



**VOLCANIC ASH IS:
HARD, HIGHLY ABRASIVE,
MILDLY CORROSIVE &
CONDUCTIVE
WHEN WET.**

VOLCANIC ASHFALL

ADVICE FOR FACILITIES MANAGERS: BUILDINGS

Ash Impacts on Buildings and Structures

Ash will accumulate on roofs and, if not removed, can collapse gutters, cause flooding into ceiling spaces and cause corrosion damage to roofing materials. Accumulated ash can also wash into and block stormwater drains. Very thick ash deposits (>100 mm) may cause roof collapse, although this is rare in New Zealand. Factors increasing the risk of roof collapse include:

- Wet conditions (if ash is wet, static loads may increase by up to 100%).
- Long-span, low-pitched and/or poor condition roofs are the most vulnerable.

If ash enters buildings it can cause soiling, abrasion and corrosion damage, and damage to computers and electronic equipment. It is a potential health hazard to building occupants.

Ash can block air filters on heat pumps and air conditioning units (HVAC systems). This can reduce airflow and cause overheating.

Ash can cause indirect effects on buildings, for example through power and water outages.

See companion poster on 'Advice for Facilities Managers: GenSets and HVAC systems'



Volunteer firefighters work to clean ash from roofs in the town of Junin de los Andes, Argentina. Following the April 2015 eruption of Calbuco volcano in Chile, 200 km to the southwest, approximately 3 cm of fine andesitic ash fell across the town of Junin. Photo credit: Bomberos Voluntarios, Junin de los Andes.



Ash loading can cause gutters to partially or completely detach from buildings. Basaltic ash from 2018 eruption of Ambae volcano, Vanuatu. Photo credit: Sally Dellow, GNS Science.

Recommended Actions

WHERE TO FIND WARNING INFORMATION

See www.geonet.org.nz for ashfall forecasts in the event of a volcanic eruption.

HOW TO PREPARE

At-risk facilities should develop operational plans for managing ashfall events, including:

- Pre-planning a safe work method for roof clean-up. A plan is required for all roofs, from single-level to multi-level. Typically a plan will include:
 - » Provision for safe access to the roof.
 - » Required qualifications and training of personnel.
 - » Safety and personal protective equipment required.
 - » Provision for collection/disposal of ash.
- Identification of a single entry and exit point for the building, and identification of any areas that require sealing off (e.g. computer rooms).
- Ensuring supplies of necessary equipment such as plastic sheeting and duct tape.
- Considering dependency on critical services and taking steps to increase resilience, such as installing backup power generation.

If you anticipate using contractors, discuss the safe work method ahead of time to ensure that contractors are prepared.

If you are a critical facility, such as a hospital or police station, discuss priority access to services with your contractor.

Ash cleanup operations create substantial additional labour and resource demands.

HOW TO RESPOND

IF ASH IS FORECAST FOR YOUR LOCATION:

- Use a single entry/exit point for the building, preferably with a set of double doors which can act as an 'ash lock'. Ash-covered clothing and footwear can be left in this area.
- Seal all remaining doors and windows, using damp towels or duct tape to seal any gaps.
- Shut down heat pumps and air conditioning units.
- Disconnect inlet pipes from roof catchment rainwater tanks.
- Cover sensitive equipment such as computers and electronics with plastic sheeting, or seal off rooms.

WHILE ASH IS FALLING, remain indoors.

AFTER ASH HAS STOPPED FALLING:

Roof clean-up must be planned carefully. Many injuries and some fatalities have occurred while clearing ash from roofs. Therefore you must take all reasonable steps to manage the clean-up so people will not fall from roofs. Property owners and contractors will have legal duties under the Health and Safety at Work Act 2015. Duties include:

- Providing workers with personal protective equipment.
- Ensuring a safe working environment.

For further information, see Worksafe NZ's best practice guidelines for working on roofs:

<http://www.worksafe.govt.nz/worksafe/information-guidance/all-guidance-items/best-practice-guidelines-for-working-on-roofs/roofs-best-practice.pdf>

Avoid using hoses to clean up as this can 1) deplete municipal water supplies and 2) wash ash into storm drains where it can cause blockages. It is preferable to sweep up the ash and collect it in bags. Dampening the surface slightly can help stop the ash lifting into the air and becoming a breathing hazard.

For cleaning up indoors, use a vacuum cleaner where possible. Avoid excessive rubbing as ash is highly abrasive and can scratch surfaces.

Follow any official instructions about ash collection and storage.

In the absence of specific advice, collect ash in small bags (such as doubled supermarket plastic bags, tied tightly closed) and store in a sheltered location on the property.



FURTHER RESOURCES:

- <http://www.geonet.org.nz> (volcano monitoring information)
- <http://www.gns.cri.nz/volcano> (general information on volcanic hazards)
- http://volcanoes.usgs.gov/volcanic_ash (volcanic ash impacts and mitigation encyclopedia)
- <http://www.ivhnh.org> (information on volcanic health hazards)

CONTENT BY CAROL STEWART, JO FOX, TOM WILSON & SUSANNA JENKINS

DESIGNED BY DARREN D'CRUZ

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