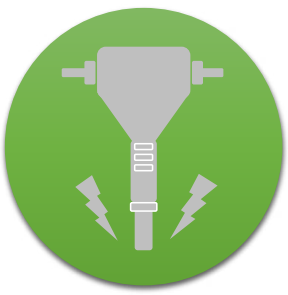
HONG KONG RETTUNGSHUNDE ASSOCIATION (HKRA) LIMITED
[redacted]

Informations of Retractable Noise Barrier

Acoustics Innovation

SilentUP®
Retractable Noise Barrier


Roadworks


Breaking
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Loading
Unloading


Concreting

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R&D Division of
Wilson Acoustics Limited

Acoustics Innovation

SilentUP®

Product Description

SilentUP® is a patented retractable noise barrier for construction works and outdoor music events. It can be easily installed and mobilized by people without using any machines. No concrete foundation is required and the installation process is quiet enough to be conducted even at night time. The panels are installed upwards from ground level and connected by magnetic gap sealing.

Our product has been widely used in Hong Kong. Visit our website for the job references aihk.hk/SilentUP/reference.

Benefits

- Minimize noise complaints
- Quiet and manual installation
- No concrete foundation required
- Flexible construction site planning
- Facilitate Construction Noise Permit (CNP) application process

Technical Information

SilentUP® noise barrier material conforms to the flammability requirement specifications.

BS5867-2:2008 TYPE B
GB8624

Product Specification

STC	18	24
Insertion Loss*	22 dB(A)	27 dB(A)
Modular Weight	5kg	8kg
Maximum Height	7m	5m
Modular Size	1m(H) x1.35m(W)	
Standard Colour	Grey	
Panel Thickness	100mm on edges	

* Tested with white noise source

CITF 建造業創科基金
CITF Pre-approved Product [redacted]

Installation videos available at [redacted]

Client Feedback

"Some of our contractors have used the retractable noise barriers to facilitate CNP application. They have found this innovative product useful - lightweight, easy to manoeuvre, and fit for purpose."

Richard Kwan
Environment Manager
MTR Corporation Ltd

"We are impressed by SilentUP's quick installation and relocation, it is definitely one of the best innovations and practicable approaches for the noise mitigation measures for the construction activities."

Lighting Chan
Environmental Compliance Support Manager,
Leighton Asia Ltd

"We are happy with Acoustics Innovation's professional service (SilentUP Noise Barrier) in helping us achieve our noise mitigation goals."

Ronald Fung
Project QA & Environmental Manager
Kier - Laing O'Rourke - Kaden Joint Venture

"SilentUP is definitely a useful tool to minimize the noise pollution. We successfully obtained a CNP and most importantly no complaint has been received from the NSRs."

Clarence Yeung
Environmental Officer
Chun Wo Construction and Engineering Co. Ltd

[redacted] [redacted] [redacted]

R&D Division of Wilson Acoustics Limited

REPORT TO: **Acoustics Innovation Limited**

ADDRESS: [redacted]

ATTN.: Mr. Max Yiu

REPORT NO.: APJ16-034-RP001(STC)

ISSUE DATE: 3 February 2017

HOKLAS Accredited Laboratory
Sound Transmission Loss Measurement
Test Report
for
SilentUP® Retractable Noise Barrier

(PROJECT NO.: APJ16-034)

[redacted]

1. Method of Measurement

1.1 The measurement was carried out in accordance with ASTM E90-09 "Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions" in the reverberation room of Acoustics and Air Testing Laboratory Co. Ltd. And the single number rating of airborne sound transmission loss is given as Sound Transmission Class (STC) by evaluated in accordance with ASTM E413-10 "Classification for Rating Sound Insulation".

2. Details of Measurement

2.1 Principle of Measurement

The sound transmission loss is usually measured in a laboratory by placing the element in an opening between two adjacent reverberant rooms designed for such tests. Noise is introduced into one of the rooms, referred to as the source room, and part of the sound energy is transmitted through the test element into the second room, referred to as the receiving room. The resulting mean space-average sound pressure levels in the source and receiving rooms are denoted by L_1 and L_2 respectively.

