

RSIC-1 ACOUSTIC ASSEMBLY

FLOOR/CEILING ASSEMBLY

DIRECT FIX TO CONCRETE SLAB

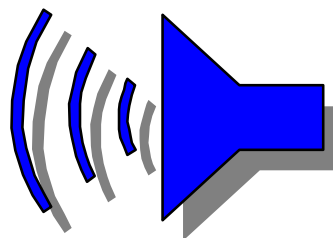


FCS2 DSWA FIIC 70



CONSTRUCTION

- * Ceramic Tile
- * 1/4" James Hardie tile backer
- * 8" PT concrete slab
- * R-8 insulation
- * RSIC-1 installed 48" oc.
- * 7/8" furring channel 24" oc.
- * 1 Layers 5/8" Gypsum Drywall



**SOUND
TRANSMISSION
CLASS**
(Insul 5.5)

STC 71



Fire resistance ratings
ANS/UL
Non combustible design

**FIELD IMPACT
ISOLATION
CLASS**

FIIC70

Sound Insulation Prediction (v5.5)



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PAC

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Margin of error is generally within +/- 3STC

JobName:

Notes:

Job No.:

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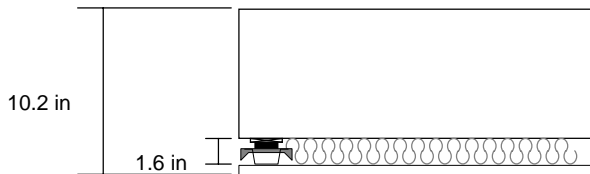
DSA Vanc SCT 71

Date: 25 May 04

Initials:

File name:insul

1 x 8.0 in Concrete



$f_n = 80$ Hz
1 x 0.6 in Type X Gypsum Board
thickness 2 in

STC 71
OITC 51

Panel size 8.9x13 ft

Surf. mass 97.4 lb/ft²

Crit. freq 147 Hz

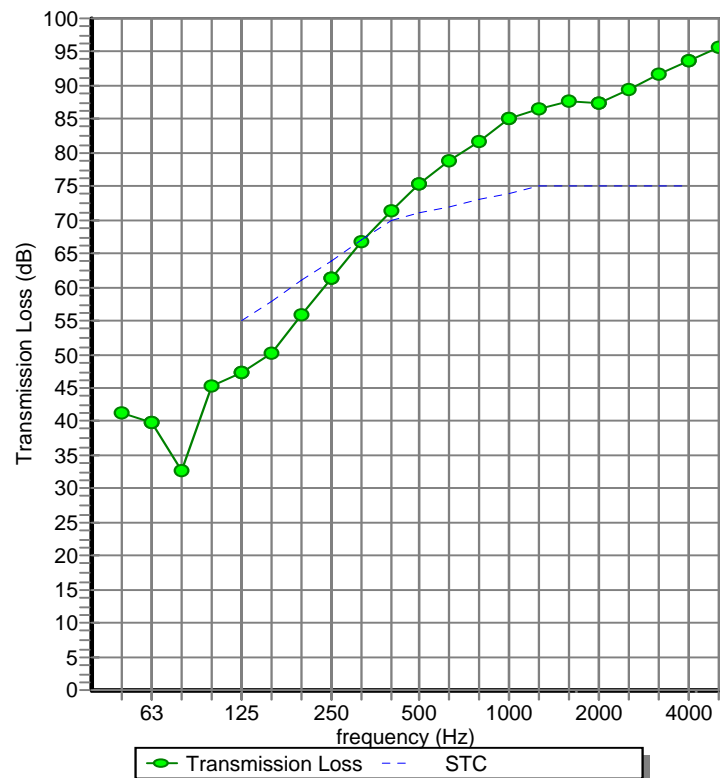
damping 0.01

Surf. mass 2.9 lb/ft²

Crit. freq 1997 Hz

damping 0.01

Frequency (Hz)	TL(dB)	TL(dB)
50	41	
63	40	36
80	33	
100	45	
125	47	47
160	50	
200	56	
250	61	59
315	67	
400	71	
500	75	74
630	79	
800	82	
1000	85	84
1250	87	
1600	88	
2000	87	88
2500	89	
3150	92	
4000	94	93
5000	96	



June 6, 2003



PAC International Inc.
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Aloha OR 97006

Daly • Standlee & Associates, Inc.

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(503) 646-4420
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Attn: Mike Gernhart

From: Daly-Standlee & Associates, Inc.

