# Buildings 220, 221, 223, & 225 – Fire Alarm Replacements

National Institute of Standards and Technology

FA Narrative
Final Submission
CFR Project Number: 24049
August 29th, 2025

**Prepared By:**

**CFR Engineering Consultants, Inc.**

**20251 Century Blvd, Suite 120**

**Germantown, MD 20874**

**(877) 871-4229**

## FIRE ALARM AND MASS NOTIFICATION SYSTEM

The existing fire alarm systems in Buildings 220, 221, 223, and 225 will be demolished. A new, addressable fire alarm system, compliant with NFPA 72, will be installed to notify occupants inside the buildings. This system will be a fully integrated, electrically supervised, addressable, intelligent fire alarm and detection system, featuring both manual and automatic operation, with annunciation throughout the buildings.

Buildings 220, 221, 223, and parts of 225 are not equipped with sprinkler systems. Automatic detection will be provided throughout each building to provide total coverage. The system will notify building occupants through a combination of speakers and strobes. These speakers will meet NFPA 72 standards, including intelligibility requirements. The mass notification system will provide audible messaging both within the buildings and via exterior speakers located at exits and key outdoor areas where personnel may be present.

A new fire alarm control panel (FACP), specifically the Simplex 4100ES, will be installed at the main entrance of each building. This FACP will be compatible with the existing fire alarm reporting loop. The system will include a battery backup power supply with sufficient capacity to operate under quiescent conditions, and in the event of an emergency, it will maintain functionality during fire or other emergency situations.

## FIRE ALARM DESIGN

### General

All fire protection devices, equipment, and materials shall be listed for their intended use in accordance with FM Global and/or Underwriters Laboratories (UL) standards. Unless otherwise specified, each floor of every building will be covered by a single fire alarm zone.

The new fire alarm system must be fully installed before the demolition of the existing system. All new fire alarm systems must be approved, tested, and fully operational prior to the removal of the existing systems in each building.

NIST shall be given the option to salvage any existing fire alarm devices slated for demolition before they are disposed of.

### Control Panels

All buildings will be provided with a 4100ES FACP located in the first floor lobby (serving circuits within the sub-basement, basement, first floor, and second floor) and a 4100ES transponder panel located in the Attic (serving circuits within the third floor, attic, and penthouse).

**Circuit Performance**

Fire protective signaling systems shall have the following circuit performance in accordance with NFPA 72:

- All signaling line circuits (SLCs) shall meet Class A requirements.
- All panel-to-panel communication shall meet Class X requirements.
- Initiating device circuits (IDCs) serving more than one device shall meet Class A requirements. IDCs serving only one device, such as an IDC from a monitor module to an adjacent waterflow alarm, may meet Class B requirements.
- All notification appliance circuits (NACs) shall meet Class A requirements. All fire alarm notification circuits shall use a 70 v RMS amplifier circuit.

Fire alarm circuits shall be provided as follows:

- Separate Strobe Circuits for Each Level.
- Separate Strobe Circuits for Each Spine.
- Separate Speaker Circuits for Each Level.
- Separate Speaker Circuits for Each Spine.
- Separate SLC Circuits for Each Level.
- Separate SLC Circuits for Each Spine.
- Separate Exterior Speaker Circuits for Each 1st Level and Penthouse Level.
- Separate Acoustic Hailing Device (Loudspeaker) Circuit for Each 1st Level.
- Separate M&E Circuit for Each Panel.

**Notification**

Notification shall be via speakers and strobes. Spacing and location of speakers and strobes shall be compliant with the ABA (Architectural Barriers Act), NFPA 72, NIST O/P 7400 and NIST S 7401. The quantity and location of interior speakers shall be determined by the audibility requirements. For voice systems, additional speakers tapped at lower wattage provide greater intelligibility.

Visual signals shall be provided via multi-candela, field selectable strobe lights utilizing high-intensity, white xenon flash tube with a clear plastic lens. The body of the strobe shall be white in color marked “ALERT”. All strobes shall be UL 1971 compliant as well as ABA compliant.

Notification devices shall be installed in locations required by NFPA 101 and NFPA 72 and NIST 7401 and meet audibility/intelligibility requirements. See Appendix for audibility and intelligibility calculations. *(To be provided at a later submission)*

**Initiating Devices**

Fire alarm initiating devices shall be provided in accordance with NFPA 101 and NFPA 72 except as modified herein.

- Smoke detectors shall only be installed as required by codes. Only photoelectric smoke detectors shall be utilized.
- Heat detectors shall be provided thoughout each building as required by codes.
- Duct detectors shall only be installed as required by codes or referenced herein.
- All automatic detection devices shall be clearly labeled and access shall be provided for testing and maintenance.
- Manual pull stations shall be required at all exits and so that all occupants can reach a pull station within 200ft of travel distance.

**PERMITTING REQUIREMENTS**

All design must be reviewed and approved by the NIST AHJ, and no work shall be started without an approved NIST-383 form as required by NIST S 7401.01.

# Audibility and Intelligibility Calcs

Appendix – A.1

# NIST SINGLE MODULE LAB

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

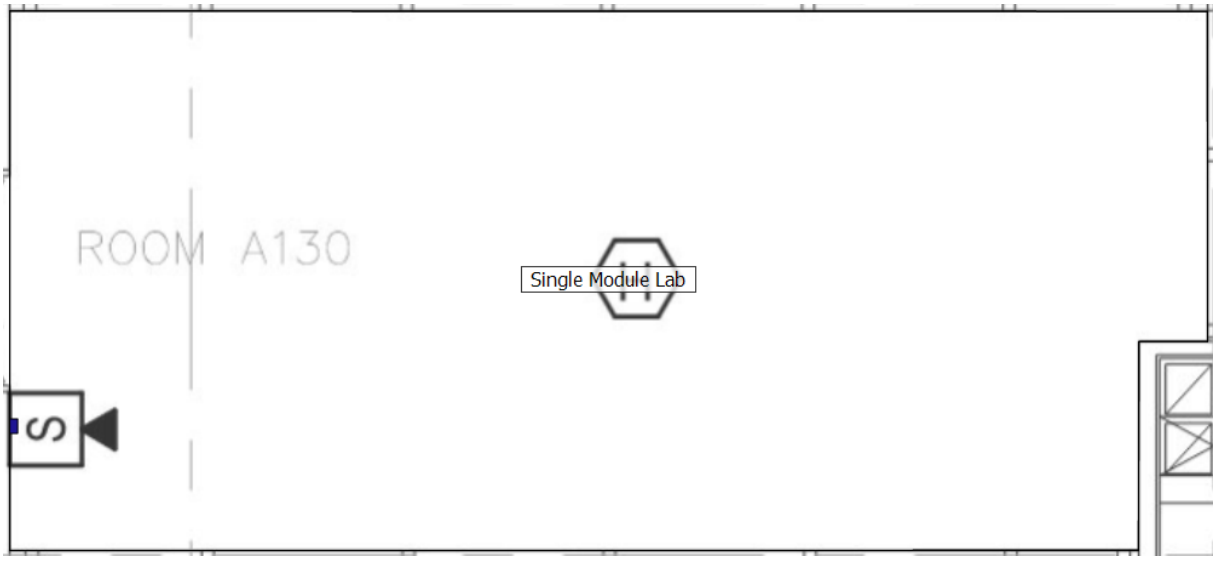
# Project Information

| | |
|---|---|
| **Title:** | **NIST SINGLE MODULE LAB** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

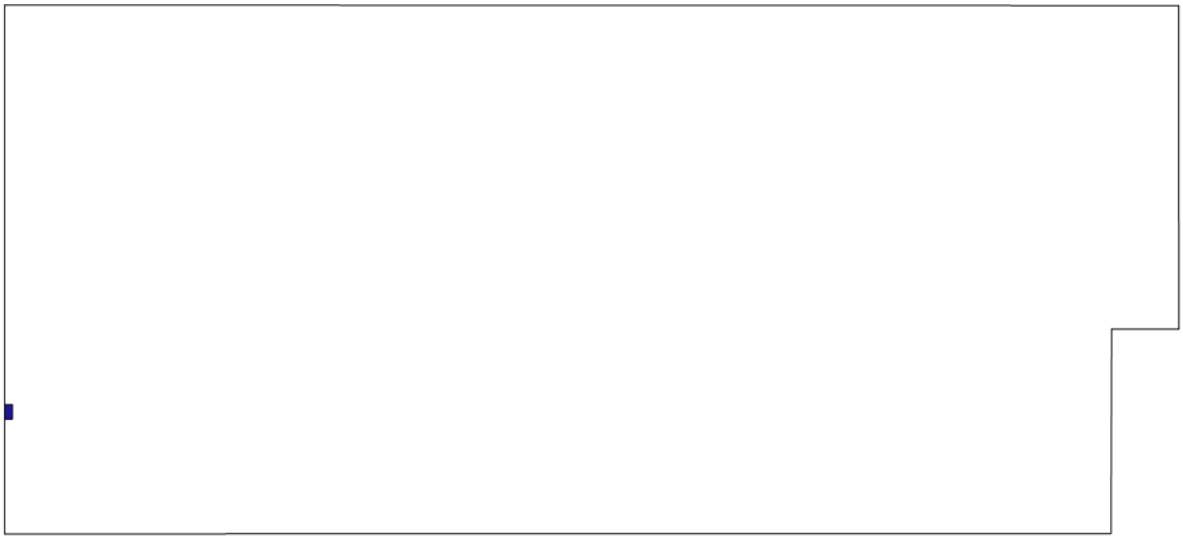
## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Layout Overview



# Room: Single Module Lab



| | |
|---|---|
| **Label:** | **Single Module Lab** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.81 ft x 10.70 ft** |
| **Volume:** | **2488.3 cb ft (net: 2488.3 cb ft)** |
| **Surface Area:** | **1187.5 sq ft (net: 1187.5 sq ft)** |
| **Ear Height:** | **5.51 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.3 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

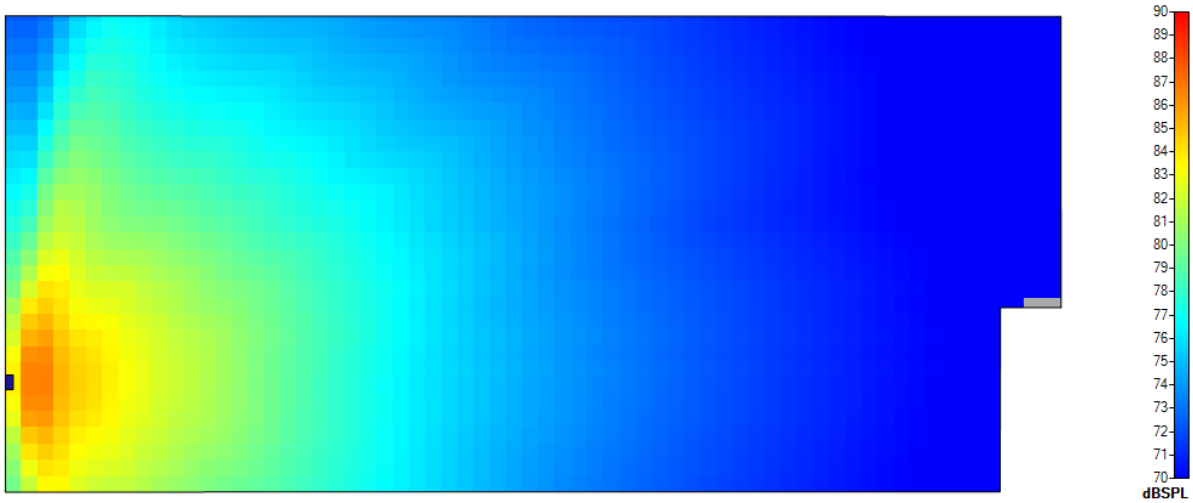
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 248.83 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 248.83 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 224.31 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 41.37 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 13.65 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 65.43 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 238.04 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 107.00 | Steel, Wall, Floor, or Ceiling |

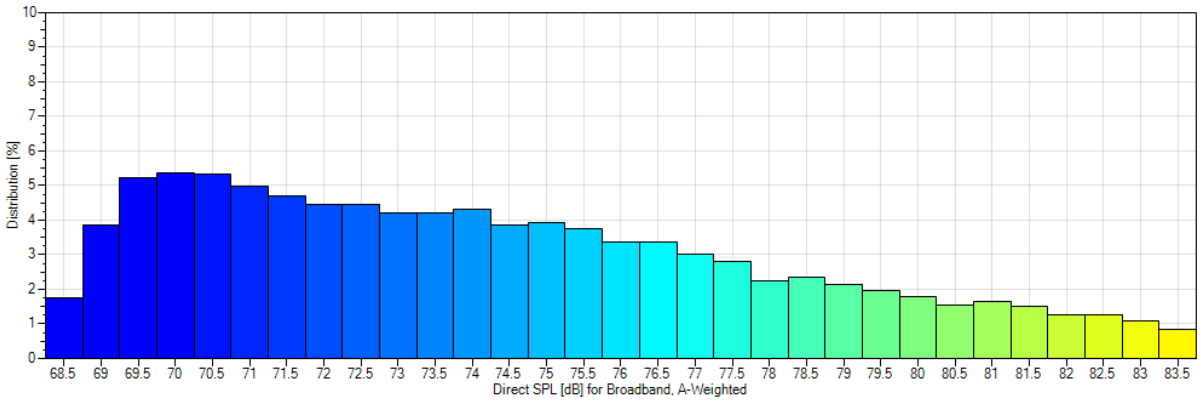
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 4.58 | 3.75 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |

## Mapping and Distribution

### Direct SPL (A-Weighted), Broadband



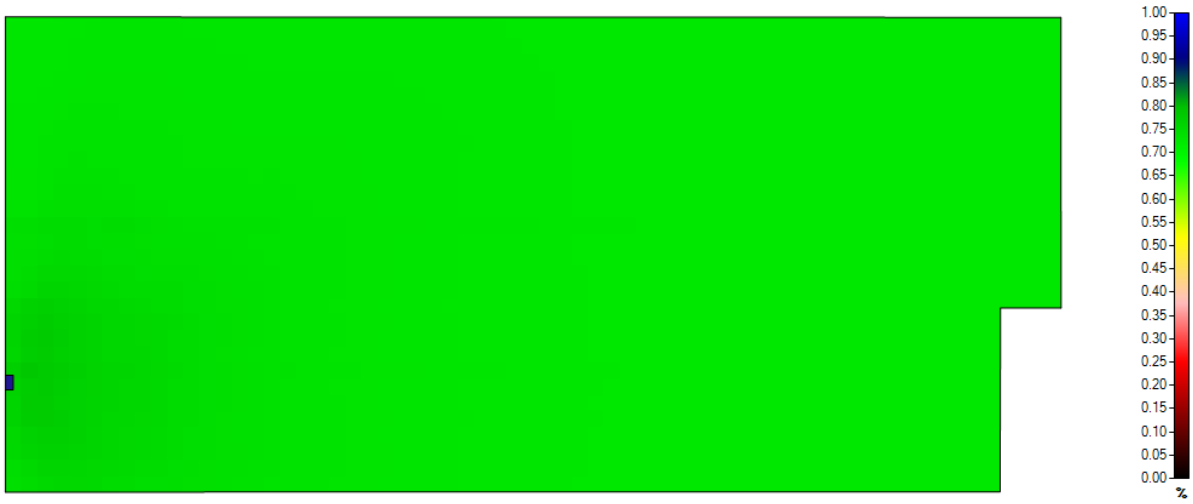

| | |
|---|---|
| Average: | 72.6 dB ±20.1 dB |
| Average + Std. Dev.: | 92.7 dB |
| Average - Std. Dev.: | 52.6 dB |
| Max. Value: | 86.7 dB |
| Min. Value: | -178.3 dB |
| Data Points: | 1993 |

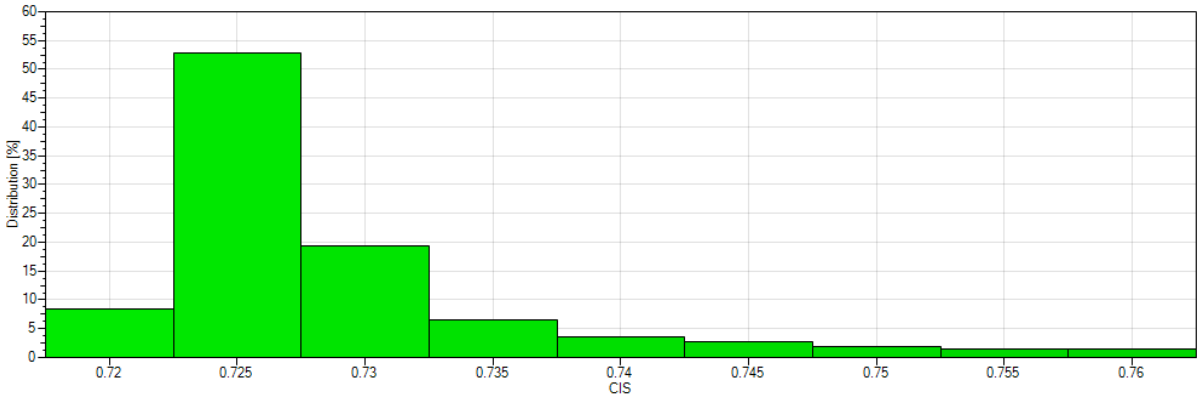
| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥69.1 dB | 74.8 dB |
| 90% | ≥69.6 dB | 75.1 dB |
| 85% | ≥70.0 dB | 75.4 dB |

| | | |
|---|---|---|
| 80% | ≥70.5 dB | 75.7 dB |

## Additional Mappings

### CIS




| | |
|---|---|
| Average: | 0.73 ±0.01 |
| Average + Std. Dev.: | 0.74 |
| Average - Std. Dev.: | 0.72 |
| Max. Value: | 0.78 |
| Min. Value: | 0.72 |
| Data Points: | 1993 |

| Area Covered: | CIS | Average |
|---|---|---|
| 95% | ≥0.72 | 0.73 |
| 90% | ≥0.72 | 0.73 |
| 85% | ≥0.72 | 0.73 |
| 80% | ≥0.72 | 0.73 |

# NIST FA COMMON ROOMS

[Your Name]
[Your Company]

Wednesday, May 14, 2025

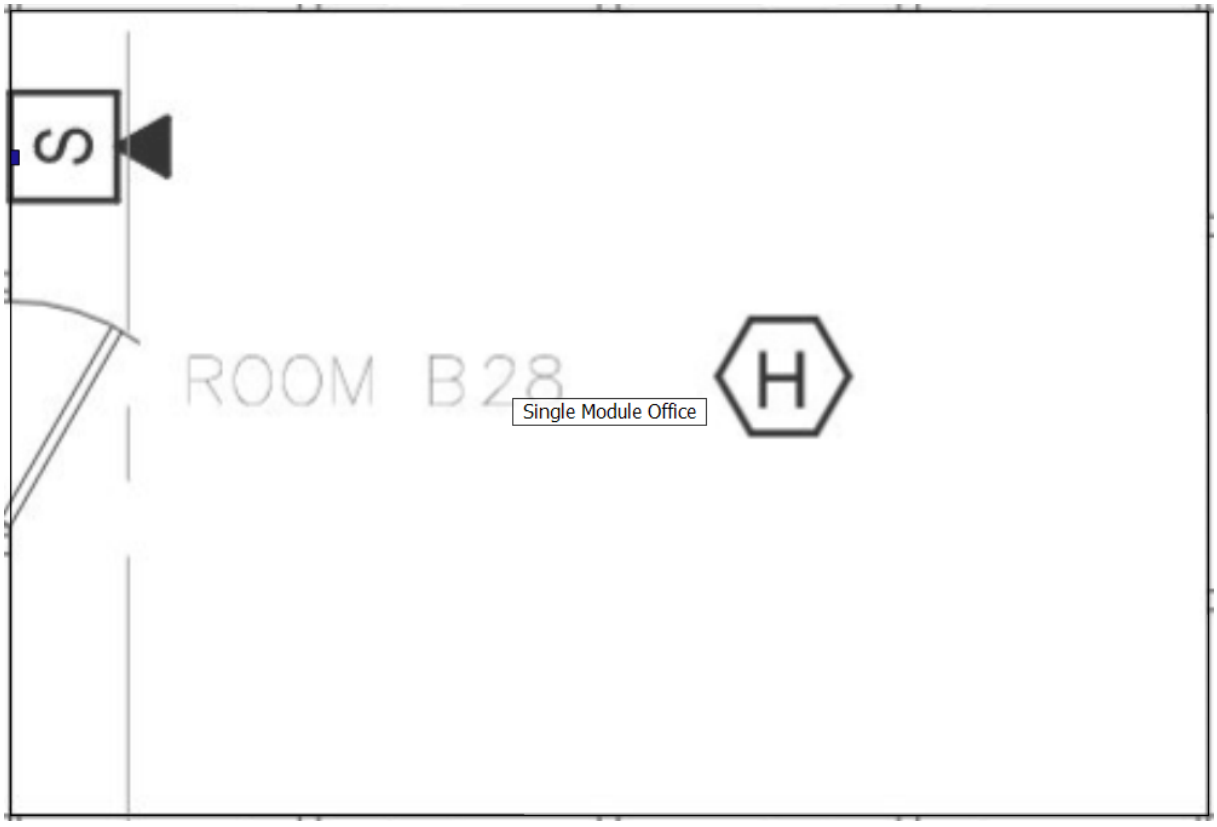
# Project Information

| | |
|---|---|
| **Title:** | **NIST FA COMMON ROOMS** |
| **Author:** | **[Your Name]** |
| **Company:** | **[Your Company]** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

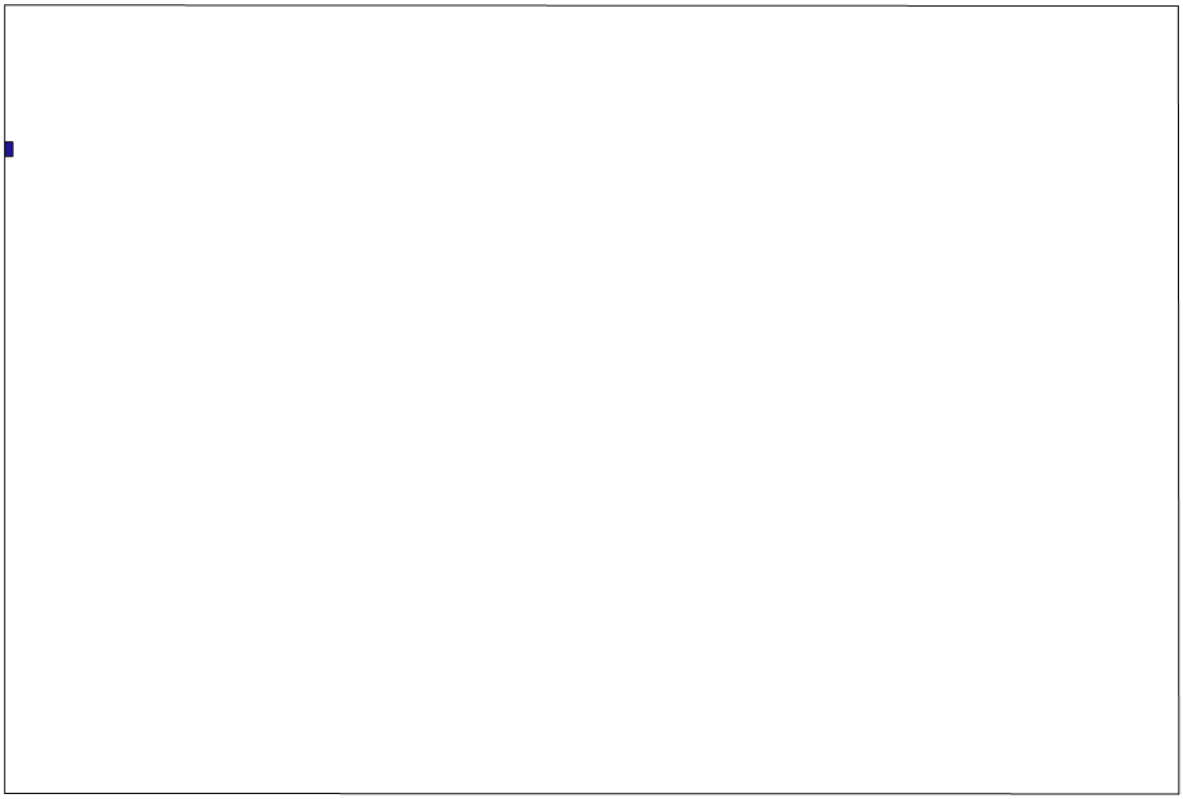
## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Layout Overview



# Room: Single Module Office



| | |
|---|---|
| **Label:** | **Single Module Office** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **16.03 ft x 10.75 ft** |
| **Volume:** | **1721.5 cb ft (net: 1721.5 cb ft)** |
| **Surface Area:** | **879.7 sq ft (net: 879.7 sq ft)** |
| **Ear Height:** | **6.80 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.3 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 172.15 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 172.15 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 160.29 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 107.40 | Concrete, Painted, Wall or Floor |

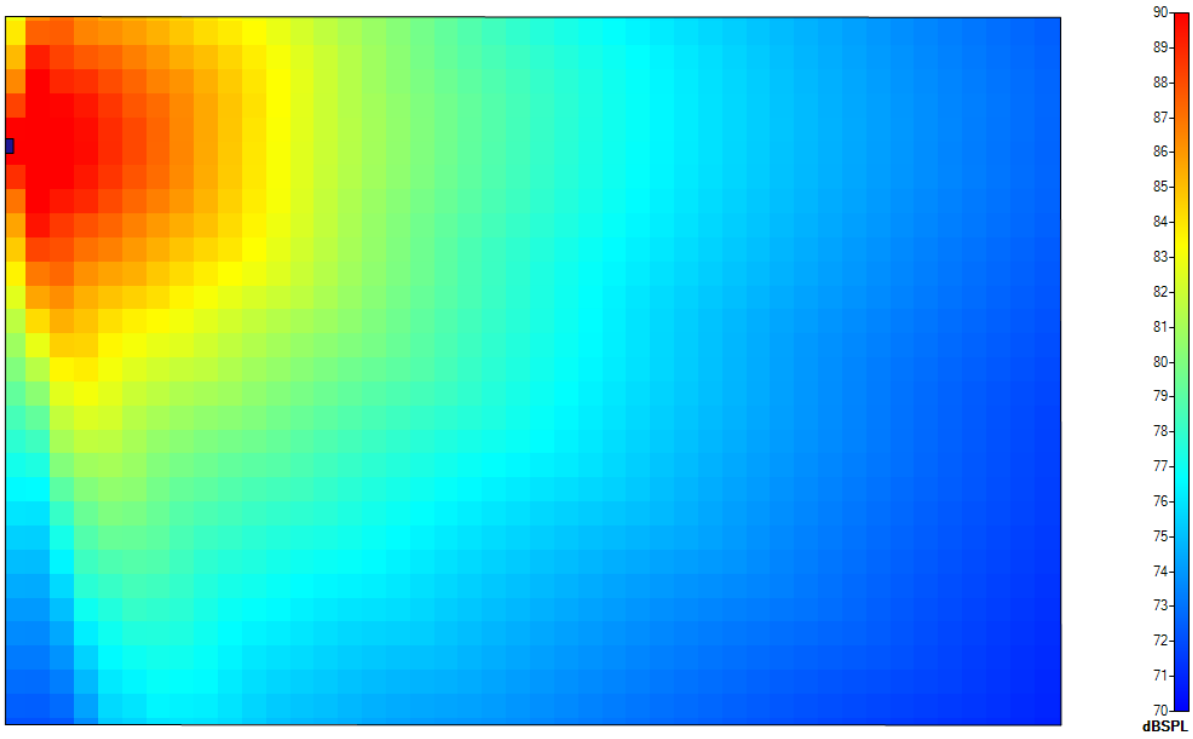
| | | | |
|---|---|---|---|
| Wall #3 | Main Area | 160.19 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 107.47 | Steel, Wall, Floor, or Ceiling |

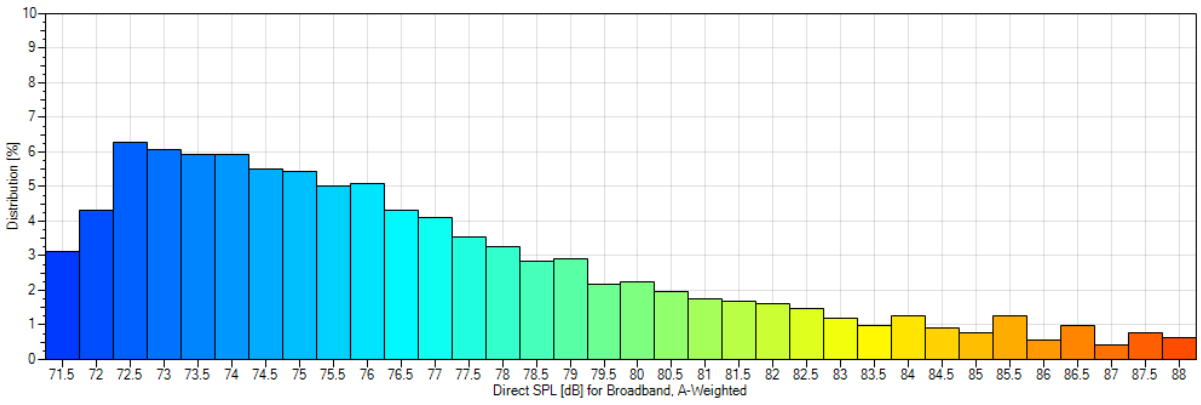
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 0.98 | 9.59 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |

## Mapping and Distribution

### Direct SPL (A-Weighted), Broadband



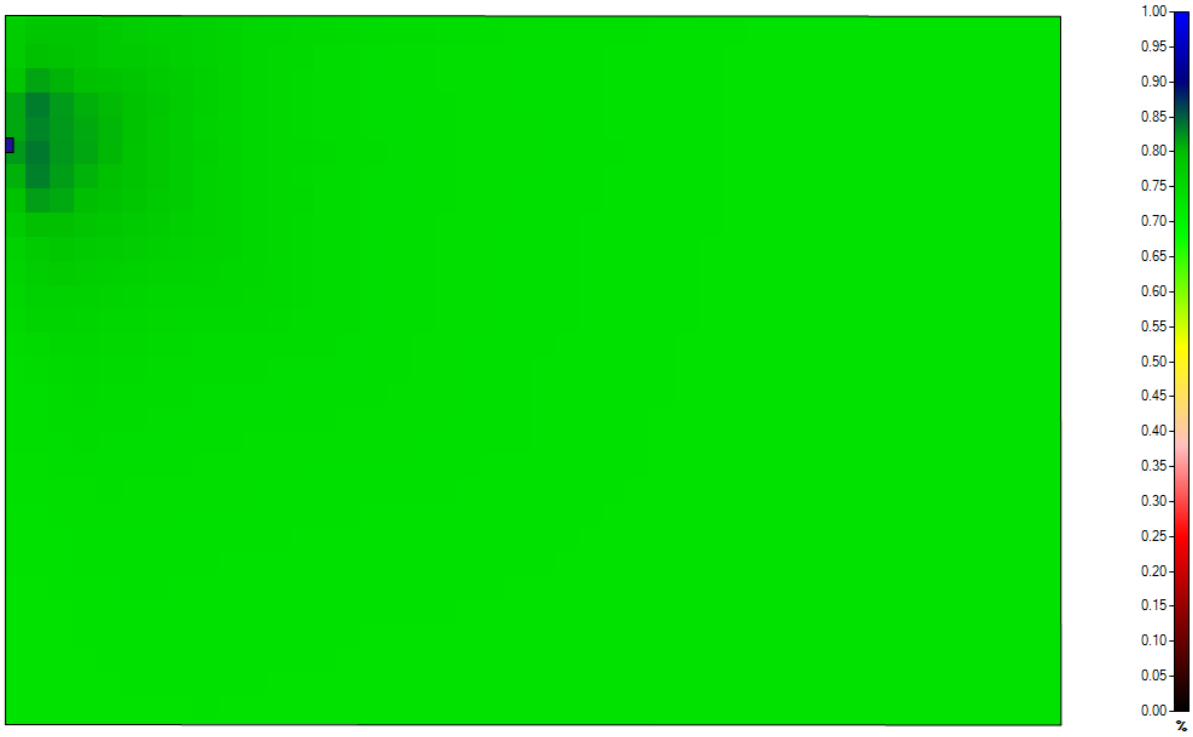

| | |
|---|---|
| Average: | 76.3 dB ±12.2 dB |
| Average + Std. Dev.: | 88.4 dB |
| Average - Std. Dev.: | 64.1 dB |
| Max. Value: | 92.5 dB |

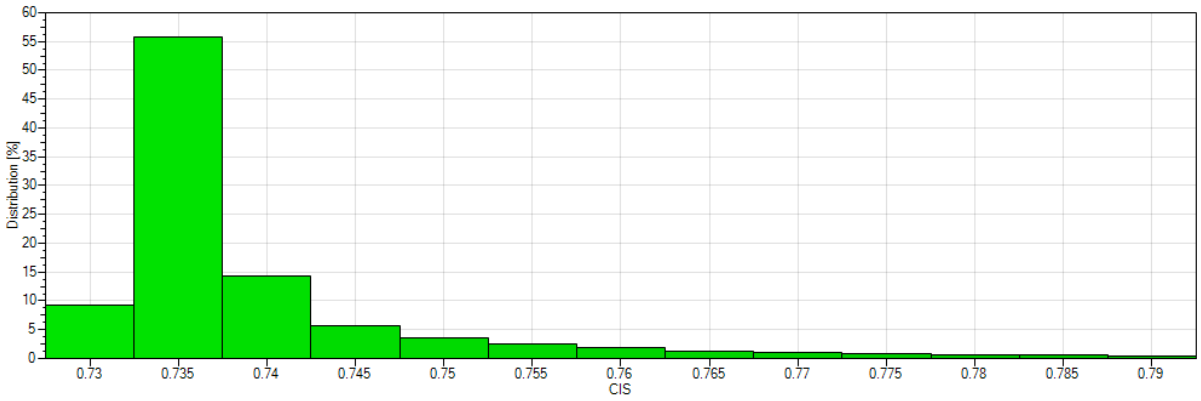
| | |
|---|---|
| **Min. Value:** | **-123.1 dB** |
| **Data Points:** | **1436** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥71.8 dB | 77.2 dB |
| 90% | ≥72.3 dB | 77.5 dB |
| 85% | ≥72.7 dB | 77.8 dB |
| 80% | ≥73.1 dB | 78.1 dB |

# Additional Mappings

## CIS




| | |
|---|---|
| **Average:** | **0.74 ±0.01** |
| **Average + Std. Dev.:** | **0.76** |
| **Average - Std. Dev.:** | **0.73** |

| | |
|---|---|
| **Max. Value:** | **0.84** |
| **Min. Value:** | **0.73** |
| **Data Points:** | **1436** |

| Area Covered: | CIS | Average |
|---|---|---|
| **95%** | **≥0.73** | **0.74** |
| **90%** | **≥0.73** | **0.74** |
| **85%** | **≥0.73** | **0.74** |
| **80%** | **≥0.73** | **0.74** |

# NIST DOUBLE MODULE LAB

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

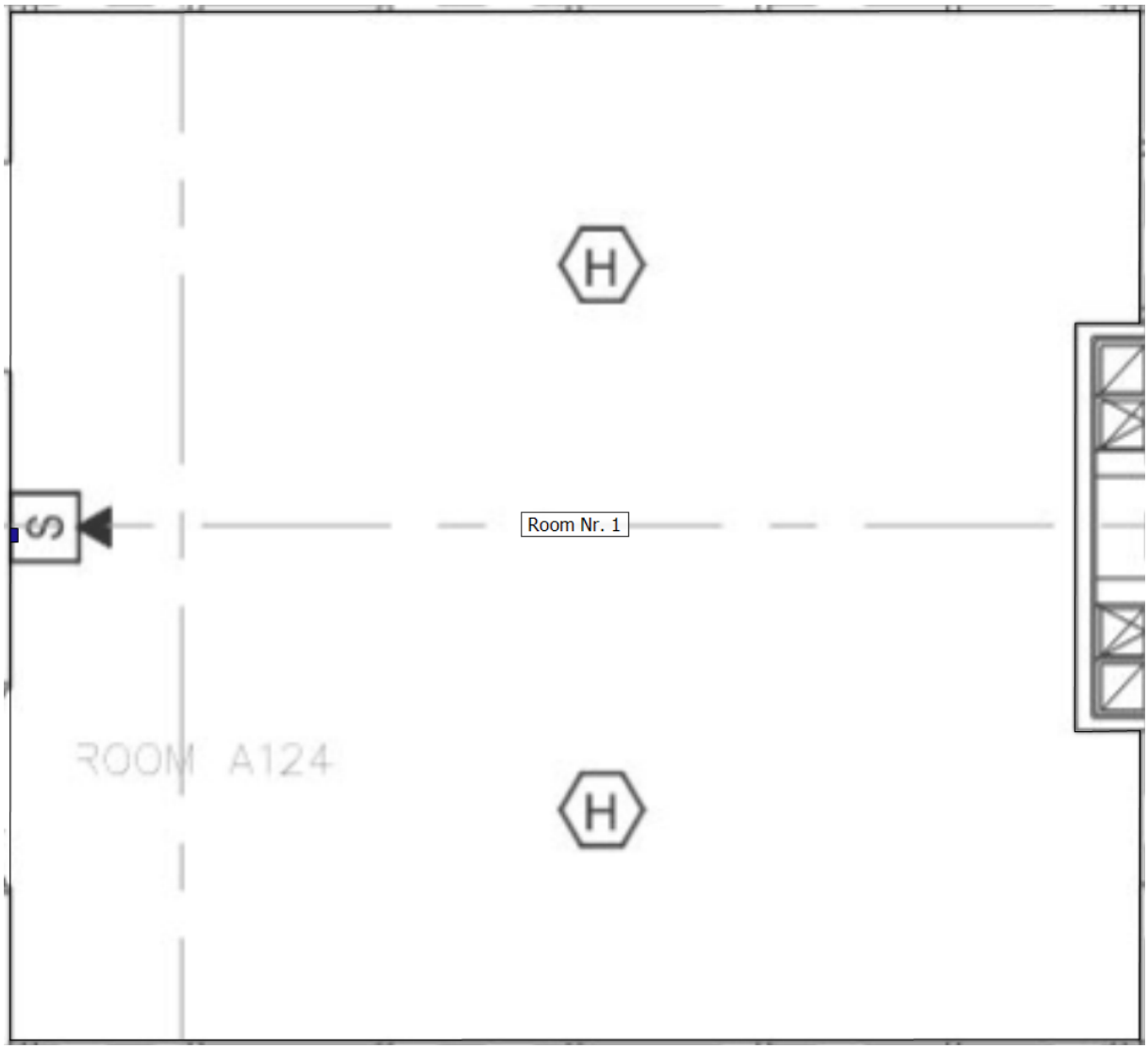
# Project Information

| | |
|---|---|
| **Title:** | **NIST DOUBLE MODULE LAB** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

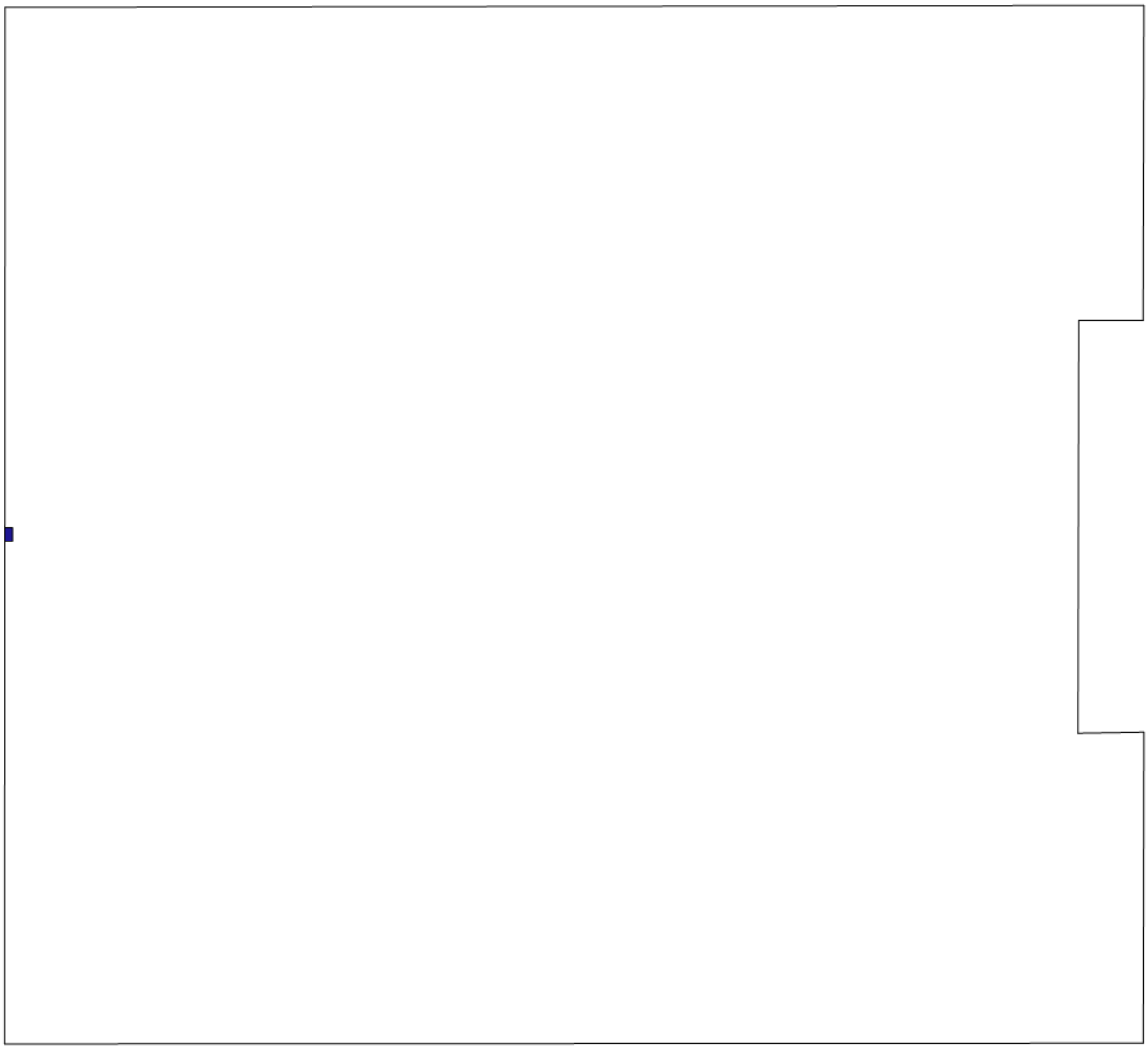
## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Layout Overview



# Room: Room Nr. 1



| | |
|---|---|
| **Label:** | **Room Nr. 1** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.83 ft x 21.70 ft** |
| **Volume:** | **5042.7 cb ft (net: 5042.7 cb ft)** |
| **Surface Area:** | **1945.7 sq ft (net: 1945.7 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.3 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

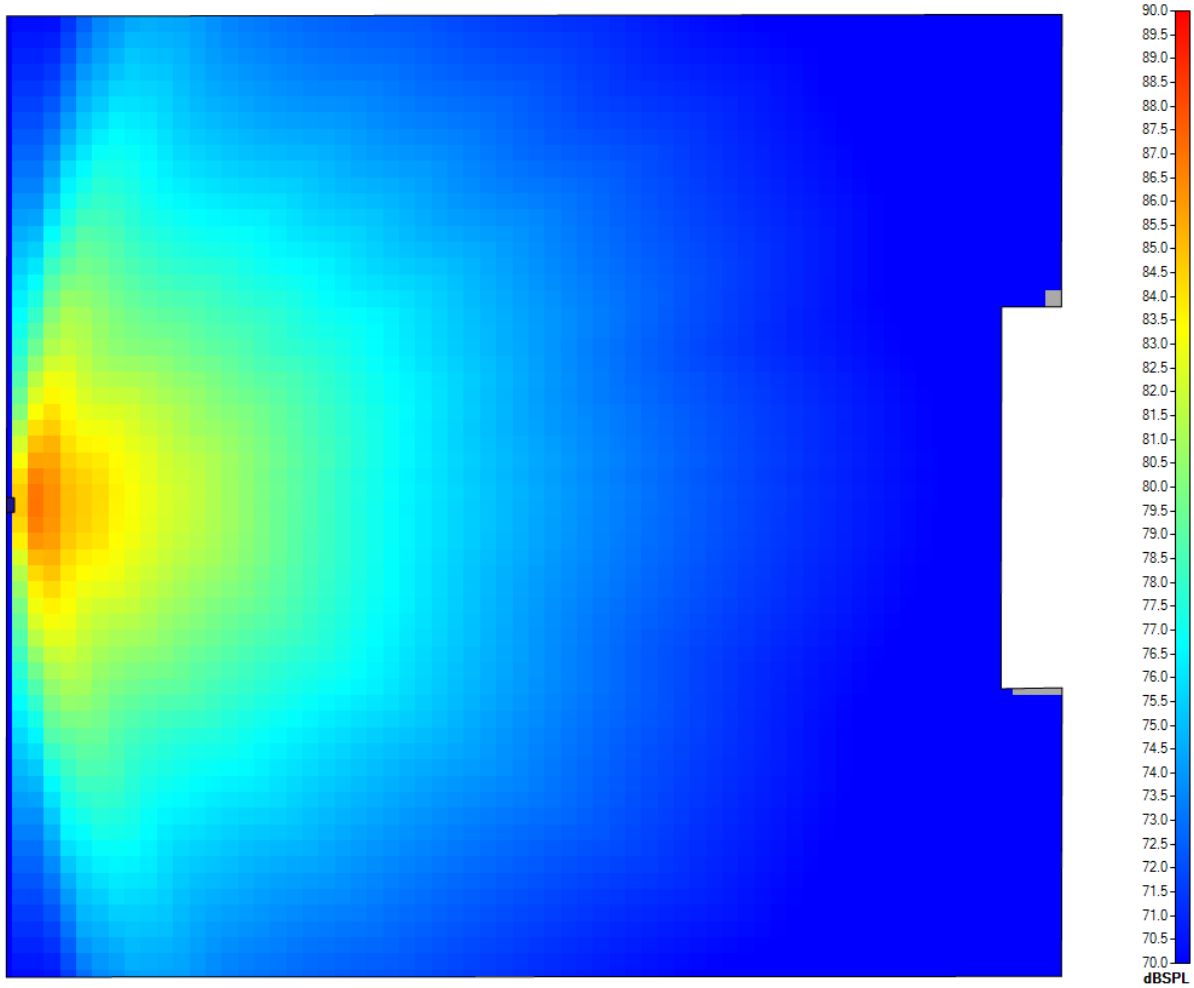
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 504.27 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 504.27 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 238.15 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 65.89 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 13.47 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 86.08 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 13.77 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 65.06 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 238.15 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 216.56 | Steel, Wall, Floor, or Ceiling |

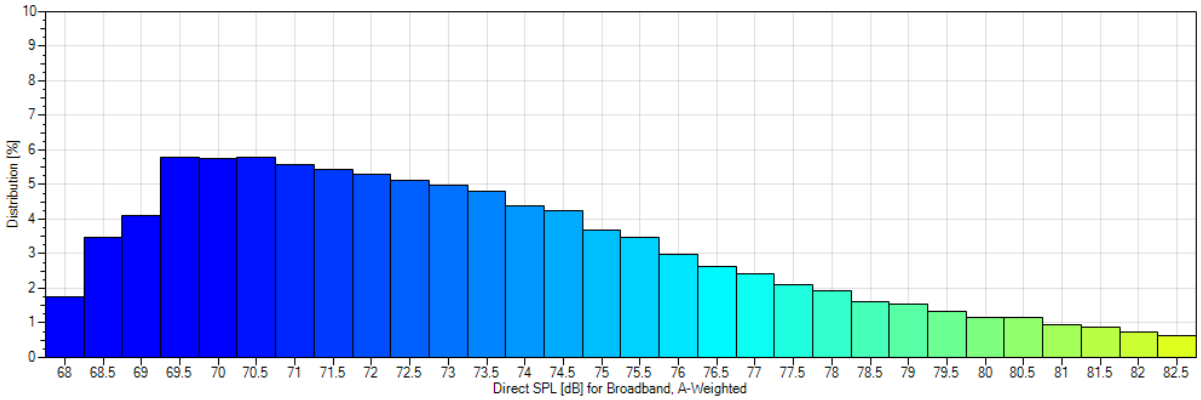
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 4.09 | 12.12 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



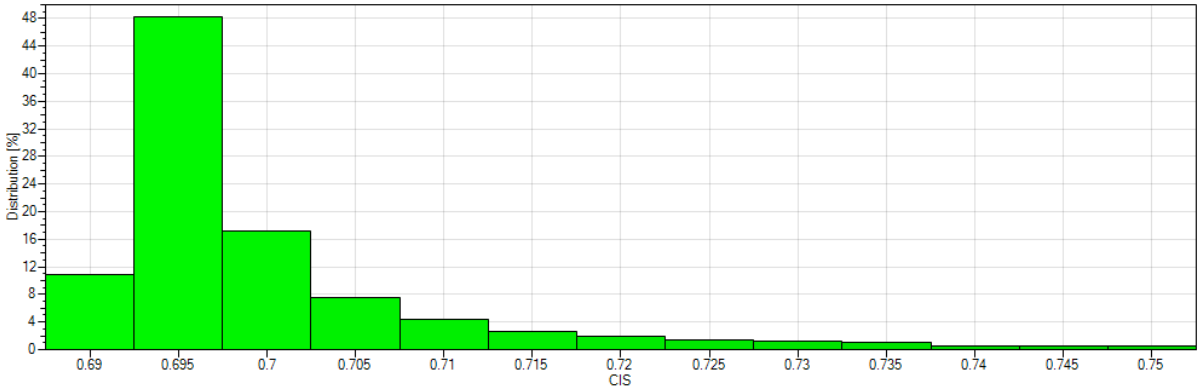

| | |
|---|---|
| **Average:** | **69.7 dB ±27.7 dB** |
| **Average + Std. Dev.:** | **97.4 dB** |
| **Average - Std. Dev.:** | **42.1 dB** |
| **Max. Value:** | **86.9 dB** |
| **Min. Value:** | **-178.3 dB** |

| Data Points: | 4020 |
|---|---|

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥68.4 dB | 73.7 dB |
| 90% | ≥69.1 dB | 74.0 dB |
| 85% | ≥69.6 dB | 74.2 dB |
| 80% | ≥70.0 dB | 74.5 dB |

# Additional Mappings

## CIS




| | |
|---|---|
| **Average:** | **0.70 ±0.01** |
| **Average + Std. Dev.:** | **0.72** |
| **Average - Std. Dev.:** | **0.69** |
| **Max. Value:** | **0.80** |
| **Min. Value:** | **0.69** |
| **Data Points:** | **4020** |

| Area Covered: | CIS | Average |
|---|---|---|
| **95%** | **≥0.69** | **0.70** |
| **90%** | **≥0.69** | **0.70** |
| **85%** | **≥0.69** | **0.70** |
| **80%** | **≥0.69** | **0.70** |

# NIST DOUBLE MODULE OFFICE

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

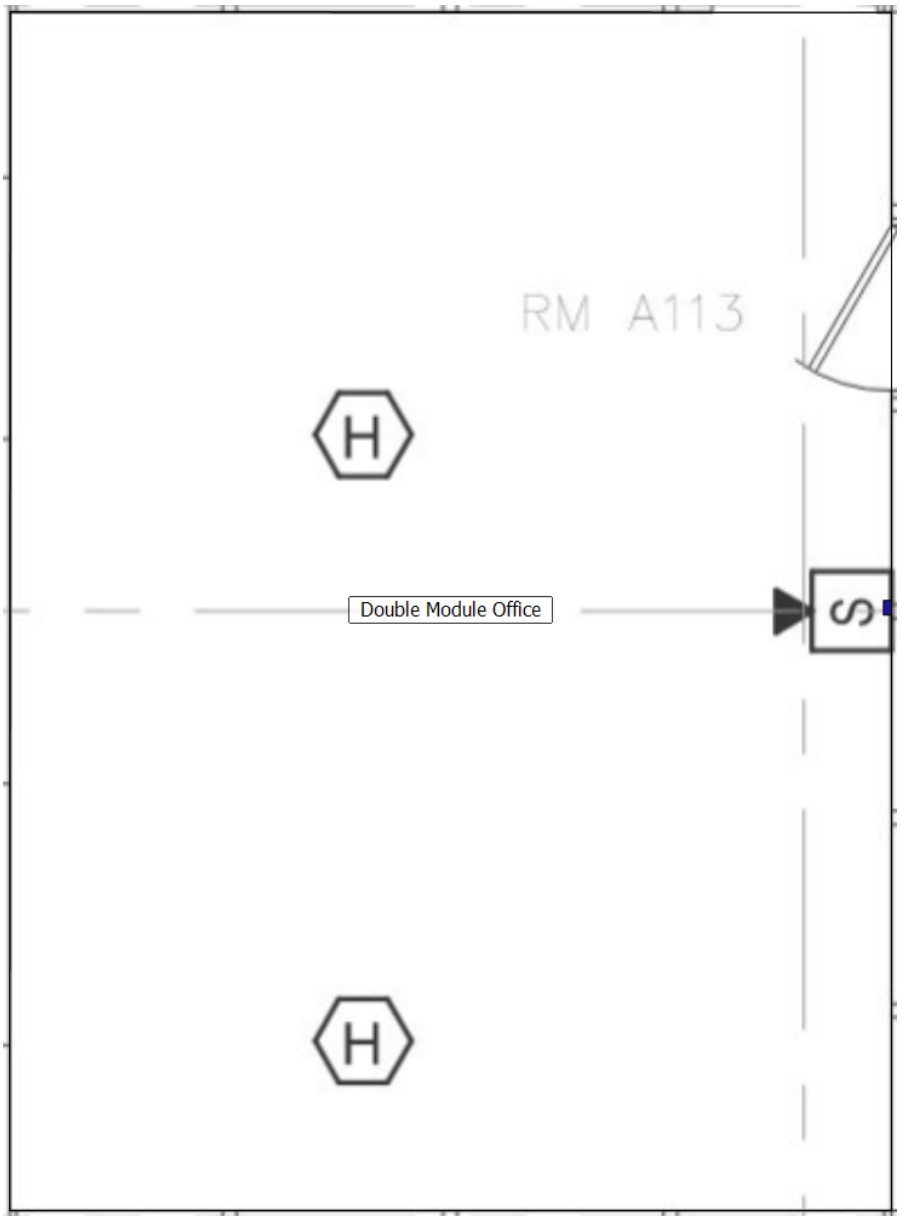
# Project Information

| | |
|---|---|
| **Title:** | **NIST DOUBLE MODULE OFFICE** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

