



# **ENVIRONMENTAL SANITATION FOR HIGH-RISK NON-HEALTHCARE PREMISES IN SINGAPORE TECHNICAL GUIDE**

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## **Introduction**

Infectious diseases can be transmitted by various modes, and maintenance of good environmental hygiene is one of the measures to prevent or control the spread of such diseases in the community.

The objective of these guidelines by the National Environment Agency of Singapore is to improve the cleaning regimes of buildings or premises in non-healthcare settings deemed to pose a public health risk, so as to achieve higher levels of public cleanliness and hygiene in both front-of-house areas and back-of-house areas. These guidelines are not intended to deal with infectious disease outbreaks.

This document provides a background on the importance of environmental sanitation in preventing the transmission of infectious diseases, and details how owners or operators of buildings and premises can reduce the incidences of community-acquired infections transmittable by contaminated surfaces and manage pest infestations with good environmental sanitation.

This document also provides environmental cleaning and disinfection guidelines by the National Environment Agency to assist owners or operators of buildings and premises to respond to bodily discharge incidents such as vomitus that may pose a public-health risk, so as to ensure that the buildings and premises are safe for the occupants and public.

These guidelines should complement existing personal and food hygiene practices, as well as public cleanliness efforts.

This document is put together with inputs from members of the National Environment Agency's Environmental Sanitation Technical Committee, as well as the Ministry of Health, and other members. Reference has also been made to international sources such as the Centers for Disease Control and Prevention, United States Environmental Protection Agency, the Japanese law for Environmental Health in Buildings, and the ISSA - The Worldwide Cleaning Industry Association. The contributors and references are listed in Appendices I and II.

Guidelines on environmental cleaning and disinfection issued by the National Environment Agency in response to known infectious disease transmissions may also be found in the Annex.

Readers are encouraged to contextualise the guidelines further for their respective buildings or premises for enhanced environmental sanitation.

## Definitions

This section helps to align readers' understanding on some of the common terms used in the chapter.

*Cleaning* – Cleaning refers to using water and detergent to physically remove dirt, impurities from surface or objects.<sup>1</sup> Cleaning does not kill all infectious pathogens.

*Contact time* – The time a disinfectant is in direct contact with the item to be disinfected.<sup>2</sup>

*Disinfection* – Disinfection refers to using disinfectants to kill infectious pathogens found in bodily discharge and on surfaces of objects. For a disinfectant to work properly, a dirty surface should first be cleaned with detergent and water.<sup>1</sup>

Refer to **Chapter 2** for information on the various types of disinfectants available. More details can also be found from international sources such as the United States Environmental Protection Agency<sup>3</sup> and the Centers for Disease Control and Prevention.<sup>2</sup>

*High-risk premises* – Premises with factors that increase risk of contamination with pathogens and place them at risk of contributing to infectious disease transmission.

*Incident* - An incident that may pose a public-health risk is defined as the identification of a potential source of infection in the premises.<sup>a</sup>

*Pathogen* – A bacterium, virus, fungus or other microorganism that can cause disease.

*Personal protective equipment (PPE)* – specialised clothing or equipment worn for protection against infectious diseases.

*Reservoir* – Sites where pathogens live and reproduce. Reservoirs may be living organisms or non-living sites (e.g. different environments).

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<sup>a</sup> Examples of incidents are bodily discharge such as vomitus, blood, pus.

## **Importance of Environmental Sanitation**

Proper environmental sanitation practices reduce incidences of infectious disease transmissions and improve the well-being of occupants and users of the premises. More details on infectious disease transmission may be found in **Appendix III**.

### Modes of Disease Transmission

Infectious diseases can be transmitted via droplets containing bacteria or viruses expelled from an infected person, or via direct contact with infected persons or their secretions and bodily discharge, or via indirect contact with objects contaminated by infectious agents. Diseases can also be transmitted by air, food, water or vectors.

Some infectious agents may be transmitted by more than one route. For example, viral gastroenteritis caused by Norovirus can be spread through exposure to surfaces contaminated with vomit particles from an infected person, or ingestion of contaminated food or water. Vectors such as cockroaches and flies can also play a part in food-borne diseases like Salmonellosis.

### Preventing Disease Transmission in the Community

To prevent or control the spread of diseases in the community, there is a need to reduce the factors causing transmission of diseases. One of the ways this could be achieved is ensuring a good standard of environmental cleanliness via a programme of consistent cleaning and disinfection, as well as implementing measures to prevent pest infestation. Owners or operators of buildings and premises should also take appropriate action if they detect that a potential source of infection and/or reservoir is present. Such action could include removing the potential source of infection and/or reservoir, and ensuring that the premises are thoroughly cleaned and disinfected. Other measures include practising personal hygiene such as regular handwashing and covering one's face when coughing or sneezing.

Owners or operators of buildings and premises are encouraged to conduct a basic health check of staff and all workers on site for signs of fever and potential sources of infection which are visible such as open wounds, to ensure that staff and workers take the necessary precautions to prevent any possible spread of infectious diseases before beginning work.

## **Chapter 1: Routine and Periodic Environmental Cleaning and Disinfection**

### **1 Risk Profiling of Premises**

1.1 To assess if their premises require an environmental sanitation programme as prescribed in this document, owners or operators of buildings and premises should consider the following factors which may pose a risk in the spread of infectious diseases:

- Human footfall or occupancy
- Presence of vulnerable groups
- History of disease outbreaks and pest infestation
- Presence of pest infestation
- Presence of organic waste generators e.g. food shops and activities such as preparation, serving and storage of food
- Activities and areas for handling of animals
- Exposure to imported diseases

### **2 Environmental Sanitation Programme**

2.1 Owners or operators of high-risk buildings and premises are required to ensure environmental sanitation of their premises and have an environmental sanitation programme drawn up, with proper records maintained. The programme should detail minimally the following:

- a) Scope of cleaning, disinfection and facility inspection
- b) Frequency of cleaning, disinfection and inspections to be conducted
- c) Manpower, equipment and cleaning agents used

The programme should also provide for good pest management, to prevent vector-borne and/or food-borne diseases caused by pest issues. The following sections provide guidance on the scope and frequency of cleaning, disinfection, pest management and facility inspections, as well as the use of cleaning and disinfection agents.<sup>b</sup> A sample programme can be found in **Appendix IV**.

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<sup>b</sup> All persons involved in the operations should comply with existing workplace safety and health guidelines during the course of their work.

### 3 Scope and Frequency of Cleaning and Disinfection

3.1 A good environmental cleaning programme should comprise both routine and periodic operations to ensure all areas are thoroughly cleaned and disinfected regularly. Owners or operators of buildings and premises would need to identify the inventory of areas within a building or premises to be cleaned, and may refer to the Singapore Standards on Cleaning<sup>c</sup> for examples of such inventories. Besides front-facing areas, these should include the back-of-house areas such as staff rest areas and toilets, loading/unloading bays, service channels, bin centres and bin-holding areas.

#### 3.2 Routine Operations

3.2.1 In general, routine cleaning and disinfection operations should include, but are not limited to, the areas below:

- High-touch surfaces such as door handles, escalator railings, lift buttons
- Toilets and shower facilities, including diaper changing areas in family rooms
- Family and children-centric facilities e.g. playgrounds
- Food preparation / service areas e.g. kitchens, table-tops

3.2.2 The frequency of cleaning would depend on the risk profile of the area depicted by the following factors<sup>4,5</sup>

- whether the surfaces are high-touch or low-touch,
- the vulnerability of the people using the premises, and
- the probability of contamination based on the amount of bodily fluid contaminating surfaces in the area.

