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CLOSING CONFERENCE

NOISE TRAINING PROJECT

www.noise-training.eu

info@noise-training.eu

Virtual Noise Audits

Learning and assessment tool



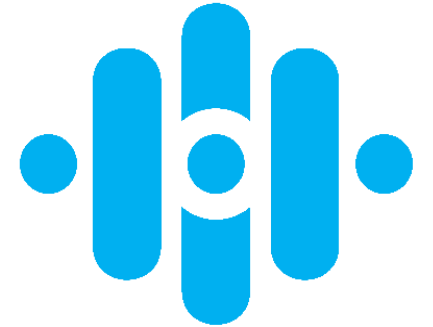
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IMPROVEMENT OF ENVIRONMENTAL

NOISE

MANAGEMENT

SKILLS IN AUDITS



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Objective



IMPROVEMENT OF ENVIRONMENTAL
NOISE
MANAGEMENT
SKILLS IN AUDITS

- Develop a tool that can be helpful for training of students and for their assessment in noise audits

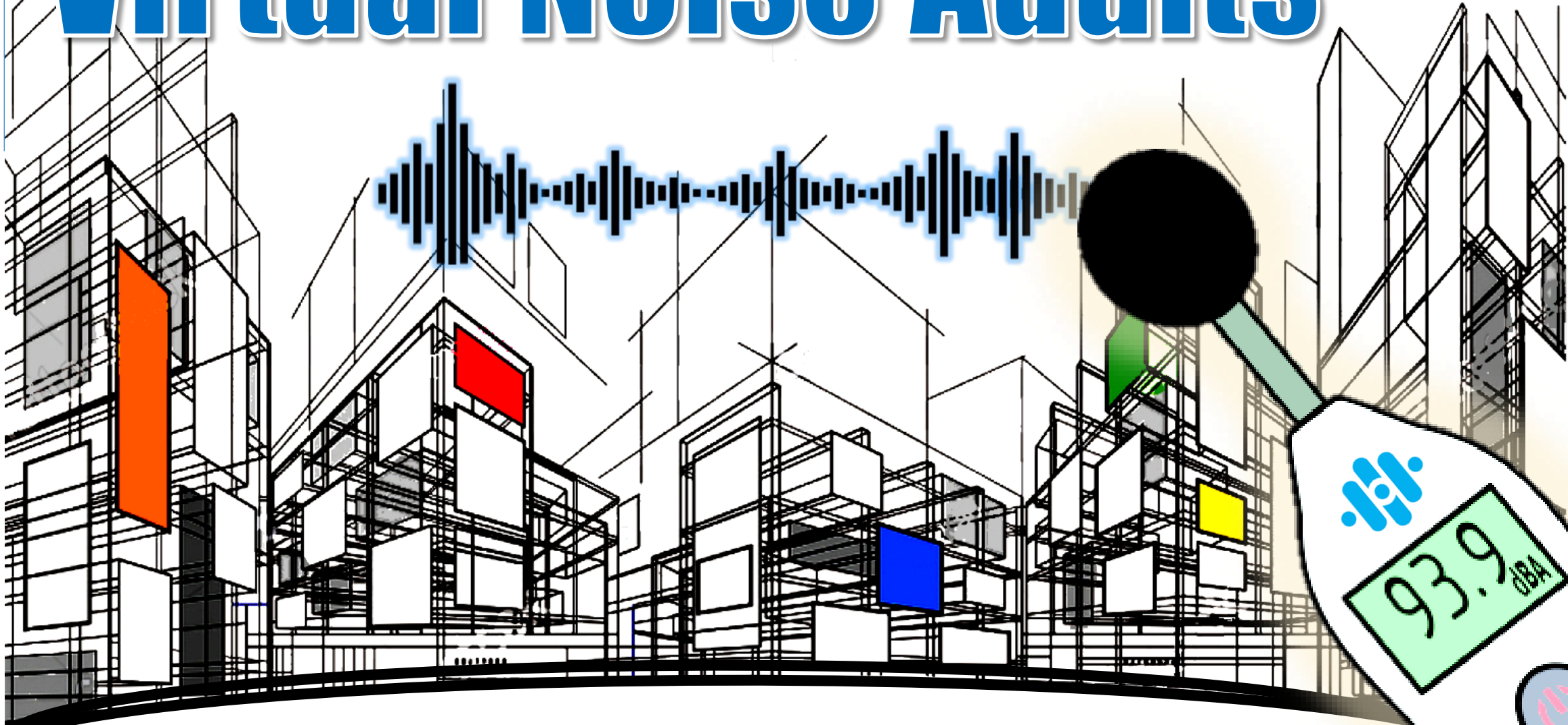




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IMPROVEMENT OF ENVIRONMENTAL
NOISE
MANAGEMENT
SKILLS IN AUDITS

Virtual Noise Audits





Learning objectives



IMPROVEMENT OF ENVIRONMENTAL
NOISE
MANAGEMENT
SKILLS IN AUDITS



What?
Where?
When?



Sound
level
meter



Processin
g
Reportin
g



Learning objectives

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1

PLAN

2

MEASURE



3

REPORT





Learning objectives



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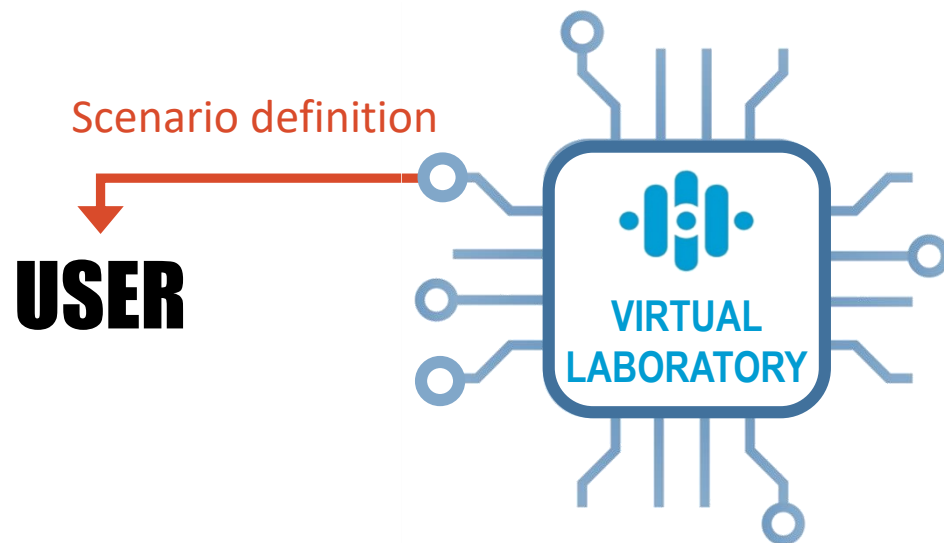