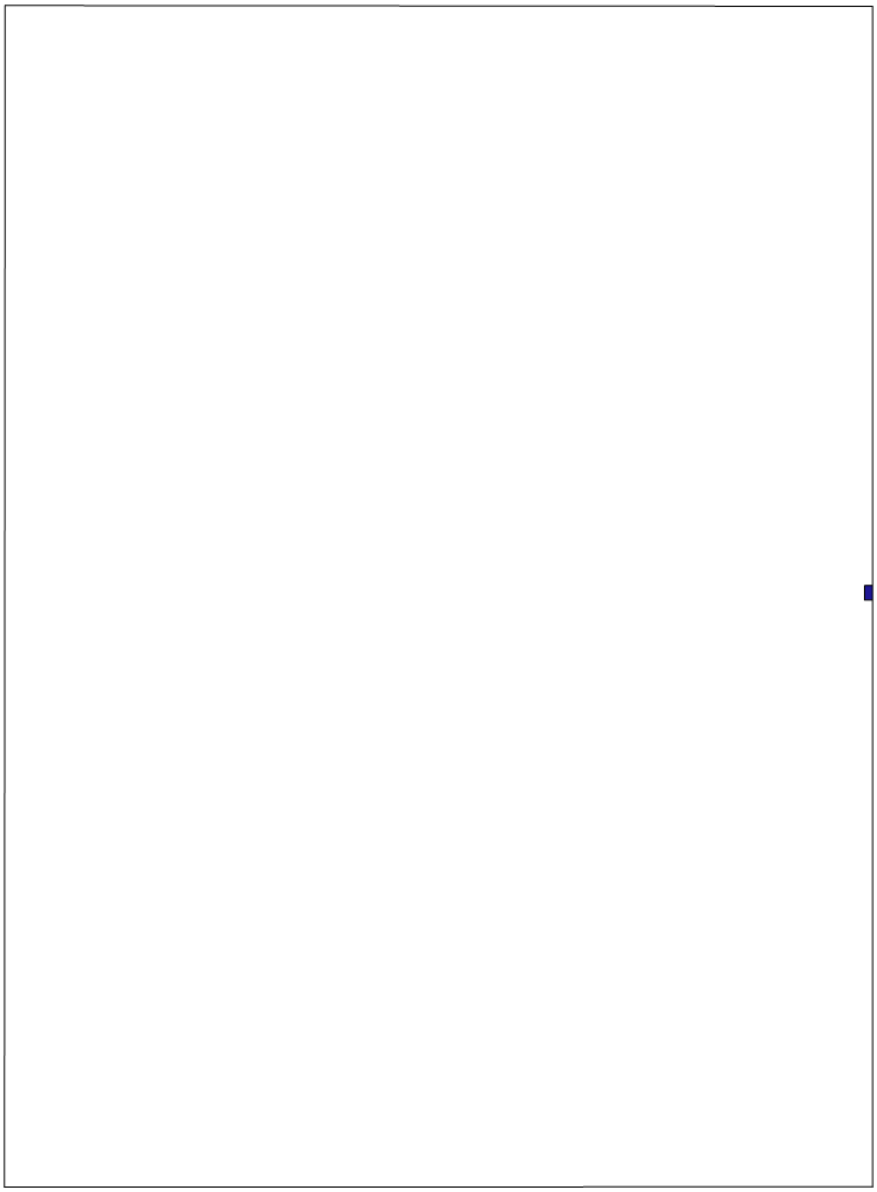
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **1** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Double Module Office



| | |
|---|---|
| **Label:** | **Double Module Office** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **15.99 ft x 21.74 ft** |
| **Volume:** | **3472.2 cb ft (net: 3472.2 cb ft)** |
| **Surface Area:** | **1448.6 sq ft (net: 1448.6 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.3 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

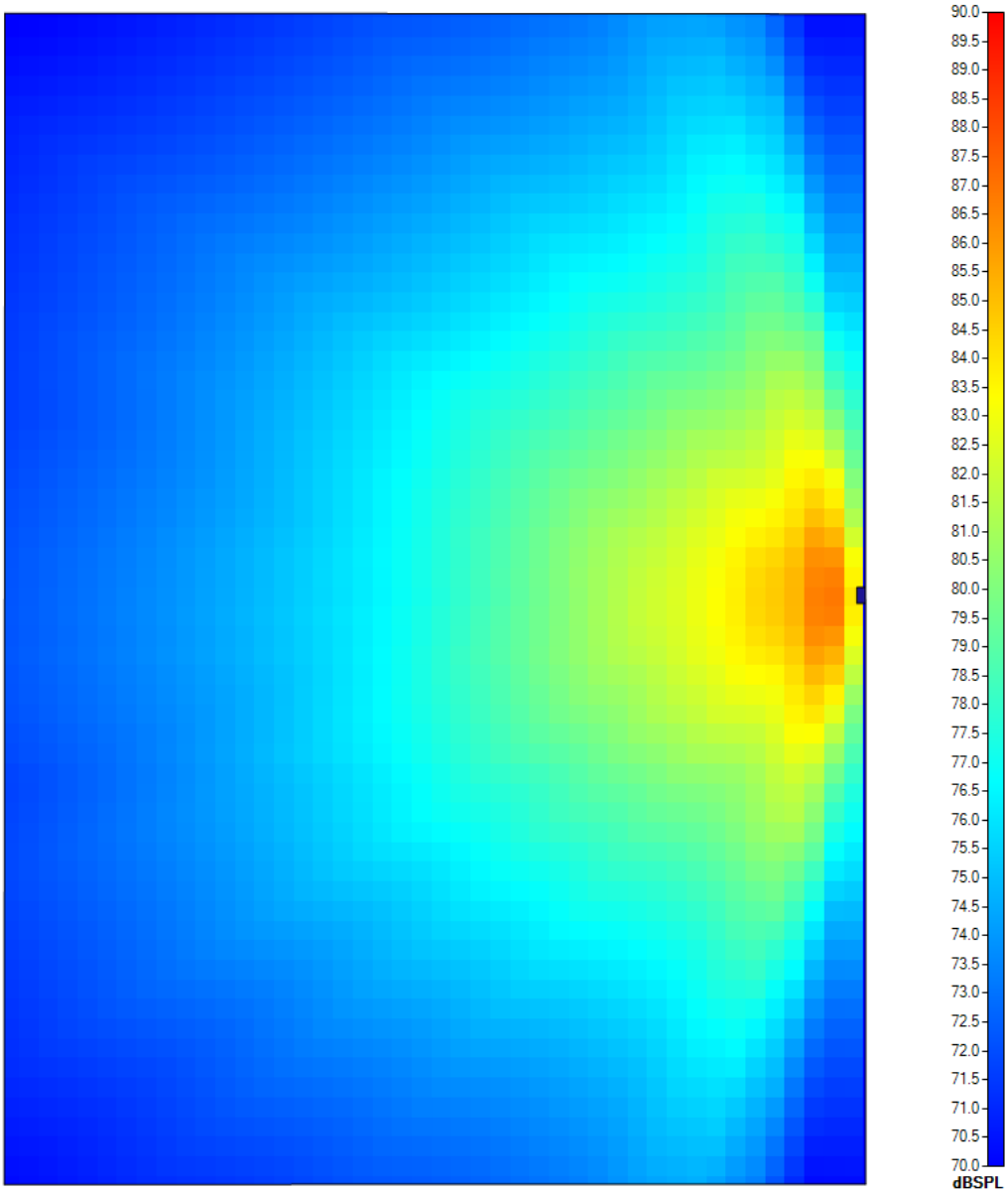
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 347.22 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 347.22 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 159.86 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 217.22 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 159.70 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 217.41 | Concrete, Painted, Wall or Floor |

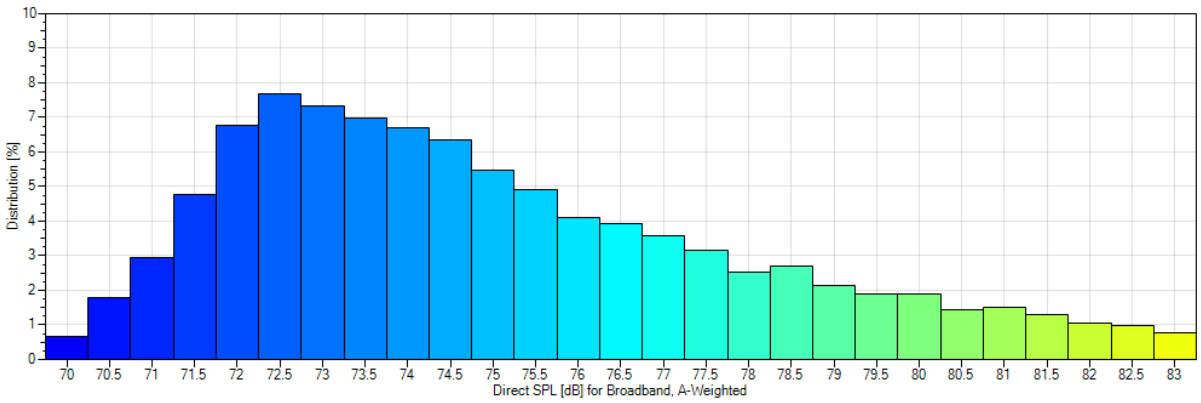
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 19.89 | 12.78 | 8.00 | -180.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



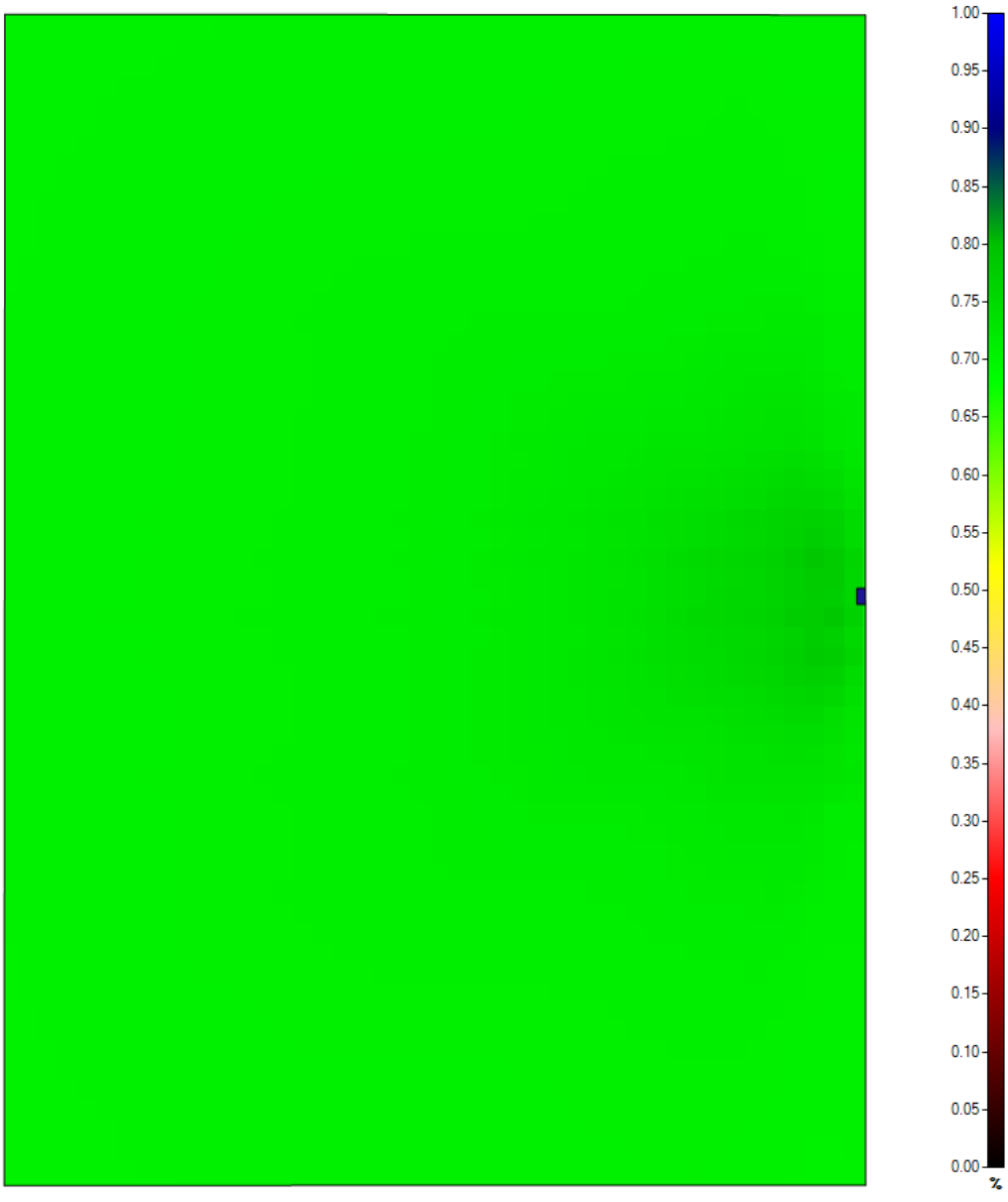

| | |
|---|---|
| **Average:** | **71.0 dB ±28.6 dB** |

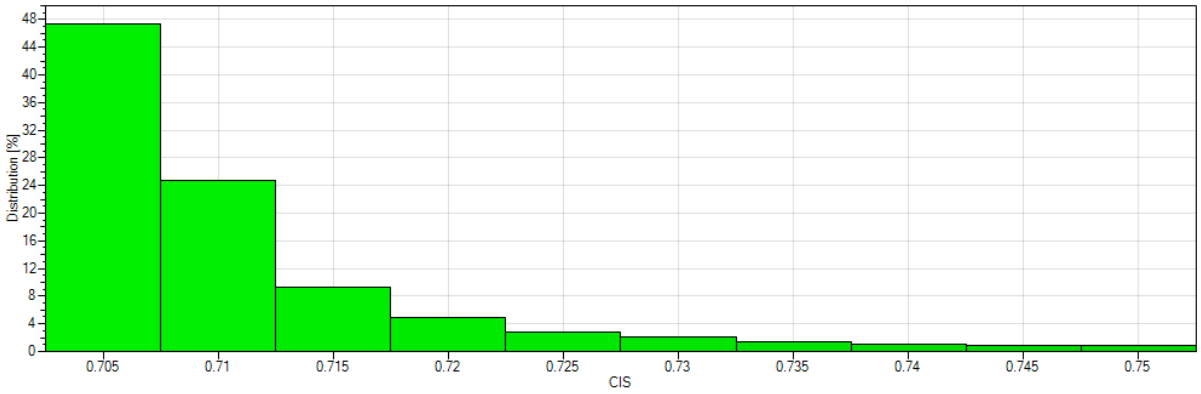
| | |
|---|---|
| **Average + Std. Dev.:** | **99.6 dB** |
| **Average - Std. Dev.:** | **42.4 dB** |
| **Max. Value:** | **86.8 dB** |
| **Min. Value:** | **-124.3 dB** |
| **Data Points:** | **2767** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥70.8 dB** | **75.4 dB** |
| **90%** | **≥71.5 dB** | **75.6 dB** |
| **85%** | **≥72.0 dB** | **75.9 dB** |
| **80%** | **≥72.3 dB** | **76.1 dB** |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.71 ±0.01** |
| **Average + Std. Dev.:** | **0.72** |
| **Average - Std. Dev.:** | **0.70** |
| **Max. Value:** | **0.78** |
| **Min. Value:** | **0.70** |
| **Data Points:** | **2767** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.70** | **0.71** |
| **90%** | **≥0.70** | **0.71** |
| **85%** | **≥0.71** | **0.71** |
| **80%** | **≥0.71** | **0.71** |

# NIST TRIPLE MODULE LAB

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

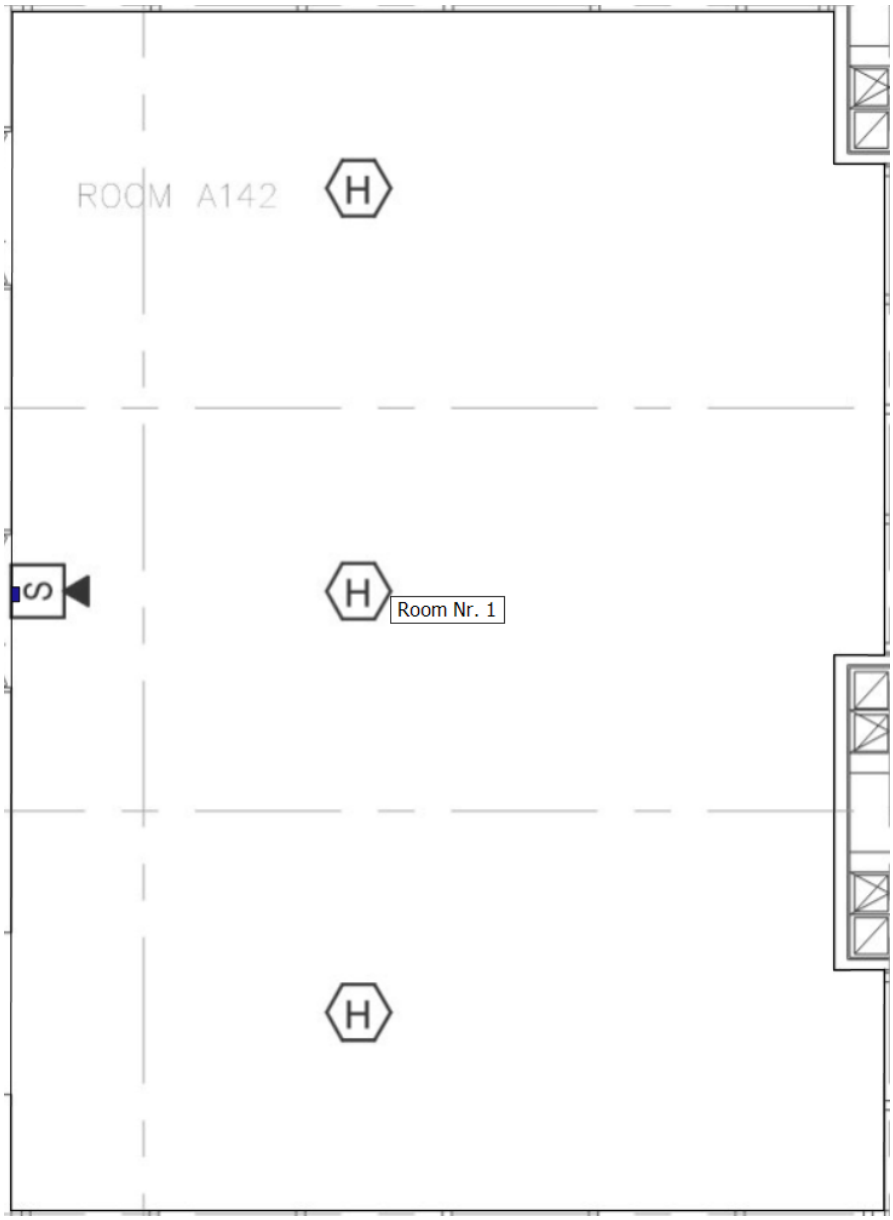
# Project Information

| | |
|---|---|
| **Title:** | **NIST TRIPLE MODULE LAB** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

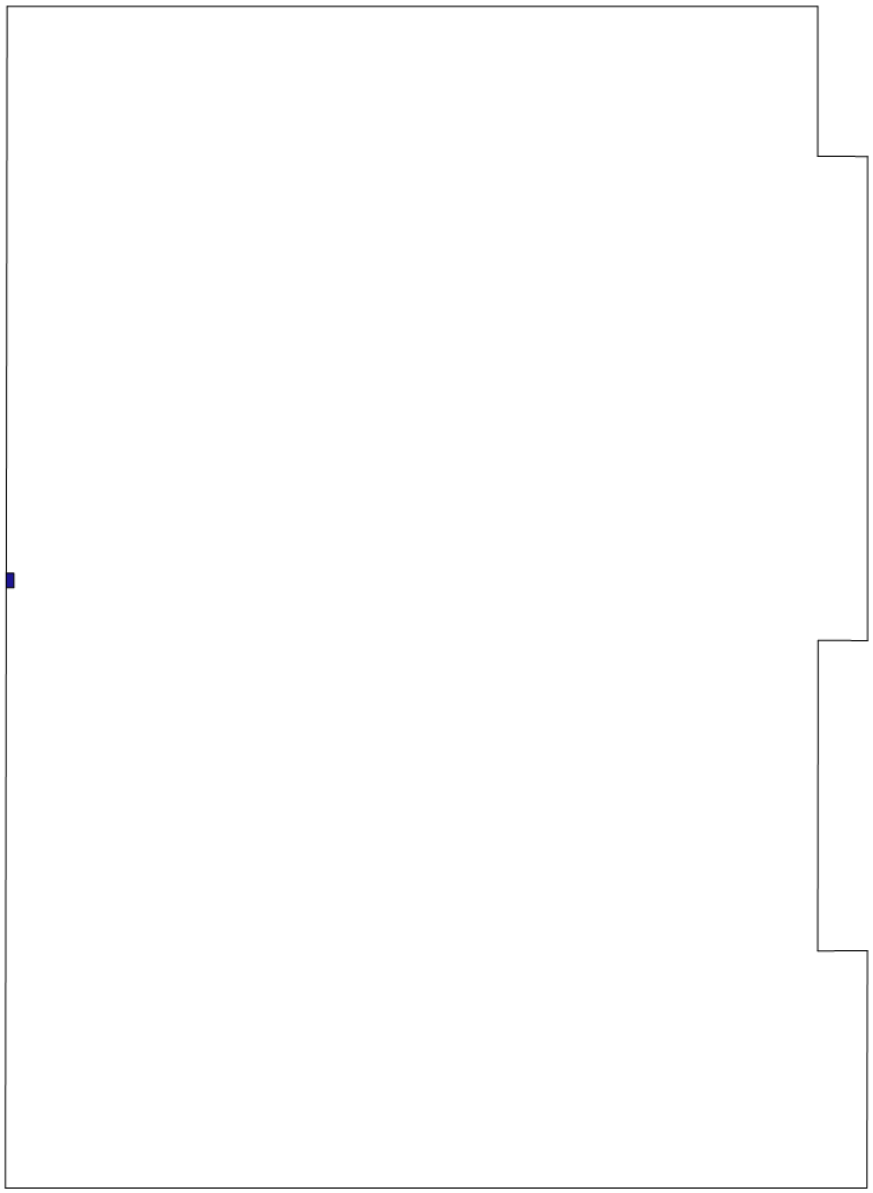
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **1** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Room Nr. 1



| | |
|---|---|
| **Label:** | **Room Nr. 1** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.80 ft x 32.63 ft** |
| **Volume:** | **7581.6 cb ft (net: 7581.6 cb ft)** |
| **Surface Area:** | **2671.7 sq ft (net: 2671.7 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

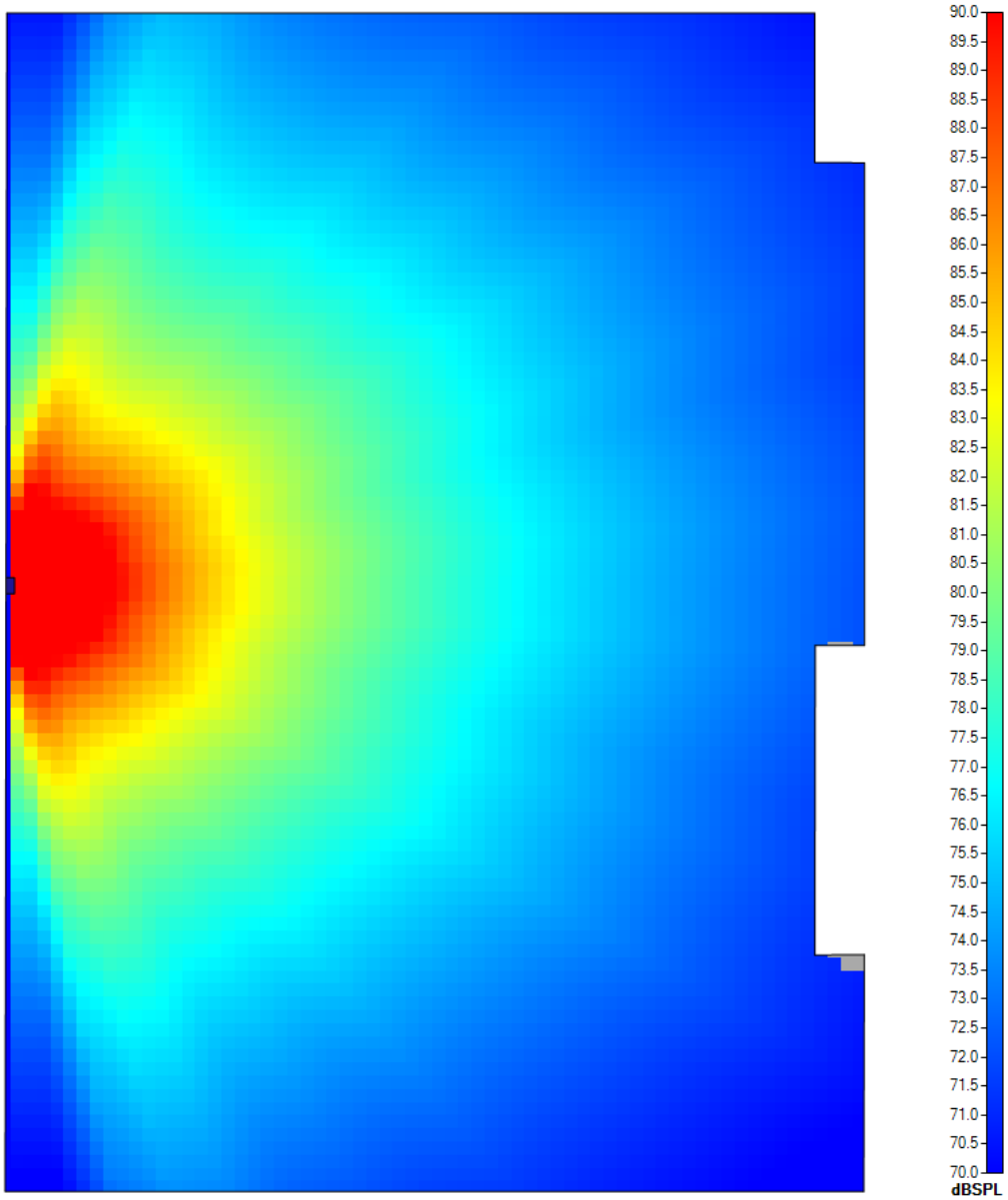
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 758.16 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 758.16 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 223.70 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 41.35 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 13.78 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 133.69 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 13.67 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 85.79 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 13.71 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 65.62 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 237.74 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 326.29 | Steel, Wall, Floor, or Ceiling |

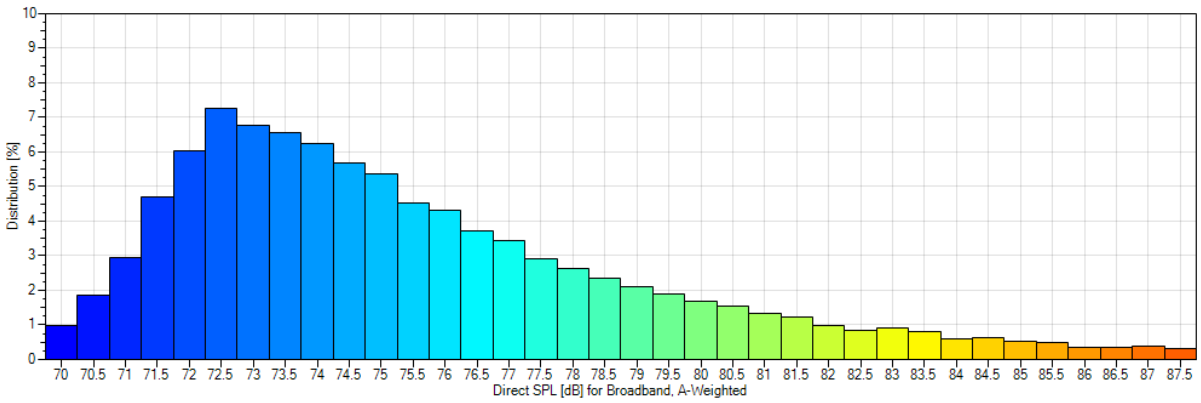
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 5.89 | 17.76 | 5.65 | -0.1 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



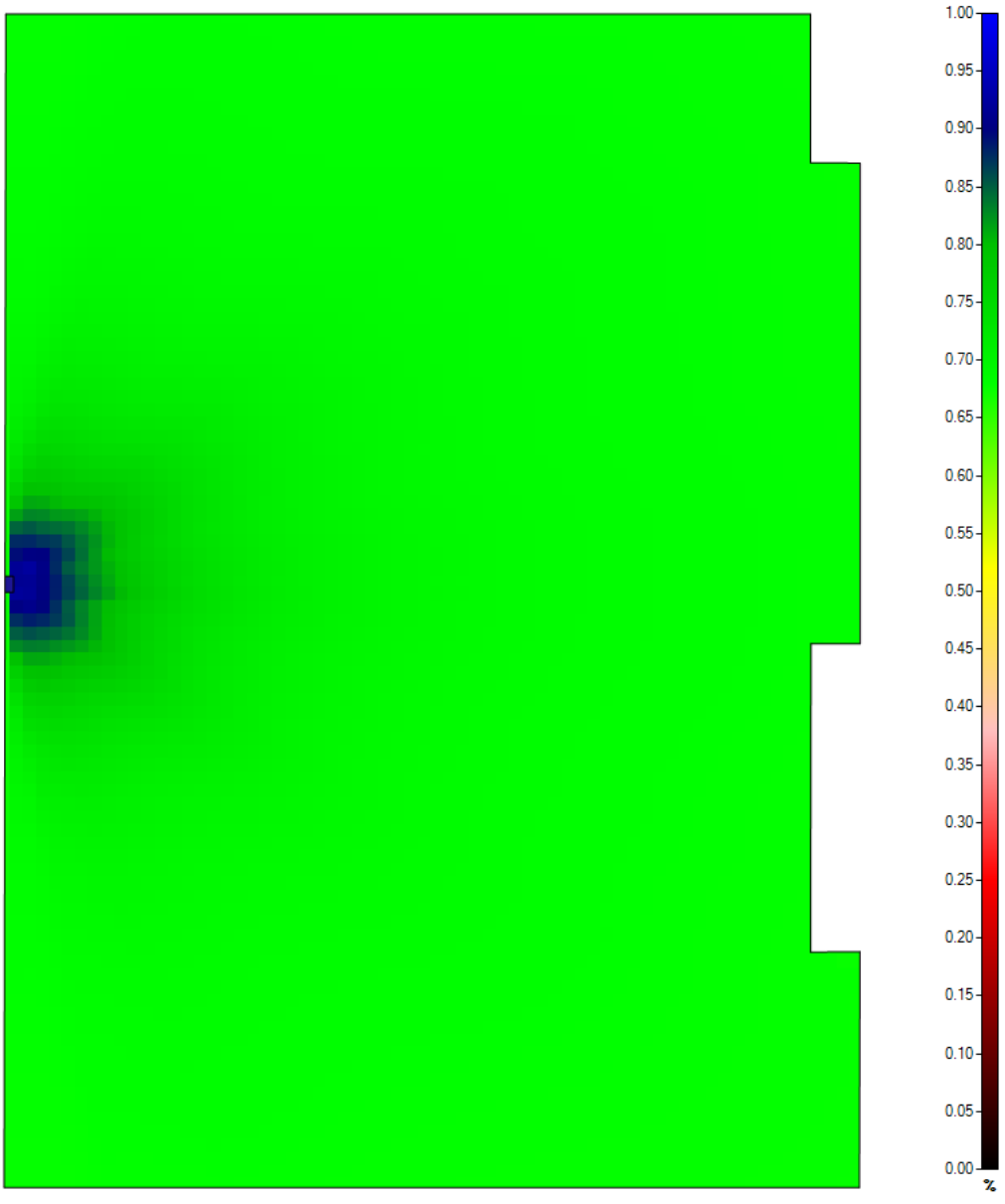

| | |
|---|---|
| **Average:** | **71.7 dB ±28.9 dB** |

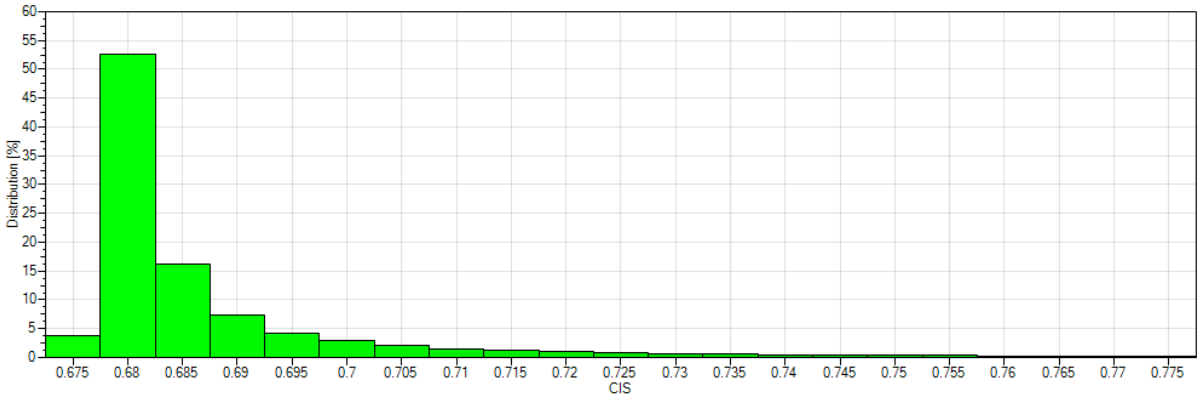
| | |
|---|---|
| **Average + Std. Dev.:** | **100.6 dB** |
| **Average - Std. Dev.:** | **42.8 dB** |
| **Max. Value:** | **108.9 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **5904** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥70.7 dB | 76.1 dB |
| 90% | ≥71.5 dB | 76.3 dB |
| 85% | ≥71.9 dB | 76.6 dB |
| 80% | ≥72.3 dB | 76.9 dB |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.69 ±0.03** |
| **Average + Std. Dev.:** | **0.72** |
| **Average - Std. Dev.:** | **0.66** |
| **Max. Value:** | **0.92** |
| **Min. Value:** | **0.68** |
| **Data Points:** | **5904** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.68** | **0.69** |
| **90%** | **≥0.68** | **0.69** |
| **85%** | **≥0.68** | **0.69** |
| **80%** | **≥0.68** | **0.69** |

# NIST TRIPLE MODULE OFFICE

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

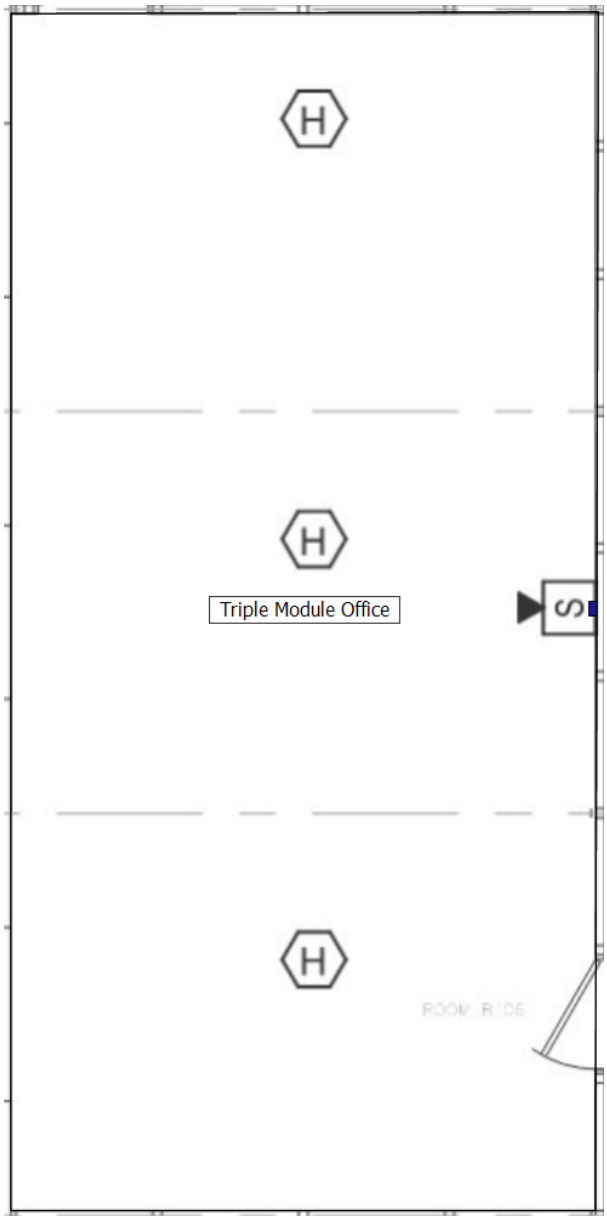
# Project Information

| | |
|---|---|
| **Title:** | **NIST TRIPLE MODULE OFFICE** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

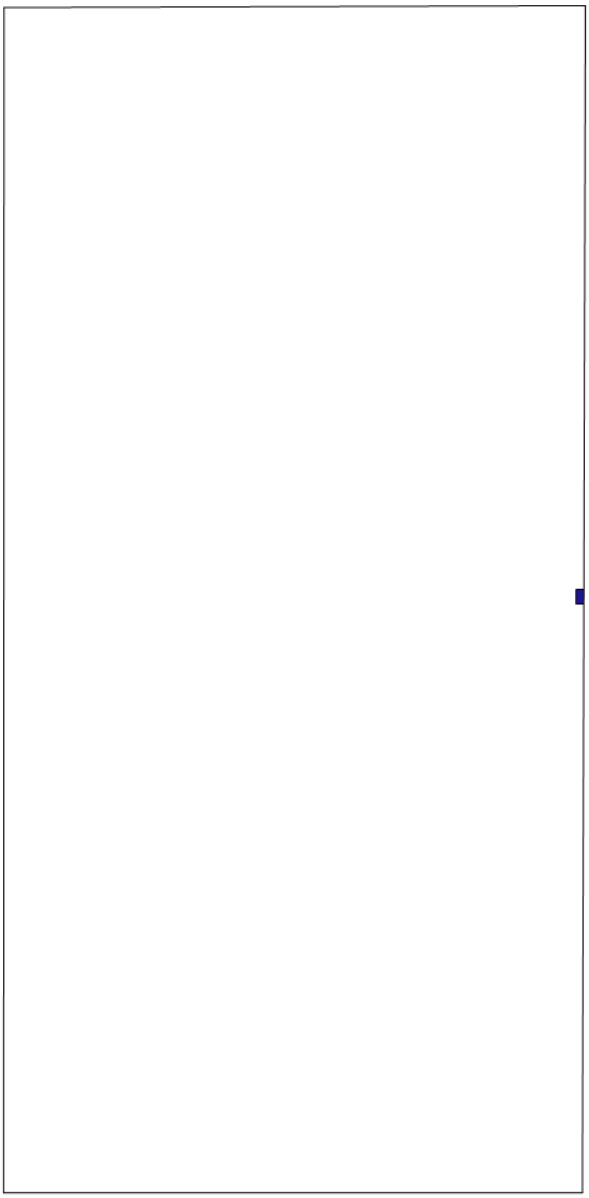
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **1** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Triple Module Office



| | |
|---|---|
| **Label:** | **Triple Module Office** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **16.05 ft x 32.79 ft** |
| **Volume:** | **5243.5 cb ft (net: 5243.5 cb ft)** |
| **Surface Area:** | **2024.0 sq ft (net: 2024.0 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

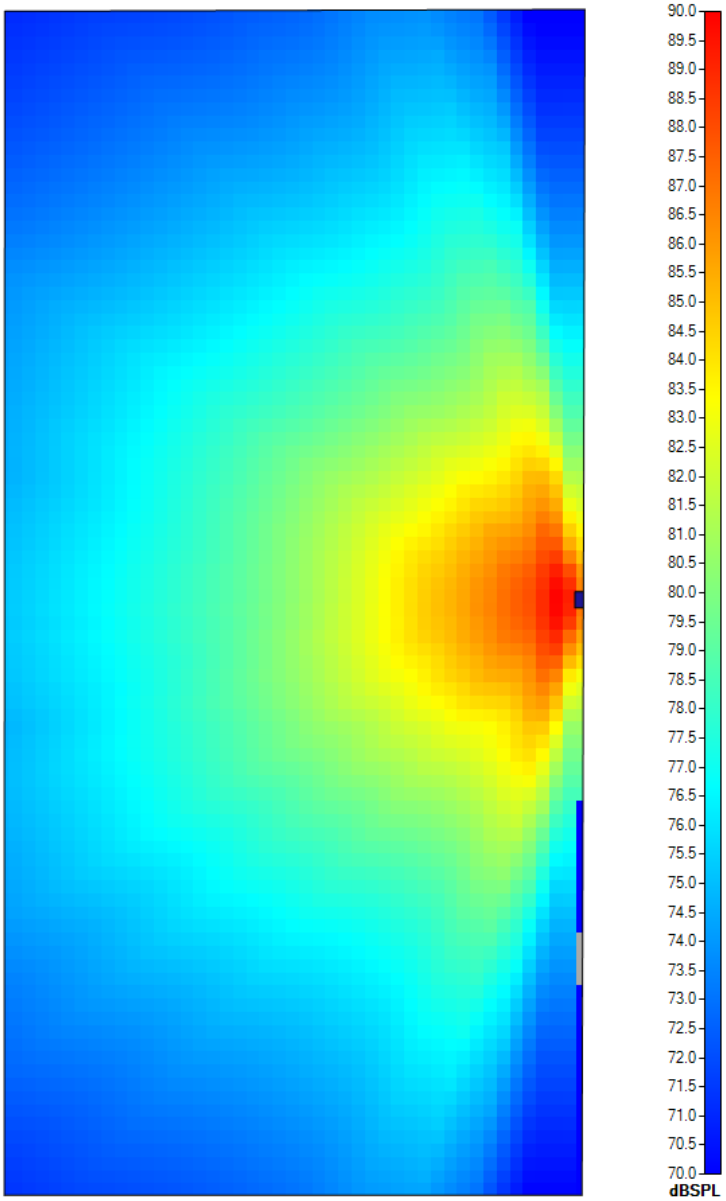
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 524.35 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 524.35 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 159.71 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 327.85 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 160.42 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 327.34 | Concrete, Painted, Wall or Floor |

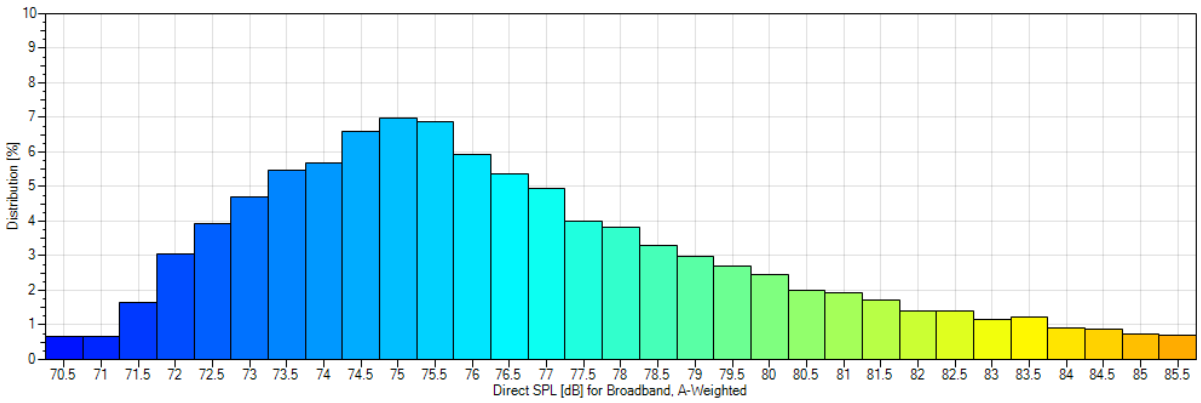
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 19.33 | 18.14 | 8.00 | 179.9 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



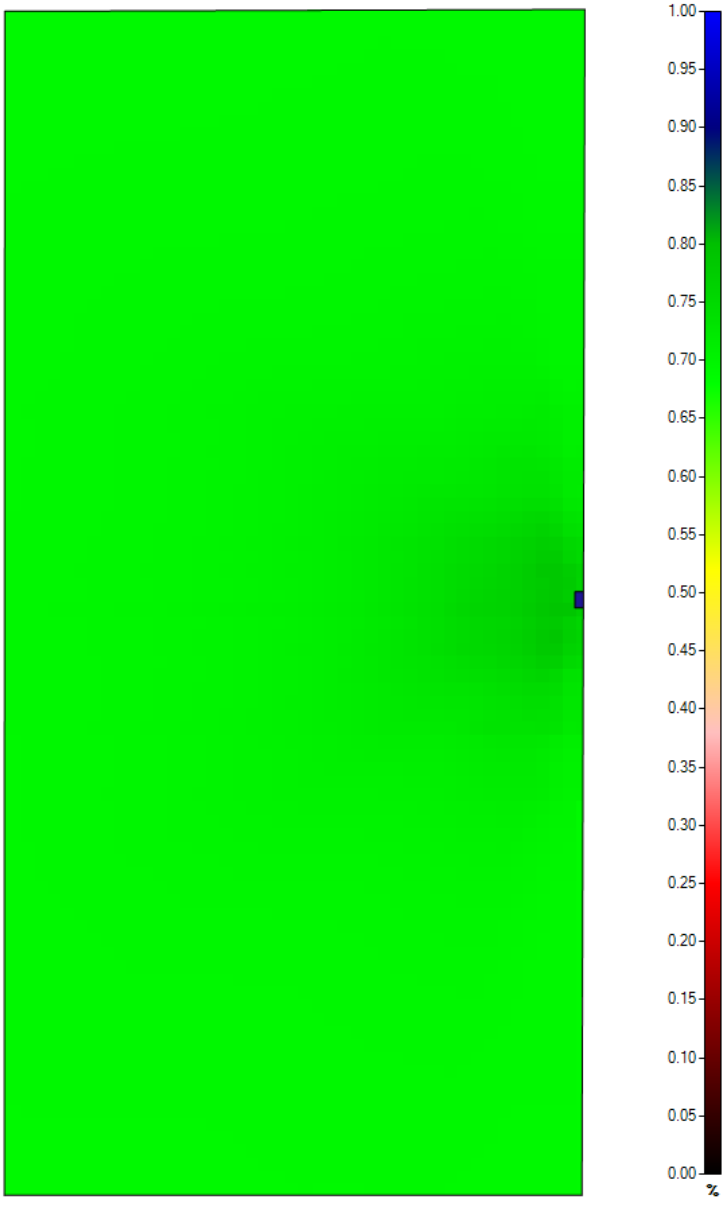

| | |
|---|---|
| **Average:** | **73.7 dB ±24.7 dB** |

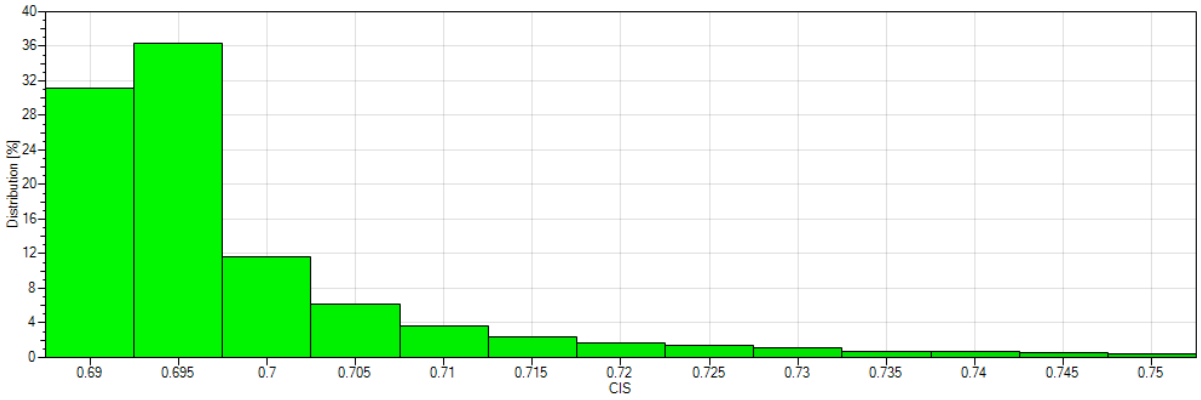
| | |
|---|---|
| **Average + Std. Dev.:** | **98.4 dB** |
| **Average - Std. Dev.:** | **49.0 dB** |
| **Max. Value:** | **89.9 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **4105** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥71.8 dB | 76.9 dB |
| 90% | ≥72.5 dB | 77.2 dB |
| 85% | ≥73.1 dB | 77.5 dB |
| 80% | ≥73.6 dB | 77.7 dB |

## Additional Mappings

### CIS






| | |
|---|---|
| **Average:** | **0.70 ±0.01** |
| **Average + Std. Dev.:** | **0.71** |
| **Average - Std. Dev.:** | **0.69** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.69** |
| **Data Points:** | **4105** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.69** | **0.70** |
| **90%** | **≥0.69** | **0.70** |
| **85%** | **≥0.69** | **0.70** |
| **80%** | **≥0.69** | **0.70** |

# NIST QUADRUPLE MODULE LAB

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

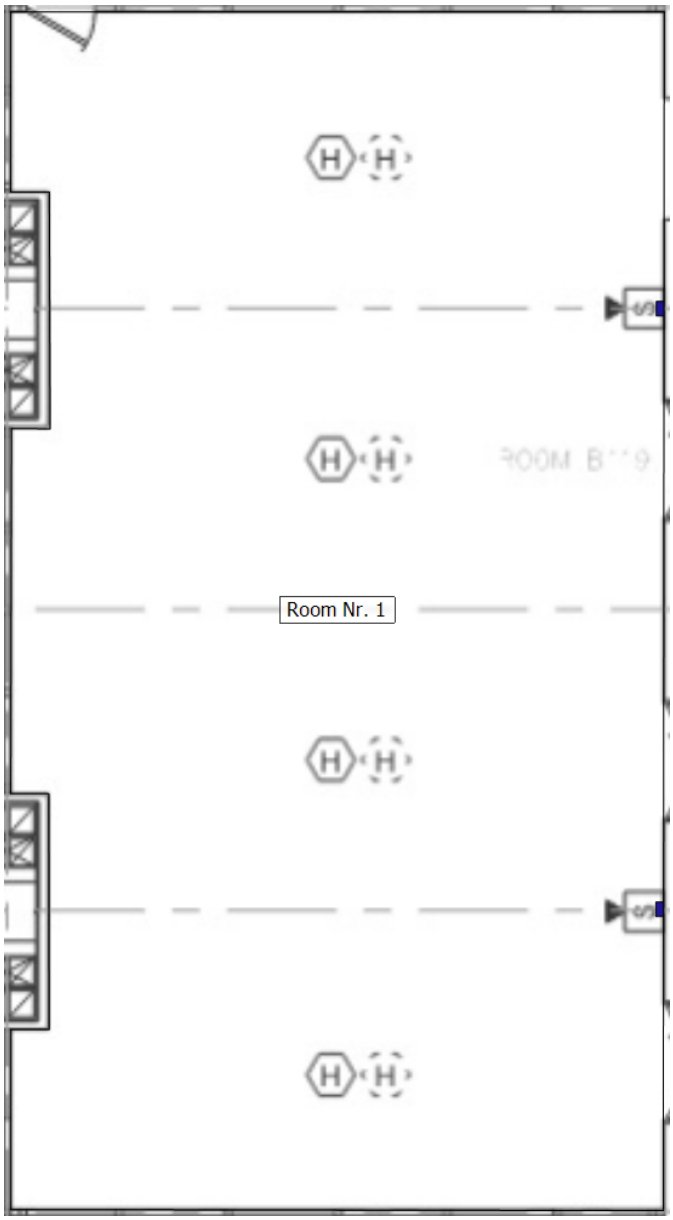
# Project Information

| | |
|---|---|
| **Title:** | **NIST QUADRUPLE MODULE LAB** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

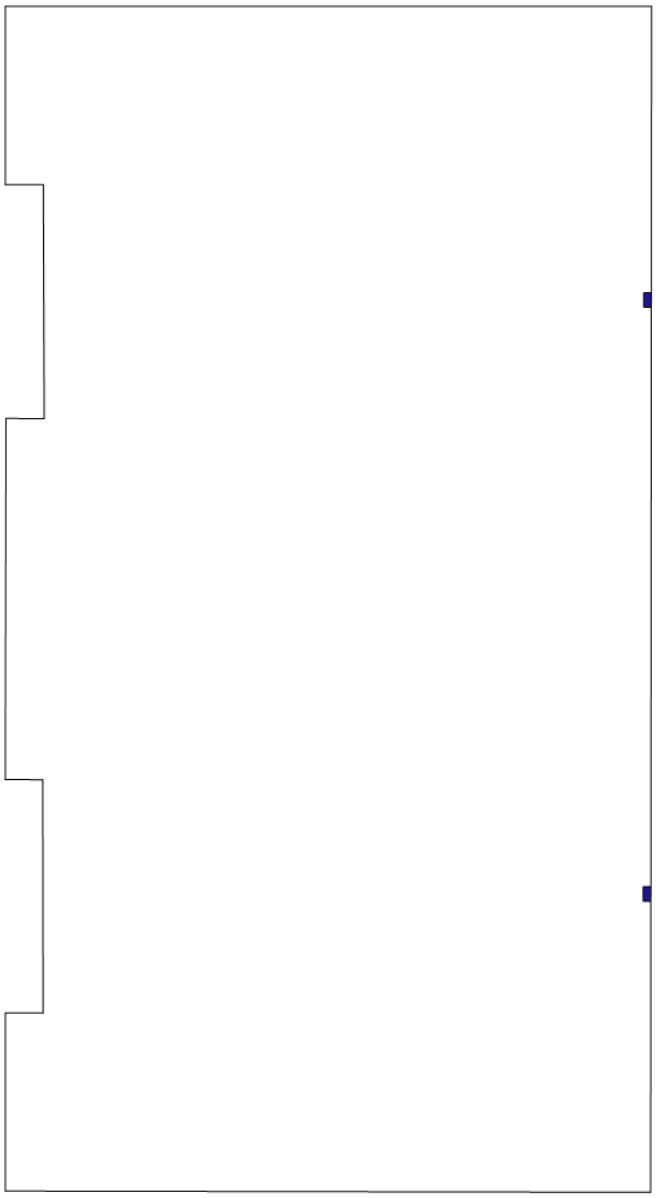
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **2** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Room Nr. 1



| | |
|---|---|
| **Label:** | **Room Nr. 1** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.69 ft x 43.55 ft** |
| **Volume:** | **10062.4 cb ft (net: 10062.4 cb ft)** |
| **Surface Area:** | **3412.0 sq ft (net: 3412.0 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 2 | E70 (Cooper Notification) |