The sound transmission loss is given by

$$TL = L_1 - L_2 + 10\log(S/A)$$

Where

L_1 is the average sound pressure level in the source room, in dB;
L_2 is the average sound pressure level in the receiving room, in dB;
S is the area of the test specimen, in m^2;
A is the equivalent absorption area in the receiving room, in meters sabins.

$$A = (0.9210Vd / c)$$

Where

V is the receiving room volume, in m^3;
d is the rate of decay of sound pressure level in receiving room, dB/s;
c is the speed of sound in the medium , m/s.

The speed of sound changes with temperature and is shall be calculated for the conditions existing at the time of test from the equation:

$$c = 20.047\sqrt{273.15 + t}$$

Where

t is the receiving room temperature, measured to nearest degree.

[redacted]

The Sound Transmission Class (STC) of test specimen is calculated by comparing the sixteen values of Sound Transmission Loss from 125 Hz to 4000 Hz with a defined reference curve which is incremented until the requirements of ASTM E 413-10 are met.

2.2 Laboratory Location

Fo Tan Main Laboratory -
Room 422, Leader Industrial Centre, 57-59 Au Pui Wan Street,
Fo Tan, Shatin, N.T., Hong Kong.

2.3 Test Condition

Conditions	Source room	Receiving room
Volume	84m^3	203m^3
Air Temperature	22.0°C	21.6°C
Relative Humidity	51.0%	52.5%

2.4 Test Date

Date of receipt of test item: 25 January 2017

Dates of commencement and completion of test
Commencement date: 2 February 2017
Completion date: 2 February 2017

2.5 Instrumentation

2.5.1 For sound production

Type	Serial No.
One Real Time Frequency Analyzer – LAN-XI 3160A	3160-100361
One Equalizer – Marantz EQ20D	56E040097
One Amplifier – B&K 2716 Power Amplifier	2571771
One OmniPower Sound Source – Bruel & Kjaer 4296	2128136
One Loudspeaker – JBL EON 515 Loudspeaker	VTP0890-14112

2.5.2 For sound measurement

One Real Time Frequency Analyzer – LAN-XI 3160A	3160-100361
Two Free-field ½" Microphone – Bruel & Kjaer 4190	2731708 & 2731709
Two ½" Microphone Preamplifier – Bruel & Kjaer 2669	2081972 & 2081971
One Sound Level Calibrator – Bruel & Kjaer 4231	1914426

2.5.3 For reverberation time measurement

One Real Time Frequency Analyzer – LAN-XI 3160A	3160-100361
One Free-field ½" Microphone – Bruel & Kjaer 4190	2731708
One ½" Microphone Preamplifier – Bruel & Kjaer 2669	2081972

3. Results Application

3.1 The results obtained can be used to design building elements with appropriate acoustic properties, to compare the sound insulation properties of building elements and to classify such elements according to their sound insulation capabilities.

3.2 The measurements are performed in laboratory test facilities in which transmission of sound on flanking paths is suppressed. Results of measurements shall not be applied directly in the field without accounting for other factors affecting sound insulation, especially flanking transmission and loss factor.

3.3 The obtained test results relate only to the tested specimen.

4. Description of the Test Construction

4.1 Specimen description: The test specimen composed of 2 layers of 40mm thick acoustics absorptive infill (0.5kg/m^2) sandwiched by 2 layers of 0.55kg/m^2 acoustic mat (0.9mm thick) with ~100mm separation.

4.2 The system was essentially as detailed in the client supplied drawing reproduced as in Appendix 1. Only the physical dimensions of the system were verified by the laboratory.

4.3 Overall specimen size: 3000 mm (wide) X 3450 mm (high) X ~100 mm (thick).

4.4 The tested noise barrier system was supplied and installed by Acoustics Innovation Limited

4.5 Photographic records showing the test specimen and measurement setup are given in Appendix 2.

[redacted]

5. Measurement Results

5.1 The results of measurement for the tested specimen are given in the following table:

Frequency f, Hz	Sound Transmission loss, dB	Sound Transmission loss, dB	Uncertainty, dB
100	2	5	± 1.64
125	6		± 1.20
160	8		± 0.90
200	7	7	± 1.21
250	7		± 1.07
315	7		± 0.74
400	9	11	± 0.68
500	12		± 0.56
630	15		± 0.45
800	20	22	± 0.41
1000	23		± 0.36
1250	26		± 0.32
1600	28	30	± 0.29
2000	31		± 0.34
2500	32		± 0.27
3150	33	34	± 0.29
4000	34		± 0.31
5000	35		± 0.33

5.2 The measured sound transmission loss of the tested specimen against 1/3-octave band center frequencies is plotted on Figure 1.

