

Guidance Notes for the Management of Indoor Air Quality in Schools

December 2022

1. INTRODUCTION

In Hong Kong, children spend a significant part of their time (up to 7 hours a day) in a school environment from Monday to Friday. Indoor air quality (IAQ) in schools is therefore recognised as a key influence on students' health. Several studies have revealed that poor IAQ in classrooms can lead to different health symptoms (e.g. headache, dizziness, stuffy nose, fatigue, tiredness, concentration problems, allergy, asthma, rhinitis, etc.), and affect the performance of students.

Common indoor air pollutants in classrooms include carbon dioxide (CO₂), moulds, bacteria, allergens, particulates, volatile organic compounds (VOCs), etc. On the other hand, temperature and relative humidity, which are considered as thermal comfort factors rather than pollutants in usual room conditions, would also affect students' perception of IAQ.

This Guidance Notes provides background information as well as simple and practical guidelines to facilitate school¹ premises management to identify and rectify IAQ problems in schools. A school walkthrough inspection checklist (checklist) is appended to identify pollutant sources and diagnose IAQ problems so that appropriate corrective actions can be taken to prevent recurrences. However, whenever an outbreak of infectious disease occurs in a school, the advice on ventilation by the Centre for Health Protection of the Department of Health for infection control purposes should be followed.

Schools with mechanical ventilation and air conditioning (MVAC)² systems may also refer to the Guidance Notes published by the Indoor Air Quality Management Group [1] for measures to prevent IAQ problems and enhance IAQ.

In gist, the strategy to achieve good IAQ in schools includes:

- i) Developing an IAQ management programme to identify and assess indoor air problems;
- ii) Implementing measures to achieve good ventilation, prevent pollutant sources, and ensure thermal comfort in indoor environments;
- iii) Monitoring IAQ parameters where necessary; and
- iv) Educating and communicating with school occupants (e.g. teachers and students) to enhance awareness and practices to achieve good IAQ.

¹ Schools include government schools, estate and non-estate aided schools, direct subsidy scheme schools and private schools.

² Mechanical ventilation and air conditioning (MVAC) system means the equipment that provides temperature and humidity control, ventilation or air-purification or any other associated processes to a conditioned space except window-type or split-type air conditioners.

2. COMMON INDOOR AIR PROBLEMS IN SCHOOLS AND THEIR FACTORS

Children are more susceptible to adverse health effects of indoor air pollutants than adults, especially those who are already suffering from allergies, asthma or airway hyper-reactivity. Studies have shown that poor IAQ in schools has been associated with some respiratory health problems in childhood, such as asthma, rhinitis and rhino-conjunctivitis. [2, 3] Poor IAQ and inadequate ventilation in schools can also cause and aggravate other health problems (e.g. irritation); spread airborne infectious diseases; reduce student productivity and increase school absenteeism.

The air quality of a school depends on several factors, such as the location of the school, the outdoor air quality, roadside and outdoor activities nearby, as well as building-related factors, such as the condition of the building envelope, maintenance and cleaning of air conditioners, adequacy of ventilation, and the occupants' behaviour, etc.

2.1 Outdoor Sources of Indoor Air Pollution

Polluted outdoor air may enter the indoor environment by natural and mechanical ventilation or infiltration through leakages (e.g. cracks in ceilings and walls, around doors and windows, etc.). If schools are located next to busy roads or within a zone with many urban and industrial activities, the level of pollutants (e.g. particulates, nitrogen dioxide, etc.) indoors would be affected accordingly.

Table 1. Typical Outdoor Sources in Schools

I. Outdoor Sources
Pollen, dust, mould spores
Industrial emissions
Vehicle emissions
Outdoor machinery emissions
II. Nearby Sources
Odours from rubbish bins
Unsanitary debris or building exhausts near air intakes

2.2 Indoor Sources of Indoor Air Pollution

A majority of air pollutants, however, originate from the indoor environment, such as the release from building materials and furniture, and processes that occur within schools. On the other hand, the IAQ also depends on the level of occupancy, and activities of occupants, as well as the type, effectiveness, efficiency, sanitation and maintenance of mechanical ventilation systems.