## Surfaces

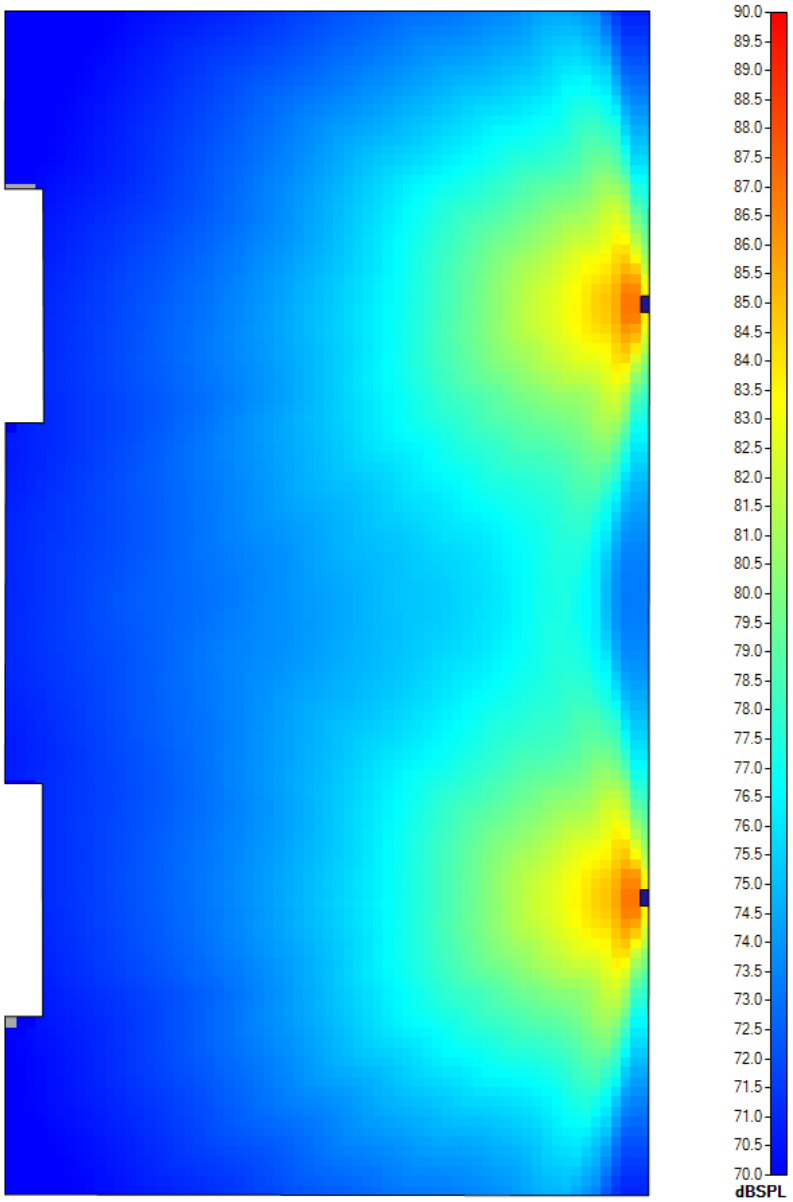
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1006.24 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1006.24 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 236.88 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 435.45 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 236.54 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 65.41 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 13.81 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 85.63 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 13.76 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 132.62 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 14.01 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 85.96 | Steel, Wall, Floor, or Ceiling |
| Wall #11 | Main Area | 13.97 | Steel, Wall, Floor, or Ceiling |
| Wall #12 | Main Area | 65.50 | Steel, Wall, Floor, or Ceiling |

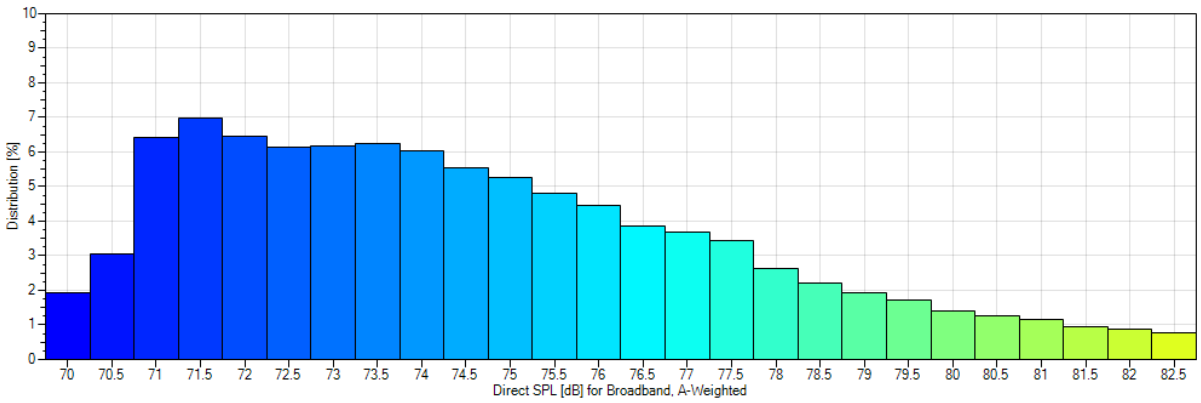
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 30.74 | 23.86 | 8.00 | 180.0 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 30.72 | 2.04 | 8.00 | 180.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



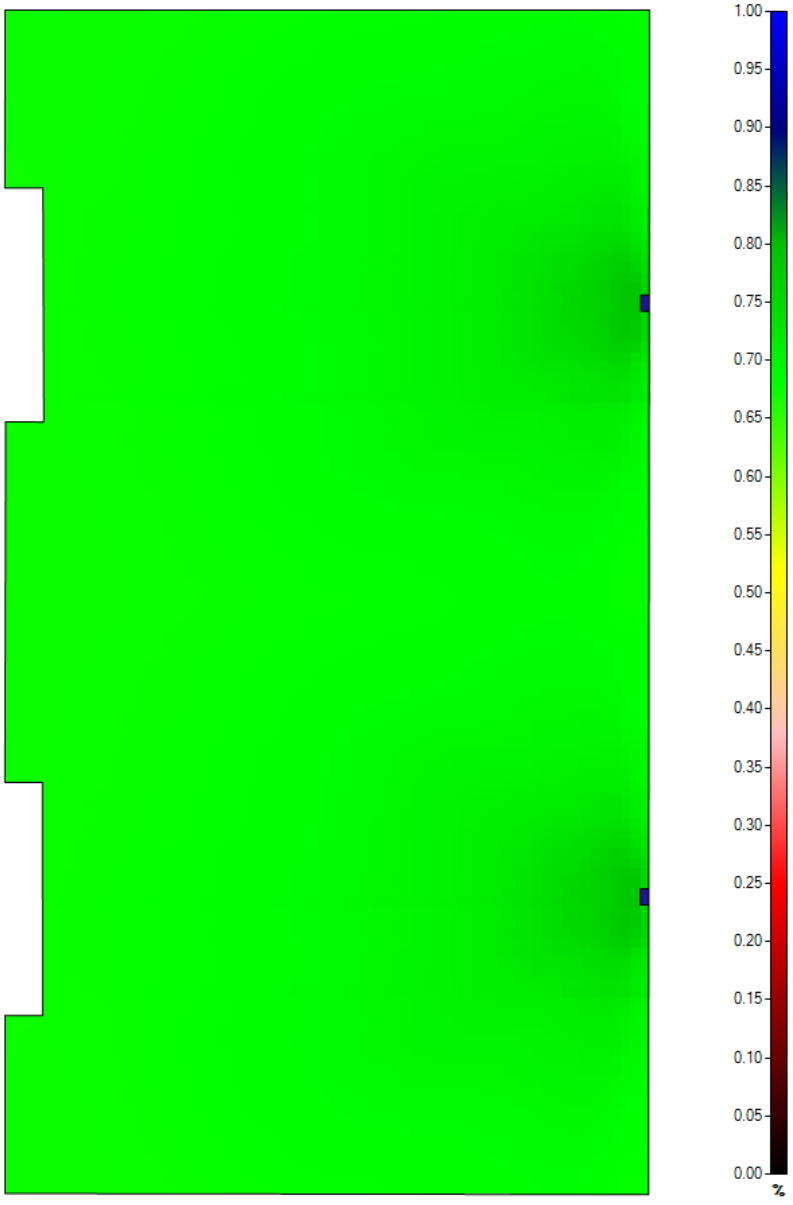

| | |
|---|---|
| **Average:** | **74.3 dB ±10.5 dB** |

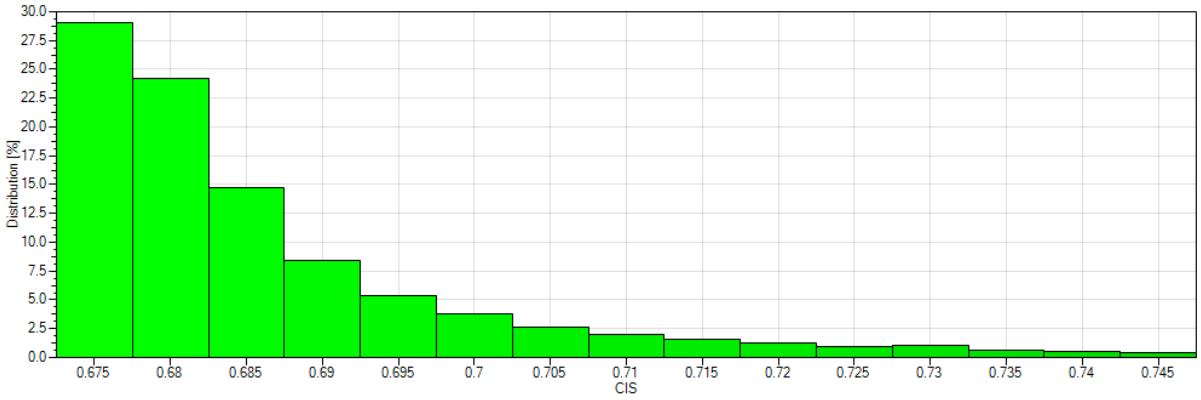
| | |
|---|---|
| **Average + Std. Dev.:** | **84.8 dB** |
| **Average - Std. Dev.:** | **63.9 dB** |
| **Max. Value:** | **86.9 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **7808** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥70.4 dB | 75.0 dB |
| 90% | ≥71.0 dB | 75.2 dB |
| 85% | ≥71.4 dB | 75.4 dB |
| 80% | ≥71.7 dB | 75.7 dB |

## Additional Mappings

### CIS






| | |
|---|---|
| **Average:** | **0.69 ±0.02** |
| **Average + Std. Dev.:** | **0.71** |
| **Average - Std. Dev.:** | **0.67** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.67** |
| **Data Points:** | **7808** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.67** | **0.69** |
| **90%** | **≥0.67** | **0.69** |
| **85%** | **≥0.68** | **0.69** |
| **80%** | **≥0.68** | **0.69** |

# NIST 5 MODULE LAB

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

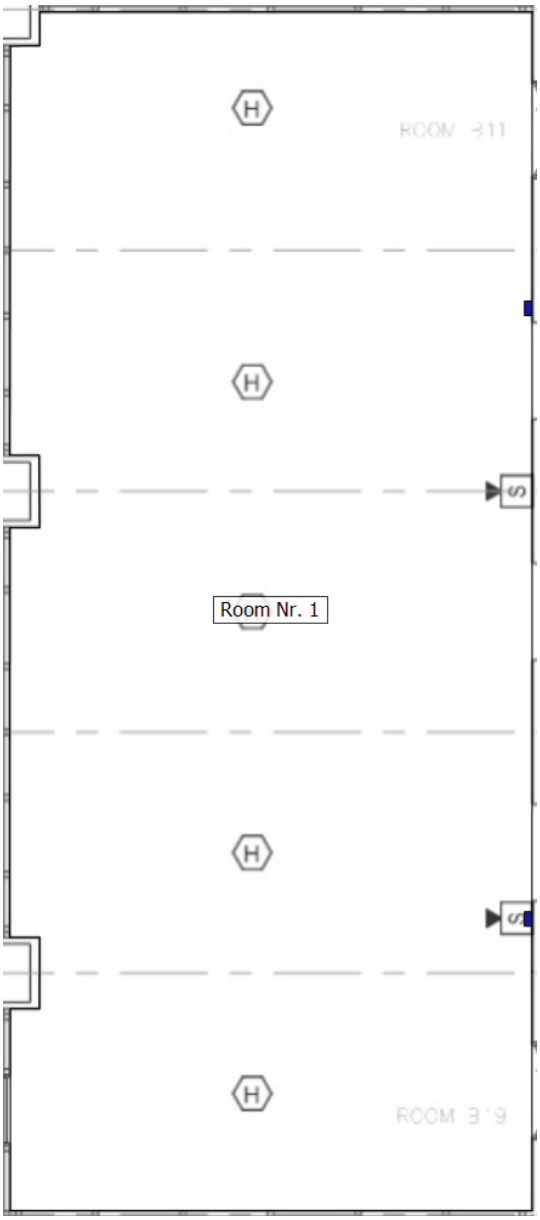
# Project Information

| | |
|---|---|
| **Title:** | **NIST 5 MODULE LAB** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

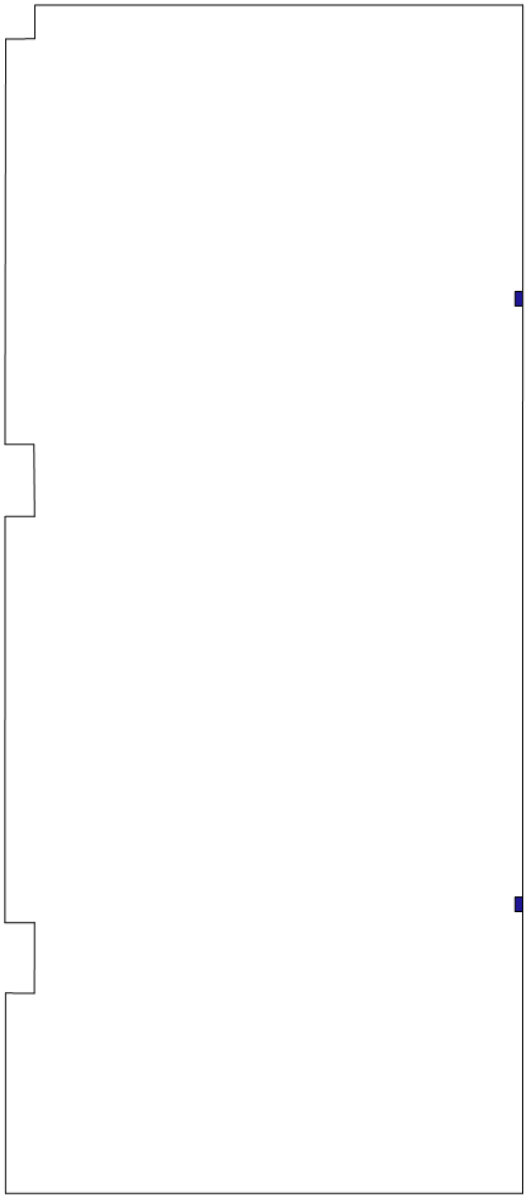
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **2** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Room Nr. 1



| | |
|---|---|
| **Label:** | **Room Nr. 1** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.95 ft x 55.07 ft** |
| **Volume:** | **13064.7 cb ft (net: 13064.7 cb ft)** |
| **Surface Area:** | **4246.6 sq ft (net: 4246.6 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 2 | E70 (Cooper Notification) |

## Surfaces

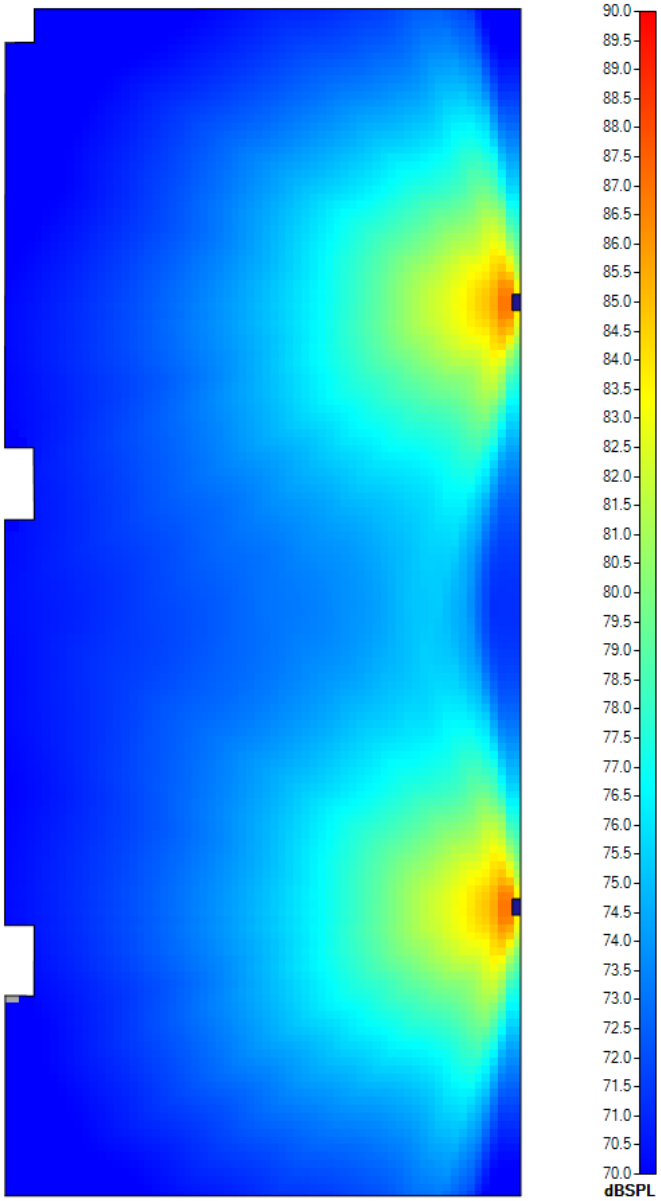
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1306.47 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1306.47 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 15.51 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 225.63 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 550.71 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 239.12 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 92.89 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 13.35 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 32.77 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 13.71 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 188.20 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 13.65 | Steel, Wall, Floor, or Ceiling |
| Wall #11 | Main Area | 33.35 | Steel, Wall, Floor, or Ceiling |
| Wall #12 | Main Area | 13.38 | Steel, Wall, Floor, or Ceiling |
| Wall #13 | Main Area | 187.90 | Steel, Wall, Floor, or Ceiling |
| Wall #14 | Main Area | 13.48 | Steel, Wall, Floor, or Ceiling |

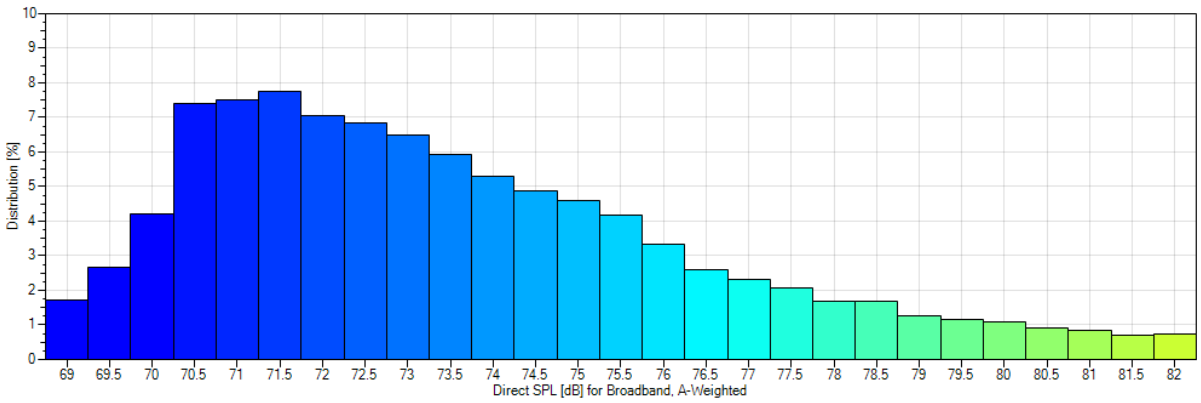
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 30.74 | 21.02 | 8.00 | 180.0 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 30.74 | -7.04 | 8.00 | 180.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



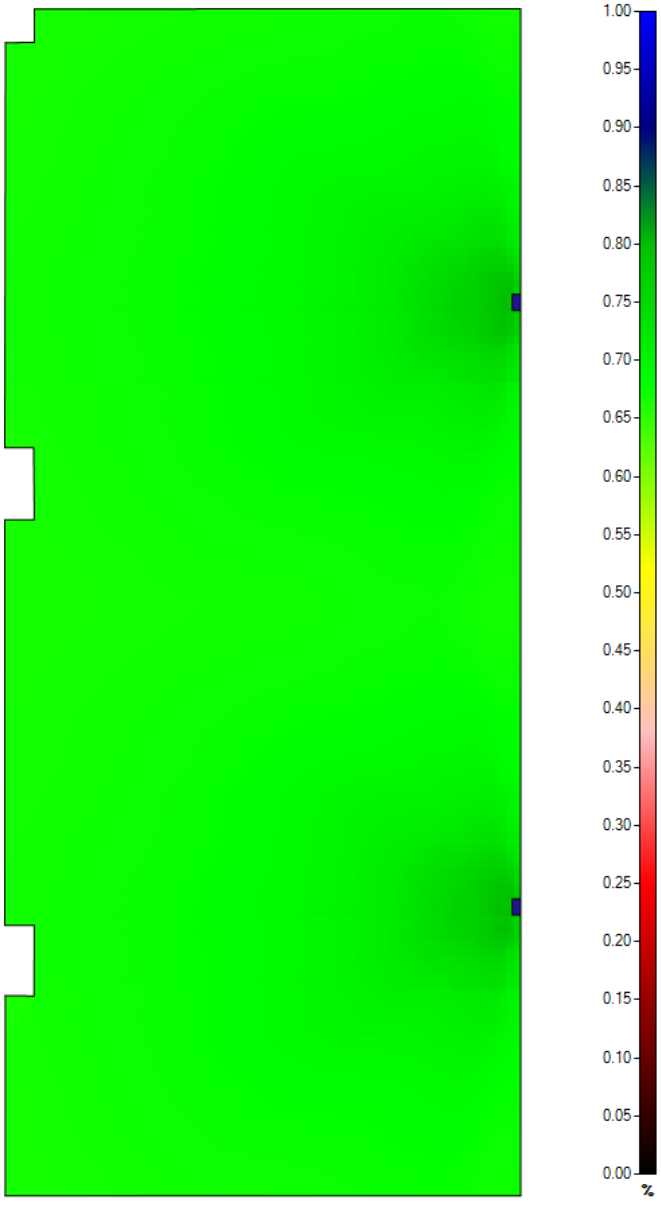

| | |
|---|---|
| **Average:** | **73.7 dB ±5.5 dB** |

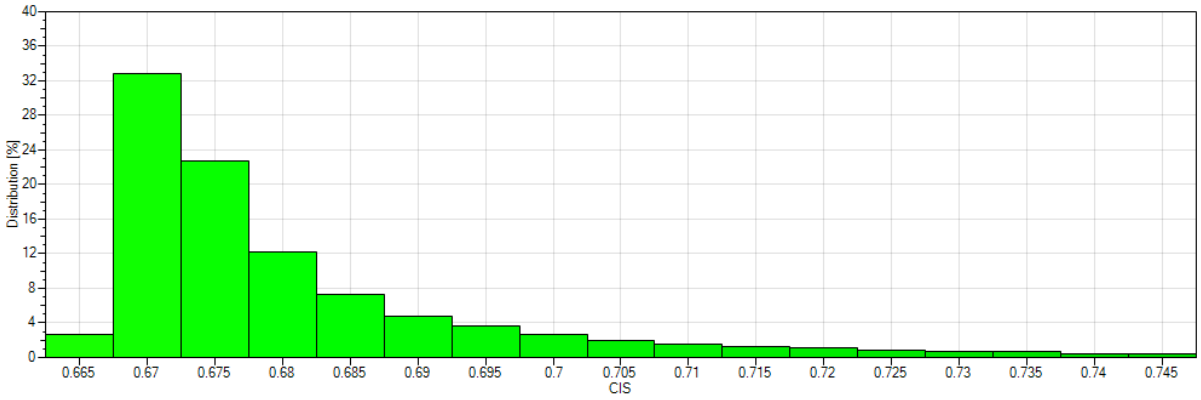
| | |
|---|---|
| **Average + Std. Dev.:** | **79.2 dB** |
| **Average - Std. Dev.:** | **68.2 dB** |
| **Max. Value:** | **86.9 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **10078** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥69.7 dB** | **74.0 dB** |
| **90%** | **≥70.3 dB** | **74.2 dB** |
| **85%** | **≥70.6 dB** | **74.4 dB** |
| **80%** | **≥71.0 dB** | **74.7 dB** |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.68 ±0.02** |
| **Average + Std. Dev.:** | **0.70** |
| **Average - Std. Dev.:** | **0.66** |
| **Max. Value:** | **0.80** |
| **Min. Value:** | **0.66** |
| **Data Points:** | **10078** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.67** | **0.68** |
| **90%** | **≥0.67** | **0.68** |
| **85%** | **≥0.67** | **0.69** |
| **80%** | **≥0.67** | **0.69** |

# NIST PENTHOUSE TRANSFORMER VAULT

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

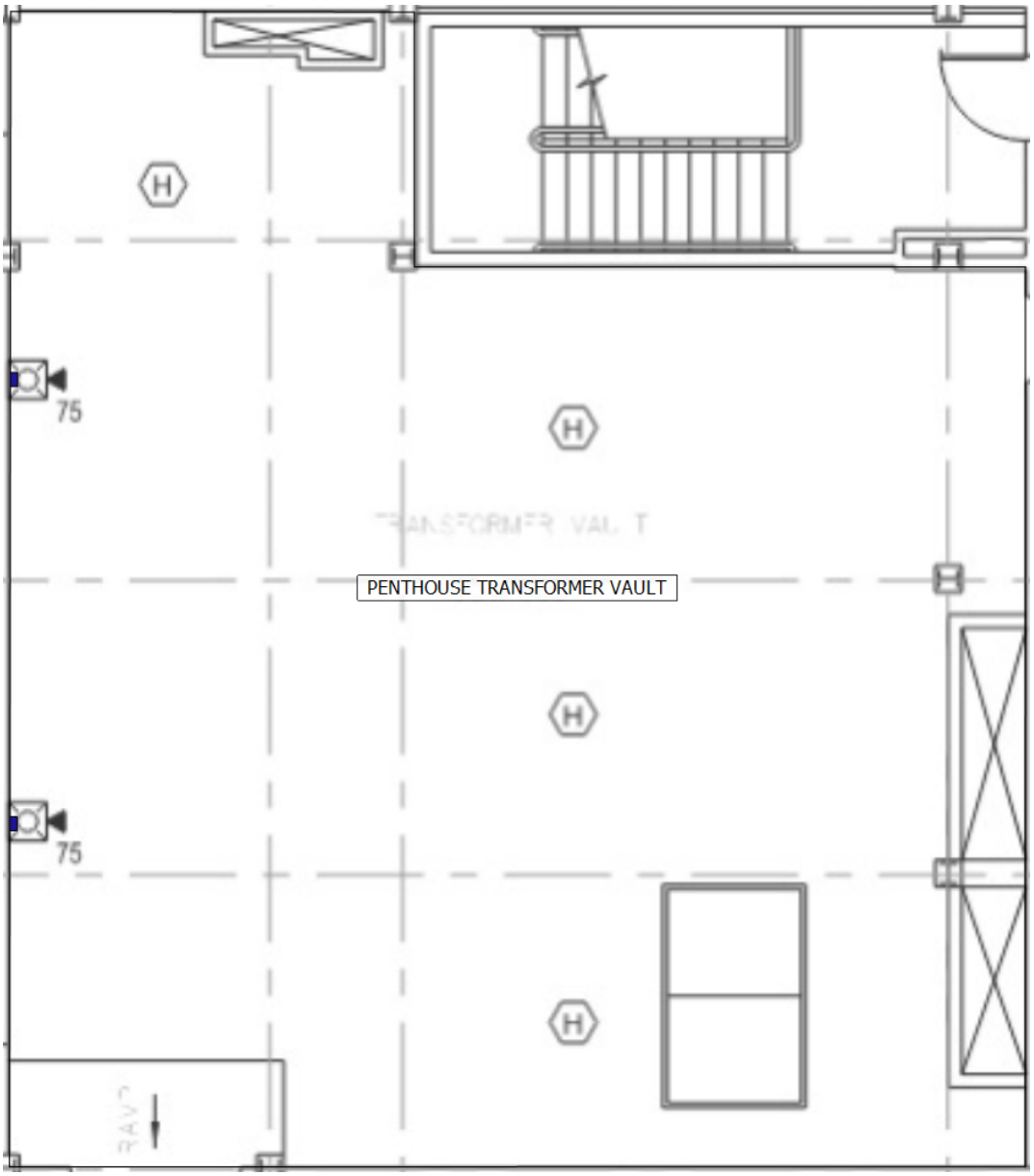
# Project Information

| | |
|---|---|
| **Title:** | **NIST PENTHOUSE TRANSFORMER VAULT** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

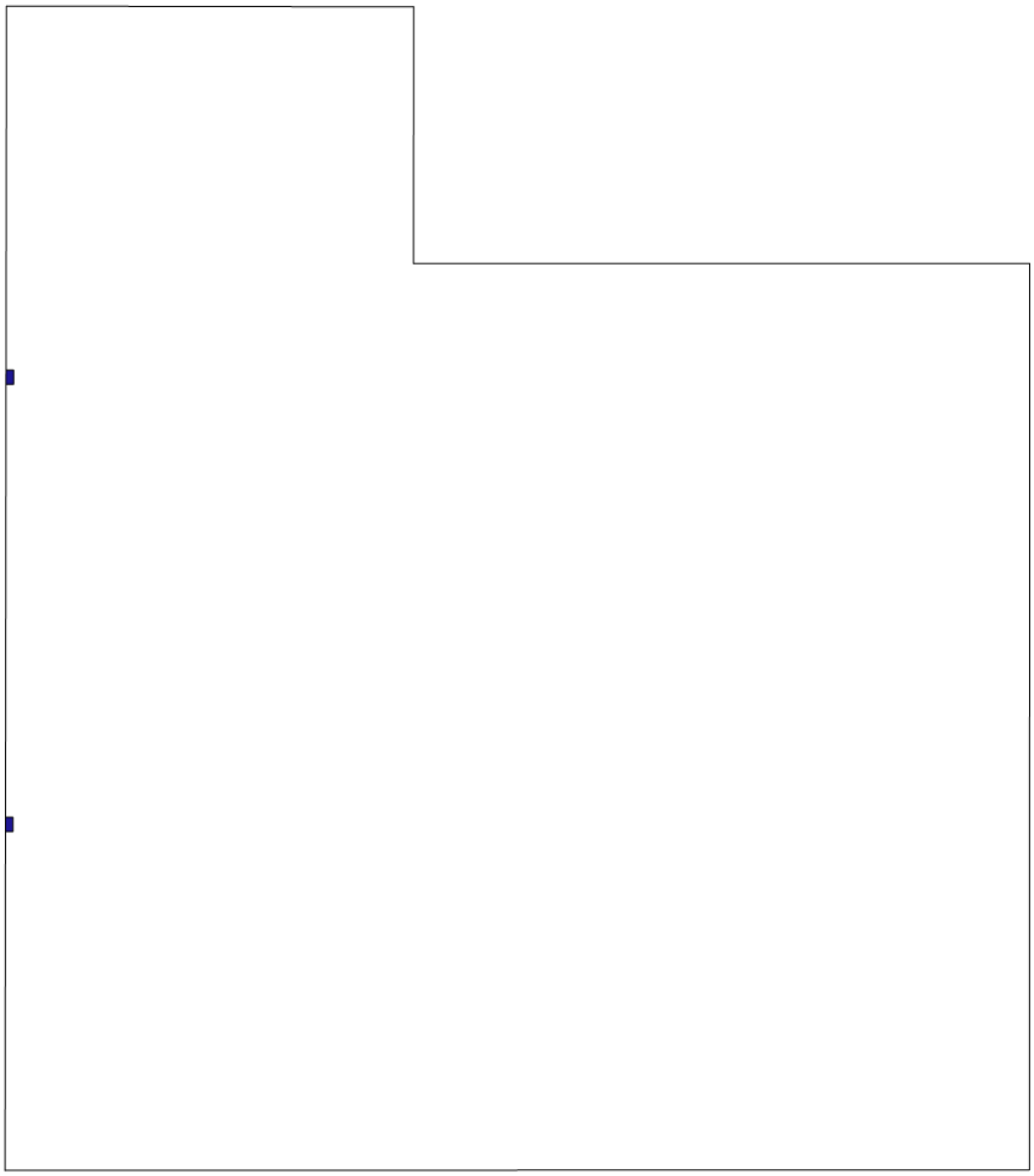
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **2** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: PENTHOUSE TRANSFORMER VAULT



| | |
|---|---|
| **Label:** | **PENTHOUSE TRANSFORMER VAULT** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **37.96 ft x 43.18 ft** |
| **Volume:** | **14192.6 cb ft (net: 14192.6 cb ft)** |
| **Surface Area:** | **4460.2 sq ft (net: 4460.2 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **1.0 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 2 | E70 (Cooper Notification) |

## Surfaces

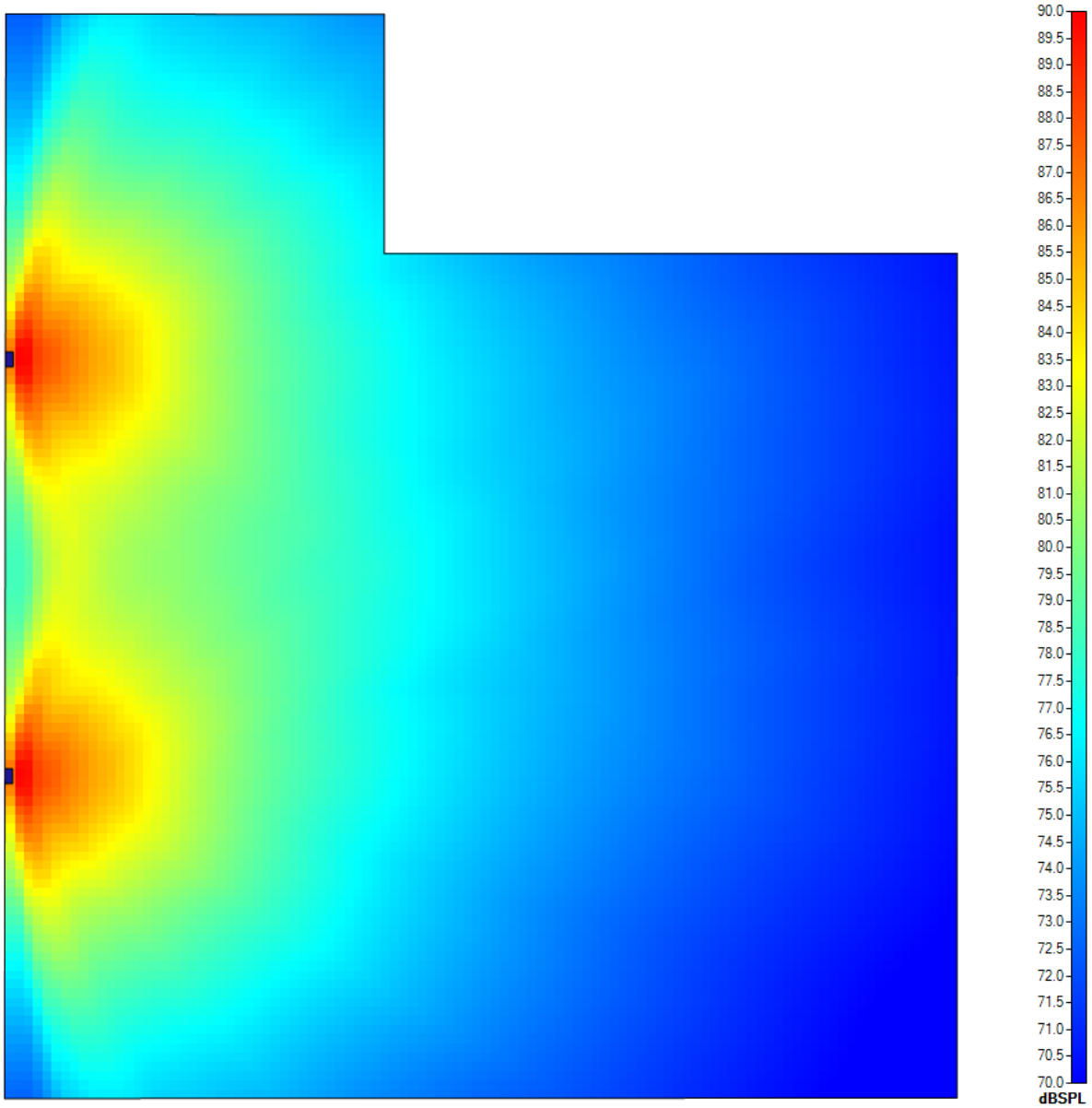
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1419.26 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1419.26 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 150.85 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 95.17 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 228.31 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 336.11 | Concrete, Painted, Wall or Floor |
| Wall #5 | Main Area | 379.51 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 431.76 | Concrete, Painted, Wall or Floor |

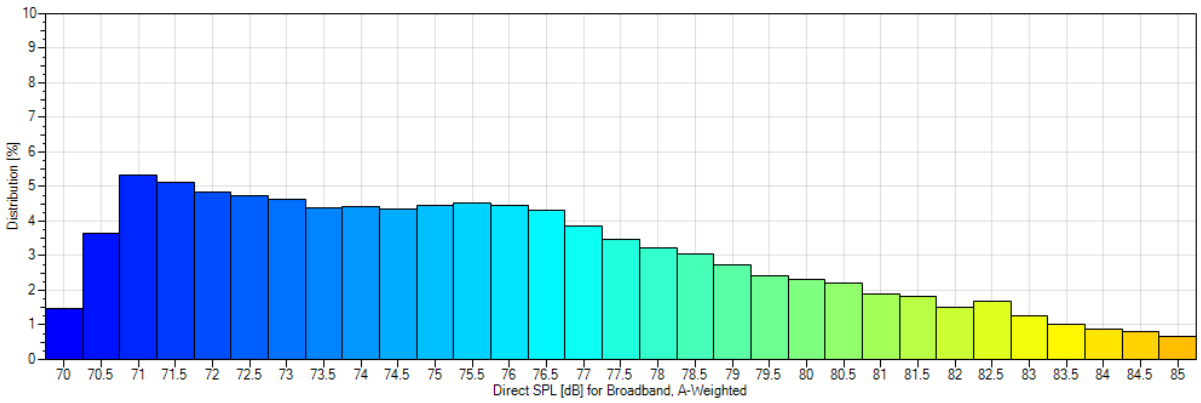
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 2.00 | 31.43 | 8.00 | -0.1 | 0.0 | 1/2 W (70V) |
| 2 | Wall | E70 | 1.98 | 14.84 | 8.00 | -0.1 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



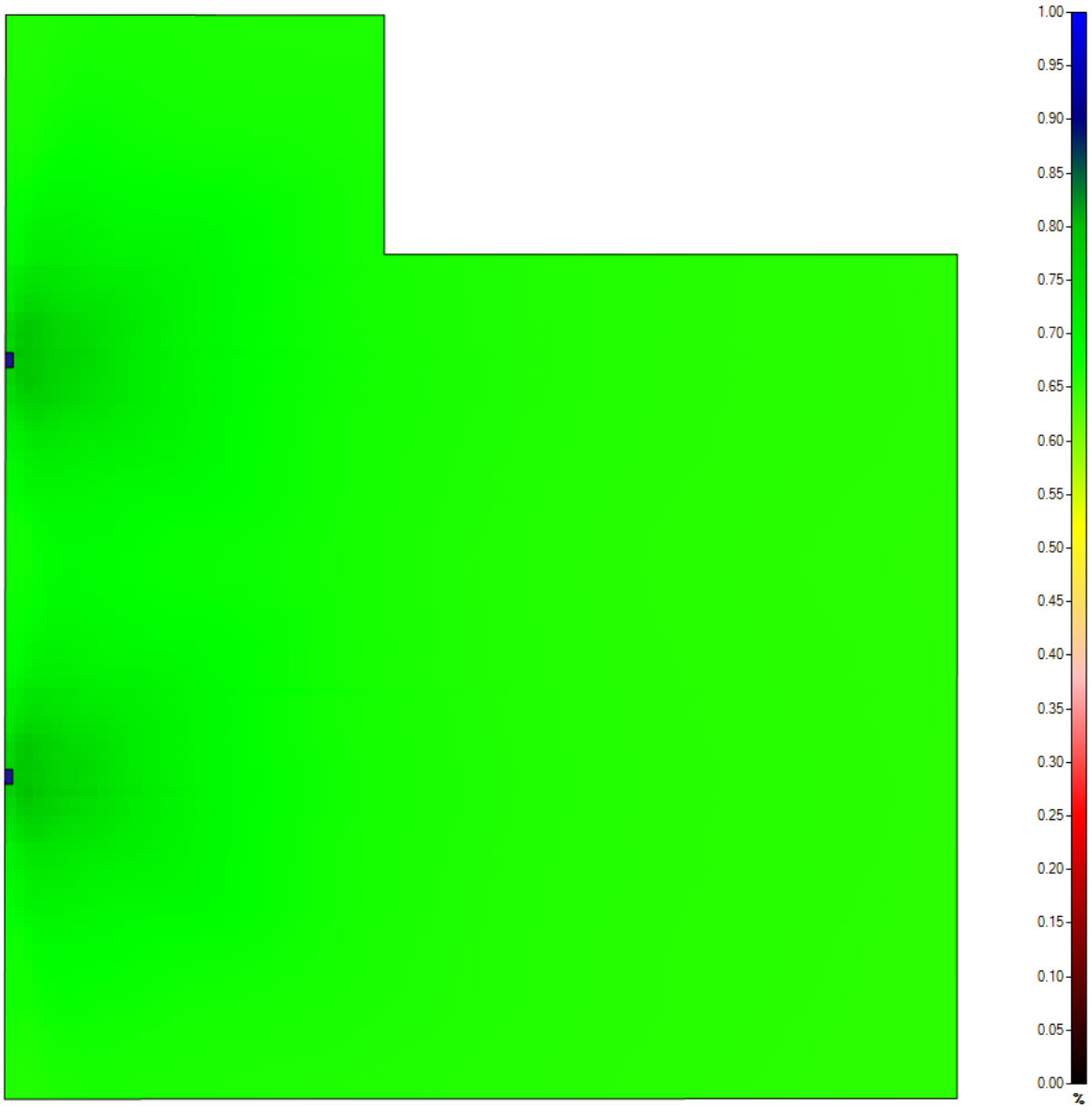

| | |
|---|---|
| **Average:** | **73.9 dB ±20.2 dB** |

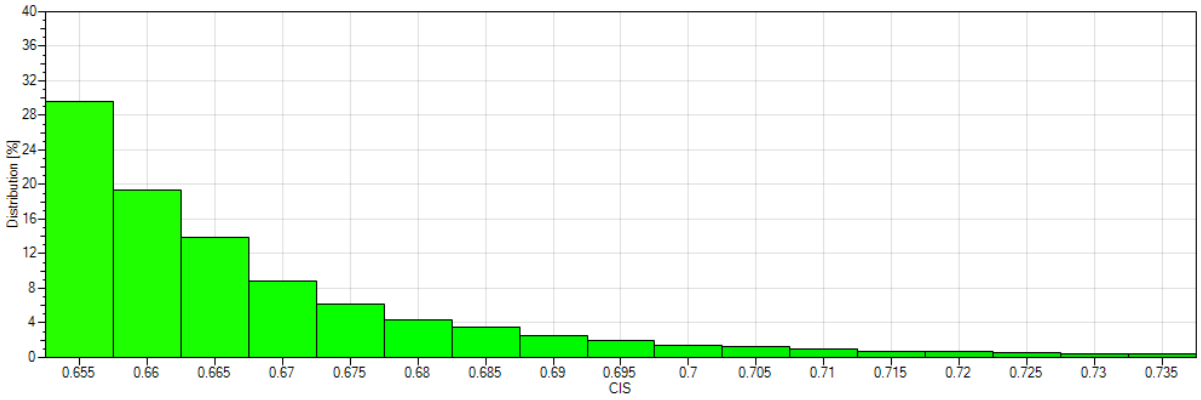
| | |
|---|---|
| **Average + Std. Dev.:** | **94.1 dB** |
| **Average - Std. Dev.:** | **53.7 dB** |
| **Max. Value:** | **89.9 dB** |
| **Min. Value:** | **-122.4 dB** |
| **Data Points:** | **10917** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥70.5 dB | 76.2 dB |
| 90% | ≥71.0 dB | 76.5 dB |
| 85% | ≥71.5 dB | 76.8 dB |
| 80% | ≥72.0 dB | 77.1 dB |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.67 ±0.02** |
| **Average + Std. Dev.:** | **0.69** |
| **Average - Std. Dev.:** | **0.65** |
| **Max. Value:** | **0.80** |
| **Min. Value:** | **0.65** |
| **Data Points:** | **10917** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.65** | **0.67** |
| **90%** | **≥0.65** | **0.67** |
| **85%** | **≥0.66** | **0.67** |
| **80%** | **≥0.66** | **0.67** |

# NIST STORAGE ROOM TO LOADING DOCK

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

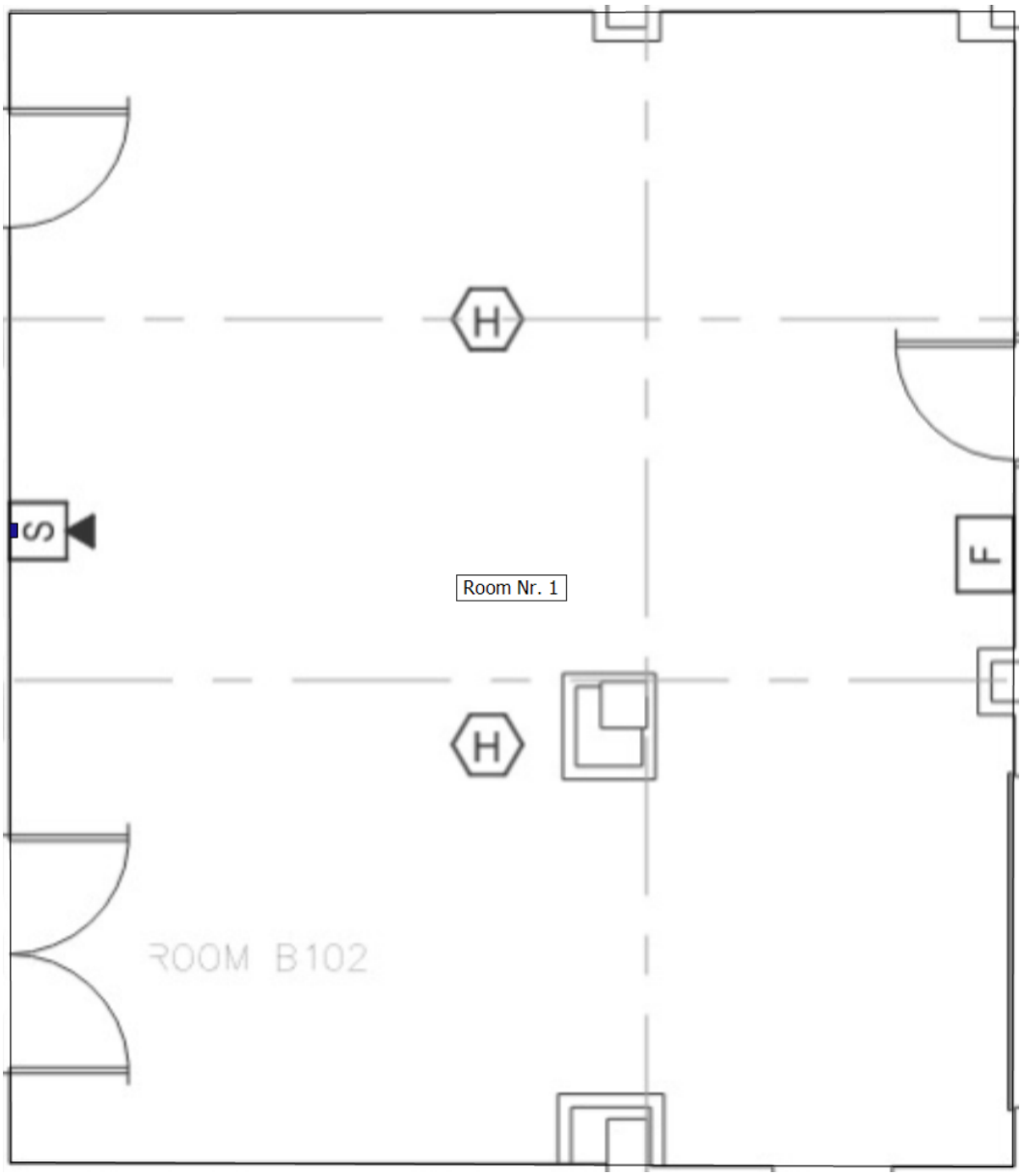
# Project Information

| | |
|---|---|
| **Title:** | **NIST STORAGE ROOM TO LOADING DOCK** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

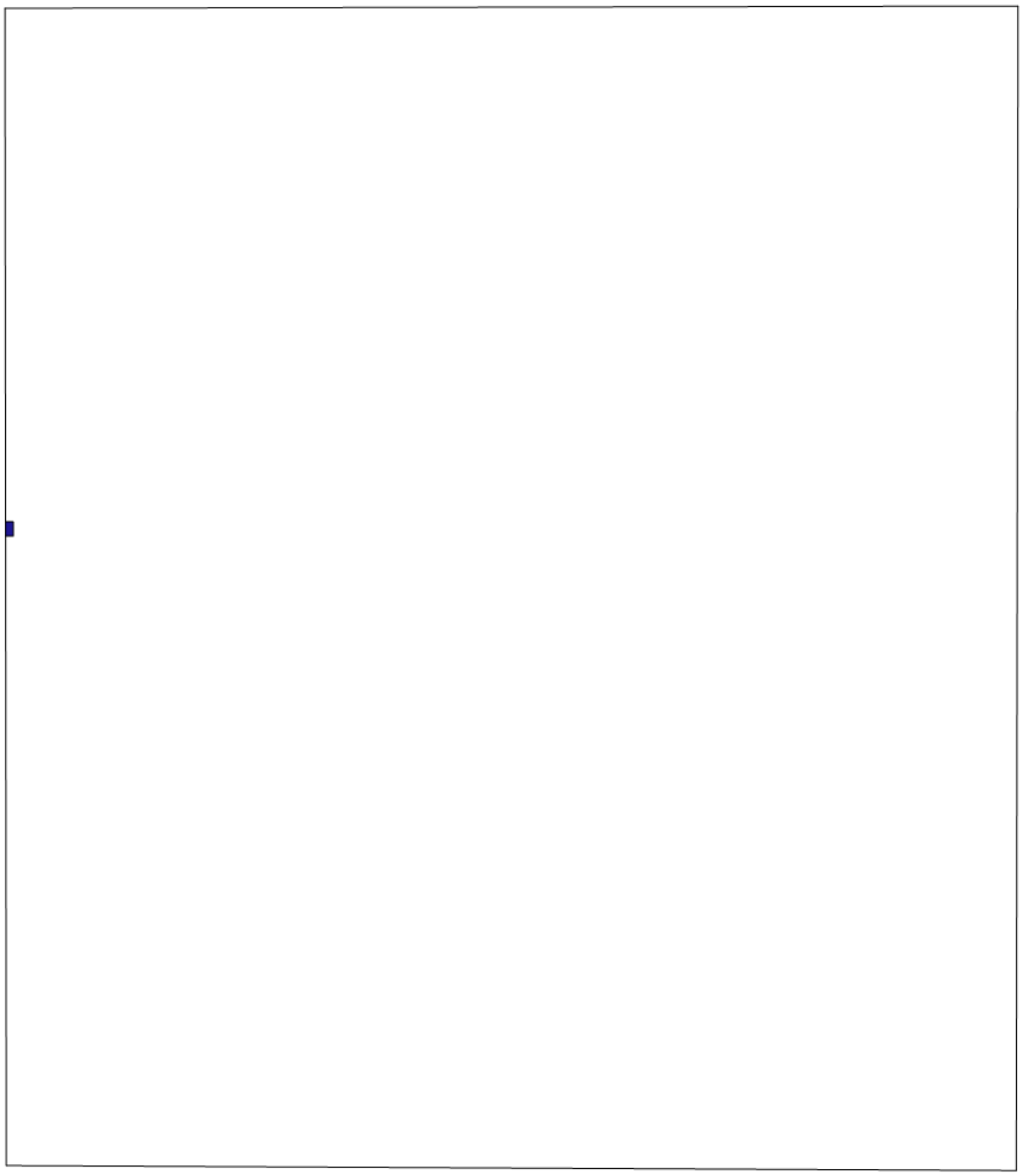
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **1** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Room Nr. 1



| | |
|---|---|
| **Label:** | **Room Nr. 1** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **25.21 ft x 29.01 ft** |
| **Volume:** | **7280.5 cb ft (net: 7280.5 cb ft)** |
| **Surface Area:** | **2538.0 sq ft (net: 2538.0 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

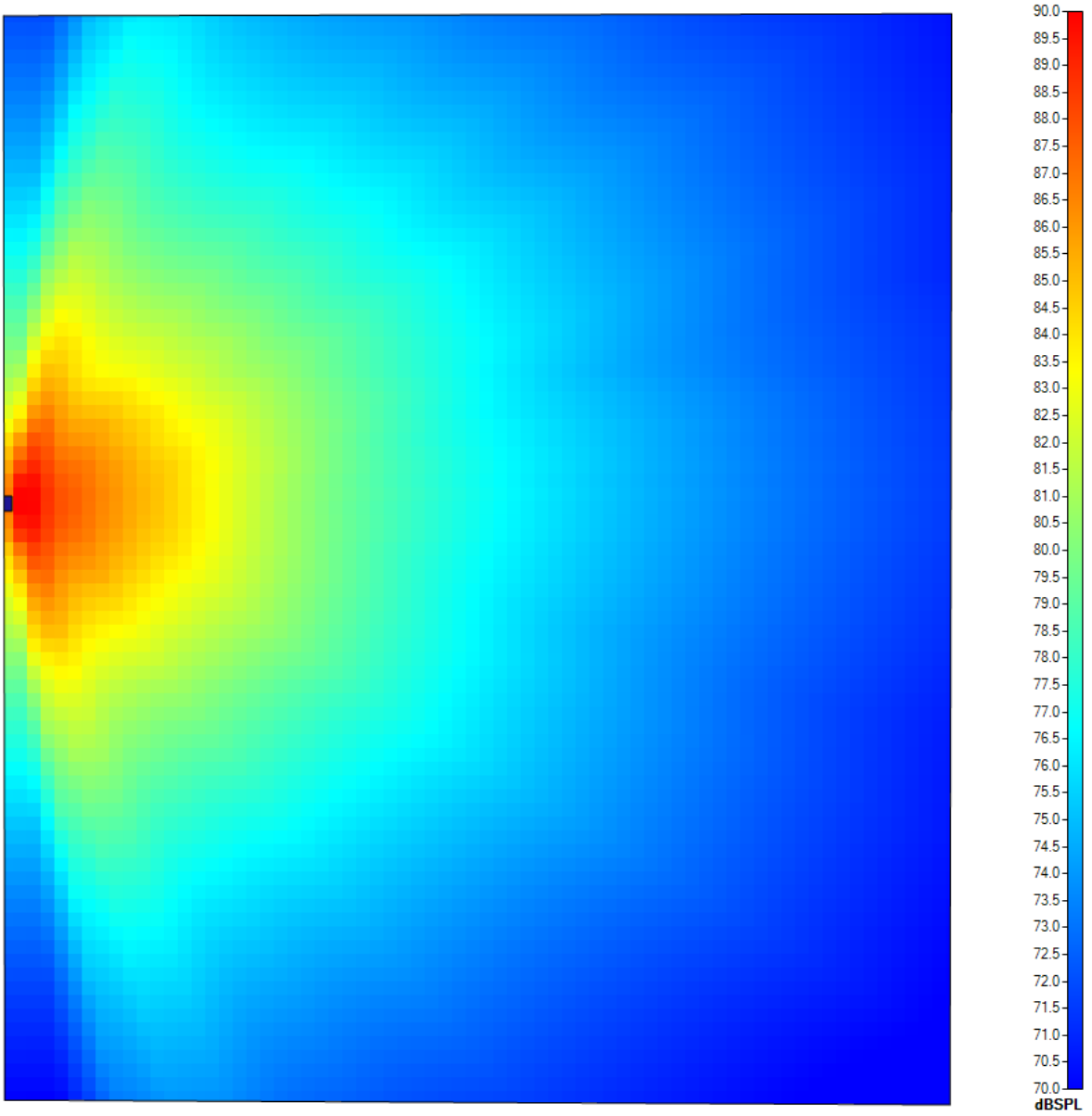
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 728.05 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 728.05 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 252.14 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 290.09 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 251.37 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 288.30 | Concrete, Painted, Wall or Floor |