Joseph C. Begin
Sr. Engineer

Re: **Supplement to DSA Report No 129031-IIC1**
Additional Impact Tests With Floor Covering Samples
DSA File #: 129031

Introduction

On May 12, 2003, at the request of PAC International, Daly-Standlee & Associates, Inc. (DSA) conducted a test of a post-tensioned concrete floor with a resiliently mounted ceiling, to determine its Field Impact Insulation Class (FIIC) rating. This test was conducted on a bare concrete floor. As reported in the official test report (DSA report No 129031-IIC1) as tested, the rating of this floor-ceiling system with no floor covering (bare concrete) was FIIC 51.

In addition to the test of the bare floor, several samples of different floor coverings were tested the same evening at the same location. These samples, which measured approximately 4 feet by 4 feet, were tested by placing the sample on the concrete floor, centered on the location of the original test, and then conducting the test with the impact machine centered on the sample. The test was conducted in the manner prescribed in ASTM E1007-97. However, because these were samples only and were not installed over the entire floor, these additional sample tests do not fully meet the requirements of ASTM E1007. Accordingly, these tests are being reported in this supplemental report.

Due to time constraints, and the building owner's desire to not have any samples glued or otherwise fastened to the floor, some of the samples tested may not accurately represent a final installed condition.

Although these additional tests did not fully meet the requirements of ASTM E1007, they provide useful information which may be indicative of the improvement in impact insulation performance with different types of floor finishes.

Description of the Samples Tested

Table 1 lists the tests conducted with a description of the floor finish for each test. Test 1 refers to the base condition (the bare concrete floor).

Table 1. Description of Test Samples

Test No	Sample Name	Sample Description
1	Base condition (not a sample)	Bare concrete floor. Floor/ceiling system consisted of an 8" post-tensioned concrete slab with 5/8" gypsum board ceiling mounted to the underside of the slab using PAC International RSIC-1 resilient sound insulation clips and 7/8" x 25 gauge furring channel. The 1-5/8" cavity between the concrete and the gypsum board was filled with R8 insulation.
2	Tile laying on concrete	1/4" x 12" x 12" ceramic tile bonded to 1/4" thick fiber-cement backer board and grouted. Sample was laid on concrete floor, not bonded to it.
3	Tile on Regupol™	Tile sample described in Test 2 with one layer of 5 mm Regupol™ underlayment material placed between the sample and the concrete floor. No adhesive was used.
4	Hardwood on 1/16" foam	3/8" thick x 3" wide pre-finished tongue & groove bevel-edge hardwood (boards made from plywood substrate with 1/16" oak surface) glued at seams and laid on 1/16" foam vapor barrier mat. No adhesive (other than between board edges) was used.
5	Hardwood without foam	Hardwood sample described in Test 4, except that foam was replaced with 0.7 mil poly vapor barrier. No adhesive (other than between board edges) was used.
6	Cushioned vinyl on concrete	Armstrong 1/8" cushioned vinyl flooring laid on concrete floor without adhesive.
7	Carpet with pad	40 oz carpet on 7 lb rebond pad. Sample was laid on concrete with no adhesive or fasteners.
8	Carpet without pad	40 oz carpet without pad. Sample was laid on concrete with no adhesive or fasteners.

Test Results

Test results are listed in Table 2.

Table 2. Test Results

Test No	Sample Name	FIIC Equivalent*	Bands in Which Impact Noise Was Less Than 5 dB Above Ambient
1	Base condition (not a sample)	51	none
2	Tile laying on concrete	70*	1000 to 3150 Hz
3	Tile on 5 mm Regupol™	69*	1250 to 3150 Hz
4	Hardwood on 1/16" foam	74*	800 to 3150 Hz
5	Hardwood without foam	72*	3150 Hz
6	Cushioned vinyl on concrete	72*	1250 to 3150 Hz
7	Carpet with pad	87*	All, except 60 Hz
8	Carpet without pad	84*	250 to 3150 Hz

* Except for Test 1, the base condition, the tests did not fully meet the requirements of ASTM E1007, because a sample, not a completely installed floor covering was tested. Hence the results are reported in Table 2 as an "FIIC Equivalent" rating. (Only the base condition Test 1 may be considered a true FIIC rating.)

