

GG258-14

302.1, 807, 903.1, Appendix E (New)

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise as follows:

807-APPENDIX E **ACOUSTICS**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

807.1-E101.1 Sound transmission and sound levels. ~~Where required by Table 302.1, Buildings and tenant spaces shall comply with the minimum sound transmission class and maximum sound level requirements of Sections E101.2 807.2 through E101.5.2 807.5.2.~~

Exception: The following buildings and spaces need not comply with this section:

1. Building or structures that have the interior environment open to the exterior environment.
2. Parking structures.
3. Concession stands and toilet facilities in Group A-4 and A-5 occupancies.

807.2-E101.2 Sound transmission. Sound transmission classes established by laboratory measurements shall be determined in accordance with ASTM E 413 based on measurements in accordance with ASTM E 90. Sound transmission classes for concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined in accordance with ASTM E 413 based on measurements in accordance with ASTM E 90. Field measurements of completed construction, if conducted, shall be in accordance with ASTM E 336 where conditions regarding room size and absorption required in ASTM E 336 are met.

807.2.1-E101.2.1 Interior sound transmission. Wall and floor-ceiling assemblies that separate Group A and F occupancies from one another or from Group B, I, M or R occupancies shall have a sound transmission class (STC) of not less than 60 or an apparent sound transmission class (ASTC) of not less than 55 if the completed construction is field tested. Wall and floor-ceiling assemblies that separate Group B, I, M or R occupancies from one another shall have a sound transmission class (STC) of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45 if the completed construction is field tested. Wall and floor-ceiling assemblies that separate Group R condominium occupancies from one another or from other Group B, I, M or R occupancies shall have a sound transmission class (STC) of not less than 55 or an apparent sound transmission class (ASTC) of not less than 50 if the completed construction is field tested.

Exception: This section shall not apply to wall and floor-ceiling assemblies enclosing:

1. Public entrances to tenants of covered and open mall buildings.
2. Concession stands and lavatories in Group A-4 and A-5 occupancies.
3. Spaces and occupancies that are accessory to the main occupancy.

807.2.2-E101.2.2 Mechanical and emergency generator equipment and systems. Wall and floor-ceiling assemblies that separate a mechanical equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45 if the completed construction is field tested, Wall and floor-ceiling assemblies that separate a generator equipment room or space from the remainder of the

building shall have a sound transmission class (STC) of not less than 60 or an apparent sound transmission class (ASTC) of not less than 55 if the completed construction is field tested.

~~807.3~~ E101.3 Sound levels. The design and construction of mechanical and electrical generator systems and of walls and floor-ceilings separating such equipment from the outdoors or other building space shall achieve sound levels not greater than specified in Sections E101.3.1 ~~807.3.4~~ and E101.3.2 ~~807.3.2~~ during the normal operation of mechanical equipment and generators. Electrical generators used only for emergencies are exempt from the limits on sound levels within the building and need only meet daytime limits for sound-reaching boundaries. Where necessary, walls and floor-ceiling assemblies with sound transmission class (STC) ratings greater than specified in Section E101.2.2 ~~807.2.2~~ shall be used to meet this requirement.

~~807.3.4~~ E101.3.1 Sound of mechanical and electrical generator equipment outside of buildings. Where mechanical equipment or electrical generators are located outside of the building envelope or their sound is exposed to the exterior environment, the sound reaching adjacent properties shall comply with all applicable ordinances and zoning performance standards. In the absence of an ordinance or zoning performance standard specifying sound limits at the boundary, or a law specifying different limits if limits are imposed, an adjacent property at the boundary shall not be subjected to a sound level greater than indicated in Table E101.3.1 ~~807.3.4~~ because of the sound of the equipment. Where a generator is used only for providing emergency power and all periodic operational testing is done during the daytime period of Table E101.3.1 ~~807.3.4~~, the sound of a generator during the night-time hours shall meet the daytime limits.

**TABLE ~~807.3.4~~ E101.3.1
MAXIMUM PERMISSIBLE OUTDOOR A-WEIGHTED SOUND LEVELS**

(Portions of table not shown remain unchanged.)

~~807.3.2~~ E101.3.2 Sound of HVAC and mechanical systems within buildings. Sound levels within rooms generated by HVAC and mechanical systems within the building, including electrical generators used regularly but excluding emergency generators, for all modes of operation shall not exceed the limits shown in Table E101.3.2 ~~807.3.2~~.

**TABLE ~~807.3.2~~ E101.3.2
MAXIMUM PERMISSIBLE INDOOR BACKGROUND SOUND IN ROOMS**

(Portions of table not shown remain unchanged.)

~~807.4~~ E101.4 Structure-borne sounds. Floor and ceiling assemblies between dwelling rooms or dwelling units and between dwelling rooms or dwelling units and public or service areas within the structure in occupancies classified as Group A1, A2, A3, B, E, I, M or R shall have an impact insulation classification (IIC) rating of not less than 50 where laboratory-tested and 45 where field-tested when tested in accordance with ASTM E 492. New laboratory tests for impact insulation class (IIC) of an assembly are not required where the IIC has been established by prior tests.