Overview



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NOISE
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SKILLS IN AUDITS

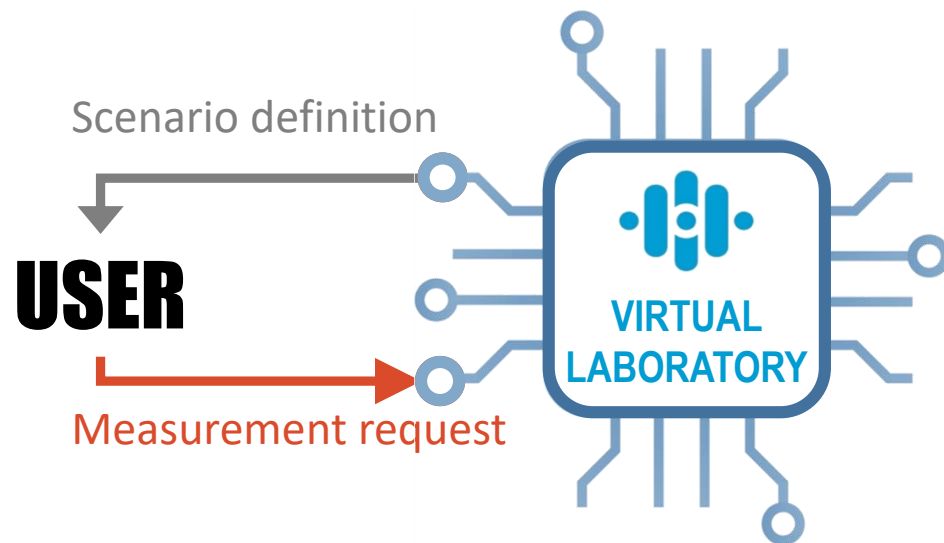




Overview



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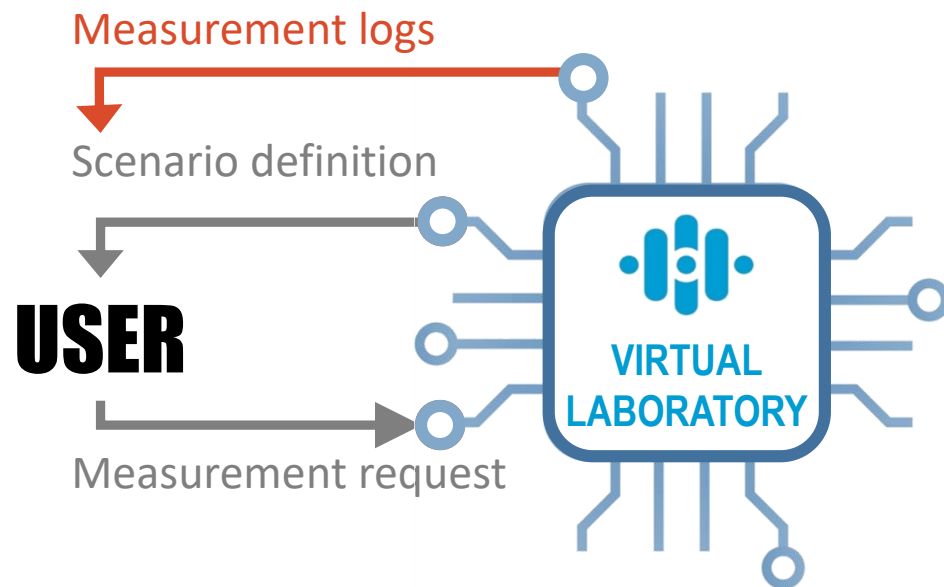




Overview



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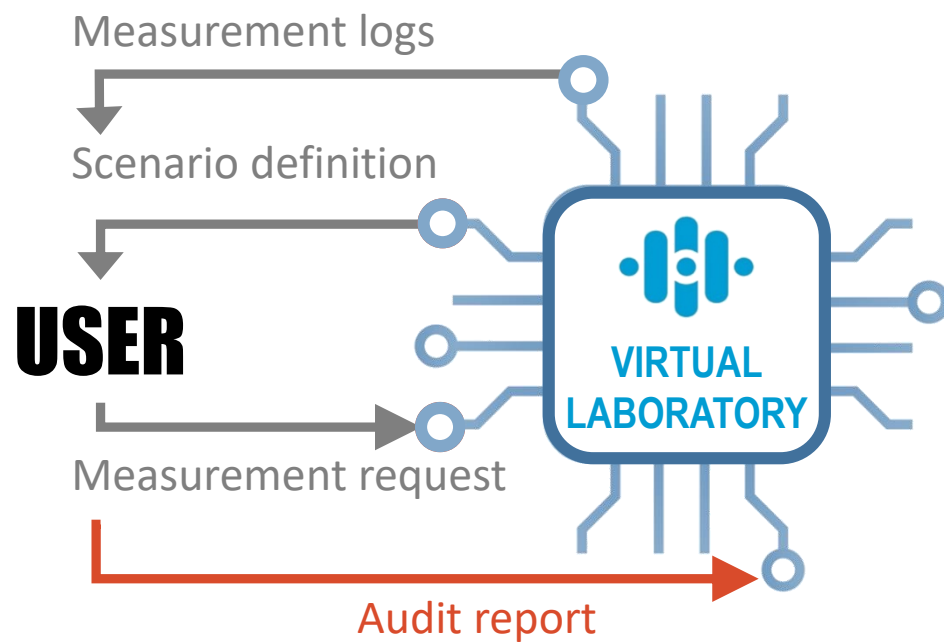




