# RSIC ACOUSTIC ASSEMBLY

## FLOOR CEILING ASSEMBLY

### DIRECT FIX TO “I” JOIST

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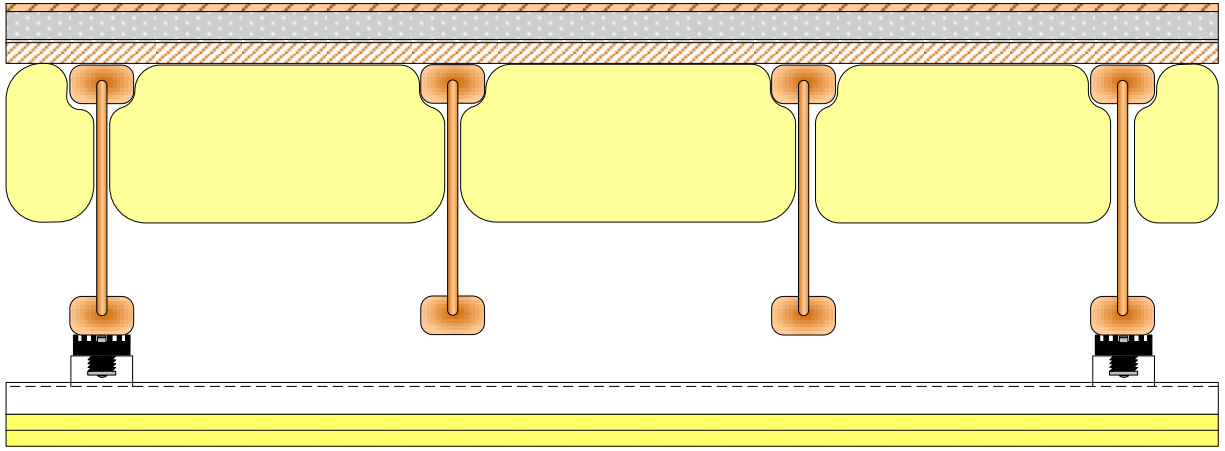
**FCS1-A DSA FSTC 54 – FIIC 55**

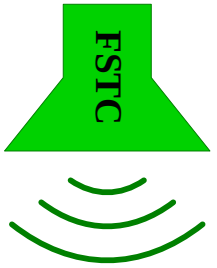


CLASSIFIED c UL us

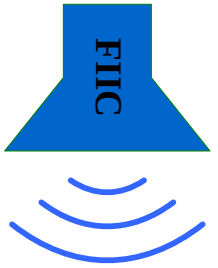
Fire Resistant Rating
ANS/UL 263
Design: L528

**CONSTRUCTION**

- 3/8" Hard Wood Flooring
- 1-1/4” Levelrock Poured in Place
- 1/4” Thick Resilient Floor Membrane
- 3/4” T&G Subfloor
- 16" “I” Joist
- 8" Min Demelec Sealection 500
- RSIC-1 Installed @ 48" OC
- 7/8" Drywall Furring Channel @ 24" OC
- 2 Layer 5/8" Gypsum Board




**FSTC 54**




**FIIC 55**

***DSA Test No:***
122051-FSTC1

***Conducted:***
August 2, 2005

Daly • Standlee & Associates, Inc.
4900 S.W. Griffith Drive
Suite 216
Beaverton, Oregon 97005
(503) 646-4420
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***Prepared for:***
Darin Park
Greystone Condominium, LLC
7008 SW Nyberg Rd.
Tualatin, OR 97062

***Report on:***

# Field Sound Transmission Class (FSTC) Test

***Subject:***

## 8569 SE Bristol Park Drive
## Floor/Ceiling between Units 15B and 15A

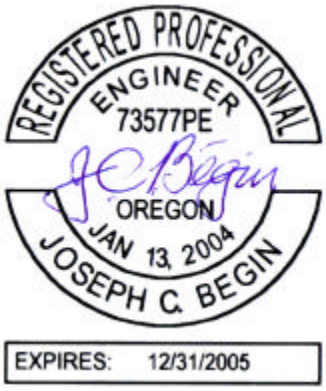
## Summary

This report describes a test conducted to determine the Field Sound Transmission Class (FSTC) rating of a floor/ceiling system between the great room of Unit 15B and the master Bedroom of unit 15A of Building Type C1 at 8569 SE Bristol Park Drive, according to standard test procedures outlined in ASTM Designation E336-97. The wall system tested consisted of the following elements:

- 16" TJI™ joists at 16" O.C
- ¾" thick plywood sub-floor, with 1-1/2" thick Gypcrete™ light concrete topping applied over ¼" Acoustimat™ resilient floor mat and finished with 3/8" thick engineered hardwood.
- Joist cavity insulated with minimum 8" thick Demilec Sealection™ 500 spray-in semi-rigid foam.
- Ceiling consisting of two layers of 5/8" thick gypsum board resiliently attached to the joists using PAC International RSIC-1™ system.

