Hazard Mitigation Supplement to the Model Land Use Management Code (Alternatives to Conventional Zoning)

Prepared for:
Office of Planning and Environmental Management
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July 1, 2014

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HAZARD MITIGATION SUPPLEMENT

The purpose of this part of the DCA Model Code is to provide supplemental model code provisions that are in the interest of public health, safety and welfare with respect to natural hazards mitigation. These provisions draw from identified best practices for natural hazards mitigation which are applicable to the general nature, purpose and intent of local zoning. Each provision is intended to serve as a supplement to provision(s) of the DCA Model Code, as referenced. The provisions may also be used to supplement existing relevant ordinances that have already been adopted by a community.

I. Flood Damage Prevention (§3-3) Supplement

The purpose of this supplement to DCA Model Code §3-3 *Flood Damage Prevention* is to provide additional provisions to limit the extent to which new development may cause increased flooding elsewhere, to protect natural resources, and to protect from flooding any new buildings and infrastructure that are essential to public health, safety and welfare.

These supplemental provisions may be incorporated into DCA Model Code §3-3 for adoption as a whole, or the provisions can be amended into a similar relevant ordinance that has previously been adopted by a community. If these provisions are inserted into an existing ordinance that is not based on DCA Model Code §3-3, it is recommended that the following standards from DCA Model Code §3-3 also be considered for inclusion, as the application of these standards are important to the effectiveness of local floodplain regulations:

- Increased Freeboard : see Sections §3-3-34 (b), §3-3-35 (a), §3-3-36 (a), §3-3-37 (a) and (b), §3-3-3-43 (b), §3-3-44 (b), and §3-3-45 (b)
- Compensatory Storage Alterative: see Section §3-3-26 (a)

  Commentary: Compensatory storage is a less restrictive alternative to "no fill" requirements. Communities that do not wish to prohibit all development, including earthen fill, within the future-conditions floodplain are encouraged to include the compensatory storage provision of Section §3-3-26 in their local codes. To implement a higher standard, see #3 under Supplemental Provisions below.
- Cumulative Substantial Improvement Standard: see Section § 3-3-5 (specifically, definitions for *substantial damage*, *substantial improvement*, and *substantially improved existing manufactured home park or subdivision*)

Supplemental Provisions:

1. Add to Section §3-3-5:

Critical facilities: Any public or private facility, which, if flooded, would create an added dimension to the disaster or would increase the hazard to life and health. Critical facilities include:

(a) structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, or water-reactive materials;

(b) hospitals and nursing homes, and housing for the elderly, which are likely to contain occupants who may not be sufficiently mobile to avoid the loss of life or injury during flood and storm events;

(c) emergency operation centers or data storage centers which contain records or services that may become lost or inoperative during flood and storm events; and

(d) generating plants, and other principal points of utility lines.

Freeboard: The height above the base flood elevation at which a structure is built.

2. (New) Section §3-3-_____ (suggested placement is before §3-3-47) STANDARDS FOR CRITICAL FACILITIES

(a) Critical facilities shall not be located in the 100-year floodplain or the 500-year floodplain.
(b) All ingress and egress from any critical facility must be protected to the 500-year flood elevation.

3. (Modified) Section §3-3-25 LIMITATIONS REGARDING FUTURE-CONDITIONS FLOODPLAIN

No development**, including earthen fill,** shall be allowed within the future-conditions floodplain that could result in any of the following:

~~(a)~~ Raising the base flood elevation or future-conditions flood elevation ~~**equal to or more than 0.01 foot**~~;
(b) Reducing the base flood or future-conditions flood storage capacity;
(c) Changing the flow characteristics as to the depth and velocity of the waters of the base flood or future-conditions flood as they pass both the upstream and the downstream boundaries of the development area; or,
(d) Creating hazardous or erosion-producing velocities, or resulting in excessive sedimentation.

Commentary: Prohibiting earthen fill ("no fill" requirement) is more restrictive than a compensatory storage requirement. Communities that wish to implement this higher standard do not need a compensatory storage alternative; as such, in conjunction with the changes above, Section §3-3-26(a) of the Model Code should be deleted to ensure consistency among the applicable provisions.

