

SE Texas Construction Tips:

#2

Getting Your Site Prepared for a Hurricane



Hurricane planning should start at the beginning of the project well in advance of an impending hurricane and developing a plan of action is highly recommended prior to the start of hurricane season. Many of the work practices discussed here were lessons learned after hurricanes Katrina, Rita, and Harvey. It is not designed to take the place of any required OSHA training or requirements or to be a complete list of things that need to be done. The purpose is to raise awareness of the unique challenges of preparing and responding to hurricanes. You should review your plan at least annually and update it as changes occur to ensure it is up to date and reflects your current operations and business needs.

Pre-Construction Work Site Basic Preparation

- Designate a person to be in charge, such as a project manager, who is responsible for the preparation and implementation of these plans. Other managers and superintendents assist as directed.
- Consider establishing two teams, one for hurricane preparation and a damage survey and repair team which will be the first on the site to assess damage after the storm and make the site safe enough for the return of the entire workforce. Have a back/up alternate person in the event the primary becomes unavailable.
- Outfit project office with a portable, battery operated weather band radio and extra batteries.
- Develop, maintain and distribute a list of emergency telephone numbers and email addresses for employees and key contractors. Establish a flow chart showing the order they are notified.
- Make a list of contact information for vendors and contractors who can provide hurricane preparation and recovery supplies. Consider establishing agreements on obtaining priority assistance and supplies.
- Evaluate your project location and how transportation issues may impact preparation and evacuation. Determine if there are other geographical features, businesses or operations nearby that can impact you.
- Determine local authorities and agencies that cover the site's location. Determine radio, internet, phone apps etc. that will be used to monitor weather and emergency information. Consider performing pre-planning with local authorities.
- Prepare a system to inform employees of when to return to work. (A company website with a bulletin or discussion board, toll-free number etc.)
- Identify a secondary location where planning and response activities will occur and to communication.
- Determine areas of high elevation and appropriate areas for storing equipment and materials. Identify areas prone to flooding on the site and avoid long-term material storage in those areas. Consider how flood prone areas on-site and surrounding areas will impact pre-hurricane preparation and recovery and consider potential means to mitigate flooding.
- Determine what fuel supplies, de-watering pumps and generators etc. are needed for repairs after the storm. Equipment needed may change during different phases of construction. Set up an inspection and testing schedule for the emergency equipment and other vital equipment and supplies.
- Determine how the site will be secured to prevent entry and theft.
- Develop a list of needed supplies necessary for preparing the site for a hurricane and for responding afterwards for clean-up and recovery operations. Procure and store the supplies.
- Maintain good housekeeping practices by keeping the project free from an accumulation of debris and scrap material that can become windblown hazards. This will reduce the amount of time necessary to complete preparations on the job site in the event of a hurricane emergency.
- Be prepared to anchor or restrain everything that could blow away with netting for dumpsters, banding and banding tools for lumber, form work, scaffold planks, port-a-potties, etc. Look and see what will fly and how it will be restrained or secured.
- Be alert to job conditions that require advance planning or special materials to reduce emergency preparation time and the inability to mitigate the hazard.
- Establish an emergency action and evacuation plan.
- Develop procedures on how crane issues will be address.
- Develop safety and health procedures for those returning for clean-up operations. Consider hazards such as energized electrical including downed power lines, flammable or hazardous materials, leaking gas, structural damage, and other utility damage.
- Ensure the plan leaves time for personnel to prepare their own families and homes for the storm.

When a Hurricane Approaches

- **If authorities call for an evacuation, leave immediately, and tell your employees to leave.**
- The designated a person in charge, e.g., a project manager, will decide when to prepare the project for a hurricane or tropical storm.
- Monitor weather alerts on internet, phone, radio etc.
- Conduct a project review meeting with members of the hurricane preparation and a damage survey and repair teams and ensure their information is up to date.
- Review the hurricane emergency action plan and ensure it's up to date. Review what off-site company resources are available for preparation and recovery.
- Contact subcontractors and outline your policy for securing job sites. Explain your contingency plan and give them phone numbers where you can be reached. Ask site subcontractors if their hurricane response plans are up to date.
- Discuss responsibilities the subcontractor/trades will have in regards to their work areas and assisting the site in general in preparing for the hurricane.
- Check the hurricane preparation and response supplies against the inventory list stockpiled at the beginning of the hurricane season.
- Identify vulnerable work in progress and determine how to best protect it from damage whether by boarding up windows and structure openings, sand bags, capping pipes, burying incomplete underground work, bracing incomplete work etc. Determine if there is any work that should be prioritized for completion that may provide protection from wind or rain or improve structural integrity.
- Survey the site for any unfinished work that can be protected from damage such as partially completed roofs.
- Determine materials required to protect the site such as plywood, netting, plastic sheeting, trailer anchors and tie-downs, concrete anchor screws etc.) need to protect the site and determine a source and availability.
- Monitor material deliveries and consider whether deliveries should be stopped or delayed, especially for non-critical items.
- Avoid storing materials or tools in low areas, beneath pipe chases, and other floor openings or near windows.
- Ensure that all loose scrap material is gathered up and disposed of in the dumpsters.
- Ensure that dumpsters will be emptied and when. If the dumpster service is unable to pull the dumpster's, securely cover them with nets to prevent the debris inside from becoming a windblown hazard.
- Keep materials that are light in weight and/or large in surface area secured when not in use and don't shake out more material than can be used during the shift and re-secure if necessary.
- Be careful not to provide covers that may fill with water that can collapse the support structure or burst releasing a massive 'water bomb'.