The test met all the requirements of ASTM E336-97. The test results establish the minimum FSTC rating of the floor/ceiling system tested as FSTC-54.

***Tested by and Approved by:***




Joseph C. Begin, PE
Sr. Engineer

DSA Test No: 122051-FSTC1
Conducted on: August 2, 2005

For: Greystone Condominium, LLC
On: 8569 SE Bristol Park Drive
Demising Wall between Units 15B and 15A

## Conformance to Standards

An airborne sound insulation field test was conducted at the request of Greystone Condominium, LLC to determine the Field Sound Transmission Class (FSTC) rating of a floor/ceiling system located between the great room (living room/dining room/kitchen) of Unit 15B and the master bedroom of Unit 15A of Building Type C1, located at 8569 Bristol Park Drive in Portland, OR. The test was conducted in conformance to the test methods and procedures outlined in the industry standard ASTM E336-97[1].

## Description of Test Environment

The subject of this test was the floor/ceiling between Units 15B and 15A of Building Type C1 at 8569 SE Bristol Park Drive. The source room for the test was the great room of Unit 15B and the sound receiving space for the test was the master bedroom of Unit 15A. The receiving space was finished with gypsum board walls and ceiling, a bare plywood floor, and no other furnishings or carpet at the time of the test. The dimensions of the main part of the ceiling under test were approximately 18'-2" by 14'-10". The total area of the ceiling was 249 square feet and the total volume of the receiving space was calculated to be approximately 2199 cubic feet.

## Description of Test Specimen

According to details provided by Greystone, LLC, the floor/ceiling system tested was constructed with 16" TJI™ joists at 16" O.C., a 3/4" thick plywood sub-floor, 1-1/2" Gypcrete™ light concrete topping applied over 1/4" Acoustimat™ resilient floor mat and a finished floor of 3/8" thick engineered hardwood. The joist cavity was insulated with minimum 8" thick Demilec Sealection™ 500 spray-in semi-rigid foam. The ceiling consisted of two layers of 5/8" thick gypsum board resiliently attached to the joists using the PAC International RSIC-1™ system.

## Description of Test Procedure

The test was conducted in accordance with the procedures outlined in ASTM Designation E336-97. All measurements were conducted with a Larson Davis Model 800B sound level meter, which meets the requirements of standard ANSI S1.4 for Type 1 meters[2], and a computer-based spectral analysis program, which allows fast real-time acquisition and analysis of sound data. As specified in Sections 10 of ASTM E336-97, a single microphone was moved continuously along a defined traverse in order to obtain the necessary space-average levels. Absorption in the receiving room was calculated from the reverberation time measurement results as prescribed in the test procedure.

## Test Results

Table 1 presents the calculated normalized Field Transmission Loss (FTL) values at each of sixteen standard 1/3-octave band test frequencies. Deficiencies in the data relative to an assigned Sound Transmission Class (STC) curve are presented and used to establish an FSTC rating per ASTM Designation E597. Table 1 also lists the receiving room absorption values in each frequency band.

1 American Society for Testing and Materials Designation E336-97, *Standard Test Method for Measurement of Airborne Sound Insulation in Buildings*

2 American National Standards Institute, S1.4-1983, Specification for Sound Level Meters

DSA Test No: 122051-FSTC1 For: Greystone Condominium, LLC
Conducted on: August 2, 2005 On: 8569 SE Bristol Park Drive
Demising Wall between Units 15B and 15A

