



**Noise Impact Assessment Study on High-performance
of Sound Insolation for Residential Building at
Neighbouring Taiwan High Speed Rail Station**

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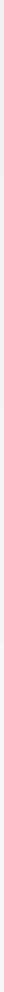
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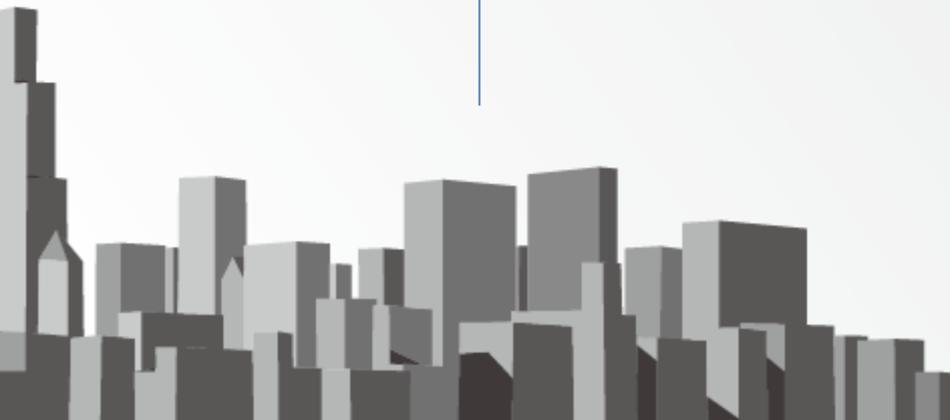
Purpose

1. When the high-speed railway through the station body, the noise generated by the impact of sound energy, through monitoring to explore the impact of ambient sound and the sound of the multiplication effect.
2. Based on field measurement survey, summarized the sound field distribution around high-speed rail station.
3. Through the measurement, corresponding to the combination of wall structure model to provide follow-up study of reference.
4. The research results may provide the basic research data on the noise intensity regionalization and high-performance residential planning strategy for the around the high-speed railway station.

