

Loss Prevention Standards

Windstorm – Protection of Buildings

Introduction

Named windstorms and high winds bring many risks to buildings and their surroundings. Without appropriate design and foresight; ongoing inspection and maintenance; developed preparation and planned responses plans; the impact of such events can be significantly increased. In addition, associated with named windstorms, can be significant rain fall, driven rain, hail and increased tidal surges. These alone or combined can threaten life, property and business activities and every available precaution should be taken to avoid this occurring.

In the vast majority of cases such events are predicted some time in advance by meteorological officials and are made public, so their impact should not be sudden and unforeseen. Therefore, we can be prepared and plan for the foreseen.



Roofs

Roofs should be designed for the maximum expected winds and the associated uplift forces. However, regardless of the design, lack of appropriate ongoing inspection, maintenance and repairs increases the risk factors of a roof or its covering failing in high winds or heavy rains. Buildings situated in open locations such as adjacent to lakes or fields, or on hillsides are particularly at risk from wind loads.

The majority of roof wind damage starts with failure of inappropriately designed, poorly maintained or poorly fastened flashing. If strong winds damage the perimeter flashing, additional damage can be expected to the remainder of the roof. Consider the following:

- ✓ On an ongoing basis, but more importantly, ahead of high winds the flashing around the edge of a building perimeter should be visually and closely checked
 - Having some threaded nails with flat washers available, enables quick and easy interim repairs where needed
- ✓ Replace missing, loose or damaged roof tiles
- ✓ Are roof-mounted structures of sound construction and condition, e.g. chimneys
- ✓ Ensure pointing is of appropriate standard
- ✓ For anything other than small repairs a roofing specialist should be contacted to expedite emergency repairs ahead of the storm

Roof and Wall Mounted Objects

Roof or wall mounted objects in high winds can increase the risk of building damage. These need to be appropriately secured:

- ✓ On an ongoing basis, but more importantly, ahead of any high winds, any roof or wall mounted equipment or plant rooms should be checked
- ✓ Ensure all roof top access hatches or plant room door ways are properly secured
- ✓ Where there are any concerns, further securement or methods of protection should be considered

Examples include:

- Lightweight plant rooms
- Air conditioners
- Solar panels
- Fans, pumps and motors, etc.

Detached items from roofs or walls are a major cause of damage to roofs and other property items in windstorms.

External Objects

External objects such as storage, bins, outdoor furniture and trees/shrubs and sometimes parked vehicles can become missiles in high winds. These can impact buildings, external services and storage, vehicles, etc. leading to immediate damage and making the impacted item more vulnerable to the ongoing effects of wind and rain.

- Precautions should be taken to prevent flying objects
- Mobile objects should be moved to secure areas or securely fixed to the ground
- If glazed elements are not impact resistant, appropriately fixed plywood can be used to protect them
- External services, equipment, etc. should be protected against impact
- The condition and location of trees and shrubs should be considered, and immediate issues of concern addressed, e.g. tree limb fracture or tree collapse

Rain

Rain and more particularly heavy rain or wind driven rain, creates many exposures. From flooding water courses, to flash or surface water flooding to driving rain through windows, doors, or external apertures from the building.

- Precautions should be taken against wind driven rain through air ventilation systems, louvres, under and around sliding glass doors, roof mounted exhausts, roof mounted access hatches or plant rooms, etc.
- Ensure roofs and gutters are cleared and clean
- Ensure drains and manhole covers are in place and secured
- Ensure public highway located storm drains are cleared and clean
- Liaise with neighbours to ensure the same. One blockage can cause a knock-on effect in a drainage network

Utilities and Services

As part of any storm management consider the potential impact to your utilities and services and ensure these form part of your emergency plans.

- What could be impacted, e.g. over-ground services?
- How could it be impacted, e.g. wind damage, impact from falling trees, etc.?
- What services require to be operational during the storm, e.g. fire alarm, sprinkler fire protection system, electricity, etc.?
- Can any services be isolated ahead of the storm?
 - This should be verified by formal documented risk assessment and permit to work
 - This should be managed with a formal lock out/tag out process
- When do services need to be restored?

Emergency Plans

Make sure your emergency preparedness and emergency response plans are up-to-date for:

- Wind
- Flood

With these types of events, unexpected flooding, flash floods, surface water accumulations and run-off can occur in areas outside of recognised designated flood zones. Experience repeatedly shows us that many floods occur in these areas, and without appropriate preparations and response, the impact to a building can be significant. Any emergency response plans should include the following:

- Move susceptible items to higher ground
- Consider skidding items on pallets or multiple pallets
- Make sure openings, windows, doors are protected and sealed
 - At all levels of the building, including
 - Basements
 - Upper levels
 - Levels adjacent to gutter valleys/troughs or flat roofs
 - If the risk is appropriate, consider having sand bags or more engineered items available on site and a plan in place of when to deploy
- Ensure any temporary or emergency water pumps and generators are protected from water ingress, have appropriate fuel or protected energy supply, and are available to operate

- Consider denial of access to the site due to the weather conditions
- Consider the impact to employees, site management and the emergency response team by these events
 - Consider if events will impact on their ability to perform any tasks required of them
- Consider the impact to your services

Emergency response plans should be regularly tested and updated.

Checklist

A generic Windstorm – Protection of Buildings Checklist is presented in Appendix 1 which can be tailored to your own organisation.