3.2.3 Owners or operators of buildings and premises should consider these factors to determine the frequency of routine cleaning and disinfection for the various areas within their premises. Table 1 below elaborates the factors and corresponding frequency of cleaning. For reference, the risk stratification matrix to determine frequency of cleaning in healthcare settings<sup>4</sup> may be found in **Appendix V**. Owners or operators of buildings and premises should also take note of the usage level of the area when determining the frequency of cleaning. Areas with higher usage would require more frequent cleaning than areas with lower usage.

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<sup>c</sup> The Singapore Standards on Cleaning are:

- (i) SS 499: 2002 (2015) Cleaning Service Industry – Cleaning Performance for Commercial Premises
- (ii) SS 610: 2016 Guidelines for Cleaning Performance of Retail Food and Beverage (F&B) Premises
- (iii) SS 533: 2007 (2015) Cleaning Performance for Public Housing Estates

**Table 1** Factors impacting the Frequency of Cleaning

<b>Factors that will impact frequency of cleaning</b>	<b>Description</b>
Potential for Exposure	<p>The potential for exposure to pathogens based on the frequency of contact with a contaminated surface, and the type of activity involved.</p> <p><b>High-touch surfaces</b> are those that have frequent contact with hands, and would require more frequent cleaning than low-touch surfaces.</p> <p><b>Low-touch surfaces</b> are those that have minimal contact with hands.</p> <p>For example, a toilet door knob or a lift button would require more frequent cleaning than a window sill.</p>
Vulnerability of population to infection	<p>This refers to the groups of people at the building or premises who might be more susceptible to infection due to their poor immunity, young or old age. This would include areas such as indoor play-areas for children.</p> <p>Such areas visited or occupied by vulnerable groups would need to be cleaned more frequently than other areas.</p>
Probability of contamination with pathogens	<p>The probability of contamination of the surface would depend on the activity in the area.</p> <p>Areas that are heavily soiled with bodily fluids or exposed to raw meat, areas where food is prepared, areas where waste is collected or stored, and areas that are likely to attract pests or were previously infested with pests would require more frequent cleaning.</p> <p>An area is considered to be <b>heavily contaminated</b> if the surfaces are routinely exposed to large amounts of bodily fluids or food preparation activities (not limited to raw meat), collection/storage of wastes (including food wastes) or if the area is likely to attract pests or is infested with pests e.g. toilets, diaper changing stations, bathrooms, kitchens, food stalls, and waste storage areas.</p> <p>An area is considered to be <b>moderately contaminated</b> if the surfaces do not routinely, but may, become contaminated with bodily fluids, food, collection/storage of wastes or pest infestations, e.g. office pantries.</p>

Factors that will impact frequency of cleaning	Description
	An area is considered to be <b>lightly contaminated</b> if the surfaces are less likely to be exposed to bodily fluids or wastes, or less likely to attract pests e.g. meeting rooms.

3.2.4 Where necessary, regular routine cleaning may need to be supplemented with more intensive cleaning techniques to ensure adequacy of cleaning. For example, heavily soiled floors need to be scrubbed even if the floors are already swept on a daily basis.

3.2.5 Generally, areas with a higher risk profile require more frequent cleaning. Such areas should also be disinfected after cleaning, and additionally as required. Regular cleaning and disinfection lower the risk of disease transmission due to poor environmental sanitation. As disinfectants are more effective on clean surfaces, cleaning prior to disinfection is recommended. For the purpose of routine disinfection, broad spectrum generic disinfectants may be used, e.g. bleach at low concentration (1 part bleach in 49 parts water). Section 6 provides more information on disinfectants.

3.2.6 In the event of an infectious disease outbreak, owners or operators of buildings and premises should increase the frequency of routine cleaning and disinfection, and pay more attention to disinfection. When the pathogen responsible for the outbreak is known, owners or operators should ensure that the right type of disinfectants is used. More information on the types of disinfectants can be found in Section 6.

3.2.7 Table 2 below shows the suggested thorough routine cleaning and disinfection frequencies for some areas in non-healthcare settings. This is an illustration and areas to be cleaned or disinfected are not exhaustive.

**Table 2** Cleaning and Disinfection in Non-Healthcare Buildings or Premises – Suggested Areas and Frequencies

Buildings/ Premises	Areas within buildings/ premises	Suggested thorough cleaning and disinfection frequencies*
Childcare centres	Toilets	Twice daily
	Children indoor play areas	Once daily
	Food preparation and service areas	Twice daily  Clean regularly as required during food preparation and service.
	Stairwells	Clean according to fixed schedule

Schools	Toilets	Twice daily
	Canteen	Twice daily
Eldercare centres	Centre premises	Twice to thrice daily

\* Subject to usage. Clean and disinfect additionally as required.

### 3.3 Periodic Operations

3.3.1 Periodic cleaning operations should cover all surfaces that could be reached within the building/ premises. In general, aside from areas covered under routine cleaning, periodic cleaning operations should also include areas not easily accessible and not covered by routine cleaning that include:

- Lighting and other fixtures such as pipes, ceiling fans, switch boxes, railings
- Secondary ceilings
- Perimeter drains

3.3.2 Periodic cleaning operations may also require intense cleaning techniques for areas covered under routine cleaning, such as

- Scrubbing and polishing of floor surfaces
- Shampooing of carpets and upholstery

3.3.3 In addition to cleaning procedures, inspections should be conducted to check for physical defects that may affect cleaning and such defects should be repaired promptly.

3.3.4 **Owners or operators of buildings and premises are required to conduct thorough periodic cleaning operations every six months<sup>6</sup>**, or as warranted, depending on the risk profile of the building or premises. For example, for premises with higher risk profile such as food establishments, it is recommended for the thorough periodic cleaning operations to be conducted more frequently than once every six months. Areas or fixtures that are hard to reach and are generally inaccessible may be cleaned once a year. A fixed duration for periodic operations will ensure that areas that are not easily accessible and/or not covered under routine operations would still be cleaned, disinfected and inspected on a regular basis. Similar to routine operations, for areas with a higher risk profile, disinfection should be carried out together with cleaning.

### 3.4 Response to Incidents Involving Bodily Fluids Spill or Bodily Discharge

3.4.1 Regardless of the risk profiles of the areas, cleaning and disinfection must be conducted immediately in the event of bodily fluid spill or bodily discharge incidents, e.g. vomitus. For such operations, a more intense cleaning and disinfection process must be conducted to thoroughly remove all traces of the bodily fluids and discharges, and potential pathogens within. Care must be taken to prevent and control the transmission of potential diseases from the bodily fluids through the contaminated environment, especially during disease outbreaks. The next chapter provides more details on incident response cleaning and disinfection.

## **4 Measurement of Effectiveness of Cleaning**

4.1 A holistic environmental sanitation programme should include a process to review and improve on the programme. To assess the quality of cleaning, checks should take place soon after the cleaning operations. Minimally, visual checks should be conducted to ensure that an area at least appears to be clean. The Singapore Standards on Cleaning provide a reference on the quality benchmarks for visual inspection<sup>7</sup>. The use of visual indicators such as fluorescent gel is also advised to complement visual inspections of the cleaning operations. In addition, the use of ATP (adenosine triphosphate) meters is recommended for food preparation areas upon routine cleaning, and areas with higher risk profile during periodic operations.

