Designation: E 557 – 93

Standard Practice for Architectural Application and Installation of Operable Partitions[1]

This standard is issued under the fixed designation E 557; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice describes procedures to be followed in preparation for, and application and installation of, operable partitions and, to some extent, in the design of the building in which they are installed. Operable partitions are those that are quickly movable.

1.2 Excluded from this practice are those partitions that are classified by the building products industry as *demountable*. Demountable partitions are those that are designed and installed with the intent of later being taken down and re-erected by a crew over a period of time, with the components being reusable.

1.3 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

E 90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions[2]

E 336 Test Method for Measurement of Airborne Sound Insulation in Buildings[2]

E 413 Classification for Rating Sound Insulation[2]

E 497 Practice for Installing Sound-Isolating Lightweight Partitions[2]

E 1155 Test Method for Determining Floor Flatness and Levelness Using the *F*-Number System[3]

E 1155M Test Method for Determining Floor Flatness and Levelness Using the *F*-Number System (Metric)[3]

3. Significance and Use

3.1 Rooms formed by operable partitions must often be isolated acoustically. Sound-isolating properties of operable partitions are specified by architects in terms of sound transmission class (STC) and so advertised by the manufacturer on the basis of laboratory tests in accordance with Test Method E 90 and Classification E 413.

3.2 Because normal building design and construction practices are not the same as those used in acoustical laboratories, actual field performance of operable partitions may be less than that of test specimens. Sound transmission between areas to be isolated will occur through all of the connecting building components in addition to the operable partition, that is, floor and ceiling slabs, ceiling plenums, common walls, etc. All possible paths between the areas being isolated should have a sound insulation performance at least equal to the operable partition. Unless good acoustical practice is followed in both building design and installation, there may be a significant discrepancy between the sound isolation expected and that achieved.

3.3 Because of the complex nature of the sound flanking paths adjacent to operable partitions, it is highly recommended that all related construction details be reviewed by a person qualified in acoustical construction.

3.4 This practice does not specify requirements. However, persons desiring to write installation and construction specifications may find the contents useful in developing requirements for the site preparation, and installation practices necessary to minimize leakage and flanking sound around the operable partition.

4. Properties of Operable Partitions

4.1 There are several types of operable partitions. Some are supported by overhead track with or without a floor guide or track. They may be manual or power-operated. One type consists of movable panels secured in place by vertical expansion to seal against the floor and ceiling. Seals or gaskets are of many kinds; some consist of resilient material that maintains continuous flexible contact with floor or ceiling, and some include a mechanical, hydraulic or pneumatic mechanism that maintains clearance when in motion and a positive seal when finally closed.

4.2 *Sound Leaks*:

4.2.1 The seals at the top of the partitions should make continuous contact with smooth surfaces on both sides of the operable partitions. The sound path through an insufficient seal, up and over the track, and out on the other side through the insufficient seal constitutes a serious sound leak.

4.2.2 When a partition consists of several panels, leaks may

[1] This practice is under the jurisdiction of ASTM Committee E-33 on Environmental Acoustics and is the direct responsibility of Subcommittee E33.04on Application of Acoustical Materials and Systems.

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[2] *Annual Book of ASTM Standards*, Vol 04.06.

[3] *Annual Book of ASTM Standards*, Vol 04.07.

occur at the vertical joints when the seals at the joint are not tight.

4.3 *Sound Flanking Paths*—Although the operable partition may be an adequate barrier itself, sound may pass from one side to the other by going over, around, or under the partition. The passage of sound by paths other than directly through the partition itself is called flanking transmission.

5. Recommendations

5.1 *Area Above Track*:

5.1.1 If there is a plenum above the partition, sound may pass up through the ceiling on one side and down through the ceiling on the other. A barrier should be erected directly above the operable partitions. This barrier, in conjunction with the ceiling, should have a sound transmission loss equal to or greater than that of the partition. The barrier is best designed as part of the building and not added as an afterthought (see Fig. 1). Often a seemingly solid ceiling has hollows behind it, such as spaces between the joists, or spaces in corrugated decks, that provide a flanking path around an operable partition below. The hollow spaces must be blocked directly above the operable partition. The sound transmission loss provided by the blocking barrier should be equal to or greater than that provided by the operable partition.

5.1.2 When a plenum is part of the air conditioning system, a sound-attenuating duct or silencer should be provided through the barrier wall. The composite attenuation of the duct or silencer, and the ceiling, should be equal to or greater than the sound transmission loss of the partition (see Fig. 2).

