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The People's Republic of China
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1 March 2022

To: Supervisors/ Heads of Private Primary and Secondary Schools

Dear Supervisor/ Principal,

Ventilation Assessment and Improvement Works for Private Schools

Since the outbreak of COVID-19, the Education Bureau (EDB) has been encouraging schools to put in place various anti-epidemic measures including maintaining good ventilation in order to ensure safety of the school environment. As stipulated in the "Health Protection Measures for Schools" guidelines, schools should keep doors/ windows of school halls, classrooms and special rooms open in order to increase flow of fresh air, minimise having air blowing directly from one person to another and clean dust-filters regularly, etc.

In view of the severe epidemic situation recently, we have required publicly-funded schools to conduct ventilation assessment and adopt subsequent improvement measures as soon as practicable with a view to maintaining proper ventilation on campus and safeguarding the health of students and school staff. Private primary and secondary schools are also advised to conduct a thorough ventilation assessment and step up related measures in order to strengthen epidemic control and guard against communicable disease.

Ventilation Assessment and Improvement Works

Schools should arrange quotation/ tender exercise to procure consultancy service for ventilation assessment and improvement works as well as any required ventilation equipment as recommended by registered contractors on their own. A list of such contractors could be obtained from the webpage of the Buildings Department (https://www.bd.gov.hk/en/resources/online-tools/registers-search/registrationsearch.html) by selecting, under the box "Register type", "RSC(V) Register of Specialist Contractors (Sub-register of Ventilation Works Category)", and then clicking "Search". To facilitate schools to procure the required services, sample service specifications for procurement of contractors' services are attached at Annex I for reference.

A set of checklist and report template is also provided below for use by schools, if applicable, for ventilation assessment:

(a) Checklist on Ventilation System – for ventilation assessment of all the occupied spaces of the school premises (Annex II);
(b) Assessment Report on Ventilation System – for making recommendations of necessary actions (Annex III); and
(c) Certificate on Ventilation System – for confirming that respective remedial actions have been taken (Annex IV).

For improvement works, subject to the recommendations of the registered contractor, it may include installing exhaust fans, performing minor improvement works, or procuring air purifiers. If purchase of air purifiers is recommended by the registered contractors, they should meet the same specified specifications as those for use in dine-in catering premises. Schools may refer to the webpage of the Food and Environmental Hygiene Department (https://www.fehd.gov.hk/english/licensing/guide_general_reference/Information_air-changes_purification.html) for relevant information. When procuring the services/ equipment, private schools are reminded to observe the relevant requirements stipulated in the EDB Circular No. 14/2003 on "Acceptance of Advantages and Donations by Schools and their Staff".

To safeguard the safety and health of students and school staff, we advise private primary and secondary schools to complete the ventilation assessment and improvement works as soon as practicable. This is an important step to ensure proper ventilation and a safe learning environment. For enquiries, please contact the respective Senior School Development Officer.

Yours sincerely,

(Dr Verena LAU)
for Permanent Secretary for Education

c.c. CSDOs

Annex I

Provision of Ventilation Assessment Services

Service Specifications

Notes: (a) Tenderers shall note that **all the specifications stated in these Service Specifications are essential requirements**.

(b) Tenderers shall provide documentary evidence thereto wherever requested in the Service Specifications to show compliance of their offered ventilation assessment services with all the requirements.

Service Specifications

1. General

1.1. Introduction

1.1.1. This Invitation to Tender calls for the provision of ventilation assessment services for _____ (the School).
(Name of school)

1.1.2. The information of the School as stated in Clause 1.1.1, including names, addresses, school size and estimated number of rooms are provided below.

Address	
School Size (m^2)	
Estimated number of occupied spaces (including classroom, function room, Hall, library, laboratory, staff room, toilets, etc.)	

1.2. Scope of Services

1.2.1. The scope of services under these Service Specifications is to call for provision of ventilation assessment services to the School in accordance with the below guiding principle.

Items	Suggested Standard
Fresh Air Supply at occupied space[1]	6 Air Change per Hour in enclosed rooms or 10L/s/person whichever is greater
Toilet Ventilation	15 Air Change per Hour (Exhaust)
Distance between fresh air intake and other sources of contamination	5 metres
Air Flow Pattern	Maintain the air flow direction from clean zones to dirty zones

Note:

1. This fresh air requirement should cover all occupied space, including but not limited to classrooms, function rooms, staff rooms and the school hall. (The School shall specify other occupied space e.g. laboratories, theatre(s), etc, as appropriate.) The number of persons per room shall follows the permitted accommodation.