### **4.2 Use of ATP Meters<sup>8</sup>**

4.2.1 The technology in ATP meters allows a quantifiable evaluation of cleaning effectiveness, providing a valuable source of data to allow a review of the cleaning processes, frequencies and cleaning agents used. This technology is already in use in the food industry.

4.2.2 As different surfaces and cleaning procedures may have different ATP thresholds for measurement of cleanliness, users are encouraged to first establish a baseline reading of the surfaces to be checked. For example, ATP testing should be conducted before and after cleaning, during periodic cleaning operations, and after a change in processes (such as change of cleaning service provider or cleaning products). Users should record the ATP readings taken for comparison to evaluate the effectiveness of the cleaning operations. Due to the different technologies amongst different brands of ATP meters, users are advised to follow the manufacturer's instructions for the specific model measurements and testing procedures.

4.2.3 The limitations of ATP technology include limited sensitivity in detecting low levels of microbial contamination, being prone to different disinfectant chemistries, and ineffectiveness to virus particles. ATP meters would also be incompatible with new cleaning technologies such as probiotic cleaning agents, which make use of high levels of non-pathogenic bacteria in the cleaning process.

### 4.3 Inspection of Cleaning and Disinfection

4.3.1 In consideration of both the benefits and limitations of the ATP meter, Table 3 states the inspections to be conducted for routine and periodic operations to measure the effectiveness of the cleaning work performed.

**Table 3** Inspections of Routine and Periodic Cleaning Operations

<b>Routine</b>	<b>Periodic</b>
Inspections of areas covered under routine operations should be done by  (i) Visual checks and/or (ii) Visual indicators, e.g. fluorescent gel.  Additionally, for large scale food preparation areas, it is recommended to use ATP meters to randomly inspect 10% of the areas cleaned.	Inspections of areas covered by periodic operations should be done by  (i) Visual checks and/or (ii) Visual indicators, e.g. fluorescent gel  In addition, owners or operators of buildings and premises could explore the use of ATP meters for areas with higher risk profiles. Areas to be inspected with the ATP meter should be rotated over different periodic operations, depending on the risk profile of the areas.

## 5 **Pest Management**

5.1 Aside from cleaning operations, a good environmental sanitation programme should also include pest management measures to prevent pest issues such as mosquito breeding or rodent infestation that may cause vector-borne and/or food borne diseases. This section outlines the pest management measures for owners of buildings or premises.

### 5.2 General Pest Management Measures

- Ensure good refuse management and housekeeping to avoid harbourage and breeding of pests.
- **A comprehensive survey should be conducted once every six months** to identify the effectiveness of the pest management plan<sup>d</sup> and any damaged structures that may promote breeding and harbourage of pests. Premises with history of pest infestations should conduct the survey more frequently than once every six months.
- In the event that pest infestation is detected, step up surveillance and control measures to eradicate heavy pest infestation. Hire a licensed vector control operator to carry out surveillance and treatment.

<sup>d</sup> For mosquito and rodent control, readers may refer to guidelines on NEA's website at <https://www.nea.gov.sg/our-services/pest-control/>

- Should any carcasses be found within the premises, proper disposal should be carried out and affected areas sanitised.
- Pest-proof premises by ensuring openings such as windows or external doors are close fitting. Gaps should be less than 6mm to prevent entry of rodents.
- Ensure sanitary system and grease trap are in good working condition.

### 5.3 Specific Pest Control Measures

5.3.1 Key areas within buildings or premises would require specific pest control measures as outlined in Table 4 below:

**Table 4** Specific Pest Control Measures for Key Areas

Areas	Maintenance & Checks	
	Routine	Periodic
Common areas e.g. corridors, stairwells	<ul style="list-style-type: none"> <li>• Ensure gully traps are covered and in good condition to prevent rodent or cockroach access</li> <li>• Ensure prompt and proper disposal of food waste</li> </ul>	<ul style="list-style-type: none"> <li>• Dispose of any unwanted paraphernalia and bulky items</li> <li>• Inspect false ceiling, wallboards, secondary flooring/ roofing (where applicable) for signs of pest infestation</li> </ul>
Bin centres/ Waste conveyance systems	<ul style="list-style-type: none"> <li>• Ensure refuse are properly bagged and disposed of properly into covered bins.</li> <li>• Ensure bins are cleared daily without any refuse kept overnight</li> <li>• Ensure bins/skip tanks are cleared promptly and minimise accumulation of refuse to prevent overflowing refuse in bins/skip tanks</li> <li>• Keep bulk bins clean</li> <li>• Clean up any spillage immediately</li> <li>• Remove any sullage water promptly and clean up affected area</li> </ul>	<ul style="list-style-type: none"> <li>• Replace any damaged bins and/or bin covers</li> <li>• Do a thorough cleaning of bin centres</li> </ul>
Dry Riser	<ul style="list-style-type: none"> <li>• Ensure no clutter which would give rise to rodent or cockroach harbourage</li> </ul>	<ul style="list-style-type: none"> <li>• Seal any cracks, crevices, gaps or openings, using wire mesh or suitable caulking materials, to prevent entry of rodent or cockroach.</li> </ul>

Areas	Maintenance & Checks	
	Routine	Periodic
External perimeter and landscaping area	<ul style="list-style-type: none"> <li>• Check and remove any potential mosquito breeding habitats weekly</li> <li>• Where stagnant water cannot be removed, treat with sand granular insecticide regularly.</li> <li>• Remove any sullage water promptly and clean up affected area</li> <li>• Dispose of any littered food waste/packaging</li> <li>• Treat rodent burrows and seal them once they are inactive</li> </ul>	<ul style="list-style-type: none"> <li>• Repair any structural defects promptly.</li> </ul>
Loading and unloading bays	<ul style="list-style-type: none"> <li>• Ensure no clutter which would give rise to rodent or cockroach harbourage</li> <li>• Clean up any spillage immediately</li> <li>• Inspect goods to ensure no harbourage of pests before storage</li> </ul>	<ul style="list-style-type: none"> <li>• Dispose of any unwanted paraphernalia and bulky items</li> </ul>

5.4 Records of pest surveillance findings and pest control works carried out in the premises should be kept.

## 6 Use of Cleaning Agents and Disinfectants

6.1 Cleaning agents, disinfectants and any other chemicals should be used according to the manufacturer's instructions. Disinfectants should be diluted to the appropriate concentration and applied for an appropriate contact time on the surface. Note that cleaning agents and disinfectants, which are marketed as separate products, should not be mixed together to avoid hazardous reactions.

6.2 The following are common disinfectants that may be used in routine cleaning and disinfection procedures. Refer to **Chapter 2** for disinfectants to be used in response to incidents.

- Hypochlorites – They are the most widely-used disinfectant and are readily available as household bleach (5.25-6.15% sodium hypochlorite). Hypochlorites have been shown to possess bactericidal, virucidal, fungicidal, tuberculoicidal and sporicidal properties<sup>2</sup>. For routine cleaning

and disinfection, dilute 1 part bleach in 49 parts water. Hypochlorite solutions should be prepared fresh.