2.2.1 Building Materials and Furniture

Wall and flooring, furniture, paints and glues, insulation materials, etc., can release harmful pollutants. For example, emissions from flooring made of polyvinyl chloride (PVC)/vinyl or linoleum products can irritate the respiratory system. The timing of renovations is also important. For example, the installation of new furniture and furnishings should be arranged during summer holidays or off-school periods to minimise exposure to gaseous pollutants.

2.2.2 Activities at Schools

Many school activities would generate indoor air pollutants. For example,

- i) In classrooms, chalk may be used on the blackboard. If the blackboard is not properly cleaned (e.g. with a wet sponge), dust can be dispersed throughout the classroom. Moreover, the use of stationery such as glue, markers and similar pens as well as hand sanitisers will also emit VOCs.
- ii) In science laboratories, bottles containing volatile chemicals are commonly found. If they are left open or unattended for a long time, the gaseous chemicals will disperse in the room.
- iii) In offices, gaseous and particle emissions from photocopying machines and printers will accumulate if ventilation inside the room is inadequate.
- iv) During school repair and renovation, the use of high-VOC products such as paints and adhesives will significantly deteriorate the IAQ.
- v) The use of VOC-containing cleaning agents, disinfectants and pesticides will increase the risk of students' exposure to the strong off-gas residues.
- vi) Extensive use of air fresheners, hand sanitisers and personal care products may cause irritation to some students.
- vii) Carpets and filters of air conditioners without proper cleaning can be a source of trapped pollutants and dust.

Table 2. Typical Indoor Sources in Schools

I. Building Equipment, Components & Furniture
a) Air conditioners and mechanical ventilation equipment
<ul style="list-style-type: none">• Mould growth in condensate pans, ductworks, coils and humidifiers• Dust or debris in ductworks
b) Other equipment
<ul style="list-style-type: none">• Emissions from office equipment• Emissions from laboratory and cleaning equipment
c) Components
<ul style="list-style-type: none">• Mould growth on or in soiled or water-damaged materials• Materials containing VOCs, inorganic compounds or damaged asbestos• Materials that produce dust
d) Building materials and furniture
<ul style="list-style-type: none">• Emissions from new furniture and floorings• Mould growth on or in soiled or water-damaged furnishings
II. Other Potential Indoor Sources
<ul style="list-style-type: none">• Science laboratory supplies• Vocational art supplies• Cleaning materials/air fresheners• Emissions from rubbish• Pesticides• Paint, caulk, adhesives and varnishes• Dry-erase markers and similar pens• Personal care products

2.3 Status of Building Envelope for Schools

An aged school would unavoidably have damages to walls and ceilings. If proper maintenance of the building structure is not carried out, infiltration of outdoor air pollutants, water moisture, heat, etc., into classrooms can occur. Water infiltration via the leakages can lead to mould growth inside the building which may cause allergies and irritation to the occupants.

2.4 Type and Condition of Ventilation Systems

The age, type, cleanliness and maintenance of ventilation systems can significantly affect the accumulation and removal of indoor air pollutants. An old ventilation system that lacks proper maintenance may not function up to the desired standards, for instance, relevant guidelines published by the Labour Department. When the ventilation is insufficient or not effective, the air pollutants may not be removed effectively from indoor areas, and the supply of fresh air is insufficient to meet the respiratory needs of the school occupants, resulting in unsatisfactory IAQ. Both properly maintained natural ventilation (through doors, windows or any openings) and mechanical ventilation (through exhaust fans, fresh air supply fans, air conditioners, etc.) can help to maintain good IAQ, in particular for venues with

window/split type air conditioners and fan coiled units which are designed to condition indoor thermal comfort but unable to handle air pollutants effectively. They should be complemented by exhaust fans to remove indoor air pollutants and openable windows or doors to provide adequate fresh air.

2.5 Thermal Comfort

Thermal comfort is the condition of mind that expresses satisfaction with the thermal environment, and it can vary from one individual to another. As thermal comfort is a subjective perception, it is not possible to have a single comfort level that can satisfy all occupants in a space.

Temperature has the most direct effect on thermal comfort, while relative humidity relates to thermal comfort by affecting the human body's ability to lose body heat through sweating. In addition, air movement is also an important factor.

The design and operation of an air-conditioning system can significantly affect the level of thermal comfort³. Based on different uses of premises, air temperature from 20°C to 26°C (20°C to 23°C in winter-time and 24°C to 26°C in summer-time), relative humidity from 40% to 70% and air movement not exceeding 0.2m/s are optimum ranges for most occupants in air-conditioned spaces.

