

RSIC-1 ACOUSTIC ASSEMBLY

FLOOR/CEILING ASSEMBLY

DIRECT FIX TO ENGINEERED JOIST

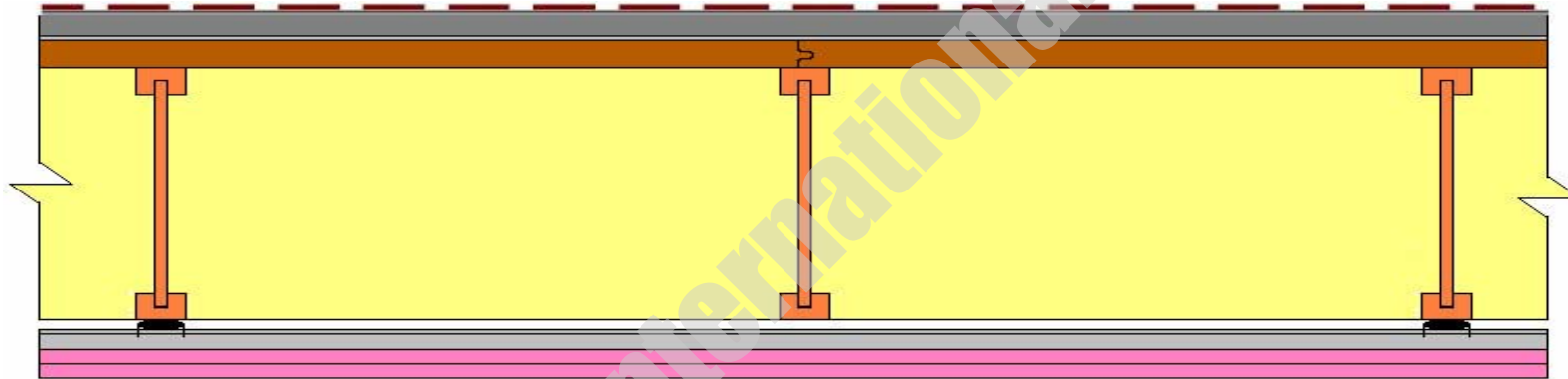


Telephone: (503) 649-7700

Fax: (503) 649-2710

www.pac-intl.com

FCS1 SMWNV FIIC63-FSTC57



CONSTRUCTION

- * Ceramic Tile
- * 1-1/4" thick lightweight concrete floorslab
- * 1/4" thick resilient floor membrane
- * 1-1/8" T&G plywood deck
- * 22" deep I-beam
- * Cellulose insulation 22" blown in
- * RSIC-1 installed 48" oc.
- * 7/8" furring channel 24" oc.
- * 2 Layers 5/8" Gypsum Drywall



**FIELD SOUND
TRANSMISSION
CLASS**

FSTC 57



Fire resistance ratings

ANS/UL

Design L518 (generic version)

**FIELD IMPACT
ISOLATION
CLASS**

FIIC 63



SHEN MILSOM WILKE
TECHNOLOGY CONSULTANTS IN
TELECOMMUNICATIONS,
AUDIOVIDEO, AND ACOUSTICS

5729 BRACANA COURT
LAS VEGAS, NV 89141
T: (702) 242-5081
F: (702) 240-9548

Report Date: May 20, 2003
Test Date: May 7 and May 8 2003
Test Site: Tramonto Villas, Lake Las Vegas, NV
Test Construction: Building No. 7, Floor-Ceiling between
3rd & 2nd Floor Villas
SM&W File No.:

Submitted To: Elzo F. Gernhart, Vice President
PAC International, Inc.
P.O. Box 5369
Aloha, Oregon 97006-0369

NEW YORK

PRINCETON

WASHINGTON, DC

CHICAGO

HOUSTON

DENVER

LAS VEGAS

SAN FRANCISCO

HONG KONG

LONDON

UNITED ARAB EMIRATES

Conformance to Standard

Test of floor-ceiling assembly was conducted according to ASTM Standard E1007-97: *Standard Test Method for Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures*. The measurements acquired was then used to calculate a Field Impact Insulation Class (FIIC) in accordance with ASTM E989-89(1999), *Standard Classification for Determination of Impact Insulation Class (IIC)*.

