



**TOMS RIVER TOWNSHIP  
DESIGN STANDARDS GUIDANCE  
STORM RESILIENCY FOR YOUR HOME,  
BUSINESS, NEIGHBORHOOD AND COMMUNITY  
MAY 17, 2017**



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**Our File No. A-410-023-000**



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## 1. **DESIGN GUIDANCE: PURPOSE AND FOCUS**

Severe coastal storms can and do bring extensive flooding, evacuations, extended business interruptions and significant property damage along Toms River oceanfront and back bay flood prone areas. Even infrequent repeat flooding can produce serious disruptions to the lives of residents, the operation of businesses and management of the Township.

The **PURPOSE** of *Toms River Design Standards Guidance* is to provide storm resilient designs and techniques for your home, business neighborhood and community. Community-wide references and methods are identified advancing structural and natural resiliency in flood prone areas. Design Standards Guidance **DSG** advance safe, effective, efficient, integrated and sustainable development and redevelopment, including infrastructure rehabilitation, and environmental restoration and protection. The **FOCUS** of **DSG** is to provide guidelines for Toms River community residents and businesses for disaster resilient improvements. These resiliency guidelines include home, business, neighborhood, and community designs and infrastructure system management in flood hazard areas<sup>1</sup> fostering communities of place and setting standards for flood resiliency at the street level.

Flexible and context-sensitive approaches to development and redevelopment are critical in application of these design guidelines, allowing for consideration of both project and community needs including the broader impacts to both built and natural environments. Community designs and infrastructure are installed and maintained for the safety and comfort of everyone, regardless of age, ethnicity, income, or chosen travel mode.

## 2. **DESIGN GUIDANCE: OVERVIEW**

Designing and building in flood-prone areas require special approaches and techniques to make sure residents and businesses experience minimal disruption and damage during and after a storm. The New Jersey State Uniform Construction Code (UCC), and International Building Codes (IBC) govern flood area construction. These codes and regulations determine the type of structures, foundations and materials used to build resilient structures in flood prone areas. Toms River provides comprehensive land use policies, as well as specific design guidance addressing storm vulnerabilities.

Design Guidance for resilient communities within and beyond UCC and IBC include flood resilience strategies for residents, property and building owners, developers, and businesses. These design guidelines can also be used by designers and builders as a guide for making buildings relate well to one another, while preserving connectivity with a pedestrian-friendly streetscape and enhancing the character of Toms River neighborhoods both business and residential.

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<sup>1</sup> Flood Hazard Areas in Toms River are primarily within Residential Zones R-100, R-200, R-400 A/B/C, R-75, R-90, MF-8, MF-16 and EMF-8; and Business/Office Zones GB, HB and VO.

A key term applied in Design Guidance is Design Flood Elevation (DFE). The DFE is the elevation to which construction is regulated. It is calculated by taking the Base Flood Elevation on the Adopted Regulatory Flood Maps and adding required Freeboard. Freeboard is a specified height above the anticipated flood elevation that accounts for future conditions and limitations in estimating flood elevations.

It should also be noted these Design Guidelines include strategies for reducing flood insurance premiums. This document includes information on using flood resilient building materials, flood proofing measures, protecting utilities and mechanical systems, and foundation design.

A Construction Permit is required for most repairs and renovation or improvements made to a building or piece of property. If the property is located within the Special Flood Hazard Area and the renovations are substantial, or new construction is proposed, additional permits may also be required.

The design review process is virtually the same for homeowners, building and property owners, businesses and developers, although requirements for compliance vary based on the building type and amount of work being proposed.

In resiliency design, the use of specified materials may increase the cost of renovation, but will reduce the time and expense of recovery from future flooding. For example, standard paper-coated sheetrock and fiberglass insulation act like sponges drawing moisture up the wall much higher than the water level reached by the flooding. As result, moisture can easily be trapped. Closed-cell foam insulation is mold resistant, can get wet and will dry completely without having to be replaced. Such materials can reduce or eliminate the need for replacement.

Loss of electricity, heat and hot water also significantly increase the amount of recovery time after any natural disaster such as a flood, heavy snow or ice storm. For that reason, all new or replacement utility connections, breaker panels and meters are elevated above DFE. Mechanical equipment such as HVAC, boilers, and water heaters should also be relocated above DFE. A backflow prevention system prevents sewage from backing up into buildings.

There are many ways to retrofit an existing building. Examples include moving utilities, elevating the lowest floor and installing engineered flood vents as a means to decrease flood exposure and reduce flood insurance premiums. Vent ratio to enclosed area is a critical component to risk and premium reduction.