Overview



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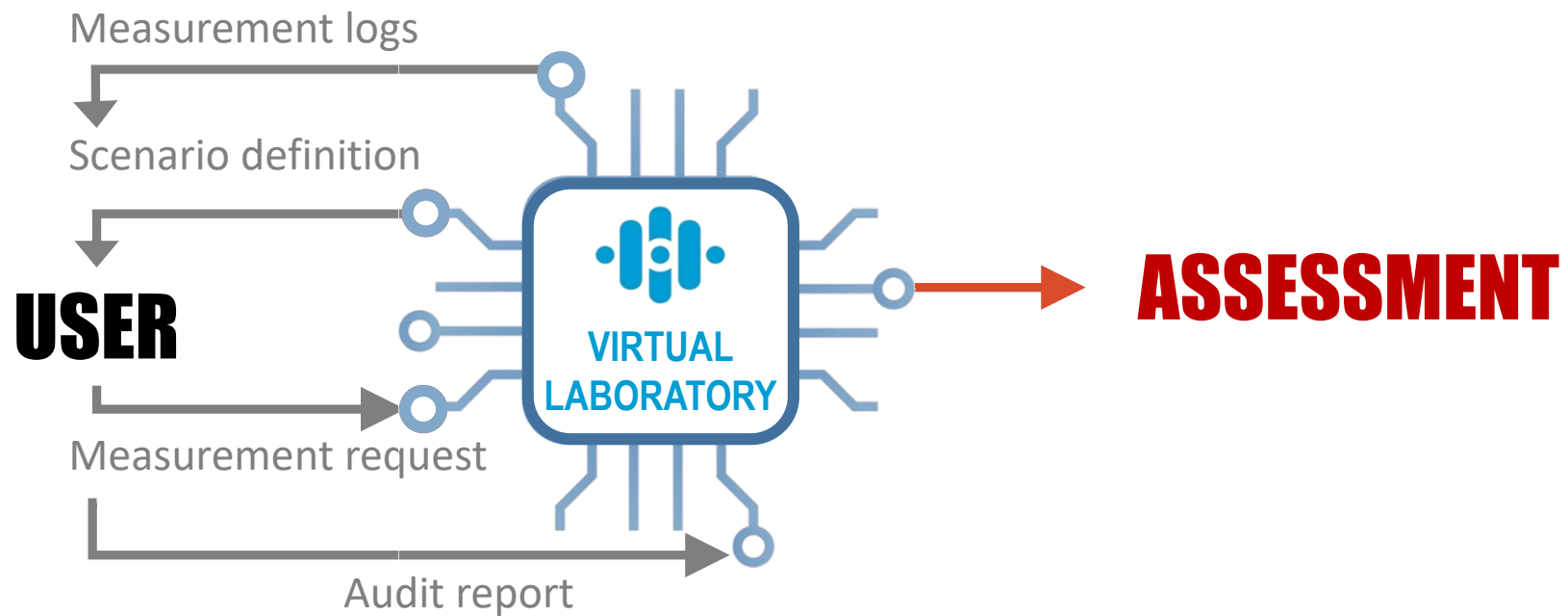




Overview



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Virtual noise management



IMPROVEMENT OF ENVIRONMENTAL
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GENERAL SCOPE 01

Comparison: countries or regulations
Training technicians
Assessment of students
Assessment of measurement procedures

02 LEARNING OBJECTIVES

Time and Spatial sampling
Background noise
Penalties
Uncertainty calculation

DEFINITION OF SCENARIOS 03

04 VIRTUAL LAB SETUP





General requirements of the first scenario



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Recreational noise

Since this is one of the main focus in this project



Simple scenario

Easy to implement and easy to understand



Based in a real case

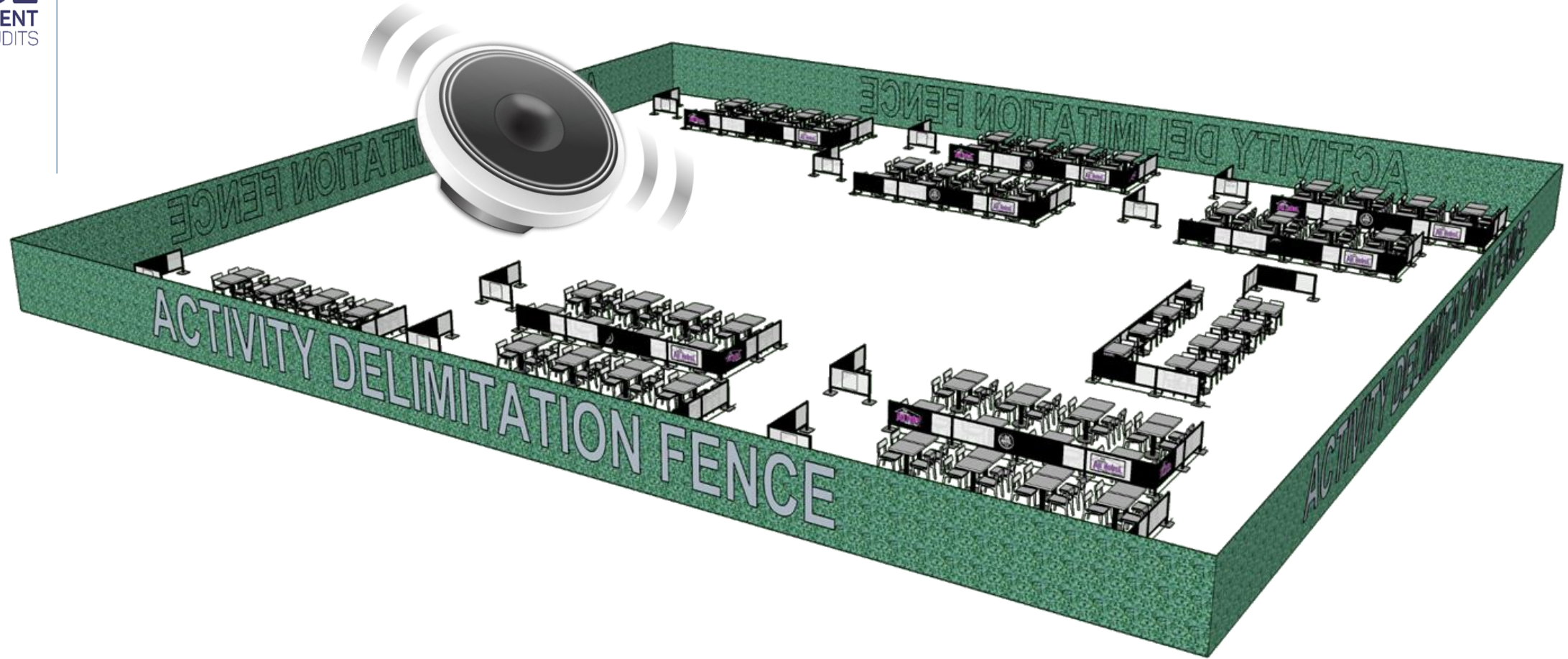
Reference measurements and recordings where obtained in a real audit