Additional Information

Aviva Loss Prevention Standards:

- Emergency Response Teams
- Flood
- Impairment Management
- Photovoltaic Solar Panel Systems

Further risk management information can be obtained from [Aviva Risk Management Solutions](#)

Please Note

This document contains general information and guidance and is not and should not be relied on as specific advice. The document may not cover every risk, exposure or hazard that may arise and Aviva recommend that you obtain specific advice relevant to the circumstances. AVIVA accepts no responsibility or liability towards any person who may rely upon this document.

Appendix 1 – Windstorm – Protection of Buildings Checklist

| | |
|--|--|
| Location | |
| Date | |
| Completed by (name and signature) | |

| | Windstorm – Protection of Buildings | Y/N | Comments |
|----|--|------------|-----------------|
| 1. | Are the buildings and roofs designed for the maximum expected winds and the associated uplift forces? | | |
| 2. | Are the buildings situated in an exposed location which is prone to windstorm? | | |
| 3. | Are ongoing inspection, maintenance and repairs made to roofs? | | |
| 4. | <p>Ahead of any expected high winds is the flashing around the edge of a building perimeter visually and closely checked?</p> <ul style="list-style-type: none"> • To facilitate immediate small level repairs, do you have a supply of threaded nails with flat washers available? | | |
| 5. | Are any missing, loose or damaged roof tiles replaced? | | |
| 6. | Are all roof mounted structures sound and where appropriate is pointing of an appropriate standard? | | |
| 7. | Ahead of any storm, for anything other than small repairs is a roofing specialist contacted to expedite emergency repairs? | | |
| 8. | <p>Are roof and wall mounted objects, equipment or plant rooms appropriately secured, and has this been checked?</p> <p>Have all roof top access hatches or plant room door ways been properly secured?</p> | | |
| 9. | <p>Have all external objects such as storage, bins, outdoor furniture, pole mounted utilities and trees/shrubs and sometimes parked vehicles, etc. that can become missiles in high winds, been identified?</p> <p>Have appropriate precautions been taken to prevent objects from becoming missiles or flying?</p> <p>Have mobile objects been moved to secure areas or securely fixed to the ground?</p> | | |



| | Windstorm – Protection of Buildings Contd. | Y/N | Comments |
|-----|---|------------|-----------------|
| 10. | Are glazed elements (including skylights) impact resistant? If not has appropriately fixed plywood been used to protect them? | | |
| 11. | Have any external services, equipment, etc. been protected against impact? | | |
| 12. | Has the condition and location of nearby trees and shrubs been considered? Are there any issues with any of these? Have appropriate remedial works been taken to prevent tree limb fracture or collapse, impacting a building or any associated services or equipment, etc.? | | |
| 13. | Has the impact of heavy rain or wind driven rain been reviewed? Has the following been considered: <ul style="list-style-type: none"> • Flooding from water courses? • Flash or surface water flooding? • Driving rain through windows, doors, or external apertures? | | |
| 14. | Have precautions been taken against wind driven rain through any potential external openings: <ul style="list-style-type: none"> • Air ventilation systems? • Louvres or air bricks? • Under and around sliding glass doors? • Roof mounted exhausts? • Roof mounted access hatches? • Roof mounted plant or plant rooms, etc.? | | |
| 15. | Are roofs and gutters cleared and clean? | | |
| 16. | Are drains and man hole covers in place and secured? | | |
| 17. | Are the public highway located storm drains identified, cleared and clean? | | |
| 18. | Have you liaised with your neighbours to ensure they have clear drainage channels? | | |



| | Windstorm – Protection of Buildings Contd. | Y/N | Comments |
|-----|--|------------|-----------------|
| 19. | <p>Has the potential impact to your utilities and services been considered?</p> <p>Is this part of your emergency plans?</p> <p>Have you identified what could be impacted and how?</p> <p>Have you identified what services require to be operational during the storm, and what contingencies need to be put in place to ensure they remain operational, e.g. uninterruptible power supplies?</p> <ul style="list-style-type: none"> • Can any services be isolated ahead of the storm? • Has this been verified by formal documented risk assessment and permit to work? • Is this managed with a formal lock out/tag out process? • Have you identified when services need to be restored? | | |
| 20. | <p>Are your emergency preparedness and emergency response plans up-to-date for:</p> <ul style="list-style-type: none"> • Wind? • Flood? <p>Have the plans been recently tested?</p> <p>Do your plans provide accountability for tracking any storms before, during and post their impact?</p> | | |
| 21. | <p>Have you moved susceptible items to higher ground?</p> <p>Have you considered skidding items on pallets or multiple pallets?</p> | | |
| 22. | <p>Are all openings, windows, doors protected and sealed?</p> <ul style="list-style-type: none"> • At all levels of the building? <ul style="list-style-type: none"> ○ Consider basement levels ○ Consider upper levels ○ Consider levels adjacent to gutter valleys/troughs or flat roofs | | |
| 23. | <p>If appropriate do you have sand bags or more specifically engineered items available on site?</p> <p>Do you have a plan of when to deploy these?</p> | | |

| | Windstorm – Protection of Buildings Contd. | Y/N | Comments |
|-----|---|------------|-----------------|
| 24. | <p>Are any temporary or emergency water pumps and generators needed?</p> <p>If not permanent arrangements, are temporary devices and connections required?</p> <p>Are these devices protected from water ingress or wind damage?</p> <p>Do they have appropriate fuel or protected energy supply?</p> <p>Are they available to operate?</p> | | |
| 25. | Has denial of access to the site been considered? | | |
| 26. | <p>Has the impact to employees, site management and the emergency response team by these events been considered?</p> <p>Will these events impact on their ability to perform any tasks required of them?</p> | | |
| 27. | Additional comments: | | |