Test Equipment Used

Equipment used for the measurements included recently calibrated floor tapping machine, pink noise generator, powered-amplified loudspeaker, and a Brüel & Kjær Type 2260 Modular Precision Digital Sound Analyzer.

Site Observations

The 3rd floor villa was designated as the source room for the test. The test was conducted on the 18" x 18" x 3/8" glazed flooring that extended throughout the large combine foyer/living/dining/kitchen space. The villa itself was unfinished. The tapping machine was positioned on the approximate center of the combined space.

The receive or measurement room was a similar space located on the 2nd floor level, directly below the source room. The walls and ceiling for both units are painted drywall, with hard glazed flooring. The ceiling height for the combined living/dining area is approximately 9'-0", with the kitchen area being approximately 8'-0". The volume of the combined space is approximately 10,000 cubic feet.

Description of Floor-Ceiling Assembly

The test floor-ceiling assembly consisted of 3/8" thick glazed floor tile on 1-1/4" thick Gyproc on 1/4" thick Maxxon Acoustimat II resilient floor underlayment on 1-1/8" T&G plywood deck. The system is supported by 20" deep I-beam filled with cellulose insulation. The two layers 5/8" thick drywall ceiling in the 2nd floor villa is mounted to the structure via PAC International RISC resilient mount.

Test Procedure

The measurement process was conducted in accordance with ASTM E1007-97. Both source and receive room's windows and doors were closed and latched securely. Prior to the actual tests, measurements were taken to verify that the sound pressure level in the receive room are not influenced by flanking noise.

We initially observed that flanking noise was significant due to the elevator shaft. However, this condition was mitigated the following day by sealing the elevator doors on the 3rd and 2nd floor villas with two layers of 5/8" thick drywall, cavity lined with unfaced fiberglass insulation, and all edge conditions sealed with a continuous bead on non-hardening acoustical sealant.

Four microphone locations were selected throughout the space for each of the four tapping machine orientations. Each measurement consisted of a minimum of 15-seconds averaging time, following a manual swept figure "8" pattern.

No extraneous mechanical operation noise by the tapping machine was observed and measured.

The decay rate method was used to calculate the receive room sound absorption from reverberation time measurements.

For Field Sound Transmission Class (FSTC), the test was conducted in accordance with procedure set forth in ASTM E90, wherein a sound source is placed in the source room, and measurements are taken in the receive room to determine the background noise levels with and without the sound source.

Conclusion

The attached data sheet summarizes the measured and calculated data. The results indicated a rating of FIIC-63. This rating exceeds the standards set in the 1997 Uniform Building Code, Appendix 12, Division II – Sound Transmission Control, Section 1208.3 states: *"All separating floor-ceiling assemblies between separate units or guest rooms shall provide impact sound insulation equal to that required to meet an Impact Insulation Class (IIC) of 50 (45 if field tested)."* A 5-point difference between laboratory tests (IIC) and field test (FIIC) is typical.

We found the Field Sound Transmission Class of the floor-ceiling assembly to be approximately FSTC-57. This is identical to our calculated result based on double membrane Transmission Loss Synthesis.

Finally, note that the UBC guideline is general in its application. However, the United States Department of Housing and Urban Development (HUD) has develop guidelines for various classification of buildings (HUD AD669.933, *Airborne, Impact, and Structure-Borne Noise Control in Multifamily Dwellings*). Under this guideline, luxury constructions are considered Grade I, where HUD recommends a laboratory IIC rating of 55, or greater for floor-ceiling assemblies between residential units. While the IIC 55 is not a field-tested criterion, the field equivalence is generally 5 points below the laboratory IIC rating.

In either case, the Tramonto Villa floor-ceiling assembly surpassed the minimum requirements.

This concludes the summary of our field tests. Please call should you have questions.

Sincerely,
Shen Milsom & Wilke, Inc.