Another key concept is that unlike residential properties, non-residential commercial space may be dry flood-proofed. Dry flood-proofing prevents flood water from entering the unit altogether. Once floodwaters recede, the business can resume operations immediately.



A combination of methods may be necessary to completely dry-proof a commercial location. The most commonly used are watertight shields for windows and doors that are easily deployed when flooding or severe weather is forecast. Shields block flood water and other debris from coming in contact with the storefront keeping the commercial unit dry and protected. Ref.: *FEMA P-936, Floodproofing Non-Residential Buildings*.

### 3. **DESIGN GUIDANCE: OBJECTIVES AND ACTIONS**

- 3.1 Expand Toms River flood resiliency and preparedness as part of everyday business; involve stakeholders in funding flood risk mitigation projects. Monitor funding opportunities for flood mitigation efforts/projects from FEMA Hazard Mitigation Grant Program (HMGP), US HUD, and New Jersey State programs.
- 3.2 Quantify cost benefit results of flood mitigation projects and efforts completed.
- 3.3 Expand community understanding of potential flood risks beyond designated flood zones as Mother Nature doesn't read flood maps.
- 3.4 Define course of action to help flood damaged areas avoid being flooded altogether, or bounce back faster.
- 3.5 Provide additional water filling station for residents in partnership with water companies.
- 3.6 Incorporate designs that maximize safe and efficient movement of people and materials, while accommodating non-motorized users in project planning, construction, operations, and maintenance.
- 3.7 Incorporate Federal and State guidelines for accessibility of all who qualify under the Americans with Disabilities Act.
- 3.8 Consider incorporating LEED v 4 for neighborhood development (updated April 5, 2016) as appropriate.
- 3.9 Strengthen community infrastructure systems (water, sewer, roads, communication, electric, gas) for greater resiliency to major storm events.
- 3.10 Quantify Sandy related economic losses to Toms River tax base.
- 3.11 Prioritize methods to mitigate flood risks by cost benefit and cost effectiveness; include:
  - property acquisition and relocation
  - stabilizing bay/river/stream banks
  - green infrastructure improvements
  - flood warning systems

- flood emergency response
  - structural and non-structural flood mitigation measures
- 3.12 Expand program to raise structures throughout flood zones; quantify number of structures raised and maintain ongoing account.
- 3.13 Expand neighborhood connectivity; encourage phone/e-mail links.
- 3.14 Evaluate effectiveness of existing stormwater management systems; expand effectiveness.
- 3.15 Improve neighborhood visual identity.
- 3.16 Achieve highest potential level of service at signalized and non-signalized intersections.
- 3.17 Prioritize installation of vehicular traffic and transportation improvements by order of usage to key destinations within Toms River; account for seasonal.
- 3.18 Prioritize non-motorized roadway improvements by order of usage by pedestrians and bicyclists to key destinations within Toms River; account for seasonal demand.
- 3.19 Add bicycle racks; provide for bicycle storage; consider a town-wide bike-sharing system.
- 3.20 Improve pedestrian safety through standardization of sidewalk, curb, and curb ramps and crosswalks.
- 3.21 Improve neighborhood appearance and cohesiveness through thematic design standards (example: Dolphin image theme in Ortley Beach).
- 3.22 Provide the most effective and cost efficient street lighting available based on neighborhood security and long term cost analysis.
- 3.23 Upgrade streetscape improvements including replacement of dead/dying street trees and plantings exclusively with **native species** indigenous to regional shore communities.
- 3.24 Revegetate to eliminate areas of bayside, river and creek erosion, with **native** vegetation indigenous to regional shore communities; hardscape only as determined required.



- 3.25 Establish bayside kayak/canoe launch locations for public use and emergency access.
- 3.26 Upgrade vacant green space within Ocean County, NJDOT rights-of-way and OCUA vacant easements with native perennial wildflowers and ground cover; install native sedges/rushes in wet areas for water quality benefits.

#### 4. **DESIGN STANDARDS GUIDANCE FOR YOUR RESIDENCES AND BUSINESSES**

##### **Foundation Guidelines**

Selection of the appropriate foundation type is important for a building's structural strength.

- Use pilings and footings in solid perimeter foundation design.
- Do not use fill to raise the ground level.
- Any enclosure that is below the DFE, but above grade are to be fitted with adequate flood openings.

##### **Mechanical Systems and Utilities**

The loss of electricity; heat or hot water significantly lengthens recovery time after any natural disaster.

