



**PLANNING BUILDING AND
PUBLIC WORKS DEPARTMENT**

**SOUND TRANSMISSION
CONTROL
REQUIREMENTS
BH-008**

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The City is divided into two sound transmission control areas:

- Area 1 (all portions of the city north of South 252nd Street or its extension) is a 35 decibel reduction zone, and
- Area 2 (all portions of the city south of South 252nd Street or its extension) is a 30 decibel reduction zone.

This informational handout is a summary of the City of Des Moines Sound Transmission Control Ordinance, Title 14. Section 1 describes the construction requirements for buildings constructed in Area 1 that must meet the requirement of 35-decibel reduction. Section 2 provides the same information for buildings constructed in Area 2.

SECTION 1

Exterior Walls in Area 1

1. Exterior walls, other than as described in this section shall have a **laboratory** sound transmission class rating of at least STC-40; **(OR)**
2. Masonry walls having a weight of at least seventy-five (75) pounds per square foot, do not require a furred (stud) interior wall. At least one surface of the concrete block walls shall be plastered.
3. Stud walls shall be at least four inches (4") in nominal depth and shall be finished on the outside with **solid sheathing under an approved exterior wall finish.** Due to energy code requirements, a 2" X 6" wall would be appropriate in order to obtain the R-21 minimum insulation requirements.
 - A. Continuous **composition board, plywood, O. S. B. board or gypsum board** sheathing at least one inch (1") thick shall cover the exterior side of the wall studs. **The thickness of the exterior sheathing includes the thickness of the sub-sheathing only. The thickness of the exterior wall finish (or siding) is not included.**
 - B. Sheathing panels shall be butted tightly and covered on the exterior with an approved building wrap. Building paper must be overlapping.
 - C. Insulation material of a type approved by the Building Official, (listed), and rated not less than R-21 shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs.
 - D. The interior surface of the exterior walls shall be of gypsum board or plaster at least five-eighths (5/8") thick, installed on the studs.
 - +The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer or stucco.
 - +If the exterior wall finish is siding on sheathing, the interior gypsum board or plaster shall be fastened using resilient channels to the studs or double thickness must be used.**

Exterior Windows in Area 1

Windows other than as described in this section shall have a **laboratory** sound transmission class rating of at least STC-38; **(OR)**

1. Windows shall be double-glazed with panes at least three-sixteenths inch (3/16") thick. Panes of glass shall be separated by a minimum one-half inch (1/2") airspace, and **shall not be equal in thickness.**
2. Double glazed windows shall employ fixed sash or efficiently weather-stripped, operable sash. The sash shall be rigid and weather-stripped with material that is compressed airtight when the window is closed so as to conform to an air infiltration test not to exceed one-half (1/2) cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.
3. Glass shall be sealed in an air-tight manner with a non-hardening sealant or a soft elastomer gasket or gasket tape.
4. The perimeter of the window frames shall be sealed air-tight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153, or other materials approved by the Building Official, (listed).

Exterior Doors in Area 1

Doors other than as described in this section shall have a **laboratory** sound transmission class rating of at least STC-33; **(OR)**

1. Double door construction is required for all hinged door openings to the exterior. Such doors shall be side hinged and shall be solid core wood or insulated hollow metal at least one and three-fourths inch (1-3/4") thick separated by an airspace of at least three inches (3") from another door, storm door. Both doors shall be tightly fitted and weather-stripped.
2. The glass of double glazed sliding doors shall be separated by a minimum one-half inch (1/2") airspace. Each sliding frame shall be provided with an efficiently airtight weather-stripping material as specified in (d) above.
3. Glass, over two (2) square feet in area, of all doors, shall be at least three-sixteenths (3/16") thick. Glass of double sliding doors shall not be of equal thickness.
4. The perimeter of door frames shall be sealed airtight to the exterior wall construction (framing) as described in section (d) above.
5. Glass in doors shall be sealed in an airtight non-hardening sealant or in a soft elastomer gasket or gasket tape.