1.2.2. Reference should also be made to "*A Supplement on Ventilation* – Guidelines on Prevention of Communicable Diseases in Schools/ Kindergartens/ Kindergartens-cum-Child Care Centres/ Child Care Centres*"* and the relevant guidelines / regulations as set out by the Buildings Department and the Fire Services

Department.

1.2.3. The ventilation assessment services as set out in section 2 of the Service Specifications shall be provided to the School during the contract period.

1.2.4. The ventilation assessment services shall be conducted by an **engineering team**. The engineering team shall comprise a team of technical competent persons which is led by a professional engineer as stated in Clause 3.1.

1.2.5. The engineering team leader (professional engineer) shall provide a report on the ventilation assessment findings and the shortcomings of ventilation system based on the guiding principle stated in Clause 1.2.1 and also provide the remedial action plan. The plan shall include the short-term modification/housekeeping proposal and long-term improvement plan.

1.3. Contract Period

1.3.1. This contract commence from _____ to _____ inclusive

Service Specifications

2. Ventilation Assessment Services

2.1. Collection of Operation Data

2.1.1. The engineering team shall collect information on operation and technical characteristics of the ventilation system of the School. The collection method shall include, but not limit to, site visits, interviews, surveys, and reviews on building layouts, drawings, schematic diagrams, operation and maintenance records.

2.1.2. The operation data of the ventilation system shall include, but not limit to, the following items:

(i) Operation days and hours of ventilation system;

(ii) Estimated internal floor area, categories and number of individual rooms;

(iii) Records on all ventilation system installation as far as reasonably practicable;

(iv) Equipment list of ventilation system as well as operation and maintenance status; and

(v) Ventilation performance in accordance with the guiding principle as stated in Clause 1.2.1 under mechanical ventilation with air-conditioning or mixed mode of natural and mechanical ventilation.

2.1.3. The engineering team shall bear any cost to collect and retrieve operation data from the building management system or similar system(s), with no additional cost to the School.

2.1.4. If some of the building data are not available, the engineering team shall conduct measurement at representative instant and intervals in order to reasonably predict the operation data with no additional cost to the School.

2.2. Site Inspection

2.2.1. The engineering team shall study the collected building data and conduct site inspections as far as practicable according to the guiding principle as stated in Clause 1.2.1.

2.2.2. The site inspection shall include, but not limit to, verification of equipment data, air flow (L/s) measurement, smoke test, CO_2 measurement and visual inspection of the ventilation system.

2.2.3. The engineering team shall identify any abnormalities of the ventilation system

installation and take photo record of any abnormalities found. The engineering team shall also examine their effects according to the guiding principle as stated in Clause 1.2.1.

2.3. Analysis and Recommendations

2.3.1. With the analysis of site inspection result, the engineering team shall be able to advise the School and the School Sponsoring Body (SSB) / School Management Committee (SMC) / Incorporated Management Committee (IMC) of the School of the followings: -

- Condition of the existing ventilation system;
- Fresh air supply status to different rooms in the School;
- Air change rate of toilets;
- Dead air zone / area;
- Distance between fresh air intake and other sources of contamination; and
- Proposed short-term modification/housekeeping proposal and long-term improvement plan.

2.3.2. For each item mentioned in Clause 2.3.1, the engineering team shall provide the root cause and propose remedial action plan with illustration of drawings and photos, which include a short-term modification/housekeeping proposal and a long-term improvement action plan.

2.4. Number of Ventilation Assessment Service Provided

2.4.1. The engineering team shall at least provide one full ventilation assessment and a follow-up visit to the School during the Contract Period. As the exact number of the on-site visits to school may vary, the engineering team shall also bear the cost of all on-site visits with no additional cost to the School.

2.4.2. The engineering team shall visit the School and complete the first ventilation assessment (including submission of an assessment report as specified in Section 4) within 1 month upon award of contract. The follow-up visit shall be provided to the School within 1 month after the improvement measures have been put in place to check and advise the School again on the ventilation condition.