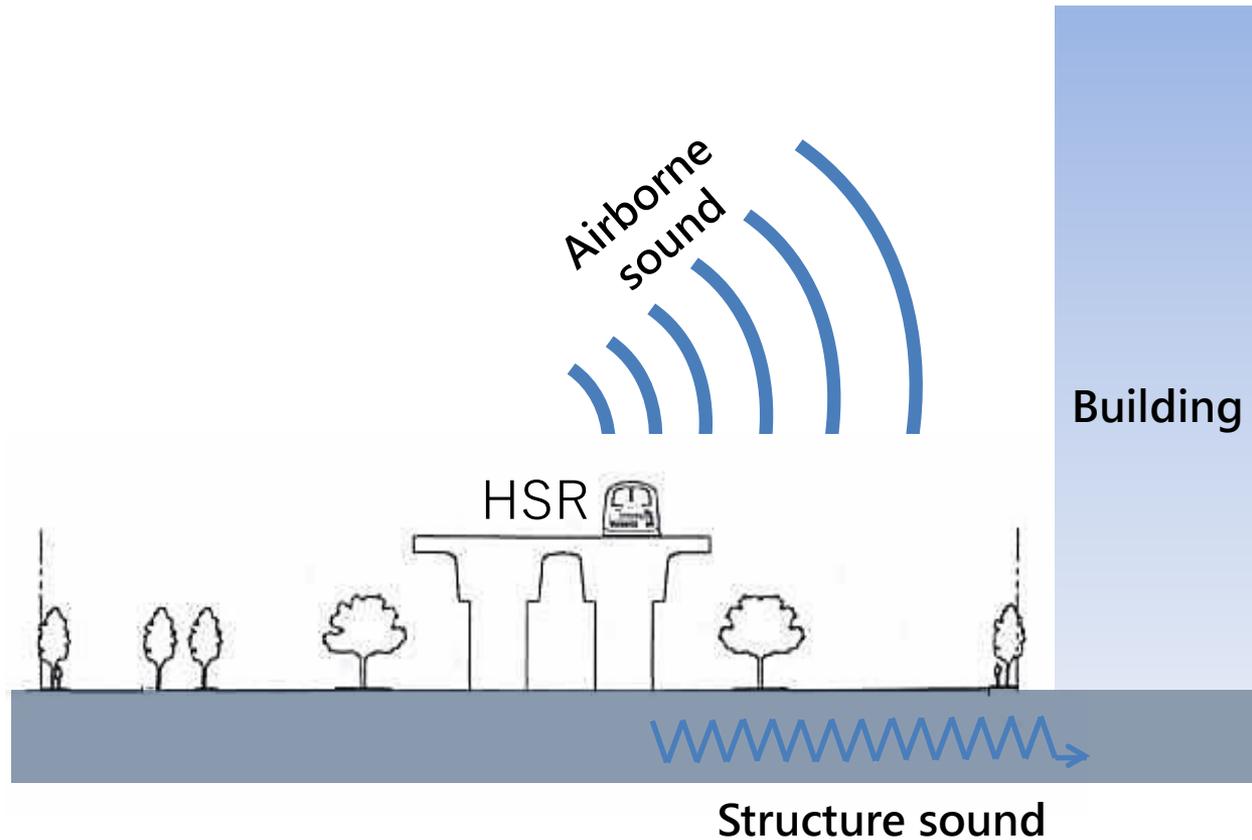




1. CONCERNING ISSUE

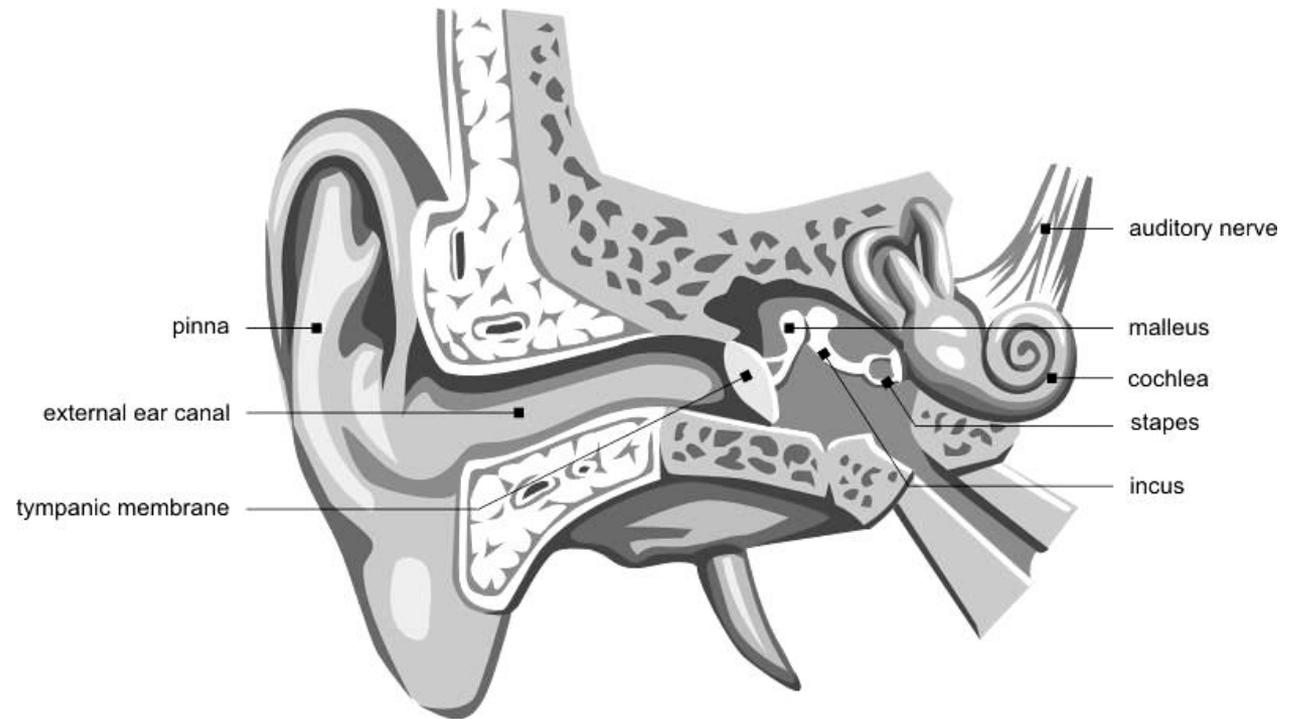


Acoustic transmission

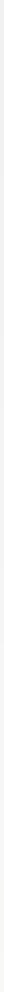


The main noise and vibration of high speed rail when pass through the station as the research