5.3 The 95% confidence interval is calculated according to the method stated in the Standard ASTM E90-09 A2.

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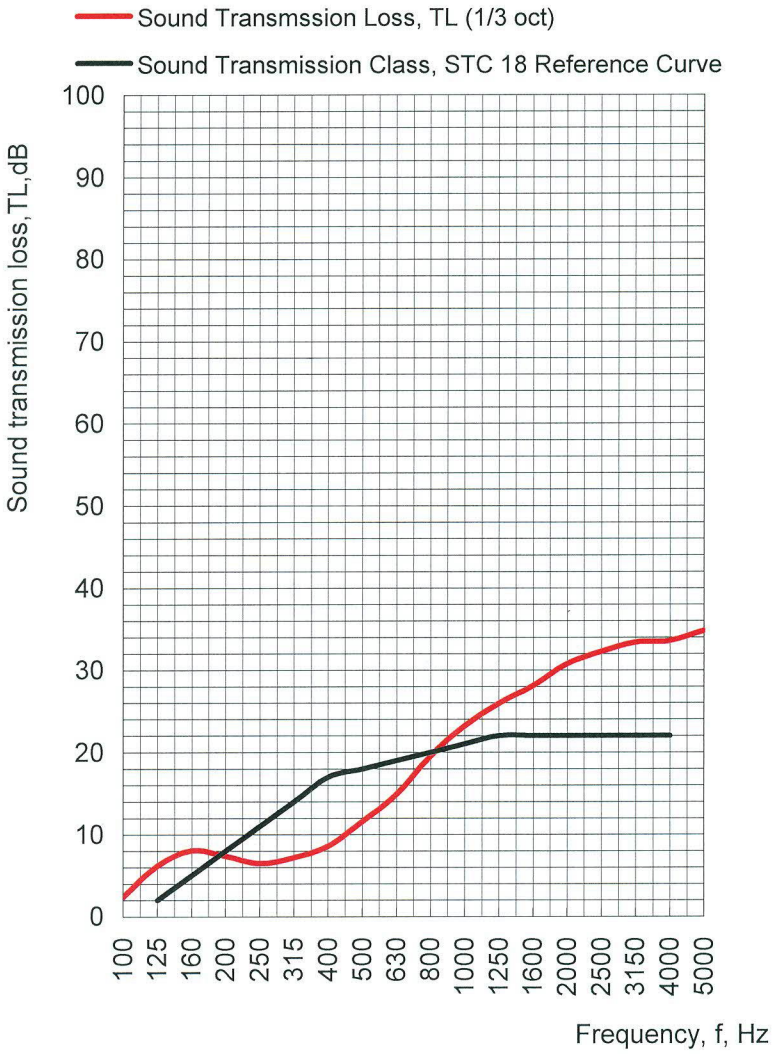

Figure 1. Sound transmission loss against Frequency

5.4 The single number rating of sound transmission class (STC) In accordance with ASTM E413-10 of the tested specimen is given below:

Description	Sound Transmission Class, STC
SilentUP® Retractable Noise Barrier	STC 18

Prepared by:

Tang Cheuk Hang
Quality Manager

Endorsed by:

Ng Yan Wa
Laboratory Manager
(Approved Signatory)