Examples of Site Superintendent duties could include:

- Ensure that all loose forming materials are neatly stacked and banded.
- Ensure that all materials, tools, sheds, gang boxes, and small equipment that can be damaged by rising water are removed from excavations and low areas prone to flooding.
- Ensure that continuous berms are installed at excavations.
- Have any non- essential barricades removed and essential barricades anchored.

- Ensure that incomplete underground piping and storm drain systems are protected against the infiltration of sand and silt.
- Ensure that all equipment is relocated out of excavations.
- Oversee the implementation of hurricane crane preparation procedures.
- Ensure dewatering, standby, and diesel powered equipment is ready to operate.
- Perform other duties as assigned.

Examples of Mechanical, Electrical, Plumbing and Elevator Superintendent duties could include:

- Identify vulnerable material and work in progress and determine how to best protect it from the effects of flooding.
- Ensure that all meter pits are outfitted with pumps so as to prevent damage to electronic equipment from rising water.
- Ensure that all electronic equipment in storage is protected from rising water.
- Ensure backup electrical generator power as required.
- Prepare to turn off the power and water to the office trailers when requested.
- Perform other duties as assigned.

Examples of Masonry and Concrete Superintendent Duties could include:

- Tie erected formwork together to make it more resistive to high winds or remove.
- Review and remove scaffolding. If the scaffold can't be removed, ensure the anchors and tie-downs are secure. Remove, stack, and band planking. Remove portable equipment or materials from the scaffold.
- Perform other duties as assigned.

Example of Site Office Personnel Duties could include:

- Ensure critical project documents are protected from damage. Move them to a permanent structure if necessary.
- Backup computer files. Disconnect all computers and office equipment from the electrical outlets.
- Be prepared to board up windows or put storm shutters in place. Have strong bracing for outside doors. Stock sandbags for doors etc.
- Stock non-perishable foods that can be eaten without cooking or with little preparation if the site is to be occupied.
- Be prepared to supply fuel tanks for de-watering pumps, portable generators and vehicles during the storm and remobilization after the storm. Be prepared to anchor or restrain or dismantle and band anything that might blow away.
- Loose tools and lumber should be tied down or placed in storage containers.
- Ensure fuel tanks of all equipment are filled and that fill caps are properly secured.
- Ensure that all office and storage trailers are tied down securely.
- Have portable toilets anchored, secured in a protected location, or scheduled to be picked up.
- Procure netting adequate to cover dumpsters that could not be emptied.
- Review the system to inform employees of when they are to return to work.
- Prepare the Damage Survey Team. This team should include infrastructure, electrical and mechanical contractors and any others whose work is in the critical path for site remobilization.

Suggested Supplies	Safety Manager/Field Manager		
	Person Assigned	Purchased	Date Checked
Bottled Water			
Matches, Sterno, Candles			
Batteries for Weather Radio			
Flashlights, Phone etc.			
Flashlights/Emergency Lights			
Rain Gear			
First Aid Kit			
Blankets			
Plywood, Nails, Hammer			
Dumpster Netting, Covers, Anchoring Means			
Banding Material, Clips, Banding Tools			
Reinforced Poly			

Preparing for a Potential Hurricane Two to Three Days Prior

These work practices consist of general actions you should consider taking 2-3 days prior to a projected hurricane landfall. Time frames may be increased or decrease due to your location, a rapidly developing or moving hurricane, size of operations, mandatory evacuation orders, and implementation of contra-flow among other factors. Hurricanes can arise quickly in the Gulf and hurricane preparation time may be limited. The following is an example of how a phased hurricane preparation plan may be implemented. It's important to monitor the weather situation and plan to act accordingly.

72 Hours Before the Storm

- Schedule a meeting with staff and contractors to review the hurricane plan and everyone's roles and responsibilities.
- Confirm the emergency contact and phone list for all staff and subcontractor supervisors. The list should be distributed to all project contractors and subcontractors.
- Ask subcontractors if they updated their hurricane response plans and that their supervisor and employee contact information has been updated.
- Review local government emergency action plans, evacuation routes etc. with the safety office, staff, and subcontractors.
- Designate an individual(s) to monitor the weather for changes and update the person in charge and other appropriate personnel every four hours.
- Verify that all erosion and sediment control devices are in place and meet adequate standards.
- Verify that all storage and office trailers are correctly tied down. Board up trailer windows.
- Confirm all needed pumps and generators are in place or are readily available, and in working order.
- Prioritize the work-plan to minimize any open excavations or loose formwork. Complete any work that would minimize the impact of the storm such as completing a roof or installing doors etc.
- Schedule trash dumpsters to be emptied. If they cannot be emptied prepare to cover them with nets to prevent flying debris.
- Arrange for extra plywood or other materials to cover windows and other openings.

