PARTITION COMPLAINTS

Most problems Involve the Acoustical Performance—Sound is Leaking

by Michael J. Kodaras

How often do you get a complaint on a job that the partition fell down or looked bad? Practically never! If a complaint does arise, it will most likely be because the acoustical performance is inadequate. In the vernacular, it isn’t soundproof!

If your company installed that partition in an office or multiple dwelling building and you receive a complaint — don’t panic! There is an excellent chance that the partition you installed is completely satisfactory but that there are some other conditions that are responsible for the leakage of sound between the rooms separated by the partition.

To clarify what can happen:

Q. How is sound transmitted from one room to an adjacent room?
A: Sound is a pressure wave — actually a very small variation in atmospheric air pressure. Air pressure variations can vibrate a large surface such as a partition and can also find a path through very small openings. What may seem a very small crack may really be a good sized hole acoustically and can leak a surprising amount of sound. For example, a 1/16” crack between the top of a 12 ft. long partition actually has the same open area as a 3 inch by 3 inch hole. (12 ft. x 12 = 144” x 1/16” = 9 sq. in.)

The mere fact that you cannot see a hole because it is above a sound transparent acoustical ceiling or behind a window sill grille does not mean that sound will not transmit efficiently through that invisible hole.

Q: What are the usual flanking sound paths?
A: The drawing on this page shows the most frequently encountered sound paths that may flank a partition.

In office and school buildings, the flanking path through the acoustical ceiling, over the top of the partition and down through the ceiling on the other side, should be the first suspect. After that, continuous window sill enclosures concealing heating coils or air conditioning supply outlets also frequently hide large holes that flank the partition. Other equally important flanking paths that may occur less frequently are also shown by the arrows.

In multifamily dwellings with concrete floors where the partition extends from slab to slab, flanking is relatively infrequent. When encountered, it is usually caused by the omission of caulking at the ceiling or floor channels of the partition.

Wood joist multifamily constructions, however, are subject to a great many flanking paths, some of them very difficult to find and to seal after they are found.

Q: How can you determine whether flanking paths are compromising the acoustical performance of the partition you installed?
A: The more obvious flanking paths may be discovered without spending a great deal of time and without any special equipment except a good pair of ears. Before starting, however, check to make sure the building is completely enclosed — all windows and glazing in, doors hung with hardware, and so on. Also, the investigation job will be much quicker and easier if you work after the building trades have left for the day.

Basically, the procedure consists of generating a noise on one side

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(source room) of the partition and
detecting the various sound trans-
mission paths from the other side
(receiving room). This may be
done most successfully if the sound
source is steady — not intermit-
tent like talking. The sound should
also be high pitched or high
frequency since high frequency
sound acts to our ears as light to
our eyes. In other words, high
frequency sound has better direc-
tional characteristics than low
frequency sounds. Lastly, the
receiving room (listening side)
should be reasonably quiet — a
condition best obtained after other
sound sources, such as mechanics
hammering, have stopped.

Q: What can you use as a sound
source?
A: The easiest obtainable high
frequency sound source is a 1/4" or
3/8" electric drill. If electrical
services have not yet been turned
on, a battery operated drill can be
used. Drills I have measured
generate about 85 to 90 dBA at a
distance of about 5 ft. Let the drill
hang from a chair or saw horse to
prevent it from transmitting
structurally through the floor
construction. Depending some-
what upon the amount of sound
absorption present in the receiving
room, the background noise level
and the rating of the partition, the
sound from the drill will almost
always be audible in the receiving
room.

Q: Do you need a sound level
meter or expensive measuring
equipment?
A: While your ears will not give
you a numerical answer, your
hearing is a better instrument for
locating flanking paths than a
sound level meter. This is because
your two ears act as a direction
finder for the high frequency noise
and quickly lead you to the crack,
hole or whatever path is flanking
the partition. Don’t forget that
your ears are on a horizontal plane.
If you suspect a sound leak at the
ceiling or at the floor, tilt your
head so that your ears are on a
vertical plane — then you can
locate the source of a leak above or
below your head.

Q: What if your customer remains
unconvinced after your demon-
stration of flanking paths?
A: If you can get your customer to
keep quiet and listen with you, you
will probably be able to convince
him that you installed the partition
properly and that he should look to
some other subcontractor for a
remedy to the problem.

In some instances, however, the
G.C. or the Owner will be
uninterested in the facts and will
want to hold all the trades
accountable. In this event you may
have no alternative but to call in a
professional acoustical consultant.

Q: How will an acoustical con-
sultant prove the field performance
of your partition?
A: A qualified acoustical consultant
has the equipment (high intensity
sound sources and narrow-band
frequency analyzers) to not only
find the flanking sound paths but
also to evaluate their importance
and recommend remedial
measures. He may be able to
evaluate the S.T.C. rating of the
partition if there were no flanking
paths. More important, he can put
his findings into a certified report
and testify in the event it becomes
necessary.

Q: What are the fees charged by
acoustical consultants?
A: Fees will vary somewhat as to
geographic location, qualifications
and experience, however, they will
usually fall into a range of $200.00
to $350.00 per day. The consultant
may be able to test more than one
partition in a day if you give him a
hand with his equipment and if he
doesn’t have to travel too far.
Traveling expenses, of course, are
extra.