Health and safety considerations for ashfall clean-up: briefing note

It is important to clean up volcanic ash promptly from homes and neighbourhoods as it is a potential health hazard, can cause damage and disruption to utilities such as power and water supplies, disrupt road transport networks, block underground drainage leading to local flooding, and cause corrosion damage to metal surfaces. Psychologically, it is also important to remove ash, so that communities can return to normality. Thick ashfalls of over 20 cm dry ash, or 10 cm saturated wet ash, can cause roofs to collapse. The major health and safety considerations for ashfall clean-up are:

Hazards of clearing ash from roofs

Working on roofs is highly hazardous, particularly when covered in ashfall which may make conditions slippery. Many injuries and some fatalities have occurred while clearing ash from roofs, either due to falling or roof collapse. Suggestions to make working conditions safer:

- Make sure there is a safe access point to the roof. Access ladders should be secured against movement and extend one metre (3.3 feet) above the stepping-off point.
- Keep at least 6 metres (20 feet) away from any electricity or telephone lines.
- Corrugated steel roofs are not designed to support a person plus equipment weighing more than 110 kg (240 lb). Be aware that roofs may have reduced capacity due to ash loading.
- People working on a steel-clad roof should always step along the lines of nails/screws (if visible) and avoid working too closely together.
- Do not work on steep roof sections (more than 25 degrees).
- Avoid any weak sections of roof such as skylights or Perspex panels.
- Place crawl boards or ladders on the roof for more secure footing. This is also recommended if areas of brittle roof cladding are suspected.
- A broom is usually the best option for cleaning a roof. Sweep the ash off the edge onto the ground. Also, remove ash from gutters, with a brush or shovel.
- Isolate the area below the roof cleaning work to protect people on the ground from falling debris.
- When piling ash on the ground, don't block building fire exits.
- Lightly dampening the surface of the ash can reduce ash lifting into the air. However, too much water may cause the ash to become cemented and much more difficult to remove. See following section for advice on PPE.

Volunteer firefighters work to clean ash from roofs in the town of Junín de los Andes, Argentina, following the April 2015 eruption of Calbuco volcano in Chile. Note the PPE worn by workers, the dry methods of clean-up, and workers staying well apart. Photo credit: Volunteer Fire Department, Junín de los Andes.

Hazards of breathing airborne ash

Clean-up operations will readily lift ash into the air where it becomes a breathing hazard, particularly for fine ash in dry conditions. People with lung disease (e.g. asthma, COPD, emphysema) should avoid ash exposures, where possible. All people assisting with ash clean-up should wear appropriate personal protective equipment (PPE) as follows:

- Long clothing (overalls are ideal) and sturdy footwear
- Goggles without side vents
- Industry-certified facemask (e.g. N95) properly fitted (see https://www.ivhhn.org/ash-protection)
- Gloves such as gardening gloves
- A hard hat (when working on a roof).

Use of ladders on roof for more secure footing during ash clean-up operations, Junín de los Andes, Argentina. Photo credit: Volunteer Fire Department, Junín de los Andes.

Physical demands of clean-up

Ash clean-up is physically demanding and time-consuming. Ash is generally much heavier than people expect, and strain injuries are common.

- Avoid overfilling bags as they will be too heavy to lift safely.
- Use wheelbarrows to move loads of ash.

Further resources:

We recommend the following slide set on ash clean-up with a focus on logistics, developed by Josh Hayes (Earth Observatory Singapore) and Tom Wilson (University of Canterbury, NZ). Clean-up after volcanic eruptions - considerations for St Vincent slide set

Some of the advice in this briefing note is based on 'Best practice guidelines for working on roofs', available on the Worksafe NZ website at: https://www.worksafe.govt.nz/topic-and-industry/working-at-height/roofs/working-on-roofs-gpg/

Written by Carol Stewart (Massey University, NZ), Claire J. Horwell (Durham University, UK), David Damby (US Geological Survey), Tamar Elias (US Geological Survey). Reviewed by Josh Hayes (Earth Observatory of Singapore). Last edited 20 April 2021. Version 1.3.