5.1.3 Generally, track systems for operable partitions are installed during the early phases of building interior construction. The panels are often among the last items installed in the building. The barrier above the track may be built between these two events. To level the track after the weight of the panels is applied, manufacturers and installers of operable partitions request access to the area above the track. This can conflict with the need to build a barrier in the same area. It is important to work out a design that provides an adequate acoustical barrier and allows access for adjustment of the track. If built-in access doors or removable gypsum board panels are used for this purpose, they must be sealed at the periphery with solid or closed cell gaskets.

5.1.4 If doors or removable panels used to cover openings in a monolithic ceiling, to gain access for servicing partition drive train components, the openings should be sufficiently large to permit all service operations without modification or damage to the ceiling. The covers must be sealed at the periphery with solid or closed cell gaskets. Fig. 3 shows the recommended locations of access panels. The doors or removable access panels should have a sound transmission loss equal to or greater than the ceiling transmission loss.

5.2 *Floor Below Partition*:

5.2.1 Some types of floors are intentionally designed with hollow spaces below (for example, some gymnasium wood floors or computer room access floors). Where there is a hollow space under the operable partition, sound may pass down through the floor on one side and up through the floor on the other. A barrier should be erected directly below the operable partition. The barrier, in conjunction with the floor, should have a sound transmission loss equal to or greater than that of the partition (see Fig. 4, (a) and (b)).

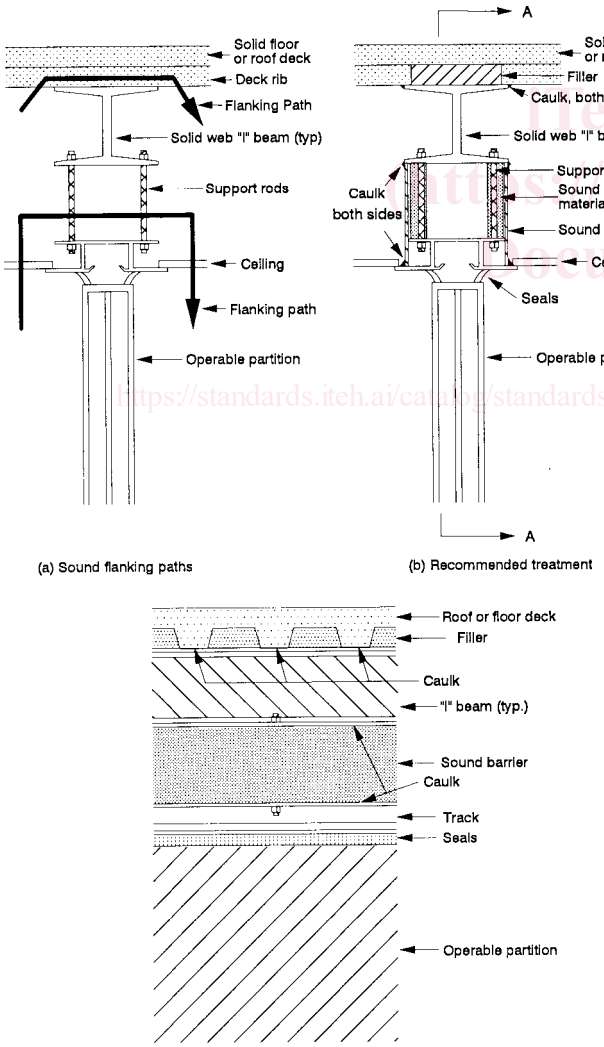

FIG. 1 Recommended Ceiling Barrier Installation

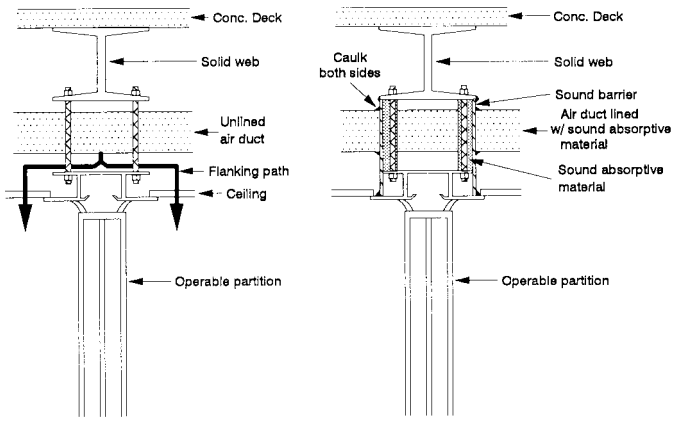

FIG. 2 Recommended Sound Attenuating Duct Installation