task. Noise transmission may occur by airborne sound and structure sound

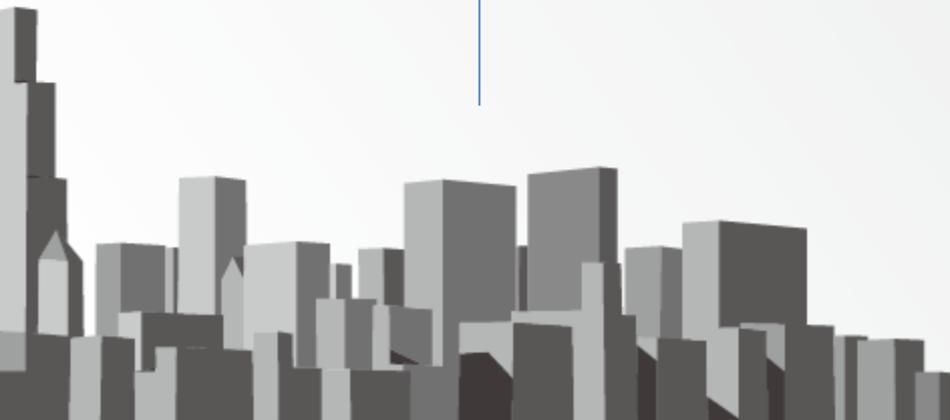
Sound source



The dizzy reaction was affected by the vibration frequency 0.1 ~ 0.5Hz, and be affect on the human body's comfort at 0.5 ~ 80 Hz .