WN / MT / KW / JL

- END -

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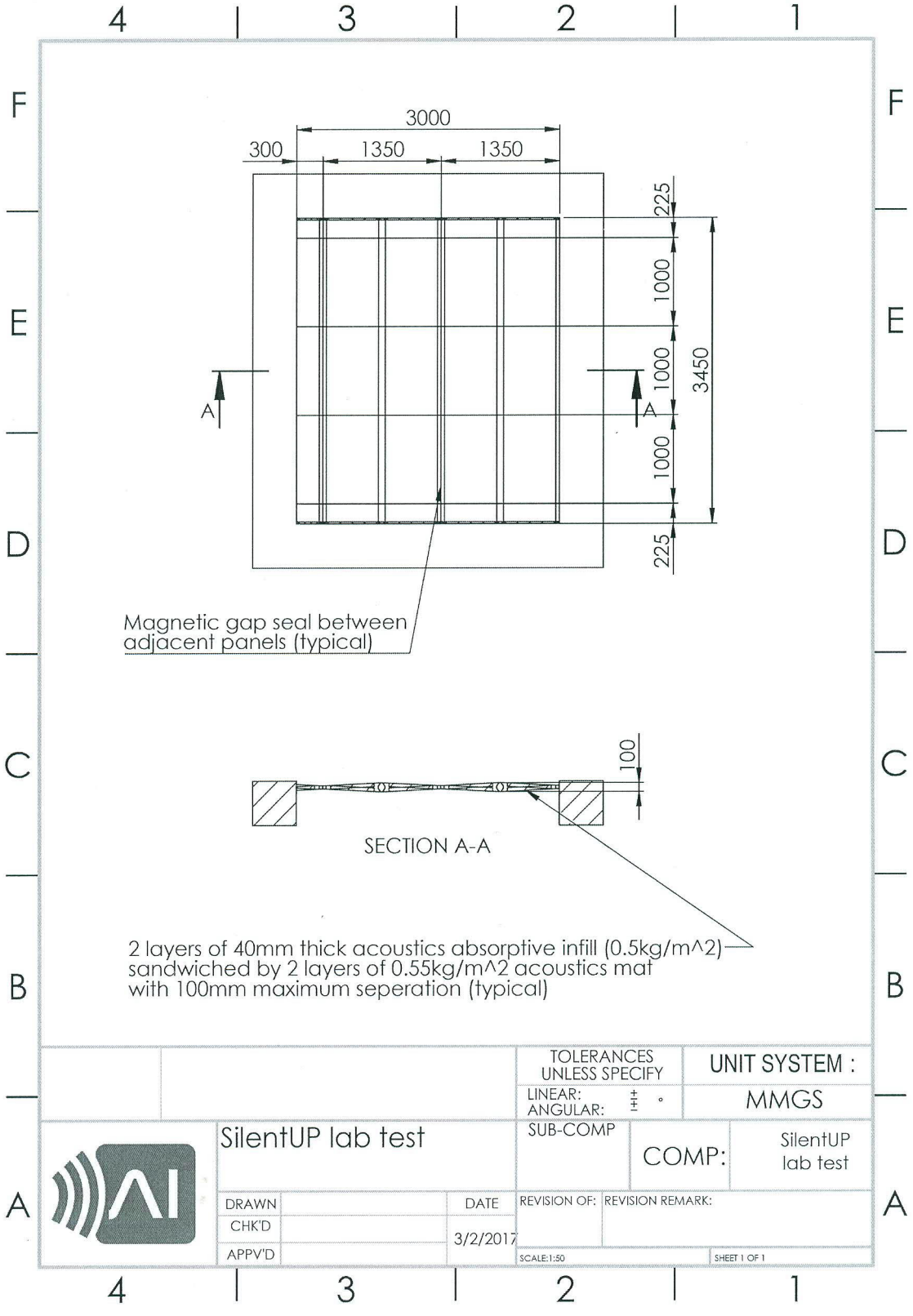
Appendix List

Appendix 1	**Details of Test Specimen (Drawing supplied by the Client)**
Appendix 2	**Photographic Records**

[redacted]

Appendix 1

Details of Test Specimen (Drawing supplied by the Client)



Appendix 2

Photographic Records

Measurement set-up (Source room)

Measurement set-up (Receiving room)

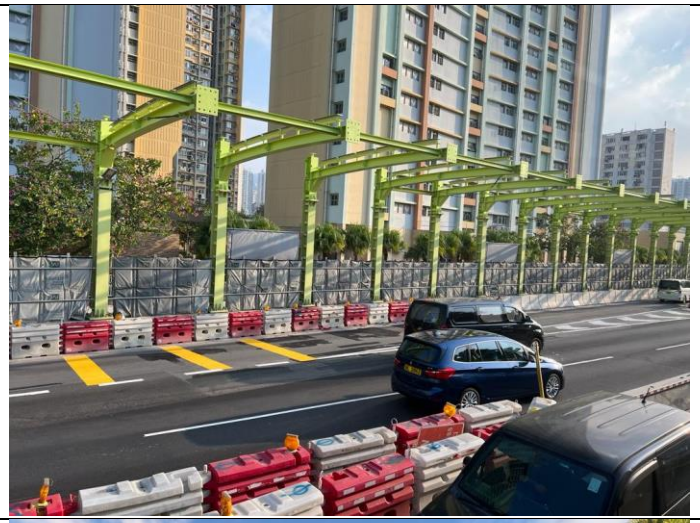
[redacted]