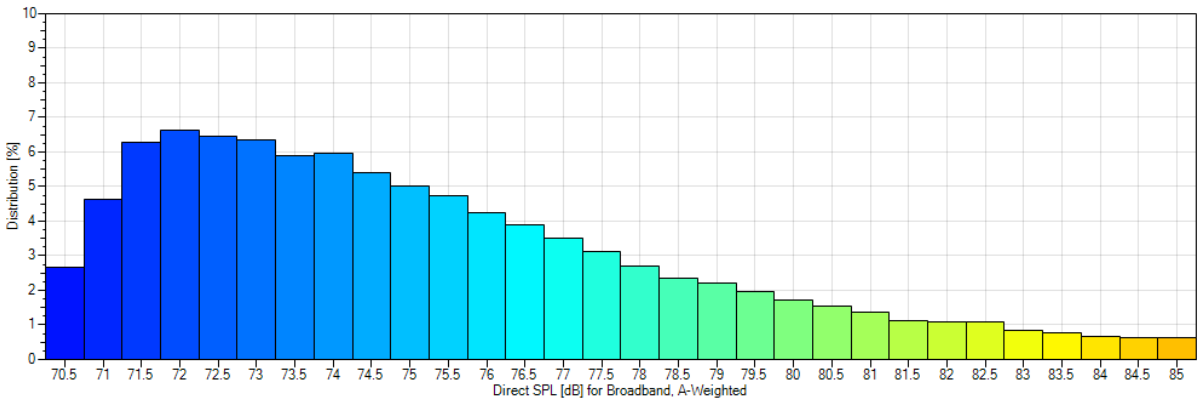
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 1.40 | 16.90 | 8.00 | 0.1 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



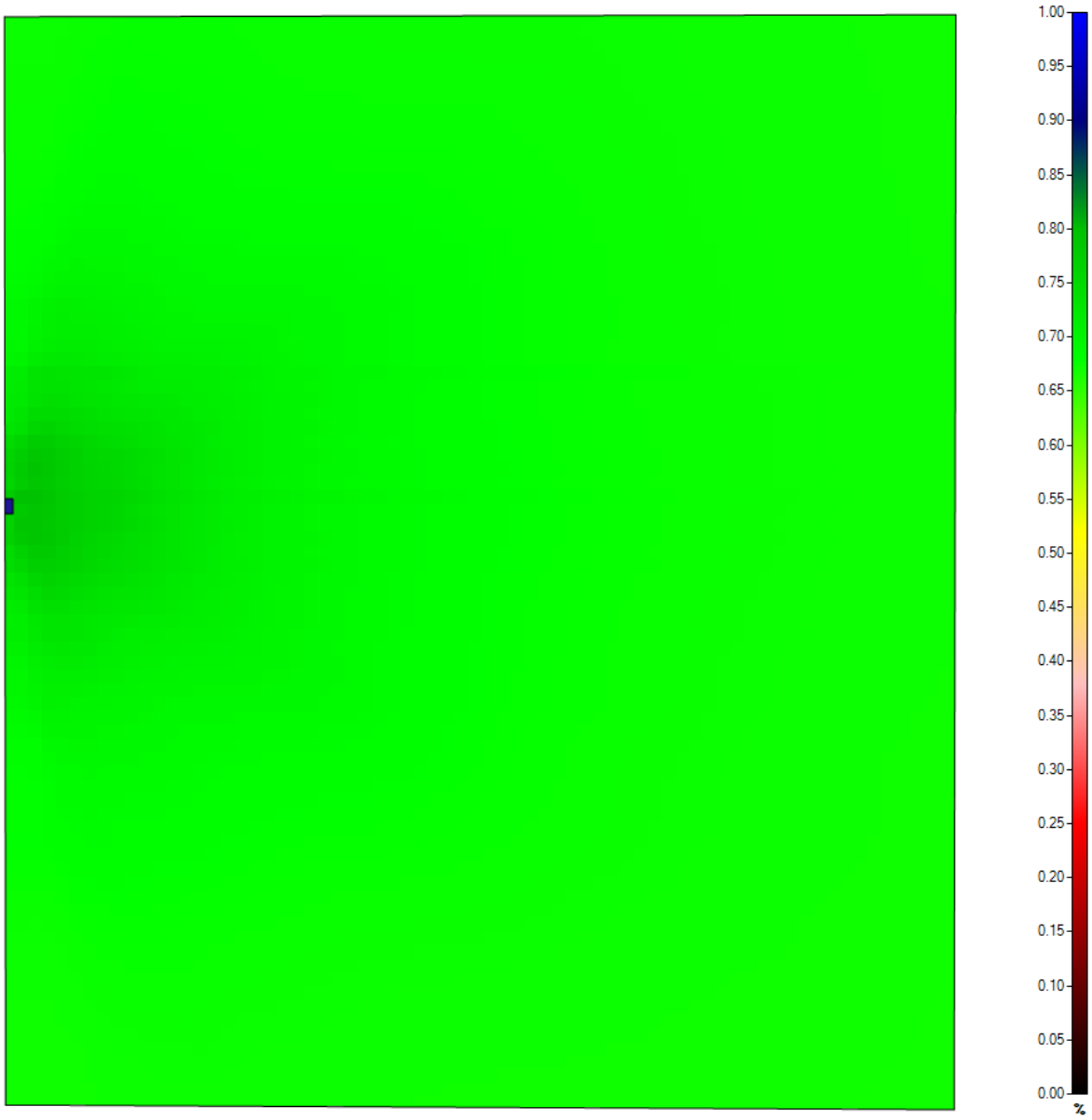

| | |
|---|---|
| **Average:** | **74.1 dB ±16.0 dB** |

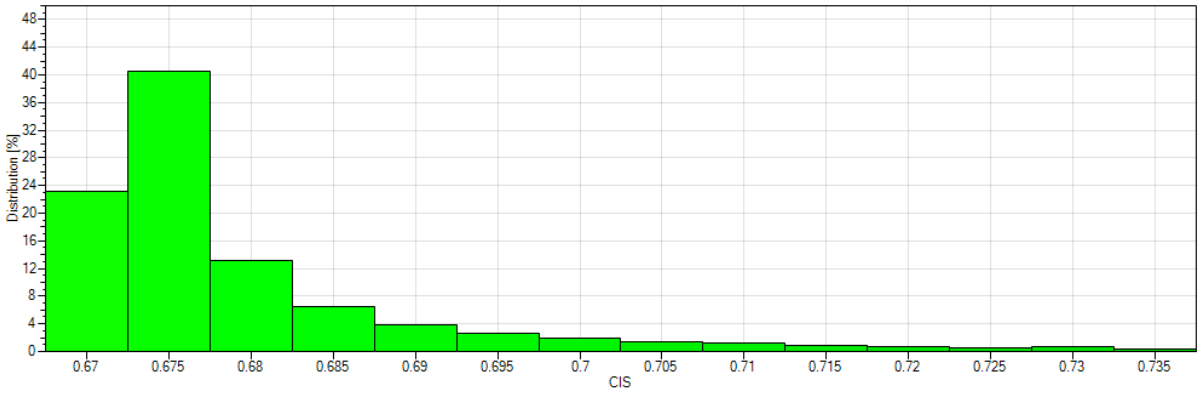
| | |
|---|---|
| **Average + Std. Dev.:** | **90.1 dB** |
| **Average - Std. Dev.:** | **58.1 dB** |
| **Max. Value:** | **89.9 dB** |
| **Min. Value:** | **-125.0 dB** |
| **Data Points:** | **5645** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥70.7 dB | 75.6 dB |
| 90% | ≥71.3 dB | 75.9 dB |
| 85% | ≥71.7 dB | 76.1 dB |
| 80% | ≥72.0 dB | 76.4 dB |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.68 ±0.02** |
| **Average + Std. Dev.:** | **0.70** |
| **Average - Std. Dev.:** | **0.66** |
| **Max. Value:** | **0.80** |
| **Min. Value:** | **0.67** |
| **Data Points:** | **5645** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.67** | **0.68** |
| **90%** | **≥0.67** | **0.68** |
| **85%** | **≥0.67** | **0.68** |
| **80%** | **≥0.67** | **0.68** |

# NIST B220 BASEMENT

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

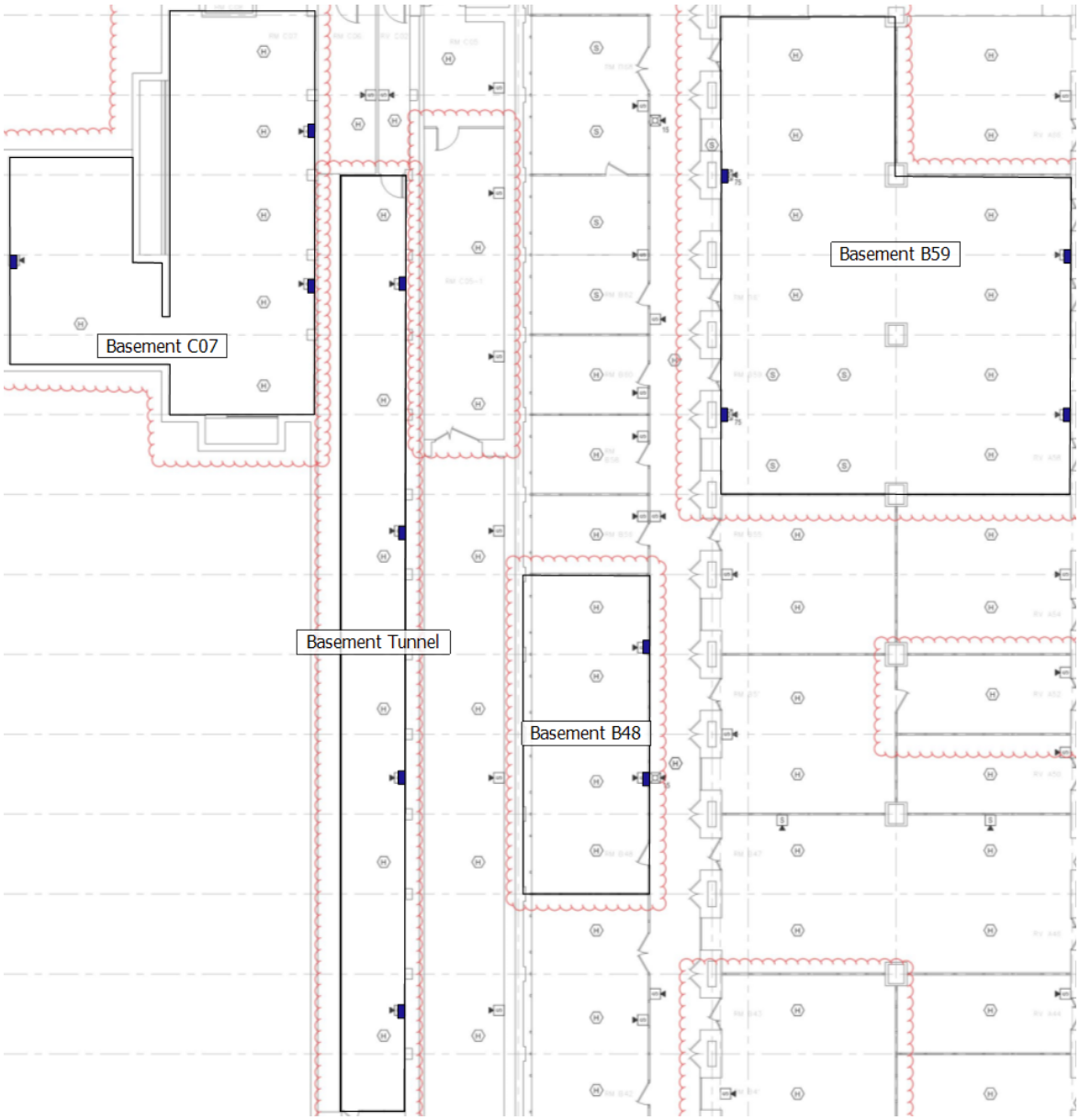
# Project Information

| | |
|---|---|
| **Title:** | **NIST B220 BASEMENT** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| **13** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Basement Tunnel

| | |
|---|---|
| **Label:** | **Basement Tunnel** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **9.04 ft x 129.64 ft** |
| **Volume:** | **11581.0 cb ft (net: 11581.0 cb ft)** |
| **Surface Area:** | **5087.4 sq ft (net: 5087.4 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **1.0 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 4 | E70 (Cooper Notification) |

## Surfaces

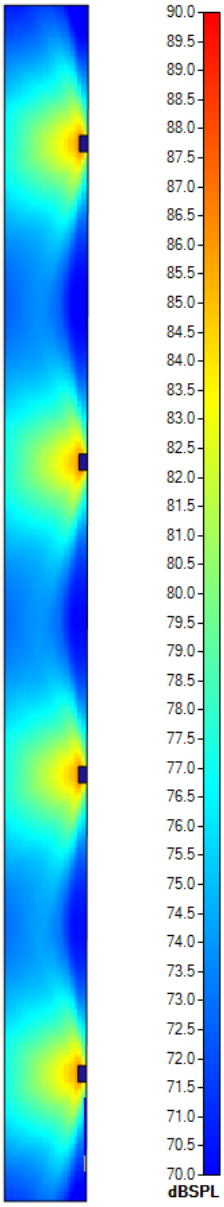
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1158.10 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1158.10 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 88.27 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 1296.38 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 90.42 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 1296.15 | Concrete, Painted, Wall or Floor |

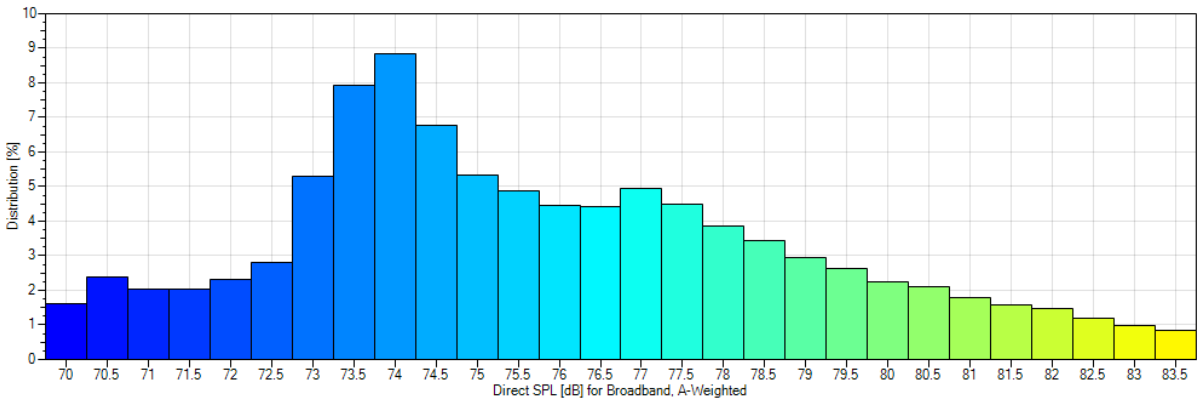
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 104.43 | 161.62 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 104.37 | 127.10 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 3 | Wall | E70 | 104.32 | 93.23 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 4 | Wall | E70 | 104.26 | 60.81 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



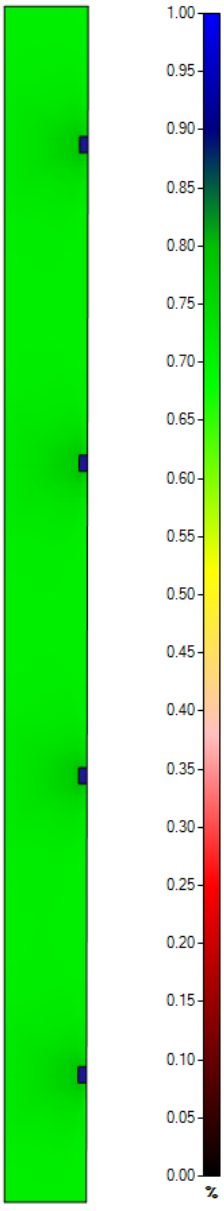

| | |
|---|---|
| **Average:** | **73.2 dB ±23.6 dB** |

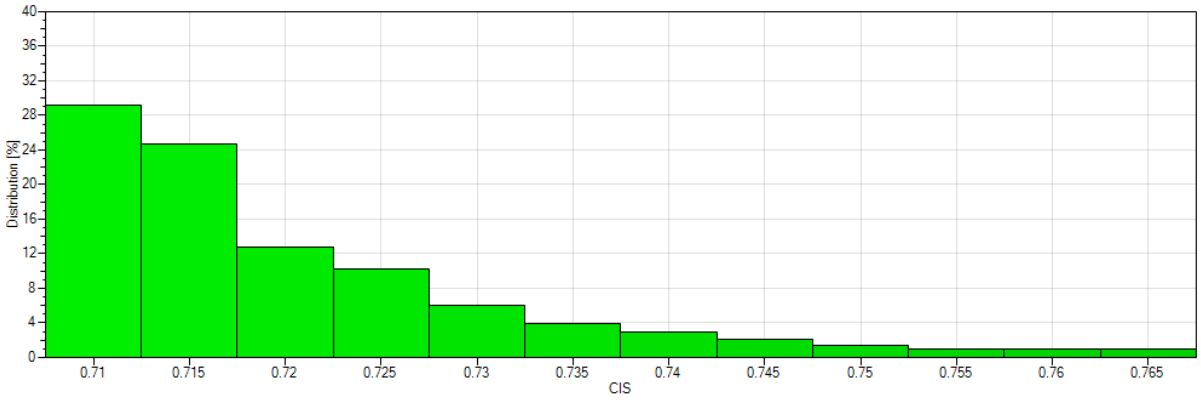
| | |
|---|---|
| **Average + Std. Dev.:** | **96.8 dB** |
| **Average - Std. Dev.:** | **49.6 dB** |
| **Max. Value:** | **87.0 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **9136** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥70.5 dB** | **76.2 dB** |
| **90%** | **≥71.7 dB** | **76.5 dB** |
| **85%** | **≥72.7 dB** | **76.7 dB** |
| **80%** | **≥73.2 dB** | **77.0 dB** |

# Additional Mappings

## CIS

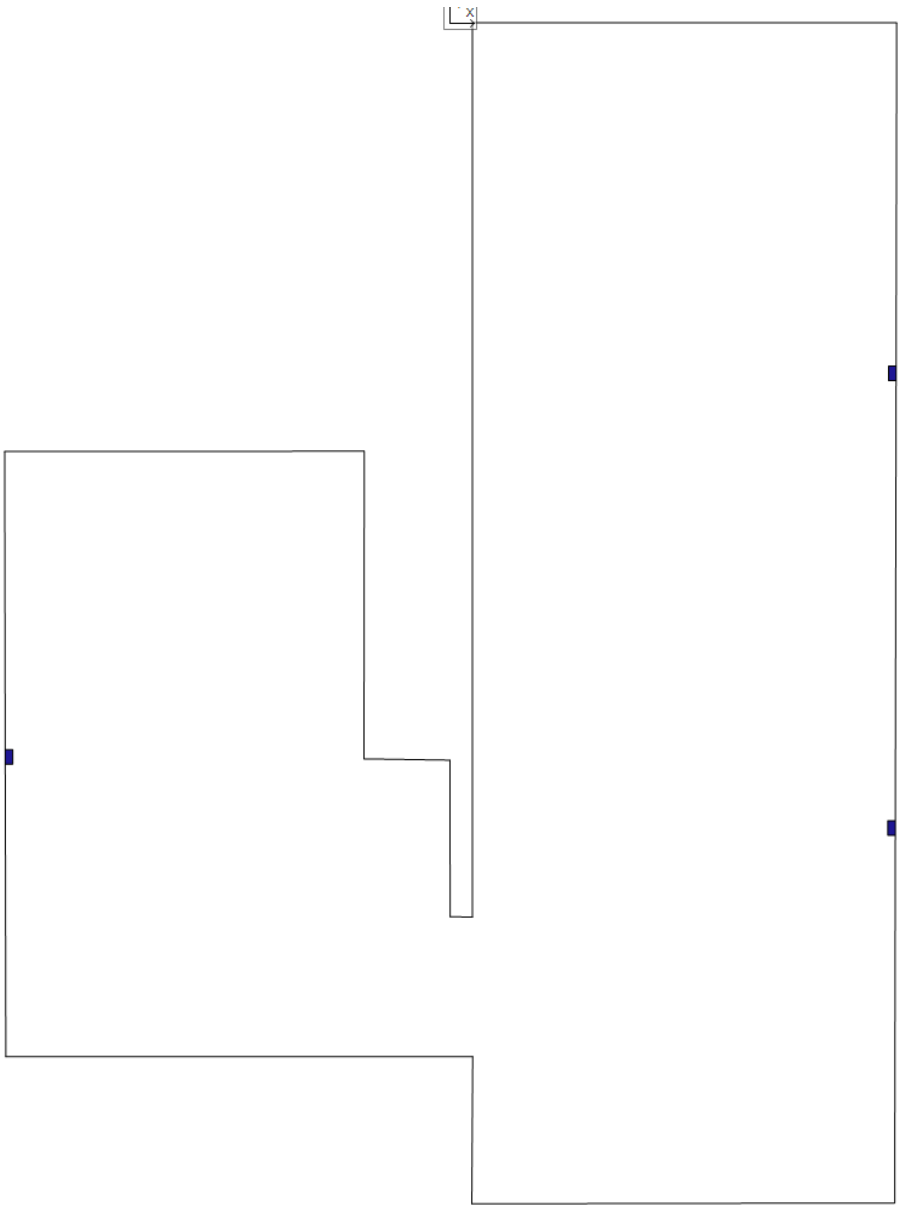





| | |
|---|---|
| **Average:** | **0.72 ±0.01** |
| **Average + Std. Dev.:** | **0.74** |
| **Average - Std. Dev.:** | **0.71** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.71** |
| **Data Points:** | **9136** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.71** | **0.72** |
| **90%** | **≥0.71** | **0.72** |
| **85%** | **≥0.71** | **0.72** |
| **80%** | **≥0.71** | **0.72** |

# Room: Basement C07



| | |
|---|---|
| **Label:** | **Basement C07** |
| **Room Height:** | **15.00 ft** |
| **Dimensions (WxD):** | **42.23 ft x 55.94 ft** |
| **Volume:** | **25076.2 cb ft (net: 25076.2 cb ft)** |
| **Surface Area:** | **6947.0 sq ft (net: 6947.0 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.8 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 3 | E70 (Cooper Notification) |

## Surfaces

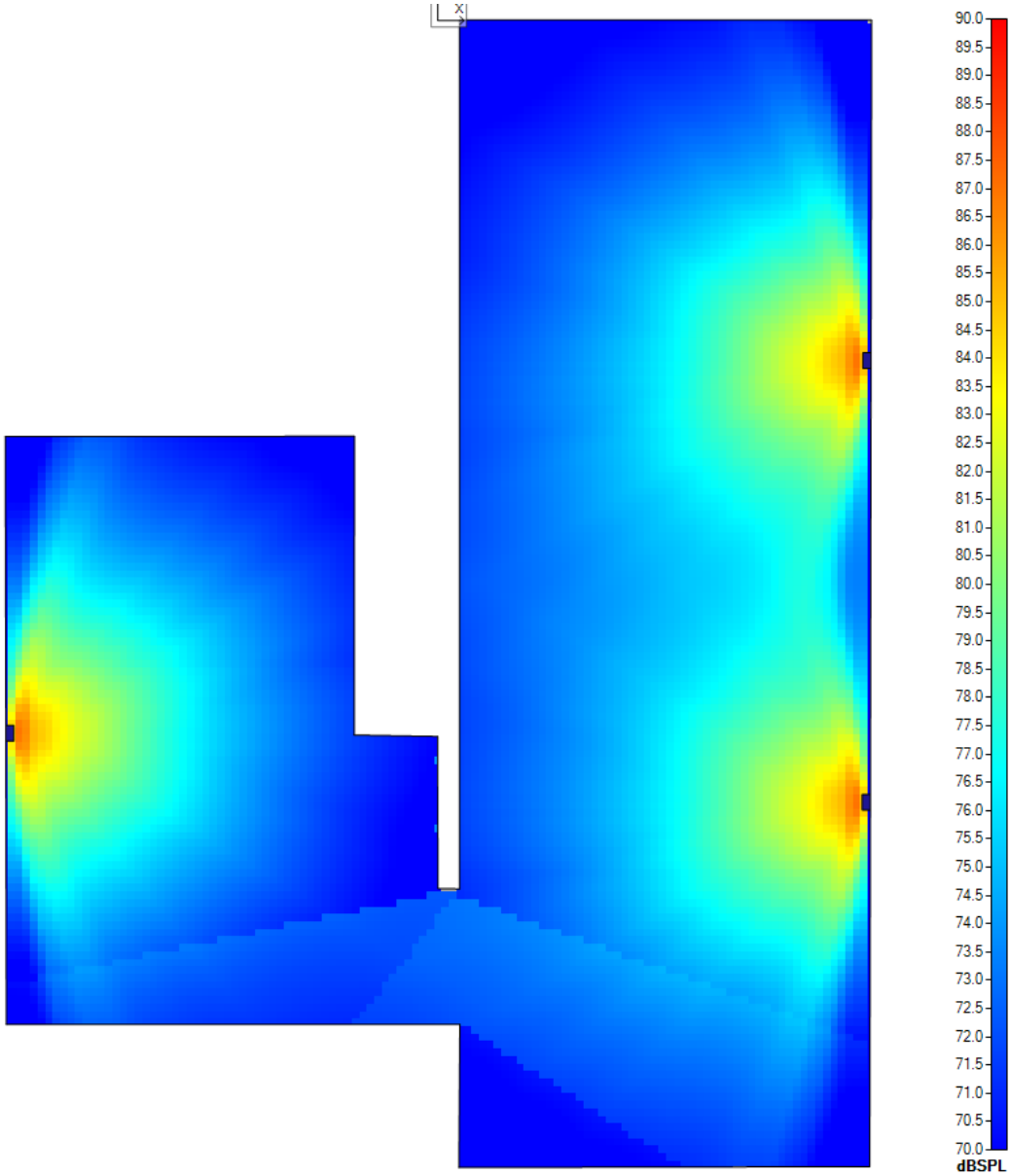
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1671.74 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1671.74 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 301.34 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 838.36 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 300.30 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 104.65 | Concrete, Painted, Wall or Floor |
| Wall #5 | Main Area | 331.59 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 429.95 | Concrete, Painted, Wall or Floor |
| Wall #7 | Main Area | 255.32 | Concrete, Painted, Wall or Floor |
| Wall #8 | Main Area | 218.56 | Concrete, Painted, Wall or Floor |
| Wall #9 | Main Area | 61.01 | Concrete, Painted, Wall or Floor |
| Wall #10 | Main Area | 111.18 | Concrete, Painted, Wall or Floor |
| Wall #11 | Main Area | 15.85 | Concrete, Painted, Wall or Floor |
| Wall #12 | Main Area | 635.37 | Concrete, Painted, Wall or Floor |

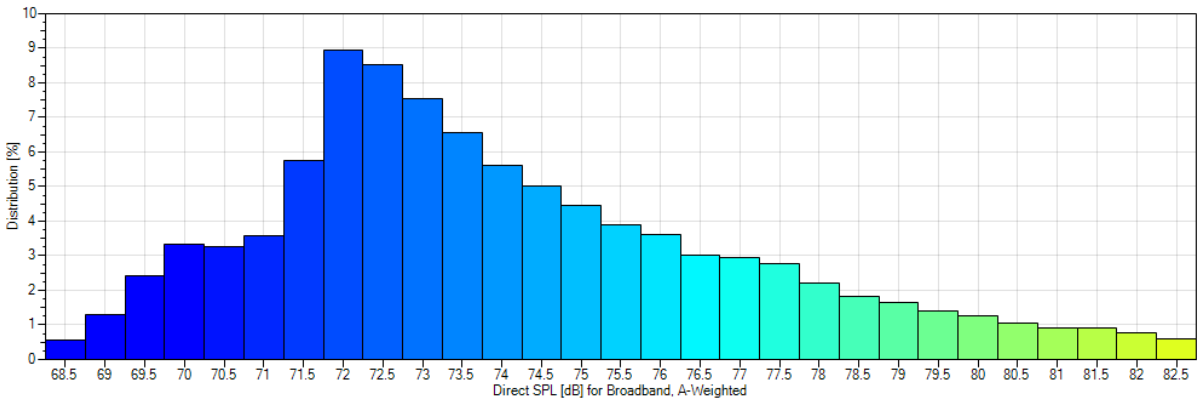
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 21.10 | -16.58 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 21.07 | -38.11 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 3 | Wall | E70 | -21.04 | -34.75 | 8.00 | 0.1 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



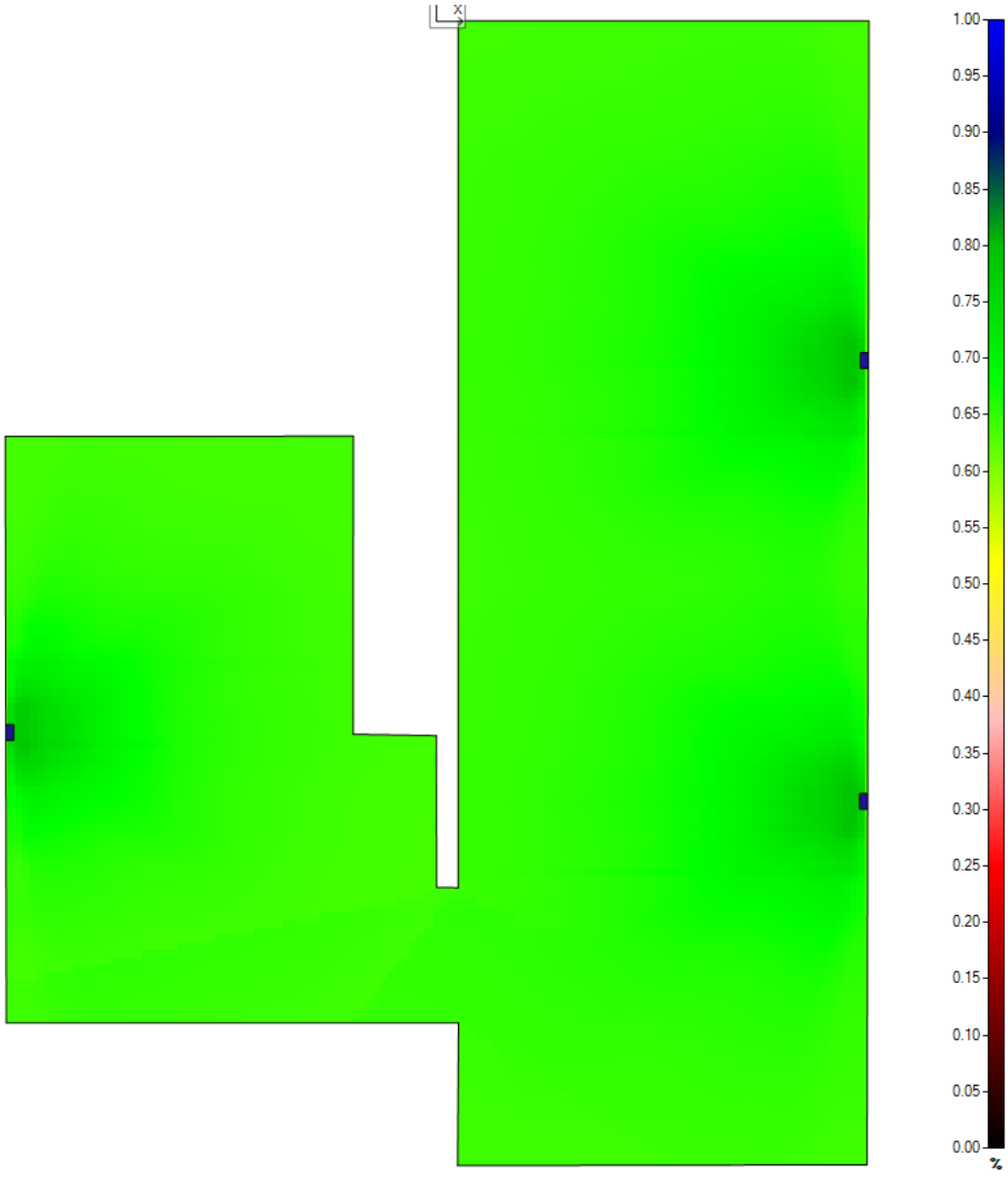

| | |
|---|---|
| **Average:** | **71.1 dB ±24.9 dB** |

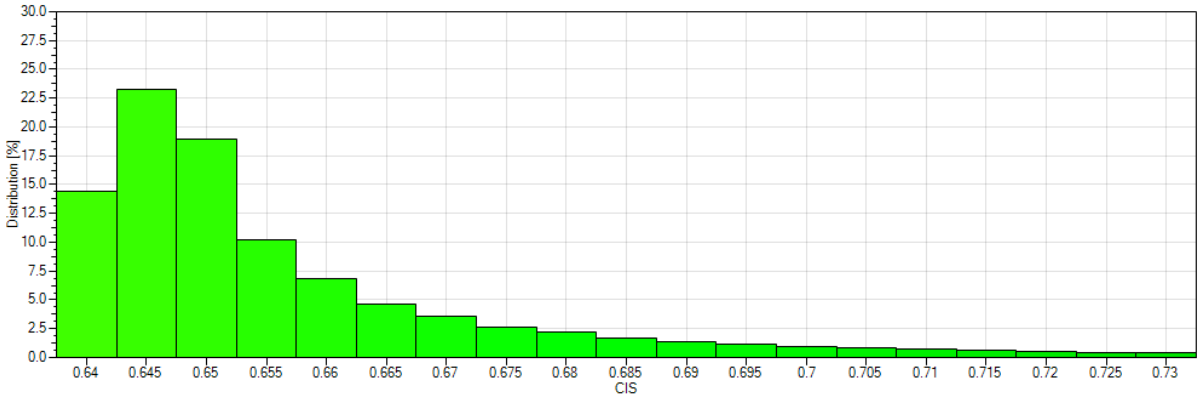
| | |
|---|---|
| **Average + Std. Dev.:** | **96.0 dB** |
| **Average - Std. Dev.:** | **46.2 dB** |
| **Max. Value:** | **87.0 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **12926** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥69.5 dB | 74.5 dB |
| 90% | ≥70.3 dB | 74.7 dB |
| 85% | ≥71.1 dB | 74.9 dB |
| 80% | ≥71.6 dB | 75.2 dB |

# Additional Mappings

## CIS

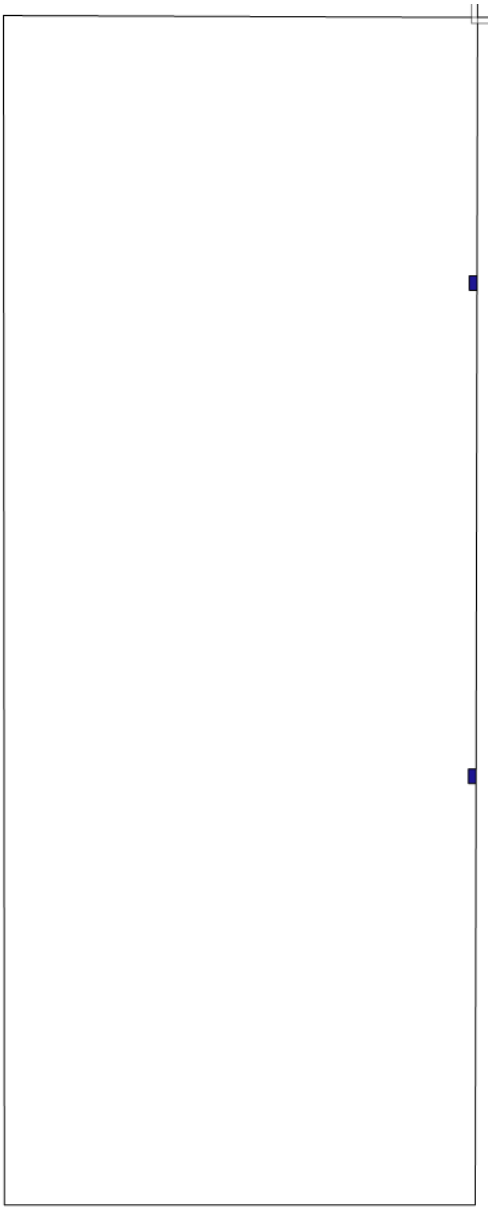





| | |
|---|---|
| **Average:** | **0.66 ±0.02** |
| **Average + Std. Dev.:** | **0.68** |
| **Average - Std. Dev.:** | **0.63** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.63** |
| **Data Points:** | **12926** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.64** | **0.66** |
| **90%** | **≥0.64** | **0.66** |
| **85%** | **≥0.64** | **0.66** |
| **80%** | **≥0.64** | **0.66** |

# Room: Basement B48



| | |
|---|---|
| **Label:** | **Basement B48** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **17.57 ft x 44.15 ft** |
| **Volume:** | **7724.4 cb ft (net: 7724.4 cb ft)** |
| **Surface Area:** | **2777.3 sq ft (net: 2777.3 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 2 | E70 (Cooper Notification) |

## Surfaces

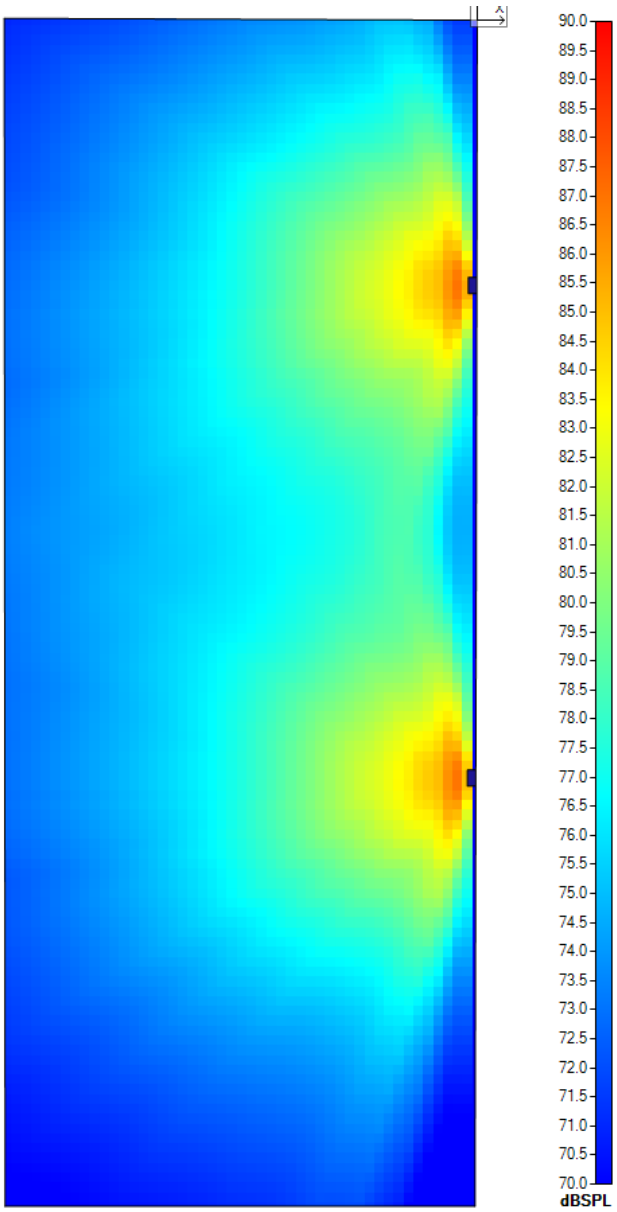
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 772.44 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 772.44 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 440.76 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 174.52 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 441.49 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 175.69 | Steel, Wall, Floor, or Ceiling |

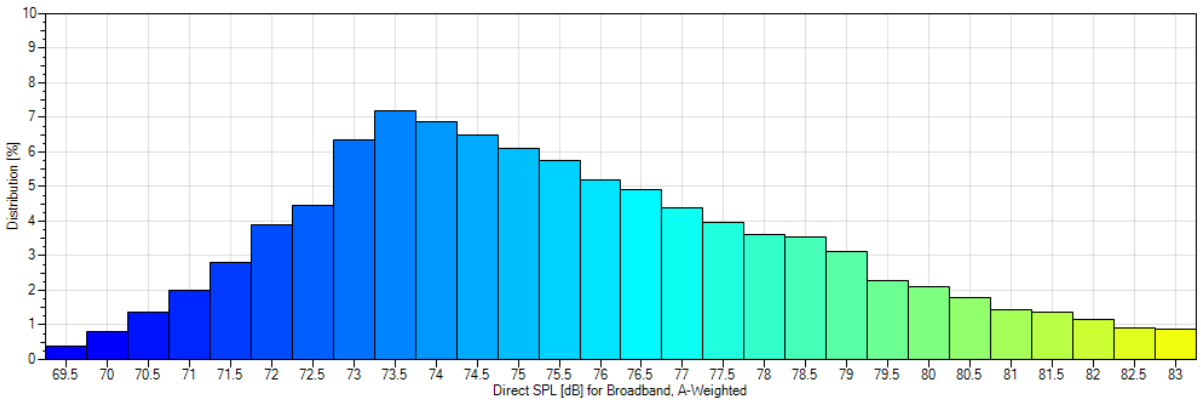
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | -0.03 | -9.86 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | -0.07 | -28.17 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



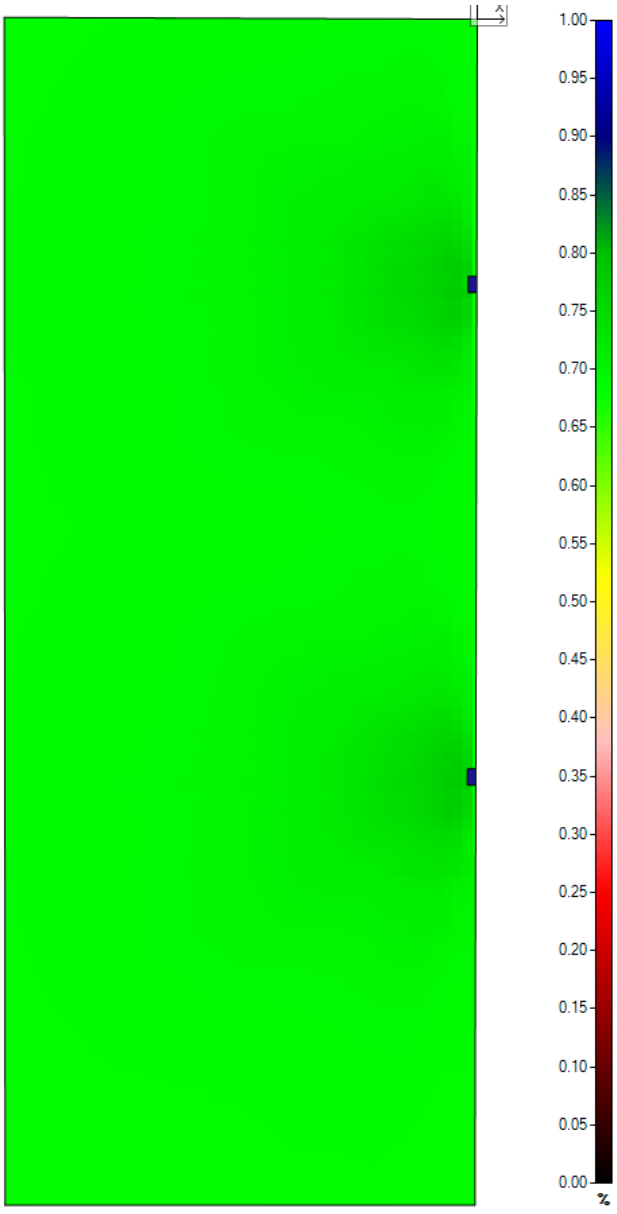

| | |
|---|---|
| **Average:** | **71.8 dB ±27.6 dB** |

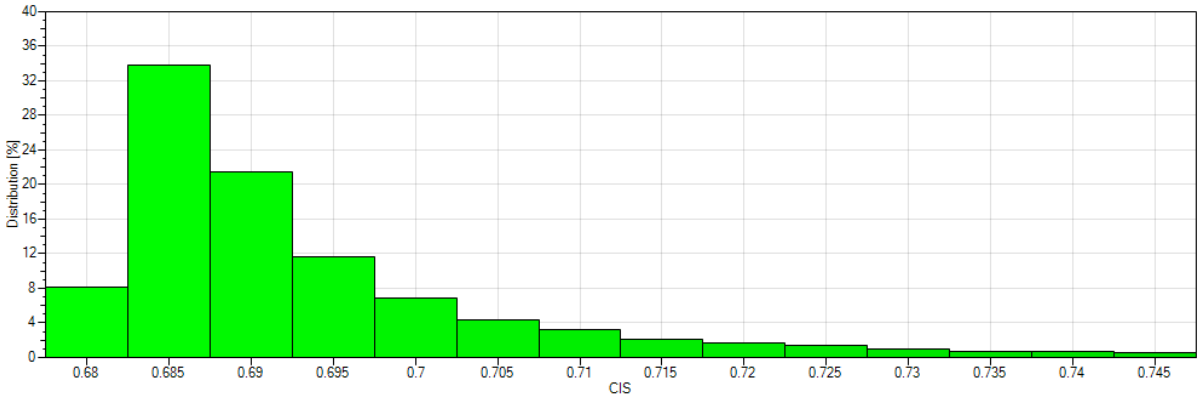
| | |
|---|---|
| **Average + Std. Dev.:** | **99.4 dB** |
| **Average - Std. Dev.:** | **44.2 dB** |
| **Max. Value:** | **87.0 dB** |
| **Min. Value:** | **-126.6 dB** |
| **Data Points:** | **5978** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥70.7 dB** | **75.9 dB** |
| **90%** | **≥71.8 dB** | **76.2 dB** |
| **85%** | **≥72.4 dB** | **76.4 dB** |
| **80%** | **≥72.9 dB** | **76.7 dB** |

# Additional Mappings

## CIS

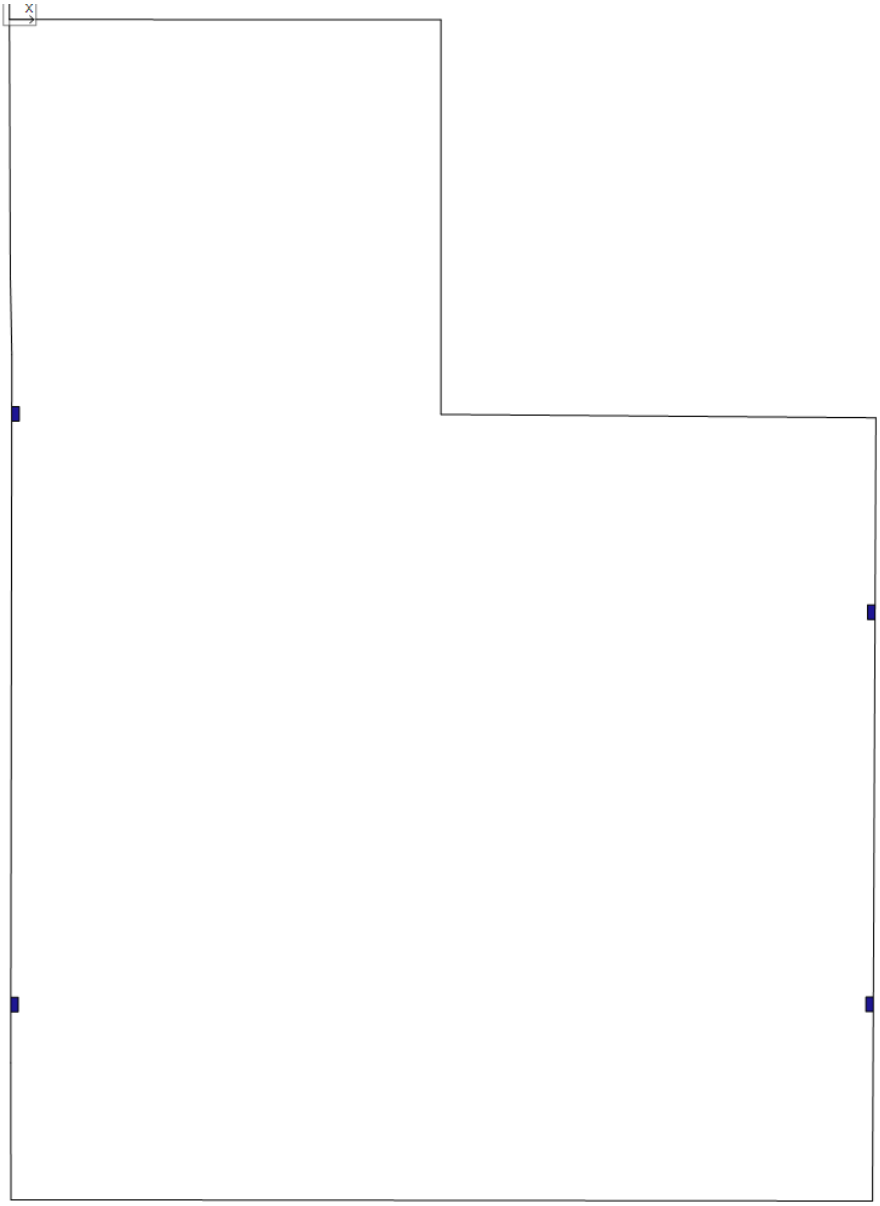





| | |
|---|---|
| **Average:** | **0.69 ±0.02** |
| **Average + Std. Dev.:** | **0.71** |
| **Average - Std. Dev.:** | **0.68** |
| **Max. Value:** | **0.78** |
| **Min. Value:** | **0.68** |
| **Data Points:** | **5978** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.68** | **0.70** |
| **90%** | **≥0.68** | **0.70** |
| **85%** | **≥0.68** | **0.70** |
| **80%** | **≥0.68** | **0.70** |

# Room: Basement B59



| | |
|---|---|
| **Label:** | **Basement B59** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **48.53 ft x 66.17 ft** |
| **Volume:** | **26585.8 cb ft (net: 26585.8 cb ft)** |
| **Surface Area:** | **7605.7 sq ft (net: 7605.7 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **1.3 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 4 | E70 (Cooper Notification) |

## Surfaces

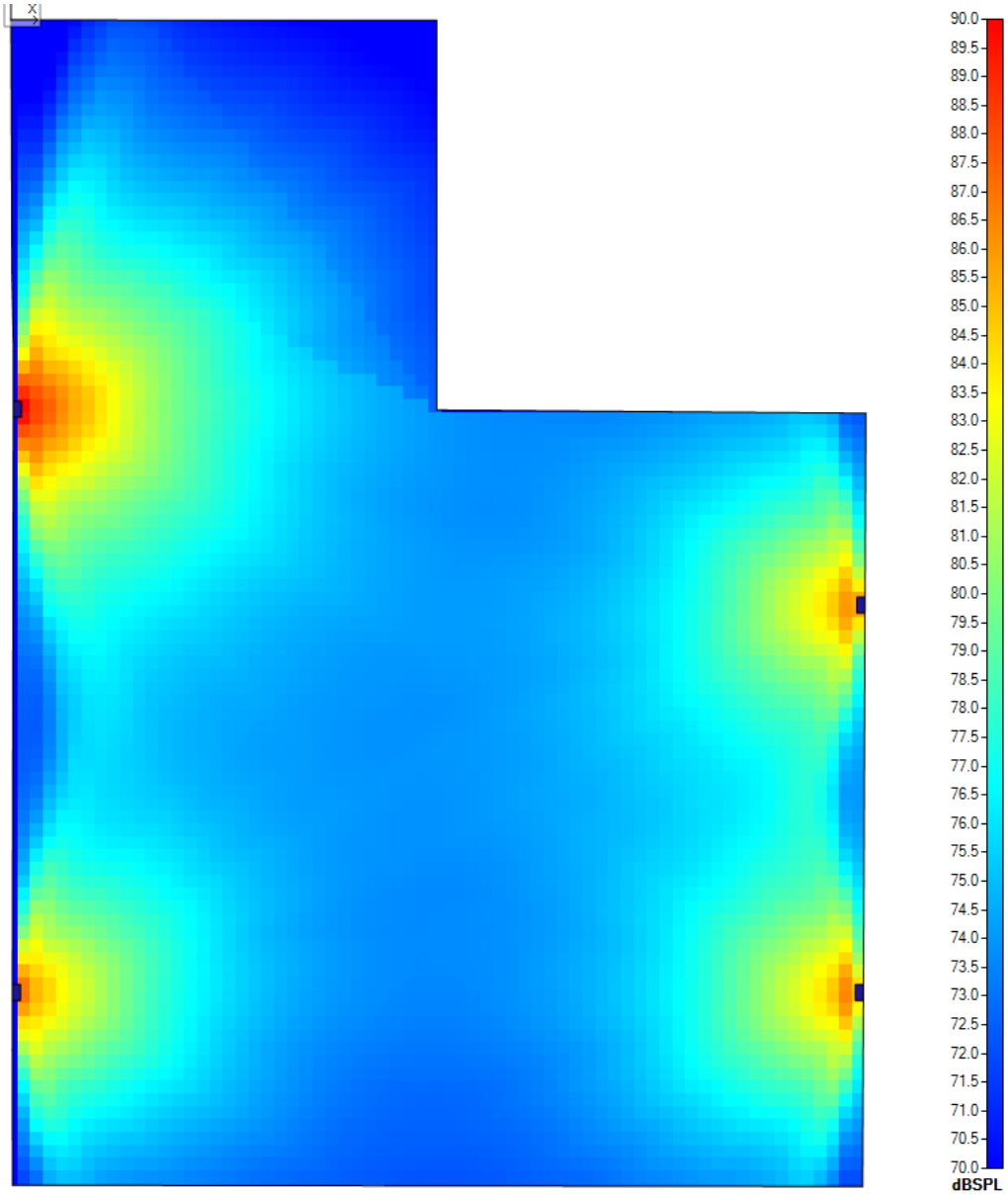
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 2658.58 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 2658.58 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 241.72 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 221.04 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 243.59 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 438.64 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 482.60 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 76.76 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 396.40 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 44.13 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 143.65 | Steel, Wall, Floor, or Ceiling |

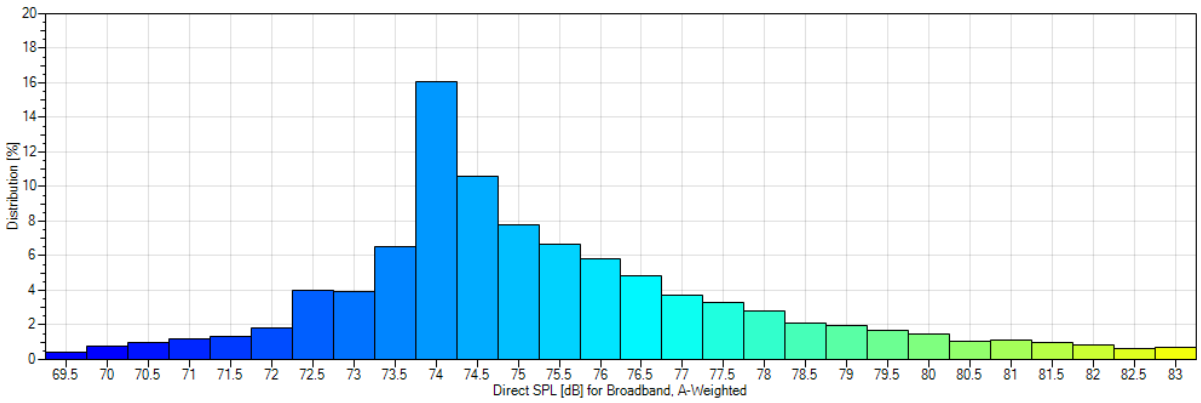
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 0.14 | -22.08 | 8.00 | -0.1 | 0.0 | 1/2 W (70V) |
| 2 | Wall | E70 | 0.09 | -55.16 | 8.00 | -0.1 | 0.0 | 1/4 W (70V) |
| 3 | Wall | E70 | 48.47 | -33.19 | 8.00 | 179.8 | 0.0 | 1/4 W (70V) |
| 4 | Wall | E70 | 48.38 | -55.16 | 8.00 | 179.8 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