Service Specifications

3. Staffing Requirement

3.1. The engineering team shall at least comprise of 4 members, 2 sub-team heads and a team leader. Their qualification requirements are listed as follows: -

Grade of Staff	Role	Qualification
Professional Engineer	Team Leader	• Member of HKIE in Building Services Engineering or Mechanical Engineering or equivalent; and • 3 years' experience in air-conditioning design or 6 years' experience in maintenance of air-conditioning installations
Inspector	Sub-team head	• Higher diploma / higher certificate in Building Services Engineering or Mechanical Engineering or equivalent; and • 3 years' experience in supervision of air-conditioning projects or 6 years' experience in maintenance of air-conditioning installations
Work Supervisor	Team member	• Diploma /Ordinary certificate in Building Services Engineering or Mechanical Engineering or equivalent; and • 3 years' experience in supervision of air-conditioning projects or 6 years' experience in maintenance of air-conditioning installations

Service Specifications

4. Ventilation Assessment Report

4.1. The engineering team shall complete the ventilation assessment report in a specified form in **Appendix 1** [Please refer to Annex III of EDB's letter to private schools dated 1 March 2022 on *Ventilation Assessment and Improvement Works for Private Schools*.] with Check list on Ventilation System for the School as an appended annex upon the full ventilation assessment, and the Certificate on Ventilation System for School in a specified form in **Appendix 2** [Please refer to Annex IV of EDB's letter to private schools dated 1 March 2022 on *Ventilation Assessment and Improvement Works for Private Schools*.] upon the follow-up visit, taking into account the guiding principle as stated in Clause 1.2.1 and such report shall be approved and issued by the engineering team leader.

4.2. If the School is recommended to procure air purifier(s) and/or air disinfection equipment(s) as the remedial action plan, the engineering team shall be responsible to vet the model of such equipment(s) proposed/submitted by the School to ensure the specification compliance.

Service Specifications

5. Briefing on Ventilation Assessment Report

5.1. Upon completion of the ventilation assessment service for the School, the engineering team leader shall conduct a briefing to explain the report to the School. The presentation shall cover the following items:

(i) detailed description of the ventilation assessment;

(ii) findings and results of the ventilation assessment;

(iii) short-term proposal; and

(iv) long-term improvement plans if necessary.

5.2. The presentation shall normally include questions and answers.

Annex II

Checklist on Ventilation System

School Name: _____ (School No.:_____)

Address:

District:

Type of school: Primary / Secondary / Primary-cum-Secondary#

Inspection Date:

1 General

1.1 MVAC Installation adopted for school (Please tick ✓ as appropriate)

System Type	Classroom	Function Room	Laboratory	Hall	Staff Room	Others
A/C system (1.window-type / 2.split-type / 3.VRV / 4.packaged a/c unit / 5.central a/c)	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#
Natural ventilation (1.cross-ventilating / 2.single-side)	☐ (1 / 2)#	☐ (1 / 2)#	☐ (1 / 2)#	☐ (1 / 2)#	☐ (1 / 2)#	☐ (1 / 2)#
Mechanical ventilation (1.exhaust / 2.OAP / 3.FAP / 4.packaged a/c unit / 5.central a/c)	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#	☐ (1 /2 /3 /4 /5)#
Other (**)**	☐	☐	☐	☐	☐	☐

 # - Delete as appropriate

Remarks : 1. _____

2. _____

1.2 Summary of Assessment (Occupied Spaces)

Nos. of room	Classroom	Function Room	Laboratory	Hall	Staff Room	Others
☑ 10L/s/person ☑ 5 metres separation distance						
☑ 10L/s/person ☒ 5 metres separation distance						
☒ 10L/s/person ☑ 5 metres separation distance						
☒ 10L/s/person ☒ 5 metres separation distance						
Total:						

1.3 Summary of Assessment (Toilets)

Nos. of toilet		Student Toilets	Staff Toilets
☑ 15 ACH	☑ Proper air intake & discharge		
☑ 15 ACH	☒ Proper air intake & discharge		
☒ 15 ACH	☑ Proper air intake & discharge		
☒ 15 ACH	☒ Proper air intake & discharge		
Total:			

Annex II

Checklist on Ventilation System

School Name: _____ (School No.:_____)

