ACOUSTICAL PERFORMANCE:
Knowing the Details

Furnishing Accurate Answers to
Questions is Important For Success in This
Growing Market

By Michael J. Kodaras

Your secretary reminds, “You have a meeting with the architect on that new Preston High School job this afternoon. He wants to discuss some changes to bring the job in under budget”.

When you attend meetings with architects, general contractors or owners, are you unprepared to discuss partition S.T.C., ceiling sound attenuation, acoustical performance guarantees? Most contractors can handle discussions of job quantities, price adjustments, time schedules, but many feel uneasy when the subject turns to questions regarding the acoustical performance of the products they install.

To illustrate, I have departed from my usual format of answering questions that would be asked by a contractor. Instead, I will pose questions frequently asked by architects, builders, general contractors and building owners. I will also furnish the answers. See how many of the questions you would be able to handle in the give and take of a job meeting.

Q: Mr. Contractor, the carpeting subcontractor has offered a credit if he is permitted to lay his rubber-backed carpet over the entire floor of the classroom building before the demountable partitions are installed. Will this affect the sound transmission loss of your partition?
A: There is no way I can seal the joint between the button channel of my partition and the carpet. In order to approach the laboratory rated transmission loss of my partition in a field installation, I must seal this joint with caulking or a polyurethane gasket. This can only be done by installing the bottom channel on the concrete slab. Controlled test data indicates that if I install the bottom channel on top of carpeting, the Sound Transmission Class (S.T.C.) of the partition may be as much as 10 points below the laboratory test rating. I do not recommend this procedure.

Q: Mr. Contractor, I have shown a drywall partition rated at S.T.C. 50 between the Carpentry Shop and the Sheet Metal Shop. Can I substitute a less expensive partition at this location?
A: There is no way I can seal the joint between the button channel of my partition and the carpet. In order to approach the

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TILZEY: (Continued from page 21)

can arrange it quickly no matter where the delivery truck is.

DIMENSIONS: Do you do much selling and negotiating as opposed to straight bidding?

TILZEY: Well, we’re mainly a bidding contractor, but each year I find we’re selling more. Selling, I think, will be the future.

I have personal contact with most of the architects in the area and it’s on a first name basis. The area is small and that enables me to get around and see and talk to them.

DIMENSIONS: The additional emphasis on selling would be most helpful for a penetration into the remodeling market, wouldn’t it?

TILZEY: It would, and we do all the remodeling business we can get. Right now, it amounts to about 15 percent of our total volume. It’s a good profit market, rarely bid, and most jobs are arranged right over the telephone.

That’s one of the reasons I maintain what’s probably a larger inventory than most contractors carry. These remodeling buyers want the work done NOW, and if you don’t have it you can’t sell it.

DIMENSIONS: Do collections represent any particular problem for your company, Fred?

TILZEY: No, not really. If a payment is late, I simply call the contractor involved—not his employees. If he claims non-payment to himself, I check with the architect or owner. Then, if I find out he’s holding back, I go straight to his office.

We do some retail and related type selling here and I have Sandra take care of that. She handles it extremely well, but I take responsibility for the construction payments mainly.

DIMENSIONS: ‘The construction industry is still in a rather depressed condition. What do you see as the necessary conditions for a resurgence?

TILZEY: I think if the interest rates stay in line, we’ll have growth. Just why the industry is so low right now, I’m not certain. But it does seem to me that when the interest rate jumps the first to suffer are the construction suppliers —and then it’s passed on to us.

DIMENSIONS: ‘And what will be your immediate goals?

TILZEY: Only one. I just want to stay on the profit line. That’s always been my primary goal.

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A: Partition sound transmission loss requirements depend not only upon the noise or speech levels used but also upon the background noise level normally encountered in the rooms. Both shop teachers will probably use normal speech levels and the background noise levels in shops is usually high—about 40 dB(A). A partition rated at between 35 to 45 S.T.C will be sufficient to make normal speech inaudible in the adjacent room that has a background noise level of 40 dB(A). A partition rated at 25 to 35 S.T.C. will be adequate for normal speech to be faintly heard in the adjacent room. I suggest that the partition used between the shops be rated at S.T.C. 40. (See Figure 1 for speech audibility and background noise relationships to S.T.C. ratings.)

Q: Mr. Contractor, I have called for S.T.C. 40 partitions between Classrooms. The School Board has recommended the installation of a 3 ft. x 7 ft. door between several classrooms. If I specify a hollow-core door with gasketing, will the partitions with the doors have the same sound transmission loss as the partitions without a door?

A: The installation of a door in a partition will almost always reduce the sound transmission loss. The smallest reduction in the combined S.T.C. of partition and door will be achieved by a sound insulating door with an S.T.C. rating equal to the partition S.T.C. rating. If a rated sound insulating door cannot be specified, a completely gasketed solid core door should be used. (See Figure 2 for data of relative acoustical performance of hollow and solid core doors.)

Q: Mr. Contractor, the partitions extend from the floor to the underside of the suspended

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Acoustical ceilings. S.T.C. 50 partitions are specified for the Music Rooms, however, the S.T.C. of the specified acoustical ceiling is only 40-44. What can you do to prevent the sound in one room from flanking over the partition, through the suspended acoustical ceilings?

A: It should be understood that the rated Sound Transmission Class of suspended acoustical ceilings is the sound attenuation obtained by sound passing through the ceiling on one side of the room, through the ceiling plenum, over the partition and down through the ceiling on the other side of the partition. Furthermore, the rating is obtained using ceiling constructions, caulking and other special precautions against the passage of sound that are rarely installed on a job. It is doubtful, therefore, that the rated ceiling S.T.C. of 40-44 will be fully achieved on the job. The best way to improve the S.T.C. of this ceiling-plenum-ceiling path is to extend the partition to the underside of the concrete slab above. Installing the Music Suite partitions from slab to slab before the suspended ceilings are installed would provide assurance that the rated partition construction blocks the entire sound path. An alternate but not equal construction would be to install a sound barrier blanket or lead sheet from the underside of the slab down to the top of the partition.

Q: Mr. Contractor, instead of extending the partition to the underside of the slab above would it be possible to improve the S.T.C. of the ceiling construction by installing a suspended gypsum board ceiling in the Music Suite and then cementing acoustical tile to the gypsum board?

A: Yes, tests of acoustic tile cemented to suspended ½" thick gypsum board ceilings resulted in ratings of S.T.C. 55-59. While this type of suspended ceiling construction provides excellent sound transmission loss, it has a detrimental effect upon the low frequency sound absorption properties of the ceiling: Because there is no longer an air space behind the acoustical tile the long wavelength, low frequency sound “sees” just the thin, 5/8" tile and then reflects from the gypsum board in back of the tile. (See Figure 3 which shows the absorption coefficients of the same acoustical tile in one case suspended—No. 7 Mounting; and in the other case cemented to a hard surface—No. 1 Mounting. Note the loss in efficiency at 125, and 250 Hz of the cemented application.)

In an office installation this loss of low frequency sound absorption may not be important because most office noises—typing, telephone bells, office machines—produce noise that is rich at mid and high frequencies. A school Music Suite, however, would sound “boomy” without a balanced acoustical environment of low, mid and high frequency absorption.

The answers given above represent only a small portion of what “A Contractor Should Know About Acoustics”. The word “KNOW” is probably misleading. A contractor has more important things to do than to memorize acoustical know-how. See future columns in Construction Dimensions for additional information a contractor should have available on practical acoustics. These columns will provide a handy reference source for every day use.

Figure 3
From “A Picture Story of Architectural Acoustics”