##### **Current Requirements**

- Locate all new or replacement utility connections at or above the DFE.
- Locate all new mechanical equipment above the DFE.

##### **General Guidelines**

- Move external equipment to the roof.
- Relocate internal equipment to higher floors.
- Replace multi-unit systems with smaller on-demand systems within individual units.
- Remove fuel tanks if heating systems are placed with a natural gas system.



- Consider clearance and venting requirements before relocating.
- In areas below the DFE, raise internal equipment as high as possible.
- Place external equipment on platforms above the DFE.
- Anchor equipment against wind.
- Mechanical equipment in non-residential buildings may be located inside barriers that are designed to resist flood loads and keep floodwaters away from the equipment.

### **Electrical**

- When replacing electrical wiring in areas below DFE, wires should run down from the ceiling, instead of along the floor, and outlets should be elevated above the DFE.
- Any wiring installed below the DFE must be water-resistant and comply with the National Electric Code.
- All new electric meters and panels must be relocated above the DFE.
- Use conduits mounted on walls, which are easier to replace after flooding.

### **Heating and Cooling Equipment**

- Furnaces, water heaters and other equipment can be protected by floodproof gates in non-residential buildings, but elevating equipment above the DFE offers the surest protection from flood damage.
- Underground Storage Tanks are to be properly anchored or removed since submerged tanks can collapse or be dislodged.
- For existing buildings, consider converting to natural gas.

### **Water and Sewer Pipes**

- Utility pipes and lines should be installed in a manner to prevent the entry of floodwaters.
- Backflow prevention valves should be added to sewer lines and floor drains to prevent stormwater and sewage flowing into buildings.



- Establish protocols and penalties for piercing storm/sanitary/water lines by utilities.

#### **Duplicate Power Sources**

- Back-up power such as natural gas generators or battery back-ups should be used to provide power to life safety equipment, alarms, or emergency lighting.
- Install generator-ready hookups for quick-connections after floodwater recedes.

#### **Residential Units Below the DFE**

- New residential units are not permitted below the DFE.
- An existing residential unit below DFE may remain in place if the total work done in the unit and/or the building is not a substantial improvement.
- Areas below the DFE should be prepared to flood.

#### **Commercial Uses Below the DFE**

- Commercial buildings or mixed-use buildings may have dry floodproofed non-residential uses such as offices or retail units below the DFE.
- Commercial uses below the DFE are to be dry floodproofed.

#### **Other Acceptable Uses Below the DFE**

- Building access, lobbies and emergency hallways.
- Storage.
- Parking, driveways, and loading docks.

#### **Enclosures Below the DFE**

- Areas below DFE should not be extensively finished. Where finishes are used they are to be flood resistant to withstand direct and prolonged contact (up to 72 hours) with flood waters.
- Enclosed areas below DFE are to be fitted with hydrostatic openings (flood vents).
- No bathroom or plumbing outlets are permitted below DFE.

- Appliances are not to be in an enclosed wet floodproofed area.
- Electrical outlets should be elevated and wiring done “top-down” to the greatest extent possible.
- Use water resistant paints and finishes to allow easy cleanup after floodwater exposure in accessory structures and areas below DFE.
- Use check valves, sump pumps and back flow devices.

### **Emergency Exits**

- Emergency exits are to open at grade.
- Emergency exit stairways and corridors are to be wet floodproofed and designed with flood vents to maintain operation of the exit door.

### **Material Guidelines Below the DFE**

- Structural elements should be steel or concrete.
- Specially treated and decay-resistant lumber and marine grade plywood can be used for certain applications but should be limited.
- Flooring materials should be nonporous, such as polished concrete, ceramic or porcelain tile.
- Wood flooring and carpeting should not be used below DFE.
- Walls and ceilings should be finished with materials such as, but not limited to, aluminum studs, cement board, treated lumber.
- Only closed cell insulation below DFE.





### **Designing Flood Openings**

- Flood openings allow inflow and outflow of water to minimize pressure on walls and allow water levels within the enclosure to rise and fall at the same rate as outside.
- Number of openings engineered for the amount of enclosed space: General rule of thumb is 1 square inch of vent area to 1 square foot of enclosed floor area.
- Vents located on at least two (2) sides of the enclosed area.
- The bottom of each vent opening located not more than 12 inches above the interior floor or the exterior grade immediately below the opening, whichever is higher.

### **Non-Residential Dry Floodproofing**

Dry Floodproofing is a combination of design modifications that result in a building or structure being water tight below the DFE, with structural components having the capacity to resist flood loads. Dry Floodproofing allows both existing and new non-residential uses to operate at the street level.

