

CIBW062 Symposium 2021 (26-27 Oct)

SESSION F – DRAINAGE AND SANITATION II. Session Chair: M. Gormley.
Session: 27/10 Wednesday, 08.35(UK), 15.35(HK)

Measurement of positive air pressure in a ventilation section of a 150-mm diameter stack during a branch pipe discharge

Presentation speaker:

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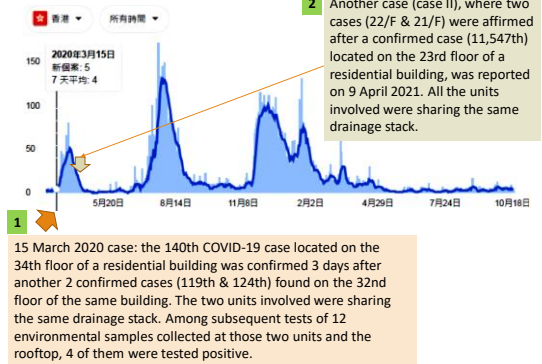
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COVID-19 Cases in Hong Kong



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Cases Observations

Prior Case:

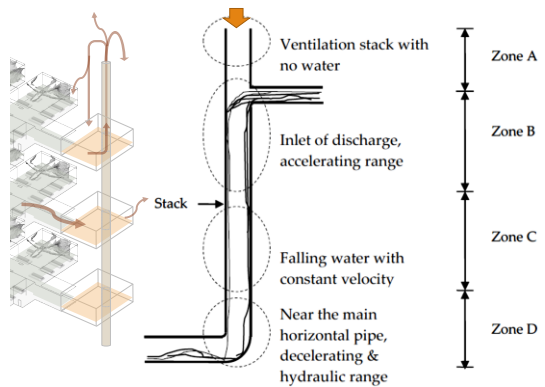
- Both units' WC were connected to the same stack, (higher floors $H'p = 0.85-0.9$)
- The 34/F unit's WC was connected to the stack Zone A when 32/F unit's WC discharging.
- Later confirmed case and tested positive samples were reported above 32/F (Zone A) but not floors below it (Zone B).

Later Case:

- All of the WCs involved were connected to the same stack ($H'p = 0.80-0.88$).
- Discharges at a lower level (i.e., 20/F and below) into a stack contaminated by pathogens generated local positive air pressure (Zone A)
- Excessive transmission risk posed to the upper levels (i.e., 21/F & 22/F).

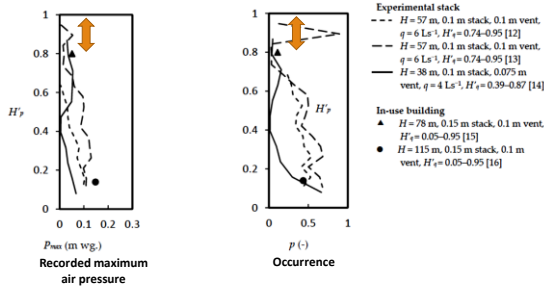
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Objective

To study the time-variant probabilistic positive air pressures in the discharging stack ventilation section with no water

Scope

To measure the instantaneous air pressures in an upstream ventilation section of a drainage stack of 2.5-m long, 150 mm-diameter during a downstream connected branch pipe discharging at a flow rate of 1–4 Ls^{-1}

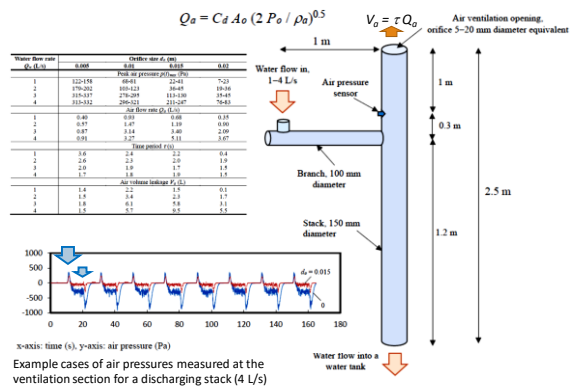
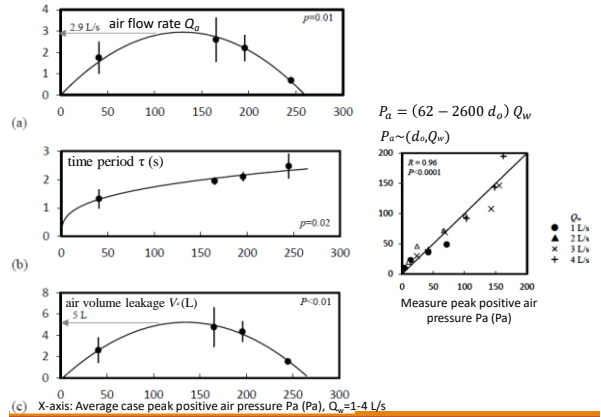
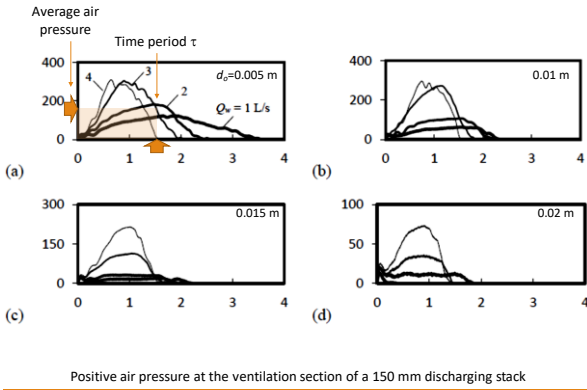


Figure 1- Experimental set-up



Remarks

In the experimental set up

1. a positive air pressure could be recorded at the first 0.4-3.6 s of the discharge (?? due to the displacement of the discharge water entering from the branch pipe to the stack and compressed the air in it)
2. the maximum air flow rate leaving the ventilation opening of the stack is estimated to be 2.9 L/s
3. for (2), the corresponding total air leakage is 5L per discharge



Acknowledgement

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