Description of the activity to audit

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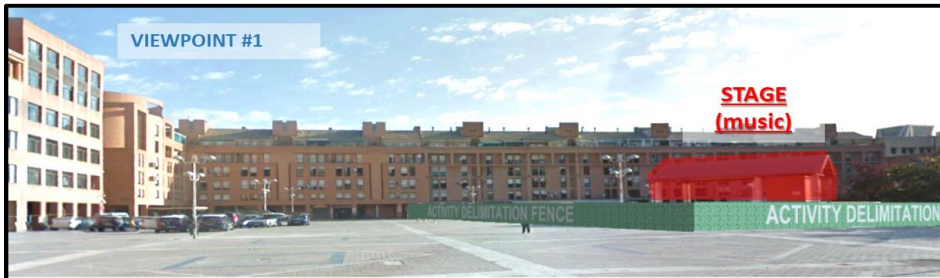
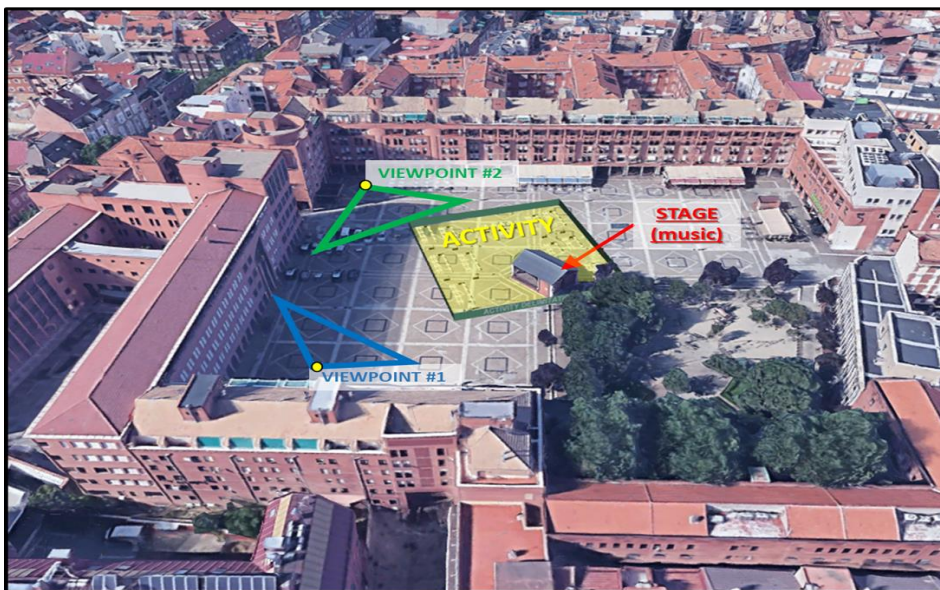




Scenario description



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VIRTUAL NOISE AUDIT

IMPROVEMENT OF ENVIRONMENTAL NOISE
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ACTIVITY DETAILS

- ☐ City: You decide
- ☐ Activity: Bar / cafe outdoors
- ☐ Music allowance: Activity was audited, license was granted
- ☐ Started: September 2014
- ☐ Opening hours: 20:00 – 02:00
- ☐ Scenario.kmz (Google Earth)

NOISE DETAILS

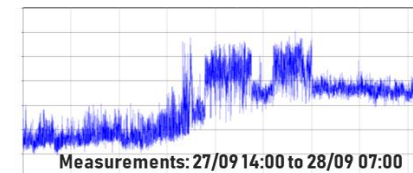
- ☐ Main activity's noise source:
 - Music
- ☐ Background noise sources:
 - Road traffic outside the square
 - Any other not specified

AUDIT SCOPE

Recreational activity with music allowance granted. Residents of this square have been complaining about the activity:

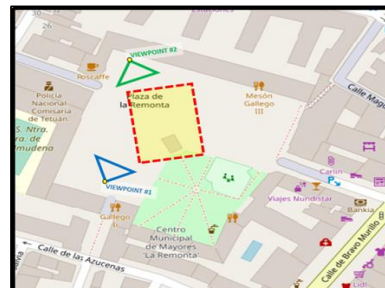
- ☐ They claim that the closing hours are not being complied with.
- ☐ They claim that music is very loud

The goal of this audit is to check if the activity complies with the regulation (in your country, your city..., you decide)



MEASUREMENTS AVAILABLE

- ☐ Sound recordings and B&K Evaluator files available (1 location only, for reference)
- ☐ Continuous 1 second duration measurements
- ☐ 1/3 octave bands measurements available (L_{req})
- ☐ Averaging time: on request (minimum 1 second)
- ☐ Frequency weighting available: Z, A, C
- ☐ Time weighting available: Fast, impulse, peak
- ☐ Measurement locations outdoors: On request (just provide coordinates and height)
- ☐ Locations indoors:
 - On request (just provide coordinates and floor)
 - Indicate: Windows open - closed



* This is a virtual scenario, artificially generated to meet the objectives of the training activity. The sounds and measurements are not real.