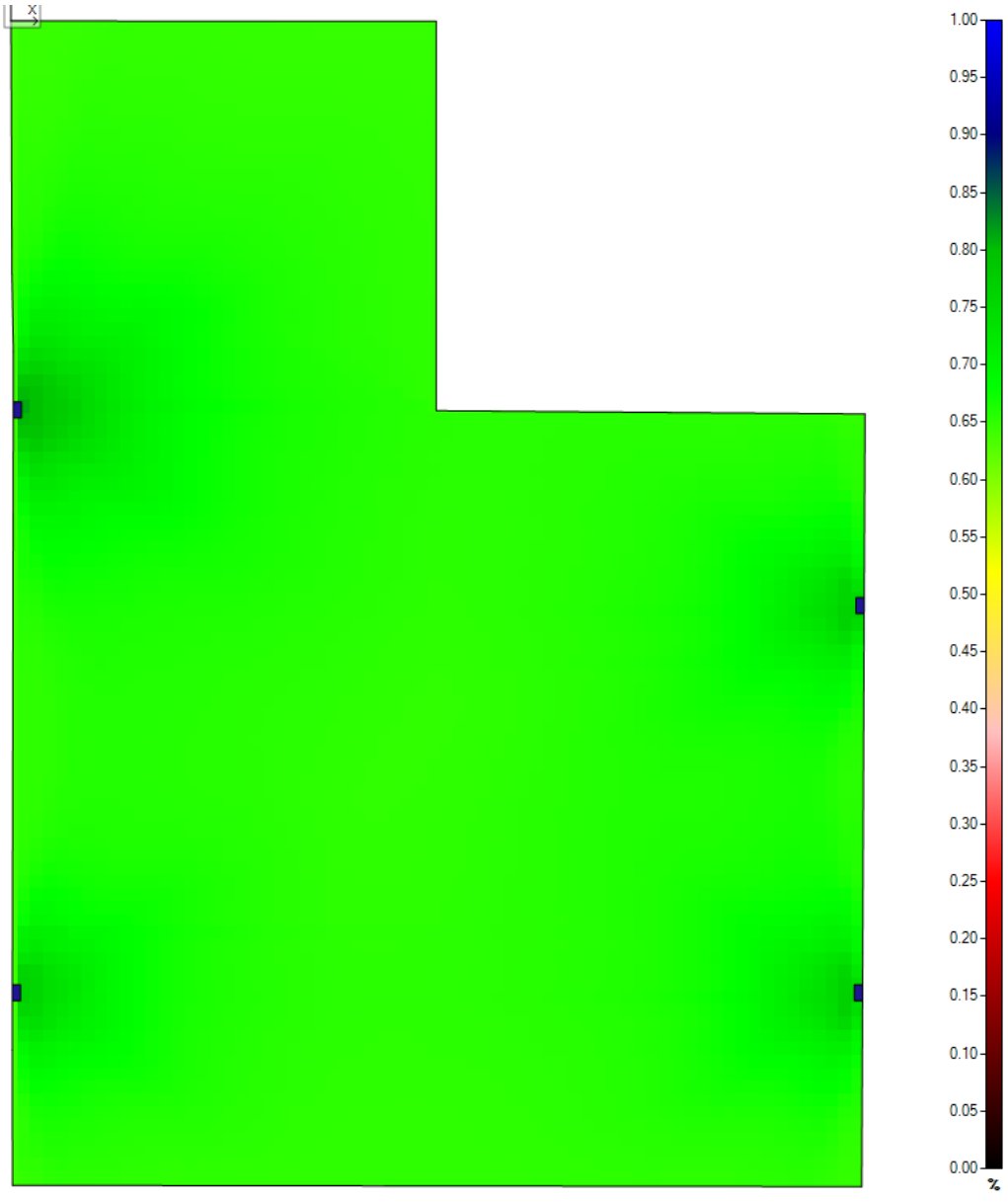

| | |
|---|---|
| **Average:** | **75.3 dB ±3.3 dB** |

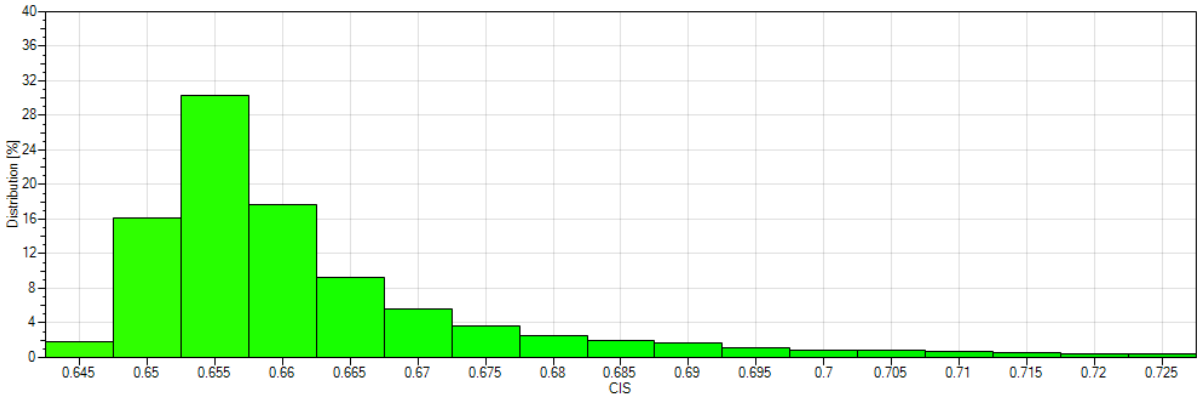
| | |
|---|---|
| **Average + Std. Dev.:** | **78.6 dB** |
| **Average - Std. Dev.:** | **72.0 dB** |
| **Max. Value:** | **89.8 dB** |
| **Min. Value:** | **57.8 dB** |
| **Data Points:** | **5189** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥70.9 dB | 75.7 dB |
| 90% | ≥72.4 dB | 75.9 dB |
| 85% | ≥73.0 dB | 76.1 dB |
| 80% | ≥73.6 dB | 76.3 dB |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.66 ±0.02** |
| **Average + Std. Dev.:** | **0.68** |
| **Average - Std. Dev.:** | **0.64** |
| **Max. Value:** | **0.81** |
| **Min. Value:** | **0.64** |
| **Data Points:** | **5189** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.65** | **0.66** |
| **90%** | **≥0.65** | **0.67** |
| **85%** | **≥0.65** | **0.67** |
| **80%** | **≥0.65** | **0.67** |

# NIST B220 SUB-BASEMENT

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

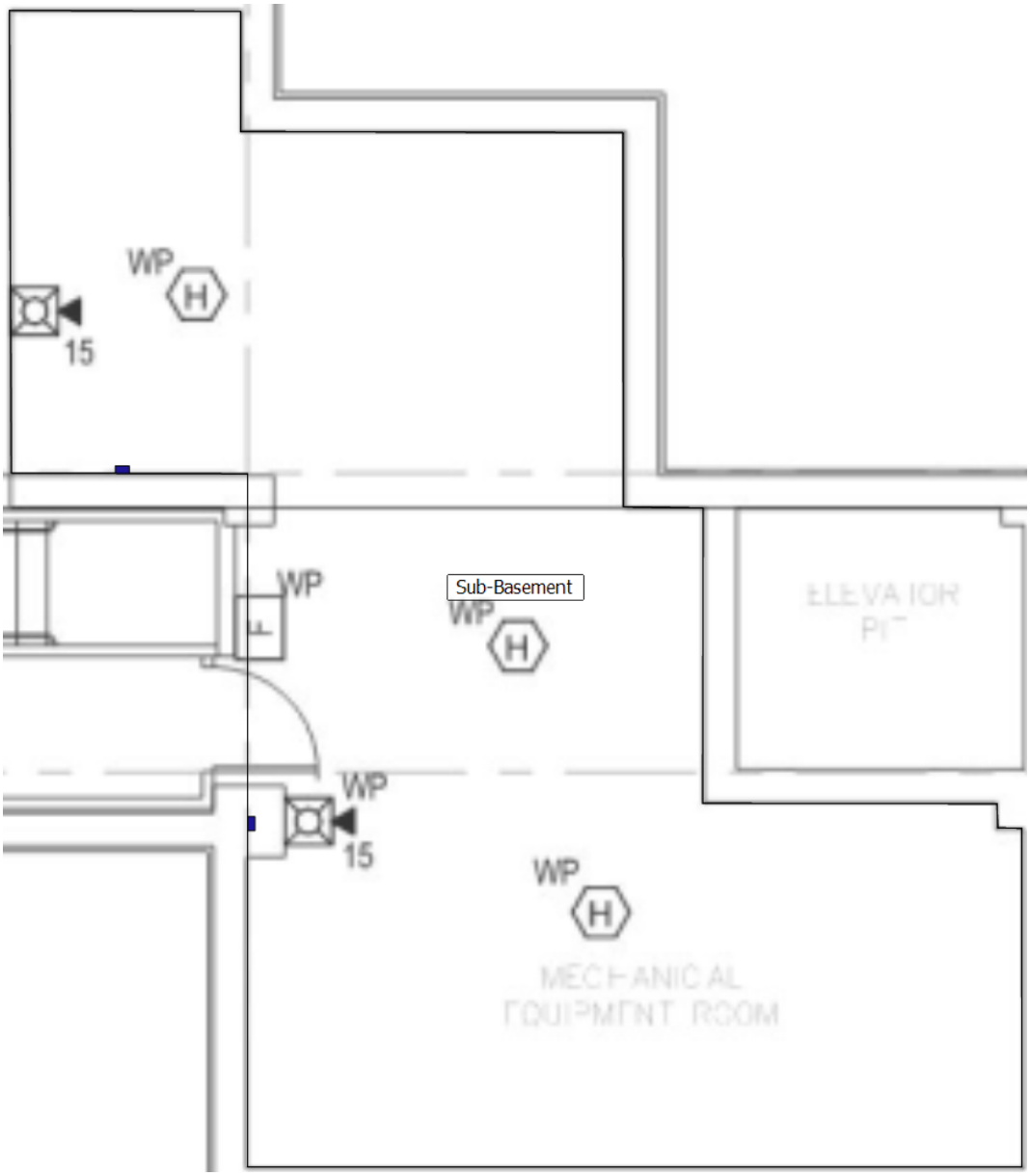
# Project Information

| | |
|---|---|
| **Title:** | **NIST B220 SUB-BASEMENT** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

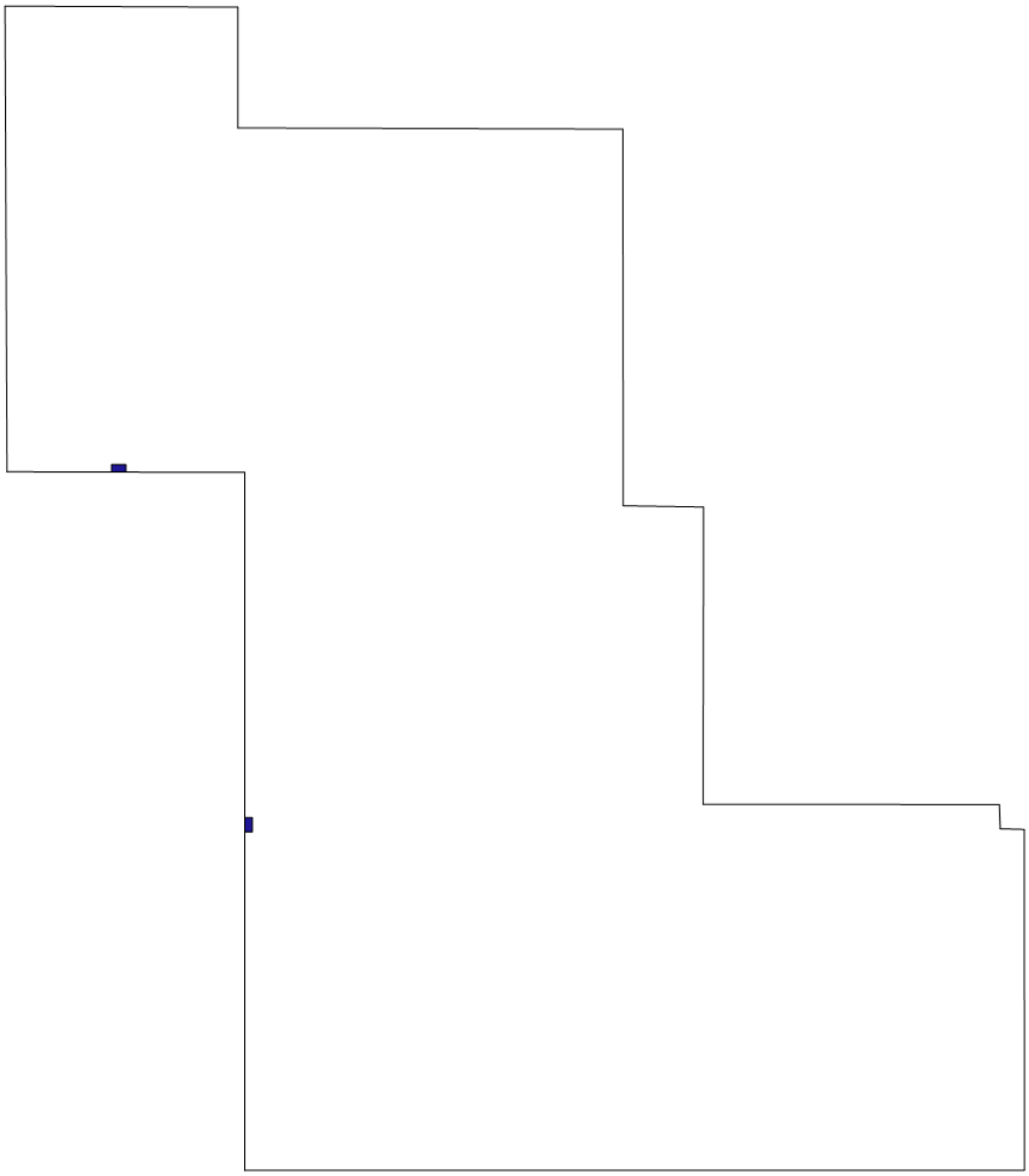
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **2** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Sub-Basement



| | |
|---|---|
| **Label:** | **Sub-Basement** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **30.91 ft x 35.30 ft** |
| **Volume:** | **6199.7 cb ft (net: 6199.7 cb ft)** |
| **Surface Area:** | **2561.5 sq ft (net: 2561.5 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 2 | E70 (Cooper Notification) |

## Surfaces

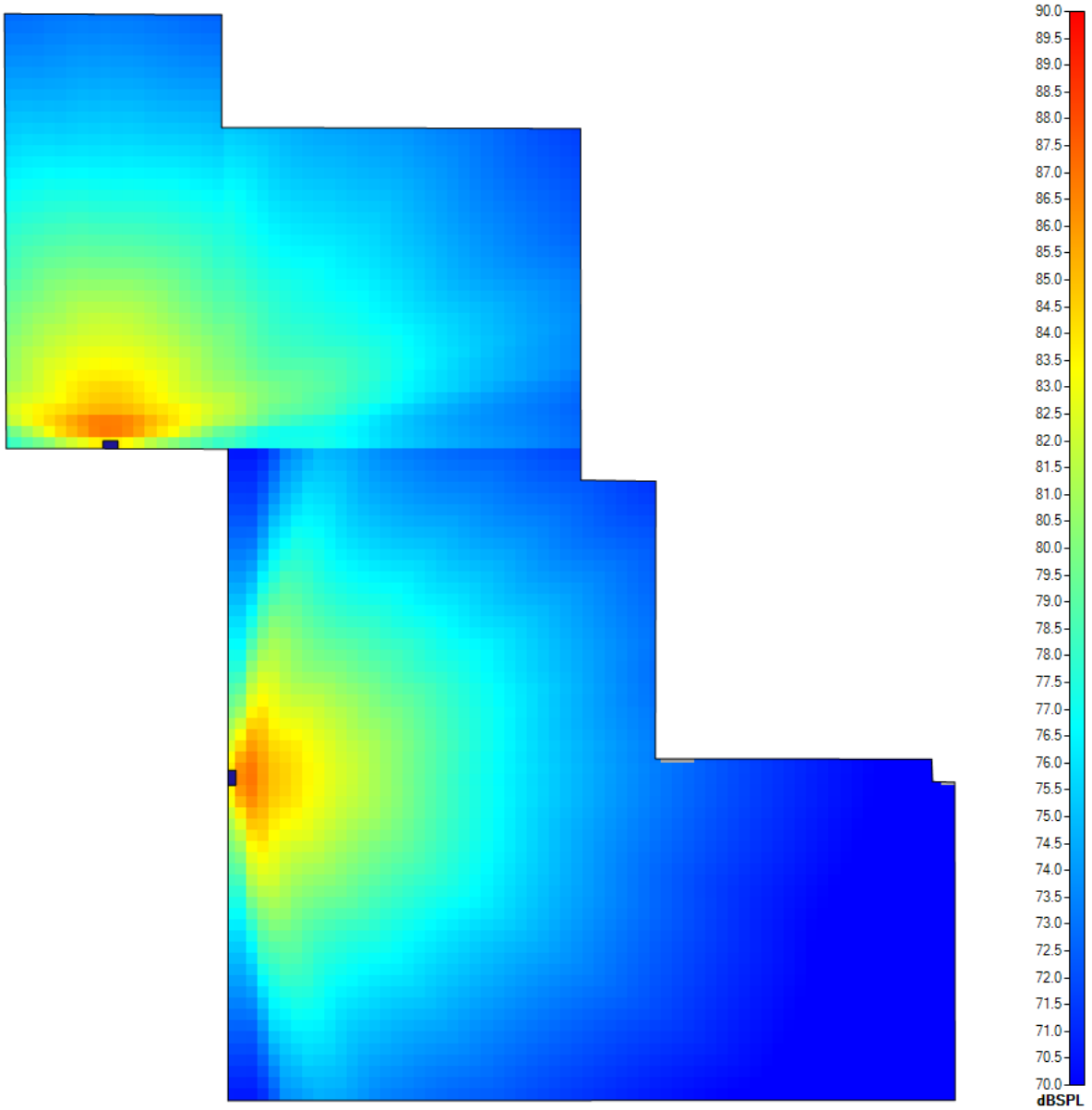
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 619.97 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 619.97 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 103.27 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 7.26 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 7.31 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 89.84 | Concrete, Painted, Wall or Floor |
| Wall #5 | Main Area | 90.10 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 24.36 | Concrete, Painted, Wall or Floor |
| Wall #7 | Main Area | 114.17 | Concrete, Painted, Wall or Floor |
| Wall #8 | Main Area | 116.68 | Concrete, Painted, Wall or Floor |
| Wall #9 | Main Area | 36.63 | Concrete, Painted, Wall or Floor |
| Wall #10 | Main Area | 70.63 | Concrete, Painted, Wall or Floor |
| Wall #11 | Main Area | 141.17 | Concrete, Painted, Wall or Floor |
| Wall #12 | Main Area | 72.13 | Concrete, Painted, Wall or Floor |
| Wall #13 | Main Area | 211.59 | Concrete, Painted, Wall or Floor |
| Wall #14 | Main Area | 236.45 | Concrete, Painted, Wall or Floor |

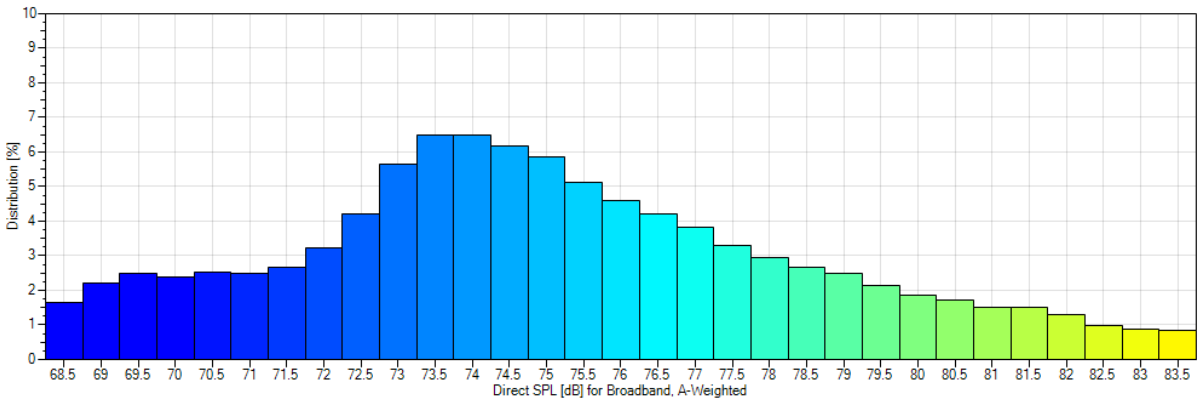
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 144.33 | 53.27 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 140.50 | 63.97 | 8.00 | 89.8 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



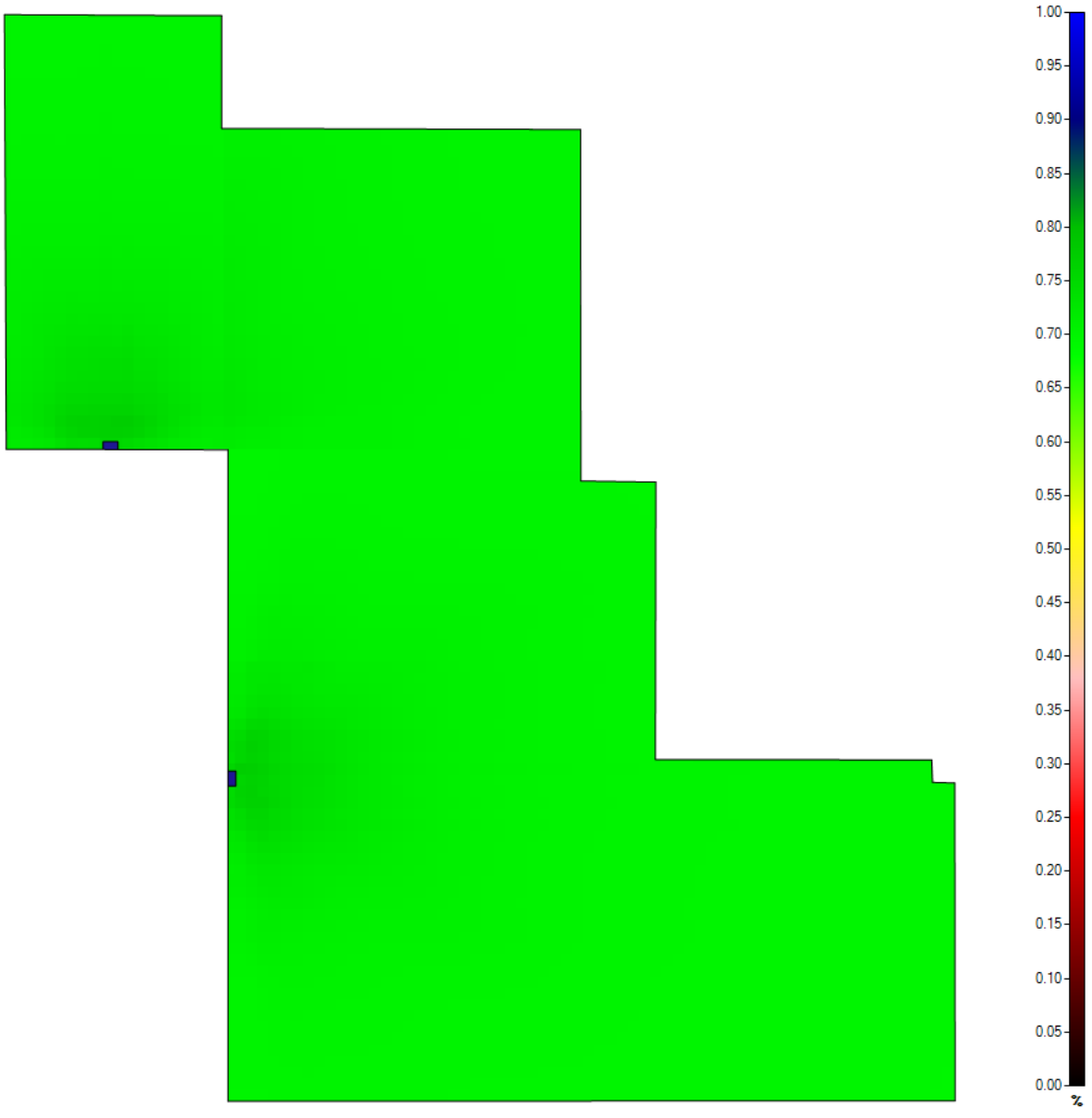

| | |
|---|---|
| **Average:** | **73.8 dB ±17.3 dB** |

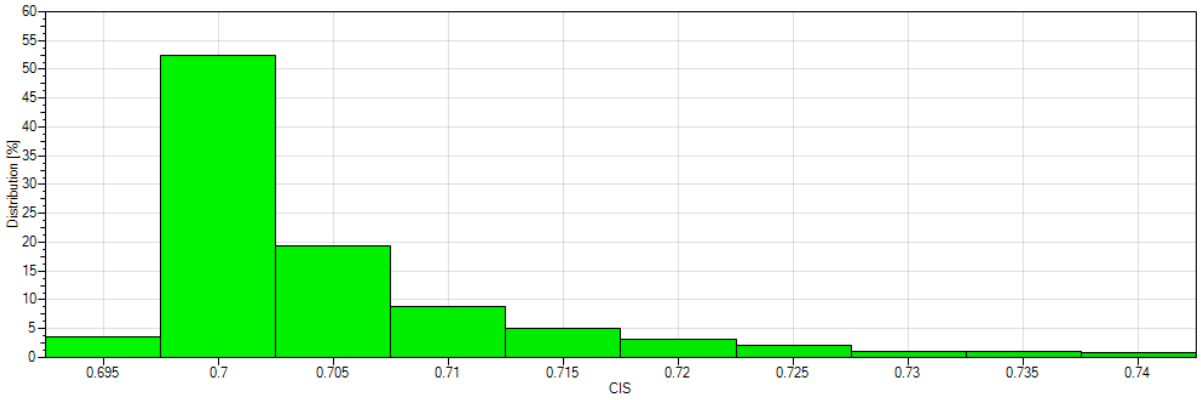
| | |
|---|---|
| **Average + Std. Dev.:** | **91.1 dB** |
| **Average - Std. Dev.:** | **56.5 dB** |
| **Max. Value:** | **86.9 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **4928** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥69.1 dB | 75.5 dB |
| 90% | ≥70.2 dB | 75.8 dB |
| 85% | ≥71.2 dB | 76.1 dB |
| 80% | ≥72.1 dB | 76.4 dB |

## Additional Mappings

### CIS






| | |
|---|---|
| **Average:** | **0.71 ±0.01** |
| **Average + Std. Dev.:** | **0.72** |
| **Average - Std. Dev.:** | **0.69** |
| **Max. Value:** | **0.77** |
| **Min. Value:** | **0.70** |
| **Data Points:** | **4928** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.70** | **0.71** |
| **90%** | **≥0.70** | **0.71** |
| **85%** | **≥0.70** | **0.71** |
| **80%** | **≥0.70** | **0.71** |

# NIST B220 THIRD FLOOR UNIQUE ROOMS

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

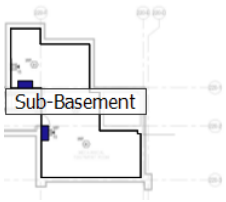
# Project Information

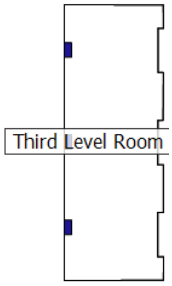
| | |
|---|---|
| **Title:** | **NIST B220 THIRD FLOOR UNIQUE ROOMS** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

## Sound Sources Summary

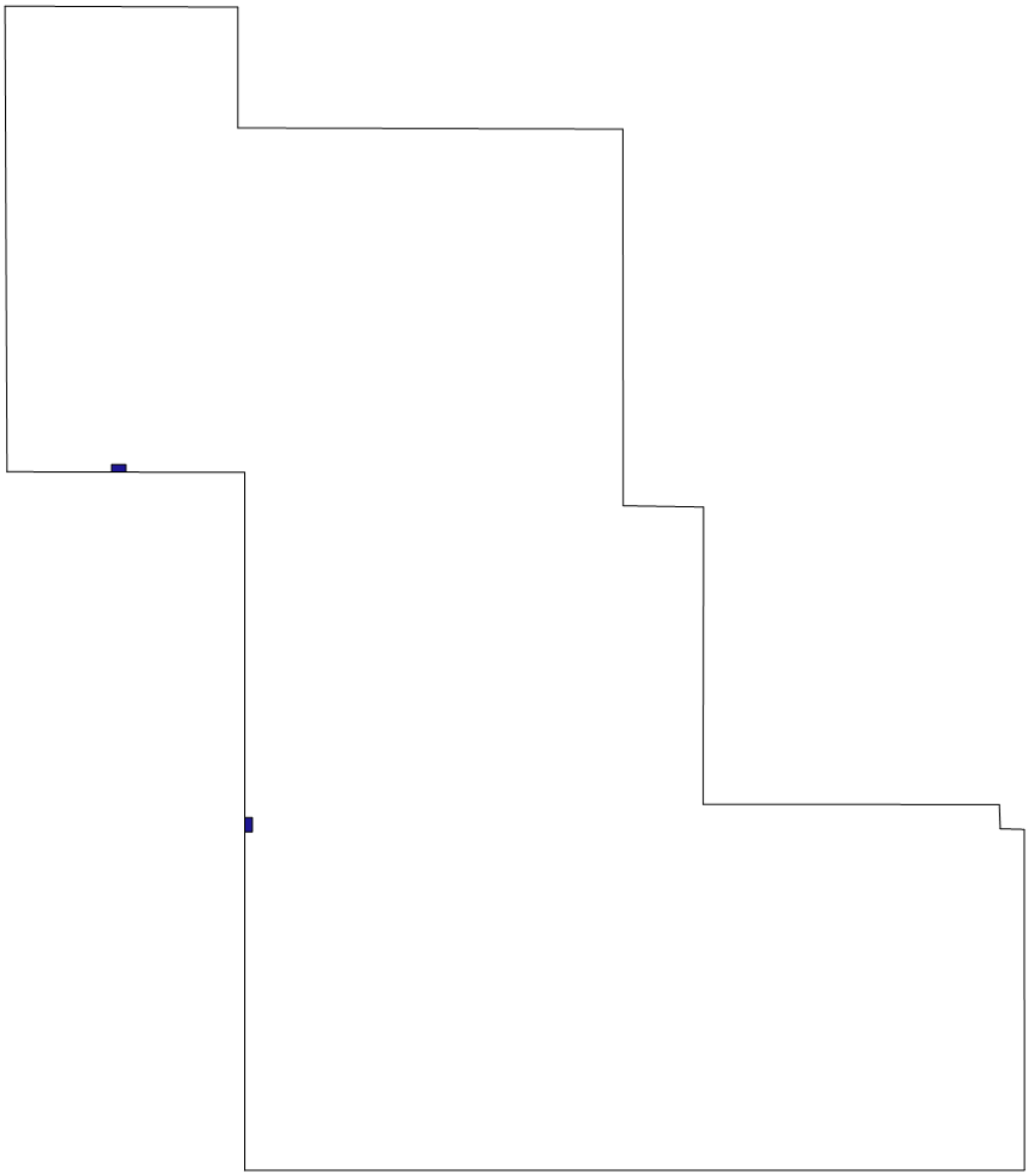
| Quantity | Type |
|---|---|
| **5** | **E70 (Cooper Notification)** |

## Layout Overview





# Room: Sub-Basement



| | |
|---|---|
| **Label:** | **Sub-Basement** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **30.91 ft x 35.30 ft** |
| **Volume:** | **6199.7 cb ft (net: 6199.7 cb ft)** |
| **Surface Area:** | **2561.5 sq ft (net: 2561.5 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 2 | E70 (Cooper Notification) |

## Surfaces

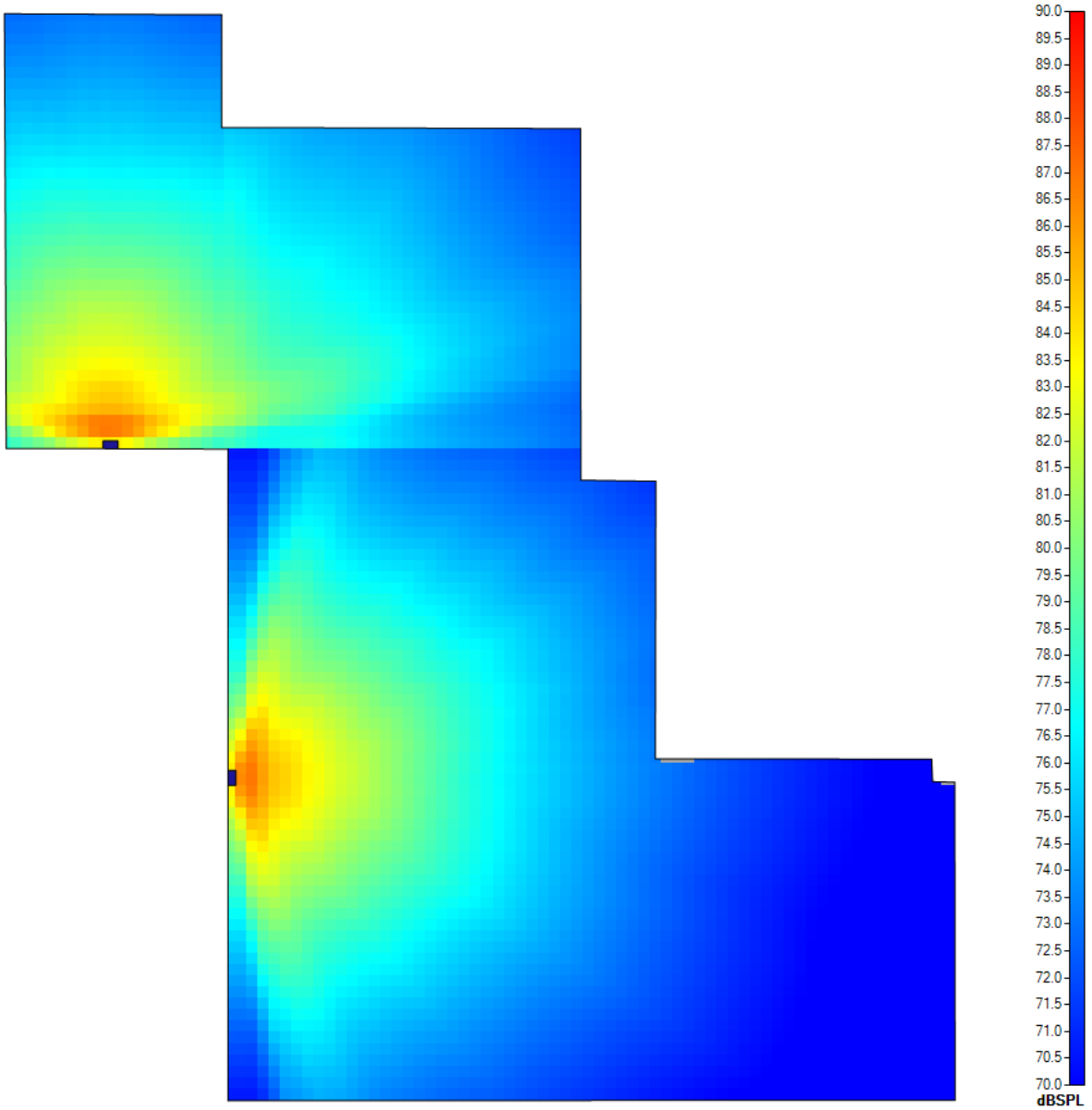
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 619.97 | Steel, Wall, Floor, or Ceiling |
| Ceiling | Main Area | 619.97 | Steel, Wall, Floor, or Ceiling |
| Wall #1 | Main Area | 103.27 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 7.26 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 7.31 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 89.84 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 90.10 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 24.36 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 114.17 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 116.68 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 36.63 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 70.63 | Steel, Wall, Floor, or Ceiling |
| Wall #11 | Main Area | 141.17 | Steel, Wall, Floor, or Ceiling |
| Wall #12 | Main Area | 72.13 | Steel, Wall, Floor, or Ceiling |
| Wall #13 | Main Area | 211.59 | Steel, Wall, Floor, or Ceiling |
| Wall #14 | Main Area | 236.45 | Steel, Wall, Floor, or Ceiling |

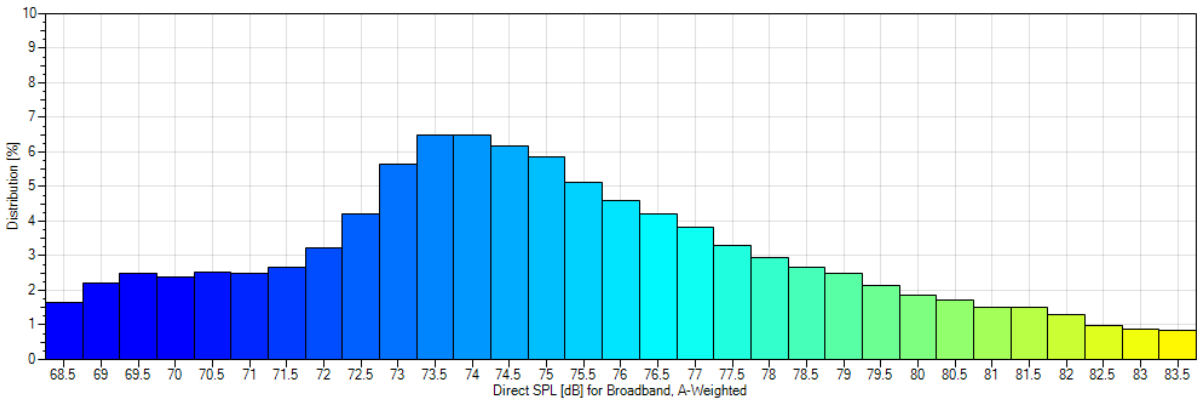
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 144.33 | 53.27 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 140.50 | 63.97 | 8.00 | 89.8 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



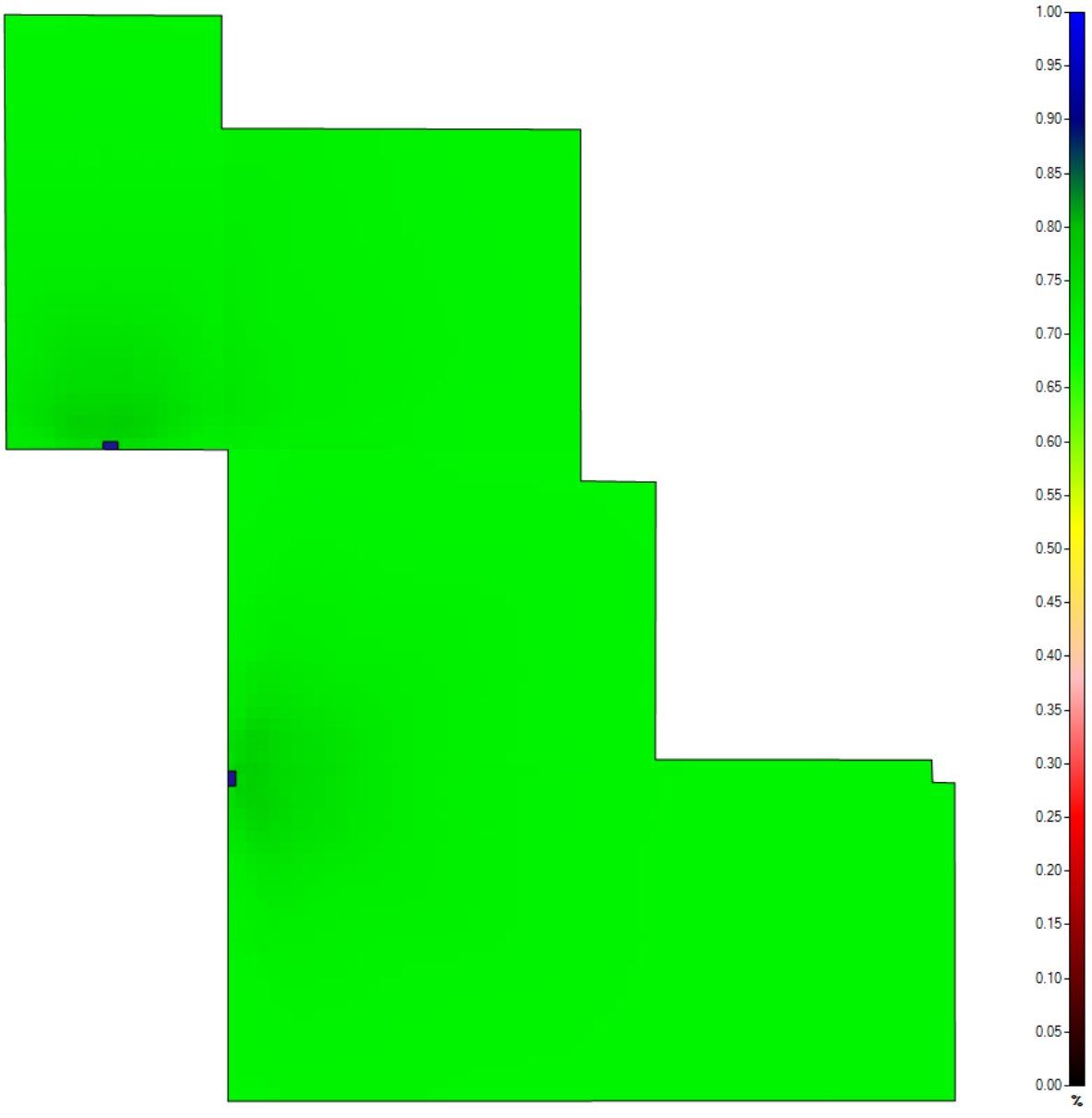

| | |
|---|---|
| **Average:** | **73.8 dB ±17.3 dB** |

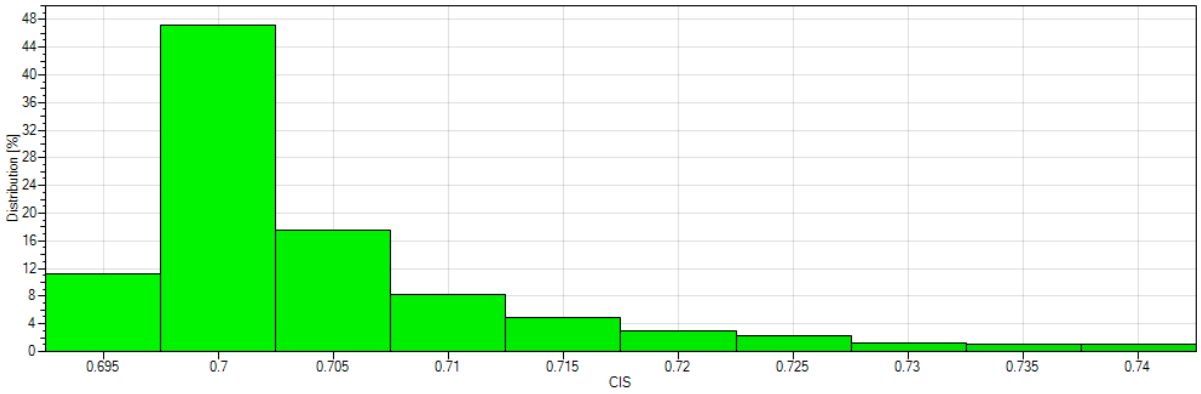
| | |
|---|---|
| **Average + Std. Dev.:** | **91.1 dB** |
| **Average - Std. Dev.:** | **56.5 dB** |
| **Max. Value:** | **86.9 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **4928** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥69.1 dB | 75.5 dB |
| 90% | ≥70.2 dB | 75.8 dB |
| 85% | ≥71.2 dB | 76.1 dB |
| 80% | ≥72.1 dB | 76.4 dB |

## Additional Mappings

### CIS

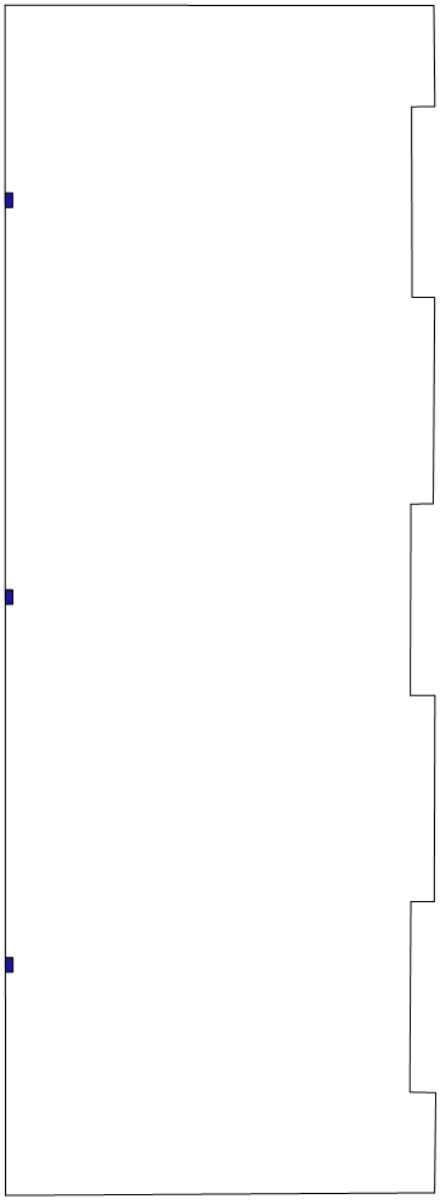





| | |
|---|---|
| **Average:** | **0.71 ±0.01** |
| **Average + Std. Dev.:** | **0.72** |
| **Average - Std. Dev.:** | **0.69** |
| **Max. Value:** | **0.77** |
| **Min. Value:** | **0.70** |
| **Data Points:** | **4928** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.70** | **0.71** |
| **90%** | **≥0.70** | **0.71** |
| **85%** | **≥0.70** | **0.71** |
| **80%** | **≥0.70** | **0.71** |

# Room: Third Level Room B341



| | |
|---|---|
| **Label:** | **Third Level Room B341** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.63 ft x 65.35 ft** |
| **Volume:** | **14960.8 cb ft (net: 14960.8 cb ft)** |
| **Surface Area:** | **4845.3 sq ft (net: 4845.3 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.8 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 3 | E70 (Cooper Notification) |

## Surfaces

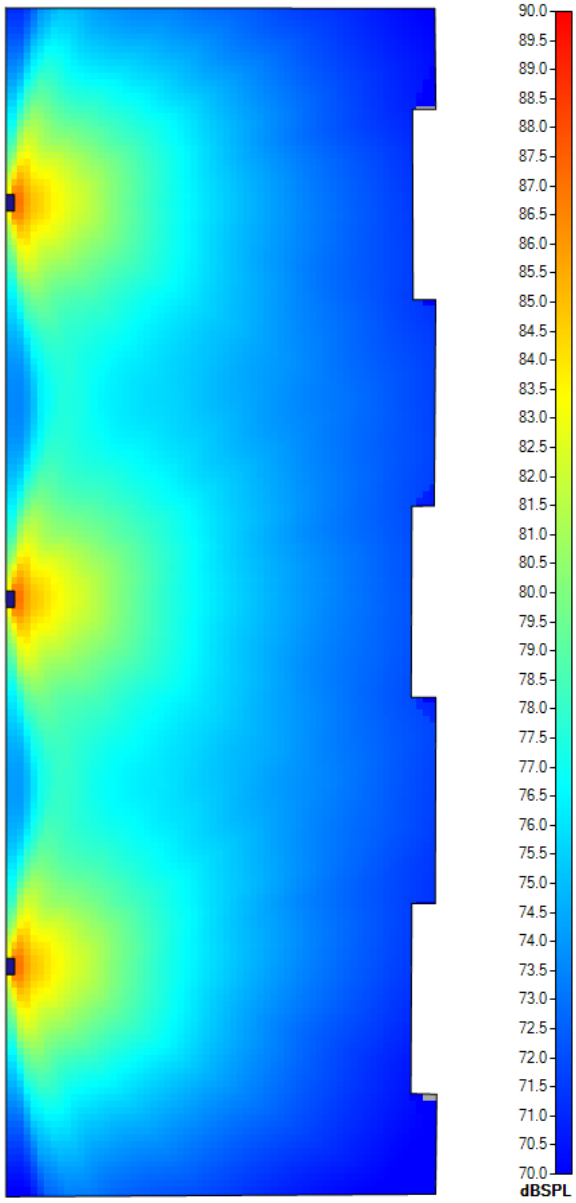
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1496.08 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1496.08 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 653.47 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 235.47 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 54.92 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 14.20 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 104.48 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 12.83 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 113.26 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 13.54 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 104.98 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 12.27 | Steel, Wall, Floor, or Ceiling |
| Wall #11 | Main Area | 113.24 | Steel, Wall, Floor, or Ceiling |
| Wall #12 | Main Area | 12.41 | Steel, Wall, Floor, or Ceiling |
| Wall #13 | Main Area | 104.65 | Steel, Wall, Floor, or Ceiling |
| Wall #14 | Main Area | 12.78 | Steel, Wall, Floor, or Ceiling |
| Wall #15 | Main Area | 55.39 | Steel, Wall, Floor, or Ceiling |
| Wall #16 | Main Area | 235.25 | Steel, Wall, Floor, or Ceiling |

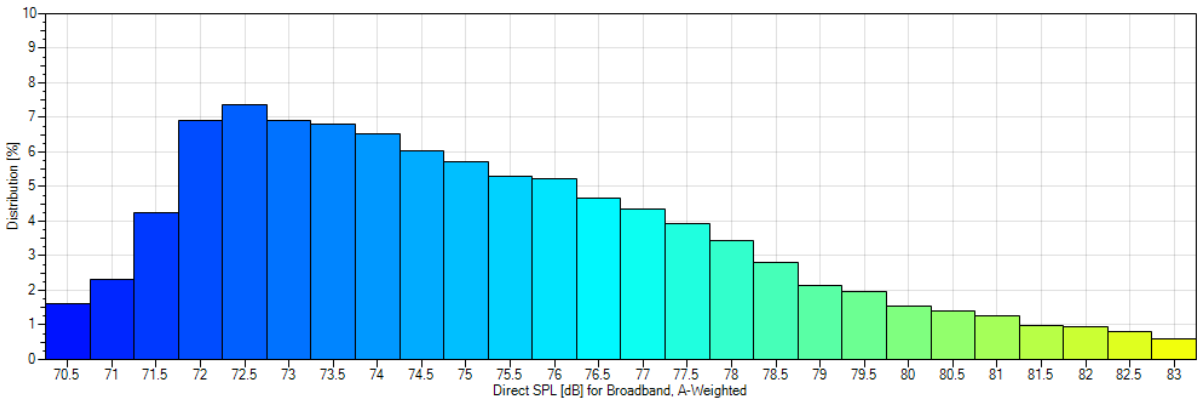
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 48.41 | 46.58 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 48.41 | 66.77 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |
| 3 | Wall | E70 | 48.40 | 88.56 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



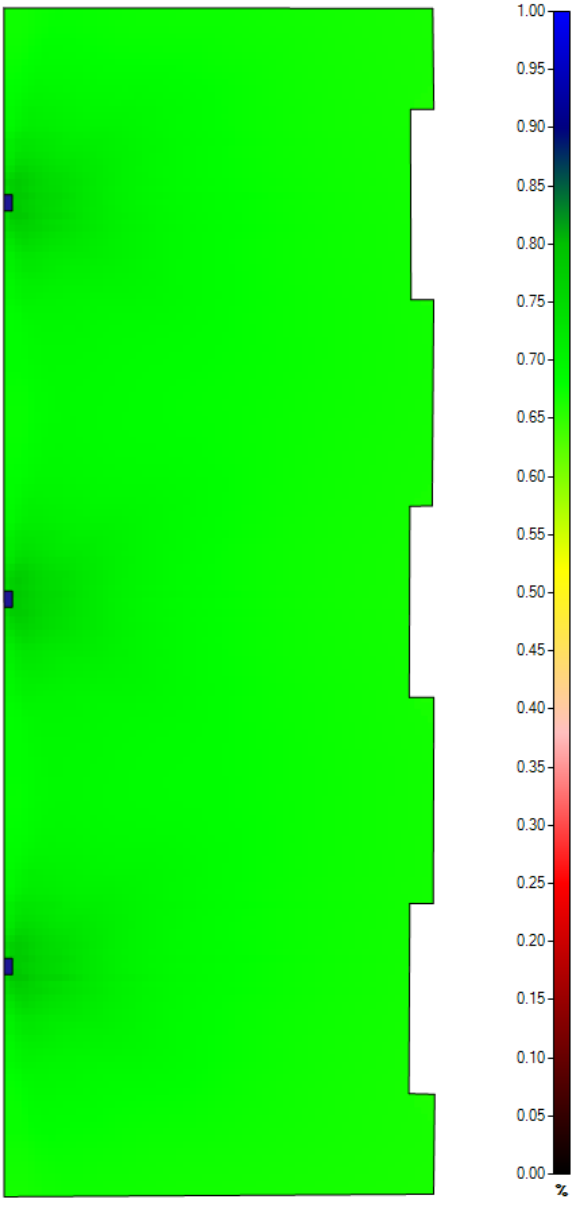

| | |
|---|---|
| **Average:** | **74.0 dB ±15.9 dB** |

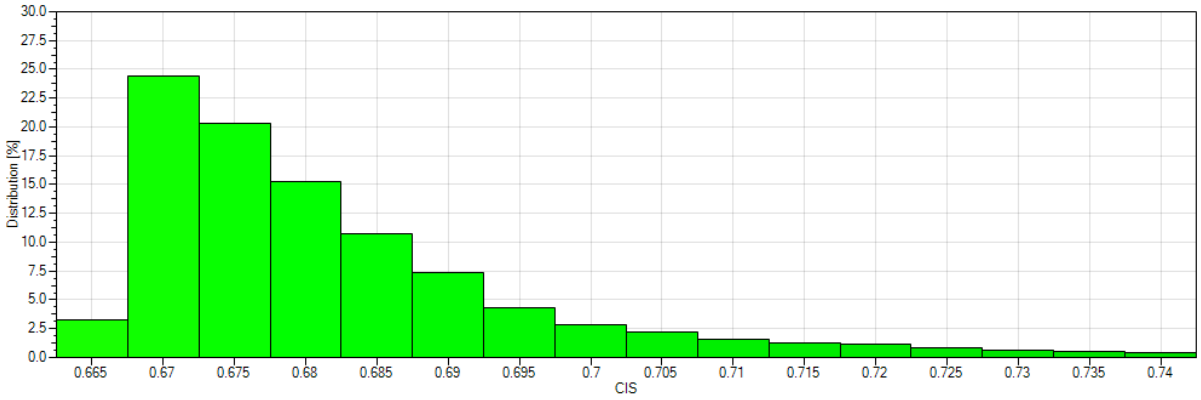
| | |
|---|---|
| **Average + Std. Dev.:** | **90.0 dB** |
| **Average - Std. Dev.:** | **58.1 dB** |
| **Max. Value:** | **87.1 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **11615** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥71.0 dB** | **75.5 dB** |
| **90%** | **≥71.7 dB** | **75.7 dB** |
| **85%** | **≥72.1 dB** | **75.9 dB** |
| **80%** | **≥72.4 dB** | **76.1 dB** |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.68 ±0.02** |
| **Average + Std. Dev.:** | **0.70** |
| **Average - Std. Dev.:** | **0.67** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.66** |
| **Data Points:** | **11615** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.67** | **0.68** |
| **90%** | **≥0.67** | **0.69** |
| **85%** | **≥0.67** | **0.69** |
| **80%** | **≥0.67** | **0.69** |