Apart from thermal comfort, proper control of indoor air temperature and relative humidity (less than 70%) are important for preventing mould growth. They should also be taken into consideration while achieving other objectives of satisfactory IAQ.

2.6 Health Effects of Poor IAQ

The effects of IAQ problems on school occupants are often non-specific symptoms rather than well-defined diseases.[8] Symptoms commonly attributed to IAQ problems include eye, nose, throat and skin irritation; sinus congestion, coughing and sneezing; shortness of breath; and headaches and fatigue. These symptoms may be caused by the deterioration of air quality in the school environment (indoors and outdoors) or may also be linked to other factors (e.g. poor lighting, stress, noise, etc.). Due to varying sensitivities among school occupants, IAQ problems may affect a group of people or specific individuals and may affect people in different ways. Symptoms may also provide a clue to the cause of the problem, although it is often difficult to prove a direct causal relationship, especially where a combination of factors is involved.

³ Reference can be made to the "Guidelines on Optimum Indoor Air Temperature, Relative Humidity and Air Movement" published by the Environmental Protection Department [5], and other international guidelines such as the ASHRAE Standard 55-2017 [6] and British Standard, BSEN 15251:2007.[7]

3. STRATEGY TO ACHIEVE GOOD IAQ IN SCHOOLS

3.1 IAQ Management Programme

Executing an IAQ Management Programme would be a systematic approach to help monitor and maintain good IAQ at schools. The programme includes a plan of preventive and corrective measures to reduce indoor air pollution.

3.1.1 Establish an IAQ Team

Schools should assign appropriate personnel to form an IAQ team to design and implement the IAQ Management Programme. Key responsibilities of the team are to:

- i) Develop, review and modify the IAQ Management Plan, including IAQ policies and procedures that support and enhance good IAQ;
- ii) Communicate with staff, students and other stakeholders (e.g. parents) about IAQ matters;
- iii) Assign members (the inspectors) to conduct walkthrough inspections with the help of a checklist;
- iv) Investigate IAQ concerns and complaints, and take corrective and preventive actions;
- v) Meet regularly to review IAQ-related matters;
- vi) Coordinate IAQ-related activities; and
- vii) Consult an external IAQ expert (Note: a list of relevant service providers is available from the IAQ Information Centre website: www.iaq.gov.hk), if needed.

3.1.2 Perform Walkthrough Inspections

The inspectors should conduct walkthrough inspections of schools at least annually or more if determined necessary by the IAQ team to identify potential areas for improvement. A checklist would facilitate a systematic and effective inspection. A sample checklist is provided in Appendix I for reference. However, the IAQ team should develop a checklist to suit the need or specific situations of the school and modify them when needed. After each inspection, the inspector should sign the checklist, which should be documented.

3.1.3 Evaluate and Resolve Identified IAQ Problems

When IAQ issues are identified during a walkthrough inspection, or there are IAQ concerns or complaints, the IAQ team should investigate and take appropriate actions to address the issues as soon as possible, and ensure that problems are rectified. All actions taken should be documented.

Section 3.2 suggested commonly used measures to reduce and manage IAQ problems in schools.

3.2 Measures for Good IAQ

3.2.1 Building Design and Renovation

Schools are subject to registration by the Education Bureau under the Education Ordinance (Cap. 279).[9] The design of all school premises must allow for adequate ventilation to the satisfaction of the Permanent Secretary for Education according to the requirements stipulated in the Education Regulations (Cap. 279 A) and make reference to the relevant guidelines.

a) Materials Selection

During school renovation, selection and use of environmentally friendly materials and products are essential for good IAQ:

- i) Select renovation materials and furniture with low-emission or green labels.
- ii) Select floor coverings that can be damp wiped or cleaned easily.
- iii) Select low-VOC or water-based paint over solvent-based paint, and choose paints which give a less glossy finish.
- iv) Use water-based coatings, low-VOC adhesives and surface-treating agents for flooring installation and treatment.

b) Renovation Control

School occupants' exposure to the pollutants generated during renovation should be minimised:

- i) Appropriate timing—Conduct renovation works during holidays, weekends, evenings or when the occupants are not in schools.
- ii) Keeping distance—Keep school occupants or activities as far from renovation work as possible.
- iii) Isolating—Set up physical barriers around the renovation areas to reduce the spread of pollutants to adjacent areas. Also, cover all air inlets or vents nearby to prevent the dispersion of contaminants by the ventilation system.
- iv) Cleaning up—Clean the renovation areas frequently so that there is less chance that these pollutants (e.g. dust) will enter other areas.