Acoustics Innovation

[redacted]

SilentUP Job Reference

Client	Job Description	Period	Photo
Vibro Joint Venture (SD/2022/02)	Project name: Cha Kwo Ling Ex-mine site formation, Contract No. JV202310 Scope of works: Design and implement a 6m high x 12.2 long SilentUP® retractable noise barrier.	2023-present	
Hip Hing Engineering Company Limited	Project name: Design and Construction of Expansion of the Legislative Council Complex (Project code. 141KA) Scope of works: Design and implement a 4m high x 5.4m long SilentUP® retractable noise barrier.	2023-present	

China Railway-China Railway First Group-Zhen Hua Engineering Joint Venture	<u>Project name: Road Widening and Retrofitting Noise Barriers on Tai Po Road (Sha Tin Section), Contract No. NE/2017/05</u> Scope of works: Implement a 2m high x 104m long SilentUP® retractable noise barrier.	2023-present		
Fulam Construction Engineering Co., Ltd.	<u>Project name: HKJC Beas River Country Club Fun Pool and Members' Changing Room Refurbishment</u> Scope of works: Design and implement a 2m high x 104m long SilentUP® retractable noise barrier.	2023-present		

Kam Fung Decoration Engineering Co., Ltd.	<u>Project name: Pui O Ham Tin Villas</u> Scope of works: Design and implement a 3m high x 135m long SilentUP® retractable noise barrier.	2022-2023	
Kin Lei Trading Maintenance Engineering Limited,	<u>Project name: HKJC Shatin Racecourse Horse Stable Refurbishment</u> Scope of works: Design and implement a 3m high x 2.5m long x 1.5m wide enclosure by using SilentUP® retractable noise barrier.	2022-2023	

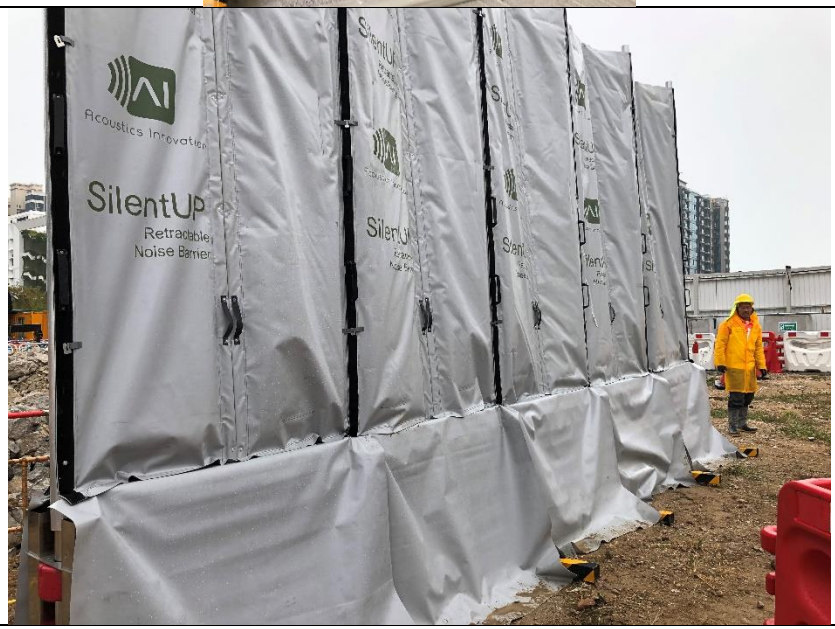
CW-FWS JV	<u>Project name: In-situ Reprovisioning of Sha Tin Water Treatment Works. (South Works) – Administration Building (Contract No. 6WSD21)</u> Scope of works: Design and implement a 5m high x 10.8m long SilentUP® retractable noise barrier.	2022-2023		
Chun Wo Building Construction Ltd.	<u>Project name: Main Contract Works for 250-Place Student Hostel at United Campus, The Chinese University of Hong Kong</u> Scope of works: Design and implement a 6m high x 5.4m long SilentUP® retractable noise barrier.	2022-2023		