# NIST B221 Basement Unique Rooms

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

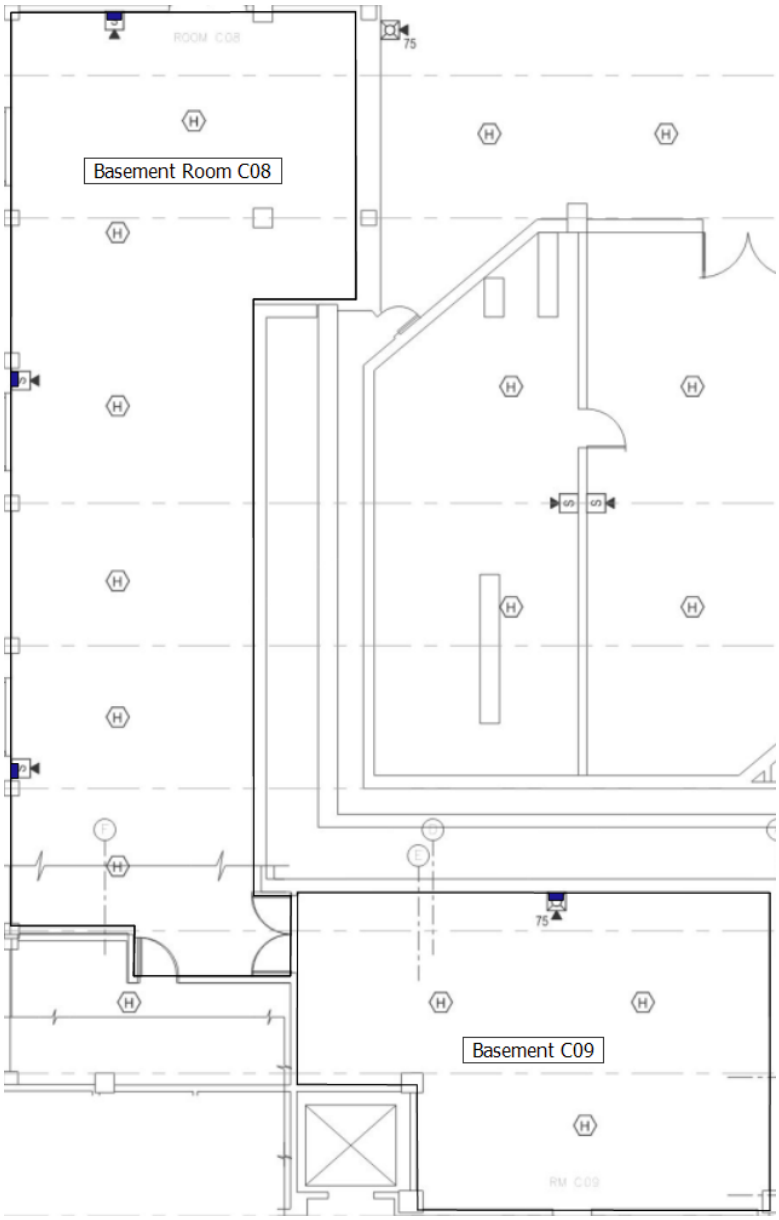
# Project Information

| | |
|---|---|
| **Title:** | **NIST B221 Basement Unique Rooms** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

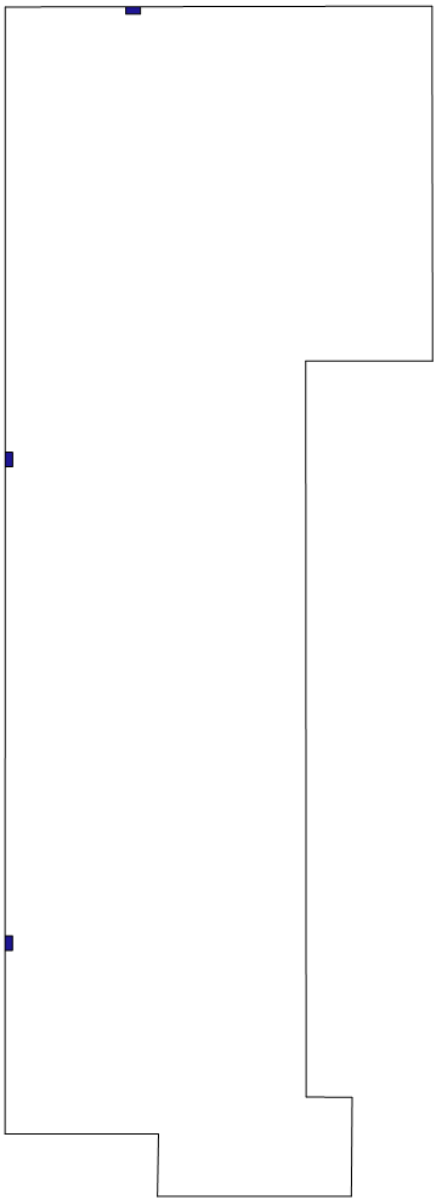
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **4** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Basement Room C08



| | |
|---|---|
| **Label:** | **Basement Room C08** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **26.75 ft x 74.66 ft** |
| **Volume:** | **15607.1 cb ft (net: 15607.1 cb ft)** |
| **Surface Area:** | **5206.3 sq ft (net: 5206.3 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **1.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 3 | E70 (Cooper Notification) |

## Surfaces

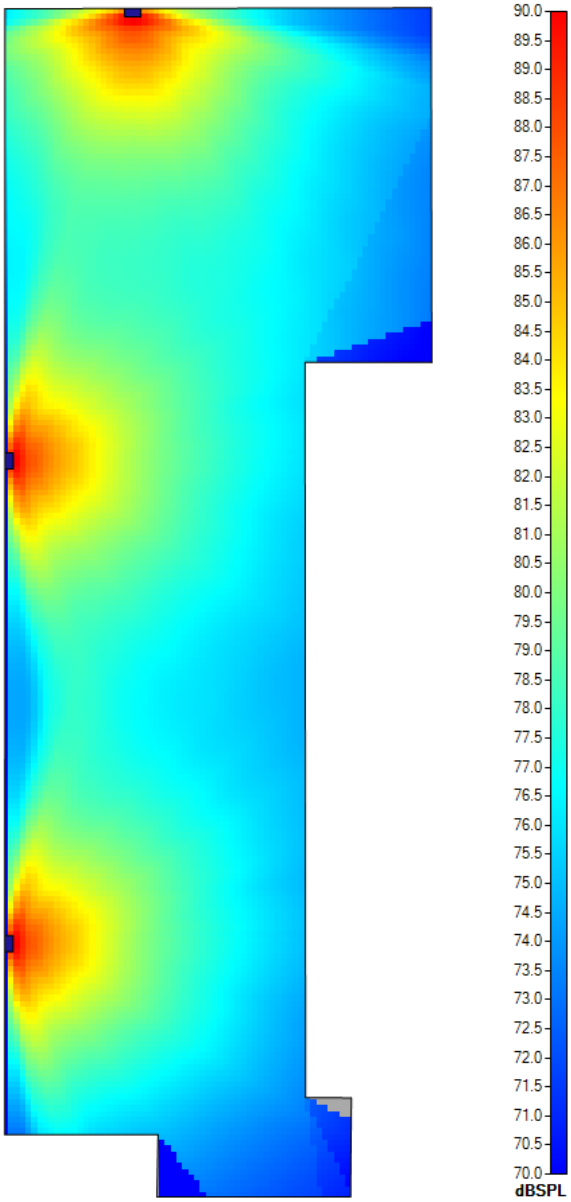
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1560.71 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1560.71 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 266.99 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 706.90 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 95.98 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 39.13 | Concrete, Painted, Wall or Floor |
| Wall #5 | Main Area | 121.37 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 62.03 | Concrete, Painted, Wall or Floor |
| Wall #7 | Main Area | 28.77 | Concrete, Painted, Wall or Floor |
| Wall #8 | Main Area | 461.63 | Concrete, Painted, Wall or Floor |
| Wall #9 | Main Area | 79.42 | Concrete, Painted, Wall or Floor |
| Wall #10 | Main Area | 222.69 | Concrete, Painted, Wall or Floor |

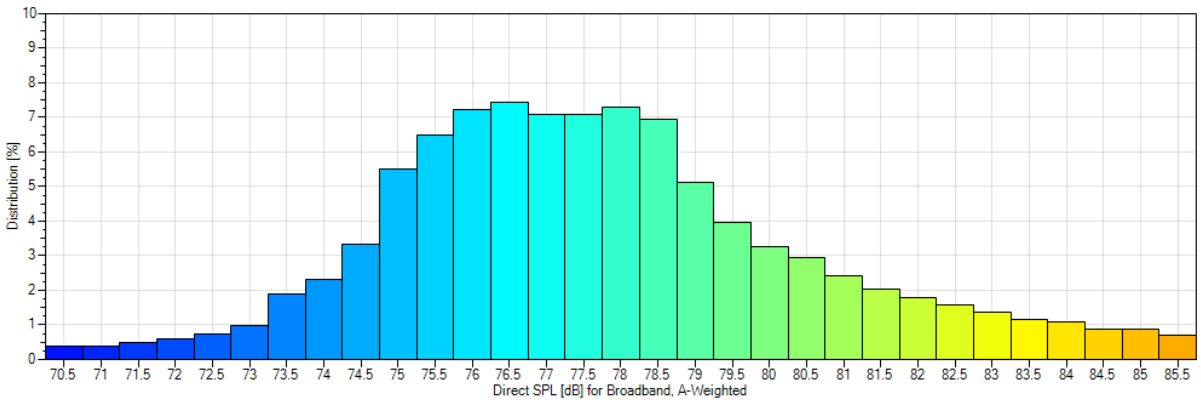
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 28.07 | 81.41 | 8.00 | 0.0 | 0.0 | 1/2 W (70V) |
| 2 | Wall | E70 | 28.08 | 111.73 | 8.00 | 0.0 | 0.0 | 1/2 W (70V) |
| 3 | Wall | E70 | 36.08 | 140.12 | 8.00 | -90.0 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



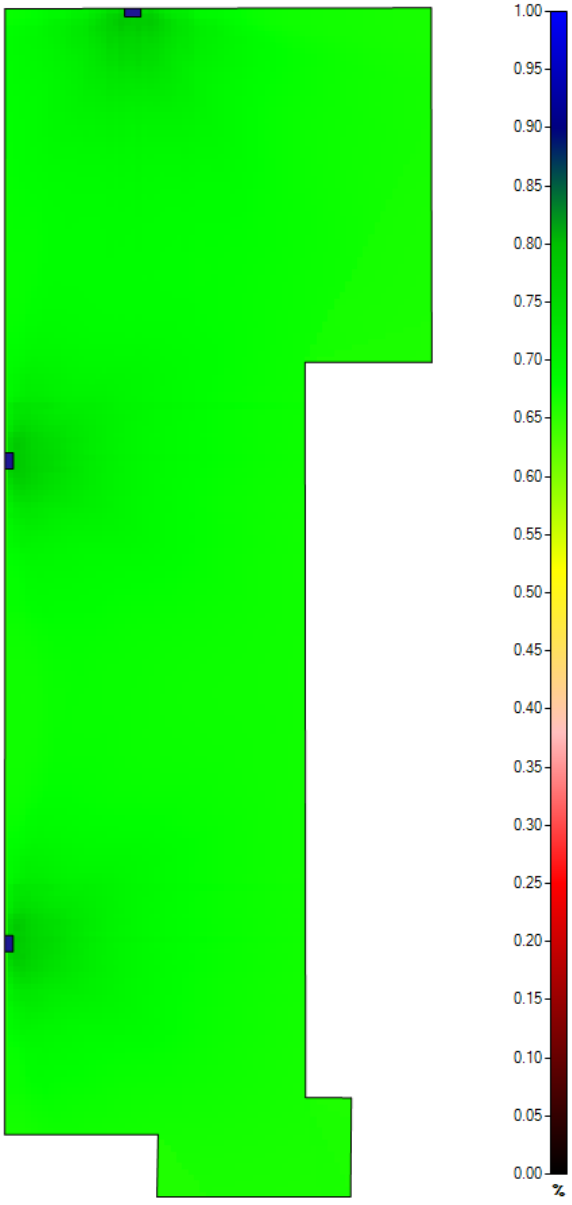

| | |
|---|---|
| **Average:** | **76.9 dB ±15.5 dB** |

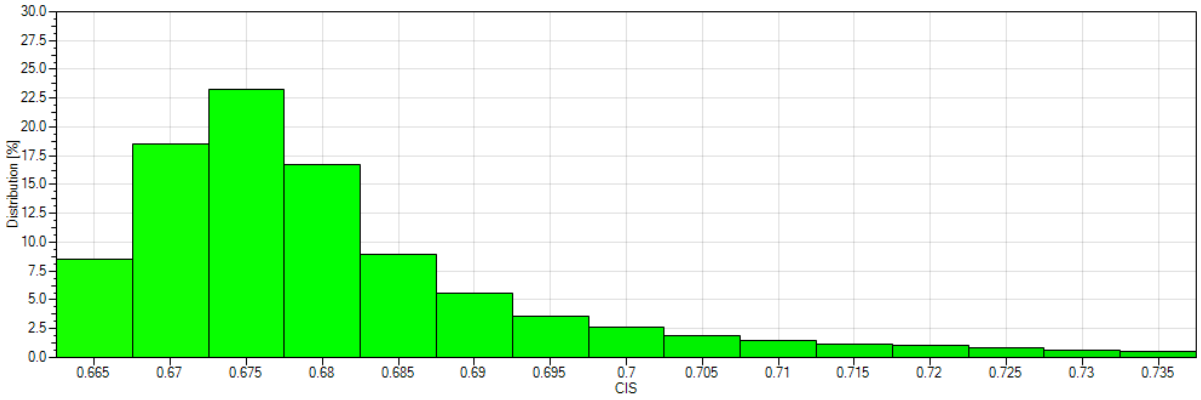
| | |
|---|---|
| **Average + Std. Dev.:** | **92.3 dB** |
| **Average - Std. Dev.:** | **61.4 dB** |
| **Max. Value:** | **90.0 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **12090** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥72.8 dB | 78.1 dB |
| 90% | ≥74.2 dB | 78.4 dB |
| 85% | ≥74.9 dB | 78.6 dB |
| 80% | ≥75.3 dB | 78.8 dB |

# Additional Mappings

## CIS

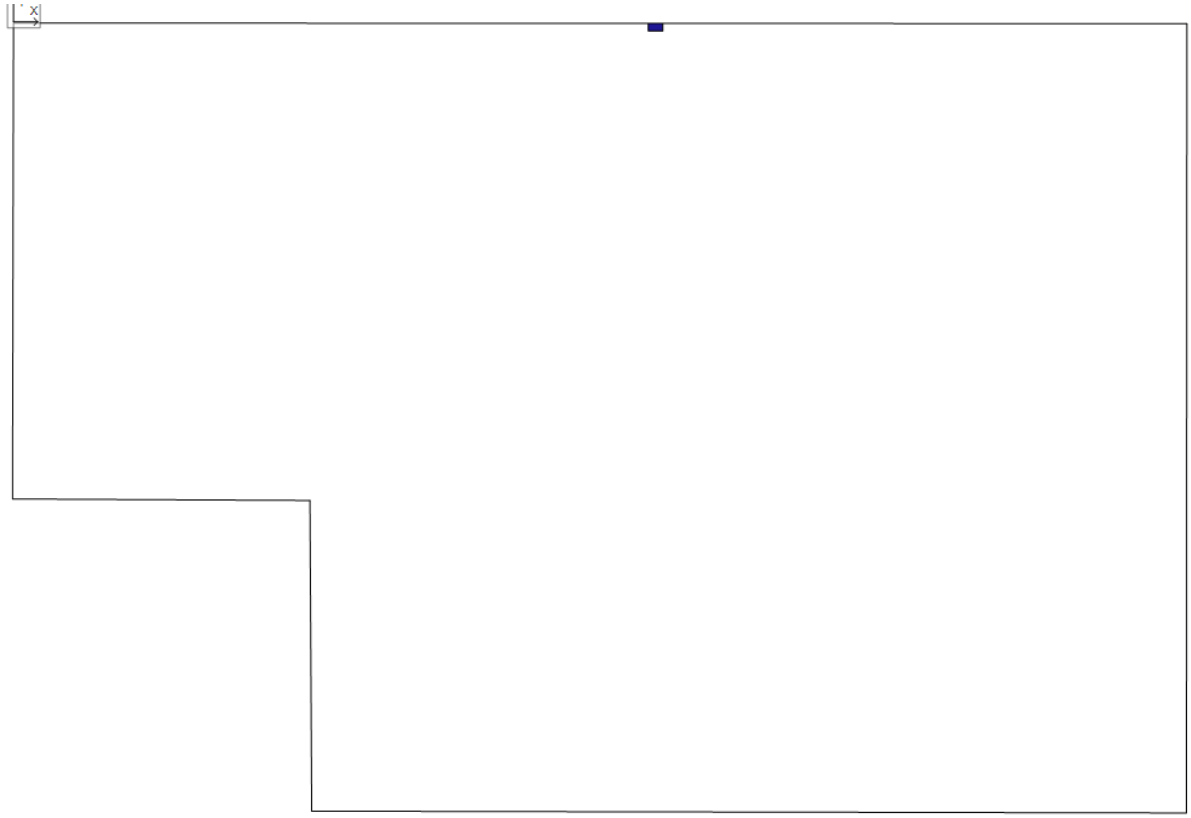





| | |
|---|---|
| **Average:** | **0.68 ±0.02** |
| **Average + Std. Dev.:** | **0.70** |
| **Average - Std. Dev.:** | **0.66** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.66** |
| **Data Points:** | **12090** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.66** | **0.68** |
| **90%** | **≥0.67** | **0.68** |
| **85%** | **≥0.67** | **0.68** |
| **80%** | **≥0.67** | **0.69** |

# Room: Basement C09



| | |
|---|---|
| **Label:** | **Basement C09** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **36.65 ft x 24.63 ft** |
| **Volume:** | **8101.2 cb ft (net: 8101.2 cb ft)** |
| **Surface Area:** | **2843.5 sq ft (net: 2843.5 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| **1** | **E70 (Cooper Notification)** |

## Surfaces

| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| **Floor** | **Main Area** | **810.12** | **Concrete, Painted, Wall or Floor** |
| **Ceiling** | **Main Area** | **810.12** | **Concrete, Painted, Wall or Floor** |
| **Wall #1** | **Main Area** | **366.18** | **Concrete, Painted, Wall or Floor** |
| **Wall #2** | **Main Area** | **246.08** | **Concrete, Painted, Wall or Floor** |

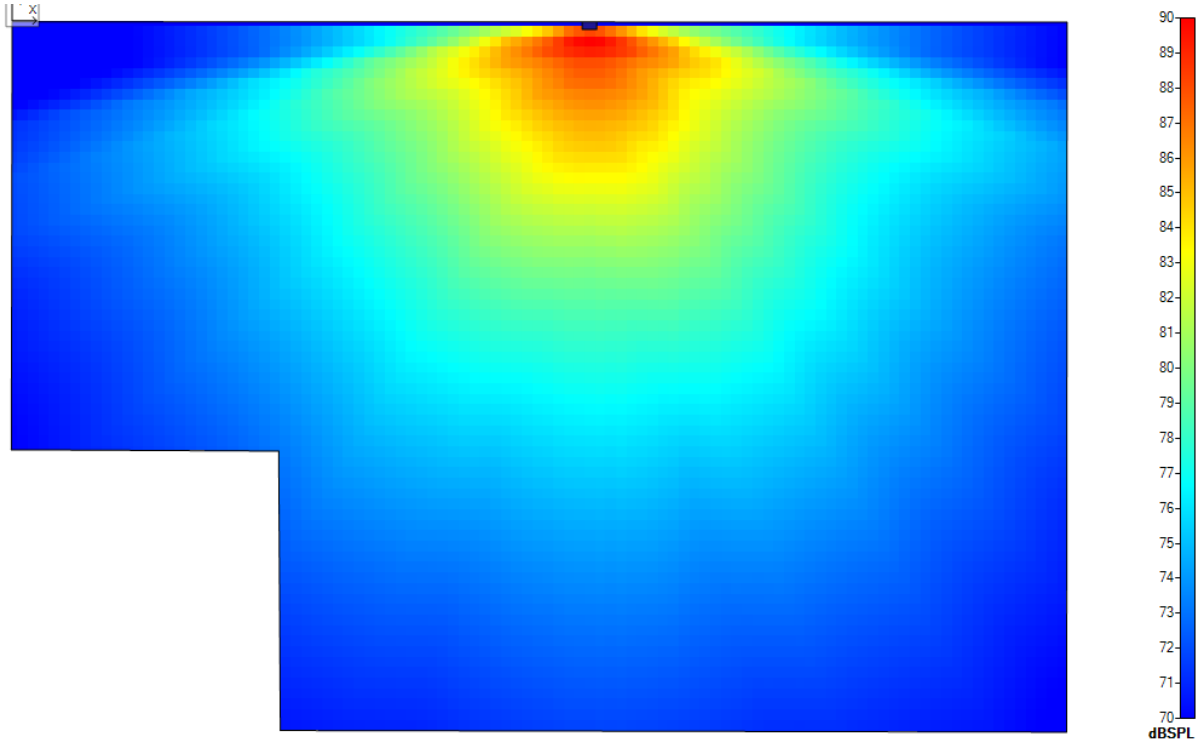
| | | | |
|---|---|---|---|
| Wall #3 | Main Area | 272.96 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 96.86 | Concrete, Painted, Wall or Floor |
| Wall #5 | Main Area | 92.81 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 148.38 | Concrete, Painted, Wall or Floor |

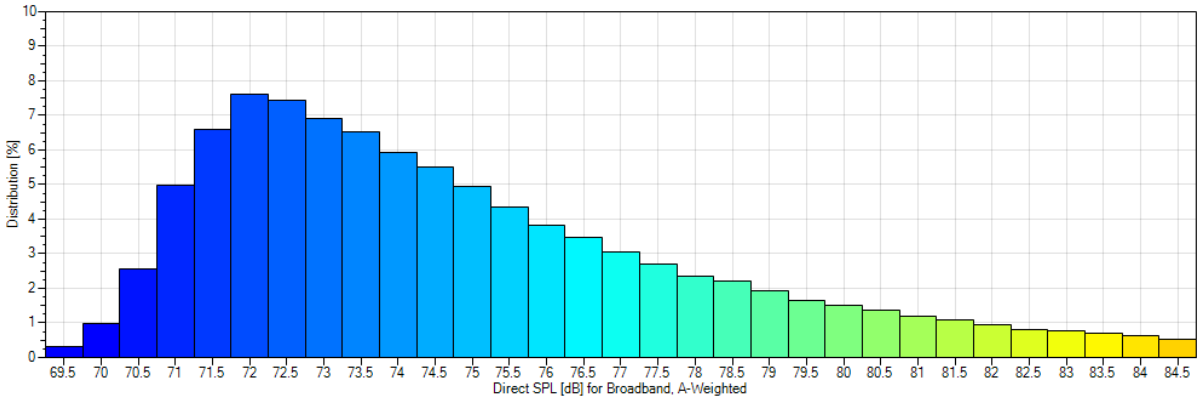
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 20.04 | -0.06 | 8.00 | -90.0 | 0.0 | 1/2 W (70V) |

## Mapping and Distribution

### Direct SPL (A-Weighted), Broadband



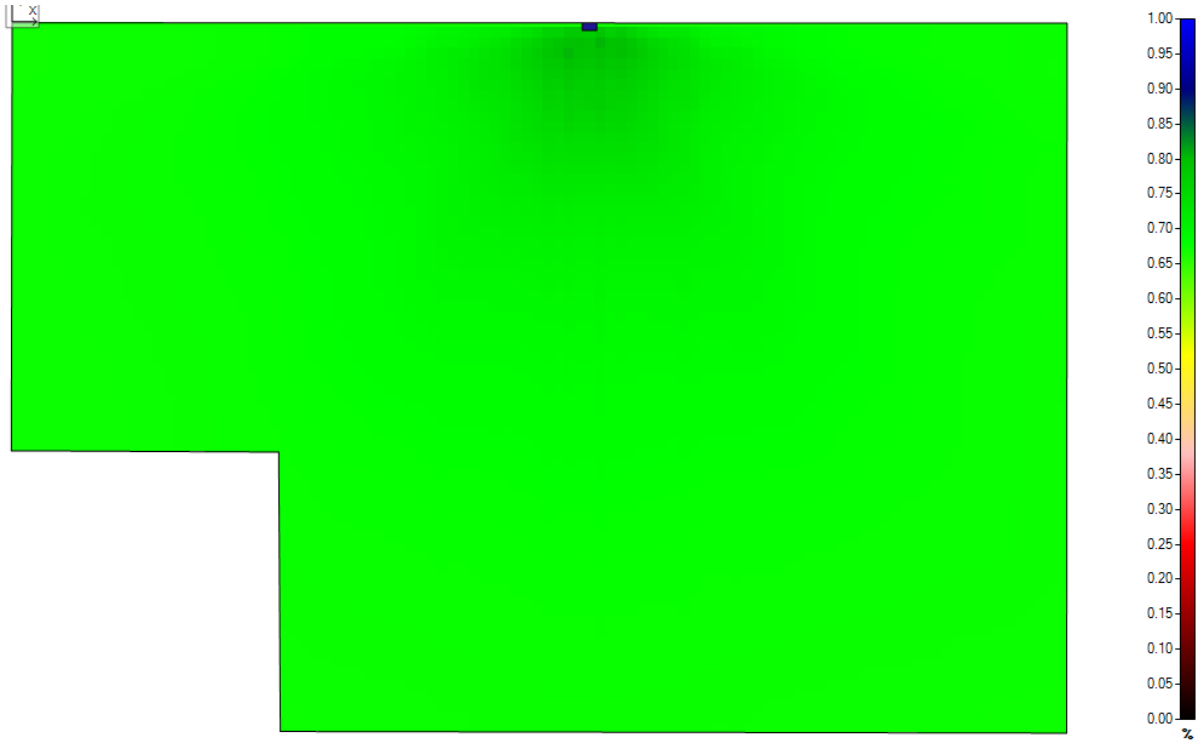

| | |
|---|---|
| Average: | 72.0 dB ±24.5 dB |
| Average + Std. Dev.: | 96.5 dB |

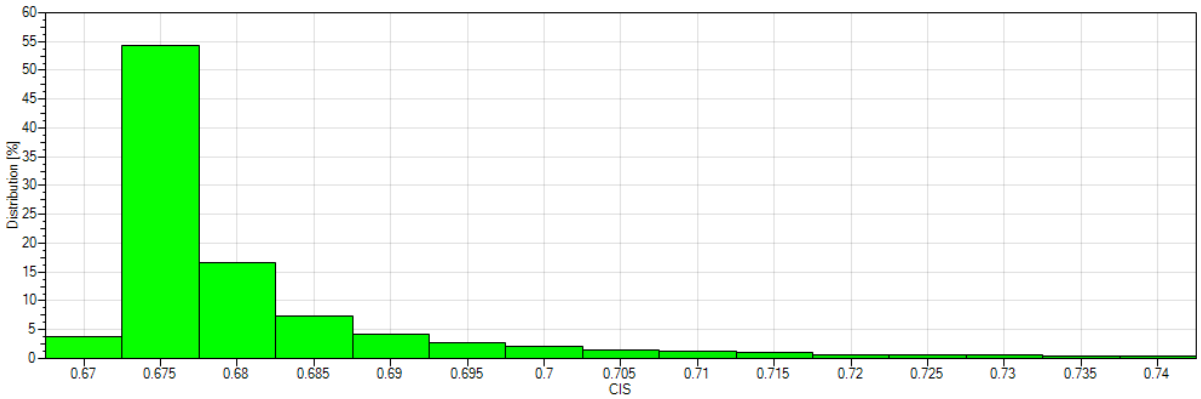
| | |
|---|---|
| **Average - Std. Dev.:** | **47.4 dB** |
| **Max. Value:** | **90.0 dB** |
| **Min. Value:** | **-126.5 dB** |
| **Data Points:** | **6342** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥70.6 dB** | **75.2 dB** |
| **90%** | **≥71.2 dB** | **75.5 dB** |
| **85%** | **≥71.6 dB** | **75.7 dB** |
| **80%** | **≥71.9 dB** | **76.0 dB** |

# Additional Mappings

## CIS




| | |
|---|---|
| **Average:** | **0.68 ±0.02** |

| | |
|---|---|
| **Average + Std. Dev.:** | **0.70** |
| **Average - Std. Dev.:** | **0.67** |
| **Max. Value:** | **0.81** |
| **Min. Value:** | **0.67** |
| **Data Points:** | **6342** |

| Area Covered: | CIS | Average |
|---|---|---|
| **95%** | **≥0.67** | **0.68** |
| **90%** | **≥0.67** | **0.68** |
| **85%** | **≥0.67** | **0.68** |
| **80%** | **≥0.67** | **0.68** |

# NIST B221 FIRST FLOOR UNIQUE ROOMS

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

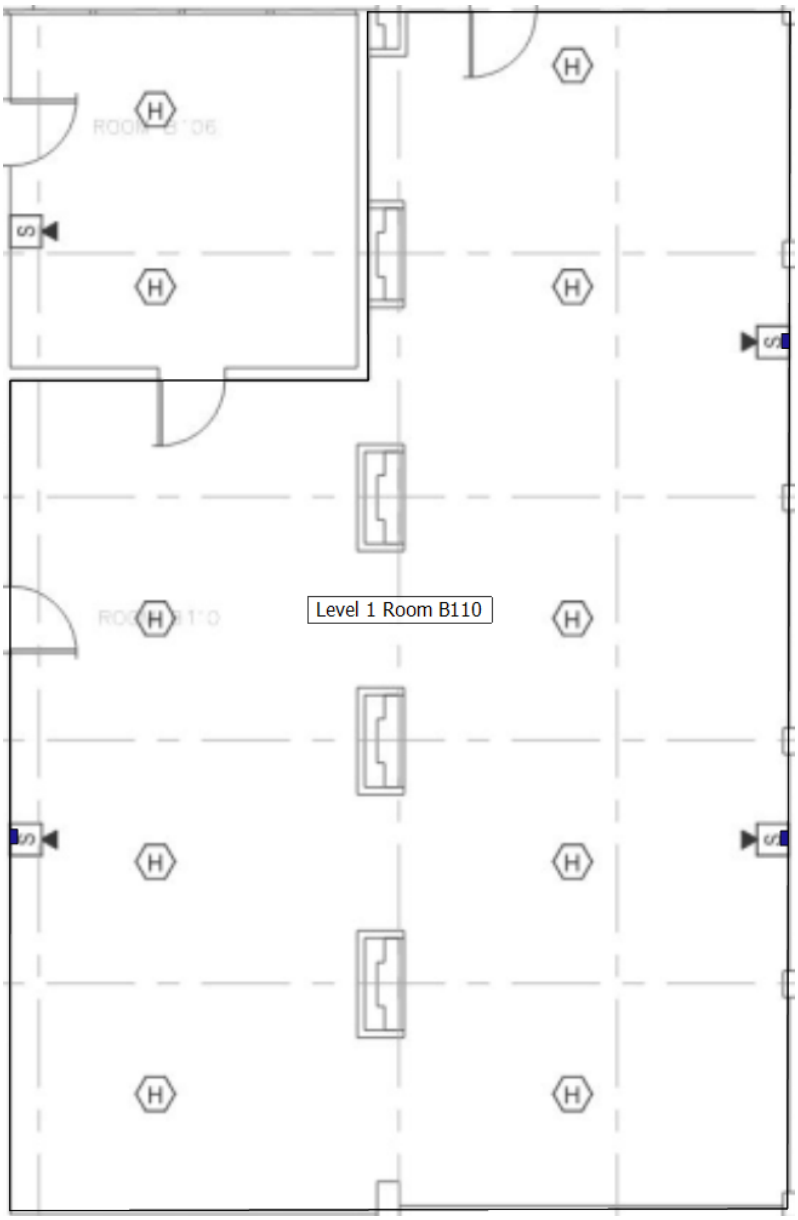
# Project Information

| | |
|---|---|
| **Title:** | **NIST B221 FIRST FLOOR UNIQUE ROOMS** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

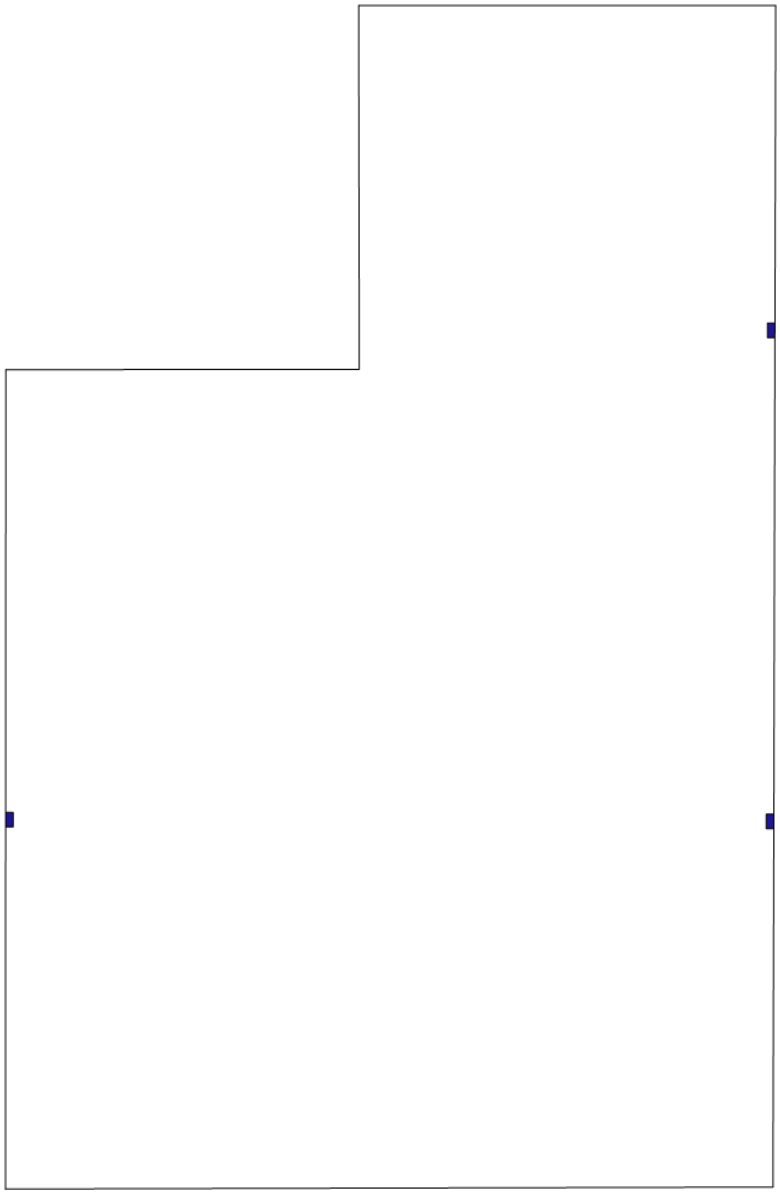
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **3** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Level 1 Room B110



| | |
|---|---|
| **Label:** | **Level 1 Room B110** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **35.36 ft x 54.41 ft** |
| **Volume:** | **16472.0 cb ft (net: 16472.0 cb ft)** |
| **Surface Area:** | **5087.6 sq ft (net: 5087.6 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.8 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 3 | E70 (Cooper Notification) |

## Surfaces

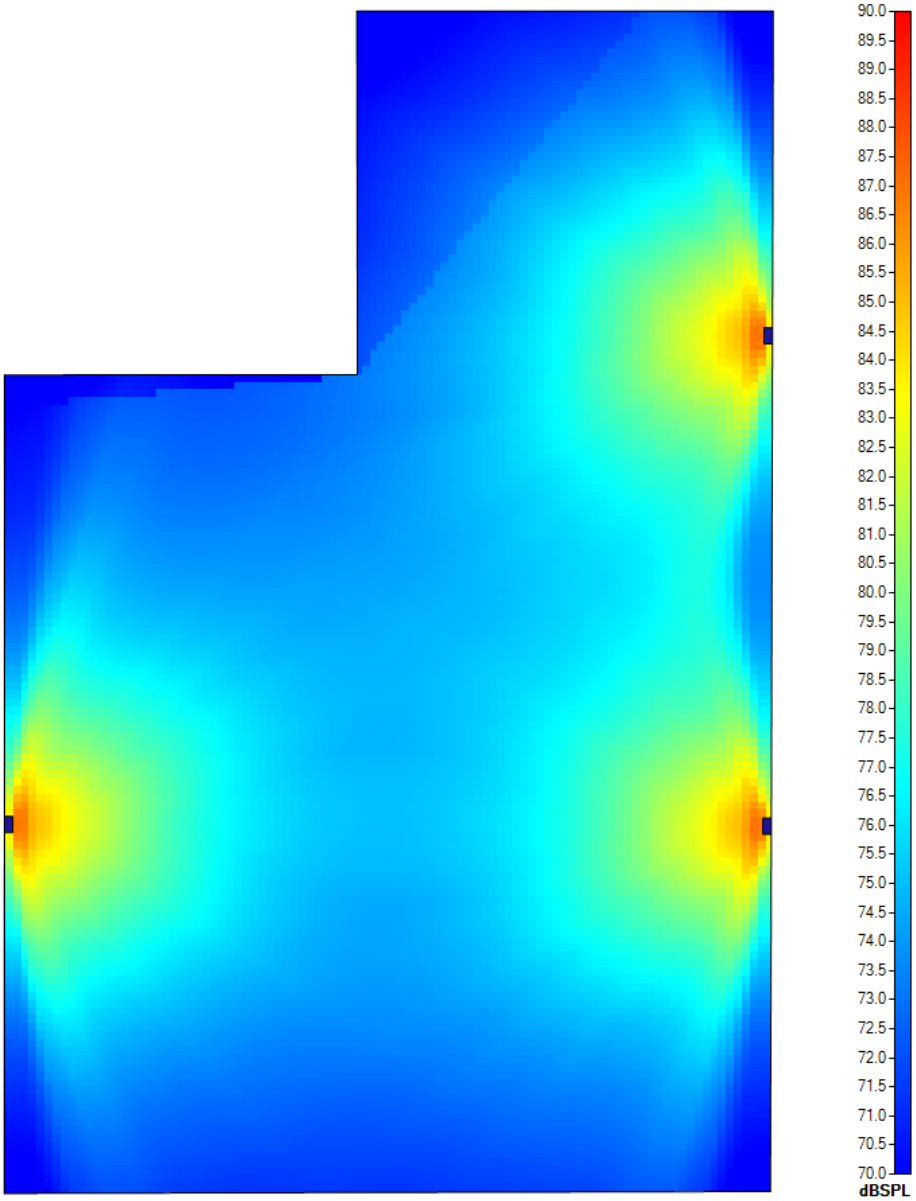
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1647.20 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1647.20 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 162.23 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 167.22 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 191.48 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 543.22 | Concrete, Painted, Wall or Floor |
| Wall #5 | Main Area | 352.36 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 376.69 | Steel, Wall, Floor, or Ceiling |

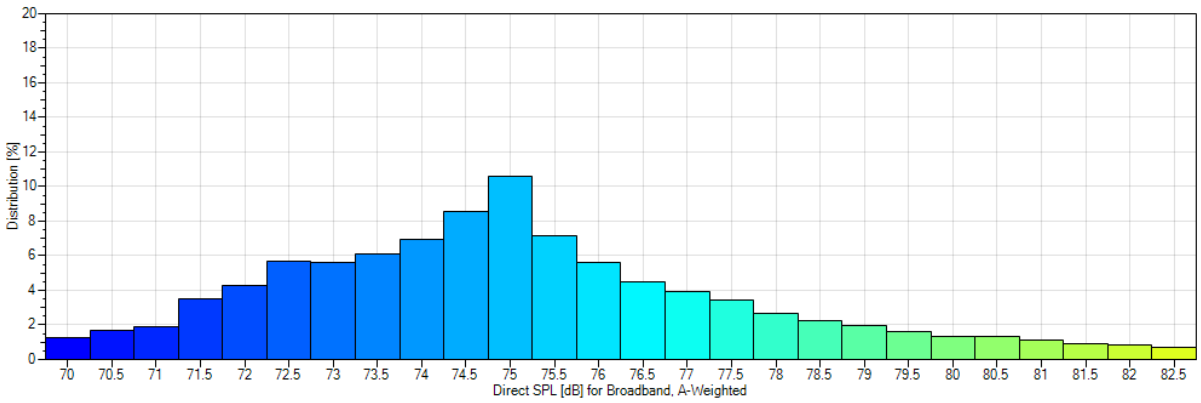
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 194.77 | 176.18 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | 194.71 | 153.61 | 8.00 | 179.9 | 0.0 | 1/4 W (70V) |
| 3 | Wall | E70 | 159.47 | 153.69 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



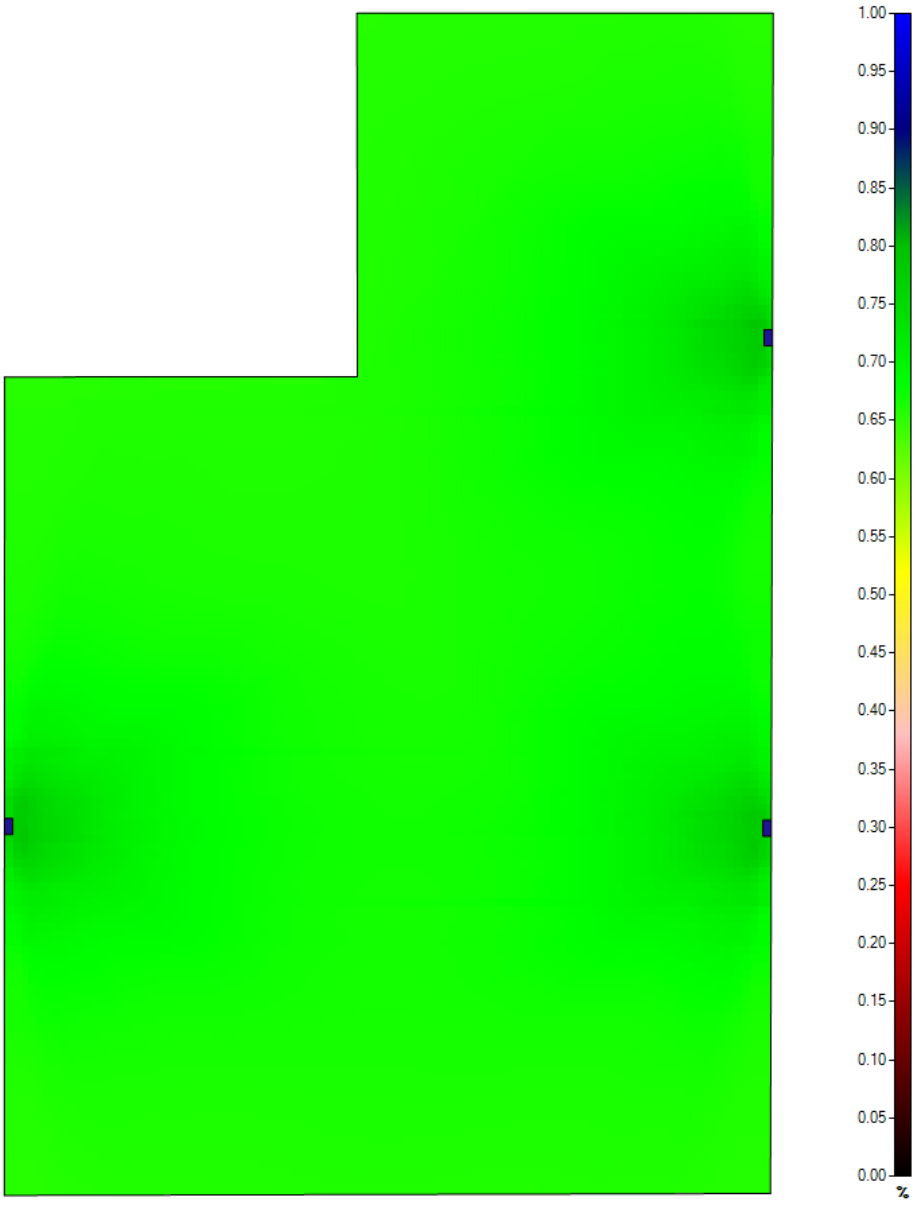

| | |
|---|---|
| **Average:** | **75.2 dB ±3.1 dB** |

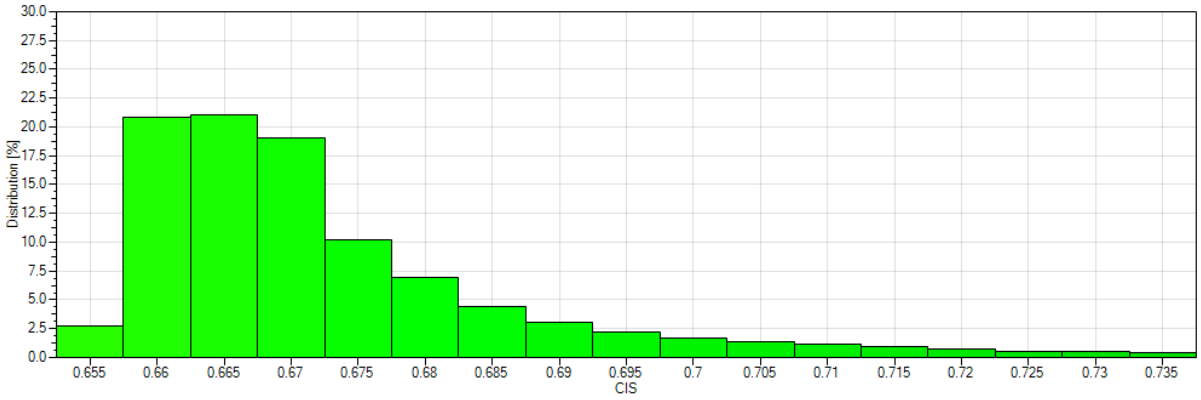
| | |
|---|---|
| **Average + Std. Dev.:** | **78.3 dB** |
| **Average - Std. Dev.:** | **72.1 dB** |
| **Max. Value:** | **87.0 dB** |
| **Min. Value:** | **63.7 dB** |
| **Data Points:** | **12648** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥70.7 dB | 75.5 dB |
| 90% | ≥71.7 dB | 75.7 dB |
| 85% | ≥72.3 dB | 75.9 dB |
| 80% | ≥72.7 dB | 76.1 dB |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.67 ±0.02** |
| **Average + Std. Dev.:** | **0.69** |
| **Average - Std. Dev.:** | **0.66** |
| **Max. Value:** | **0.78** |
| **Min. Value:** | **0.65** |
| **Data Points:** | **12648** |

| Area Covered: | CIS | Average |
|---|---|---|
| **95%** | **≥0.66** | **0.68** |
| **90%** | **≥0.66** | **0.68** |
| **85%** | **≥0.66** | **0.68** |
| **80%** | **≥0.66** | **0.68** |

# NIST B221 Sub-Basement

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

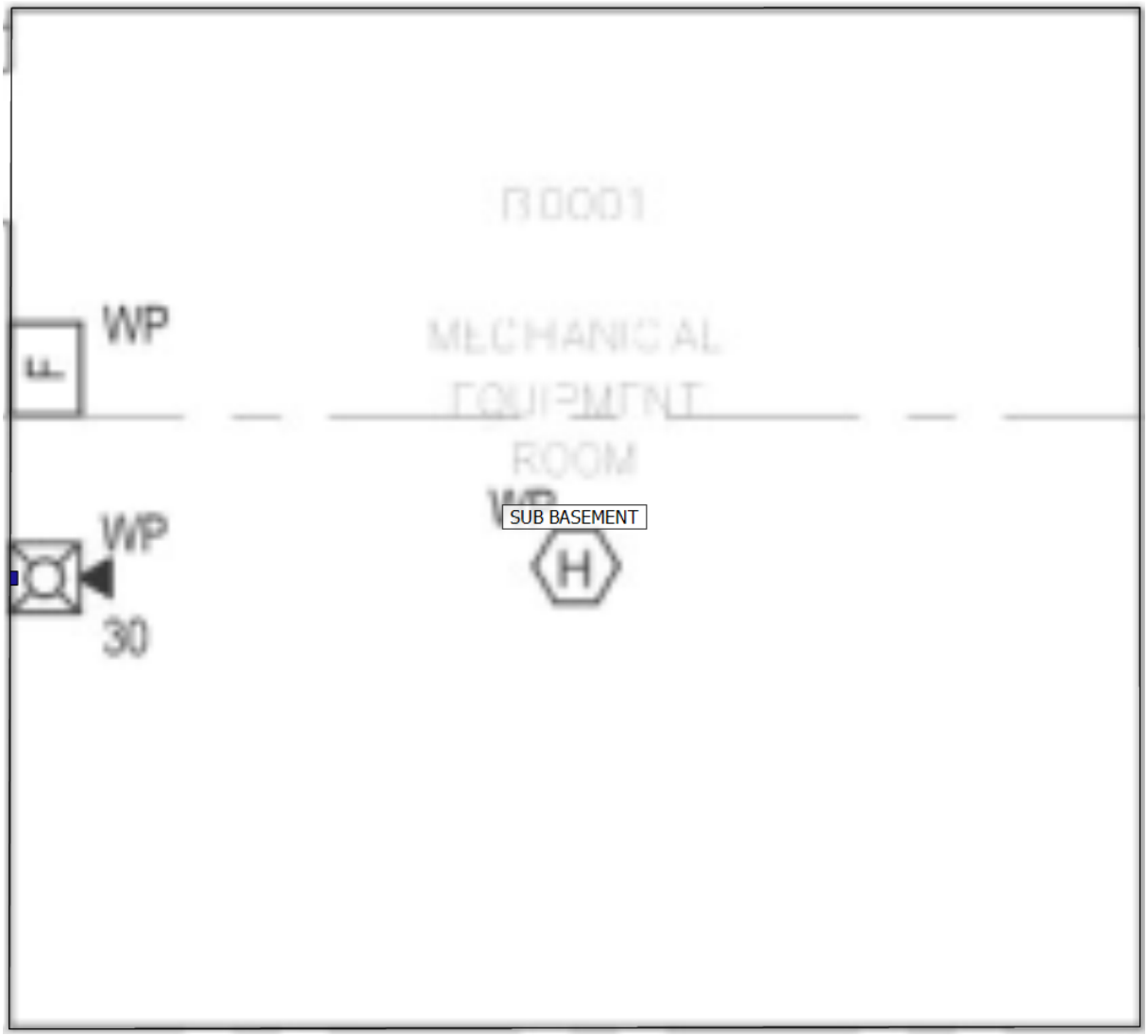
# Project Information

| | |
|---|---|
| **Title:** | **NIST B221 Sub-Basement** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

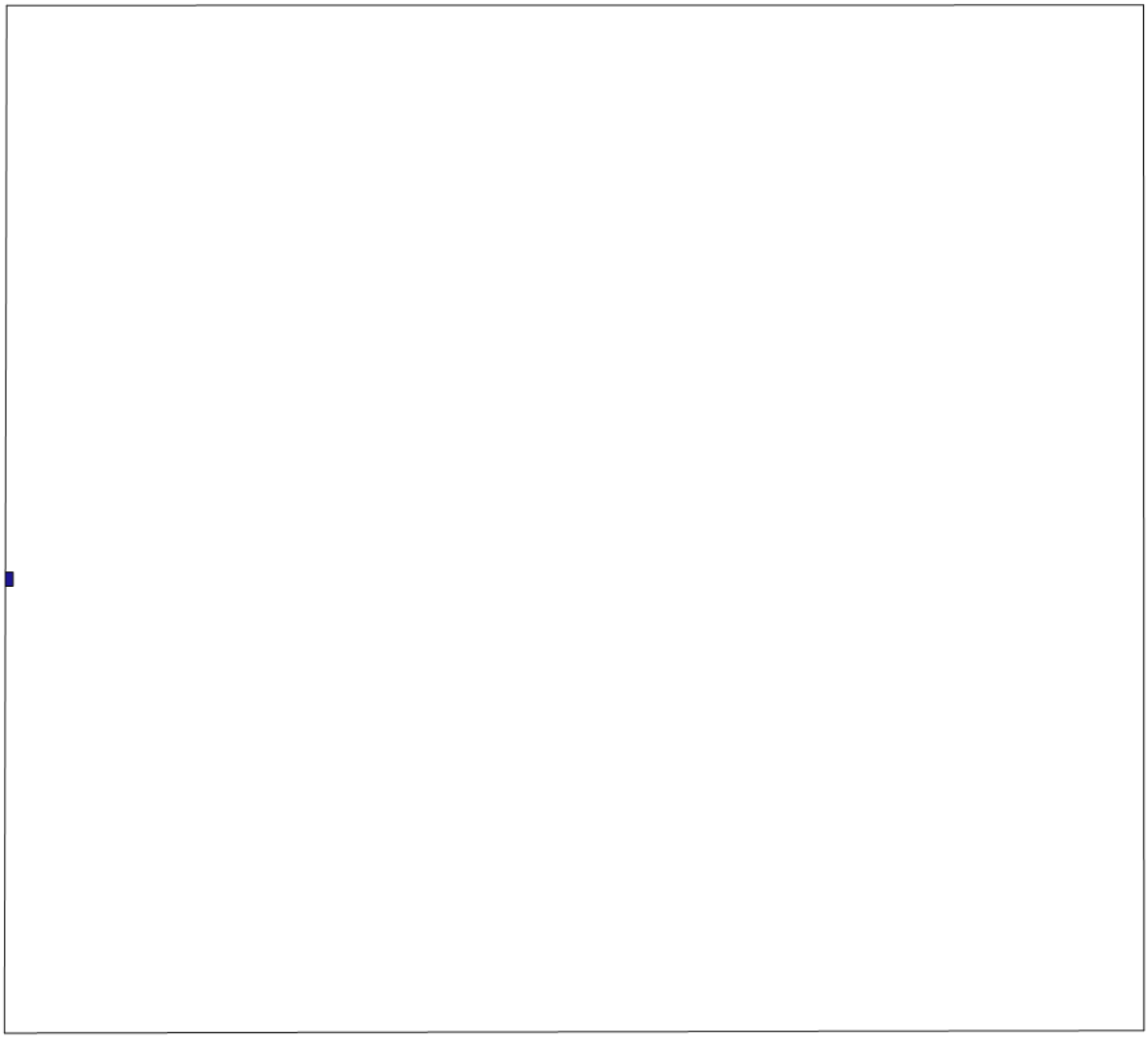
## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Layout Overview



# Room: SUB BASEMENT



| | |
|---|---|
| **Label:** | **SUB BASEMENT** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.27 ft x 20.98 ft** |
| **Volume:** | **4870.7 cb ft (net: 4870.7 cb ft)** |
| **Surface Area:** | **1858.1 sq ft (net: 1858.1 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.3 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

