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Preparing Sites for Extreme Weather

For Industry Professionals



Contractors are responsible for maintaining their construction sites in a safe and lawful manner at all times – including inclement weather conditions.

Contractors must properly secure and prepare construction sites for extreme weather – during which sustained winds reach or exceed 60 miles per hour or when ordered to do so by the Buildings Commissioner – to ensure public safety and protect adjoining property.

Contractors and construction site managers must have an action plan to prepare, secure and protect their construction sites, including:

- Proper task planning;
- Pre-storm preparation;
- An emergency response team; and
- Post-storm inspection and repair procedures on construction sites.

The action plan should include, but not be limited to, the following:

1. General Construction

1.1 Storage of Construction Materials / Debris

NYC Building Code §3303 – Safeguards and Maintenance of Site

- a. Materials and debris shall not be stored closer than 10 feet to the perimeter of the building, unless the perimeter is permanently enclosed or full height (slab-to-slab) vertical cabling and netting are installed. Material and debris shall be banded and tied down to prevent dislodgment from wind, regardless of its location on floor or site.
- b. No material (form work, shores, reshores) shall project over the perimeter.
- c. Material/debris shall be removed from roofs and setbacks.
- d. Hole covers (floor) shall be properly fastened.

1.2 Masonry Walls Under Construction or Repair

- a. Masonry under construction or demolition shall be shored and braced to prevent collapse under wind load. Shoring of masonry shall take in account the size (thickness) of the wall, the height of the wall and the condition (strength gain in time) of mortar and grout. BC §2104.1 Masonry Construction; American Concrete Institute §530.1 3.3F Bracing of Masonry

- b. Special attention shall be given to masonry along the leading edge of the building that is above pedestrian right-of-way.
- c. Protect and cover against water infiltration of all unfinished or open masonry under construction or repair. BC §2104.1.7 Masonry Protection

1.3 Steel Frame

- a. Frame, brace and/or shore all structural steel frames and light-gage frame. BC §2205.6.4.4 Erection of Frames
- b. Secure planks and metal deck to supporting structure with positive attachments (mails, bolts, welds).

1.4 Wood Floor and Roofing

- a. Secure planks, plywood and roofing to supporting structure with positive attachments (mails, bolts, welds).
- b. In limited cases only with an engineer's direction, prevent uplift by weighing down with bags of sand or brick pallets. These bags or pallets need to be solidly packaged so they will not fall apart under wind and rain.

1.5 Unfinished Building Enclosures

Stop installation of enclosures well in advance of wind event. Brace and shore.

1.6 Concrete Construction

See instruction at 2.2 for formwork and reshores.

2. Temporary Installations for Construction

BC §1601.1 Scope; BC §1604.1 General; BC §1609.1 Applications

- a. Temporary installations must be designed for wind.
- b. Remove any add-ons and temporary structures not engineered, including any mock-ups.
- c. When the manufacturer does not specifically indicate that prefabricated proprietary or modular installation was designed for construction loads that include wind effects (at levels prescribed in the NYC Building Code), such installation may be used only when additional design is provided for local wind conditions.
- d. The contractor shall be familiar with the installation and implement all indicated manufacturer instructions.
- e. Adjoining property roof protections must be inspected and secured.

2.1 Perimeter Netting, Guardrails, Cocoon

BC §3308.3 Vertical Safety Netting Requirements

- a. Horizontal netting shall be cleaned of debris, retracted and properly secured.
- b. All vertical perimeter netting, cabling and guard rails shall be inspected and properly secured.
- c. "Cocoon" systems and climbing formwork shall be properly secured according to manufacturer and/or engineer of record's recommendations for high wind.

2.2 Concrete Formwork

BC §1906.1.1 Safe Support of Loads; BC §1906.1.2 Vertical and Lateral Loads; BC §1906.1.5 Design; BC §1906.3 Design of Concrete Formwork; BC §1906.3.3 External Lateral Loads

- a. Remove any concrete formwork that is not weighted down by concrete. Consult with engineer.
- b. The formwork should be proportioned to account for all potential wind effects (in any horizontal or vertical direction), including increased in wind load due to increase in elevation or specific building exposure.
- c. Nailed or bolted connections should be proportioned to safely sustain all wind-load effects. Nailing schedules should be proportioned for wet wood conditions. Friction connections should not be relied on unless the down-weight provides a factor of safety of four (in wet conditions).
- d. Special attention shall be provided to adequate wind bracing and the transfer of these wind forces to braces and to their anchorage.
- e. Special consideration shall be provided to securing perimeter decking against uplift. Horizontal formwork deck panels and beam formwork located within 16 feet from the building perimeter shall, at a minimum, be positively attached to all formwork support systems.
- f. Reshores in close proximity (within 10 feet/3048 mm) of an unenclosed building perimeter shall be secured to prevent them from falling off the building.
- g. Wedges shall not be used within 10 feet (3048 mm) of the façade or at such other locations as determined by the Commissioner.