Description of the virtual scenario

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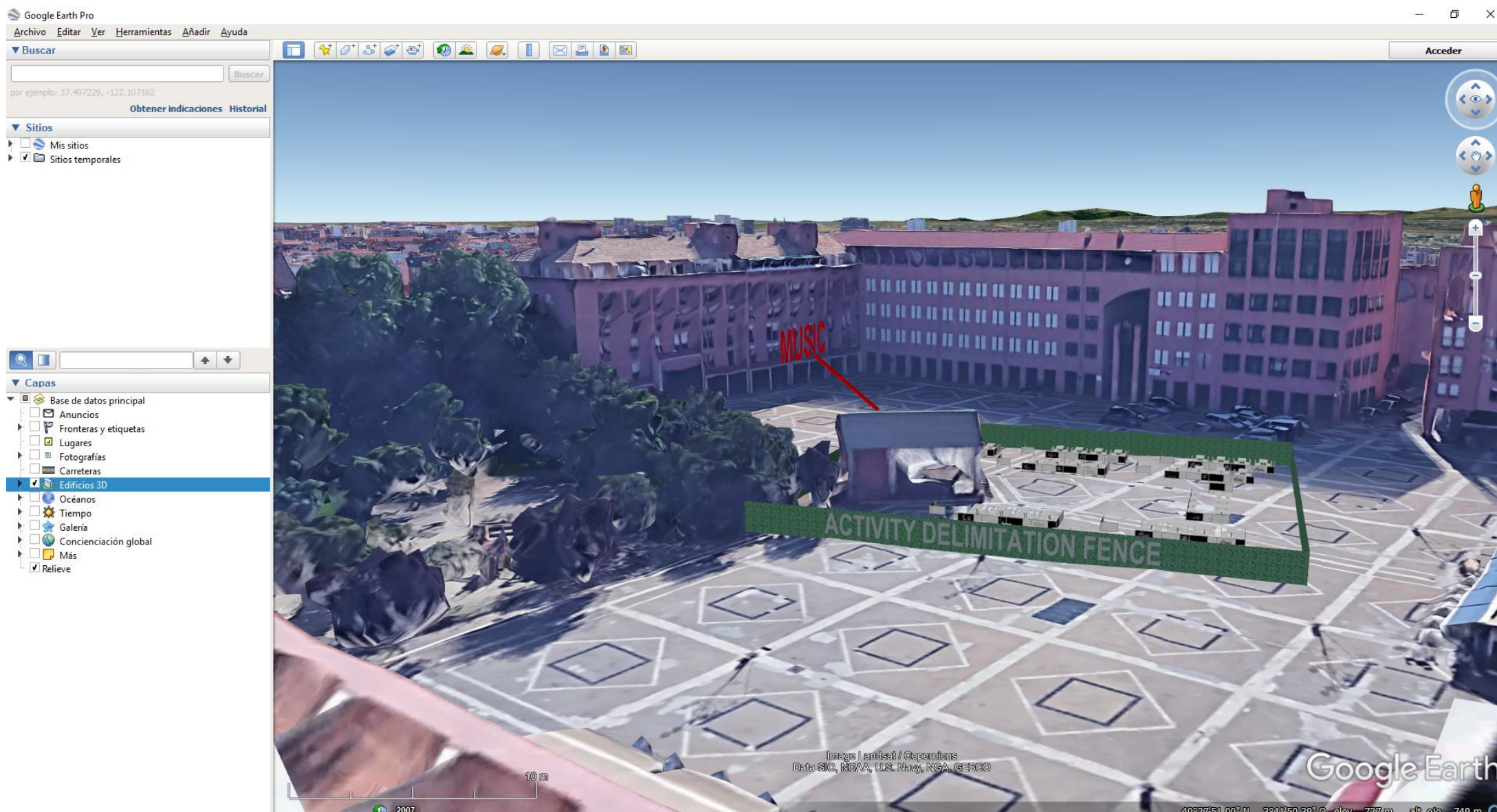




Google Earth



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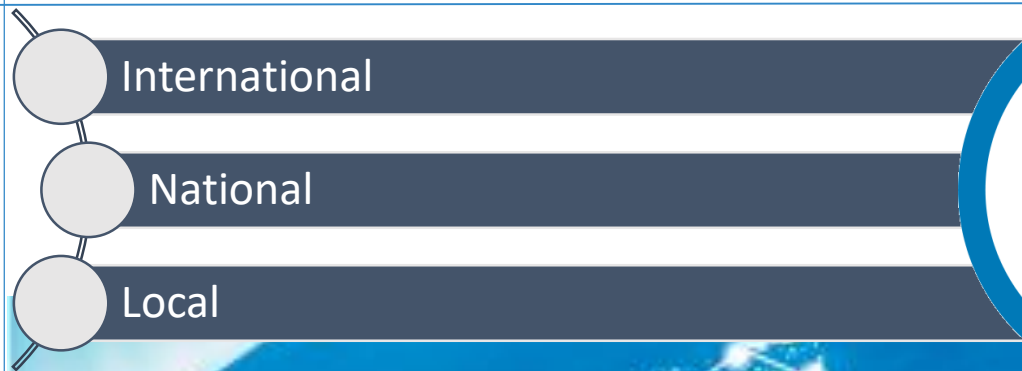




Regulation



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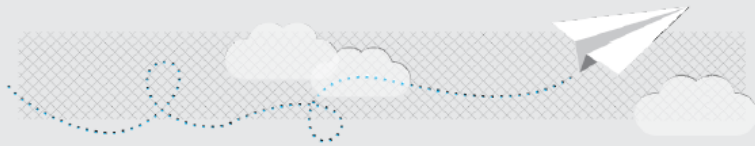




Measurement request form



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VIRTUAL NOISE AUDIT | Noise measurement requests

The Virtual Noise Audit Coordinator (VNAC) will provide each participant the set of measurements they request according to their requirements. The measurement locations, duration, and setup will be specified in this form by each participant independently.