- Chlorine-based products – Alternative chlorine-based products release chlorine dioxide, sodium dichloroisocyanurate, or chloramine-T, based on their mode of action. Refer to the manufacturer’s guidelines for details on disinfection properties and use.
- Hydrogen peroxide – This disinfectant also possesses bactericidal, virucidal, sporicidal, and fungicidal properties<sup>2</sup>. For routine cleaning and disinfection, use at 3%<sup>4</sup>.
- Alcohol-based disinfectants – Alcohol-based disinfectants are effective against bacteria and enveloped viruses, but they have limited fungicidal, tuberculoicidal and sporicidal properties.
- Quaternary ammonium compounds (QUATs) –QUATs are effective against bacteria and enveloped viruses, but they have limited fungicidal, tuberculoicidal and sporicidal properties.

6.3 For more information on the types of disinfectants, please refer to international sources such as the United States Environmental Protection Agency<sup>3</sup> and the Centers for Disease Control and Prevention<sup>2</sup>.

6.4 Users or outsourced personnel should also be equipped with the appropriate tools and where necessary, personal protective equipment as prescribed in the Safety Data Sheet of the chemicals used, before conducting any cleaning, disinfection or pest management operations.

## 7 Facility Inspections

7.1 **Owners or operators of buildings and premises are required to conduct regular facility inspections to correct any issues, for example, physical defects that may hinder cleaning and pest control measures**, as specified in Section 5. Owners or operators of buildings and premises should also advocate proper organisation of workplaces within their buildings or premises including back-of-house areas, and may refer to the guidelines by the Workplace Safety and Health Council on Workplace Housekeeping<sup>9</sup>.

7.2 In addition, air-conditioning and mechanical ventilation (ACMV) systems should be visually inspected for cleanliness, that is, a condition that is free of non-adhered substances and debris. **Inspection of air handling units and air ducts are recommended every 6 and 12 months respectively**<sup>10</sup>, and more frequently if necessary. A vacuum test or deposit thickness test may also be performed to quantify the surface deposit levels. ACMV systems should be cleaned when they are: (1) contaminated with non-adhered substances and debris; (2) discharging visible particulate and (3) restricted or blocked by non-adhered substances and debris.

7.3 The inspection and cleaning of ACMV systems and air ducts is a specialised work that should be performed by competent persons. The Code of Practice for Indoor Air Quality for Air-conditioned Buildings (SS 554: 2016)<sup>10</sup> provides guidance on the inspection and cleaning of ACMV systems.

## **Chapter 2: Incident Response Cleaning and Disinfection**

### **1 Incident Response**

1.1 This section provides guidelines for response to incidents that pose a public-health risk such as the evidence of contamination by bodily discharge e.g. vomitus or faecal/urine discharge of a sick person. This also applies to stools and urine present in toilets other than those discharged in toilet bowls/urinals, which can be appropriately flushed away.

1.2 Owners or operators of premises are expected to ensure the availability of manpower and resources to carry out the incident response. The personnel responding to the incidents should be familiar with the incident response cleaning and disinfection guidelines. Owners or operators of premises may identify personnel or teams to respond to such incidents.

#### 1.3 Evidence of contamination by bodily discharge

1.3.1 If bodily discharge is detected in the premises, or if contamination by bodily discharge is suspected, the area where the bodily discharge/contamination was detected should be cordoned off from the public, with a minimum radius of 3 metres<sup>11</sup> surrounding the area. Environmental cleaning and disinfection of the area should be carried out immediately as described in Section 3.2.1.

1.3.2 If persons who released the bodily discharge are present in the premises, they may be potentially infectious and unwell. Attend to the potentially infectious persons as described in Section 4.

### **2 Materials and Equipment**

2.1 The appropriate use of PPE, cleaning equipment and disinfectant is required to prevent or minimise the spread of infection when cleaning and disinfection is carried out. Owners and operators of premises should ensure that they have adequate stock of items listed in Sections 2.2-2.4.

2.2 The following lists the minimum required PPE that should be available when environmental cleaning and disinfection of bodily discharge is carried out:

- Disposable vinyl gloves
- Disposable aprons or gowns, or a change of clothes
- Surgical mask\*
- Shoe covers or cleaning boots (where necessary)

\*N95 masks and goggles may be required in scenarios where there is a risk of aerosolisation of the infectious agents. Personnel must be mask-fitted prior to the use of N95 masks.

2.3 The following lists the minimum required materials and cleaning equipment that should be available when environmental cleaning and disinfection of bodily discharge is carried out:

- Detergent
- Water
- Absorbent material (disposable cloths/rags)
- Disposable bins
- Disposable forceps/tongs
- Disposable puncture-resistant container (for disposal of sharps)
- Double-lined plastic/trash bags
- Mop
- Pail
- Signage/warning notices to alert public (in various languages where possible)
- Tape or marker cones to cordon off area

## 2.4 Disinfectants

2.4.1 The disinfectant used should be selected based on the likely pathogen present. Disinfectants should be prepared and applied in accordance with the manufacturer's guidelines. Users should ensure that appropriate contact time is given before removing any disinfected materials. Users should also be equipped with the appropriate tools and where necessary, PPE as prescribed in the Safety Data Sheet of the disinfectants used, before conducting any cleaning and/or disinfection.

2.4.2 The following are common disinfectants that may be used in cleaning and disinfection procedures in response to incidents:

- Hypochlorites e.g. household bleach (5.25-6.15% sodium hypochlorite) – For cleaning and disinfection of highly contaminated surfaces, dilute 1 part bleach in 9 parts water or 5,000 ppm. Allow contact time of 10 minutes. Hypochlorite solutions should be prepared fresh.
- Chlorine-based products – Alternative chlorine-based products release chlorine dioxide, sodium dichloroisocyanurate, or chloramine-T, based on their mode of action. Refer to the manufacturer's guidelines for details on disinfection properties and use.
- Hydrogen peroxide – This disinfectant possesses bactericidal, virucidal, sporicidal, and fungicidal properties<sup>2</sup>. They can be used as a disinfectant in a post-incident cleaning and disinfectant procedure (7.5%, 30 minutes contact time).

Alcohol-based disinfectants and quaternary ammonium compounds (QUATS) are not encouraged for use in cleaning and disinfection procedures in response to incidents when the infectious agent is unknown.

2.4.3 For more information on the types of disinfectants available, please refer to international sources such as the United States Environmental Protection Agency<sup>3</sup> and the Centers for Disease Control and Prevention<sup>2</sup>.

### **3 Cleaning and Disinfection Procedures**

3.1 This section describes recommended procedures to carry out cleaning and disinfection of premises when there is evidence of contamination by bodily discharge or when there is prolonged exposure to individuals infected with severe infectious diseases that may be environmentally acquired.

#### **3.2 Safety Precautions**

3.2.1 Safety precautions are work practices that assume all bodily discharge are potentially infectious. When cleaning and disinfection is carried out, these safety precautions should be observed to minimise the risk of disease transmission:

a) General practices:

- Good hygiene practices are encouraged before and after a cleaning and disinfection procedure. This will include hand washes before and after a cleaning and disinfection procedure is carried out.
- Before and during clean-up and disinfection, cordon-off area surrounding the bodily discharge, put up signage to inform public to avoid the area.

b) PPE:

- Gloves, surgical mask (or N95 and goggles)\* and disposable gowns should be worn when clean-up is carried out and when wastes are handled. Gloves should be changed when they have come into contact with the bodily discharges or are visibly soiled.
- Shoe covers or cleaning boots should be worn when necessary to avoid dirtying and contaminating shoes (for example, if the bodily fluid is found on the floor).