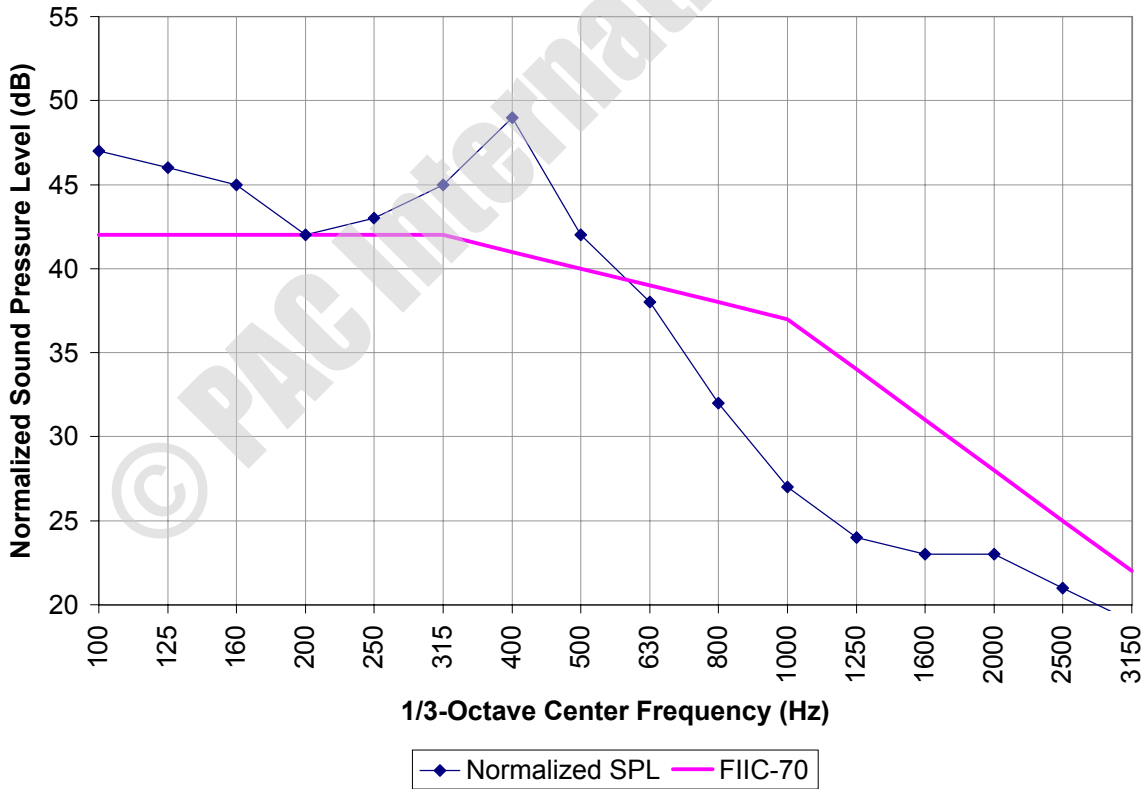
For each test, a sheet is attached that shows the normalized impact sound levels from the test in tabular and graphical form.

Vancouver Center Apartments - 424/324 - T2 - Tile w/o Regupol

1/3 Octave Center Frequency (Hz)	Normalized Impact SPL (dB)	Deficiency (dB)	Receiving Room Absorption (Sabins)	Notes	1/3 Octave Center Frequency (Hz)	Normalized Impact SPL (dB)	Deficiency (dB)	Receiving Room Absorption (Sabins)	Notes
100	47	5	129	1	630	38	0	42	
125	46	4	66		800	32	0	42	
160	45	3	64		1000	27	0	47	2
200	42	0	52		1250	24	0	50	2
250	43	1	49		1600	23	0	54	2
315	45	3	44		2000	23	0	61	2
400	49	8	41		2500	21	0	64	2
500	42	2	39		3150	19	0	61	2
Total Deficiencies = 26					FIC = 70				

Notes: 1. Receiving room volume was less than the ideal value specified in ASTM E1007-97 (6.4) for testing in this frequency band.
 2. Impact noise level in this band was less than 5 dB above ambient. Therefore level indicates only an upper bound of the impact noise level.

Vancouver Center Apartments - 424/324 - T2 - Tile w/o Regupol





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Report on

Field Impact Insulation Class (FIIC) Test

Subject:

**Concrete Floor With Resiliently Mounted Ceiling
 Vancouver Center Apartments, Units 424/324**

Prepared for:

Mike Gernhart
 PAC International Inc.
 PO Box 5369
 Aloha OR 97006

DSA Test No: 129031-IIC1
 Conducted: May 12, 2003

Summary

This report describes a test conducted to determine the Field Impact Insulation Class (FIIC) rating of a floor/ceiling system according to standard test procedures outlined in ASTM Designation E1007-97. The floor/ceiling system tested consisted of the following elements:

- An 8" thick post-tensioned concrete slab
- A single layer of 5/8" gypsum board resiliently mounted to the underside of the slab using PAC International RSIC-1 Resilient Sound Insulation Clips and 7/8" x 25 gauge furring channel.
- The 1-5/8" cavity between the concrete slab and the gypsum board was filled with R8 fiberglass batt insulation.

The test met all the requirements of ASTM E1007-97. When tested with no floor covering (bare concrete), the assembly achieved a FIIC rating of 51).

Tested by:

Joseph C. Begin
 Sr. Engineer

Approved by:



EXPIRES: 6/30/04

Principal