Participant info

E-mail

Name

General information:

This is general information available for all the participants through Google Drive or WeTransfer

We will provide you all these files, as a reference to have very detailed information about the virtual scenario. This is general information, not customized for every measurement location. If you need further information, just let us know

- ☒ Scenario description (*.PDF)
- ☒ Audio files (*.wav)
- ☒ B&K Evaluator file (*.RLP)
- ☒ Google Earth file (*.KMZ)

Measurement setup

Please, indicate the type of measurements you will use in your audit. This information will be provided by the VNAC according to your customization requirements

Measurement file

The VNAC will send you an Excel file with all the information you request. For each measurement location and every period of time you decide, the excel file will show a time history in time intervals as defined by your averaging time.

L_{Aeq} (A-weighted dB) ☐ Sí ☐ No

L_{Ceq} (C-weighted dB) ☐ Sí ☐ No

L_AI_{eq} (Impulse, A-weighted dB) ☐ Sí ☐ No

L_FA_{max} (fast, A-weighted dB) ☐ Sí ☐ No

L_FA_{min} (fast, A-weighted dB) ☐ Sí ☐ No

L_Cpeak (peak, C-weighted dB) ☐ Sí ☐ No

1/3 octave band measurements, L_Zeq (Z-weighted dB) ☐ Sí ☐ No

Averaging time (seconds)

Measurement request

We will provide you as many measurements as you request, just specify the location (coordinates) and the floor (outdoor measurements) or height (indoor measurements). The minimum averaging time we can provide is 1 second. Depending on your measurement procedure, you can request longer duration (5 seconds, 1 minute, 5 minutes...), or you can use this 1 second measurement to perform your own processing on this. The averaging time you specify will determine the number of measurements you receive within the specified time interval. Every measurement will be a different row in an Excel sheet. If you need more than 4 locations, or periods, use this form more than once.

Location 1

1. Latitude 1. Longitude 1. Height

1. Start time 1. End time 1. Floor

1. Type of measurement ☐ Outdoor measurement (any location)
☐ Facade measurement (any location)
☐ Indoor measurement, open window (centre of the room)
☐ Indoor measurement, closed window (centre of the room)

Location 2

2. Latitude 2. Longitude 2. Height

2. Start time 2. End time 2. Floor

2. Type of measurement ☐ Outdoor measurement (any location)
☐ Facade measurement (any location)
☐ Indoor measurement, open window (centre of the room)
☐ Indoor measurement, closed window (centre of the room)

Location 3

3. Latitude 3. Longitude 3. Height

3. Start time 3. End time 3. Floor

3. Type of measurement ☐ Outdoor measurement (any location)
☐ Facade measurement (any location)
☐ Indoor measurement, open window (centre of the room)
☐ Indoor measurement, closed window (centre of the room)

Location 4

4. Latitude 4. Longitude 4. Height

4. Start time 4. End time 4. Floor

4. Type of measurement ☐ Outdoor measurement (any location)
☐ Facade measurement (any location)
☐ Indoor measurement, open window (centre of the room)
☐ Indoor measurement, closed window (centre of the room)

After your virtual audit, you will have to report your results. Assume that this new activity started to work in January 2019, and this is a residential area.



Measurement request form



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Measurement setup

Please, indicate the type of measurements you will use in your audit. This information will be provided by the VNAC according to your customization requirements

Measurement file

The VNAC will send you an Excel file with all the information you request. For each measurement location and every period of time you decide, the excel file will show a time history in time intervals as defined by your averaging time.

LAeq (A-weighted dB) ☐ Sí ☐ No

LCeq (C-weighted dB) ☐ Sí ☐ No

LAImeq (Impulse, A-weighted dB) ☐ Sí ☐ No

LFAMax (fast, A-weighted dB) ☐ Sí ☐ No

LFAMin (fast, A-weighted dB) ☐ Sí ☐ No

LCpeak (peak, C-weighted dB) ☐ Sí ☐ No

1/3 octave band measurements, LZeq
(Z-weighted dB) ☐ Sí ☐ No

Averaging time (seconds)



Measurement request form



IMPROVEMENT OF ENVIRONMENTAL
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Measurement request

We will provide you as many measurements as you request, just specify the location (coordinates) and the floor (outdoor measurements) or height (indoor measurements).

The minimum averaging time we can provide is 1 second. Depending on your measurement procedure, you can request longer duration (5 seconds, 1 minute, 5 minutes...), or you can use this 1 second measurement to perform your own processing on this. The averaging time you specify will determine the number of measurements you receive within the specified time interval.

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If you need more than 4 locations, or periods, use this form more than once.