Build King Civil Engineering Limited	<u>Tung Chung New Town Extension – Major Infrastructure Works in Tung Chung East (Contract No. NL/2020/03)</u> 7m high SilentUP® x 80m long retractable noise barrier was implemented for reducing sheet piling noise.	2021	
Paul Y-CREC JV	<u>Yuen Long Effluent Polishing Plant – Main Works for Stage 1 (DC/2019/10)</u> 4m high SilentUP® retractable noise barrier was implemented.	2021	

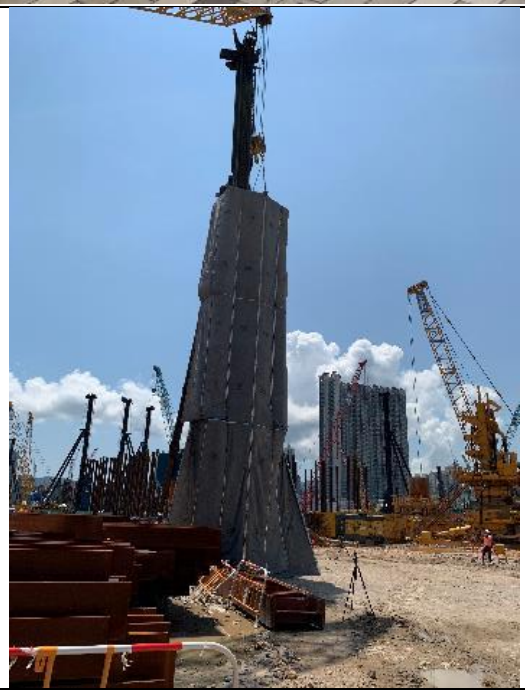
Able Engineering	Tsueng Kwan O Tong Yin Street 2sets of 5m high SilentUP® retractable noise barrier was implemented.	2020	
Gammon Building Construction Limited	Foundation and Site Formation for Public Housing Development at Lei Yue Mun Phase 4 at Yan Wing Street, Yau Tong (Contract No. 20180502) 3sets of 4m high SilentUP® retractable noise barrier was implemented	2020	

Buildking Richwell JV	<u>ND/2019/01 Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas</u> 4m high SilentUP® retractable noise barrier was implemented.	2020	
Buildking SKEC JV	<u>HY/2014/08 Central Kowloon Route – Yau Ma Tei</u> 15m(L) x 18m(W) x 7m(H) Enclosure was implemented with SilentUP and acoustic mat	2020	

CW-CMGC JV	<u>Development of Anderson Road Quarry Site - Road Improvement Works and Pedestrian Connectivity Facilities Works Phase 2A</u> 5m high SilentUP® retractable noise barrier was implemented.	2020	
Shui On Joint Venture	<u>Redevelopment of Kwai Chung Hospital</u> 5m high SilentUP® retractable noise barrier was implemented.	2020	

Buildking -SCT JV	<u>Tung Chung New Town Extension</u> 4m high SilentUP® retractable noise barrier was implemented	2020	
Hip Hing Construction Limited	<u>Tseung Kwan O Immigration headquarters</u> 4m high SilentUP® retractable noise barrier was implemented	2019	

China State Construction Engineering	<u>West Kowloon Cultural District – Hong Kong Palace Museum</u> CNP was successfully granted by EPD for the use of concrete lorry mixer. 4m high SilentUP® retractable noise barrier was implemented.	2019	
BuildKing-SKEC Joint Venture	<u>HY/2014/08 Central Kowloon Route - Yau Ma Tei East</u> 4m high SilentUP® retractable noise barrier was implemented.	2019	

Multilink Project Management Limited	2m high SilentUP® retractable noise barrier with trolley was implemented.	2019	
Vibro (H.K.) Limited	<u>Kai Tak Sports Park</u> 15m high noise barrier was implemented to reduce piling noise.	2019	

Paul Y - Able Joint Venture	<u>Redevelopment of Queen Mary Hospital, phase 1</u> 3m(H) x 10.4m(L) x 1sets SilentUP® retractable noise barrier and 2m(W) x 4m(L) x 30 sets SilentMAT were implemented.	2019	
Willey Construction and Engineering Company	<u>Demolition Works at Mai Po Nature Reserve Infrastructure</u> 5m high SilentUP® retractable noise barrier was implemented.	2019	
CRBC- Build King JV	<u>Tseung Kwan O – Lam Tin Tunnel – Road P2</u> 5m high SilentUP® retractable noise barrier was implemented.	2018-2019