A combination of methods may be necessary to completely dry floodproof a non-residential location. The most commonly used are watertight shields for windows and doors that are easily deployed when flooding or severe weather is forecast. Shields block flood water and other debris from coming in contact with the storefront keeping the commercial unit dry and protected.

#### **Dry Floodproofing Guidelines**

- Can only be used for non-residential buildings or for commercial uses in mixed-use buildings in “A” or “AE” zones.
- Dry floodproofing measures are not permitted in the “V” zone.
- Where possible, use automatic or “passive” floodproofing measures. Measures that require human intervention before an event may result in higher insurance premiums.

### **5. DESIGN STANDARDS GUIDANCE FOR NEIGHBORHOODS AND COMMUNITY**

#### **Streetscape Guidelines**

- Limit the negative effects of blank walls at street level by adding a green buffer such as an at-grade planting bed or Green Wall.
  - Use curb-side trees to create an inviting environment around the building.
  - Use low voltage LED lighting to give landscaping a dramatic effect or highlight architectural details.
  - Use windows around a lobby or commercial entrance to draw the attention of passers-by to the building.
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- Use planting beds, rain gardens or green wall systems installed and maintained by the property owner(s) to soften design along the streetscape.
  - Empty street tree standards to limit height of trees under overhead utilities.

#### **Floodplain Avoidance**

- For all sites within the flood hazard areas, design new buildings and structures in accordance with National Flood Insurance Program (NFIP) requirements.



- On sites previously developed in flood hazard areas, design buildings additions and improvements in accordance with National Flood Insurance Program (NFIP) requirements.
- On vacant sites in specific flood hazard areas, do not develop on land that is within either a regulatory floodway or a coastal high hazard area (Zone V), as shown on the Flood Hazard Map.
- Protect all designated buffer areas along streams, creeks, rivers and bay areas (100'-300' per NJDEP Rules); supplement with native vegetation as necessary.
- Monitor land use in Flood prone/Flood hazard areas; continue to require compliance with NJDEP Flood Standards.
- If projects involve a critical facility intended to remain operational in the event of a flood, or whose function is critical for post flood recovery, design the facility to be protected and operable at the water levels represented by a 0.2% annual chance (500-year) flood. For the purpose of this requirement, critical facilities include, but are not limited to, hospitals, emergency operations centers, building or portions of buildings designated as an emergency shelters, water and sewage treatment facilities, fire and police stations, and electrical substations.

### **Bicycle Facilities**

- Promote bicycling and transportation efficiency, and reduce vehicle distance traveled; encourage utilitarian and recreational physical activity.
- For office space, provide short-term bicycle storage for at least 1 per 1,000 s.f. of office space.
- For retail space, provide at least two (2) short-term bicycle storage spaces for every 5,000 square feet.

### **Walkable Streets**

- Promote transportation efficiency and reduce vehicle distance traveled by providing safe, appealing, and comfortable street environments for pedestrians that encourage daily application.
- Continuous sidewalks for walking are to be provided along one, or preferably, both sides of the circulation network.

**Connected Community**

- Promote projects that advance high levels of physical and social connectivity, and are well connected to the overall community.

**Safe Growth**

- Perform a “Safe Growth Audit” (Zoning Practice No. 10, American Planning Association) to assess Toms River on-going implementation program of addressing hazard risk and community resiliency.

**Mixed Use Neighborhood**

- Reduce vehicle distance traveled and automobile dependence by encouraging daily walking, biking, and transit use, and support car-free living by providing access to adjacent or nearby diverse land uses.
- Implement medium to high density residential above first floor retail.

**Reduced Parking Footprint**

- Minimize environmental impacts associated with parking facilities, including land consumption and stormwater runoff; promote transportation alternatives. Consider shared parking lots and landscaped (shadow) parking areas.
- For new nonresidential buildings and multi-unit residential buildings, locate all new off-street surface parking lots at the side or rear, leaving building frontages facing the circulation network free of surface parking lots.
- Use no more than twenty percent (20%) of the total development footprint area for all new off-street surface parking facilities. Underground or multistory parking facilities can be used to provide additional spaces.
- Provide preferred parking for carpool or shared-use vehicle parking spaces.

**Transit Facilities**

- Encourage transit use and reduce vehicle distance traveled by providing safe, convenient, and comfortable transit waiting areas.
- Work with the Transit Authority serving Toms River to inventory existing transit stops and potential new transit stops.