~~807.5~~ E101.5 Special inspections for sound levels. An approved agency, funded by the building owner, shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Add new table as follows:

TABLE E101.5(1)
COMMISSIONING PLAN FOR SOUND TRANSMISSION

<u>SYSTEM REQUIRING VERIFICATION</u>	<u>COMMISSIONING PLAN FOR SOUND TRANSMISSION</u>	<u>PREOCCUPANCY</u>	<u>POST-OCCUPANCY METHOD</u>
<u>Mechanical and emergency generator equipment located outside buildings or located where exposed to exterior environment</u>	<u>X</u>	<u>None</u>	<u>Field testing and verification</u>
<u>HVAC background noise</u>	<u>X</u>	<u>None</u>	<u>Field testing and verification</u>

Revise as follows:

807.5.1 E101.5.1 Testing for mechanical and electrical generator equipment outside of buildings. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section E101.3.1 ~~807.3.1~~. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall demonstrate that the equipment is capable of compliance with the night-time limits under normal night-time operating conditions, and if higher sound levels are possible during the daytime, compliance with the daytime limits shall also be demonstrated.

807.5.2 E101.5.2 Testing for building system background noise. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section E101.3.2 ~~807.3.2~~. Testing shall be executed within not less than 50 percent of the total number of rooms contained in a building or structure of the types listed in Table E101.3.2 ~~807.3.2~~ for the given occupancy in accordance with Table E101.5 (1) ~~903.4~~. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

807.5.3 E101.5.3 Separating assemblies. Wall and floor-ceiling assemblies that separate a mechanical or emergency generator equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 60 determined in accordance with ASTM E 90 and ASTM E 413, or for concrete masonry and clay masonry assemblies as calculated in accordance with TMS 0302 or as determined in accordance with ASTM E 90 and ASTM E 413.

807.5.4 E101.5.4 HVAC background sound. HVAC system caused background sound levels for all modes of operation within rooms shall be in accordance with the lower and upper noise criteria (NC) limits as shown in Table E101.3.2 ~~807.3.2~~. Special inspections shall be required and conducted in accordance with Section 903.1 in order to demonstrate compliance.

807.6 E101.6 Special inspections for sound transmission. An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

807.6.1 E101.6.1 Testing for mechanical and emergency generator equipment outside of buildings. In accordance with Section E101.3.1 ~~807.3.4~~, all mechanical and emergency generator equipment shall be field tested in accordance with Table E101.5 (1) ~~903.4~~. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall occur on a Tuesday, Wednesday or Thursday at both the day and night times within the periods shown in Table E101.3.1 ~~807.3.4~~.

807.6.2 E101.6.2 Testing for building system background noise. Testing shall be executed in accordance with Section E101.3.1 ~~807.3.4~~ within not less than 50 percent of the total number of rooms contained in a building or structure, exclusive of closets and storage rooms less than 50 square feet (4.65 m²) in area, and exclusive of toilet facilities in accordance with Table E101.5(1) ~~903.4~~. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT			
804.2	Post-Construction Pre-Occupancy Baseline IAQ Testing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
807.4	Sound transmission and sound levels	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 8: Indoor Environmental Quality and Comfort						
Building construction, features, operations and maintenance facilitation						
Air-handling system access	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.2
Air-handling system filters	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.3

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
HVAC systems						
Temperature and humidity in occupied spaces	—	X	Field inspection and verification	—	18 - 24 months	803.2
Specific indoor air quality & pollutant control measures						
Listing, installation and venting of fireplaces and combustion appliances	X	—	Field inspection and verification	During construction and prior to occupancy	—	804.1
Sound transmission						
Mechanical and emergency generator equipment located outside buildings or located where exposed to exterior environment.	X	None	Field testing and verification	See Section 807.5.1	None	807.5.1
HVAC background sound	X	None	Field testing and verification	See Section 807.5.2	None	807.5.2

For SI: 1 square foot = 0.0929 m².

(Portions of table not shown remain unchanged.)

Reason: The base IRC and IBC codes already address acoustics issues from a basic health and safety perspective. Higher levels of acoustic protection in the IgCC at present are not related to specific improvements in health or safety compared to the base codes. The requirements simply evolved from an argument that more is better.

In addition, there are significant technical issues with this section that would be problematic if not coordinated with local ordinances. For example, the existing language introduces ownership issues into the code. Implementation of a significant part of the requirements for higher STC ratings relies on the term “condominium occupancies” to trigger application. A condominium is not an occupancy use group in the IBC because it is a form of ownership, not a use group or building type. Different types of buildings can be under condominium ownership and this ownership can change throughout the life of the building. Buildings that are not under condominium ownership can be changed to this type of ownership in the future. Often this is regulated in zoning and planning ordinances and that is where these decisions belong.

While there are certainly unique situations where adjacent buildings are impacted by outdoor noise or mechanical equipment, the existing approach in the IgCC does not adequately address this and consists of vague and inconsistent requirements. For example, existing Section 807.3.1 only requires the code requirements to be met in the absence of local laws or ordinances. It does not specify criteria for the local laws or ordinances. An ordinance could be wholly inadequate yet still be used to comply with the IgCC. This section makes the case that acoustics should be a local decision.

Moving the acoustics section to an appendix will assign decision-making on acoustics to the local jurisdiction where specific local conditions and ordinances can be examined for potential conflicts and acceptable protection.

Cost Impact: Will not increase the cost of construction

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