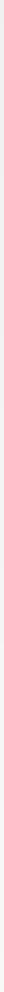


2. RESEARCH METHOD

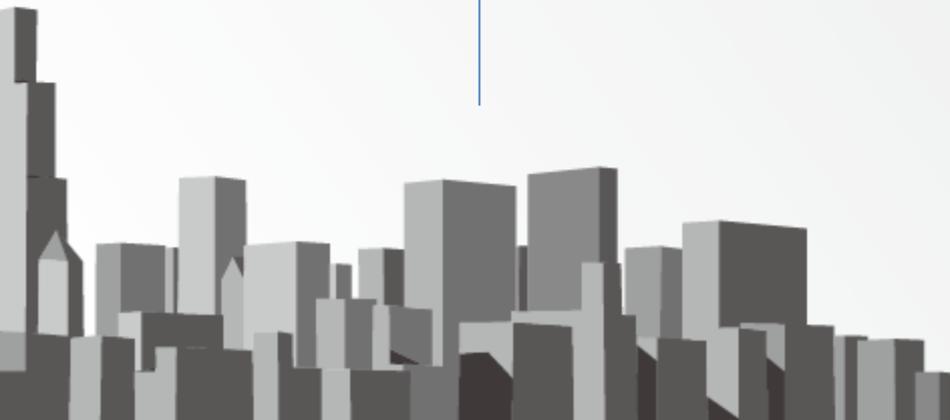


Research Method

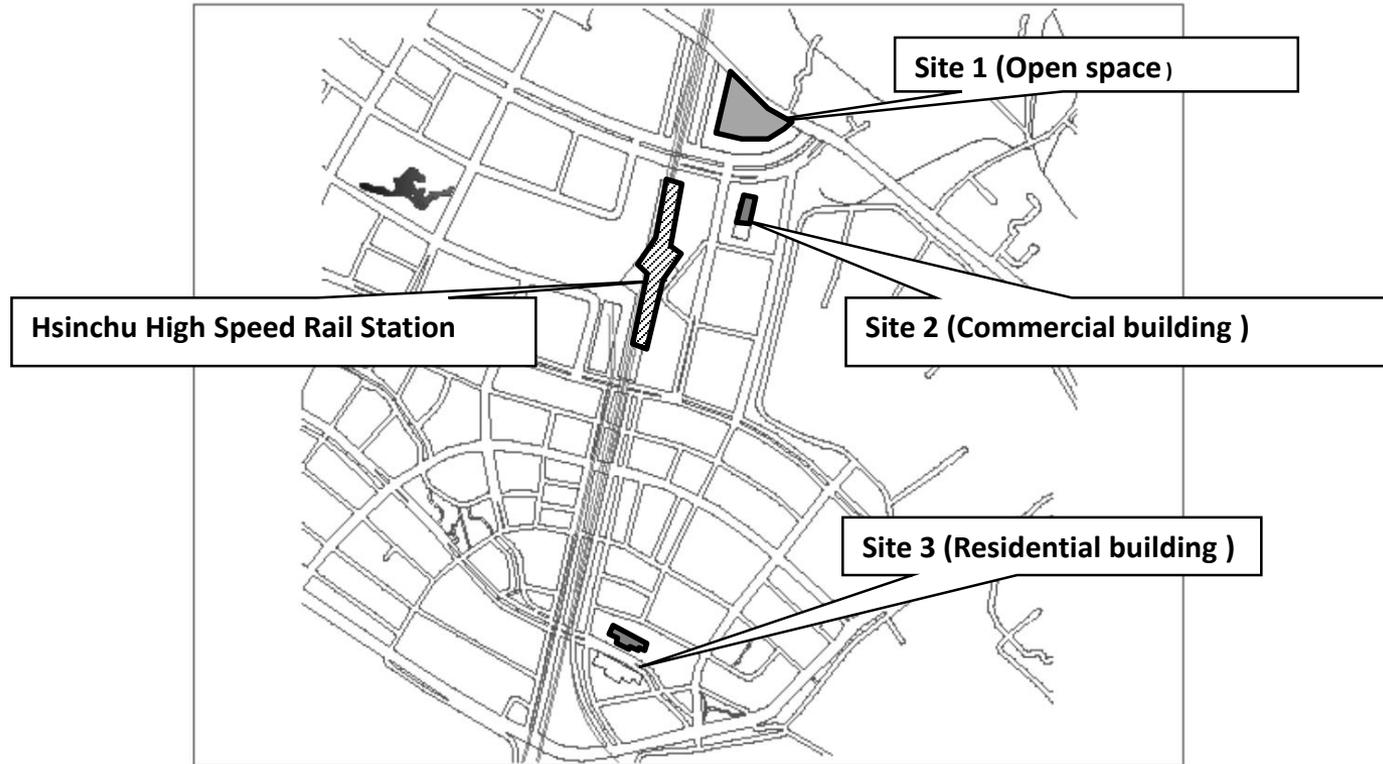
1. According to CNS 7183 noise level measurement method, the noise meter complies with the national standard (CNS 7129) Type 1 or the International Electrotechnical Society standard Class 1.
2. Record results following two evaluation indicators, including the volume of noise can process the event (equivalent) LAeq (dB) and the maximum volume (Maximum) LAmax (dB).
3. In frequency-weighting, this measurement method shall be weighted by A, and the measurement shall be noted with the weighted name used for field measurement.
4. In addition, the dynamic characteristic uses the Fast (F) characteristic in principle, but the Slow (S) characteristic can be used when the sound generated by the sound source is not dynamic.



