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Memorandum

To:	City of Rollingwood
From:	Jay Campbell, P.E.
Subject:	Floodplain Ordinance Update (Optional Modifications)
Proj. #:	110043.100.2
Date:	Wednesday, February 12, 2020

The purpose of this memo is to provide a summary of optional modifications to the Floodplain Ordinance. The modifications to the floodplain ordinance will provide options for the City to implement floodplain regulations which reduce flood damage and overall impacts of floods. Theses impacts include human risk, environmental damage, property damage, flood insurance claims, displacement of residents, and burden on community infrastructure and services. In addition to providing a safer environment with less risk of flood damage, the city will also benefit from a higher score achieved with the National Flood Insurance Program (NFIP) Community Rating System (CRS). The NFIP's CRS credits community efforts beyond the minimum standards by reducing flood insurance premiums for property owners. A guide for the CRS published by FEMA is attached to this report.

1. **Freeboard:**

   Freeboard is the single most effective means and most common method for reducing flood risk to a structure in the floodplain. Freeboard will not have much impact to development cost and typically pays for itself in reduced insurance premiums and prevented flood damage within the first 10 years of a structure's lifetime. Significant Community Rating System (CRS) credit is available for this activity which leads to lower flood insurance premiums for all policy holders in Rollingwood.

   A. Objective:

      To protect structures against damage from flood in floodplain areas. To apply to areas with or without FEMA established 1% annual-chance elevations.

   B. Suggested language:

      New Construction and substantial improvement of any structure, including manufactured homes, shall have the lowest floor, including basement, elevated 2 feet above the base flood elevation. Where base flood elevation data is not available, the structure shall have the lowest floor, including basement, elevated at least two feet above the highest adjacent natural grade or above the crown of the nearest street, whichever is higher OR have a floodplain study performed by a Professional Engineer (PE) establishing the base flood elevation (BFE) and the floodplain and floodway boundaries prior to issuing a development permit.

   C. Modify ***Sec. 103-177. - Specific standards***

      In all areas of special flood hazards where base flood elevation data has been provided as set forth in ***Section 103-116***, ***103-144(8),*** or ***103-178(c)***, the following provisions are required:

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(1) **Residential construction**. New construction and substantial improvement of any residential structure shall have the lowest floor (including basement), elevated ~~to or above~~ two feet above the base flood elevation. A registered professional engineer, architect, or land surveyor shall submit a certification to the floodplain administrator that the standard of this subsection as proposed in ***section 103-145 (a)(1)*** is satisfied.

(2) **Nonresidential construction**. New construction and substantial improvements of any commercial, industrial or other nonresidential structure shall either have the lowest floor (including basement) elevated ~~to or above~~ two feet above the base flood level or together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice as outlined in this subsection. A record of such certification which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained by the floodplain administrator.

*Note that ***Chapter 107-Zoning,*** **section** ***107-106(a)(5)(f) – Development plan approval for commercial buildings***, already provides the 2 feet above the ultimate 100-year floodplain rule. It reads as follows:

f. Minimum finished floor slab elevations shall be shown for all lots. Such elevations shall be a minimum of two feet above the ultimate 100-year floodplain.

If ***Division 3, Sec 103-177(2)-Nonresidential construction*** is modified to reflect 2 feet of freeboard for non-residential, it will provide more stringent requirement and be consistent with Zoning requirements. For additional protection, the City may consider more stringent freeboard for commercial development by increasing the freeboard elevation to 3 feet above the 100-year floodplain. The Base Flood Elevation (BFE) shown on the current effective FEMA floodplain map (dated January 22, 2020) is outdated. The City of Austin is currently analyzing the Eanes Creek watershed and will be providing FEMA with results that should be incorporated into future versions of the FEMA floodplain map, currently the timeframe is unknown. There will also be a change in the BFE's when the Atlas 14 rainfall intensities are implemented, timing is also unknown. With the above taken into consideration, a 3 foot minimum or more freeboard is recommended to provide some cushion in preparation of potential higher BFE's likely to occur in the future.

Note that there are alternatives to freeboard including floodproofing, but freeboard is the safer, more economical in the long run and a more common alternative.

2. Access (Ingress-Egress):

Providing requirements for a safe and dry land access during floods decreases the likelihood of stranded resident, reduces the need for rescues which places emergency response at risk, and increases public safety.