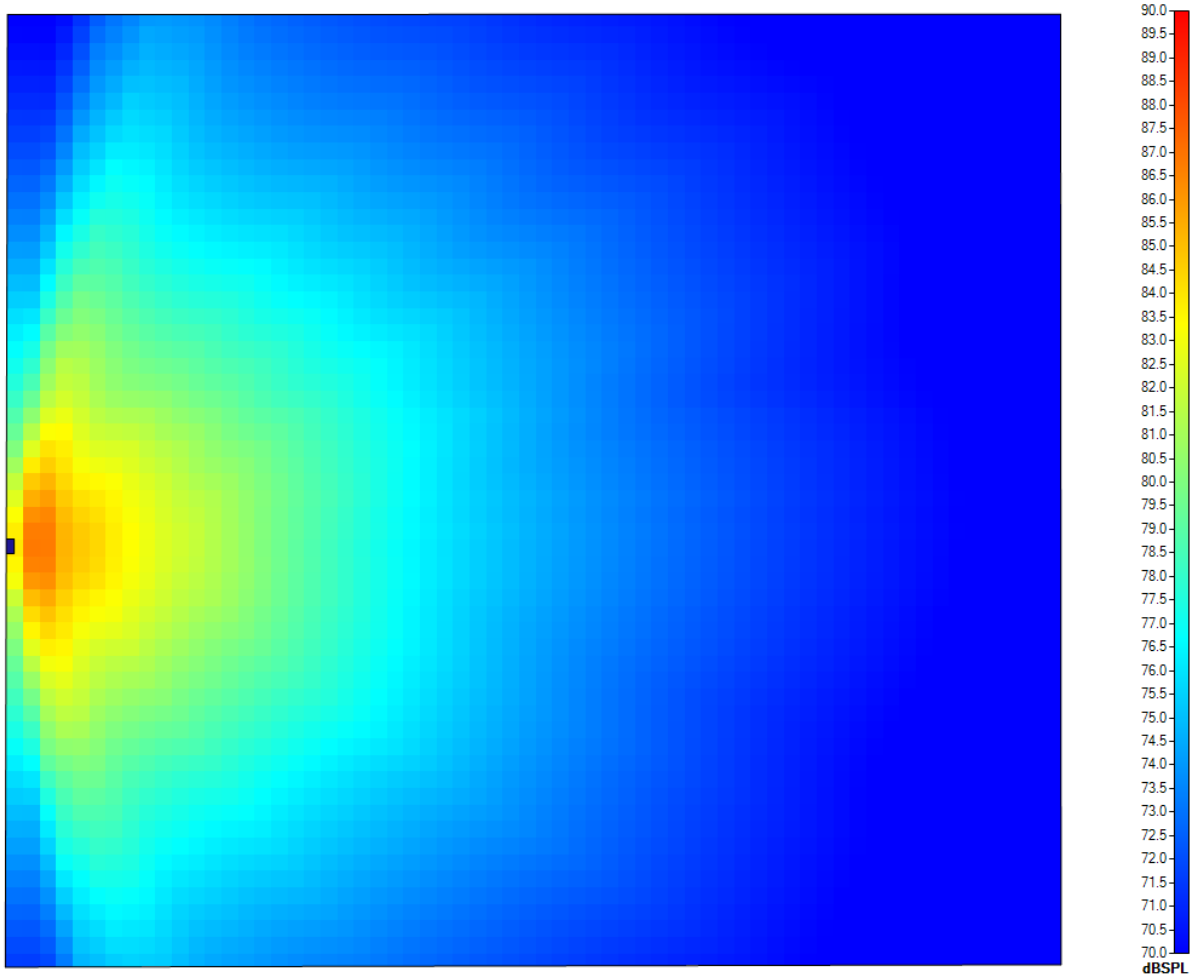
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 487.07 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 487.07 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 232.73 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 209.32 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 232.17 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 209.76 | Concrete, Painted, Wall or Floor |

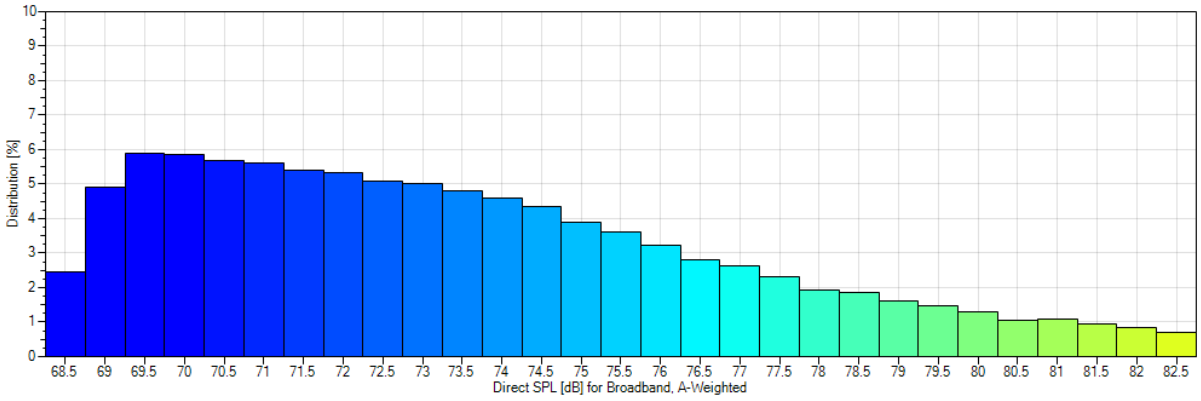
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 145.27 | 41.96 | 8.00 | -0.1 | 0.0 | 1/4 W (70V) |

## Mapping and Distribution

### Direct SPL (A-Weighted), Broadband



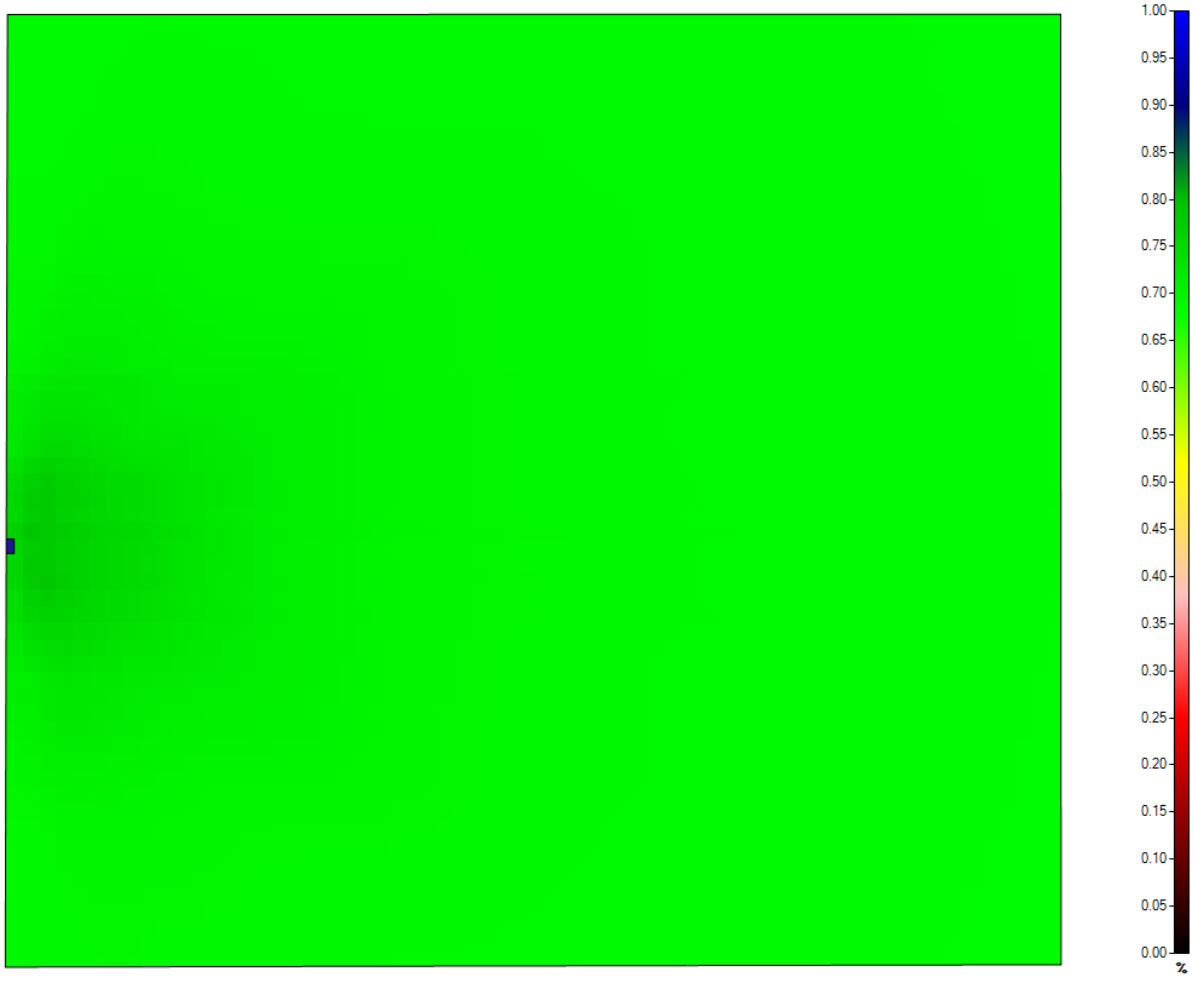


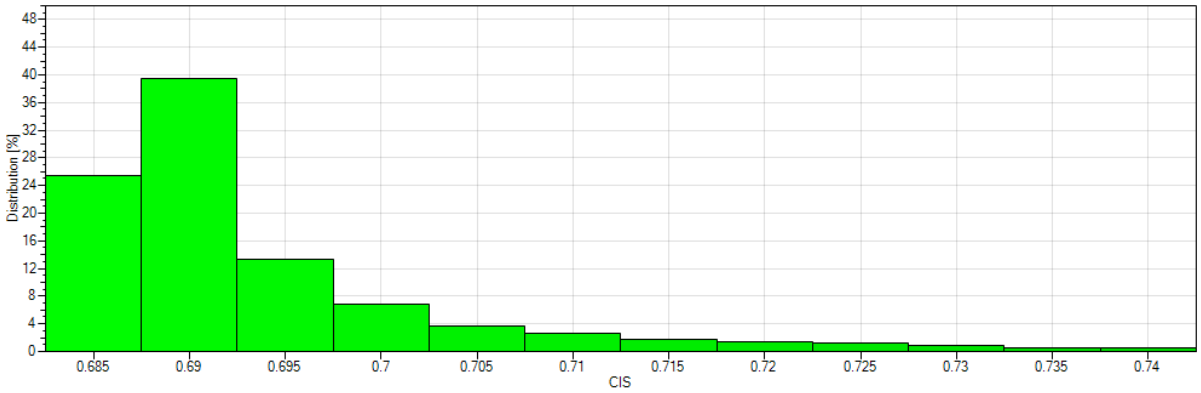

| | |
|---|---|
| **Average:** | **71.4 dB ±21.3 dB** |
| **Average + Std. Dev.:** | **92.7 dB** |
| **Average - Std. Dev.:** | **50.2 dB** |
| **Max. Value:** | **86.8 dB** |
| **Min. Value:** | **-124.0 dB** |
| **Data Points:** | **3758** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥68.9 dB** | **74.0 dB** |
| **90%** | **≥69.4 dB** | **74.2 dB** |
| **85%** | **≥69.8 dB** | **74.5 dB** |
| **80%** | **≥70.2 dB** | **74.8 dB** |

# Additional Mappings

## CIS




| | |
|---|---|
| **Average:** | **0.70 ±0.01** |
| **Average + Std. Dev.:** | **0.71** |
| **Average - Std. Dev.:** | **0.68** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.68** |

| Data Points: | 3758 |
|---|---|

| Area Covered: | CIS | Average |
|---|---|---|
| 95% | ≥0.69 | 0.70 |
| 90% | ≥0.69 | 0.70 |
| 85% | ≥0.69 | 0.70 |
| 80% | ≥0.69 | 0.70 |

# NIST FA B223 FIRST FLOOR UNIQUE ROOMS

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

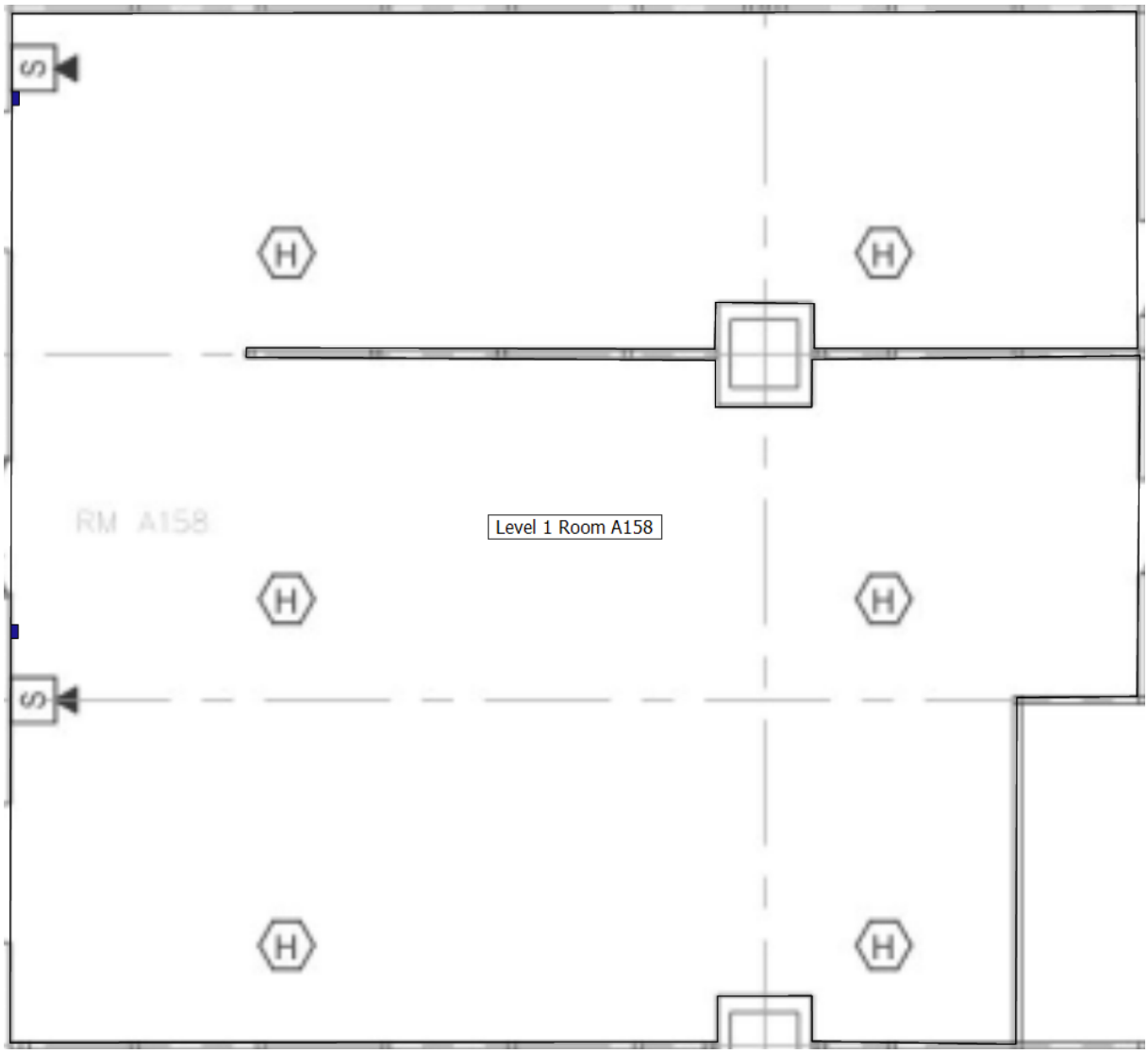
# Project Information

| | |
|---|---|
| **Title:** | **NIST FA B223 FIRST FLOOR UNIQUE ROOMS** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

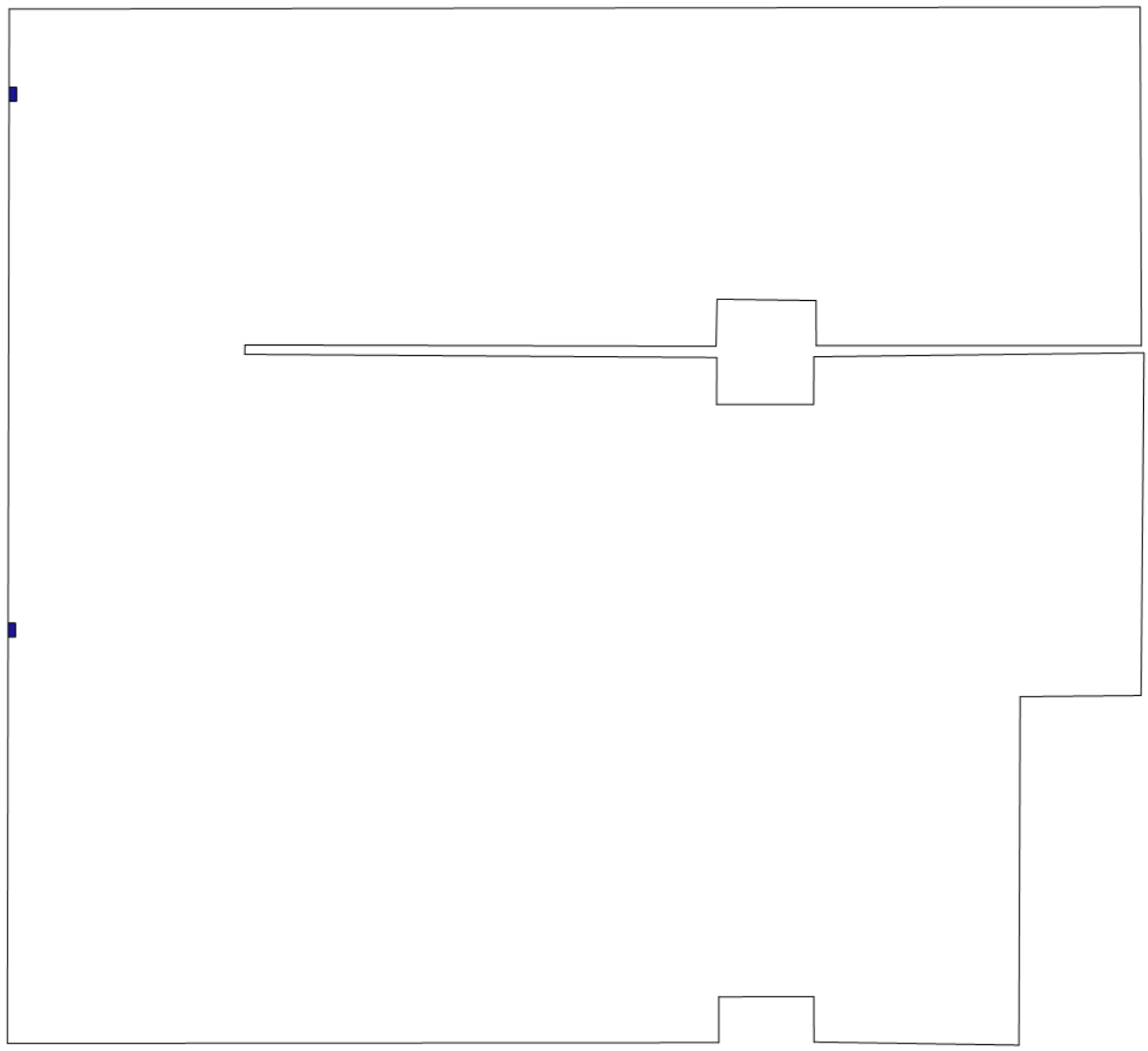
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **2** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Level 1 Room A158



| | |
|---|---|
| **Label:** | **Level 1 Room A158** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **36.08 ft x 32.93 ft** |
| **Volume:** | **11159.7 cb ft (net: 11159.7 cb ft)** |
| **Surface Area:** | **4266.1 sq ft (net: 4266.1 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **1.0 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| 2 | E70 (Cooper Notification) |

## Surfaces

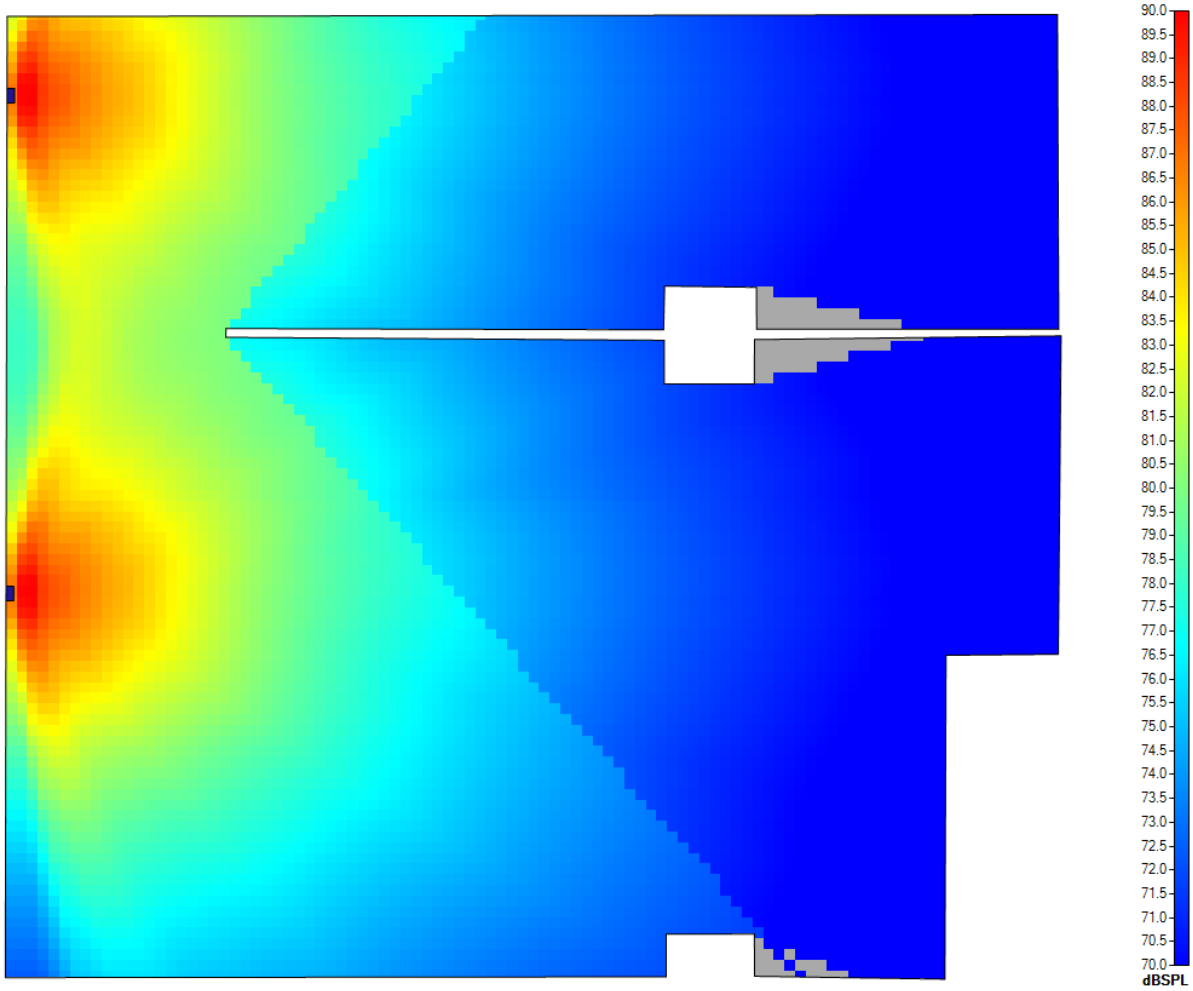
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1115.97 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1115.97 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 110.56 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 38.38 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 108.70 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 104.78 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 15.14 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 30.79 | Concrete, Painted, Wall or Floor |
| Wall #7 | Main Area | 14.92 | Concrete, Painted, Wall or Floor |
| Wall #8 | Main Area | 149.85 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 3.00 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 149.54 | Steel, Wall, Floor, or Ceiling |
| Wall #11 | Main Area | 14.93 | Concrete, Painted, Wall or Floor |
| Wall #12 | Main Area | 31.39 | Concrete, Painted, Wall or Floor |
| Wall #13 | Main Area | 14.31 | Concrete, Painted, Wall or Floor |
| Wall #14 | Main Area | 103.24 | Steel, Wall, Floor, or Ceiling |
| Wall #15 | Main Area | 107.44 | Steel, Wall, Floor, or Ceiling |
| Wall #16 | Main Area | 358.94 | Steel, Wall, Floor, or Ceiling |
| Wall #17 | Main Area | 328.17 | Steel, Wall, Floor, or Ceiling |
| Wall #18 | Main Area | 225.86 | Steel, Wall, Floor, or Ceiling |
| Wall #19 | Main Area | 14.54 | Concrete, Painted, Wall or Floor |
| Wall #20 | Main Area | 30.13 | Concrete, Painted, Wall or Floor |
| Wall #21 | Main Area | 14.47 | Concrete, Painted, Wall or Floor |
| Wall #22 | Main Area | 65.06 | Steel, Wall, Floor, or Ceiling |

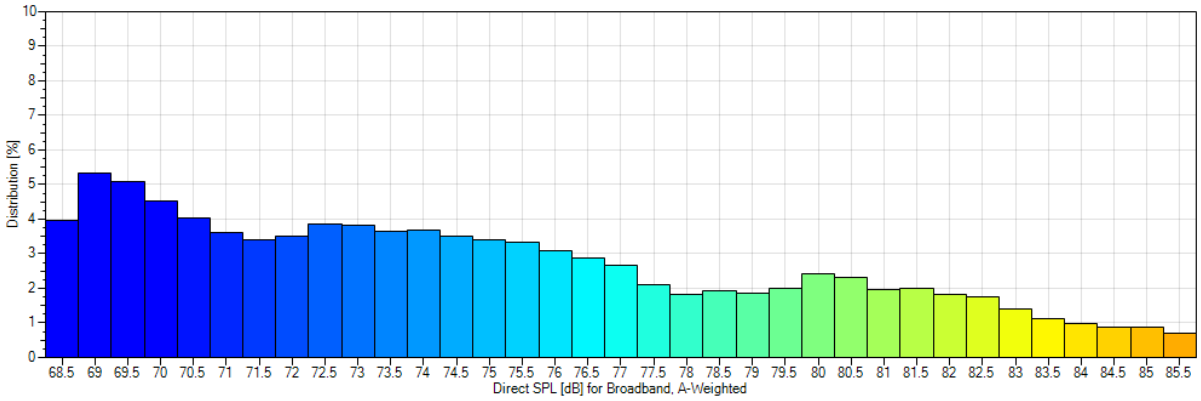
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 114.30 | 106.74 | 8.00 | -0.1 | 0.0 | 1/2 W (70V) |
| 2 | Wall | E70 | 114.33 | 123.74 | 8.00 | -0.1 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



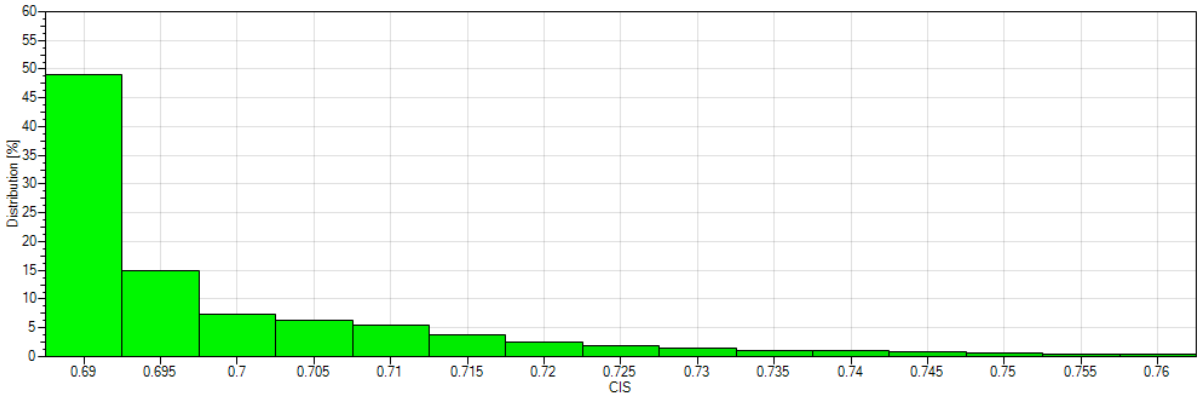

| | |
|---|---|
| **Average:** | **71.4 dB ±29.8 dB** |
| **Average + Std. Dev.:** | **101.2 dB** |
| **Average - Std. Dev.:** | **41.7 dB** |
| **Max. Value:** | **89.9 dB** |
| **Min. Value:** | **-178.3 dB** |

| Data Points: | 8703 |
|---|---|

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥68.6 dB | 75.3 dB |
| 90% | ≥69.1 dB | 75.7 dB |
| 85% | ≥69.6 dB | 76.1 dB |
| 80% | ≥70.1 dB | 76.5 dB |

# Additional Mappings

## CIS




| | |
|---|---|
| **Average:** | **0.70 ±0.02** |
| **Average + Std. Dev.:** | **0.72** |
| **Average - Std. Dev.:** | **0.68** |
| **Max. Value:** | **0.81** |
| **Min. Value:** | **0.69** |
| **Data Points:** | **8703** |

| Area Covered: | CIS | Average |
|---|---|---|
| **95%** | **≥0.69** | **0.70** |
| **90%** | **≥0.69** | **0.70** |
| **85%** | **≥0.69** | **0.70** |
| **80%** | **≥0.69** | **0.70** |

# NIST FA B223 SUB-BASEMENT

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

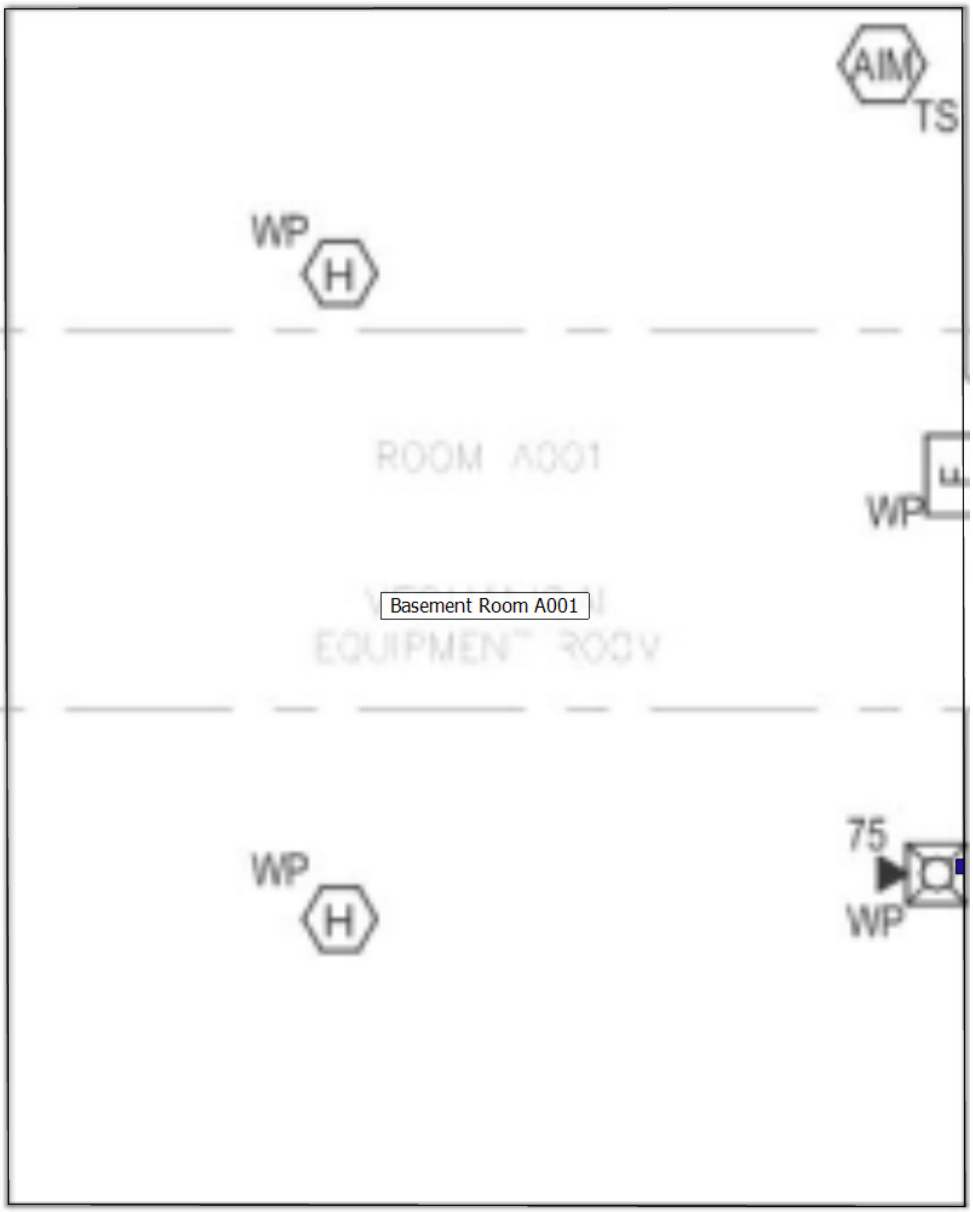
# Project Information

| | |
|---|---|
| **Title:** | **NIST FA B223 SUB-BASEMENT** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

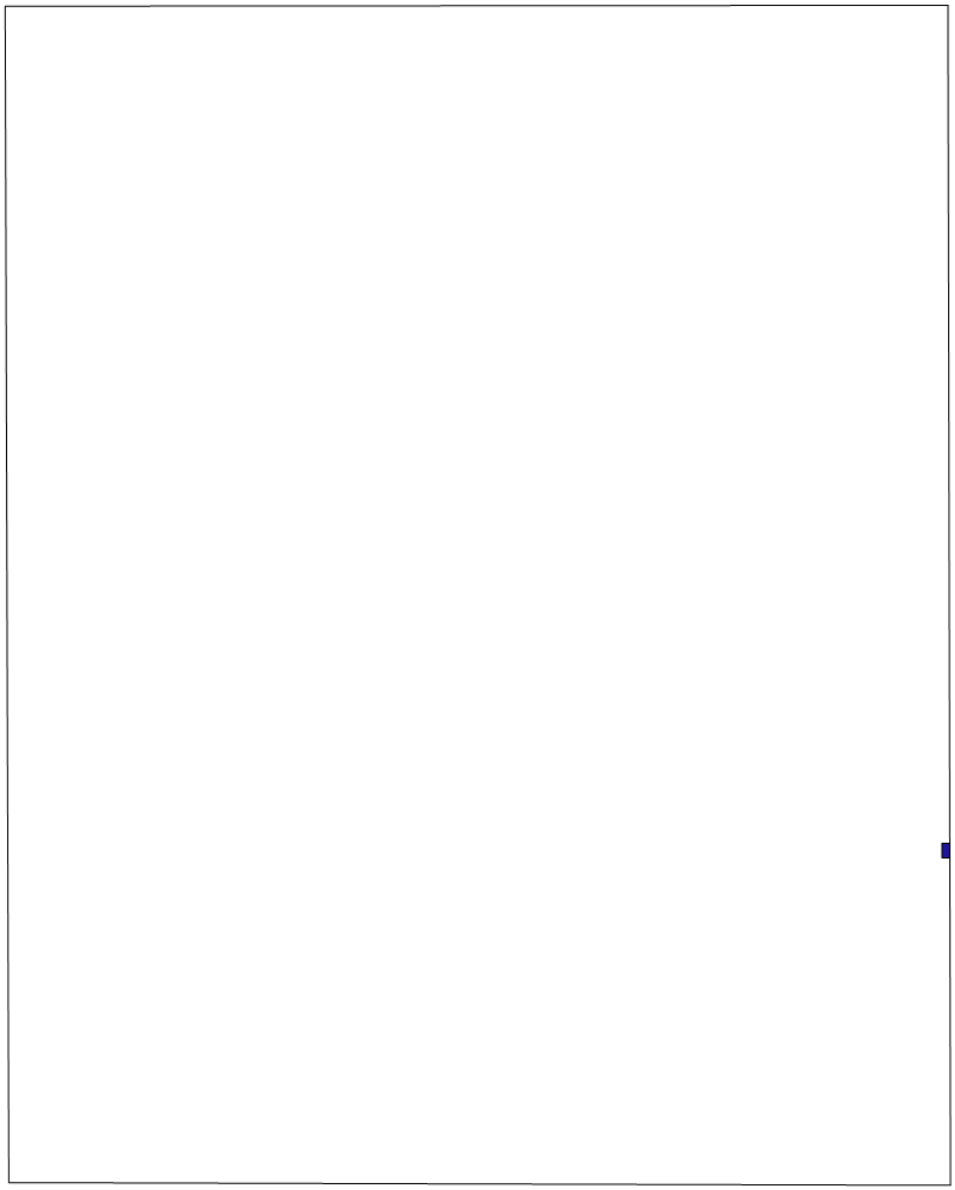
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **1** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Basement Room A001



| | |
|---|---|
| **Label:** | **Basement Room A001** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.04 ft x 28.75 ft** |
| **Volume:** | **6592.4 cb ft (net: 6592.4 cb ft)** |
| **Surface Area:** | **2351.9 sq ft (net: 2351.9 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

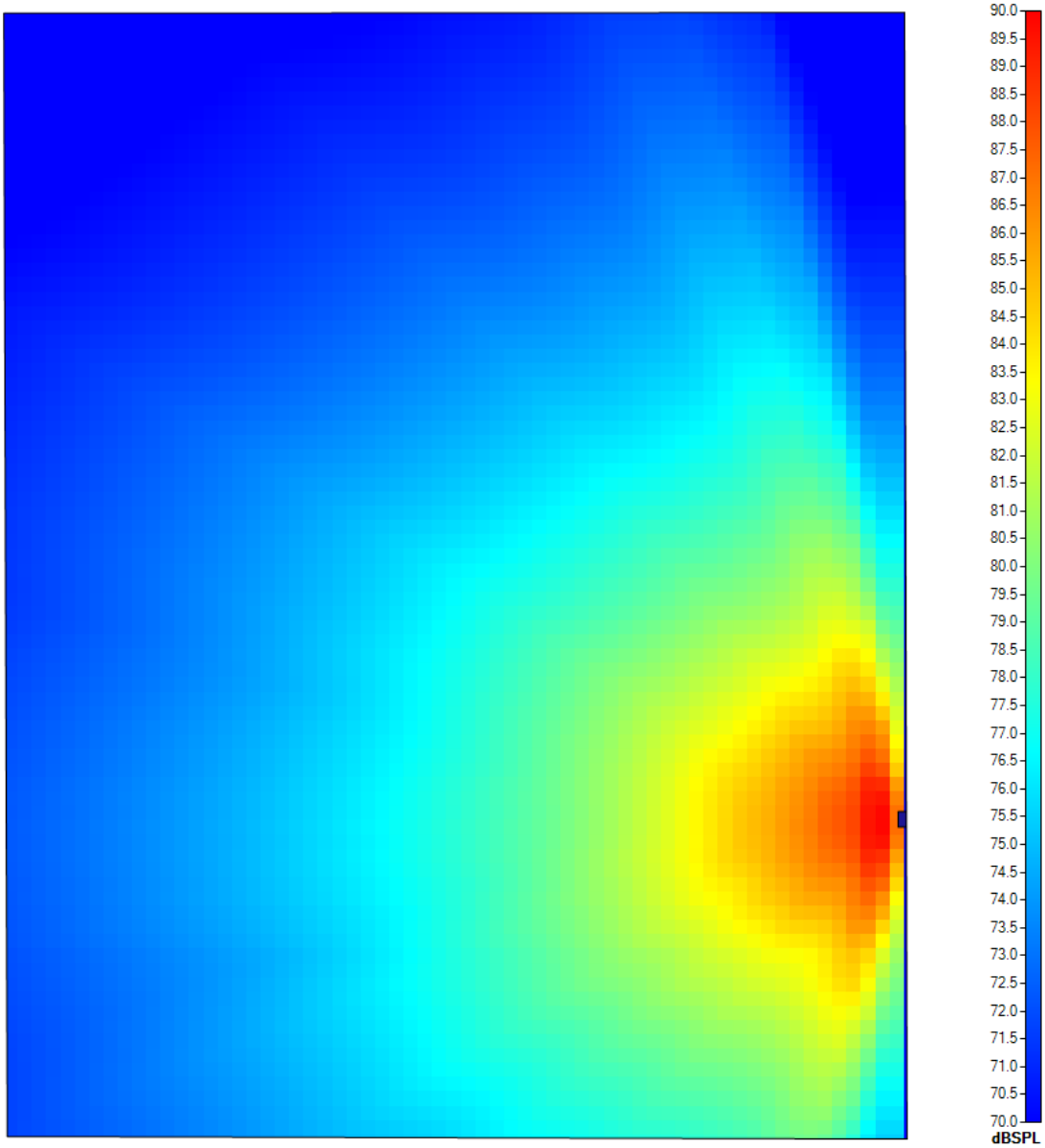
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 659.24 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 659.24 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 229.75 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 287.54 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 229.49 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 286.66 | Concrete, Painted, Wall or Floor |

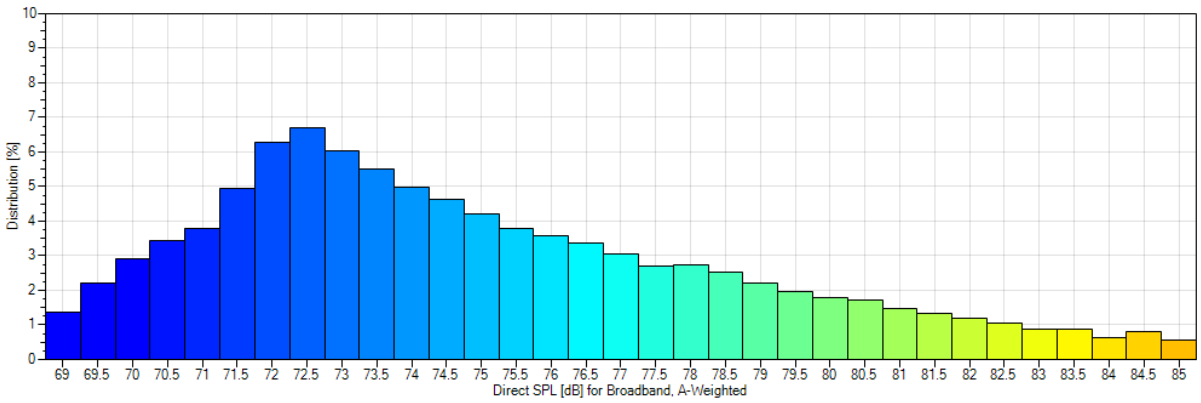
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 119.44 | 45.04 | 8.00 | -179.9 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



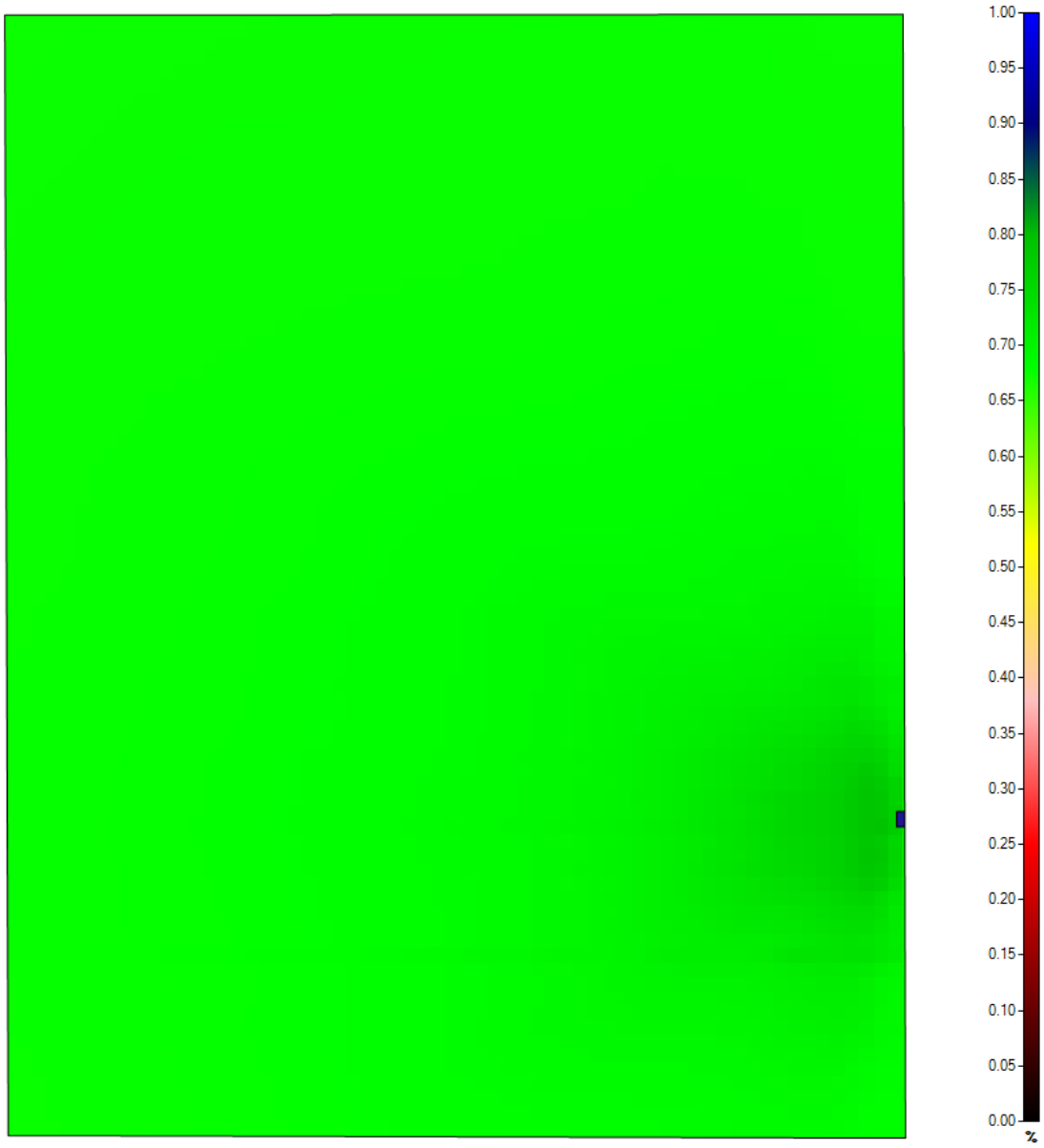

| | |
|---|---|
| **Average:** | **72.2 dB ±24.2 dB** |

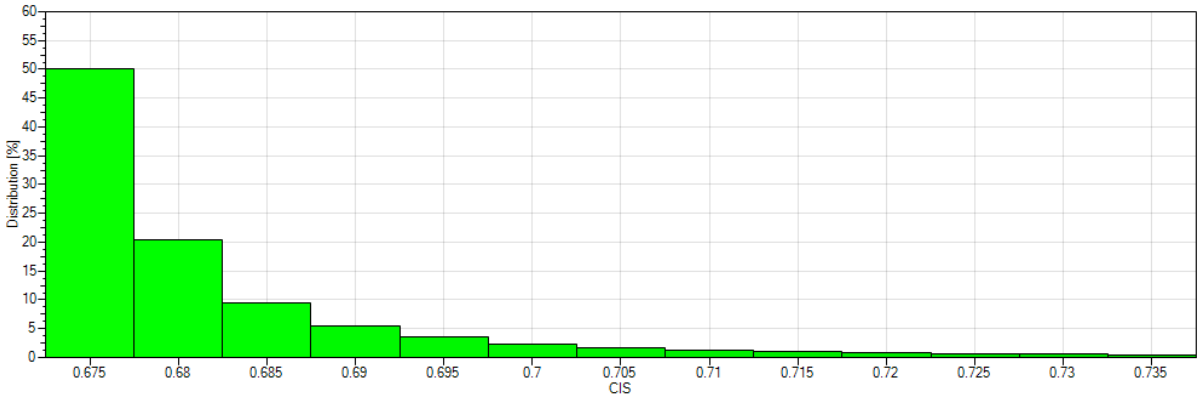
| | |
|---|---|
| **Average + Std. Dev.:** | **96.4 dB** |
| **Average - Std. Dev.:** | **48.0 dB** |
| **Max. Value:** | **89.8 dB** |
| **Min. Value:** | **-126.7 dB** |
| **Data Points:** | **5164** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥69.5 dB** | **75.4 dB** |
| **90%** | **≥70.4 dB** | **75.7 dB** |
| **85%** | **≥71.1 dB** | **76.0 dB** |
| **80%** | **≥71.6 dB** | **76.3 dB** |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.68 ±0.02** |
| **Average + Std. Dev.:** | **0.70** |
| **Average - Std. Dev.:** | **0.67** |
| **Max. Value:** | **0.79** |
| **Min. Value:** | **0.67** |
| **Data Points:** | **5164** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.67** | **0.68** |
| **90%** | **≥0.67** | **0.68** |
| **85%** | **≥0.67** | **0.69** |
| **80%** | **≥0.67** | **0.69** |

# NIST B225 BASEMENT UNIQUE ROOMS

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

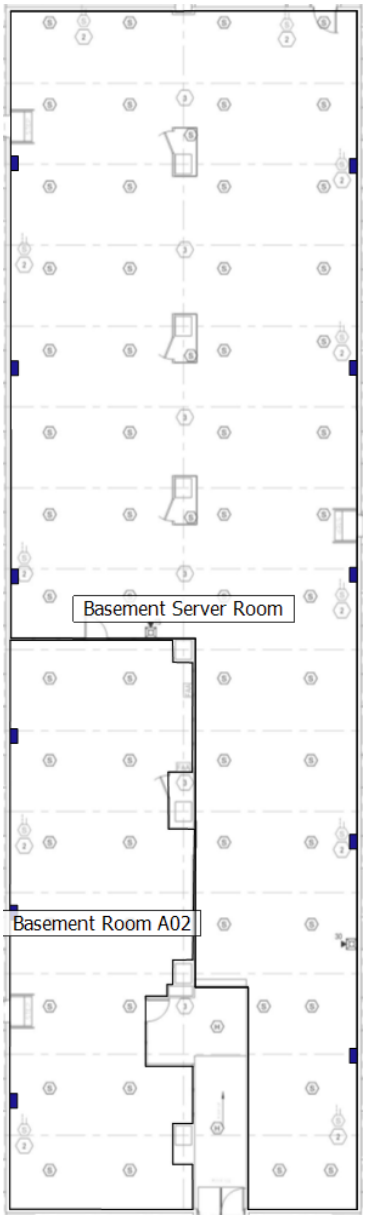
# Project Information

| | |
|---|---|
| **Title:** | **NIST B225 BASEMENT UNIQUE ROOMS** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

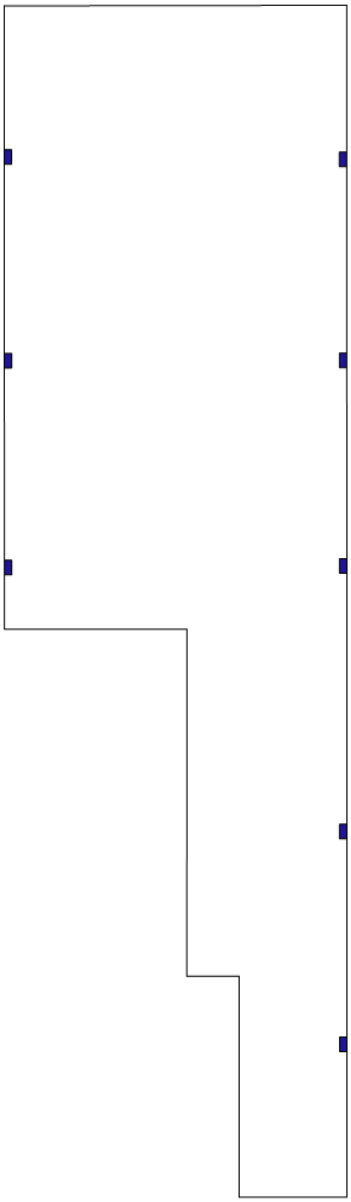
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **11** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Basement Server Room



| | |
|---|---|
| **Label:** | **Basement Server Room** |
| **Room Height:** | **12.00 ft** |
| **Dimensions (WxD):** | **47.17 ft x 163.99 ft** |
| **Volume:** | **66549.9 cb ft (net: 66549.9 cb ft)** |
| **Surface Area:** | **16157.4 sq ft (net: 16157.4 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **4.0 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 8 | E70 (Cooper Notification) |

## Surfaces

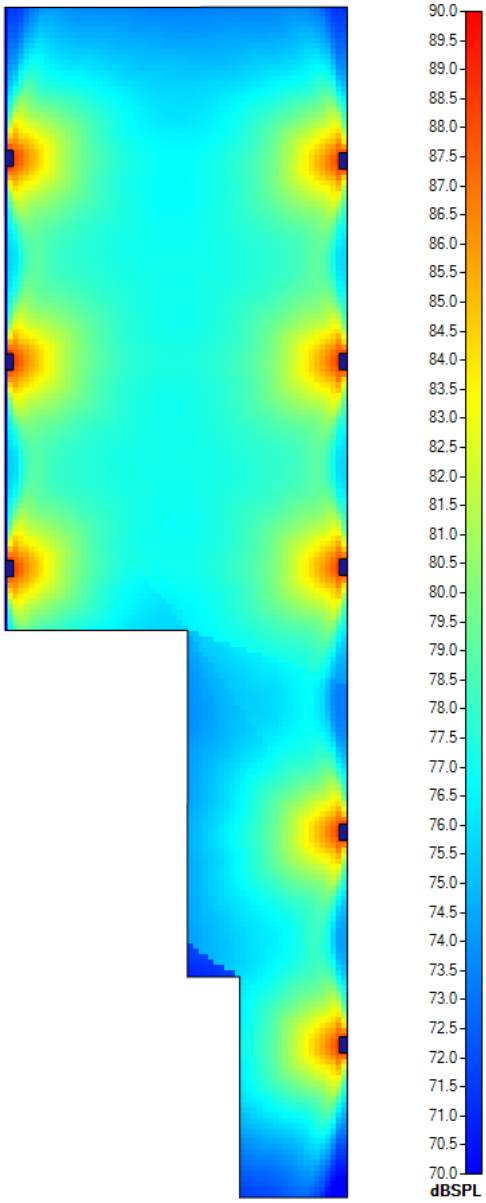
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 5545.83 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 5545.83 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 1028.95 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 301.45 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 572.39 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 86.57 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 365.01 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 178.16 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 1967.53 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 565.68 | Steel, Wall, Floor, or Ceiling |