3. FIELD MEASUREMENT

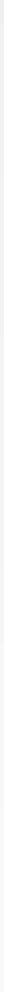


Study Field

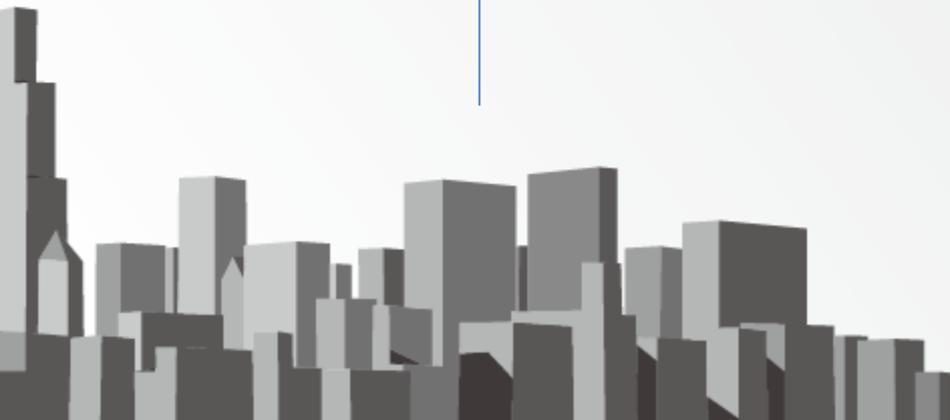




The object of the study is located in the vicinity of Hsinchu High Speed Rail Station, which is located in North of Taiwan.



4. RESULTS



RESULTS OF ENVIRONMENTAL SOUND MEASUREMENT

Parameter \ Locations	<u>L_{Amax}</u> (dB)	<u>L_{Aeq}</u> (dB)
St. A	60.6	54.1
St. B	76.3	64.8
St. C	71.8	61.4
In Site area	64.5	57.2

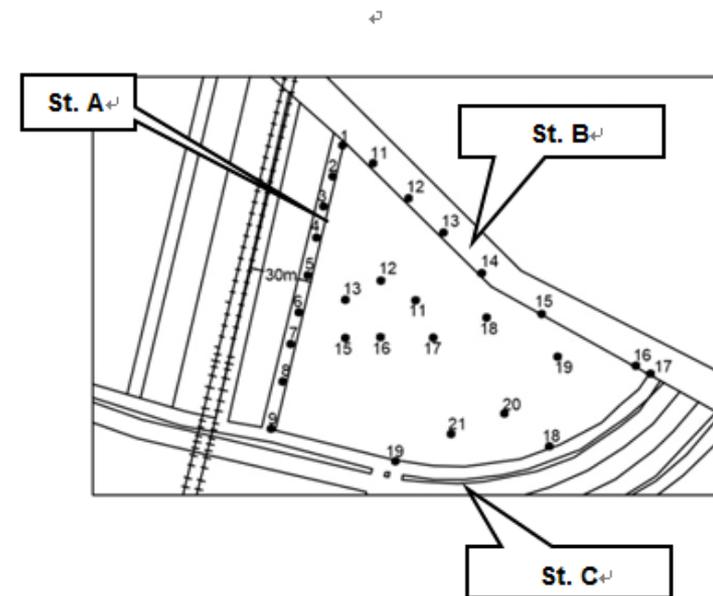


Table 1. The distribution of survey locations and measurement results of environmental acoustics

RESULTS OF ENVIRONMENTAL SOUND MEASUREMENT (Cont.)