2.3 Supported Scaffolds

BC §3314.3 Design of Scaffolds; BC §3314.3.1 Design; BC §3314.3.3 Loading; BC §3314.4 Installation and Use of Scaffolds; BC §3314.12.1 Standard Designs; BC §3314.12.2 Erection and Removal; BC §3314.12.5 Bracing; BC §3314.13 Fabricated Frame Scaffolds

- a. Material/debris to be removed from scaffolds.
- b. Tiebacks to building shall be checked and properly secured.

- c. Planking shall be removed or properly fastened to prevent dislodgment.
- d. Netting shall be properly secured. Fully netted scaffolds (all floors) may require removal of netting or the cutting of holes in netting to reduce wind load. Consult applicant of record for scaffold.

2.4 Construction Fences and Barriers

- a. Brace and secure all construction fences.
- b. Increase attachment of plywood to connection and supporting lumber.
- c. Secure construction barriers.

2.5 Excavation, SOE, Underpinning

- a. Inspect excavation pre- and post-storm.
- b. Complete all SOE shoring systems in accordance with plans if time allows or provide stable, benched berms (no less than 1:1 slope effective, or in accordance with recommendations by engineer of record).
- c. Complete all excavated underpinning pits and transfer load. Secure pins against lateral displacement by means of shoring, tiebacks, benching and berming, in accordance with recommendations by engineer of record.
- d. If water table has been drawn down, make provision for maintaining ongoing dewatering systems throughout storm, including use of back-up generators. Do not cease ongoing dewatering unless recommended by the engineer of record.

2.6 Sidewalk Sheds

BC §3307.6.3 Design of Sidewalk Sheds

- a. Remove material and debris from deck.
- b. Secure deck planking against dislodgment
- c. Secure deck parapet (side deck enclosure), which is particularly vulnerable to displacement in high winds.
- d. Consider lateral and uplift bracing of particularly tall or narrow sidewalk sheds. Consult with applicant of record.

3. Material and Personnel Hoisting Equipment

Reference Standards 19-2 Power-Operated Cranes and Derricks

3.1 Cranes

The crane engineer of record and contractor must follow the pre-storm procedures that are part of the approved plans and secure the crane as per those plans. Contractors shall confirm to the crane engineer of record that their equipment has been made safe and that all pre-storm procedures have been implemented as outlined in the approved plans.

3.1.1 Mobile Cranes

- a. Telescopic Cranes: retract boom, stow jibs, retract outriggers, then store and secure crane.
- b. Crawler Cranes: lower boom to ground or otherwise fasten securely against displacement, and secure body of crane from displacement as per engineer or manufacturer recommendations.

3.1.2 Tower Cranes and Derricks

- a. Execute the pre-storm plan.
- b. Weather Vane Mode: release slew brake and verify (provided that, site surroundings permit weather vane mode). Follow engineer of record's specific instructions.
- c. Trolley: position in inner position.
- d. Tie-ins: check collars and ties as well as all connections. Verify with engineer of record need to release tie-ins.
- e. Pre-storm Inspection: check all base, mast and boom connections.
- f. Climb Frame: position lowest possible (unless otherwise recommended by manufacturer).
- g. Hook: raise with no load.
- h. Foundation: provide protection surrounding mast base and insure sufficient drainage.

3.2 Construction Hoists

BC §3316; BC §3317; BC §3318; BC §3316.5 Design, Construction and Inspection; BC §3316.7.1 Use; BC §3317.3 Design, Inspection and Operation; BC §3318.3 Design and Inspection

- a. Properly secure mast connections, overhead protection, nettings, cat head, outriggers and landing plates.
- b. Remove any loose debris from car top, inside cab, landing and surrounding areas.
- c. Properly secure hoist cab and counterweight as per manufacturer's (storm) recommendation.
- d. Shut off electrical power to hoist.

3.3 Suspended Scaffolds and Unguided Material Hoist

BC §3314.3.1.3 Suspension Scaffolds; BC §3314.3.3 Loading; BC §3314.4 Installation and Use of Scaffolds

- a. Suspended scaffold rigs shall be lowered to sidewalk sheds or set back and properly secured. All rope (wire and otherwise), along with lifelines shall be removed or secured to prevent rope from displacing and damaging building or breaking windows.
- b. Shut off electrical power to scaffold hoist motors.
- c. C-hooks shall be removed.
- d. Outrigger beams shall be removed or secured against displacement.
- e. Unguided material hoist shall be secured, wire rope removed, electrical supply shut off.

The Department of Buildings issues weather advisories to advise contractors to safeguard their construction sites during periods of inclement weather.

To receive these weather advisories, sign up at nyc.gov/buildings.