A. Objective:

Promote development which will reduce flood damage and facilitate emergency vehicular access and/or pedestrian access and evacuation during flood events. Accomplished by requirement of new development of non-residential building sites, walkways, driveways, and roadways are

located on land with a natural grade with elevation not less than the base food elevation and with dry land access. This would be difficult in some areas, but the rule could be applied with adding the "to the maximum extent practicable" for some relief.

B. Suggested Language:

New development proposals will be designed, to the maximum extent practicable, so residential building sites, walkways, driveways, and roadways are located on land with a natural grade with elevation not less than the base flood elevation and with dry land access.

Note that this is highly recommended for commercial development and also encouraged for residential development.

3. Compensatory Storage:

Placement of fill in the floodplain can create negative impacts by impairing flood storage and disturbing natural habitat and water quality. Prohibiting placement of fill in the floodplain should be enforced but if unavoidable, require compensatory storage to mitigate negative impacts.

A. Objective:

Discourage fill to be placed in floodplain but allow with provision that fill shall result in no net loss of natural floodplain storage or increase in water surface elevations during the base flood. The volume of the loss of floodwater storage due to the fill shall be offset with providing equal volume of flood storage by excavation or other compensatory measures at or adjacent to the development site.

B. Suggested Language:

Fill within the special flood hazard area shall result in no net loss of natural floodplain storage or increase in water surface elevations during the base flood. The volume of the loss of floodwater storage due to filling in the special flood hazard area shall be offset by providing an equal volume of flood storage by excavation or other compensatory measures at or adjacent to the development site.

Note that the current Ordinance ***Sec 103-144*** include flood capacity protection measures but not to the extent recommended above.

4. Critical Development Protection:

A. Objective:

Protect critical development such as hospitals, schools, daycare facilities, public/private utilities, fire station, emergency operation centers, police facilities, and ww treatment. Require access during 0.2% flood (500 yr) and prohibit developments in 1% flood areas and when adjacent to floodplain, require 2 feet freeboard above the 0.2% flood elevation to be used as basis for access (ingress/egress) provisions.

Critical developments are defined by FEMA in two categories as follows:

1) Class I Critical Facilities are those facilities that must remain accessible during the 0.2% flood event because they are the base of operations for emergency responders, are particularly difficult to evacuate during a flood even, or facilities that provide services essential to the life, health, and safety of the community. Class 1 critical facilities include

police and fire stations, emergency medical center, communication centers, hospitals, jails, nursing homes, and other residential uses for persons with limited mobility and/or dependency on life-sustaining medical equipment.

2) Critical Facilities are structures that store public records, museums and libraries, schools, and other buildings that store rare and/or valuable items and information that sustain the history and public records of a community. These structures are not expected to remain accessible or functioning during a flood even, though in many instances their functions must resume as soon as possible after a flood event. Critical Facilities also include public infrastructure such as water distribution and wastewater treatment facilities, which are expected to remain functioning during a flood event although they may be temporarily inaccessible or accessible only by watercraft during a flood event.

B. Suggested Language:

Class I Critical Facilities are prohibited in all flood hazard areas, including the 1% and 0.2% change flood areas. Critical Facilities must be constructed to 1 foot above the 0.2% flood elevation.

5. Fill Standards:

A. Objective:

Provide guidelines for placement of fill in special flood hazard areas. Require the following for development within the floodplain:

B. Suggested Language:

The following standards apply to all fill activities in special flood hazard areas:

1) Fill sites, upon which structures will be constructed or placed, must be compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test method or an acceptable equivalent method;
2) Fill slopes shall not be steeper than one foot vertical to two feet horizontal;
3) Adequate protection against erosion and scour is provided for fill slopes. When expected velocities during the occurrence of the base flood are greater than five feet per second armoring with stone or rock protection shall be provided. When expected velocities during the base flood are five feet per second or less protection shall be provided by covering them with vegetative cover;
4) Fill shall be composed of clean granular or earthen material.

6. Potential Updates to DCM:

A. DCM: Modify pond requirements to require armored emergency spillway to provide above the 1% storm water surface elevation and have sufficient capacity to convey the 1% storm with the 1-foot of freeboard from top of embankment. The spillway design calculations shall be included in the construction plans.