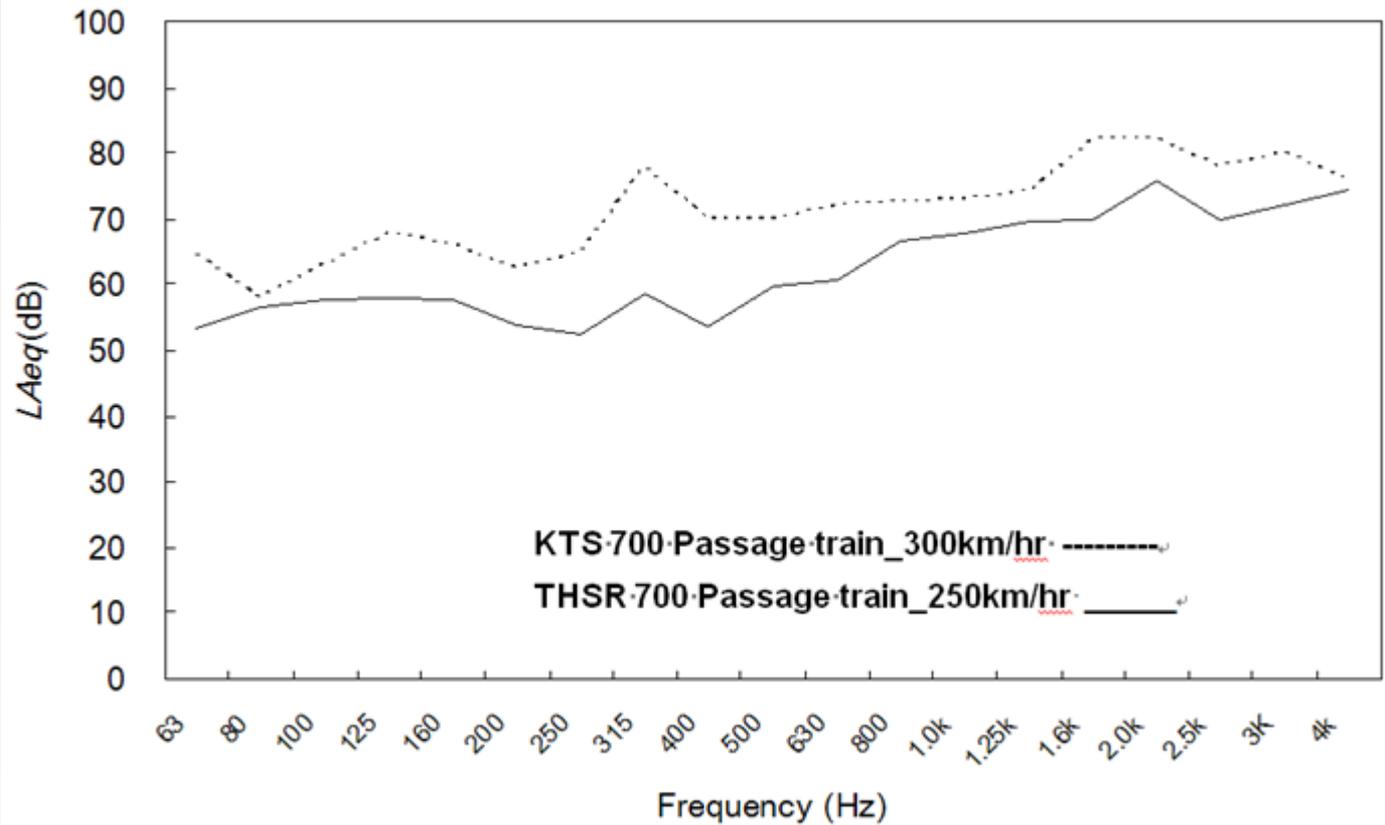


Figure 2: Measurement results of LAeq of THSR (—) in the perimeter of Hsinchu Station at 1/3 octave frequency band compared with the measurements of Korea high-speed railway (KTS) (----) between the station Chunan to Chungwon.

RESULTS OF ENVIRONMENTAL SOUND MEASUREMENT (Cont.)