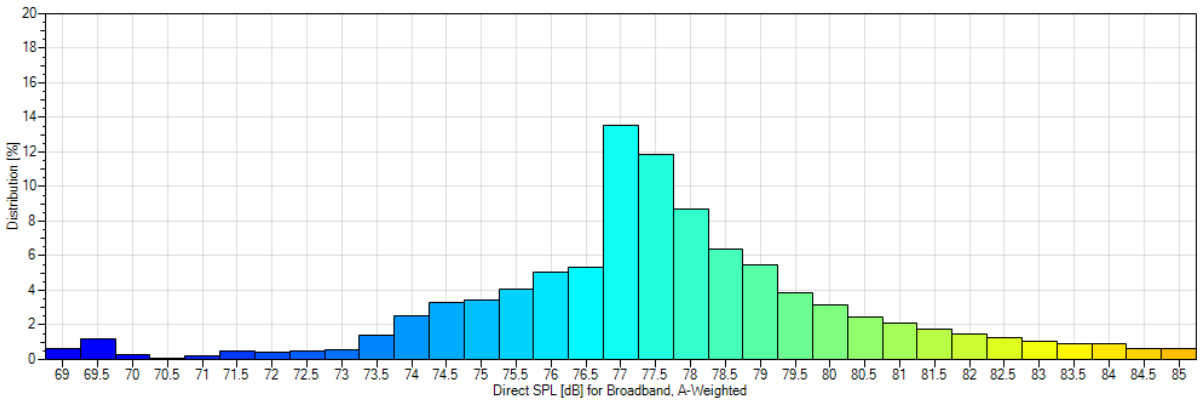
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 96.31 | 144.56 | 8.00 | 0.0 | 0.0 | 1/2 W (70V) |
| 2 | Wall | E70 | 96.30 | 173.03 | 8.00 | 0.0 | 0.0 | 1/2 W (70V) |
| 3 | Wall | E70 | 96.29 | 201.05 | 8.00 | 0.0 | 0.0 | 1/2 W (70V) |
| 4 | Wall | E70 | 143.39 | 200.71 | 8.00 | -180.0 | 0.0 | 1/2 W (70V) |
| 5 | Wall | E70 | 143.40 | 173.07 | 8.00 | -180.0 | 0.0 | 1/2 W (70V) |
| 6 | Wall | E70 | 143.41 | 108.24 | 8.00 | -180.0 | 0.0 | 1/2 W (70V) |
| 7 | Wall | E70 | 143.41 | 144.77 | 8.00 | -180.0 | 0.0 | 1/2 W (70V) |
| 8 | Wall | E70 | 143.42 | 78.98 | 8.00 | -180.0 | 0.0 | 1/2 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



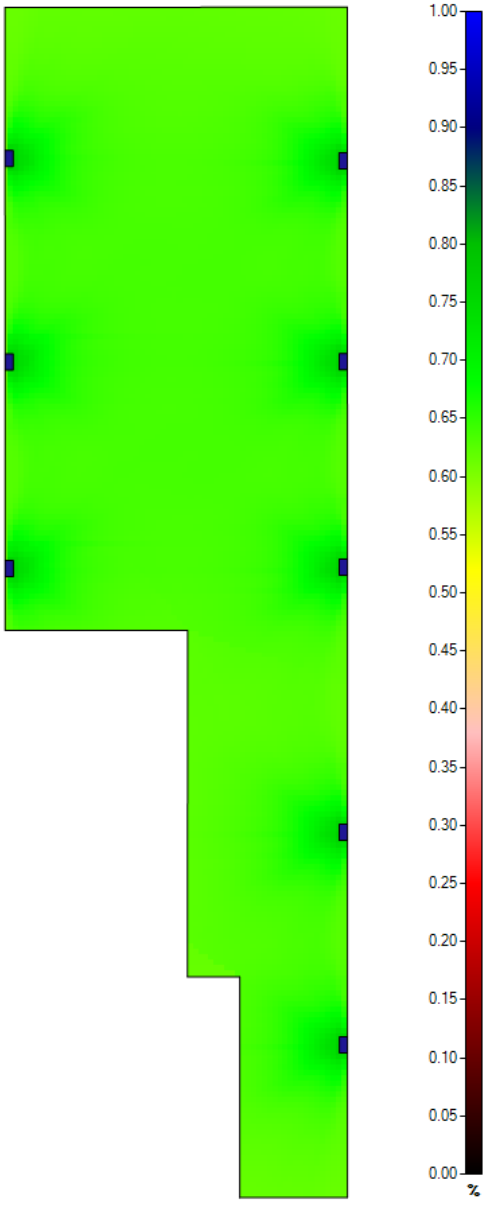

| | |
|---|---|
| **Average:** | **76.8 dB ±12.3 dB** |

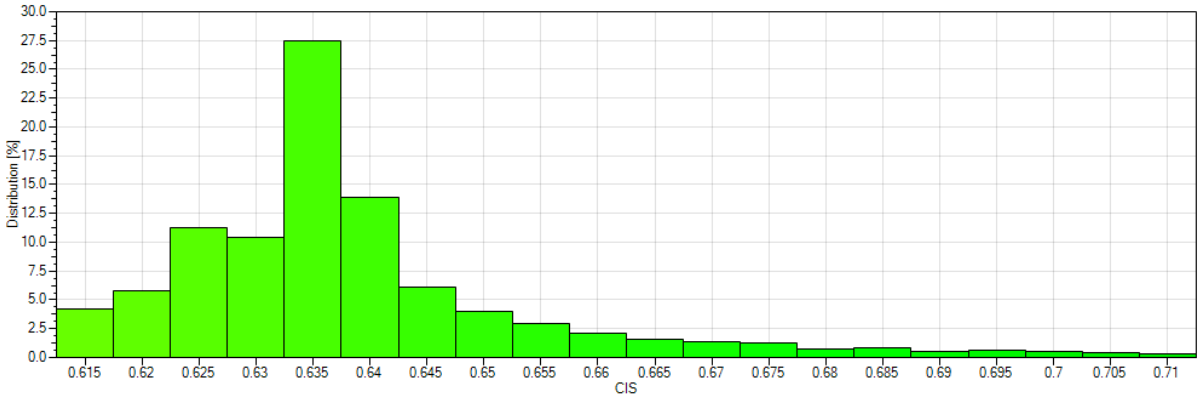
| | |
|---|---|
| **Average + Std. Dev.:** | **89.2 dB** |
| **Average - Std. Dev.:** | **64.5 dB** |
| **Max. Value:** | **90.0 dB** |
| **Min. Value:** | **-126.2 dB** |
| **Data Points:** | **10865** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥71.9 dB | 78.0 dB |
| 90% | ≥74.2 dB | 78.3 dB |
| 85% | ≥74.9 dB | 78.5 dB |
| 80% | ≥75.6 dB | 78.7 dB |

# Additional Mappings

## CIS

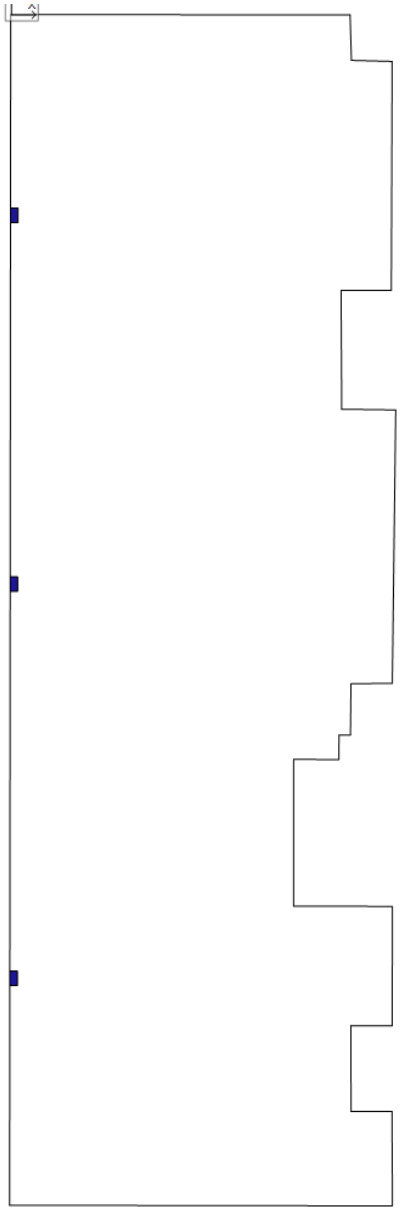





| | |
|---|---|
| **Average:** | **0.64 ±0.02** |
| **Average + Std. Dev.:** | **0.66** |
| **Average - Std. Dev.:** | **0.62** |
| **Max. Value:** | **0.78** |
| **Min. Value:** | **0.61** |
| **Data Points:** | **10865** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.62** | **0.64** |
| **90%** | **≥0.62** | **0.64** |
| **85%** | **≥0.62** | **0.64** |
| **80%** | **≥0.63** | **0.65** |

# Room: Basement Room A02



| | |
|---|---|
| **Label:** | **Basement Room A02** |
| **Room Height:** | **12.00 ft** |
| **Dimensions (WxD):** | **25.14 ft x 77.85 ft** |
| **Volume:** | **21748.6 cb ft (net: 21748.6 cb ft)** |
| **Surface Area:** | **6386.2 sq ft (net: 6386.2 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.8 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 3 | E70 (Cooper Notification) |

## Surfaces

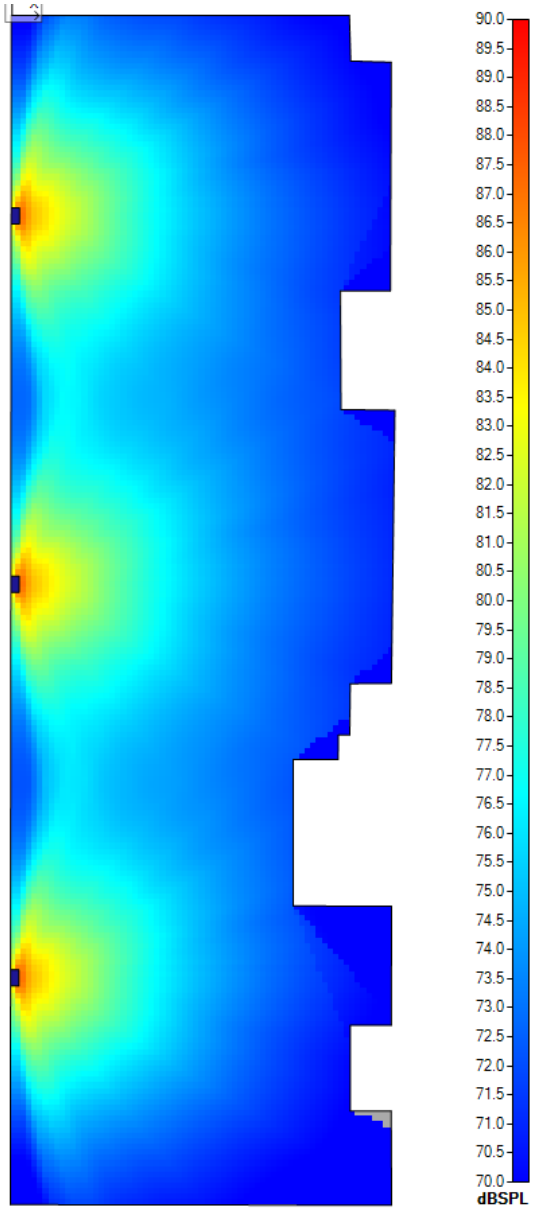
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1812.38 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1812.38 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 265.19 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 35.73 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 31.81 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 179.63 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 39.24 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 93.22 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 42.22 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 214.37 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 32.33 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 40.20 | Steel, Wall, Floor, or Ceiling |
| Wall #11 | Main Area | 8.89 | Steel, Wall, Floor, or Ceiling |
| Wall #12 | Main Area | 19.12 | Steel, Wall, Floor, or Ceiling |
| Wall #13 | Main Area | 35.22 | Steel, Wall, Floor, or Ceiling |
| Wall #14 | Main Area | 115.06 | Steel, Wall, Floor, or Ceiling |
| Wall #15 | Main Area | 77.14 | Steel, Wall, Floor, or Ceiling |
| Wall #16 | Main Area | 93.60 | Steel, Wall, Floor, or Ceiling |
| Wall #17 | Main Area | 32.32 | Steel, Wall, Floor, or Ceiling |
| Wall #18 | Main Area | 67.29 | Steel, Wall, Floor, or Ceiling |
| Wall #19 | Main Area | 32.03 | Steel, Wall, Floor, or Ceiling |
| Wall #20 | Main Area | 74.04 | Steel, Wall, Floor, or Ceiling |
| Wall #21 | Main Area | 299.08 | Steel, Wall, Floor, or Ceiling |
| Wall #22 | Main Area | 933.69 | Steel, Wall, Floor, or Ceiling |

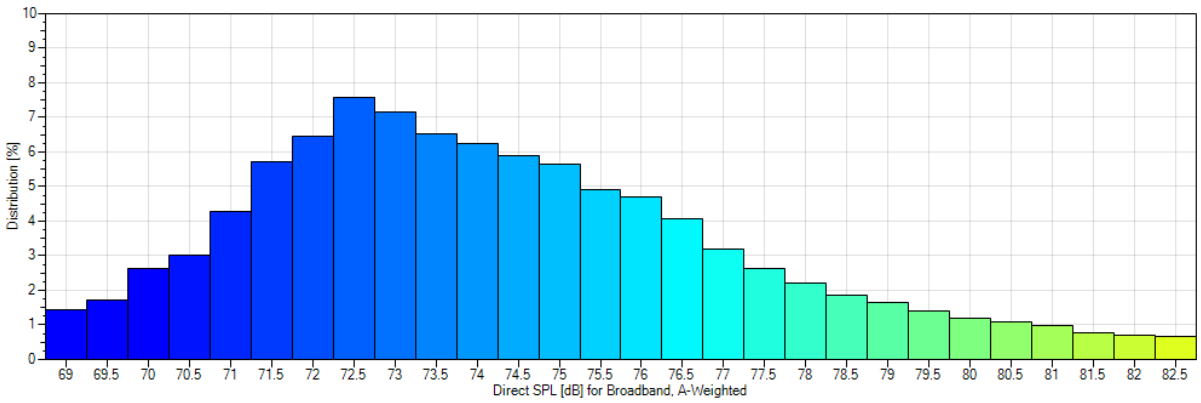
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | -0.09 | -62.97 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |
| 2 | Wall | E70 | -0.07 | -37.21 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |
| 3 | Wall | E70 | -0.05 | -13.10 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



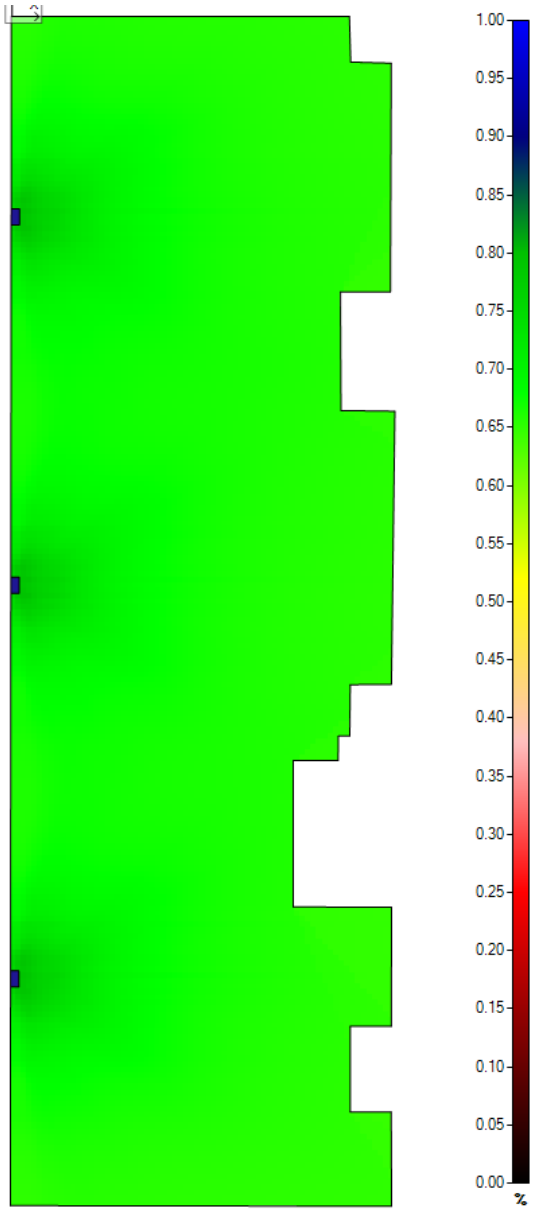

| | |
|---|---|
| **Average:** | **74.1 dB ±8.9 dB** |

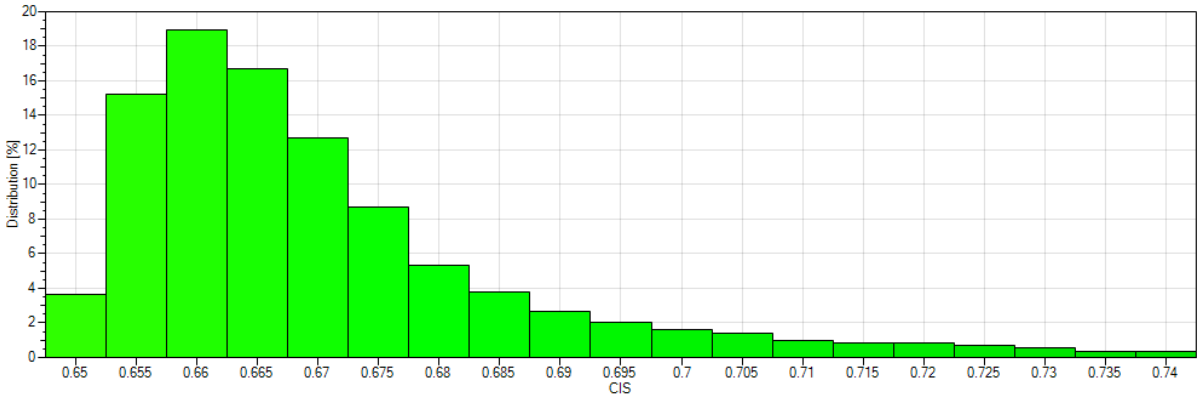
| | |
|---|---|
| **Average + Std. Dev.:** | **83.0 dB** |
| **Average - Std. Dev.:** | **65.2 dB** |
| **Max. Value:** | **87.1 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **13978** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| 95% | ≥69.8 dB | 74.7 dB |
| 90% | ≥70.7 dB | 74.9 dB |
| 85% | ≥71.3 dB | 75.2 dB |
| 80% | ≥71.7 dB | 75.4 dB |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.67 ±0.02** |
| **Average + Std. Dev.:** | **0.69** |
| **Average - Std. Dev.:** | **0.65** |
| **Max. Value:** | **0.80** |
| **Min. Value:** | **0.65** |
| **Data Points:** | **13978** |

| **Area Covered:** | **CIS** | **Average** |
|---|---|---|
| **95%** | **≥0.65** | **0.67** |
| **90%** | **≥0.66** | **0.67** |
| **85%** | **≥0.66** | **0.68** |
| **80%** | **≥0.66** | **0.68** |

# NIST B225 FIRST FLOOR UNIQUE ROOMS

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

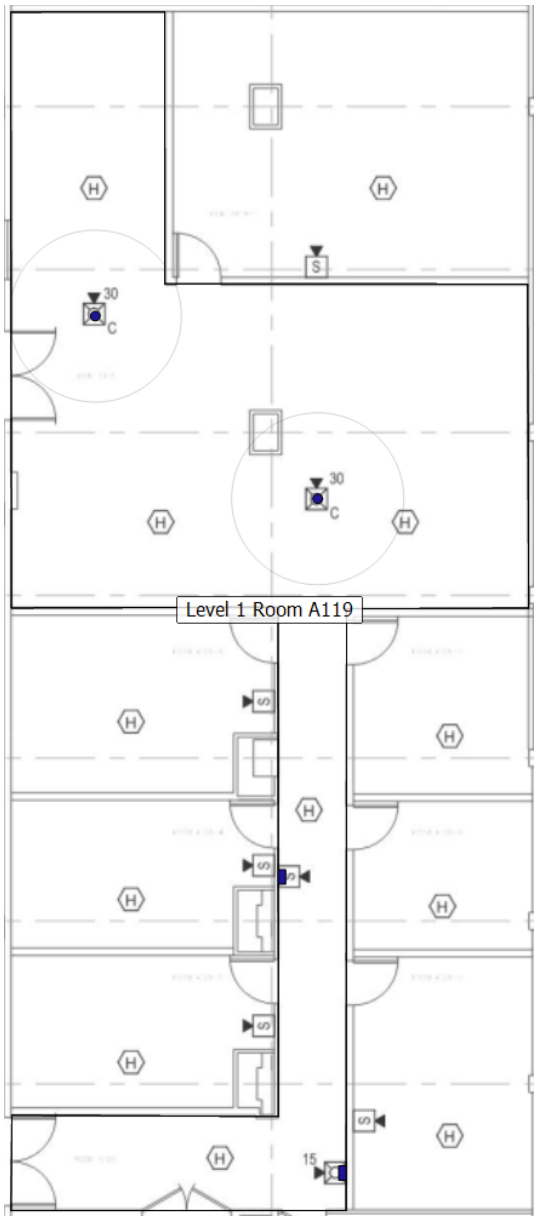
# Project Information

| | |
|---|---|
| **Title:** | **NIST B225 FIRST FLOOR UNIQUE ROOMS** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

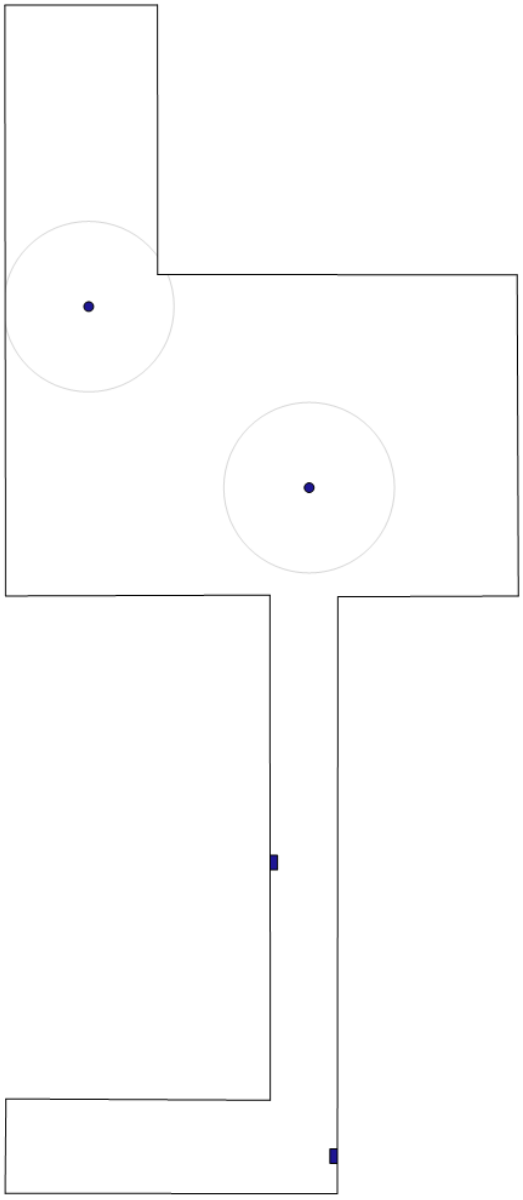
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **4** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Level 1 Room A119



| | |
|---|---|
| **Label:** | **Level 1 Room A119** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **35.06 ft x 81.28 ft** |
| **Volume:** | **12650.1 cb ft (net: 12650.1 cb ft)** |
| **Surface Area:** | **5216.6 sq ft (net: 5216.6 sq ft)** |
| **Ear Height:** | **5.88 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **1.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|

| | |
|---|---|
| 4 | E70 (Cooper Notification) |

## Surfaces

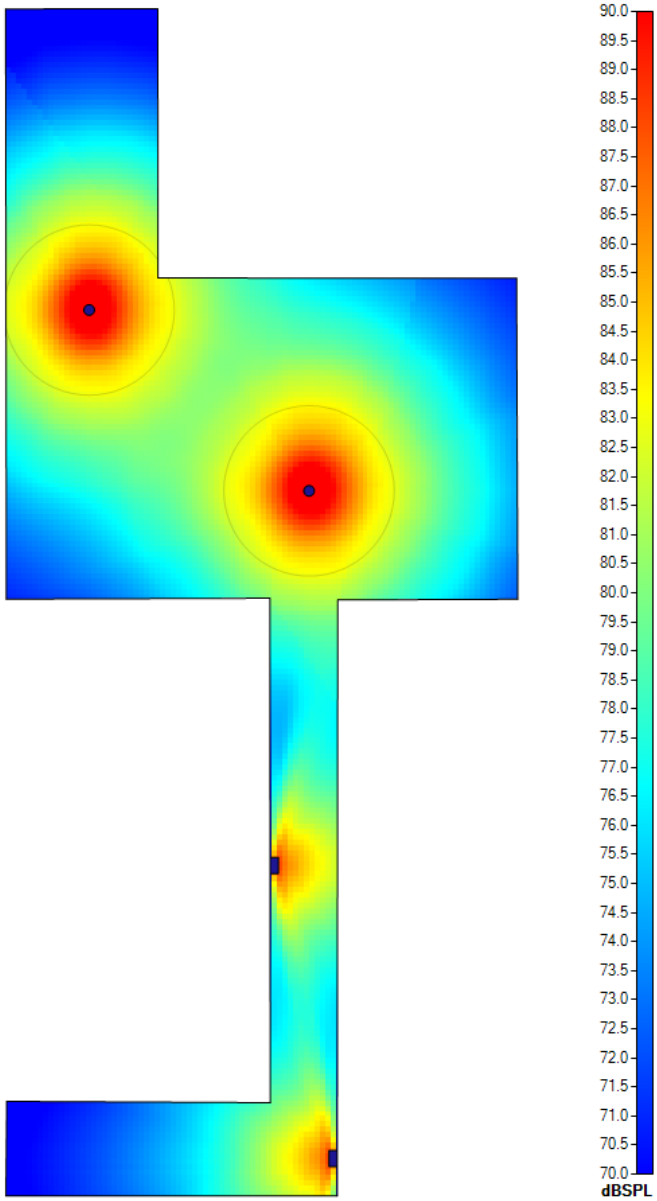
| Surface | Part | Area sq ft | Material |
|---|---|---|---|
| Floor | Main Area | 1265.01 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 1265.01 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 123.22 | Steel, Wall, Floor, or Ceiling |
| Wall #2 | Main Area | 408.04 | Steel, Wall, Floor, or Ceiling |
| Wall #3 | Main Area | 226.87 | Steel, Wall, Floor, or Ceiling |
| Wall #4 | Main Area | 64.66 | Steel, Wall, Floor, or Ceiling |
| Wall #5 | Main Area | 180.49 | Steel, Wall, Floor, or Ceiling |
| Wall #6 | Main Area | 345.38 | Steel, Wall, Floor, or Ceiling |
| Wall #7 | Main Area | 180.43 | Steel, Wall, Floor, or Ceiling |
| Wall #8 | Main Area | 403.93 | Steel, Wall, Floor, or Ceiling |
| Wall #9 | Main Area | 104.16 | Steel, Wall, Floor, or Ceiling |
| Wall #10 | Main Area | 184.31 | Steel, Wall, Floor, or Ceiling |
| Wall #11 | Main Area | 245.47 | Steel, Wall, Floor, or Ceiling |
| Wall #12 | Main Area | 219.66 | Concrete, Painted, Wall or Floor |

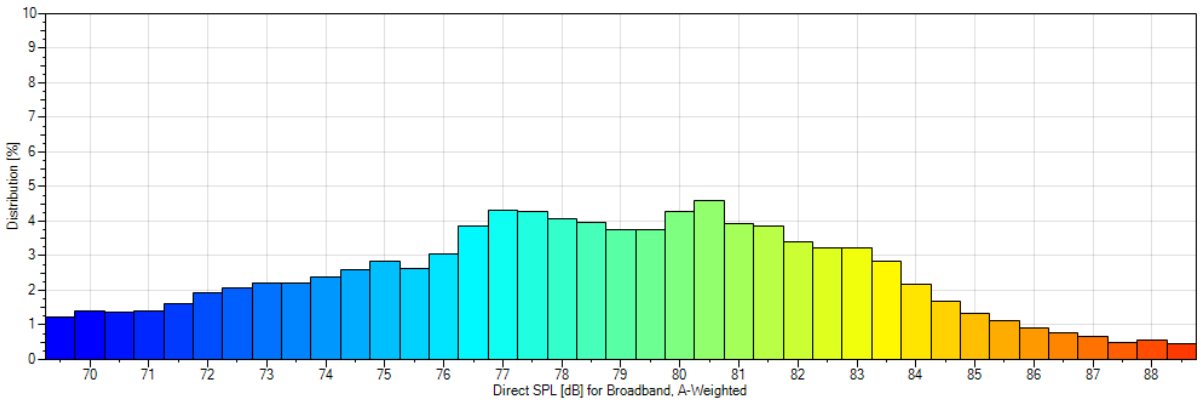
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Ceiling | E70 | 152.08 | 142.14 | 8.00 | 0.0 | -90.0 | 1/2 W (70V) |
| 2 | Ceiling | E70 | 167.13 | 129.76 | 8.00 | 0.0 | -90.0 | 1/2 W (70V) |
| 3 | Wall | E70 | 164.48 | 104.12 | 8.00 | 0.0 | 0.0 | 1/4 W (70V) |
| 4 | Wall | E70 | 169.05 | 84.05 | 8.00 | 180.0 | 0.0 | 1/4 W (70V) |

# Mapping and Distribution

## Direct SPL (A-Weighted), Broadband



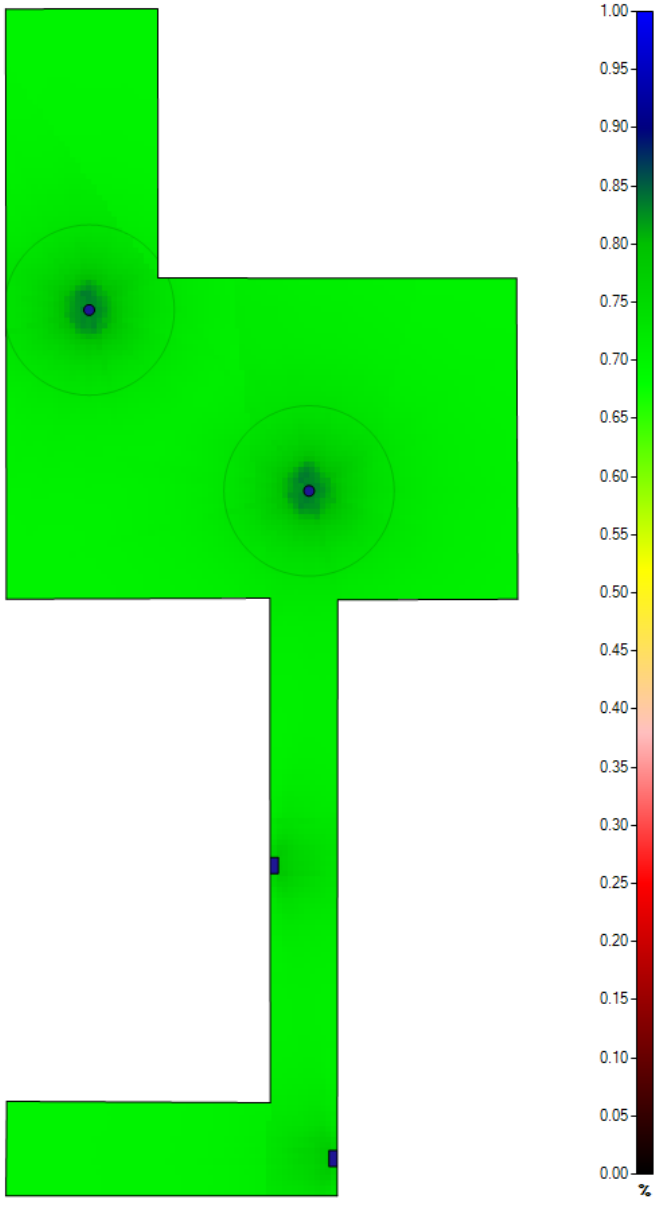

| | |
|---|---|
| **Average:** | **78.6 dB ±4.7 dB** |

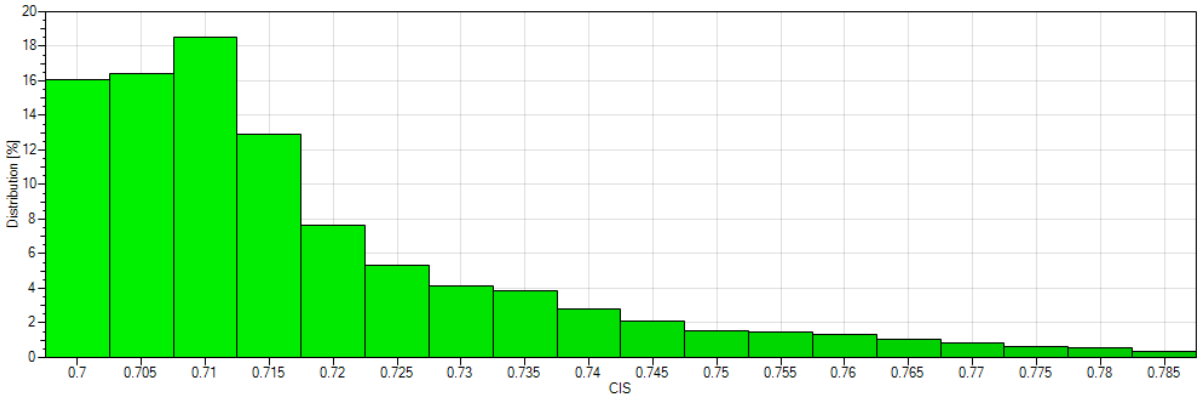
| | |
|---|---|
| **Average + Std. Dev.:** | **83.3 dB** |
| **Average - Std. Dev.:** | **73.9 dB** |
| **Max. Value:** | **93.2 dB** |
| **Min. Value:** | **67.6 dB** |
| **Data Points:** | **9935** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥70.6 dB** | **79.1 dB** |
| **90%** | **≥72.1 dB** | **79.5 dB** |
| **85%** | **≥73.3 dB** | **79.9 dB** |
| **80%** | **≥74.4 dB** | **80.2 dB** |

# Additional Mappings

## CIS






| | |
|---|---|
| **Average:** | **0.72 ±0.02** |
| **Average + Std. Dev.:** | **0.74** |
| **Average - Std. Dev.:** | **0.70** |
| **Max. Value:** | **0.84** |
| **Min. Value:** | **0.70** |
| **Data Points:** | **9935** |

| Area Covered: | CIS | Average |
|---|---|---|
| **95%** | **≥0.70** | **0.72** |
| **90%** | **≥0.70** | **0.72** |
| **85%** | **≥0.70** | **0.72** |
| **80%** | **≥0.70** | **0.72** |

# NIST B225 SUB-BASEMENT

Alec Lauterbach
Stanton Engineering

Wednesday, May 14, 2025

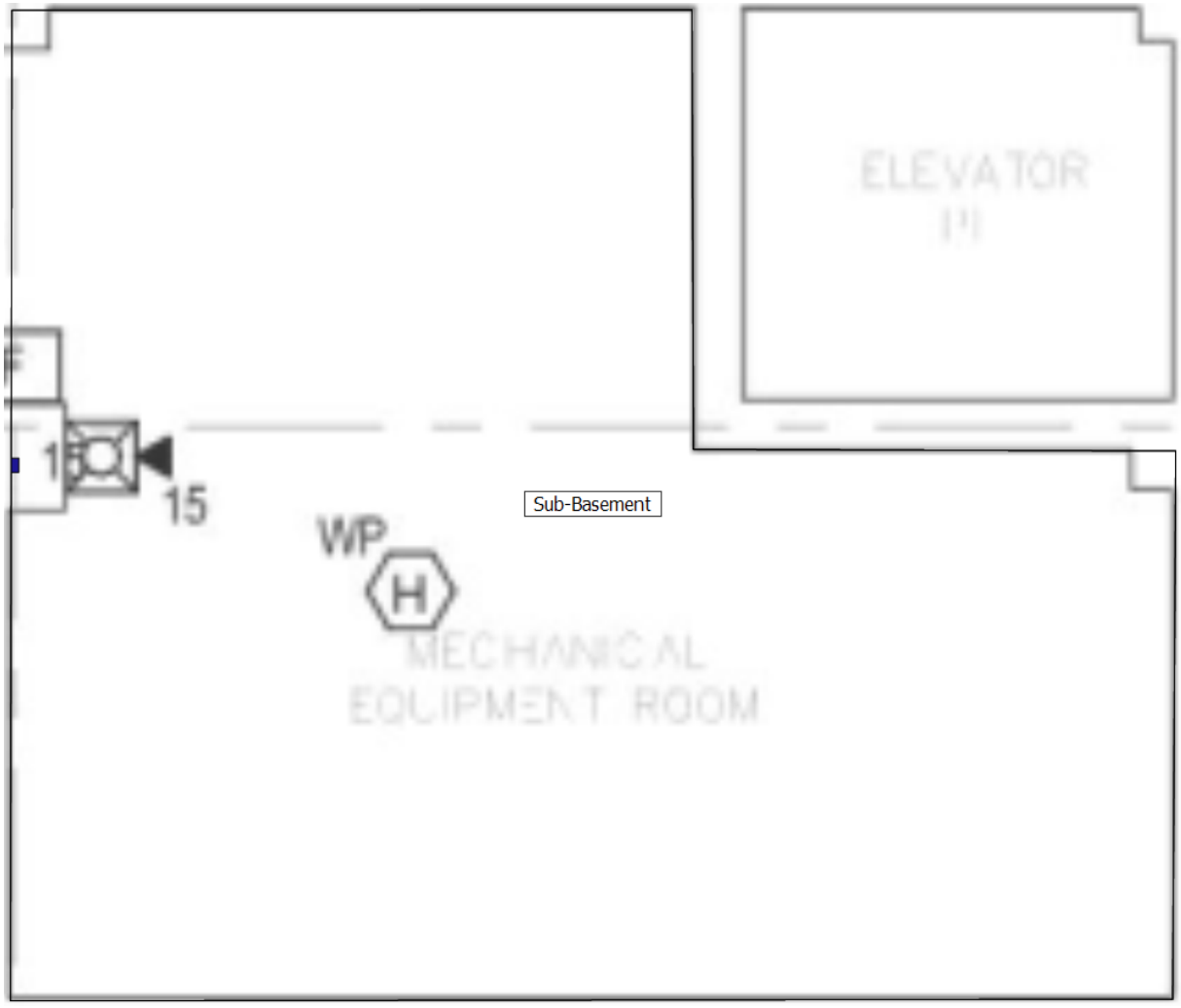
# Project Information

| | |
|---|---|
| **Title:** | **NIST B225 SUB-BASEMENT** |
| **Author:** | **Alec Lauterbach** |
| **Company:** | **Stanton Engineering** |
| **Temperature:** | **68.0°F** |
| **Pressure:** | **Standard (29.8 inHg)** |
| **Humidity:** | **Standard (60%)** |
| **Input Signal Spectrum:** | **Program (IEC 60268-1)** |
| **Input Signal Crest Factor:** | **Sine** |
| **Calculation Accuracy:** | **Fast Approximation** |
| **STI Standard:** | **IEC 60268-16 (2020)** |
| **Software Version:** | **EASE Evac, Version 2.0.40** |

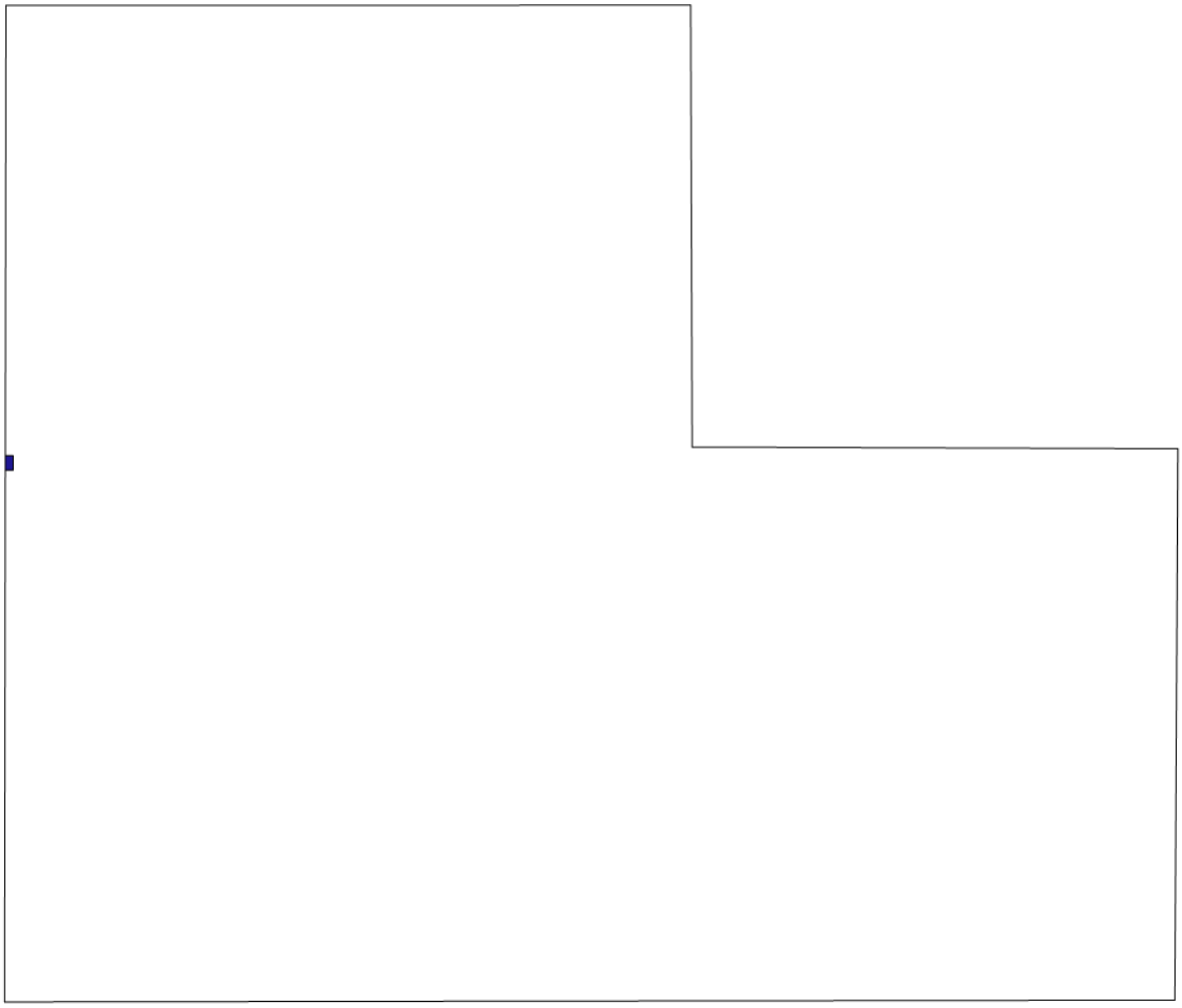
## Sound Sources Summary

| Quantity | Type |
|---|---|
| **1** | **E70 (Cooper Notification)** |

## Layout Overview



# Room: Sub-Basement



| | |
|---|---|
| **Label:** | **Sub-Basement** |
| **Room Height:** | **10.00 ft** |
| **Dimensions (WxD):** | **23.71 ft x 20.13 ft** |
| **Volume:** | **3883.2 cb ft (net: 3883.2 cb ft)** |
| **Surface Area:** | **1651.5 sq ft (net: 1651.5 sq ft)** |
| **Ear Height:** | **5.58 ft** |
| **Network Voltage:** | **70.7 V** |
| **Power Consumption:** | **0.5 W** |

## Sound Sources Summary

| Quantity | Type |
|---|---|
| 1 | E70 (Cooper Notification) |

## Surfaces

| Surface | Part | Area sq ft | Material |
|---|---|---|---|

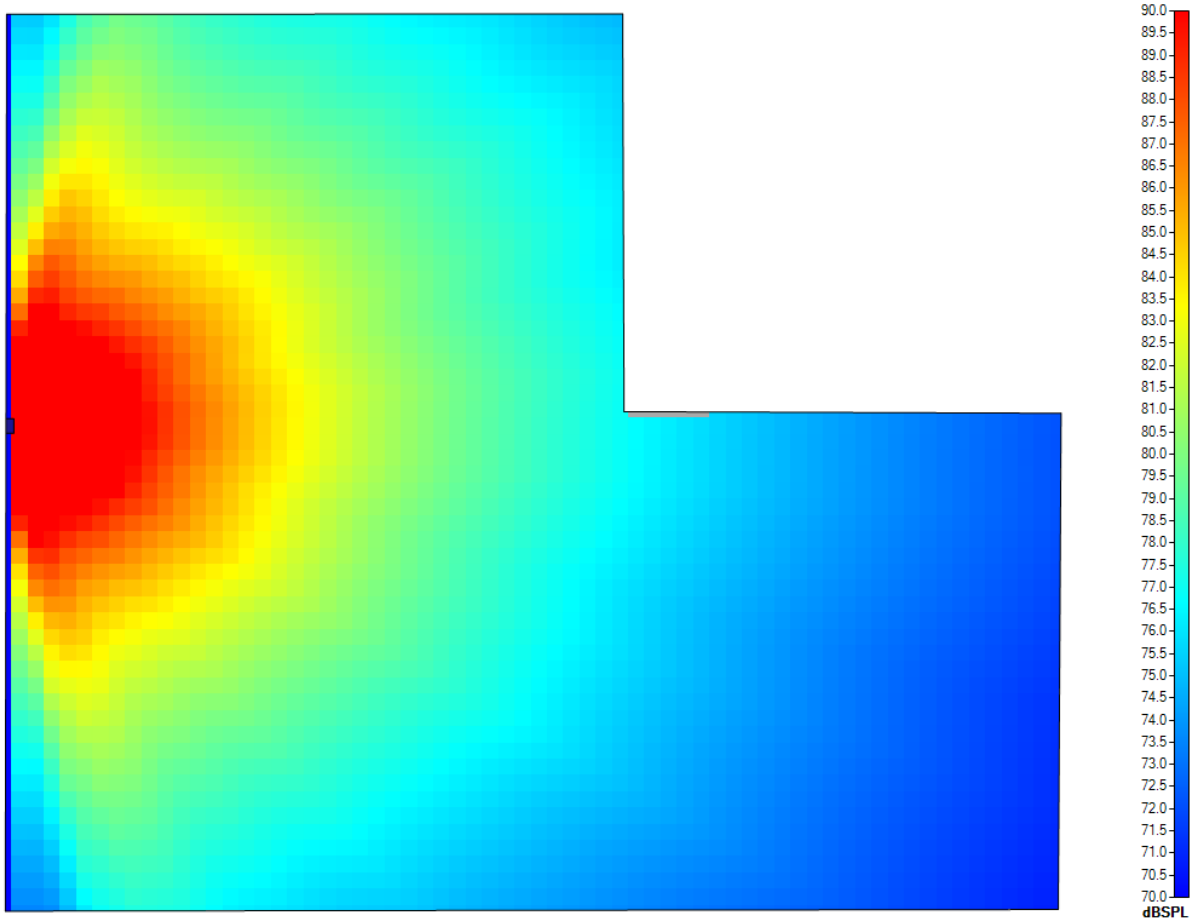
| | | | |
|---|---|---|---|
| Floor | Main Area | 388.32 | Concrete, Painted, Wall or Floor |
| Ceiling | Main Area | 388.32 | Concrete, Painted, Wall or Floor |
| Wall #1 | Main Area | 111.36 | Concrete, Painted, Wall or Floor |
| Wall #2 | Main Area | 98.14 | Concrete, Painted, Wall or Floor |
| Wall #3 | Main Area | 89.25 | Concrete, Painted, Wall or Floor |
| Wall #4 | Main Area | 138.35 | Concrete, Painted, Wall or Floor |
| Wall #5 | Main Area | 201.26 | Concrete, Painted, Wall or Floor |
| Wall #6 | Main Area | 236.48 | Concrete, Painted, Wall or Floor |

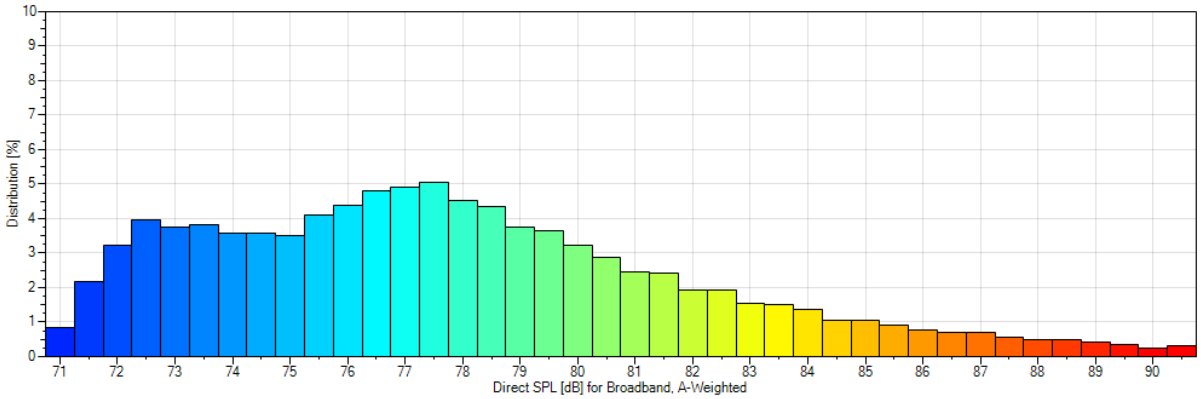
## Sound Sources

| Nr. | Mounting | Type | X [ft] | Y [ft] | Z [ft] | Hor [°] | Ver [°] | Tap Settings |
|---|---|---|---|---|---|---|---|---|
| 1 | Wall | E70 | 132.04 | 44.83 | 5.53 | -0.1 | 0.0 | 1/2 W (70V) |

## Mapping and Distribution

### Direct SPL (A-Weighted), Broadband



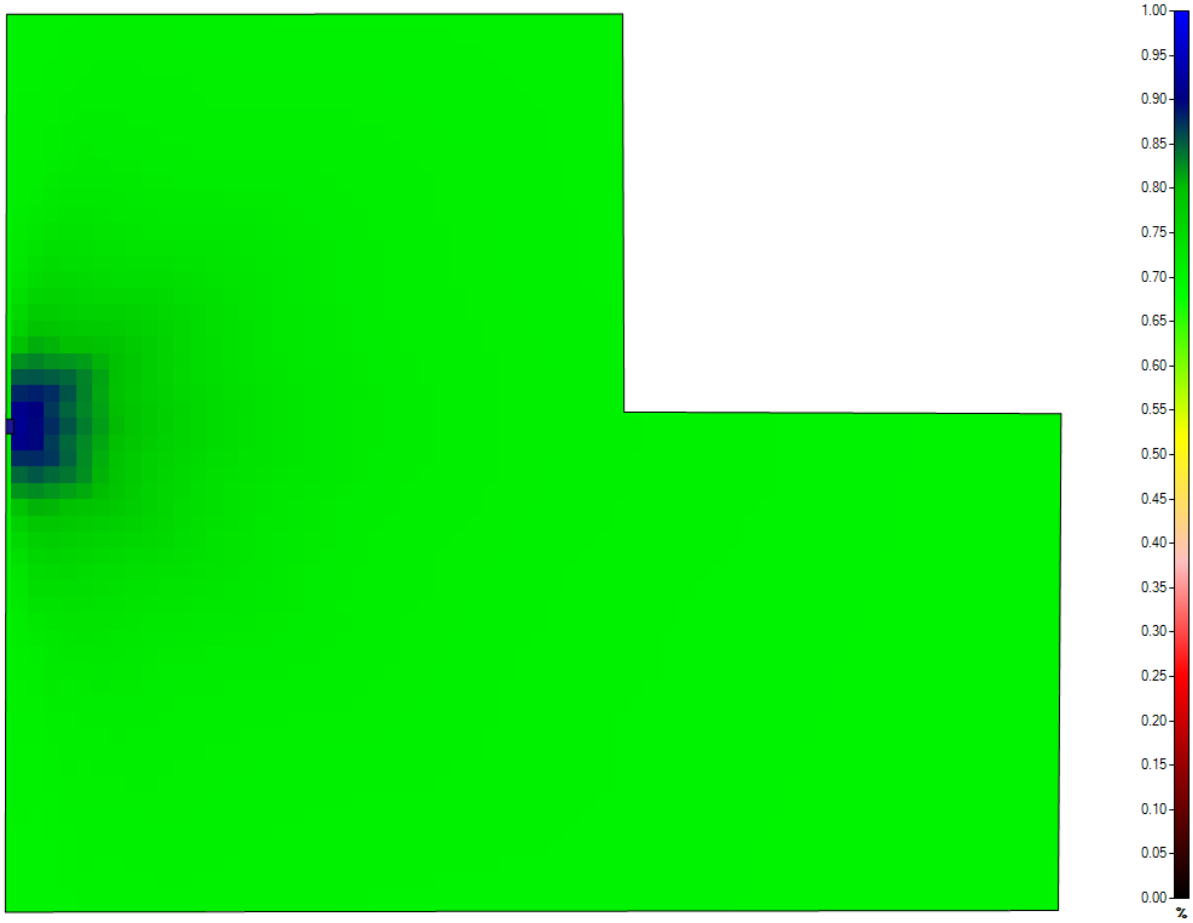


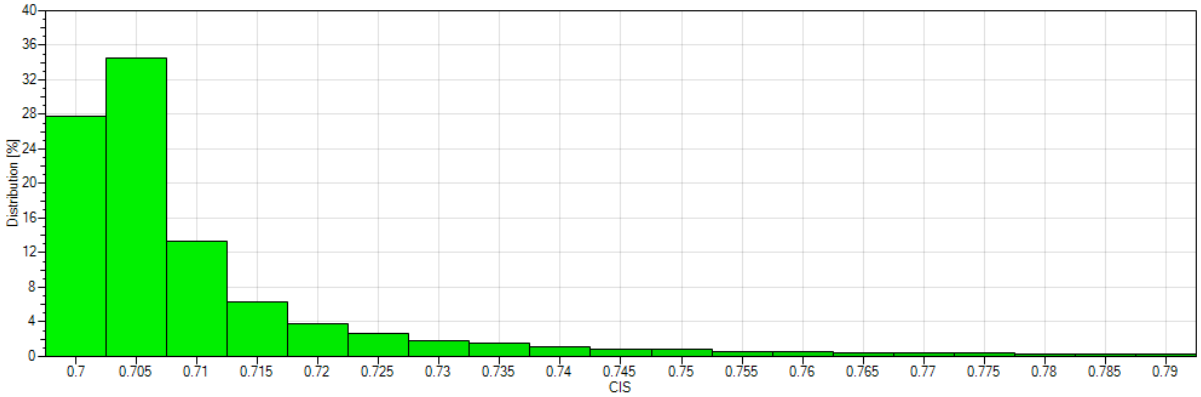

| | |
|---|---|
| **Average:** | **73.6 dB ±30.3 dB** |
| **Average + Std. Dev.:** | **104.0 dB** |
| **Average - Std. Dev.:** | **43.3 dB** |
| **Max. Value:** | **110.3 dB** |
| **Min. Value:** | **-178.3 dB** |
| **Data Points:** | **3065** |

| Area Covered: | Direct SPL(A) | Average |
|---|---|---|
| **95%** | **≥71.7 dB** | **78.4 dB** |
| **90%** | **≥72.4 dB** | **78.8 dB** |
| **85%** | **≥73.1 dB** | **79.1 dB** |
| **80%** | **≥73.7 dB** | **79.5 dB** |

# Additional Mappings

## CIS




| | |
|---|---|
| **Average:** | **0.71 ±0.02** |
| **Average + Std. Dev.:** | **0.74** |
| **Average - Std. Dev.:** | **0.69** |
| **Max. Value:** | **0.91** |
| **Min. Value:** | **0.70** |
| **Data Points:** | **3065** |

| Area Covered: | CIS | Average |
|---|---|---|
| 95% | ≥0.70 | 0.71 |
| 90% | ≥0.70 | 0.71 |
| 85% | ≥0.70 | 0.72 |
| 80% | ≥0.70 | 0.72 |