**Table 1 - Field Transmission Loss Values for Floor/Ceiling Located Between Units 15B and 15A of 8569 SE Bristol Park Drive**

| 1/3-Octave Center Frequency f (Hz) | Avg. SPL in Source Room $L_1$ (dB) | Avg. SPL in Receiving Room $L_2$ (dB) | Receiving Room Absorption A (sabins) | Field Transmission Loss (dB) | Deficiency (dB) | Notes | | |
|---|---|---|---|---|---|---|---|---|
| 125 | 89.0 | 56.3 | 92 | 37 | 1 | | | |
| 160 | 86.4 | 52.3 | 113 | 38 | 3 | | | |
| 200 | 86.9 | 53.5 | 115 | 37 | 7 | | | |
| 250 | 89.5 | 51.4 | 121 | 41 | 6 | | | |
| 315 | 91.8 | 52.0 | 112 | 43 | 7 | | | |
| 400 | 94.2 | 49.2 | 83 | 50 | 3 | | | |
| 500 | 95.0 | 47.3 | 75 | 53 | 1 | | | |
| 630 | 94.9 | 45.0 | 74 | 55 | 0 | | | |
| 800 | 97.4 | 43.3 | 73 | 59 | 0 | | | |
| 1000 | 97.4 | 39.4 | 69 | 63 | 0 | | | |
| 1250 | 98.1 | 36.8 | 72 | 67 | 0 | | | |
| 1600 | 97.6 | 36.3 | 79 | 66 | 0 | | | |
| 2000 | 97.9 | 39.8 | 92 | 62 | 0 | | | |
| 2500 | 99.7 | 36.7 | 90 | 67 | 0 | | | |
| 3150 | 97.2 | 30.1 | 86 | 72 | 0 | | | |
| 4000 | 92.7 | 23.8 | 84 | 74 | 0 | | 1 | |
| **FSTC-54** | | | | | | | | |
| **Total Deficiencies = 28** | | | | | | | | |

Notes: 1. Receiving room noise level in this band was less than 5 dB above ambient. Therefore level indicates only a lower bound of the Field Transmission Loss at this frequency

## Field Sound Transmission Class (FSTC)

The Field Sound Transmission Class rating of the demising wall tested was FSTC-54. The deficiencies between the measured Field Transmission Loss values and the assigned STC curve total 28 dB, with no deficiency exceeding 8 dB in any 1/3-octave frequency band. Per ASTM E336 (13.5.1), this FSTC rating should be considered a minimum rating, because exhaustive tests for flanking sound transmission were not conducted[3].

Figure 1 displays the Field Transmission Loss values and the STC-54 contour.

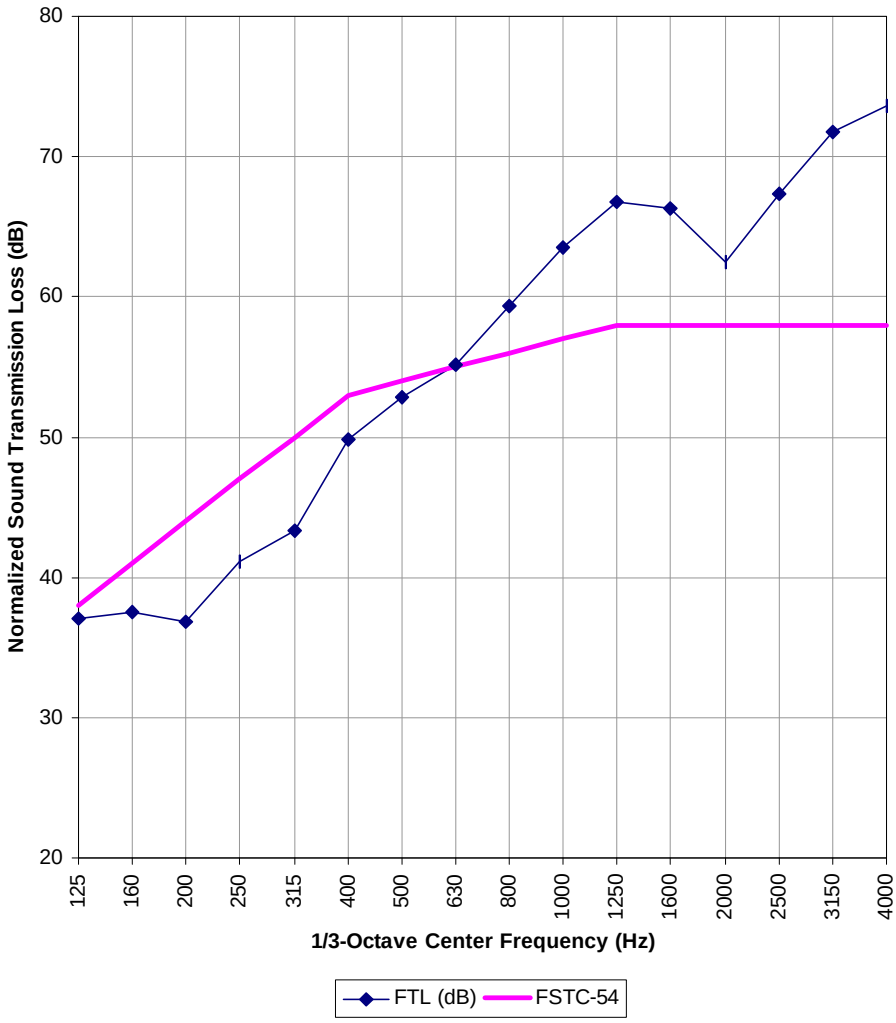
3 Note: Evaluation of flanking path sound transmission involves creating temporary auxiliary partitions and other invasive measures, which was beyond the scope of this test.