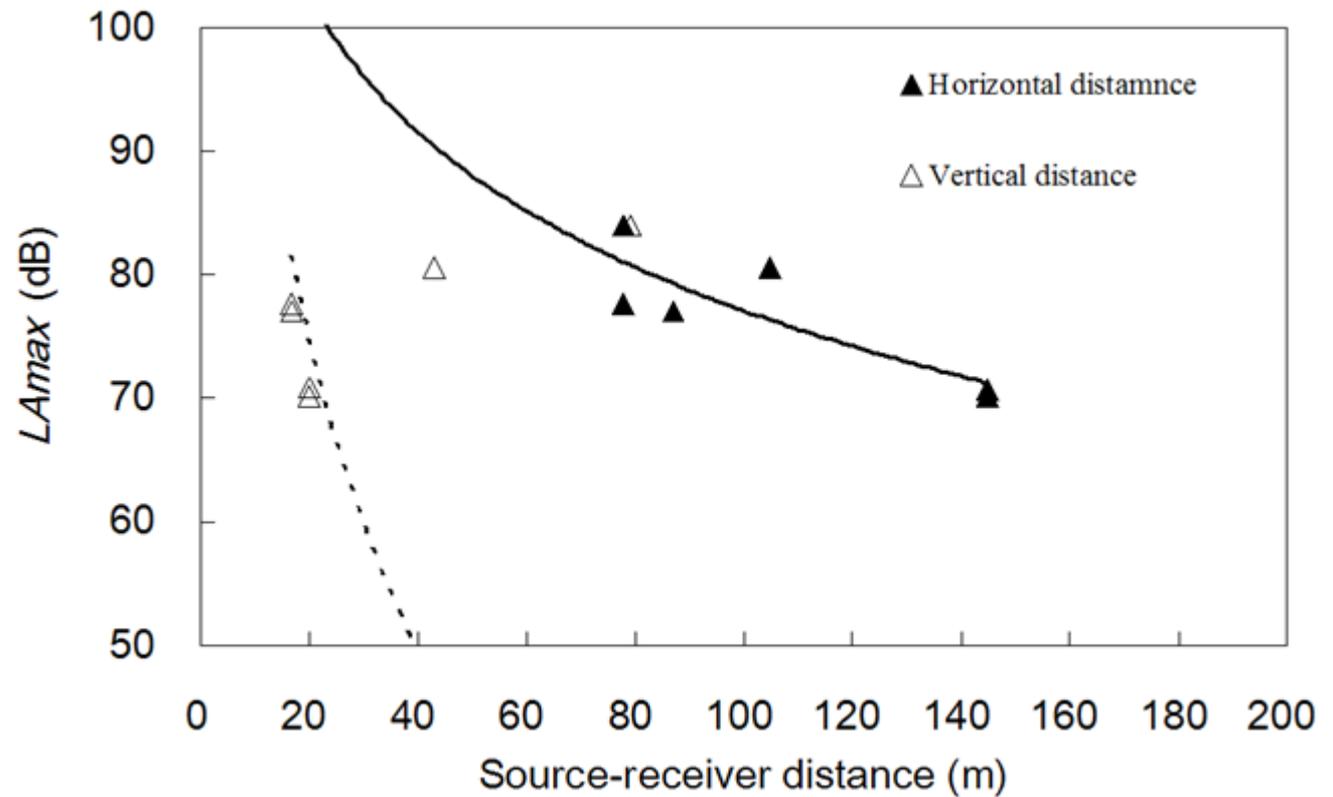
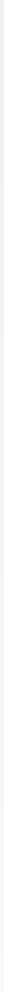


Figure 3: Measurement results of LAmax (dB) shown as a function of source-receive distance of vertical distance (- -) and horizontal distance(—).



5. DISCUSSION



Discussion

1. The environmental noise LAeq (dB) value is between 54.1 to 64.8dB (A) at study site, when the high-speed railway vehicles through the station.
2. At 50 meter away from the outer track center line at the site, 1.5 meter above ground, the distribution at 1/3 octave band of LAeq (dB) is similar as of the measurements results of Korea high-speed railway (KTS) , the maximum sound energy LAm_{ax} is 70.1 (dB).
3. Sound source is away from vertical distance of 40 meter or more, the sound energy will be amplified, and the maximum sound LAm_{ax} (dB) can reach above 84dB (A).
4. Considering the maximum sound energy of 80dB (A), the sound insulation performance index STC35 (40) for the external curtain wall installed will be suggested.

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Thank you for the attention.