3.2.2 Improving Air Ventilation

IAQ would be improved by introducing cleaner or adequate properly treated

outdoor air into the building to dilute indoor air pollutants and remove the pollutants from the building by means of mechanical exhaust systems.

a) Proper Operation of Ventilation Systems

Proper operation of ventilation system can help remove air pollutants timely and effectively:

- i) Ventilate classrooms (by natural or mechanical means) before the school day starts and during breaks.
- ii) Enhance the ventilation rate (e.g. switching on exhaust fans) to boost ventilation effectiveness when there are pollutant-releasing activities and/or high occupancy rates.

b) Natural Ventilation

Natural ventilation can complement the ventilation of window- or split-type air conditioners and enhance the dilution of indoor pollutants:

- i) Open windows and doors wider when the outdoor air cleanliness and conditions permit.
- ii) Allow cross-ventilation by opening windows at opposite walls.

c) Mechanical Ventilation

Fan-assisted air movement is a simple and cost-effective way to enhance ventilation:

- i) Switch on oscillating fans to enhance indoor air circulation.
- ii) Switch on exhaust fan(s) to extract and remove indoor pollutants, and fresh air supply fan(s) to bring in fresh outdoor air to dilute indoor pollutants.

d) Regular Inspection and Maintenance of Mechanical Ventilation Equipment and Air Conditioners

Maintaining the working efficiency of air conditioners, exhaust fans and oscillating fans is needed to ensure sufficient ventilation and indoor air pollutants are removed effectively:

- i) Inspect ventilation systems regularly⁴.
- ii) Establish a cleaning and maintenance plan and schedule.

⁴ "Operational Manual for Pre-primary Institutions" published by the Education Bureau and the Social Welfare Department [11] indicated that any mechanical ventilating system installed in pre-primary institutions shall be inspected by a registered specialist contractor at intervals not exceeding 12 months.

- iii) Change air filters regularly.
- iv) Drain condensate pans.
- v) Keep air-conditioning outlet clear without obstruction.

Further reference can be made to guidelines for ventilation control published by the Labour Department.[4] The Department of Health has also provided supplementary information[10] related to ventilation control in reducing the spread of communicable diseases in institutions. Specific criteria for ventilation systems with regard to hygiene and other important factors are also given in the *World Health Organization Guidelines for Indoor Air Quality: dampness and mould* [12] and the latest version of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1 *Ventilation for Acceptable Indoor Air Quality*.[13]

3.2.3 Pollutant Source Management

a) Source Removal & Control (Outdoor)

Outdoor pollutants should be minimised from entering the schools:

- i) Close the vent valves of window-type air conditioners, close the windows and switch on portable air purifiers when the outdoor air condition is very poor. Improve indoor air circulation by opening windows and the vent valves of the window-type air conditioners when the outdoor air quality improves, even temporarily.
- ii) Impose measures to control the potential impact of vehicular emissions, e.g. avoid opening windows that are susceptible to vehicle emissions, designating pickup and drop off at appropriate areas, and switching off idling engines.
- iii) Use of air filters of suitable particulate removal efficiencies in the MVAC systems to efficiently filter outdoor air pollutants.

b) Source Removal & Control (Indoor)

Since the majority of indoor pollutants come from products and activities within the schools, identification and removal of pollutant sources are essential:

- i) Avoid excessive use of fragranced and pollutant emitting products, such as cleaning agents and air fresheners.
- ii) Install dedicated exhaust-fume cupboards or exhaust fans for areas with pollution sources, such as restrooms, science laboratories, storerooms for cleaning agents and chemicals, printing and photocopy rooms, and vocational training areas (e.g. with welding booths).
- iii) Open windows and doors wider when the outdoor air cleanliness and conditions permit.
- iv) Conduct regular inspection and proper maintenance of the exhaust system,

especially in science laboratories with reference to relevant guidelines published by the Education Bureau.[14]

c) Source Substitution

Materials that affect IAQ should be avoided and substituted with less harmful ones:

- i) Maintain a list of pollutant-emitting products used in schools.
- ii) Develop guidelines on the use of pollutant-releasing materials and products.
- iii) Use alternative products with low-VOC or green labels.

d) Source Encapsulation

If pollutant emissions cannot be avoided, the pollutant source should be isolated to prevent affecting other areas:

- i) Place a barrier around the source to reduce the spread of pollutants to nearby areas.
- ii) Place the pollutant emitting equipment or products, such as photocopiers, printers, hand sanitisers and cleaning agents, in a separate well-ventilated room.

3.2.4 Housekeeping and Cleaning

a) Effective Cleaning and Preventive Maintenance

Good maintenance and cleaning practices are essential to maintain a good IAQ in schools:

- i) Conduct proper cleaning regularly to remove dust, dirt and contaminants, for example, wet clean classrooms and tabletops, and disinfect washrooms daily.
- ii) Develop a maintenance plan and arrange regular inspections for the building, and air conditioners and ventilation equipment to ensure they are operating effectively.

b) Moisture/Mould Control

Mould growth can be inhibited if moisture and dust are controlled. Control measures include:

- i) Repair cracks on walls and ceilings, as well as, leaks to avoid water or moisture infiltration.
- ii) Maintain indoor relative humidity to below 70% as far as possible.
- iii) Clean or remove mouldy items. Let them dry through after cleaning.

- iv) Vacuum at least weekly, using cleaners with high-efficiency particulate air (HEPA) filters.

More information about mould remediation can be found in the guidelines published by the Environmental Protection Department.[15]

3.2.5 Use of Other Equipment

Use of appropriate equipment where necessary to further improve indoor air conditions. For example, using portable air purifiers that are equipped with HEPA filters to remove airborne particulates and dehumidifiers to remove moisture.

3.3. Monitoring

Apart from the routine walkthrough inspections of ventilation systems, humidity and temperature control, concentration of other IAQ parameters (e.g. CO₂, particulates and total VOC) may be monitored to identify where necessary if extra measures are needed to enhance the IAQ. The CO₂ level is also a good indicator of the effectiveness of the ventilation system and the adequacy of ventilation in a room.⁵ Reference can be made to the Guidelines published by the Indoor Air Quality Management Group.[1] An external IAQ expert may be consulted to measure these IAQ parameters and evaluate the findings if needed.

3.4. Communication

Staff, students and other stakeholders should contact the IAQ team, if there is any IAQ concern or issue. The IAQ team should always communicate with them in a prompt and transparent manner until the IAQ issue is resolved.

3.5 Education

All staff and school occupants play an important role in school IAQ. Their behaviour can indeed affect the IAQ in schools, hence providing IAQ information would help promote their awareness of the importance of IAQ and help to maintain good IAQ:

- i) Basic information of IAQ, e.g. health effects of poor IAQ and types and sources of indoor air pollutants.
- ii) Tips on how to maintain good IAQ (e.g. avoid using VOC-containing products, ventilation control, moisture control, effective cleaning and maintenance) during their daily activities at school.

⁵ CO₂ has been commonly adopted by IAQ researchers as an indicator with levels above 1,000 parts per million by volume (ppmv) in office environments indicating that the ventilation rate is low and that other airborne contaminants are accumulating.

4. GENERAL TIPS FOR A HEALTHY SCHOOL ENVIRONMENT

The followings are general tips [8] to achieve good IAQ regarding different types of rooms and facilities in a school.

I. Classroom

Furniture

- Low-VOC furniture is preferred.
- New furniture should be stored in a clean, dry, well-ventilated area until VOC off-gassing has diminished.
- The installation of furniture and furnishings should be scheduled during periods of non-occupancy or holidays, well in advance of the beginning of school terms.

Blackboard or Whiteboard

- Blackboards should only be cleaned with a wet sponge.
- Cleaning and maintenance work should be done after classes and accompanied by abundant ventilation during and after cleaning
- Cleaning agents used should be appropriate for the task and according to the instructions, with reasonable frequency and in reasonable quantities.
- Low-VOC cleaning products are preferred.