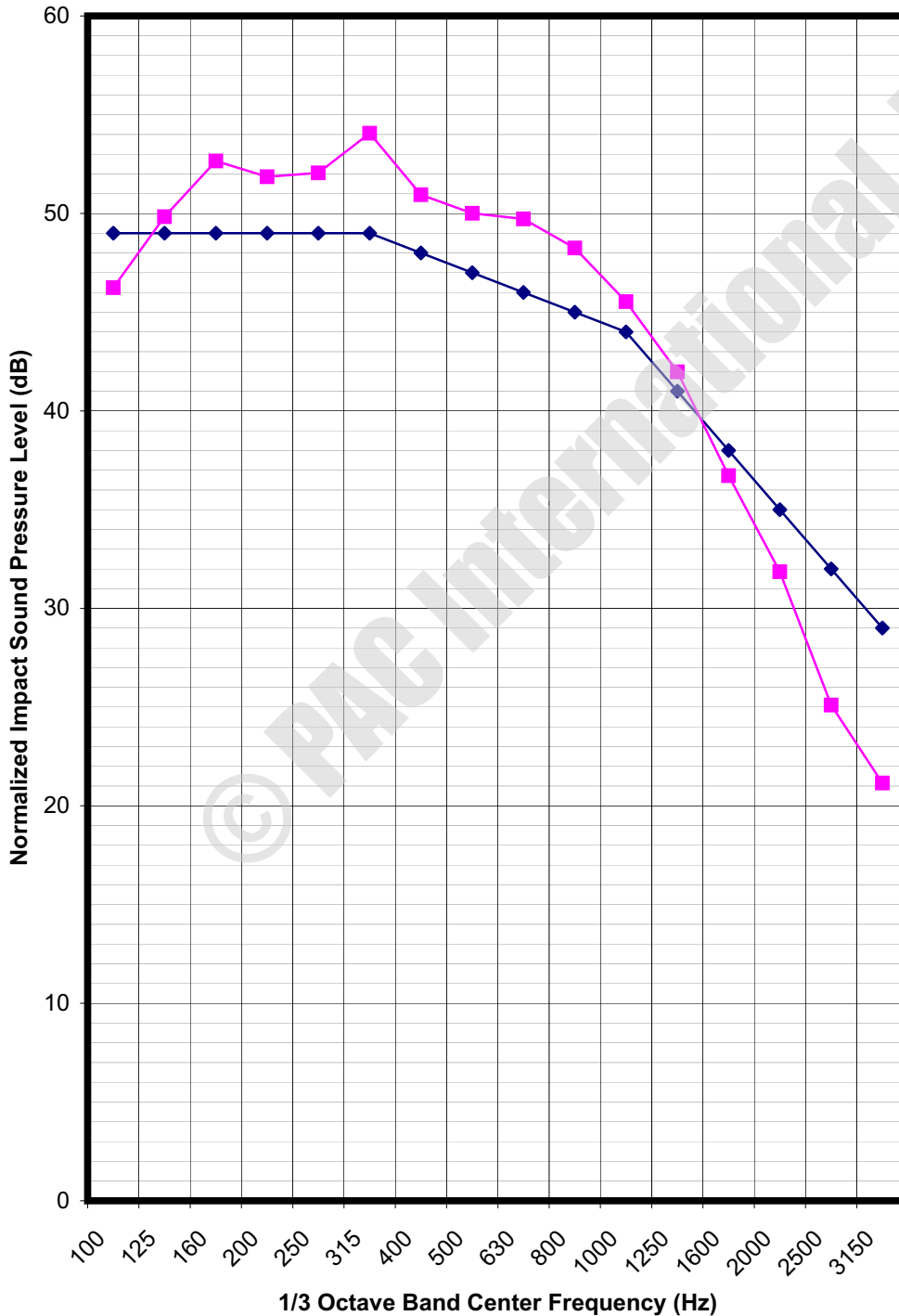
A handwritten signature in black ink, appearing to read "Paul L. Tan", written over a horizontal line.

Paul L. Tan, Director
Las Vegas Branch

Report Date: May 20, 2003
 Test Date: May 7 and May 8 2003
 Test Site: Tramonto Villas, Lake Las Vegas, NV
 Test Construction: Bldg. #7, Floor-Ceiling between
 3rd & 2nd Floor Villas