*\* In scenarios where cleaning activities may generate aerosols, or if infectious agents are transmitted via aerosols, wear an N95 mask in place of a surgical mask, and eye goggles or face shields.*

c) Waste disposal:

- For liquid wastes (blood, bodily fluids), absorb the bulk of the spill with disposable materials like disposable cloths.
- Special care should be taken if spill area contains sharp materials. Sharp materials should be picked up with tongs or forceps, wrapped securely in

layers of newspaper and disposed into double-lined plastic/trash bags, or thrown in puncture-resistant containers.

- All infectious wastes should be discarded into double-lined plastic/trash bags, or a puncture-resistant container.
- Double-lined plastic/trash bags and puncture-resistant containers containing potentially-infected wastes should be segregated from other waste, and disposed of as general waste which will be incinerated.

### 3.3 Cleaning and disinfection procedures

3.3.1 The following describes general procedures for cleaning and disinfection at premises when there is evidence of contamination by bodily discharge:

1. Wash hands and put on PPE. Avoid touching face, mouth, nose and eyes during clean-up. Gloves should be removed and discarded if they become soiled or damaged, and a new pair worn.
2. Prepare the disinfectant according to the manufacturer's recommendations or bleach solution (dilute 1 part bleach in 9 parts water, 5,000 ppm).
3. Cordon off the area for cleaning from the public, with a minimum radius of 3 metres around the bodily discharge.
4. Pre-soak absorbent materials such as disposable cloths with disinfectant or bleach.
5. Avoid using a spray pack to apply disinfectant on potentially highly contaminated areas (such as toilet bowl or surrounding surfaces) as it may create splashes which can further spread the infectious agents.
6. If solids or semi-solids (e.g. stools, watery stools) are present, using a pair of tongs, pick up the discharge with disinfectant-soaked absorbent material. Dispose of the solid/semi-solids into double-lined plastic/trash bags.
7. Sharp materials should be picked up with tongs or forceps, wrapped securely in layers of newspaper and disposed of in double-lined plastic/trash plastic bags, or thrown in puncture-resistant containers.
8. Cover the remaining spill area with disinfectant-soaked absorbent material and allow for the appropriate contact time.
9. Remove and discard absorbent material and disinfected waste into double-lined plastic/trash bags.
10. Use new, disinfectant-soaked absorbent material to wipe off any remaining disinfected waste.
11. Discard used absorbent material and tongs into double-lined plastic/trash bags.
12. Double-lined plastic/trash bags containing infectious waste and puncture-resistant containers should be sealed securely and disposed of as general waste. Where possible, cleaning equipment used to handle infectious material should also be disposed.
13. Following the cleaning and disinfection of the premises, surface-clean the affected area with disinfectant.
14. Cleaning equipment that cannot be disposed of should be disinfected by soaking in disinfectant or bleach solution.

15. All disposable PPE should be removed and disposed of after the cleaning and disinfection activities. Hands should be washed with soap and water immediately after each piece of PPE is removed, following completion of cleaning.
16. If disposable gowns are not used, shower or wash up and change clothes immediately after the clean-up.

### 3.3.2 Special circumstances

1. For fabrics, remove curtains/ fabrics/ quilts for washing, preferably using the hot water cycle. For hot-water laundry cycles, wash with detergent or disinfectant in water at 70°C for at least 25 minutes. If low-temperature (i.e. less than 70°C) laundry cycles are used, choose a chemical that is suitable for low-temperature washing when used at the proper concentration.
2. For contaminated carpets, cushions or mattresses, arrange for a cleaning contractor as soon as possible to clean and disinfect the items. Before the area/item is cleaned, cordon off the affected area, or do not use the item, until cleaning and disinfection has been completed.

## 4 Attending to Potentially-Infected Person(s)

4.1 This section describes recommended procedures when attending to potentially-infected person(s) [scenario in Section 1.3.2]:

- Wear gloves when attending to the person(s).
- Wear a surgical mask when person(s) appears to suffer from a respiratory infection.
- If person(s) is present in the premises, provide person(s) with a surgical mask and escort person(s) to sick bay or holding area that is not publicly accessible.
- Assist person(s) to seek medical attention or care immediately.
- Dispose of PPE in general waste.
- Practise good hand hygiene by washing hands with soap before and after coming in contact with potentially-infected or known-infected person(s).
- Record down the time and nature of the incident. Obtain the contact number and details of the person(s) if they are agreeable for contact tracing purpose.

## **Appendix I: List of Contributors**

The National Environment Agency would like to thank the members of the NEA Environmental Sanitation Technical Committee, who have generously volunteered their time and effort to advise on these guidelines from August 2019 to February 2020.

### Members

Mr Chew Ming Fai (Chairman)	Director-General of Public Health (DGPH), National Environment Agency (NEA)
Mr Fong Peng Keong (Vice-Chairman)	Director (Vector Control & Sanitation Department), NEA
Ms Angela Li	Director (Research & Risk Assessment Department), National Centre for Food Science, Singapore Food Agency
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A/Prof Vernon Lee	Director (Communicable Diseases), Ministry of Health
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Mr Edy Tan	Chief Executive Officer, Chye Thiam Maintenance Pte Ltd
Mr Peter Leung	Project Manager, Scimed (Asia) Pte Ltd
Ms Sharon Kee	Honorary Secretary, Environmental Management Association of Singapore (EMAS)

## **Appendix II: List of References**

- 1 Infection Prevention Guidelines for Schools (Primary) and Child Care Centres, Third Edition 2019, Ministry of Health, Singapore
- 2 Guidelines for Environmental Infection Control in Health-Care Facilities, 2003 (Updated 2019), the Centers for Disease Control and Prevention, United States
- 3 Selected EPA-registered Disinfectants, Environmental Protection Agency, United States, <https://www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants>
- 4 The National Infection Prevention and Control Guidelines for Acute Healthcare Facilities, 2017, Ministry of Health, Singapore
- 5 Best Practices for Environmental Cleaning for Prevention and Control of Infections in all Health Care Settings, 3rd edition, 2018, Provincial Infectious Diseases Advisory Committee, Ontario Agency for Health Protection and Promotion (Public Health Ontario)
- 6 Environment and Health Management of Buildings, Law for Environmental Health in Buildings, Japan Architectural Health, Management and Education Center, 2013
- 7 The Singapore Standards on Cleaning:
  - (i) SS 499: 2002 (2015) Cleaning Service Industry – Cleaning Performance for Commercial Premises
  - (ii) SS 610: 2016 Guidelines for Cleaning Performance of Retail Food and Beverage (F&B) Premises
  - (iii) SS 533: 2007 (2015) Cleaning Performance for Public Housing Estates
- 8 ISSA Standard for Measuring the Effectiveness of Cleaning in Institutional and Commercial Facilities 0415-2015
- 9 Workplace Safety and Health Guidelines (Workplace Housekeeping), Workplace Safety and Health Council, 2016
- 10 Singapore Standard SS 554:2016 Code of Practice for Indoor Air Quality for Air-Conditioned Buildings
- 11 Catherine M.B. et al (2014) Vomiting Larry: a simulated vomiting system for assessing environmental contamination from projectile vomiting related to norovirus infection, Journal of Infection Prevention, Vol 15. No. 5

## **Appendix III:      Infectious Disease Transmission**

To understand disease outbreaks in the community, it is important to understand how the transmission of infectious diseases occurs. The transmission of infectious diseases requires the following factors (i) an infectious pathogen causing the infection; (ii) a route of transmission; and (iii) a host capable of acquiring the infection. For pathogens to survive and reproduce, they will also require reservoirs to reside in.