Location 1

1. Latitude

1. Longitude

1. Height

1. Start time

1. End time

1. Floor

1. Type of measurement
- ☐ Outdoor measurement (any location)
 - ☐ Facade measurement (any location)
 - ☐ Indoor measurement, open window (centre of the room)
 - ☐ Indoor measurement, closed window (centre of the room)



Virtual lab outcomes



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Wav files

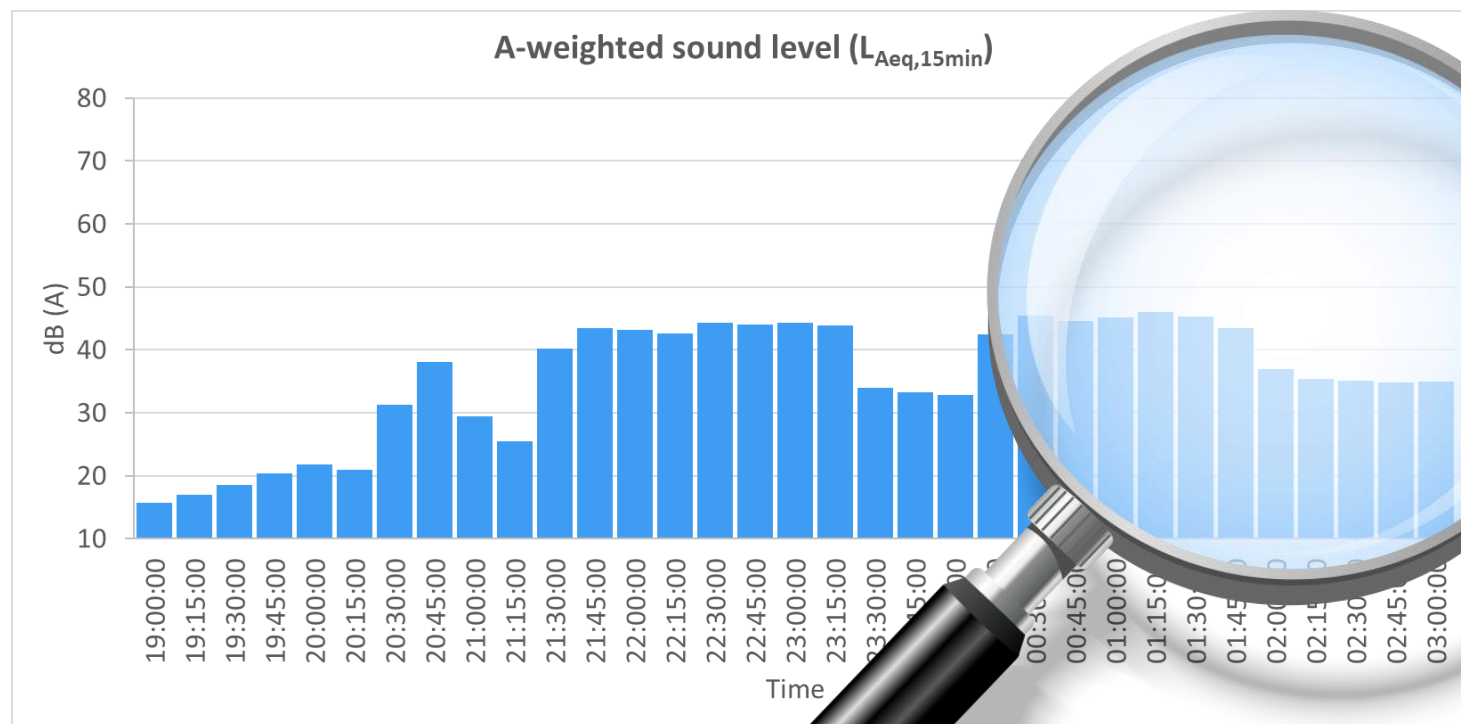
- ←
- ITALY_wav
 - ITALY_LOC1_FAC.xls
 - ITALY_LOC1_WClosed.xls
 - ITALY_LOC1_WOpen.xls
 - ITALY_LOC2_FAC.xls
 - ITALY_LOC2_WClosed.xls
 - ITALY_LOC2_WOpen.xls
 - ITALY_LOC3_FAC.xls
 - ITALY_LOC3_WClosed.xls
 - ITALY_LOC3_WOpen.xls
 - ITALY_LOC4_FAC.xls
 - ITALY_LOC4_WClosed.xls
 - ITALY_LOC4_WOpen.xls