- Confirm that transit facilities will be funded by either the transit agency or an area project developer.
- Install transit agency-approved shelters and any other required improvements at existing stops.
- Reserve space for transit facilities or install transit facilities at new stops.

#### **Community Outreach and Involvement**

- Encourage responsiveness to community needs by involving the people who live or work in the community; expand public notice methods to include websites and social media.
- Meet with stakeholders, property owners, residents, business owners, and workers; solicit and document their input on proposed projects before finalizing design.
- Establish ongoing means for public communication throughout design and construction phases.

#### **Local Food Production and Farm Markets**

- Provide for improved nutrition through expanded local access to fresh produce.
- Identify appropriate locations for farmers markets to be established on an ad-hoc temporary basis. Provide for safe and adequate parking, and easy access by pedestrians and bicyclists.

#### **Tree-lined and Shaded Streetscapes**

- Establish an ongoing capital plan for creating tree-lined and shaded streetscapes so to reduce the urban heat island effect, improve air quality, increase evapotranspiration, reduce cooling loads in buildings, encourage walking/bicycling, and discourage speeding.
- Provide trees at intervals of no more than fifty feet (50'). Establish a shore area native tree list of acceptable street trees.
- Account for tree volume and rooting to avoid curb, sidewalk and aerial impacts at full growth.

**Construction Activity Erosion Protection**

- Reduce soil erosion and offsite tracking of dirt and debris from construction activities by controlling waterway sedimentation and airborne dust, and applying the latest soil erosion control techniques including temporary stone driveway at the construction entrance.
- Actively work with the Soil Conservation District to incorporate best management practices (BMPs) to control erosion and sedimentation in runoff from project sites during construction.

**Outdoor Water Use Reduction**

- Reduce outdoor water consumption. Reductions can be achieved through native shore area based plant species selection, and irrigation system efficiency as calculated in the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.
- Discourage permanent irrigation systems; use native drought resistant plantings.

**Adaptive Reuse**

- Encourage reuse of existing buildings, facilities, improvements and infrastructure; conserve material and cultural resources by promoting preservation and adaptive reuse.
- Preserve healthy and viable existing trees as first priority in site landscape design.

**Rainwater Management**

- Reduce runoff volume and improve water quality by replicating the natural hydrology and water balance of site development; less lawn, more percolation.
- Encourage raingardens and subsurface infiltration systems in site design.

**Solar Orientation in Site Design**

- Encourage energy efficiency by creating optimum site design conditions for the use of passive and active solar strategies.
- Design and orient projects such that one axis is within  $\pm$ fifteen degrees ( $15^\circ$ ) of geographical east-west.
- Encourage use of latest technologies in solar.

**Municipal Infrastructure Energy Efficiency**

- Maximize reduction of energy used for operating public infrastructure; apply energy conservation best management practices.
- Install new municipal infrastructure (e.g., LED traffic lights and street lights, water and wastewater pumps) to achieve energy reduction below an estimated baseline energy use for this infrastructure.
- Maximize recycling of replaced municipal infrastructure (roads, pipes, sidewalk, curb).
- Establish a municipal composting facility; provide leaf and shredded bark compost to residents for free.

**Steep Slope Protection**

- Control erosion, protect habitat, and reduce stress on natural water systems by preserving steep slopes in a natural, vegetated state.
- On any slopes steeper than fifteen percent (15%), restore the slope area with biodegradable slope protection and native plants.
- Establish development agreements or other binding documents that will protect all steep slopes in perpetuity for all new development and redevelopment projects.

**Site Design for Habitat and Wetlands Conservation**

- Delineate significant habitat on new projects. Do not disturb significant habitat within a minimum fifteen foot (15') buffer (or as required by NJDEP) around the habitat. Protect significant habitat and its identified buffers from development by a conservation easement.
- Design projects to conserve 100% of all water bodies, wetlands, and adjacent land of water bodies, and land within the designated wetlands buffer on new development sites. Do not disturb wetlands, water bodies, or their buffers, and protect them from development by conservation easements.



**Restoration of Habitat and Wetlands**

- Using native shore area plants, restore predevelopment native ecological communities, water bodies or wetlands on project sites consistent with NJDEP procedures. Remove trash and debris.
- Commit to implementing a long-term management plan for existing or recently restored on-site native habitats, water bodies, or wetlands and their buffers.
- Identify an ongoing management schedule, along with parties responsible for management.
- Seek public volunteers (clubs, businesses) for ongoing management of restored habitats.
- Apply bid engineered banks stabilization techniques using native plantings and biodegradable anchoring materials.

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