Depending on the type of pathogen and reservoir, pathogens may have the mechanisms of dormancy or resilience to allow them to survive, but not reproduce, for varying periods of time in non-living environments. With the introduction of an infectious pathogen or during outbreaks, poor environmental sanitation conditions could therefore lead to increased or continual transmission within the population, especially in community settings (e.g. schools) or in areas with high human traffic or movement.

### **Infectious Pathogens**

Pathogens are microorganisms capable of causing diseases by entering the host body to invade and colonise host cells. Infectious agents can broadly be categorised into the following categories:

- a) **Viruses** are biological agents that reproduce in host cell and may survive in the environment for long periods of up to months. Examples of viruses include noroviruses and rotaviruses that cause gastroenteritis, paramyxoviruses that cause influenza, measles, and mumps, and coronaviruses that cause the common cold or more severe respiratory disease.
- b) **Bacteria** are unicellular prokaryotic organisms. Examples include *Staphylococci* which can cause skin, respiratory and wound infections, and *Escherichia coli* which can cause gastroenteritis.
- c) **Fungi** are eukaryotic organisms with rigid cell walls that reproduce by forming spores. Aspergillosis and Ringworm are examples of fungi infection.
- d) **Protozoa** are eukaryotes that do not have cell walls and are capable of rapid flexible movements. Examples include *Plasmodium* that causes Malaria; and *Giardia lamblia* which causes diarrhoeal diseases.
- e) **Helminths** are invertebrate animals which are multicellular and have differentiated tissues. Parasitic helminths live and feed on living host to receive nourishment and protection, which can result in illness of the host. An example is the pinworm, which causes skin irritation.

### **Reservoirs/Source of Infection**

Disease reservoirs are sites where pathogens live and reproduce. Reservoirs can be living organisms or non-living sites.

- a) Human reservoirs are humans who are infected and may be capable of transmitting the pathogen, depending on the stage of infection and pathogen. Examples can include sexually transmitted diseases, measles, mumps and smallpox.

- b) Animal reservoirs are animals that are infected, and some pathogens could be transmitted to humans. Zoonoses are diseases that are naturally transmitted from vertebrate animals to humans and vice-versa. Examples of zoonotic diseases include anthrax, bubonic plague, leptospirosis.
- c) Environmental reservoirs can include plants, soil and water. Examples of pathogens that are found in environmental reservoirs include *Legionella pneumophila* and *Aspergillus* species. *Legionella pneumophila* causes legionellosis and can multiply in water with warm temperatures, stagnation and low biocide levels such as cooling towers, potable water systems and decorative fountains. *Aspergillus* species causes Aspergillosis and can be found in outdoor soil and infrequently-cleaned objects such as carpets, potted ornamental plants and flowers, and false ceilings.

### Modes of Transmission

The modes of transmission and common diseases in Singapore are listed in Table 1 below. Some examples of potentially infectious bodily discharge and their possible routes of transmission are listed in Table 2.

**Table 1** Transmission routes and examples of common diseases in Singapore

<b>Mode of Transmission</b>	<b>How transmission occurs</b>	<b>Examples of communicable diseases</b>
Droplet	Inhalation of droplets containing bacteria or viruses expelled from an infected person in close proximity (e.g. after coughing or sneezing).  Droplets can also land in the environment and lead to indirect contact transmission (e.g. contaminated droplets in eye, nose or mouth)	<ul style="list-style-type: none"> <li>• Respiratory diseases including influenza and the common cold</li> <li>• Whooping Cough</li> <li>• Meningitis</li> <li>• Conjunctivitis</li> <li>• Staphylococcal disease</li> </ul>
Air-borne	Dissemination of droplet nuclei containing infectious agents, and can be dispersed over long distances	<ul style="list-style-type: none"> <li>• Measles</li> <li>• Pulmonary tuberculosis</li> <li>• Chickenpox</li> <li>• Aspergillosis</li> </ul>
Food-borne/water-borne	Ingestion of contaminated food or water	<ul style="list-style-type: none"> <li>• Viral gastroenteritis including Norovirus and Rotavirus</li> <li>• Salmonellosis</li> <li>• Escherichia coli</li> <li>• Campylobacteriosis</li> <li>• Giardiasis</li> </ul>

Contact (direct and indirect)	Direct contact with infected persons or their secretions; or indirect contact with objects contaminated by infective agents	<ul style="list-style-type: none"> <li>• HFMD</li> <li>• Ring worm</li> <li>• Scabies</li> <li>• Head lice</li> <li>• Pinworm</li> </ul>
Vector-borne	Transmitted via infected or mechanical vectors such as mosquitoes, rodents and, flies.	<ul style="list-style-type: none"> <li>• Dengue</li> <li>• Zika</li> <li>• Malaria</li> <li>• Lyme disease</li> <li>• Murine typhus</li> </ul>

**Table 2** Examples of potentially infectious bodily discharge

<b>Type of bodily discharge</b>	<b>Possible routes of transmission</b>	<b>Possible infectious diseases</b>
Blood or pus	Blood-borne, through broken skin or exposure to mucous membranes	Hepatitis B and C, human immunodeficiency virus (HIV)
Nasal or throat discharges (including but not limited to aspirates, mucus, sputum and saliva)	Airborne and/or contact	Common cold, influenza and other respiratory viruses, measles, mumps, chickenpox, tuberculosis
Secretions (including but not limited to vesicular fluids)	Airborne and/or contact	Measles, mumps, chickenpox
Stool (solid or watery)	Faecal-oral	Bacterial and viral gastroenteritis including norovirus and rotavirus, hepatitis A and E, <i>Salmonella</i> , <i>Shigella</i> , and other enteric bacteria
Urine	Contact	Cytomegalovirus
Vomitus	Faecal-oral	Bacterial and viral gastroenteritis including norovirus and rotavirus, hepatitis A and E, <i>Salmonella</i> , <i>Shigella</i> , and other enteric bacteria

## **Appendix IV:      Sample Environmental Sanitation Programme**

Owners or operators of buildings and premises may refer to the following example format to draw up an Environmental Sanitation Programme for their specified premises.

Your programme need not follow the example below but should contain the information required in the guidelines. The details below are non-exhaustive, and the inventory of areas to be cleaned and frequency of cleaning are for illustration purposes. In determining the frequency, owners or operators should refer to the risk factors listed in the guidelines.

Owners or operators of buildings and premises are required to conduct thorough periodic cleaning operations every six months, or as warranted, depending on the risk profile of the premises. For example, for premises with higher risk profile such as food establishments, it is recommended for the thorough periodic cleaning operations to be conducted more frequently than once every six months. Areas or fixtures that are hard to reach and are generally inaccessible may be cleaned once a year. Similar to routine operations, for areas with a higher risk profile, disinfection should be carried out together with cleaning.