Roofs in Area 1

Combined roof and ceiling construction on other than as described in this section and the section on ceilings shall have a **laboratory** sound transmission class of STC-49; **(OR)**

1. With an attic or rafter space at least six inches (6") deep, and with a ceiling below, the roof shall consist of one-inch (1") composition board, plywood or gypsum board sheathing topped with an approved roofing material.

2. Open beam construction shall follow the energy insulation standard method for batt insulation, except use one-inch (1") plywood decking with concrete or clay tiles.
3. Composition board shall mean asphaltic impregnated board or an approved sound board.
4. Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-38. Skylight assemblies that consist of 1/4" tempered glass, 1/2" air space and a laminated panel consisting of 1/8" tempered glass, .03" (three mils) laminate and 1/8" tempered glass will be accepted in lieu of the tested assembly.

Ceilings in Area 1

1. Gypsum board or plaster ceilings at least five-eighths inch (5/8") thick shall be provided. Ceilings shall be substantially airtight with a minimum of penetrations.
The **ceiling panels shall be mounted on resilient clips or channels.**

Insulation material of a type approved by the building official, (listed), and rated not less than R-38 shall be provided above the ceiling between joist.

Floors in Area 1

The floor of the lowest occupied rooms shall be slab on fill or below grade, over a fully enclosed basement or crawl space. All door and window openings in a fully enclosed basement shall be tightly fitted.

Ventilation in Area 1

The Washington State Code on Ventilation and Indoor Air Quality shall prevail. The following items shall be included. The inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least twenty (20) gauge steel, which shall be lined with one inch (1") thick coated glass fiber, and shall be at least five feet (5') long with one (1) ninety degree bend.

Gravity vent openings in attics shall be as close to code minimum in number and size, as practical. The openings shall be fitted with transfer ducts at least six feet (6') in length containing internal one inch (1") thick coated fiber glass sound-absorbing duct lining. Each duct shall have a lined ninety degree bend in the duct such that there is no direct line of sight from the exterior through the duct into the attic.

Bathroom, laundry and similar exhaust ducts connecting interior space to the outdoors shall be provided with a ninety degree bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room opening cross section. Duct lining shall be coated glass fiber duct liner at least one inch (1") thick.

Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a self-closing damper across the exterior termination that allows for proper ventilation.

SECTION 2

Exterior Walls in Area 2

1. Exterior walls, other than as described in this section shall have a **laboratory** sound transmission class rating of at least STC-35; **(OR)**
2. Masonry walls having a weight of at least forty (40) pounds per square foot, do not require a furred (stud) interior wall. At least one surface of the concrete block walls shall be plastered.
3. Stud walls shall be at least four inches (4") in nominal depth and shall be finished on the outside with **solid sheathing under an approved exterior wall finish**. Due to energy code requirements, a 2" X 6" wall would be appropriate in order to obtain the R-21 minimum insulation requirements.
 - A. Continuous **composition board, plywood, O. S. B. board or gypsum board** sheathing at least three-quarter inch (3/4") thick shall cover the exterior side of the wall studs. **The thickness of the exterior sheathing includes the thickness of the sub-sheathing only. The thickness of the exterior wall finish (or siding) is not included.**
 - B. Sheathing panels shall be butted tightly and covered on the exterior with an approved building wrap. Building paper must be overlapping.
 - C. Insulation material of a type approved by the Building Official, (listed), and rated not less than R-21 shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs.
 - D. The interior surface of the exterior walls shall be of gypsum board or plaster at least one-half inch (1/2") thick, installed on the studs.
 - +The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer or stucco.
 - +If the exterior wall finish is siding on sheathing, the interior gypsum board or plaster shall be fastened using resilient channels to the studs or double thickness must be used.**

(Please see attached Fire Stopping detail for requirements and options if using resilient channel in the exterior wall.)