2	**Classroom / Function Room / Laboratory / Staff Room** (*please add supplementary sheet if necessary*)	
2.1	**Room number:**	
2.2	**Size of room:**	(meter) _____W _____D _____ H (Volume = _____m^3)
2.3	**Capacity:**	____ Students + ____ Teachers = ____ Persons
2.4	**Air-conditioning system:**	Window-type ☐ Split-type ☐ VRV ☐ Central A/C ☐
2.5	**Natural ventilation:**	Cross-ventilating ☐ Ventilation Path = metres Single-side ☐ Room Depth / Headroom =
2.6	**Mechanical ventilation:**	
	Mechanical ventilation system	Exhaust ☐ OAP ☐ FAP ☐ Central A/C ☐
	Fresh air supply for room/ Flowrate (estimated / measured#)	_____ litres / second
	• Fresh air supply per person	_____ litres / second / person
	• Meet the fresh air requirement of 10L/second/person	Yes ☐ No ☐
	• Air change per hour (fresh air)[1]	_____
	Distance between fresh air inlet and contaminated exhaust outlet	_____ metres
	• Meet the 5 metres separation distance	Yes ☐ (default / operation#) No ☐
	• Discharge point of mechanical ventilation	Open air ☐ Semi-open air ☐
	Remarks:	
2.7	**Air filtration:**	
	• Brand & Model of air purifiers	_____
	• Type of air purifiers	HEPA filter ☐ UV-C device☐ HEPA filter cum UV-C☐ Others (please specify): _____
	• Location	Standalone at floor level ☐ Ceiling-mounted ☐ Wall-mounted or standalone at middle level ☐
	• Number of air purifier	_____
	• Serving area per air purifier (m^2)	_____(No. of Air Purifier / Floor area)
	• Air change per hour (recirculated air)	_____
2.8	**Recommended Improvement works:**	
	(e.g. Additional exhaust fans / Re-fix existing exhaust fans / Additional FAPs / Re-fix existing FAPs) (e.g. Additional OAP / Air balancing / Increase the capacity of PAU)	

[1] Calculated air change rate using formula: ACH = Room Volume / Total Air Flow Rate (i.e. (L x W x H)/(Quantity x flowrate))

Annex II

Checklist on Ventilation System

School Name: _____ (School No.:_____)

3 Hall (*please add supplementary sheet if necessary*)

3.1 Size of Hall: (meter) _____W _____D _____ H (Volume = _____m^3)

3.2 Capacity: ____ Persons *(if available)*

3.3 Air-conditioning system: Split-type ☐ VRV ☐ Packaged A/C unit ☐ Central A/C ☐

3.4 Natural ventilation: Cross-ventilating ☐ Ventilation Path = metres
Single-side ☐ Room Depth / Headroom =

3.5 Mechanical ventilation:

Mechanical ventilation system Exhaust ☐ OAP ☐ Packaged A/C unit ☐ Central A/C ☐

Fresh air supply for room/ Flowrate (estimated / measured[#]) _____ litres / second

- Meet the fresh air requirement of 10L/second/person Yes ☐ No ☐
- Allowable capacity based on 10L/s/person _____ persons
- Air change per hour (fresh air)[1] _____

Distance between fresh air inlet and contaminated air outlet _____ metres

- Meet the 5 metres separation distance Yes ☐ (default / operation[#]) No ☐
- Discharge point of mechanical ventilation Open air ☐ Semi-open air ☐

Remarks:

3.6 Recommended Improvement works:

Annex II

Checklist on Ventilation System

School Name: _____ (School No.:_____)

4	**Toilet (Student / Staff#)** (*please add supplementary sheet if necessary*)	
	4.1 Toilet number:	
	4.2 Size of toilet: Volume = _____m^3	
	4.3 Mechanical ventilation:	
	Exhaust System	Exhaust Fan ☐ Central Exhaust ☐
	Exhaust Flow Rate (estimated / measured#)	_____ m^3 / hr
	• Air change per hour[1]	_____
	• Meet the 15 ACH requirement	Yes ☐ No ☐
	• Discharge point of mechanical ventilation	Open air ☐ Semi-open air ☐
	• Do the exhaust air discharge to play area or assembly area?	Yes ☐ No ☐ (toilet no.__)
	• Do the toilets have door louvre or window/louvre at opposite side?	Yes ☐ No ☐ (toilet no.__) N/A ☐
	Remarks:	
	4.4 Recommended Improvement works: (e.g. Additional exhaust fans / Re-fix existing exhaust fans)	

Note: Site layout plan with exhaust fans / FAPs / package a/c unit indicated are attached at the end of this report.