Ventilation

- If no mechanical ventilation system is installed, natural ventilation should be used (i.e. open windows) for introducing fresh air.
- If it is not possible or permitted to open the windows because of the poor weather, high levels of outdoor air pollution, noise or safety reasons, mechanical ventilation should be switched on to provide a suitable amount of fresh air supply to the classrooms.
- The operating speed of ventilation fans should be regularly adjusted to maintain stable and comfortable indoor air temperature and humidity levels.
- Ventilation systems should be inspected regularly with a maintenance plan established.
- Air filters of air conditioners must be cleaned or renewed regularly. Condensate pans must be checked regularly to ensure that they are draining adequately.

- Teachers and students should be made aware that appropriate ventilation is essential, and that the mechanical ventilation fans should be kept switched on, with the airflow passage free from blockage by books, papers and other items.

Floor

- The least hazardous flooring products with low emissions should be selected.
- Classrooms should be dusted, vacuumed or wet-cleaned at the end of each school day.
- Use of carpet should be avoided. However, if carpets are used, they should be cleaned with vacuum cleaners equipped with a HEPA filter.
- When it is time to replace carpeting, linoleum, hardwood or tiles are recommended as alternatives.

II. Science Laboratory

Science tools

- Hazardous scientific equipment should not be left out or unattended.
- Students should be closely supervised while performing experiments.

Ventilation

- A ventilation system should be installed that is appropriate to the use of the room, its size and its occupancy rate.
- The ductwork should ensure that the air is extracted directly to the outside and not recirculated in the overall school ventilation system.
- The ventilation system should be regularly inspected, maintained and cleaned.
- Bottles containing off-gassing substances should not be left open on desks during breaks or for longer than necessary.

III. Multipurpose Hall (including Assembly Hall & Gymnasium)

Hall equipment & sports material

- Hall equipment and sports material should be dusted regularly during school periods (before or after classes).
- Cleaning agents should not be used just before an assembly, a sports class or other activities.
- Before the start of a new term, the multipurpose hall should be thoroughly cleaned and disinfected. This allows time for any off-gassing from the cleaning agents to be removed from the air.

Cleaning agents

- Low-VOC cleaning products are preferred.
- Cleaning products should be chosen according to the specific surfaces to be cleaned to avoid inappropriate mixing. They should be used according to the instructions on the label.
- Air fresheners should be avoided, or used in moderation.
- When required, stronger cleaning agents can be used, but only after classes, assemblies or other activities, and with increased ventilation rates.

Ventilation

- Both natural and mechanical ventilation systems should be installed to maintain CO₂ concentrations and humidity levels, and could contribute to temperature control across the full range of expected occupancy levels and activity types.
- If the school building design permits, the gymnasium should be located next to the school playground. Where possible, natural ventilation (open windows) should be used as much and as often as possible, especially during sports classes, assemblies or other activities.
- Natural ventilation is less advisable if the windows open onto the street, as particles from traffic and other airborne contaminants could enter the school building.
- The ventilation and air-conditioning system should be regularly checked, maintained, cleaned and repaired.
- Vents must not be blocked with furniture, sports equipment or clothing.

IV. Locker Rooms and Restrooms

Lockers

- A ventilation system should be installed that is appropriate to the size and location of the restroom and should be regularly inspected and maintained.
- Water leaks or broken fans should be repaired as quickly as possible.
- The locker room should be cleaned and vacuumed after school hours, and if possible, the doors of the lockers should be left open overnight for ventilation.
- If mould appears, it should be removed immediately.
- If disinfectants or biocides are used to remove mould, it should always be done outside school hours.

Shower cubicles/Water Closets (WCs)

- Shower cubicles and WCs should be thoroughly cleaned at the end of each school day.
- Low-VOC or plant-derived cleaning products are preferred.
- Cleaning products should be chosen according to the specific surfaces that need to be cleaned to avoid inappropriate mixing. They should be used according to the instructions on the label.
- Stronger cleaning agents can be used only after classes and with increased ventilation.
- Water pipe systems should be regularly inspected, maintained and cleaned.