| | A | B | C | D | E | F | G | H | I | J | K | L |
|----|------------|---------------|------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Date | Starting time | L _{Aeq} | L _{Zeq} 100Hz | L _{Zeq} 125Hz | L _{Zeq} 160Hz | L _{Zeq} 200Hz | L _{Zeq} 250Hz | L _{Zeq} 315Hz | L _{Zeq} 400Hz | L _{Zeq} 500Hz | L _{Zeq} 630Hz |
| 2 | 27/09/2014 | 19:00:00 | 15.74 | 20.47 | 15.34 | 7.69 | 3.6 | 4.79 | 7.98 | 8.79 | 10.57 | 11.9 |
| 3 | 27/09/2014 | 19:15:00 | 16.94 | 20.68 | 15.81 | 9.07 | 3.95 | 4.41 | 5.16 | 7.77 | 11 | 12.82 |
| 4 | 27/09/2014 | 19:30:00 | 18.58 | 23.76 | 17.67 | 8.29 | 4.91 | 4.72 | 5.4 | 8.3 | 13.05 | 14.72 |
| 5 | 27/09/2014 | 19:45:00 | 20.44 | 20.45 | 15.33 | 8.41 | 5.7 | 5.89 | 7.58 | 10.81 | 13.37 | 16.11 |
| 6 | 27/09/2014 | 20:00:00 | 21.81 | 20.76 | 16.12 | 7.23 | 6.24 | 8.47 | 9.95 | 10.3 | 13.38 | 16.12 |
| 7 | 27/09/2014 | 20:15:00 | 20.98 | 21.99 | 15.92 | 8.62 | 8.49 | 9.72 | 10.66 | 10.89 | 13.33 | 14.98 |
| 8 | 27/09/2014 | 20:30:00 | 31.35 | 21.69 | 15.42 | 15.43 | 14.44 | 16.64 | 17.52 | 20.13 | 20.77 | 22.59 |
| 9 | 27/09/2014 | 20:45:00 | 38.09 | 41.33 | 30.65 | 27.96 | 28.1 | 25.38 | 29.11 | 30.21 | 27.73 | 34.65 |
| 10 | 27/09/2014 | 21:00:00 | 29.51 | 36.41 | 25.6 | 22.33 | 23.02 | 19.23 | 20.13 | 21.34 | 23.65 | 27.14 |
| 11 | 27/09/2014 | 21:15:00 | 25.42 | 32 | 18.99 | 16.8 | 13.53 | 13.22 | 15.73 | 18.36 | 17.24 | 20.82 |
| 12 | 27/09/2014 | 21:30:00 | 40.15 | 47.5 | 33.94 | 31.2 | 31.46 | 30.61 | 31.61 | 32.4 | 33.05 | 38.04 |
| 13 | 27/09/2014 | 21:45:00 | 43.48 | 47.83 | 34.63 | 32.43 | 32.53 | 31.91 | 33.92 | 35.32 | 34.51 | 40.75 |
| 14 | 27/09/2014 | 22:00:00 | 43.16 | 47.59 | 36.19 | 33.22 | 33.3 | 31.71 | 32.72 | 35.36 | 34.81 | 40.1 |
| 15 | 27/09/2014 | 22:15:00 | 42.54 | 47.42 | 34.68 | 32.66 | 33.49 | 31.85 | 33.68 | 35.58 | 33.76 | 39.69 |
| 16 | 27/09/2014 | 22:30:00 | 44.28 | 47.26 | 35.71 | 34.02 | 34.63 | 32.59 | 34.14 | 35.73 | 34.61 | 40.2 |
| 17 | 27/09/2014 | 22:45:00 | 44.01 | 46.79 | 35.51 | 32.85 | 33.55 | 33.19 | 33.26 | 36.5 | 35.64 | 41.91 |
| 18 | 27/09/2014 | 23:00:00 | 44.35 | 45.41 | 34 | 31.3 | 32.2 | 31.84 | 33.47 | 35.68 | 34.41 | 41.6 |
| 19 | 27/09/2014 | 23:15:00 | 43.86 | 47.84 | 35.47 | 33.61 | 34.2 | 32.53 | 33.11 | 35.12 | 35.32 | 40.89 |
| 20 | 27/09/2014 | 23:30:00 | 33.95 | 38.55 | 36.48 | 32.78 | 32.57 | 32 | 31.01 | 28.53 | 29.8 | 31.31 |
| 21 | 27/09/2014 | 23:45:00 | 33.31 | 38.68 | 37.36 | 33.21 | 31.82 | 30.95 | 29.6 | 27.8 | 28.22 | 29.35 |
| 22 | 28/09/2014 | 00:00:00 | 32.84 | 39.48 | 35.76 | 32.47 | 30.6 | 29.11 | 29.07 | 28.34 | 29.59 | 30.05 |
| 23 | 28/09/2014 | 00:15:00 | 42.53 | 47.42 | 37.51 | 35.28 | 34.1 | 32.62 | 32.26 | 32.6 | 31.73 | 38.23 |
| 24 | 28/09/2014 | 00:30:00 | 45.39 | 49.52 | 36.36 | 37.15 | 35.58 | 33.73 | 35.19 | 36.95 | 35.31 | 42.99 |
| 25 | 28/09/2014 | 00:45:00 | 44.66 | 47.41 | 35.08 | 34.44 | 32.47 | 31.8 | 33.36 | 34.4 | 34.69 | 42.62 |
| 26 | 28/09/2014 | 01:00:00 | 45.14 | 51.27 | 37.16 | 37.57 | 35.5 | 33.78 | 34.87 | 35.62 | 35.94 | 41.85 |
| 27 | 28/09/2014 | 01:15:00 | 46.03 | 48.03 | 34.71 | 35.08 | 33.45 | 32.18 | 33.33 | 35.74 | 34.63 | 43.57 |
| 28 | 28/09/2014 | 01:30:00 | 45.25 | 48.8 | 36.27 | 36.22 | 33.04 | 31.56 | 31.2 | 34.3 | 34.57 | 42.03 |
| 29 | 28/09/2014 | 01:45:00 | 43.51 | 48.03 | 34.55 | 34.93 | 32.3 | 30.82 | 31.35 | 33.61 | 34.03 | 40.16 |
| 30 | 28/09/2014 | 02:00:00 | 36.99 | 40.88 | 37.01 | 35 | 31.97 | 32.72 | 32.61 | 28.92 | 30.35 | 32.36 |
| 31 | 28/09/2014 | 02:15:00 | 35.41 | 38.28 | 38.02 | 35.17 | 32.1 | 31.01 | 30.46 | 29 | 30.76 | 32.33 |

Excel files



Measurements processing



- Assessment level?
- Penalties?
- Background noise?



Audit reporting



IMPROVEMENT OF ENVIRONMENTAL
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- ☐ **Results (rating levels)**
- ☐ **Limits**
- ☐ **Compliance**



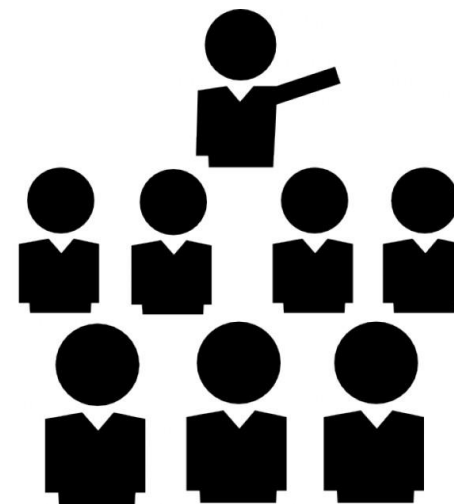
Assessment of the Virtual Noise Audit



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INTERNAL TESTS



EXTERNAL TESTS



Short video



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NOISE TRAINING PROJECT

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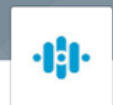
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Grupo estándar

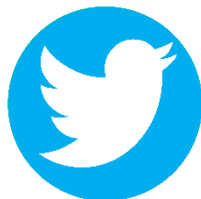




THANK YOU FOR YOUR ATTENTION AND COOPERATION!



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NOISE TRAINING PROJECT (NTP)



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