National Flood Insurance Program

Community Rating System

A Local Official's Guide to Saving Lives, Preventing Property Damage, and Reducing the Cost of Flood Insurance

FEMA B 573 / 2018

FEMA

The Community Rating System Works

Every year, flooding causes hundreds of millions of dollars' worth of damage to homes and businesses around the country. Standard homeowners and commercial property insurance policies do not cover flood losses. To meet the need for this vital coverage, the Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP).

The NFIP offers reasonably priced flood insurance to all properties in communities that comply with minimum standards for floodplain management.

The NFIP's Community Rating System (CRS) credits community efforts beyond those minimum standards by reducing flood insurance premiums for the community's property owners. The CRS is similar to—but separate from—the private insurance industry's programs that grade communities on the effectiveness of their fire suppression and building code enforcement efforts.

CRS discounts on flood insurance premiums range from 5% up to 45% (see Table 1), based on CRS credit points that are awarded to communities. The discounts provide an incentive for communities to implement new flood protection activities that can help save lives and property when a flood occurs.

The CRS provides credit under 19 public information and floodplain management activities described in the *CRS Coordinator's Manual.*

You're probably already doing many of these activities. To get credit, community officials will need to prepare documentation that verifies these efforts.

The CRS assigns credit points for each activity. Table 2 lists the activities and the possible number of credit points for each one. The table also shows the average number of credit points communities earn for each activity. These averages may give you a better indication than the maximums of what your community can expect.

To be eligible for a CRS discount, your community must do Activity 310, Elevation Certificates. If you're a designated repetitive loss community, you must also do Activity 510, Floodplain Management Planning. All other activities are optional.

Based on the total number of points your community earns, the CRS assigns you to one of ten classes. Your discount on flood insurance premiums is based on your class.

For example, if your community earns 4,500 points or more, it qualifies for Class 1, and property owners in the in the Special Flood Hazard Area (SFHA) get a 45% discount on their insurance premiums. If your community earns as little as 500 points, it's in Class 9, and property owners in the SFHA get a 5% discount. If a community does not apply or fails to receive at least 500 points, it's in Class 10, and property owners get no discount.

Table 1, below, shows the number of points required for each class and the corresponding discount.

Table 1.

How much discount property owners in your community can get

Rate Class	Discount for SFHA*	Discount for Non-SFHA**	Credit Points Required
1	45%	10%	4,500 +
2	40%	10%	4,000–4,499
3	35%	10%	3,500–3,999
4	30%	10%	3,000–3,499
5	25%	10%	2,500–2,999
6	20%	10%	2,000–2,499
7	15%	5%	1,500–1,999
8	10%	5%	1,000–1,499
9	5%	5%	500–999
10	0	0	0–499

* Special Flood Hazard Area

** Preferred Risk Policies are available only in B, C, and X Zones for properties that are shown to have a minimal risk of flood damage. The Preferred Risk Policy does not receive premium rate credits under the CRS because it already has a lower premium than other policies. Although they are in SFHAs, Zones AR and A99 are limited to a 5% discount. Premium reductions are subject to change.

Table 2.

What You Can Do to Get Credit

The CRS grants credit for 19 different activities that fall into four series:

Series 300	Public Information	Maximum Points*	Average Points *
	This series credits programs that advise people about the flood hazard, flood insurance, and ways to reduce flood damage. The activities also provide data insurance agents need for accurate flood insurance rating.		
310	**Elevation Certificates** • Maintain FEMA elevation certificates for new construction in the floodplain. (At a minimum, a community must maintain certificates for buildings built after the date of its CRS application.)	116	38
320	**Map Information Service** • Provide Flood Insurance Rate Map information to those who inquire, and publicize this service.	90	73
330	**Outreach Projects** • Distribute outreach projects with messages about flood hazards, flood insurance, flood protection measures, and/or the natural and beneficial functions of floodplains.	350	87
340	**Hazard Disclosure** • Real estate agents advise potential purchasers of flood-prone property about the flood hazard. • Regulations require notice of the hazard.	80	14
350	**Flood Protection Information** • The public library and/or community's website maintains references on flood insurance and flood protection.	125	38
360	**Flood Protection Assistance** • Give inquiring property owners technical advice on how to protect their buildings from flooding, and publicize this service.	110	55
370	**Flood Insurance Promotion** • Assess flood insurance coverage within the community and implement a plan to promote flood insurance.	110	39
	Series 300 Total	981	3448

*Maximum and average points are subject to change. See the current *CRS Coordinator's Manual* for the latest information.