<b>Premises:</b> <i>ABC Specified Premises</i>			
<b>Name of Person-in-charge:</b> <i>Lim Chee Siong</i>			
<b>Updated as of:</b> <i>1 Jan 2020</i>			
<b>Scope and Frequency of Cleaning, Disinfection and Facility Inspection</b>			
Name of cleaning contractor: <i>XYZ Cleaning Pte. Ltd.</i>			
<b>Inventory of areas within premises</b>		<b>Frequency of cleaning, disinfection and facility inspection</b>	
<b>Public Facing Areas</b>	<b>Surface/ fixture</b>	<b>Routine</b>	<b>Periodic</b>
<i>Foyer</i>	<i>Floor</i>	<i>Once daily</i>	<i>Intensive scrubbing and disinfection every 6 months</i>
	<i>Wall</i>	-	<i>Weekly in addition to thorough cleaning and disinfection once every 6 months</i>
	<i>Doors</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Door touch-panels / handles</i>	<i>Thrice daily, including</i>	<i>Thorough cleaning and disinfection once every 6 months</i>

		<i>disinfection subject to usage</i>	
	<i>Touch-screen panel displays</i>	<i>Twice daily, including disinfection</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Ceiling lights</i>	<i>N.A.</i>	<i>Thorough cleaning once every 6 months</i>
	<i>Furniture (public- seating areas)</i>	<i>Once daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
<i>Escalators</i>	<i>Handrails</i>	<i>Thrice daily, including disinfection, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Landing / Steps</i>	<i>Twice daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
<i>Lift Lobby and Lifts</i>	<i>Lift doors and buttons</i>	<i>Thrice daily, including disinfection subject to usage</i>	<i>Thorough cleaning and disinfection every Quarter</i>
	<i>Interior of lift</i>	<i>Twice daily, subject to usage</i>	<i>Thorough cleaning and disinfection every month</i>
	<i>Bin</i>	<i>Clear and wipe down every day</i>	<i>Thorough washing and disinfection once every 6 months</i>
<i>Corridors/ Walkways/ Passageways</i>	<i>Railings</i>	<i>Thrice daily, subject to usage</i>	<i>Thorough cleaning and disinfection every quarter</i>
	<i>Floor</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Walls</i>	<i>-</i>	<i>Once a week in addition to thorough cleaning and disinfection every 6 months</i>
<i>Main Staircases</i>	<i>Staircase railings</i>	<i>Twice daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Floor</i>	<i>Once daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Walls</i>	<i>N.A.</i>	<i>Once every 2 weeks; in addition to thorough cleaning and disinfection every 6 months</i>

<i>Toilets</i>	<i>Urinals and toilet bowls</i>	<i>Twice daily including disinfection and spot cleaning subject to usage</i>	<i>Intensive scouring and disinfection every quarter</i>
	<i>Hand wash Basins</i>	<i>Twice daily including disinfection and spot cleaning subject to usage</i>	<i>Thorough cleaning and disinfection once every quarter</i>
	<i>Mirrors</i>	<i>Twice daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every quarter</i>
	<i>Toilet flush panels/ handles</i>	<i>Twice daily including disinfection and spot cleaning subject to usage</i>	<i>Thorough cleaning and disinfection once every quarter</i>
	<i>Floor</i>	<i>Twice daily including disinfection and spot cleaning subject to usage</i>	<i>Thorough cleaning and disinfection once every quarter</i>
	<i>Wall</i>	<i>Twice daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every quarter</i>
	<i>Diaper changing station</i>	<i>Twice daily, including disinfection, subject to usage</i>	<i>Thorough cleaning and disinfection once every quarter</i>
	<i>Exhaust Fans</i>	<i>N.A.</i>	<i>Inspect every 6 months</i>
<i>Children play areas</i>	<i>Fixtures</i>	<i>Twice daily, including disinfection, subject to usage</i>	<i>Thorough cleaning and disinfection once every quarter</i>
	<i>Floor</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every quarter</i>
<i>Carparks</i>	<i>Floors</i>	<i>Thrice daily</i>	<i>Thorough cleaning every month</i>
<b>Back-of-House Areas</b>	<b>Surface/ fixture</b>	<b>Routine</b>	<b>Periodic</b>
<i>Bin Centre / Bin-holding areas</i>	<i>Floor / Walls</i>	<i>Once daily, including disinfection</i>	<i>Thorough cleaning and disinfection every month</i>
	<i>Bins</i>	<i>Clear and wash bins daily</i>	<i>Thorough washing and disinfection every month</i>

<i>Recyclables collection point</i>	<i>Floor /Walls</i>	<i>Thrice a week</i>	<i>Thorough cleaning and disinfection every month</i>
	<i>Collection Bins</i>	<i>Clear bins every two days or once full</i>	<i>Thorough washing and disinfection every month</i>
<i>Service Channels</i>	<i>Floor</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Wall</i>	<i>-</i>	<i>Once a week in addition to thorough cleaning and disinfection every 6 months</i>
<i>Loading and Unloading Bays</i>	<i>Floor</i>	<i>Once daily</i>	<i>Thorough cleaning every 6 months</i>
	<i>Wall</i>	<i>-</i>	<i>Once a week in addition to thorough cleaning and disinfection every 6 months</i>
<i>Cargo Lifts</i>	<i>Lift buttons</i>	<i>Twice daily, including disinfection subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Lift Floor / Wall / Door</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
<i>Staff Rest Areas</i>	<i>Floor</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Tables / Chairs</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Sink</i>	<i>Once daily</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
<i>Staff Toilets</i>	<i>Toilet bowls</i>	<i>Once daily, including disinfection, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Floor/ Walls</i>	<i>Once daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>
	<i>Hand wash basin</i>	<i>Once daily, subject to usage</i>	<i>Thorough cleaning and disinfection once every 6 months</i>

Fire Escape Stairwell	Floor/ Wall	Once a week	Thorough cleaning and disinfection once every 6 months
	Staircase railings	Once a week	Thorough cleaning and disinfection once every 6 months
Air-handling units	-	N.A.	Inspect every 6 months
Air Ducts	-	N.A.	Inspect every 12 months

### Inspection on Cleanliness

(Inspections on cleanliness to be conducted soon after cleaning)

Minimally 10% of areas above to be visually inspected daily and after periodic operations. Areas should be free of dust, stains, debris.

Areas to be checked to be rotated daily.

Day	Areas to be checked
1	Toilets (level 1), Playground (Level 1), Loading/Unloading Bay, Staircases
2	Toilets (level 2), Bin Centre/Bin-holding areas, Recyclable collection points
3	Toilets (level 3), Foyer (Level 1), Lifts, Corridors, Service Channels
4	
5	
6	
7	
8	
9	
10	

### Manpower, equipment, amenities, cleaning methodology and cleaning agents used

I declare the following:

Manpower	( √ ) Cleaners are trained in their areas of work.
Equipment and cleaning agents	( √ ) Cleaners are equipped with the necessary tools and cleaning agents.
Cleaning and disinfection methodology	( √ ) Proper cleaning and disinfection procedures for routine and thorough periodic cleaning are in place. ( √ ) Proper cleaning and disinfection procedures to respond to incidents of bodily discharge are in place.
Toilet amenities	( √ ) Toilet paper, liquid hand soap, paper towel/hand dryer are available at all times ( √ ) Sanitary fittings such as flush, wash hand basin taps and sanitary pipes are in good working condition

For internal info:

Equipment maintained by our premises: Ride on scrubber x 2, PPE for Internal ops staff, safety signage

*Equipment supplied by cleaning contractor: PPE for cleaners, regular cleaning equipment and agents*