FIIC = 63

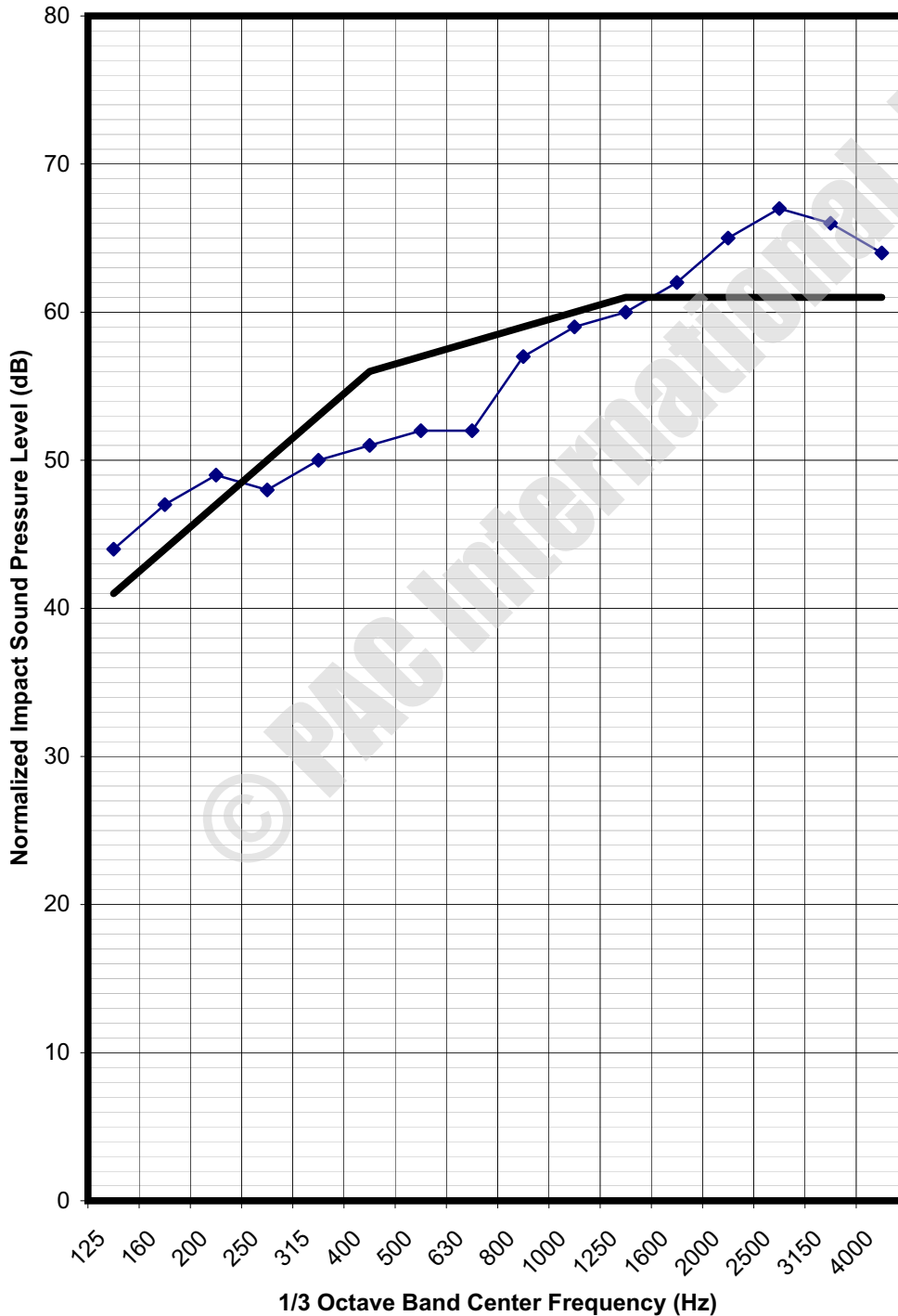


	Contour Level + IIC	Normalized SPL
100	49	46
125	49	50
160	49	53
200	49	52
250	49	52
315	49	54
400	48	51
500	47	50
630	46	50
800	45	48
1000	44	46
1250	41	42
1600	38	37
2000	35	32
2500	32	25
3150	29	21

Report Date: May 20, 2003
 Test Date: May 7 and May 8 2003
 Test Site: Tramonto Villas, Lake Las Vegas, NV
 Test Construction: Bldg. #7, Floor-Ceiling between
 3rd & 2nd Floor Villas



FSTC = 57



	TL (dB)	Contour Level (dB)
125	44	41
160	47	44
200	49	47
250	48	50
315	50	53
400	51	56
500	52	57
630	52	58
800	57	59
1000	59	60
1250	60	61
1600	62	61
2000	65	61
2500	67	61
3150	66	61
4000	64	61

◆ TL (dB) — Contour Level (dB)