II. Tree Protection (§4-4) Supplement

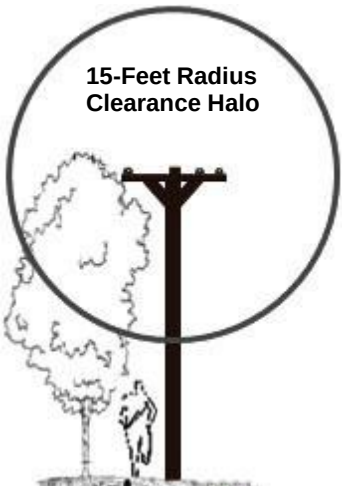
The purpose of this supplement to DCA Model Code §4-4 *Tree Protection* is to provide additional provisions and guidance to limit the extent to which trees may cause damage to public utilities and properties in a severe storm event, thus offering protection to utilities and facilities which are essential to public health, safety and welfare.

These supplemental provisions may be incorporated into DCA Model Code §4-4 for adoption as a whole, or the provisions can be amended into a similar relevant ordinance that has previously been adopted by a community.

Supplemental Provisions:

(New) Section §4-4-6 REQUIREMENTS FOR PLANTING NEAR OVERHEAD UTILITIES

In addition to Table 4-4-1, the following method shall guide the location of trees in the vicinity of above-ground utilities: Determine the measurement of half the average mature crown spread of the tree, then add 15 feet to the measurement. The resulting number of feet is the closest to an overhead power line that a tree may be safely planted.



Source: Community Tree Planting and Establishment Guidelines (Georgia Forestry Commission)

III. Landscaping and Buffers (§4-5) Supplement

The purpose of this supplement to DCA Model Code §4-5 *Landscaping and Buffers* is to provide additional provisions and guidance regarding species of trees which are more resistant to damage from high winds. The use of wind resistant tree species can limit the extent to which trees may cause damage in a severe storm event, thus helping to protect the public health, safety and welfare.

These supplemental provisions may be incorporated into DCA Model Code §4-5 for adoption as a whole, or the provisions can be amended into a similar relevant ordinance that has previously been adopted by a community.

Supplemental Provisions:

(New) Section §4-5-14.8 WIND RESISTANT NATIVE TREE SPECIES

Large Trees 40+ Feet			
Common Name	**Botanical Name**	**Wind Resistance**	
		High	**Med-High**
American holly	*Ilex opaca*	x	
Baldcypress	*Taxodium distichum* var. *distichum*	x	
Black tupelo	*Nyssa sylvatica*		x
Live oak	*Quercus virginiana*	x	
Mockernut hickory	*Carya tomentosa*		x
Pignut hickory	*Carya glabra*		x
Post oak	*Quercus stellata*		x
River birch	*Betula nigra*		x
Schumard oak	*Quercus schumardii*		x
Southern magnolia	*Magnolia grandiflora*	x	
Swamp chestnut oak	*Quercus michauxii*		x
Sweetgum	*Liquidambar styraciflua*		x
White ash	*Fraxinus americana*		x
White oak	*Quercus alba*		x
Small Trees 15-40 Feet			
Common Name	**Botanical Name**	**Wind Resistance**	
		High	**Med-High**
American hophornbean	*Ostrya virginiana*		x
Florida sugar maple	*Acer saccharum subsp. floridanum*		x
Flowering Dogwood	*Cornus florida*	x	
Fringe tree	*Chionanthus virginicus*		x
Turkey oak	*Quercus laevis*	x	
Yaupon holly	*Ilex vomitoria*	x	

Sources: LSU AgCenter publication: Make Wise Tree Removal Decisions Before a Hurricane (Hallie Dozier and Steven Wright, 2013), www.lsuagcenter.com; UGA College of Agricultural and Environmental Sciences publication: Native Plants for Georgia Part 1: Trees, Shrubs and Woody Vines (Gary Wade, 2011), www.caes.uga.edu/publications

IV. Manufactured Home Parks (§6-23) Supplement

The purpose of this supplement to DCA Model Code §6-23 *Manufactured Home Parks* is to provide additional provisions and guidance regarding inclusion of storm shelters in manufactured home parks. The inclusion of properly constructed storm shelters in manufactured home parks can provide a safe refuge for residents during a tornado or severe storm event, thus helping to protect the public health, safety and welfare.