DSA Test No: 122051-FSTC1
Conducted on: August 2, 2005

For: Greystone Condominium, LLC
On: 8569 SE Bristol Park Drive
Demising Wall between Units 15B and 15A

**Figure 1**

**Field Transmission Loss Values**



***DSA Test No:***
122051-IIC1

***Conducted:***
August 2, 2005

Daly • Standlee & Associates, Inc.
4900 S.W. Griffith Drive
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Fax (503) 646-3385

***Prepared for:***
Darin Park
Greystone Condominium, LLC
7008 SW Nyberg Road
Tualatin, OR 97062

***Report on:***

# Field Impact Insulation Class (FIIC) Test

***Subject:***

## 8569 SE Bristol Park Drive
## Floor-Ceiling between Units 15B and 15A

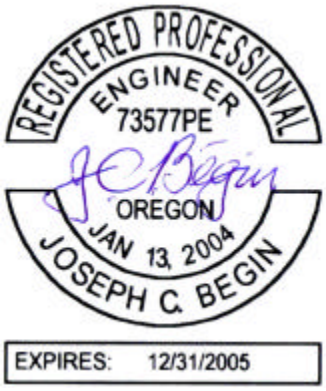
## Summary

This report describes a test conducted to determine the Field Impact Insulation Class (FIIC) rating of the Floor-Ceiling system between Units 15B and 15A at 8569 SE Bristol Park Drive according to standard test procedures outlined in ASTM Designation E1007-97. The floor-ceiling system tested consisted of the following elements:

- 16" TJI™ joists at 16" O.C.
- ¾" thick plywood sub-floor, with 1-1/2" thick Gypcrete™ light concrete topping applied over ¼" Acoustimat™ resilient floor mat and finished with 3/8" thick engineered hardwood.
- Joist cavity insulated with minimum 8" thick Demilec Sealaction™ 500 spray-in semi-rigid foam.
- Ceiling consisting of two layers of 5/8" thick gypsum board resiliently attached to the joists using PAC International RSIC-1™ system.

The test met all the requirements of ASTM E1007-97. The test results establish the minimum FIIC rating of the floor/ceiling system tested as FIIC-55.

***Conducted by:***




Joseph C. Begin, PE
Senior Engineer

DSA Test No: 122051-IIC1
Conducted on: August 2, 2005

For: Greystone Condominium, LLC
On: 8569 SE Bristol Park Drive
Floor-Ceiling between Units 15B and 15A

## Conformance to Standards

A field impact isolation class test was conducted at the request of Greystone Condominium, LLC to determine the Field Impact Insulation Class (FIIC) rating of the Floor-Ceiling system located between the great room (living room/dining room/kitchen) of Unit 15B and the master bedroom of Unit 15A of Building Type C1 at the 8569 SE Bristol Park Drive in Portland, OR . The test was conducted in conformance to the test methods and procedures outlined in the industry standard ASTM E1007-97[1].

