2

TABLE 2: BARRIER SHIELDING FACTOR	
L (ft. [m])	VALUE (dB)
0.5[0.15]	4 dB
1 [0.3]	7 dB
2 [0.6]	10 dB
3 [0.9]	12 dB
6 [1.8]	15 dB
12 [3.7]	17 dB

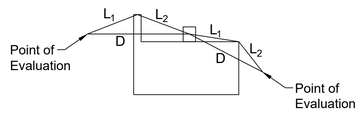


ELEVATION VIEW

$L = L_1 + L_2 - D$
$L = 6 + 5 - 10$
$L = 1$

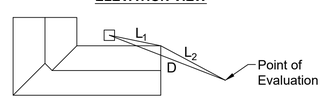
(See TABLE 2.
Results in a 7dB credit.)

Example 1:
Flat roof and parapet wall as barriers.



ELEVATION VIEW

Example 2:
Corner of building as barrier.



PLAN VIEW

L = $L_1 + L_2$ - D where:
$L_1 + L_2$ = Distance from equipment to point of evaluation around barrier. (Use minimum $L_1 + L_2$ value.)

D = Direct distance from equipment to Point of Evaluation with no barrier. (Determine D by layout sketch.)

SAMPLE BARRIER SHIELD DRAWINGS

Distance Factor

The direct distance, **D**, from the equipment location to the point of evaluation is a very significant application factor in determining the estimated A-weighted sound pressure levels resulting from the operation of outdoor equipment in any installation. AHRI Std 275(4.1.4)

TABLE 3: DISTANCE FACTOR					
ft.	VALUE (dB)	ft.	VALUE (dB)	ft.	VALUE (dB)
4	9.5	20	23.5	90	36.5
5	11.5	25	25.5	100	37.5
6	13.0	30	27.0	125	39.5
7	14.5	40	29.5	150	41.0
8	15.5	50	31.0	175	42.5
9	16.5	60	33.0	200	43.5
10	17.5	70	34.5	400	49.5
15	21.0	80	35.5		

Multiple Condenser Unit Installation

When there are two AC units, figure the dB level of each at the OLA or NW. Then use Table 4 to determine the overall combined sound level of the two units.

When there are three or more AC units, figure the dB levels of each at the OLA or NW, which ever is the least distance. Then, using Table 4, determine the overall combined sound levels of two units that are the loudest (loudest at the point of evaluation, i.e. the neighbor.) Compare those combined sound levels with the third loudest unit and come up with another combined level, etc., until all units have been considered. Those final combined sound levels are the resultant of the multiple units. AHRI Std 275(4.3.2.5)

TABLE 4: VALUES USED FOR COMBINING NUMBERS FOR MULTI-UNIT INSTALLATIONS	
Difference Between Numbers (dB) At point of evaluation	VALUE (dB) To be added to larger number
0.0 or 1.0	3.0
2.0, 3.0, 4.0, or 5.0	2.0
6.0 or 7.0	1.0
> 7.0	0.0

Values from Table 4 shall be added to the unit with the highest dB level among the units being evaluated.

Multiple Condenser Unit Calculation (ARI Std 275)

Assumptions:
We are working with a unit that has 2 condensers. The difference in sound rating between the two condensers is approximately 6.0 dB, with 72 dB being the maximum value.

Example Calculation:	Exterior	
Sound Rating of Equipment (Decibel Level)	72	dB
+ Multiple Condenser Unit Factor	+1	(see Table 4)
+ Equipment Location Factor	+6	(see Table 1)
- Barrier Shielding Factor	- 7	(see Table 2)
- Distance Factor	- 17.5	(see Table 3)
= Estimated Sound Level of Equipment at the Point of Evaluation (Neighbor)	=54.5	dB < 55 dB O.K. w/ Timer

SIDE YARD SETBACK AS DETERMINED BY A PLANNER: _____ FT. _____ PLANNER'S INITIALS

SCOPE OF WORK:	
PROJECT ADDRESS:	
OWNER'S NAME:	PLAN PREPARER:
TEL. NO.:	CONTACT INFO:
SIGNATURE:	LICENSE NO.:

Filename: 2022 AC Noise Analysis v1.DWG

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STANDARD A.C. CONDENSER NOISE ANALYSIS PLAN

MANUFACTURER'S NAME & PRODUCT DATA SHEET (LISTING dB LEVEL)

SITE PLAN

(NOTE: THE SCALE IS NOT SET, BUT MUST REMAIN CONSISTENT THROUGHOUT)

BARRIER SHIELD ANALYSIS

(NOTE: BARRIER DRAWING MUST BE TO SCALE)

UNIT #1		UNIT #2 (IF APPLICABLE)	UNIT #3 (IF APPLICABLE)	UNIT #4 (IF APPLICABLE)
Calculation:	Exterior	Exterior	Exterior	Exterior
Sound Rating of Equipment (Decibel Level)	_____dB	_____dB	_____dB	_____dB
+ Equipment Location Factor	+ _____(see Table 1)	+ _____(see Table 1)	+ _____(see Table 1)	+ _____(see Table 1)
- Barrier Shielding Factor	- _____(see Table 2)	- _____(see Table 2)	- _____(see Table 2)	- _____(see Table 2)
- Distance Factor	- _____(see Table 3)	- _____(see Table 3)	- _____(see Table 3)	- _____(see Table 3)
= Estimated Sound Level of Equipment at the Point of Evaluation (Neighbor)	= _____dB	= _____dB	= _____dB	= _____dB
When two or more units:				
+ Multi-Unit Value	+ _____(see Table 4)	+ _____(see Table 4)	+ _____(see Table 4)	+ _____(see Table 4)
= Grand Total with Multi-Unit Value	= _____dB	= _____dB	= _____dB	= _____dB

A.C. CONDENSER NOISE ANALYSIS

SIDE YARD SETBACK AS DETERMINED BY A PLANNER: _____ FT. _____ PLANNER'S INITIALS

SCOPE OF WORK:	
PROJECT ADDRESS:	
OWNER'S NAME:	PLAN PREPARER:
TEL. NO.:	CONTACT INFO:
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MANUFACTURER'S NAME & PRODUCT DATA SHEET (LISTING dB LEVEL)

SITE PLAN

(NOTE: THE SCALE IS NOT SET, BUT MUST REMAIN CONSISTENT THROUGHOUT)

BARRIER SHIELD ANALYSIS

(NOTE: BARRIER DRAWING MUST BE TO SCALE)

UNIT #1		UNIT #2 (IF APPLICABLE)	UNIT #3 (IF APPLICABLE)	UNIT #4 (IF APPLICABLE)
Calculation:	Exterior	Exterior	Exterior	Exterior
Sound Rating of Equipment (Decibel Level)	_____dB	_____dB	_____dB	_____dB
+ Equipment Location Factor	+ _____(see Table 1)	+ _____(see Table 1)	+ _____(see Table 1)	+ _____(see Table 1)
- Barrier Shielding Factor	- _____(see Table 2)	- _____(see Table 2)	- _____(see Table 2)	- _____(see Table 2)
- Distance Factor	- _____(see Table 3)	- _____(see Table 3)	- _____(see Table 3)	- _____(see Table 3)
= Estimated Sound Level of Equipment at the Point of Evaluation (Neighbor)	= _____dB	= _____dB	= _____dB	= _____dB
When two or more units:				
+ Multi-Unit Value	+ _____(see Table 4)	+ _____(see Table 4)	+ _____(see Table 4)	+ _____(see Table 4)
= Grand Total with Multi-Unit Value	= _____dB	= _____dB	= _____dB	= _____dB

A.C. CONDENSER NOISE ANALYSIS

SIDE YARD SETBACK AS DETERMINED BY A PLANNER: _____ FT. _____ PLANNER'S INITIALS

SCOPE OF WORK:	
PROJECT ADDRESS:	
OWNER'S NAME:	PLAN PREPARER:
TEL. NO.:	CONTACT INFO:
SIGNATURE:	LICENSE NO.: