



# INFORMATION BULLETIN / PUBLIC - BUILDING CODE

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## **SOUND INSULATION REQUIREMENTS FOR NOISE SENSITIVE STRUCTURES NEAR LOS ANGELES INTERNATIONAL AIRPORT**

### **PURPOSE**

Section 91.1206 of the 2023 Los Angeles Building Code (LABC) requires uniform minimum sound insulation standards and requirements to protect persons within designated noise sensitive buildings from excessive exterior noise through regulation of design, construction and modification of such buildings in the vicinity of the Los Angeles International Airport. The goal is to ensure that after proper sound insulation measures are taken, the interior Community Noise Equivalent Level (CNEL), attributable to exterior sources, shall not exceed 45 dB in any habitable room within residential structures or in any noise sensitive non-residential structures.

With the request for a building permit application for any of the structures identified in section 91.1206.1 of LABC, submitted building plans shall show evidence of compliance with the sound insulation requirements of section 91.1206.16. Compliance shall consist of submittal of an acoustical analysis report (prepared under the supervision of a person experienced in the field of acoustical engineering) with its recommendations reflected in the plans or the use of one of the applicable prescriptive building standards for residential structures in the Los Angeles County Building Code Manual (1208 Article 4, August 19, 1999) which are listed on the following pages (Attachments I-V).

### **DEFINITIONS**

#### **LOS ANGELES INTERNATIONAL AIRPORT AIRCRAFT NOISE IMPACT AREA MAP (LAX ANIA MAP):**

A map showing property line representations of the 65 dB CNEL, 70 dB CNEL, and 75 dB CNEL noise contour boundaries generated for the fourth quarter of 1992, but including data from the entire calendar year of 1992 (4Q92), in compliance with Title 21, Subchapter 6 of the California Code of Regulations. A parcel that is bisected by a noise contour boundary shall be considered to be in the more restrictive zone for the entire parcel.

**RESIDENTIAL STRUCTURES:** Hotels, motels, dormitories, residential care facilities, apartment houses and other dwellings (including single family dwellings and their accessory buildings such as recreation rooms and accessory living quarters).

**NOISE SENSITIVE NON-RESIDENTIAL STRUCTURES:** Private schools, convalescent homes, churches, synagogues, temples and other places of worship.

### **SCOPE**

These regulations and requirements shall apply to all new or altered residential buildings or noise-sensitive non-residential buildings, as defined herein, that are located on parcels that fall wholly or partially within the boundaries of the 65 dB CNEL, 70 dB CNEL, 75 dB CNEL and greater noise contours of the LAX ANIA MAP.

For existing residential buildings located anywhere between the 65 dB CNEL and the 75 dB CNEL noise zones, the sound insulation requirements are applicable only to the area of addition and/or alteration. However, when the cost of the addition and/or alteration exceeds 75 percent of the replacement value of the structure, the entire building shall be made to comply. All additions of separable habitable rooms, and all separable habitable rooms or areas that result from an expansion of the building, including both the newly expanded area and the pre-existing room or area, shall be made to fully comply with the

performance and prescriptive building standard and requirements set forth in these regulations.

For existing residential buildings located in the 75 dB CNEL and greater noise zones, no addition and/or alteration of habitable space shall be permitted unless the entire building is made to comply. An acoustic measurement report shall be submitted and required to certify compliance with the maximum 45 dB interior CNEL noise standard in all habitable rooms after construction and prior to issuance of a Certificate of Occupancy (C of O) or the final inspection if no C of O is required. All of the required sound testing shall be conducted by a City of Los Angeles approved testing agency.

## **PRESCRIPTIVE BUILDING STANDARDS**

For projects involving residential structures, there are five prescriptive building standards for sound insulation that can be applied to all habitable rooms or areas within all newly constructed or reconstructed residential structures and to all additions or alterations to existing residential structures within the LAX ANIA boundaries. These prescriptive building standards, Attachments I through V, are presented as follows:

- **NR 65<70 (Attachment I):** Sound insulation requirements for **New Residential** construction for parcels located in the noise zone **65** db CNEL and **less than 70** db CNEL of the LAX 4<sup>th</sup> Quarter 1992 ANIA Map.
- **NR 70<75 (Attachment II):** Sound insulation requirements for **New Residential** construction for parcels located in the noise zone **70** db CNEL and **less than 75** db CNEL of the LAX 4<sup>th</sup> Quarter 1992 ANIA Map.
- **ER 65<70 (Attachment III):** Sound insulation requirements for **Existing Residential** construction for parcels located in the noise zone **65** db CNEL and **less than 70** db CNEL of the LAX 4<sup>th</sup> Quarter 1992 ANIA Map .
- **ER 70<75 (Attachment IV):** Sound insulation requirements for **Existing Residential** construction for parcels located in the noise zone **70** db CNEL and **less than 75** db CNEL of the LAX 4<sup>th</sup> Quarter 1992 ANIA Map.
- **ER 75+ (Attachment V):** Sound insulation requirements for **Existing Residential** construction for parcels located in the noise zone **75** db CNEL **and greater** of the LAX 4<sup>th</sup> Quarter 1992 ANIA Map.

The above prescriptive building standards are excerpts from the Los Angeles Building Code Manual 1208, Article 4, August 19, 1999 (pages 4 -17) with revisions approved by the Los Angeles World Airports Soundproofing Bureau.

In these prescriptive building standards, a **room** shall be defined as a habitable room or a room which has direct access to a habitable room.

Use the chart below to determine when prescriptive building standards may be used and/or when an acoustical analysis report is required.

**SOUND INSULATION COMPLIANCE REQUIREMENTS BASED ON THE TYPE OF BUILDING, TYPE OF PROJECT, AND NOISE ZONE OF THE LAX 4<sup>TH</sup> QUARTER 1992 ANIA MAP**

| Type of Building | Type of Project                                      | Los Angeles International Airport 4 <sup>th</sup> Quarter 1992 ANIA MAP                                                    |                                                                                                                          |                                                                                                                                                |
|------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                                                      | 65 db CNEL and less than 70 db CNEL                                                                                        | 70 db CNEL and less than 75 db CNEL                                                                                      | 75 db CNEL and Greater                                                                                                                         |
| Residential      | New Building                                         | Prescriptive Building Standard <b>NR 65&lt;70 (Attachment I)</b><br><b>Or</b><br>Acoustical Analysis Report                | Prescriptive Building Standard <b>NR 70&lt;75 (Attachment II)</b><br><b>Or</b><br>Acoustical Analysis Report             | Prescriptive Building Standard <b>ER 75+ (Attachment V)</b><br><b>&amp;</b><br>Acoustical Measurement Report Prior to C of O <sup>1</sup>      |
|                  | Existing Bldg. Addition and/or Alteration            | Prescriptive Building Standard <b>ER 65&lt;70 (Attachment III)</b> <sup>2</sup><br><b>Or</b><br>Acoustical Analysis Report | Prescriptive Building Standard <b>ER70&lt;75 (Attachment IV)</b> <sup>2</sup><br><b>Or</b><br>Acoustical Analysis Report | Prescriptive Building Standard <b>ER75+ (Attachment V)</b><br><b>&amp;</b><br>Acoustical Measurement Report Prior to C of O/Final <sup>3</sup> |
| Non-Residential  | New Bldg. Or Exist. Bldg. Addition and/or Alteration | Acoustical Analysis Report (No Prescriptive Std) Refer to 2023 LABC <b>91.1206.16</b>                                      | Acoustical Analysis Report (No Prescriptive Std) Refer to 2023 LABC <b>91.1206.16</b>                                    | Acoustical Analysis Report (No Prescriptive Std) Refer to 2023 LABC <b>91.1206.16</b>                                                          |

- 1 An acoustic measurement report shall be submitted and required to certify compliance with the maximum 45 db interior CNEL noise standard in all habitable rooms after construction and prior to issuance of a Certificate of Occupancy (C of O).
- 2 The sound insulation requirements are applicable only to the area of addition and/or alteration. However, when the cost of the addition and/or alteration exceeds 75 percent of the replacement value of the structure, the entire building shall be made to comply.
- 3 No addition and/or alteration of habitable space shall be made to an existing residential building in the 75 db CNEL and greater noise zone unless the entire building is made to comply. An acoustic measurement report shall be submitted and required to certify compliance with the maximum 45 db interior CNEL noise standard in all habitable rooms after construction and prior to issuance of a Certificate of Occupancy (C of O) or the final inspection if no C of O is required.

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## **ATTACHMENT I**

### **PRESCRIPTIVE BUILDING STANDARD NR 65<70**

#### **BUILDING REQUIREMENTS FOR NEW RESIDENTIAL CONSTRUCTION IN THE NOISE ZONE BETWEEN 65 dB CNEL AND LESS THAN 70 dB CNEL**

##### **1. Exterior Walls**

New walls that form the exterior portion of rooms shall be constructed as follows:

- a. Studs shall be at least 4 inches in nominal depth.
- b. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by the Building Code. Wood or metal siding shall be installed over 1/2-inch solid sheathing.
- c. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item No. 5 below.
- d. Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space.
- e. Interior wall finish shall be at least 5/8-inch thick gypsum wallboard or plaster.

##### **2. Exterior Windows**

- a. All openable Windows in the exterior walls of rooms shall have a laboratory sound transmission class rating of at least STC 35 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.
- b. All fixed windows in the exterior walls of habitable rooms shall be at least 1/4-inch thick and shall be set in non-hardening glazing materials.
- c. The total area of glazing in rooms used for sleeping shall not exceed 20 percent of the floor area.

##### **3. Exterior Doors**

- a. Exterior hinged doors to rooms shall be a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 35 dB.
- b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 35 dB.
- c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB.

##### **4. Roof/Ceiling Construction**

- a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with 1/2-inch solid sheathing and any roof covering allowed by the Building Code.
- b. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.
- c. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
- d. Attic ventilation shall be:
  1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a 2" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. (See generic detail in Attachment B for clarification) or,
  2. Eave vents that are located under the roof overhang.
- e. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick.
- f. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be

mounted at the ceiling line and shall be glazed with at least 3/16-inch plastic, tempered or laminated glass. The weather-side skylight shall be any type that is permitted by the Building Code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

**5. Floors**

The floor of the lowest habitable rooms shall be concrete slab on grade or wood-framed floors.

**6. Ventilation**

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Building Code, in each room without opening any windows, door or other opening to the exterior. Unless otherwise prohibited, all concealed duct work shall be insulated flexible glass fiber ducting that is at least 10 feet long between any two points of connection.
- b. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

**7. Fireplaces**

Each fireplace constructed of masonry units shall be fitted with a damper at the top of the chimney that is operated from the firebox and shall have glass doors across the front of the firebox.

**8. Wall and Ceiling Openings**

Openings in the shell of the residence that degrade its ability to achieve an interior CNEL rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB CNEL or less standard in the room to which they provide access. (See generic details in Attachment C for clarification).

## **ATTACHMENT II**

### **PRESCRIPTIVE BUILDING STANDARD NR 70<75 BUILDING REQUIREMENTS FOR NEW RESIDENTIAL CONSTRUCTION IN THE NOISE ZONE BETWEEN 70 dB CNEL AND LESS THAN 75 dB CNEL**

#### **1. Exterior Walls**

New walls that form the exterior portion of rooms shall be constructed as follows:

- a. Studs shall be at least 4 inches in nominal depth.
- b. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by the Building Code. Wood or metal siding shall be installed over 1/2-inch solid sheathing.
- c. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item No. 5 below.
- d. Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space.
- e. Interior wall finish shall be at least 5/8-inch thick gypsum wallboard or plaster.

#### **2. Exterior Windows**

- a. All openable Windows in the exterior walls of rooms shall have a laboratory sound transmission class rating of at least STC 40 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.
- b. All fixed windows in the exterior walls of rooms shall:
  1. Have a laboratory sound transmission class rating of at least STC 40 db, or
  2. Be 5/8-inch laminated glass with a laboratory sound transmission class rating of at least STC 40 db and shall be set in non-hardening glazing materials, or
  3. Be glass block at least 3-1/2 inches thick.
- c. The total area of glazing in rooms used for sleeping shall not exceed 20 percent of the floor area.

#### **3. Exterior Doors**

- a. Exterior hinged doors to rooms shall be a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 40 dB.
- b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 40 dB.
- c. Access doors from a garage to a room within a noise sensitive structure shall have a laboratory sound transmission class rating of at least STC 30 db.

#### **4. Roof/Ceiling Construction**

- a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with 1/2-inch solid sheathing and any roof covering allowed by the Building Code.
- b. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
- c. Attic ventilation shall be:
  1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a 1/2" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. (See generic detail in Attachment B for clarification.) or,
  2. Eave vents that are located under the roof overhang.
- d. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick. Ceiling materials shall be mounted on resilient channels.
- e. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be

mounted at the ceiling line or at a point that provides at least a 4-inch space between the skylight glazing and the secondary glazing and shall be glazed with at least 3/16-inch plastic or laminated glass. The weather-side skylight shall be any type that is permitted by the Building Code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

**5. Floors**

The floor of the lowest habitable rooms shall be concrete slab on grade or wood framed. Wood framed floors for rooms will be allowed when they are directly above a habitable room, a basement, garage, workshop, utility room or other non-habitable rooms or areas that are completely enclosed with wall materials allowed by the Building Code.

**6. Ventilation**

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Building Code, in each room without opening any windows, door or other opening to the exterior. Unless otherwise prohibited, all concealed duct work shall be insulated flexible glass fiber ducting that is at least 10 feet long between any two points of connection.
- b. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

**7. Fireplaces**

Each fireplace constructed of masonry units shall be fitted with a damper at the top of the chimney that is operated from the firebox and shall have glass doors across the front of the firebox.

**8. Wall and Ceiling Openings**

Openings in the shell of the residence that degrade its ability to achieve an interior CNEL rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB CNEL or less standard in the room to which they provide access. (See generic details in Attachment C for clarification).

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## **ATTACHMENT III**

### **PRESCRIPTIVE BUILDING STANDARD ER 65<70 BUILDING REQUIREMENTS FOR EXISTING RESIDENTIAL BUILDING IN THE NOISE ZONE BETWEEN 65 dB CNEL AND LESS THAN 70 dB CNEL**

#### **1. Exterior Walls**

Exterior walls in this noise zone do not require modification.

#### **2. Exterior Windows**

- a. Openable wood frame windows in rooms shall be replaced with new openable windows that have a minimum laboratory sound transmission class rating of at least STC 35 dB if the existing window has:
  1. Missing or insecure glazing putty or other glazing materials, or
  2. Broken or cracked glass, or
  3. Operating sash that is not securely supported in its frame or does not close tightly against the frame.
- b. Openable wood frame windows in rooms that do not require replacement by Item a. above shall be fitted with a secondary window that has a laboratory sound transmission class rating of at least STC 25 dB. The secondary window may be mounted at the exterior or interior of the existing window and shall be completely trimmed and caulked in place. (See generic details in Attachment A for clarification)
- c. Openable metal frame windows in rooms shall be replaced with new openable windows that have a minimum laboratory sound transmission class rating of at least STC 35 dB if the existing windows has:
  1. Jalousie louver, glass sash, or
  2. Missing or insecure glazing putty or other glazing materials, or
  3. Broken or cracked glass, or
  4. Operating sash that is not securely supported in its frame or does not close tightly against the frame.
- d. Openable metal frame windows in rooms that do not require replacement by Item c. above shall be fitted with a secondary window that has a laboratory sound transmission class rating of at least STC 25 dB with a space of at least 2 inches between the glass surfaces of the two windows. The secondary window may be mounted at the exterior or interior of the existing window and shall be completely trimmed and caulked in place. (See generic details in Attachment A for clarification).
- e. Exterior fixed windows in rooms shall be glazed with 1/4-inch glass unless they are part of an acoustic window assembly.

#### **3. Exterior Doors**

Exterior doors of rooms shall be modified as follows:

- a. Hollow core or lightweight doors and doors with glazed openings shall be replaced with doors that have a minimum laboratory sound transmission class rating of at least STC 35 dB.
- b. Solid core or heavy panel doors shall be fitted with a drop seal at the sill and vinyl bulb seals at the jambs and head.

#### 4. Roofs

- a. Accessible attics shall be insulated to achieve a minimum R-30 insulation value.
- b. Attic vents shall be modified as follows:
  1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a 2" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. (See generic detail in Attachment B for clarification)
  2. Eave vents do not require modification.
- c. Roofs with a slope of 2:12 or less and open beam ceilings shall be modified as indicated below only if bearing walls are adequate to support the additional load stresses:
  1. Existing roof covering shall be removed to expose sheathing.
  2. Two-by-six rafters at 24-inches on center shall be installed directly above the existing roof construction and supported by existing bearing walls, shall be insulated with R-19 fiberglass batts, and shall be covered with 1/2-inch plywood sheathing.
  3. New roofing shall be installed on the new construction that can be adequately supported by the new framing and existing bearing walls.

#### 5. Floors

Floors in this noise zone do not require modification.

#### 6. Ventilation

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Building Code, in each room without opening any window, door or other opening to the exterior. All concealed duct work shall be insulated flexible glass fiber ducting that is at least 10 feet long between any two points of connection. Exposed duct work may be sheet metal with 1-inch fiberglass duct liner and shall have a bend in the duct to avoid direct line-of-sight through the duct.
- b. Kitchen cooktop vent hoods shall be replaced with non-ducted recirculating vent hoods with no ducted connection to the exterior.

#### 7. Fireplaces

Each fireplace constructed of a masonry unit shall be fitted with a damper at the top of the chimney that is operated from the firebox and shall have glass doors across the front of the firebox.

#### 8. Wall and Ceiling Openings

Openings in the shell of a residence that degrade its ability to achieve an interior CNEL rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air-conditioning, or other openings must be designed to maintain the 45 dB CNEL or less standard in the room to which they provide access. (See generic details in Attachment C for clarification).

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## **ATTACHMENT IV**

### **PRESCRIPTIVE BUILDING STANDARD ER 70<75**

#### **BUILDING REQUIREMENTS FOR EXISTING RESIDENTIAL BUILDINGS IN THE NOISE ZONE BETWEEN 70 dB CNEL AND LESS THAN 75 dB CNEL**

##### **1. Exterior Walls**

Exterior walls of rooms shall be modified as follows:

- a. Wood frame walls with exterior wood siding or other lightweight exterior finish shall be provided with a secondary interior stud wall that is supported at the ceiling and the floor and is separated from the interior surface of the exterior wall by at least 1/2-inch. The exposed surface of the secondary wall shall be finished with 5/8-inch gypsum wallboard or plaster.
- b. Wood frame walls with an exterior finish of stucco, brick veneer or other similar materials and with an interior finish that is less than 1/2-inch thick shall be provided with an additional interior layer of 5/8-inch gypsum wallboard.
- c. Wood frame walls with an exterior finish of stucco, brick veneer or other similar materials and with interior finish that is at least 1/2-inch thick do not require modification.
- d. Walls that are constructed principally of load bearing masonry do not require modifications.

##### **2. Exterior Windows**

- a. Openable windows in rooms shall be replaced with an openable window that has a laboratory sound transmission class rating of at least STC 40 dB and shall have an air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.
- b. Fixed windows in rooms shall be modified by one of the following methods:
  1. Replace the existing window with a window that has a laboratory sound transmission rating of at least STC 40 dB, or
  2. Replace the existing window with 5/8-inch laminated glass that has a laboratory sound transmission rating of STC 40 dB, or
  3. Add secondary removable glazing at the interior or exterior of the existing window. The secondary glazing shall be at least 1/4-inch float glass or laminated glass. The space between the two panes of glass shall be at least 2 inches. (See generic details in Attachment A for clarification).
- c. The joint between the wall opening and the new windows required in this Building Standard shall be continuously filled with glass fiber insulation and the exterior cover trim shall be continuously caulked to seal the joint.
- d. Fixed glass shall be set in non-hardening glazing materials.

##### **3. Exterior Doors**

- a. Exterior hinged doors of rooms shall be replaced with a door and seals that have a laboratory sound transmission class rating of at least STC 40 dB. A new rabbeted frame shall be provided for each new door to replace the existing frame.
- b. Access doors from a garage to a room within a dwelling shall be replaced with a door and seals that have laboratory sound transmissions rating of at least STC 30 dB.
- c. Sliding glass doors of rooms shall be fitted with a secondary sliding glass door installed on the exterior of the existing door and trimmed on all exposed sides with wood trim that is at least 2-inches thick (nominal).
- d. The joint between the wall opening and the new doorframe required in Item No. 3 a, b or c above shall be continuously filled with glass fiber insulation and the exterior cover trim shall be continuously caulked to seal the joint.

#### 4. Roofs

- a. Accessible attics shall be insulated to achieve a minimum R-30 insulation value.
- b. Attic vents shall be modified as follows:
  - 1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a 2" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-sight perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. (See generic detail in Attachment B for clarification)
  - 2. Eave vents do not require modification.
- c. Roofs with a slope of 2:12 or less and open beam ceilings shall be modified as indicated below only if bearing walls are adequate to support the additional load stresses:
  - 1. Existing roof covering shall be removed to exposed sheathing.
  - 2. Two-by-six rafters at 24-inches on center shall be installed directly above the existing roof construction and supported by existing bearing walls, shall be insulated with R-19 fiberglass batts, and shall be covered with 1/2-inch plywood sheathing.
  - 3. New roofing shall be installed on the new construction that can be adequately supported by the new framing and existing bearing walls.

#### 5. Floors

- a. Vent openings to underfloor areas of wood framed floors shall be provided with acoustic vent baffles that meet noise reduction levels shown in Table 1208A. Vent baffles shall be fitted with 1/4-inch mesh screen.
- b. Underfloor access doors shall be non-vented plywood or other weatherproof material.

#### 6. Ventilation

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Building Code, in each room without opening any window, door or other opening to the exterior. All concealed duct work shall be insulated by flexible glass fiber ducting that is at least 10 feet long between any two points of connection. Exposed duct work may be sheet metal with 1-inch fiberglass duct liner and shall have a bend in the duct to avoid direct line-of-sight through the duct.
- b. Kitchen cooktop vent hoods shall be replaced with non-ducted recirculating vent hoods with no ducted connection to the exterior.

#### 7. Fireplaces

Each fireplace constructed of masonry units shall be fitted with a damper at the top of the chimney that is operated from the firebox and shall have glass doors across the front of the firebox.

#### 8. Wall and Ceiling Openings

Openings in the shell of the residence that degrade its ability to achieve an interior CNEL rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB CNEL or less standard in the room to which they provide access. (See generic details in Attachment C for clarification).

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## ATTACHMENT V

### **PRESCRIPTIVE BUILDING STANDARD ER 75+ BUILDING REQUIREMENTS FOR EXISTING RESIDENTIAL BUILDINGS IN THE NOISE ZONE 75 dB CNEL AND GREATER.**

#### **1. Exterior Walls**

Exterior walls of rooms shall be modified as follows:

- a. Wood frame walls with exterior wood siding or other lightweight exterior finish shall be provided with a secondary interior stud wall that is supported at the ceiling and the floor and is separated from the interior surface of the exterior wall by at least 1/2-inch. The exposed surface of the secondary wall shall be finished with 5/8-inch gypsum wallboard or plaster.
- b. Wood frame walls with an exterior finish of stucco, brick veneer or other similar materials and with an interior finish that is less than 1/2-inch thick shall be provided with an additional interior layer of 5/8-inch gypsum wallboard.
- c. Wood frame walls with an exterior finish of stucco, brick veneer or other similar heavy materials and with interior finish that is at least 1/2-inch thick do not require modification.
- d. Walls that are constructed principally of load bearing masonry do not require modifications.

#### **2. Exterior Windows**

- a. Openable windows in rooms that have stucco or masonry exterior walls surfaces shall be replaced with an openable window that has a laboratory sound transmission class rating of at least STC 40 dB.
- b. Openable windows in rooms that have wood siding or lightweight exterior cladding shall be replaced with an openable window that has a laboratory sound transmission class rating of at least STC 44 dB. All windows shall have an air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.
- c. Fixed windows in rooms shall be modified by one of the following methods:
  1. Replace the existing window with a window that has an acoustic rating of at least STC 44 dB, or
  2. Add secondary removable glazing at the interior or exterior of the existing window. The secondary glazing shall be at least 1/4-inch float glass or laminated glass. The space between the two panes of glass shall be at least 2 inches. The joint between the wall opening and the new windows shall be continuously filled with glass fiber insulation and the exterior cover trim shall be continuously caulked to seal the joint. (See generic details in Attachment A for clarification)

#### **3. Exterior Doors**

- a. Exterior hinged doors to rooms shall be replaced with a door and seal that have a laboratory sound transmission class rating of at least STC 40 dB. A new rabbeted frame shall be provided for each new door to replace the existing frame.
- b. Access doors from a garage to a room within a dwelling shall be replaced with a door and seals that have a laboratory sound transmission rating of at least STC 30 dB.
- c. Sliding glass doors in rooms shall be fitted with a secondary sliding glass door installed on the exterior of the existing door and trimmed on all exposed sides with wood trim that is at least 2 inches thick (nominal).
- d. The joint between the wall opening and the new door frame required in Item No. 3 a, b or c above shall be continuously filled with glass fiber insulation and the exterior cover trim shall be continuously caulked to seal the joint.

#### 4. Roofs

- a. Accessible attics shall be insulated to achieve a minimum R-30 insulation value.
- b. Attic vents shall be modified as follows:
  1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a 2" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-sight perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. (See generic detail in Attachment B for clarification)
  2. Eave vents do not require modification.
- c. Roofs with a slope of 2:12 or less and open beam ceiling shall be modified only if bearing walls are adequate to support the additional load stresses:
  1. Existing roof covering shall be removed to expose sheathing.
  2. Two-by-six rafters at 24-inches on center shall be installed directly above the existing roof construction and supported by existing bearing walls, shall be insulated with R-30 fiberglass batts, and shall be covered with 1/2-inch plywood sheathing.
  3. New roofing shall be installed on the new construction that can be adequately supported by the new framing and existing bearing walls.

#### 5. Floors

- a. Vent openings to underfloor areas of wood framed floors shall be provided with acoustic vent baffles that meet noise reduction levels per section 1206.10 of LABC. Vent baffles shall be fitted with 1/4-inch mesh screen.
- b. Underfloor access doors shall be non-vented plywood or other weatherproof material.

#### 6. Ventilation

- a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Building Code, in each room without opening any window, door or other opening to the exterior. All concealed duct work shall be insulated flexible glass fiber ducting that is at least 10 feet long between any two points of connection. Exposed duct work may be sheet metal with 1-inch fiberglass duct liner and shall have a bend in the duct to avoid direct line-of-sight through the duct.
- b. Kitchen cooktop vent hoods shall be replaced with non-ducted recirculating vent hoods with no ducted connection to the exterior.

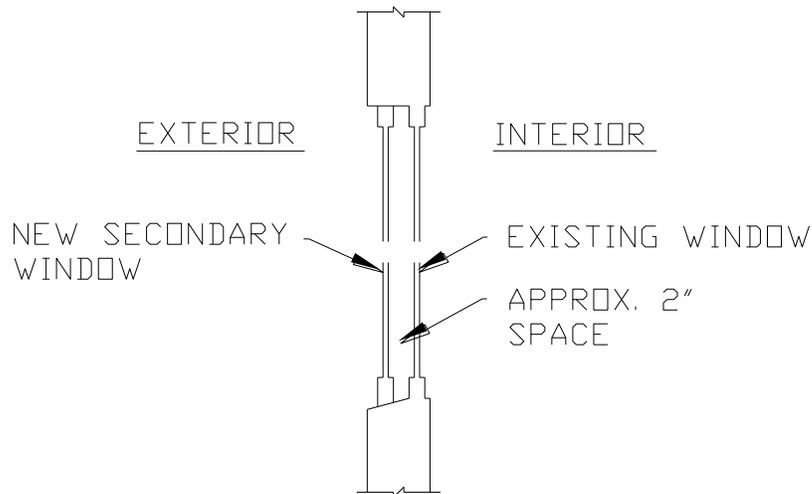
#### 7. Fireplaces

Each fireplace constructed of masonry units shall be fitted with a damper at the top of the chimney that is operated from the firebox and shall have glass doors across the front of the firebox.

#### 8. Wall and Ceiling Openings

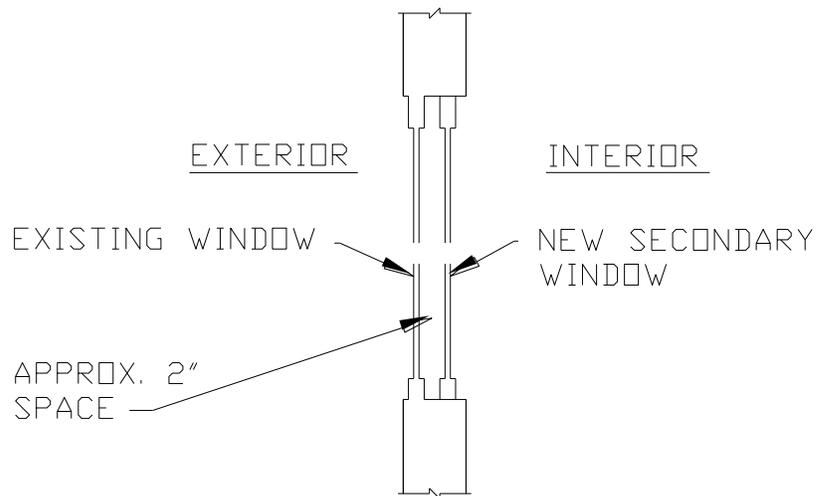
Openings in the shell of the residence that degrade its ability to achieve an interior CNEL rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB CNEL or less standard in the room to which they provide access. (See generic details in Attachment C for clarification).

**ATTACHMENT A**  
**GENERIC DETAILS FOR SOUND INSULATION**  
**PRESCRIPTIVE BUILDING STANDARDS**



EXTERIOR SECONDARY WINDOW

PLACEMENT OF SECONDARY WINDOW  
 IS DETERMINED BY THE SPACE AVAILABLE  
 ON THE INTERIOR OR THE EXTERIOR.

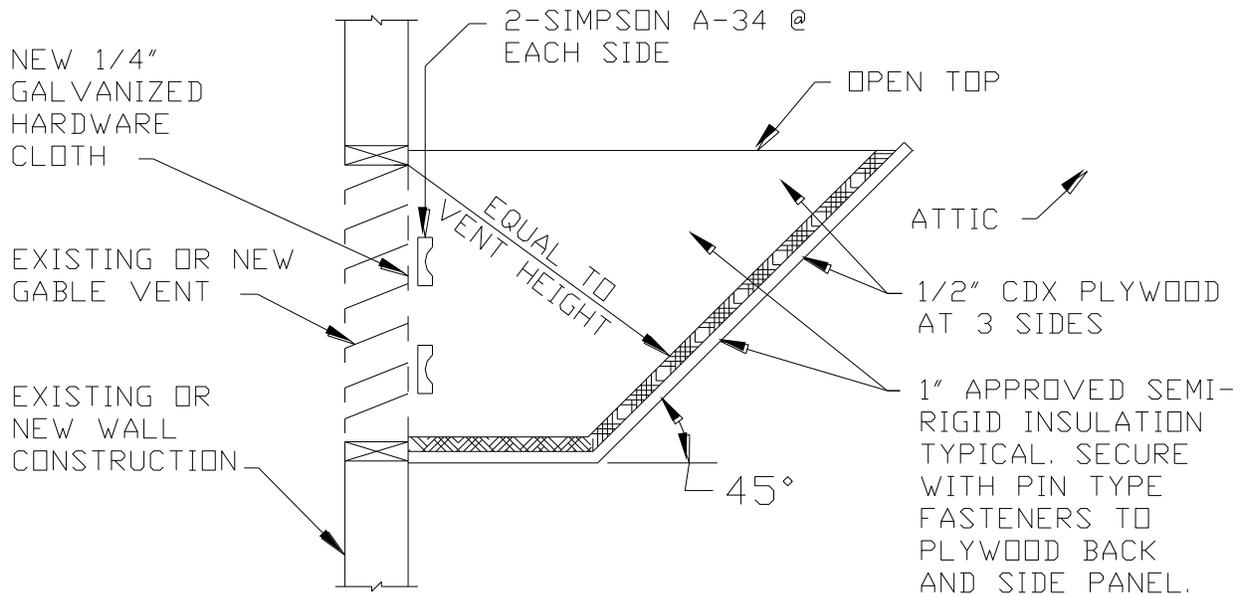


INTERIOR SECONDARY WINDOW

PLACEMENT OF SECONDARY WINDOW  
 IS DETERMINED BY THE SPACE AVAILABLE  
 ON THE INTERIOR OR EXTERIOR.

**ATTACHMENT B**

**GENERIC DETAILS FOR SOUND INSULATION  
 PRESCRIPTIVE BUILDING STANDARDS**



ATTIC BAFFLE FOR GABLE VENT

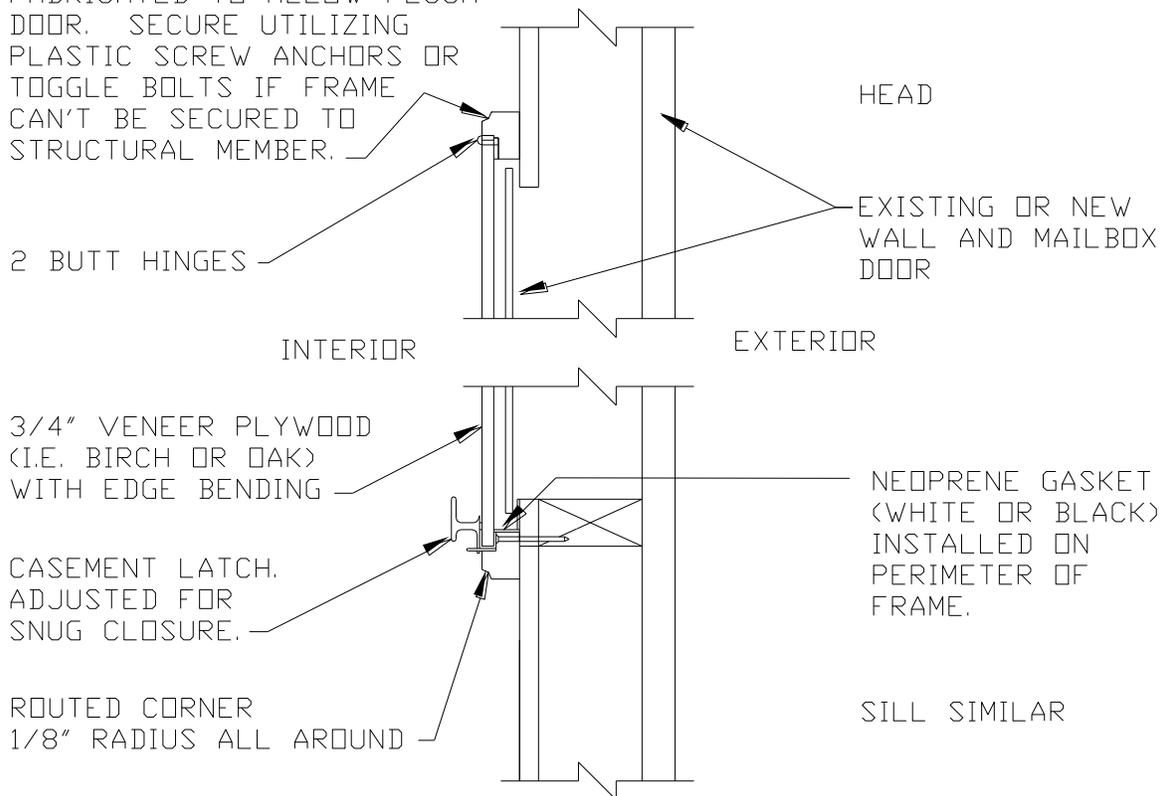
NOT TO SCALE

NOTE:

1. AFTER FABRICATION BAFFLE SHALL BE SECURELY ATTACHED IN POSITION.
2. NEW BAFFLE SHALL BE AT LEAST AS WIDE AS THE EXISTING VENT OPENING.

**ATTACHMENT C**  
**GENERIC DETAILS FOR SOUND INSULATION**  
**PRESCRIPTIVE BUILDING STANDARDS**

SHAPED 2"X2" WOOD FRAME  
 (I.E. BIRCH OR OAK) WITH MITERED  
 CORNERS. FRAME SHALL BE  
 FABRICATED TO ALLOW FLUSH  
 DOOR. SECURE UTILIZING  
 PLASTIC SCREW ANCHORS OR  
 TOGGLE BOLTS IF FRAME  
 CAN'T BE SECURED TO  
 STRUCTURAL MEMBER.



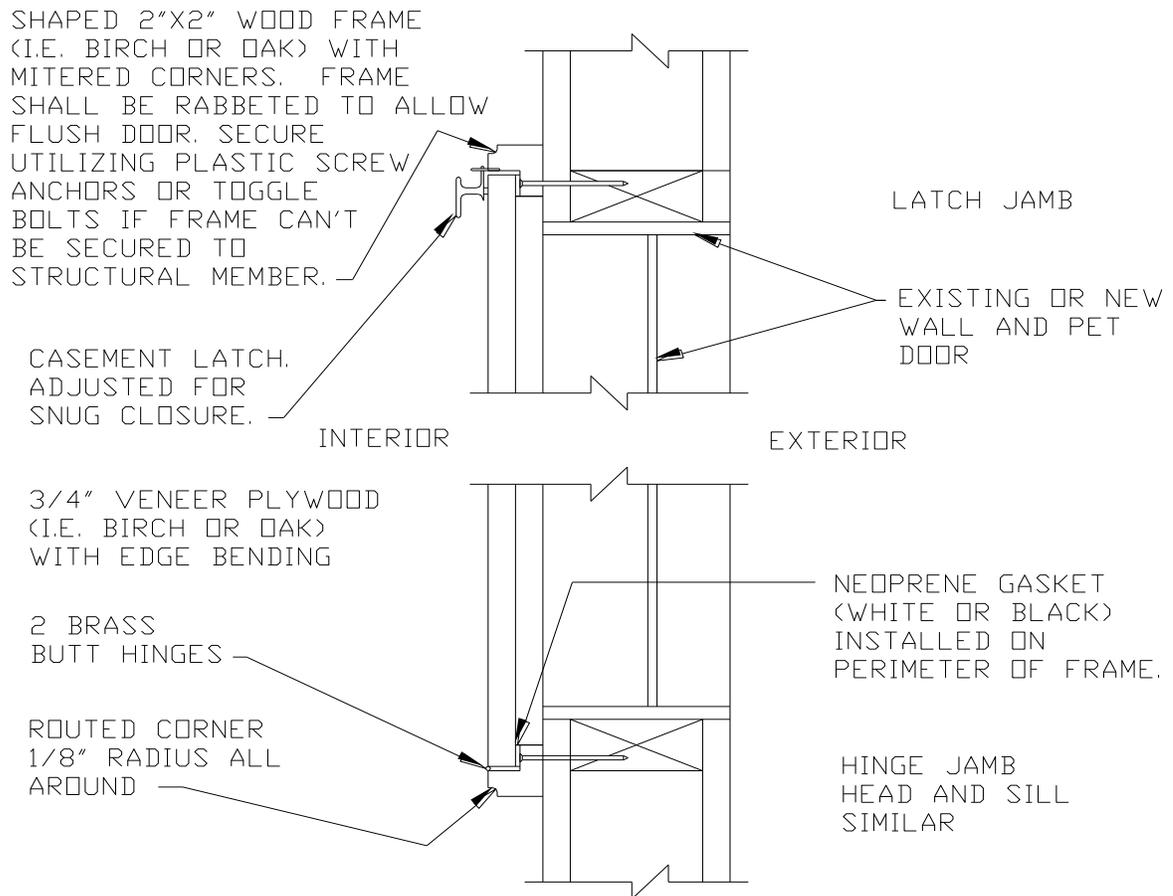
MAIL SLOT COVER (SECTION VIEW)  
 NOT TO SCALE

NOTE:

1. INTERIOR DIMENSION OF FRAME AT LEAST 1/2" LARGER THAN EXISTING METAL COVER ON ALL SIDES.
2. ALL SURFACES OF NEW DOOR AND FRAME SHALL BE STAINED AND VARNISHED OR PRIMED AND PAINTED TO MATCH ADJACENT WALL OR DOOR, AS APPROVED BY HOMEOWNER.
3. HOMEOWNER TO SELECT FINISH OF HINGES AND LATCH.

## ATTACHMENT C (continued)

### GENERIC DETAILS FOR SOUND INSULATION PRESCRIPTIVE BUILDING STANDARDS



PET DOOR MODIFICATION (PLAN VIEW)  
 NOT TO SCALE

NOTE:

1. INTERIOR DIMENSION OF FRAME AT LEAST 1/2" LARGER THAN EXISTING METAL COVER ON ALL SIDES.
2. ALL SURFACES OF NEW DOOR AND FRAME SHALL BE STAINED AND VARNISHED OR PRIMED AND PAINTED TO MATCH ADJACENT WALL OR DOOR, AS APPROVED BY HOMEOWNER.
3. HOMEOWNER TO SELECT FINISH OF HINGES AND LATCH.