### **Pest Management**

Name of pest control operator: *123 Pests Away Pte. Ltd.*

Frequency of routine pest control services	<i>Routine inspection once every 2 weeks</i>	
History of pest infestation:	<i>1 November 2019: Rats on false ceiling</i>	
Dates for surveys to be conducted:	<i>3 March 2020, 3 June 2020, 3 September 2020, 3 December 2020</i>	
Additional checks required:	<b>Areas</b>	<b>Date</b>
	<i>False Ceiling</i>	<i>7 January 2020 (once every 2 weeks or monthly for next 6 months)</i>
	<i>Bin Centres</i>	<i>7 January 2020 (Once every 2 weeks or monthly)</i>

Endorsed by:

Date:

\_\_\_\_\_  
Name and signature of Person-in-charge

#### Note:

- The Singapore Standards on Cleaning<sup>1</sup> provide examples on the inventory of areas to be cleaned. All areas should be covered, including toilets, food preparation areas, bin centres and waste holding areas, loading/unloading bays.
- Records of inspections should be duly dated and signed by the person(s) in charge.
- For inspection of cleaning and disinfection, the Singapore Standards on Cleaning<sup>e</sup> provide a reference on the quality benchmarks for visual inspection. Readers may also refer to the sample inspection checklist and plan available on NEA's Guide on Specifications for Outcome-based/Performance-based Cleaning Contract at [https://www.nea.gov.sg/industry-transformation-map/outcome-based-contracting-\(obc\)](https://www.nea.gov.sg/industry-transformation-map/outcome-based-contracting-(obc))

<sup>e</sup> The Singapore Standards on Cleaning are:

- (i) SS 499: 2002 (2015) Cleaning Service Industry – Cleaning Performance for Commercial Premises
- (ii) SS 610: 2016 Guidelines for Cleaning Performance of Retail Food and Beverage (F&B) Premises
- (iii) SS 533: 2007 (2015) Cleaning Performance for Public Housing Estates

- For mosquito and rodent control, readers may refer to guidelines on NEA's website at <https://www.nea.gov.sg/our-services/pest-control/>
- The outsourced cleaning contractor(s) and pest control operator(s) must have the relevant licences required for operation.

**Appendix V: Risk Stratification Matrix to Determine Frequency of Cleaning (Healthcare Settings)**

Source: The National Infection Prevention and Control Guidelines for Acute Healthcare Facilities, 2017, Ministry of Health, Singapore

To determine the frequency of cleaning for each area in healthcare settings, the first step is to categorize the factors that will impact on environmental cleaning, and to determine the corresponding scores as in Table 3.

**Table 3** Factors that will impact on environmental cleaning and corresponding risk stratification scores

Factors that will impact on environmental cleaning	Description	Risk Stratification Score
Probability of Contamination with Pathogens	<p>The probability that a surface, piece of equipment or care area will be contaminated is also related to the types of activities occurring within the care area.</p> <p>An area is designated as being <b>heavily contaminated</b> if surfaces and/or equipment are routinely exposed to copious amounts of fresh blood, or other body fluids (e.g. birthing suite, autopsy suite, cardiac catheterization laboratory, hemodialysis station, Emergency room, client/patient/resident bathroom if visibly soiled).</p> <p>An area is designated as being <b>moderately contaminated</b> if surfaces and/or equipment does not routinely (but may) become contaminated with blood or other body fluids and the contaminated substances are contained or removed (e.g. wet sheets). All client/patient/resident rooms and bathrooms should be considered to be, at a minimum, moderately contaminated.</p> <p>An area is designated as being <b>lightly contaminated</b> if surfaces are not exposed to blood, other body fluids or items that have come into contact with blood or body fluids (e.g. lounges, libraries, offices).</p>	<p>Heavy Contamination (Score = 3)</p> <p>Moderate Contamination (Score = 2)</p> <p>Light Contamination (Score = 1)</p>
Vulnerability of Population to Environmental Infection	<p>Areas where vulnerable patients at risk for acquiring illness due to environmental microorganisms are cared for should receive more frequent environmental cleaning.</p> <p>Susceptible clients/patients/residents are those who are <b>most susceptible to infection due to their medical condition or lack of immunity</b>. These include those who are immunocompromised (oncology, transplant and chemotherapy units),</p>	<p>More Susceptible (Score = 1)</p>

	<p>neonates (level 2 and 3 nurseries) and those who have severe burns (i.e. requiring care in a burn unit).</p> <p>For the purpose of risk stratification for cleaning, all other individuals and areas are classified as less susceptible.</p> <p>Routine regular cleaning and disinfection is still essential for these areas and populations but at a lower frequency than what is required for high-risk populations.</p>	<p>Less Susceptible (Score = 0)</p>
Potential for Exposure	<p><b>High-touch surfaces</b> are those that have frequent contact with hands. Examples include doorknobs, telephone, call bells, bedrails, light switches, wall areas around the toilet and edges of privacy curtains.</p> <p><b>Low-touch surfaces</b> are those that have minimal contact with hands. Examples include walls, ceilings, mirrors and window sills.</p> <p>High-touch surfaces in care areas require more frequency cleaning and disinfection than minimal contact surfaces. Cleaning and disinfection should be performed at least daily and more frequently if the risk of environmental contamination is higher.</p>	<p>High-touch surfaces (Scores = 3)</p> <p>Low-touch surfaces (Score = 1)</p>

The next step is to determine the total risk stratification score and the corresponding frequency for cleaning, as shown in the risk stratification matrix in Table 4.

**Table 4** Cleaning Frequencies Based on Total Risk Score for Healthcare Settings

Total Risk Score	Risk Type	Minimum Cleaning Frequency
7	High Risk	Clean after each case/event/procedure and at least twice per day. Clean additionally as required.
4-6	Moderate Risk	Clean at least once daily. Clean additionally as required (e.g. gross soiling)
2-3	Low Risk	Clean according to a fixed schedule. Clean additionally as required (e.g. gross soiling)

Some examples using the risk stratification matrix to determine the cleaning frequency of specific areas in the healthcare settings are listed in Table 5.

**Table 5** Examples using the Risk Stratification Matrix to Determine the Cleaning Frequency of Specific Areas in the Healthcare Setting

<b>Location</b>	<b>Probability of Contamination: Light = 1 Moderate = 2 Heavy = 3</b>	<b>Potential for Exposure: High-touch= 3 Low-touch = 1</b>	<b>Population: Less susceptible = 0 More susceptible = 1</b>	<b>Total Score</b>	<b>Interpretation</b>
Emergency room: trauma room	3	3	1	7	Clean after each case/event/procedure and at least twice per day. Clean additionally as required.
Autopsy / morgue	3	3	0	6	Clean at least once daily. Clean additionally as required.
Dining room / cafeteria and food preparation areas	1	3	0	4	Clean at least once daily. Clean additionally as required.
Public areas: corridors, elevators, stairwells, lobbies, libraries, meeting rooms, locker rooms	1	1	0	2	Clean according to a fixed schedule. Clean additionally as required

## **Annex A: Interim Guidelines for Cleaning and Disinfection of Areas Exposed to COVID-19 in Non-Healthcare Premises**

In consultation with the Ministry of Health (MOH) and the National Centre for Infectious Diseases (NCID), NEA has developed interim guidelines to assist owners and operators of non-healthcare commercial premises and residents to carry out cleaning and disinfection operations for areas that have been exposed to confirmed cases of the COVID-19 (Coronavirus Disease 2019) infection.

The guidelines may be found on NEA's website at <https://www.nea.gov.sg/our-services/public-cleanliness/environmental-cleaning-guidelines/guidelines-for-environmental-cleaning-and-disinfection>.