5. REFERENCES

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<https://www.edb.gov.hk/en/sch-admin/sch-registration/about-sch-registration/info-application-sch-registration.html>
- [17] **School Registration and Compliance Section, Education Bureau** (2019). Guidelines for Registration of a New School (For premises designed and constructed as a school)
<https://www.edb.gov.hk/en/sch-admin/sch-registration/about-sch-registration/info-application-sch-registration-premises.html>

Appendix I

Sample School Walkthrough Inspection Checklist

Inspector name	:	_____
Room or area	:	_____
Date completed	:	_____
Signature	:	_____

Inspection Items		Yes	No	Remarks
1. School Building Design and Renovation (Refer to GN Section 3.2.1 for details)				
a.	Materials Selection <ul style="list-style-type: none"> Selecting renovation materials and furniture with low-emission or green labels Selecting floor coverings that can be damp wiped or cleaned easily Selecting low-VOC or water-based paint over solvent-based paint, and choose paints which give a less glossy finish Using water-based coatings, low-VOC adhesives and surface-treating agents for flooring installation and treatment 			
b.	Renovation Control <ul style="list-style-type: none"> Appropriate timing for renovation Keeping distance of renovation work from school occupants/activities Isolating renovation area Cleaning renovation areas frequently 			
2. Improving Air Ventilation (Refer to GN Section 3.2.2 for details)				
a	Proper Operation of Ventilation Systems <ul style="list-style-type: none"> Ventilating classrooms before the school starts and during break Enhancing the ventilation rate when there are pollutant releasing activities and/or high occupancy rate 			
b.	Natural Ventilation <ul style="list-style-type: none"> Keeping windows and doors open wider when the outdoor air cleanliness and conditions permit Providing cross ventilation 			
c.	Mechanical Ventilation <ul style="list-style-type: none"> Using oscillating fans Using exhaust fan and fresh air supply fan 			

Inspection Items		Yes	No	Remarks
d.	Regular Inspection and Maintenance of Mechanical Ventilation Equipment and Air Conditioners <ul style="list-style-type: none"> Inspecting ventilation systems regularly. Establishing a cleaning and maintenance plan and schedule. Changing air filters regularly Draining condensate pans Not obstructing air-conditioning outlet 			
3. Pollutant Source Management (Refer to GN Section 3.2.3 for details)				
a.	Source Removal & Control (Outdoor) <ul style="list-style-type: none"> Closing the vent valves of window-type air conditioners and switching on portable air purifiers when the outdoor air condition is very poor. Improve indoor air circulation by opening windows and the vent valves of the window-type air conditioners when the outdoor air quality improves, even temporarily. Implementing measures to control impact of vehicular emissions. Use air filters of suitable particulate removal efficiencies in the mechanical ventilation & air conditioning (MVAC) systems to efficiently filter outdoor air pollutants 			
b.	Source Removal & Control (Indoor) <ul style="list-style-type: none"> Avoiding excessive use of fragranced and pollutant emitting products (e.g. cleaning agents and air fresheners) Using dedicated exhaust-fume cupboards or exhaust fans for areas with pollution sources Open windows and doors wider when the outdoor air cleanliness and conditions permit. Conducting regular inspection and proper maintenance of exhaust system 			

Inspection Items		Yes	No	Remarks
c.	Source Substitution <ul style="list-style-type: none"> • Maintaining a list of pollutant emitting products used • Using alternative products with low-VOC or green labels 			
d.	Source Encapsulation <ul style="list-style-type: none"> • Placing barriers around pollutants source • Placing the pollutant emitting equipment (e.g. photocopiers and printers) and products (e.g. hand sanitisers and cleaning agents) in a separate well-ventilated room 			
4. Housekeeping and Cleaning (Refer to GN Section 3.2.4 for details)				
a.	Effective Cleaning and Preventive Maintenance <ul style="list-style-type: none"> • Conducting cleaning regularly, e.g. daily • Developing a maintenance plan and arranging regular inspection for building, and air conditioners and ventilation equipment 			
b.	Moisture/Mould Control <ul style="list-style-type: none"> • Repairing cracks and leaks • Maintaining relative humidity to below 70% as far as possible • Cleaning and removing mouldy items. Let the items dry through after cleaning. • Vacuuming at least weekly 			
5. Use of Other Equipment (Refer to GN Section 3.2.5 for details)				
a.	<ul style="list-style-type: none"> • Use of appropriate equipment to improve indoor environmental conditions, e.g. portable air purifiers that are equipped with HEPA filters and dehumidifiers 			