- Secure extra polyethylene for use after the storm.
- Ensure all vehicles and equipment on the site are filled with fuel. Fill site safety cans and safely store them.
- Ensure that the jobsite weather radio is working and has back up batteries. Ensure there is sufficient supply of banding, clips, duct tape, tarps and sandbags as well as the workers to accomplish the preparations. Ensure that there is sufficient room to lay crane booms down.
- Verify crane preparation procedures with the crane manufacturer and/or rental company.
- Prepare to secure all items on the grounds and inside buildings.
- Obtain any additional netting, banding materials, self-tapping concrete anchoring screws etc. that may be needed.

48 Hours Before the Storm

- Review 72 hour Checklist
- Notify owners of unsecured trailers and storage containers to anchor them or remove them from the site.
- Review all scaffolding. Remove, stack and band planks, secure scaffolding or take it down. Remove any portable equipment.
- Verify that all equipment is fueled and all storage cans topped off and secure to prevent contamination of soil or wetlands.
- Begin banding loose materials with metal straps. Secure banded materials to floors and columns.
- Secure un-poured decks with additional rebar, beams, etc. being careful not to over load the shoring. Remove or secure form work.
- Install and fortify temporary bracing as best as possible. Brace or secure roof mounted equipment or other equipment prone to movement by high winds.
- Consider preparations to prevent water damage to the building such as grading, sandbagging etc. Ensure roof and drainage areas are clear of materials that can block drainage.
- Discontinue work on projects that would be vulnerable to hurricane damage.
- Complete any work, such as partially completed structures, that will minimize damage.
- Have subcontractors move any uninstalled materials to a safe location.
- Review the site drainage patterns and relocate any materials or equipment stored in low lying areas or areas prone to flooding to higher elevations.
- Begin covering dumpsters and other trash containers with netting.
- Ensure all hazardous materials cannot contaminate water (hurricanes can produce 20 – 30 inches of rain). Store materials high and dry.
- Remove, secure, isolate, or neutralize chemicals to prevent their release or reaction if disturbed.
- Broom clean the project inside and outside.
- Remove all trash from the job site. Enclose or secure in a dumpster if removal is not possible.
- Remove screening on fences, signs etc.
- Cancel any scheduled deliveries of unnecessary materials that would create additional items to secure.
- Check first aid supplies.
- Use a camera or video camera to document the condition of the entire project area inside and outside to show the condition of the site
- Check the security of fencing, or other materials that can catch wind and take flight.
- Securely cover and/or place on dunnage those materials that are susceptible to moisture or water damage.
- Prepare to protect electrical tools and cords from water.
- Ensure there are enough computer disks to back up files. Begin backing up and moving important documents and records to a safe place.

- Verify needed generators and dewatering pumps are in place or available.
- Ensure batteries for battery operated devices are kept charged.
- Close windows and doors. Emphasize to the work crews to close them after use.
- Consider rotating workers to allow them time to go home and prepare themselves and their families for the hurricane.

24 Hours Before the Storm

- Review 48 hour checklist
- Document the status of the project with pictures and/or video and store them in a dry secure place including any precautions taken to prevent damage.
- Back-up all computer files on diskette and store them in a dry secure place.
- Secure windows with plywood or tape and move items vulnerable to water damage away from windows.
- Ensure crane hurricane preparation procedures are implemented.
- Remove or anchor all trailers and storage containers that are not secured.
- Remove all non-essential barricades. Sandbag or tie down essential barricades.
- Cap all incomplete piping to prevent sand/debris infiltration.
- Return unneeded rental equipment.
- Tie down all materials and place weight e.g., rebar, block etc. on items that can be physically moved.
- Tie netting on all trash containers that are not empty.
- Review stored materials for potential of windblown rain damage.
- Remove permit board (unless prohibited) and job site signage that could become windborne.
- Have subcontractors secure or remove their tools and unnecessary materials or equipment from the site.
- Confirm the inventory of all equipment in the office and in the field.
- Begin sending workers home who are not required for last minute hurricane preparation activities.

12 Hours Before the Storm

- Review 24-hour checklist
- Have a trained and qualified person turn off water, power, gas, etc. at source.
- Take pictures of any changes to the construction site conditions for insurance purposes including any actions taken to mitigate damage.
- Photograph any valuable items that must remain at the job site for insurance purposes.
- Advise subcontractors to leave and not return until the hurricane threat has passed.
- Secure the site.

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