These supplemental provisions may be incorporated into DCA Model Code §6-23 for adoption as a whole, or the provisions can be amended into a similar relevant ordinance that has previously been adopted by a community.

Supplemental Provisions:

1. Add to Section §3-3-5:
Storm Shelter: A building, structure or portions thereof, constructed in accordance with this Code Section and intended to shelter all manufactured home park residents during a severe wind storm event, such as a tornado or hurricane.

2. (New) Section §6-23-5.12 Storm Shelters. Storm shelters when constructed shall be in compliance with International Building Code (IBC) Section 423. Storm shelters shall be maintained by the manufactured home park owner.

OR

(New) Section §6-23-5.12 Community Storm Shelters. A storm shelter shall be constructed to accommodate all residents of the manufactured home park. The shelter shall be constructed in compliance with International Building Code (IBC) Section 423. Storm shelters shall be maintained by the manufactured home park owner.

Commentary:

1. *International Building Code (IBC) Section 423 requires storm shelter construction be in compliance with International Code Council (ICC) / National Storm Shelter Association (NSSA) 500 Standard for the Design and Construction of Storm Shelters. "ICC 500" includes standards for both community storm shelters (generally, an occupant load that is 16 or greater) and residential storm shelters (occupant load does not exceed 16).*
2. *Communities may want to consider placing minimum thresholds on mandated storm shelter construction. An example is requiring shelters to be built in new manufactured home parks of (#) or more homes and/or any existing parks that add (#) or more units.*
3. *DCA's optional Disaster Resilient Construction (DRC) codes, Appendix R (for the International Residential Code, or IRC) and Appendix N (for the IBC) provide standards for storm shelters and safe rooms when constructed as separate detached buildings or as internal areas within buildings. The DRC codes may be adopted to regulate construction of such structures or, as applied in this model code supplement, to guide new standards for specific uses in existing local codes.*

V. Signs (§6-36) Supplement

The purpose of this supplement to DCA Model Code §6-36 *Signs* is to provide additional provisions and guidance regarding wind resistant design for signs. The inclusion of wind resistant design standards for signs can contribute to reduced damage to property and persons during a tornado or severe storm event, thus helping to protect the public health, safety and welfare.

These supplemental provisions may be incorporated into DCA Model Code §6-36 for adoption as a whole, or the provisions can be amended into a similar relevant ordinance that has previously been adopted by a community. If these provisions are inserted into an existing ordinance that is not based on DCA Model Code §6-36, it is recommended that the following

standards from DCA Model Code §6-36 also be considered for inclusion, as the application of these standards are important to the effectiveness of local sign regulations:

> §6-36-9 (d) "If plans are required for issuance of a building permit for a sign, the plans shall be certified as to conformance with all structural and wind-load resistive standards of the applicable Building Code by a structural engineer registered in the State of Georgia, or be prepared using standard drawings prepared by a structural engineer or other qualified professional meeting or exceeding all requirements of the applicable Building Code."
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> *Commentary:*
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> 1. *The International Building Code (IBC) requires buildings to be engineered to withstand minimum wind loads. This requirement also applies to signs.*
> 2. *The IBC requires that solid freestanding signs and solid attached signs meet the minimum wind load requirements of ASCE* 7 Minimum Design Loads for Buildings and Other Structures. Some Georgia communities require additional certification that a sign's wind load design complies with ASCE 7.*
>
> ** American Society of Civil Engineer Standards*

Supplemental Provisions:

(New) Section §6-36-_____ (suggested placement is before §6-36-21) STANDARDS TO IMPROVE WIND RESISTANCE

(a) Sign supports and braces shall be adequate for wind loadings. Acceptable methods include the use of all-metal, wire cable supports and braces, as well as the use of galvanized steel or equivalent corrosion-resistant material bolts for attaching signs to brackets and to the supporting structure.

(b) Projecting and swinging signs shall be anchored to prevent any lateral movement that would cause wear on supporting members or connections.

(c) The suspension of signs by chains or other devices that would allow the sign to swing due to wind action shall be prohibited.