~ End ~

Annex III

Assessment Report on Ventilation System

Part A - Background Information

School Name:	
School No.:	
Address:	
District:	
Type of School:	Primary / Secondary / Primary-cum-Secondary[#]
Consultant:	
Inspection Team Member:	(1)(TC)
	(2)(MTC)
	(3)(MTC)
Inspection Date:	
Inspection Time:	

Part B - Assessment Findings

Details of the assessment findings are given in the attached Checklists (***Annex A***) [Please refer to Annex II of EDB's letter to private schools dated 1 March 2022 on *Ventilation Assessment and Improvement Works for Private Schools*.] . The assessment findings are tabulated below. *The relevant site photos and school layout plans are shown in* ***Annex B*** *and* ***Annex C*** *respectively.*

Room No.	**Room Type**[1]	**Findings (☒ indicates irregularity)**				
		Insufficient mechanical ventilation[2]	Insufficient separation between fresh air inlet & other sources of contamination	Equipment Malfunction of ventilation equipment	Improper Installation / Location of ventilation equipment[3]	Others (please specify)
		☐	☐	☐	☐	☐ _____ _____ _____

[1] Classroom, function room, laboratory, staff room, hall, toilet, etc.

[2] For example, lack of air grilles / transfer air grilles, resulting in ineffective operation of ventilation equipment.

[3] For example, exhaust fans and fresh air intake grilles on the same side of a wall / window, resulting in unsatisfactory cross ventilation.

		☐	☐	☐	☐	☐ _____ _____ _____

Part C – Recommendations

Based on the site inspection conducted, the following improvement work is recommended, with illustration of drawings and photos in the attached Checklists *(Annex A)*.

Room No.	Room Type[1]	Recommended Improvement Works

Assessment Report on Ventilation System

Part D – Copyright Notice

The _____(name of school)_____ reserves the copyright of this document. It may not be reproduced, distributed, transmitted, displayed, published or disclosed any content without consent from the copyright owner.

Part E – CAVEAT

This report is confidential to the _____(name of school)_____ for the specific purposes to which it refers. It might be disclosed to the Education Bureau and / or other professional advisers assisting the ____(name of school)___ in respect of that purpose.

This report is based on the condition of mechanical ventilation system in the inspected area on the date of inspection. No liability can be accepted for any deterioration / change in condition of the premises after this date.

- END OF REPORT-

_____ _____

Chop of Registered Specialist Contractor (Ventilation Works Category) and signature of Authorized Signatory

Date (dd/mm/yy)

Name of Registered Specialist Contractor (Ventilation Works Category):

Name of Authorized Signatory:

_____ _____

Registration Number:

Date of Expiry of Registration (dd/mm/yy):

_____ _____

Registered Address:_____

Contact Tel. No.: _____ Fax No. : _____

Annex III

Assessment Report on Ventilation System

Part F – Acknowledgement

I / We (Representative of the School) agree to carry out the proposed improvement works as recommended in Part C of this report.

Signed: _____

Name: _____

_____
(School Chop)

Checklist on Ventilation System

Annex A

Inspection Report on Ventilation System

Annex B

Inspection photo	
Photo no. 1 Item: 1 Problem finding:	Photo no. 2 Item: 2 Problem finding:
Photo no. 3 Item: 3 Problem finding:	

Annex C

Layout Plan

Annex IV

Certificate on Ventilation System

School Name:	
School No.:	
Address:	

I have inspected the above school premises on _____ (dd/mm/yy) (inspection date) and certify the particulars in respect of the above premises as follows and in the Ventilation Assessment Report and Checklist on Ventilation System:

Type of Occupied Spaces Assessed	**Classroom**	**Function Room**	**Laboratory**	**Hall**	**Staff Room**	**Toilet**	**Others (please specify)**
Number of Occupied Spaces Assessed							

I confirm that the ventilation of the abovementioned occupied spaces have been assessed, improvement work has been done according to the recommendations as written in the Ventilation Assessment Report

I understand that the matters and information stated herein and the related documents submitted (if any) are subject to further checking, vetting and verification by officers of Education Bureau (EDB) or authorized officers if deems necessary by EDB.

Note: **If separate sheet is necessary, every page should be signed by the Authorized Signatory of the Registered Specialist Contractor (Ventilation Works Category).**

_____ _____

Chop of Registered Specialist Contractor (Ventilation Works Category) and signature of Authorized Signatory

Date(dd/mm/yy)

Name of Registered Specialist Contractor (Ventilation Works Category):

_____

Name of Authorized Signatory:

_____

Registration Number:

_____

Date of Expiry of Registration(dd/mm/yy):

_____

Registered Address:_____

Contact Tel. No.: _____

Fax No. : _____