



## BRIEFING

### Update on the review of ventilation systems at Managed Isolation and Quarantine facilities

<b>Date:</b>	8 June 2021	<b>Priority:</b>	Medium
<b>Security classification:</b>		<b>Tracking number:</b>	2021-4016

Action sought		
	Action sought	Deadline
Hon Chris Hipkins Minister for COVID-19 Response	Note the progress of the Ventilation Review.	15 June 2021

Contact for telephone discussion (if required)			
Name	Position	Telephone	1st contact
Shayne Gray	General Manager, Service Quality and Assurance MIQ	Privacy of natural persons	✓
Privacy of natural persons	Programme Manager, MIQ		
	Senior Policy Advisor, MIQ Policy		

The following departments/agencies have been consulted
Ministry of Health

Minister's office to complete:

- |   |  |
|---|--|
| <input type="checkbox"/> Approved             | <input type="checkbox"/> Declined            |
| <input type="checkbox"/> Noted                | <input type="checkbox"/> Needs change        |
| <input type="checkbox"/> Seen                 | <input type="checkbox"/> Overtaken by Events |
| <input type="checkbox"/> See Minister's Notes | <input type="checkbox"/> Withdrawn           |

Comments



## BRIEFING

### Update on the review of ventilation systems at Managed Isolation and Quarantine facilities [commercially sensitive]

Date:	8 June 2021	Priority:	Medium
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#### Purpose

The purpose of this briefing is to provide you with an update of the progress of the ventilation review (Review) that is being undertaken across the managed isolation and quarantine (MIQ) facilities.

#### Recommended action

The Ministry of Business, Innovation and Employment recommends that you:

- a **Note** the progress of the Ventilation Review.

*Noted*

*Proactive release*

- b **Agree** that this briefing is **not** proactively released at this time due to commercial sensitivities with the relevant facilities, and that it will only be released once the Ventilation Review is complete.

Agree /  Disagree

Shayne Gray  
General Manager, Service Quality and Assurance  
Managed Isolation and Quarantine, MBIE

8 / 6 / 2021

Hon Chris Hipkins  
Minister for COVID-19 Response

15 / 6 / 2021  
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## Background

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1. Desktop (offsite) assessments of ventilation systems of all MIQ facilities commenced in January 2021. This followed on from the ventilation assessments of the Christchurch MIQ facilities that were conducted in December 2020 following the October 2020 Sudima International facility and healthcare workers infections. The findings of these assessments were provided to you on 5 March 2021 [Health report 202110455 refers].
2. Shortly after commencement of the desktop ventilation assessment, within-facility transmission events were identified at the Pullman Hotel. A subsequent on-site ventilation assessment identified discrepancies between the results of the desktop assessments and how the ventilation system was actually operating. In response, remediation work was completed in the Pullman to return the hotel back to original design. The Pullman Hotel became operational and started receiving returnees again from 24 April 2021.
3. Aerosol transmission of COVID-19 was identified as a possible source of transmission between rooms on different floors in the Grand Mercure Auckland, and via the corridor at the Grand Millennium Auckland.

## Ventilation Review - its objectives and approach

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4. Following the findings at the Pullman Hotel, a MBIE MIQ Ventilation Team was established to undertake a full network assessment of onsite ventilation. Their objectives are to:
  - Establish how the other ventilation systems in the MIQ network are performing.
  - Improve the predictability and consistency across facilities to assist in managing infection, prevention and control (IPC) risks – noting that hotel facilities were never designed to be MIQ facilities and a range of risk mitigations are required to manage the associated risks when operating as a MIQ facility.
5. The ventilation team includes specialists from MBIE's Building System Performance (BSP) branch who designed the assessment framework to evaluate the MIQ facilities, along with two independent ventilation engineers who assist with results analysis and auditing. The ventilation team is supported by public health and IPC specialists.
6. The assessment framework includes a range of onsite tests that establish a comparable baseline of performance. The tests include measuring air supply, extract rates, room pressure and air movement tests. These tests establish a baseline of actual ventilation system performance that is compared against the hotel's original ventilation design (from the desktop evaluation).
7. The results are then compared to a preferred ventilation operating condition that provides 'negative pressure' in returnee rooms.
8. The 'negative pressure' approach is based on international evidence on strategies to reduce aerosol transmission risks. The central principle is to provide controlled fresh air to the returnee rooms and extract it out at a higher rate to create a negative pressure to contain air in the room. This minimises the risk of uncontrolled and potentially contaminated air entering corridors or adjacent rooms, which improves predictability and reduces the risk of aerosol transmission within the facility.

## Key steps in the Review

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9. All 31 MIQ facilities are within the scope of the Review. The key steps in conducting the review of each MIQ facility are:
- a) *Desktop review*: review of design plans and specifications to understand the performance of facilities' heating, ventilation, and air conditioning (HVAC) system against design specifications.
  - b) *Onsite testing and analysis* – conducted by independent qualified persons (IQPs) under the guidance of MBIE's BSP branch to assess if facilities' ventilation systems operate as designed.  
  
Results are analysed by MBIE's BSP subject matter experts and also reviewed by independent ventilation engineers against the preferred room conditions (negative pressure in returnee rooms as compared with corridors and adjacent spaces).  
  
The results and analysis are reviewed by a cross agency and multi-disciplinary Ventilation Working Group, consisting of MBIE and MoH officials, and public health and IPC experts.
  - c) *Meeting with facilities*: MBIE officials meet with the facility owners/operators to share the ventilation assessment and analysis results and discuss next steps.
  - d) *Remediation plan and work*: if the facility operators and/or owners are open to exploring works to improve the ventilation system operations, then a maintenance/remediation proposal is prepared and submitted for MIBE's review, with support from MBIE's independent ventilation engineers.  
  
This review assesses the effectiveness of the proposal to address the findings from the analysis and also impact on the overall operational capacity and how any associated risks may be mitigated (e.g. to returnees, workers and/or general MIQ operations).  
  
After remediation, the performance of the ventilation systems is then retested in order to provide assurance that they are performing at their intended design specifications and are achieving the preferred condition of negative pressure in the rooms.
10. The MIQ Technical Advisory Group, consisting of senior officials from MBIE/MoH and public health and IPC experts, provides the governance and strategic overview for the MIQ Ventilation Programme work and, if necessary, issues/risks are escalated to this group.

## Progress of the Review (as at 8 June 2021)

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11. Overall the MIQ Ventilation Review Programme is progressing well.
12. **Diagram 1** summarises the progress of the individual stages of the Review, showing the percentage complete and the number of individual facilities that have been through each step. For the final step showing total room capacity, the figures show percentage of total MIQ capacity and number of actual rooms within remediated facilities. Annex One shows the progress of each of the individual MIQ facilities.

**Diagram 1**



1 Independent Qualified Person, 2 Building Systems and Performance Group, MBIE, 3 Ventilation Working Group  
 Note: 'Percentage Complete' calculations are based on a total number of MIFs of 31

13. To date the meetings with the facilities have been positive. All facilities met with so far have indicated a willingness to undertake maintenance and/or remedial works to bring the operation of their ventilation system back to the design specification.
14. The Pullman Hotel is the one MIQ facility that has been through the whole process and has completed its maintenance/remediation works and has been brought back online.
15. The timing of future remediation work at each facility will depend on factors such as:
  - Whether the facility can undertake remediation work while returnees continue to use the facility (either fully or partially occupied) or if they will be fully vacant to complete the work.
  - The optimal time to undertake work taking into account the supply, demand and overall operation impact on the whole MIQ portfolio.
  - Availability of appropriately qualified ventilation experts and trades persons to undertake the work.

*Grand Mercure Auckland and Grand Millennium Auckland*

16. These two MIQ facilities are currently vacant and are not accepting any returnees (they have been 'de-designated' as a MIQ facility which allows free movement within the facilities). We expect the completion of the remediation works at the Grand Mercure Auckland will enable it to come back on line by mid-June 2021.
17. The Grand Millennium has provided their remediation plan, which is currently being reviewed. However, the Grand Millennium has already started work on maintaining/remediating their ventilation system and addressing areas highlighted by the assessment/analysis as they are free to do so with no returnees and the facility being de-designated as an MIQ facility. The Grand Millennium has indicated that they will shortly have all rooms in a negative pressure state and operating above design specification.
18. The Grand Millennium is expected to complete their remediation and be back on line by mid-June 2021.

19. Because of the operational challenges of operating a MIQ facility in Wellington and that bringing the Bay Plaza facility up to standard would likely be very costly and time-consuming, you have taken the decision to decommission the Bay Plaza [briefing 2021-3641 refers]. Subject to your direction, we will be soon discussing the decommissioning decision (and their ongoing involvement in the ventilation review) with the owner and senior management of the Bay Plaza.

## Findings of the Review

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### The operation of the ventilation systems

20. A number of common themes have emerged regarding the operation of the ventilation systems across the portfolio of MIQ facilities:
- The measured supply air and extraction flow rates have been variable, with some facilities demonstrating either higher or lower supply and/or extraction flow rates than expected from the original design.
  - There is generally a need for servicing and maintenance, such as cleaning of ducting to remove build-up of lint and debris (this restricts airflow e.g. exhaust rates from rooms). Some supply and extract fans were found to be non-operational for a number of reasons.
  - There is a need for rebalancing of ventilation supply and extract rates to ensure consistency of airflow across each facilities' ventilation system. Some rooms were receiving and/or extracting too little air and some too much.
  - Numerous facilities are providing higher air supply rates than extract rates. While this is consistent with the original design, it does not provide the preferred negative pressure room condition (this requires a higher exhaust rate than air supply rate). This was observed as a net positive air flow between rooms and corridors (i.e. air moving from rooms into corridors).
21. The variability of operation of ventilation systems, between design specification and actual operation, may be attributable to deferred maintenance. Opportunities to undertake general maintenance on the ventilation systems has been limited while these facilities have been used as MIQ facilities.
22. The scale of remediation work required for the hotels varies from minor to more substantial. Key factors impacting the works include the age and design of the ventilation systems and the ease of access for work to be undertaken.

### Key Findings and messages from the Ventilation Review

23. The key findings and messages of the Review are:
- Hotel ventilation systems were never designed for viral containment/isolation: The Building Code sets the minimum standards for ventilation for hotels (refer to Annex Two). Given the situation of existing buildings (hotels) being used for MIQ purposes, the original intended hotel use (and its ventilation requirements as determined by the Building Code) will never be directly comparable with a specifically designed MIQ facility, specifically built for viral containment/isolation.
  - Even when taking into account the intended use of the MIQ facilities, the risk of contracting COVID-19 within our managed isolation and quarantine facilities has been, and remains low.
  - Generally the ventilation systems across the MIQ portfolio are not operating as originally designed. This may be in part attributable to deferred maintenance of these systems.

- At this stage the facilities have shown a willingness to undertake the necessary remediation work to return their ventilation systems to design specification.
- The remediation work undertaken will enable ventilation systems to operate much closer to the preferred ventilation operating conditions of having negative pressure within returnee rooms (i.e. airflows into rooms when doors open).
- The ventilation work is part of our continuous review process of the operation of the MIQ portfolio. Ensuring facilities' ventilation systems are operating to, or close to, design offers a further layer of protection alongside the operational practices, including IPC measures, within our facilities.

### **Implications on MIQ capacity**

24. Two facilities are currently closed for remediation work on their ventilation systems - the Grand Mercure Auckland and Grand Millennium Auckland (599 rooms in total).
25. Facility maintenance/remediation proposals will outline whether the works will be undertaken occupied, partially occupied or vacant and will examine the associated risks, timings and impact on room availability. These proposals will be reviewed by MIQ and MoH subject matter experts to ensure the implications of the works are fully considered, and the work is scheduled to minimise the impact on broader MIQ operations. The remediation work will be overseen by the MIQ Technical Advisory Group, MBIE's Quality and Assurance Advisory Group and the MIQ Ventilation Steering Group.
26. At this stage, it is expected that there will be a small number of facilities that will need to be taken temporarily offline for remediation work. Future updates to you will include further detail on the remediation approach and implications for MIQ capacity.

### **Implications for MIQ workforce**

27. The communal and staff areas of the facilities are generally covered by the negative pressure preferred condition for returnee rooms being sought as part of the Review. This is alongside other interventions that are in place for these areas such as social distancing, PPE and the recent roll-out of air filtration units.

### **Next steps**

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28. The MIQ Technical Advisory Group is currently providing oversight on a number of facilities. These include:
  - Four Points Sheraton, Auckland: where areas at the end of some corridors and in shared room lobbies have low air circulation. Actions underway to address this include limiting room placements in these areas and the use of additional air filtration units.
  - Grand Mercure Wellington: because this facility provides quarantine rooms, oversight of its remediation plan is occurring.
29. We continue to monitor international trends and new evidence relating to ventilation. We have been invited to attend the Australian Ventilation Group which is currently discussing possible new standards for ventilation systems in Australia.
30. We will keep you regularly informed of the progress of the wider ventilation review as it moves through its remediation stages, including updates on any individual facilities where there are particular concerns.
31. The findings of the Ventilation Review will also contribute to wider work that MBIE is undertaking around the suitability of current MIQ facilities.

## **Annexes**

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Annex One: Progress of individual MIQ facilities.

Annex Two: The building code sets minimum standards for ventilation.



## Annex One: Progress of individual MIQ facilities

MIQF	Desktop review complete (Step 1)	Awaiting test results (Step 2)	Testing results being analysed (Step 3)	Reviewed by Ventilation Working Group (Step 4)	Hotel debriefed on results (Step 5)	Remediation plan received (Step 6)	Remediation complete (Step 7)
MIF Auckland - Crowne Plaza	✓	✓	✓	✓	✓	✓	
MIF Auckland - Four Points	✓	✓	✓	✓			
MIF Auckland - Grand Mercure	✓	✓	✓	✓	✓	✓	Expected to be on line in mid-June 2021
MIF Auckland - Grand Millenium	✓	✓	✓	✓	✓	✓	Expected to be on line in mid-June 2021
MIF Auckland - Holiday Inn Airport	✓	✓	✓	✓	✓	✓	
MIF Auckland - Jet Park	✓	✓	✓	✓	✓	✓	
MIF Auckland - M Social	✓	✓	✓	✓	✓		
MIF Auckland - Naumi	✓	✓					
MIF Auckland - Novotel-Airport	✓	✓	✓	✓	✓		
MIF Auckland - Novotel-IBIS Ellerlie	✓	✓	✓	✓	✓		
MIF Auckland - Pullman	✓	✓	✓	✓	✓	✓	✓
MIF Auckland - Rydges	✓	✓					
MIF Auckland - Sebel	✓	✓	✓	✓			
MIF Auckland - SO	✓	✓	✓	✓	✓		
MIF Auckland - Stamford	✓	✓	✓	✓	✓	✓	
MIF Auckland - Sudima	✓	✓	✓	✓	✓		
MIF Auckland - Waipuna	✓	✓					
MIF ChCh - Chateau OTP	✓	✓	✓	✓	✓	✓	
MIF ChCh - Commodore	✓	✓	✓	✓	✓		
MIF ChCh - Crowne Plaza	✓	✓	✓	✓	✓		
MIF ChCh - Distinction	✓	✓	✓	✓	✓	✓	
MIF ChCh - Novotel	✓	✓	✓	✓	✓		
MIF ChCh - Sudima	✓	✓	✓	✓	✓		
MIF Hamilton - Distinction	✓	✓	✓				
MIF Hamilton - IBIS	✓	✓	✓	✓	✓		
MIF Hamilton - Jet Park	✓	✓	✓	✓	✓		
MIF Rotorua - IBIS	✓	✓	✓	✓	✓		
MIF Rotorua - Rydges	✓	✓	✓	✓	✓		
MIF Rotorua - Sudima	✓	✓					
MIF Wellington - Bay Plaza	✓	✓	✓	✓	✓		
MIF Wellington - Grand Mercure	✓	✓	✓	✓	✓	✓	
<b>Total</b>	<b>31</b>	<b>31</b>	<b>27</b>	<b>26</b>	<b>24</b>	<b>10</b>	<b>3</b>

## **Annex Two: The building code sets minimum standards for ventilation**

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1. Building Code requirements are established at the design stage of a building and performance requirements are based on the ***intended use*** of the building in operation. For a building built before the introduction of the Building Act in 1991 there is no requirement to be retrospectively upgraded.
2. The objective for ventilation requirements within the Building Code is to 'safeguard people from illness or loss of amenity due to a lack of fresh air'. Within the Code there are a number of performance requirements for ventilation. Two relevant ones for the Review are:
  - mechanical air handling systems shall be constructed and maintained in a manner that prevents bacteria, pathogens, and allergens multiplying within them'. Assuming filtration elements are cleaned on a regular basis this requirement is likely to be achieved
  - the provision that ventilation systems need to collect or remove bacteria, viruses or other pathogens. This provision is governed by a functional requirement that specifies 'adequate ventilation consistent with the maximum occupancy and their intended use'.