## Description of Test Environment

The subject of this test was the floor-ceiling between Units 15B and 15A of Building Type C1 at 8569 SE Bristol Park Drive. The source room for the test was the great room of Unit 15B and the sound receiving space for the test was the master bedroom of Unit 15A. The receiving space was finished with gypsum board walls and ceiling, a bare plywood floor, and no other furnishings or carpet at the time of the test. The dimensions of main part of the ceiling under test were approximately 18'-2" by 14'-10". The total area of the ceiling was 249 square feet and the total volume of the receiving space was calculated to be approximately 2199 cubic feet.

## Description of Test Specimen

According to details provided by Greystone, LLC, the floor/ceiling system tested was constructed with 16" TJI™ joists at 16" O.C., a 3/4" thick plywood sub-floor, 1-1/2" Gypcrete™ light concrete topping applied over 1/4" Acoustimat™ resilient floor mat and a finished floor of 3/8" thick engineered hardwood. The joist cavity was insulated with minimum 8" thick Demilec Sealection™ 500 spray-in semi-rigid foam. The ceiling consisted of two layers of 5/8" thick gypsum board resiliently attached to the joists using the PAC International RSIC-1™ system.

## Description of Test Procedure

The test was conducted in accordance with the procedures outlined in ASTM Designation E1007-97. All measurements were made with a Larson Davis Model 800B sound level meter, which meets the requirements of standard ANSI S1.4 for Type 1 meters[2], and a computer-based spectral analysis program, which allows fast real-time acquisition and analysis of sound data. As specified in Sections 10.1, 10.3 and 10.6 of ASTM E1007-97, a single microphone was moved continuously along a defined traverse in order to obtain the necessary space-average levels. Absorption in the receiving room was calculated from the reverberation time measurement results as prescribed in the test procedure.

## Test Results

Table 1 presents the calculated normalized Sound Pressure Level (SPL) values at each of sixteen standard 1/3-octave band test frequencies. Deficiencies in the data relative to an assigned Impact Insulation Class (IIC) curve are presented and used to establish an FIIC rating per ASTM Designation E989-89. Table 1 also lists the receiving room absorption values in each frequency band.

1. American Society for Testing and Materials Designation E1007-97, *Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures*

2. American National Standards Institute, S1.4-1983, *Specification for Sound Level Meters*

DSA Test No: 122051-IIC1
Conducted on: August 2, 2005

For: Greystone Condominium, LLC
On: 8569 SE Bristol Park Drive
Floor-Ceiling between Units 15B and 15A

**Table 1 – Normalize Impact Sound Pressure Levels for the Floor-Ceiling System Located Between Units 15B and 15A of 8569 SE Bristol Park Drive**

| 1/3 Octave Center Frequency (Hz) | Normalized Impact SPL (dB) | Deficiency (dB) | Receiving Room Absorption (Sabins) | Notes | | |
|---|---|---|---|---|---|---|
| 100 | 59 | 2 | 132 | | | |
| 125 | 61 | 4 | 91 | | | |
| 160 | 63 | 6 | 113 | | | |
| 200 | 65 | 8 | 115 | | | |
| 250 | 64 | 7 | 121 | | | |
| 315 | 62 | 5 | 112 | | | |
| 400 | 53 | | 82 | | | |
| 500 | 47 | | 75 | | | |
| 630 | 43 | | 74 | | | |
| 800 | 39 | | 73 | | | |
| 1000 | 35 | | 69 | | | |
| 1250 | 31 | | 72 | | 1 | |
| 1600 | 30 | | 79 | | 1 | |
| 2000 | 29 | | 92 | | 1 | |
| 2500 | 27 | | 90 | | 1 | |
| 3150 | 25 | | 86 | | 1 | |
| **Total Deficiencies = 32** | | | **FIIC = 55** | | | |

Note 1: 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 [per ASTM E1007-97 (10.7)].

## Field Impact Insulation Class (FIIC)

The test conducted established the Field Impact Insulation Class rating of the floor-ceiling system tested at FIIC-55. The deficiencies between the recorded sound pressure levels and the assigned IIC curve total 32 dB, with no deficiency exceeding 8 dB in any 1/3-octave frequency band.

Figure 1 displays the measured normalized impact sound pressure level (SPL) values and the IIC-55 contour.

DSA Test No: 122051-IIC1
Conducted on: August 2, 2005

For: Greystone Condominium, LLC
On: 8569 SE Bristol Park Drive
Floor-Ceiling between Units 15B and 15A

Figure 1—Normalized Impact Sound Pressure Levels