Exterior Windows in Area 2

Windows other than as described in this section shall have a **laboratory** sound transmission class rating of at least STC-33; **(OR)**

1. Windows shall be double-glazed with panes at least one-eighth inch (1/8") thick. Panes of glass shall be separated by a minimum one-half inch (1/2") airspace.
2. Double glazed windows shall employ fixed sash or efficiently weather-stripped, operable sash. The sash shall be rigid and weather-stripped with material that is compressed airtight when the window is closed so as to conform to an air infiltration test not to exceed one-half (1/2) cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.
3. Glass shall be sealed in an airtight manner with a non-hardening sealant or a soft elastomer gasket or gasket tape.

4. The perimeter of the window frames shall be sealed air-tight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153, or other materials approved by the Building Official, (listed).

Exterior Doors in Area 2

Doors other than as described in this section shall have a **laboratory** sound transmission class rating of at least STC-33; **(OR)**

1. Double door construction is required for all hinged door openings to the exterior. Such doors shall be side hinged and shall be solid core wood or insulated hollow metal at least one and three-fourths inch (1-3/4") thick separated by an airspace of at least three inches (3") from another door, storm door. Both doors shall be tightly fitted and weather-stripped.
2. The glass of double glazed sliding doors shall be separated by a minimum one-half inch (1/2") airspace. Each sliding frame shall be provided with an efficiently airtight weather-stripping material as specified in (d) above.
3. Glass, over two (2) square feet in area, of all doors, shall be at least three-sixteenths (3/16") thick. Glass of double sliding doors shall not be of equal thickness.
4. The perimeter of doorframes shall be sealed airtight to the exterior wall construction (framing) as described in section (d) above.
5. Glass in doors shall be sealed in an airtight non-hardening sealant or in a soft elastomer gasket or gasket tape.

Roofs in Area 2

Combined roof and ceiling construction on other than as described in this section and the section on ceilings shall have a **laboratory** sound transmission class of STC-44; **(OR)**

1. With an attic or rafter space at least six inches (6") deep, and with a ceiling below, the roof shall consist of three-quarter inch (3/4") composition board, plywood or gypsum board sheathing topped with an approved roofing material.
2. Open beam construction shall follow the energy insulation standard method for batt insulation, except use one inch (1") plywood decking with concrete or clay tiles.
3. Composition board shall mean asphaltic impregnated board or an approved sound board.

Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-33. Skylight assemblies that consist of 1/4" tempered glass, 1/2" air space and a laminated panel consisting of 1/8" tempered glass, .03" (three mils) laminate and 1/8" tempered glass will be accepted in lieu of the tested assembly.

Ceilings in Area 2

1. Gypsum board or plaster ceilings at least five-eighths inch (5/8") thick shall be provided. Ceilings shall be substantially airtight with a minimum of penetrations.

Insulation material of a type approved by the building official, (listed), and rated not less than R-38 shall be provided above the ceiling between joist.

Floors in Area 2

The floor of the lowest occupied rooms shall be slab on fill or below grade, over a fully enclosed basement or crawl space. All door and window openings in a fully enclosed basement shall be tightly fitted.

Ventilation in Area 2

The Washington State Code on Ventilation and Indoor Air Quality shall prevail. The following items shall be included. The inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least twenty (20) gauge steel, which shall be lined with one inch (1") thick coated glass fiber, and shall be at least five feet (5') long with one (1) ninety degree bend.

Gravity vent openings in attics shall be as close to code minimum in number and size, as practical. The openings shall be fitted with transfer ducts at least six feet (6') in length containing internal one inch (1") thick coated fiber glass sound-absorbing duct lining. Each duct shall have a lined ninety degree bend in the duct such that there is no direct line of sight from the exterior through the duct into the attic.

Bathroom, laundry and similar exhaust ducts connecting interior space to the outdoors shall be provided with a ninety (90) degree bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room opening cross section. Duct lining shall be coated glass fiber duct liner at least one inch (1") thick.

Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a self-closing damper across the exterior termination that allows for proper ventilation.