Series 400	Mapping & Regulations	Maximum Points*	Average Points *
	This series credits programs that limit floodplain development or provide increased protection to new and existing development.		
410	**Floodplain Mapping** • Develop new flood elevations, floodway delineations, wave heights, or other regulatory flood hazard data for an area not mapped in detail by the flood insurance study. • Have a more restrictive mapping standard.	802	60
420	**Open Space Preservation** • Guarantee that currently open public or private floodplain parcels will be kept free from development. • Zone the floodplain for minimum lot sizes of 5 acres or larger.	2,020	509
430	**Higher Regulatory Standards** • Limit new buildings and/or fill in the floodplain. • Require freeboard. • Require soil tests or engineered foundations. • Require compensatory storage. • Require coastal construction standards in AE Zones. • Have regulations tailored to protect critical facilities or areas subject to special flood hazards (for example, alluvial fans, ice jams, subsidence, or coastal erosion).	2,042	270
440	**Flood Data Maintenance** • Keep flood and property data on computer records. • Use better base maps. • Maintain elevation reference marks.	222	115
450	**Stormwater Management** • Regulate new development throughout the watershed to ensure that post-development runoff is no greater than pre-development runoff. • Regulate new construction to minimize soil erosion and protect or improve water quality.	755	132
	Series 400 Total	5,841	1,086

Series 500	Flood Damage Reduction	Maximum Points*	Average Points *
	This series credits programs that reduce the flood risk to existing development.		
510	**Floodplain Management Planning** • Prepare, adopt, implement, and update a comprehensive flood hazard mitigation plan using a standard planning process. • Prepare an analysis of the repetitive flood loss areas within the community. *Note: category C repetitive loss communities must receive credit for either the floodplain management plan or the repetitive loss area analysis, above.* • Prepare, adopt, implement, and update a plan to protect natural functions within the community's floodplain.	622	175
520	**Acquisition and Relocation** • Acquire and/or relocate floodprone buildings so that they are out of the floodplain.	2,250	195
530	**Flood Protection** • Protect existing floodplain development by floodproofing, elevation, or minor flood control projects.	1,600	73
540	**Drainage System Maintenance** • Have a program for and conduct annual inspections of all channels and detention basins; remove debris as needed.	570	218
	Series 500 Total	5,042	661

Series 600	Flood Preparedness	Maximum Points*	Average Points *
	This series credits flood warning, levee safety, and dam safety projects.		
610	**Flood Warning and Response** • Provide early flood warnings to the public, and have a detailed flood response plan keyed to flood crest predictions.	395	254
620	**Levees** • Annually inspect and maintain existing levees; have a system for recognizing the threat of levee failure and/or overtopping, disseminating warnings, and providing emergency response; and coordinate with operators of critical facilities.	235	157
630	**Dams** • Have a high-hazard-potential dam that could affect the community; have a system for recognizing the threat of dam failure, disseminating warnings, planning and practicing emergency responses; and coordinating with operators of critical facilities.	160	35
	Series 600 Total	790	446
	All Series Total	12,654	2,537

Additional Credit

Your community can get additional credit for regulating development outside the SFHA to the same standards as development inside the SFHA. There is also credit for assessing future flood conditions, including the impacts of future development, urbanization, and changing weather patterns. See the *CRS Coordinator's Manual* for full details.

Many communities can qualify for what the CRS calls "state-based credit," based on the activities or regulations a state or regional agency implements within communities. For example, some states have disclosure laws eligible for credit under Activity 340 (Hazard Disclosure). Any community in those states can receive the state-based credit.

Your community may want to consider floodplain management activities not listed in the *CRS Coordinator's Manual.* You should evaluate these activities for their ability to increase public safety, reduce property damage, avoid economic disruption and loss, and protect the environment. In addition, you can request a review of these activities to determine whether they could be eligible for CRS credit. FEMA welcomes innovative ways to prevent or reduce flood damage.

How to Apply

Participation in the CRS is voluntary. If your community is in full compliance with the rules and regulations of the NFIP, you may apply. There's no application fee, and all CRS publications are free.

Your community's chief executive officer (your mayor, city manager, or other top official) must appoint a CRS coordinator to serve as the liaison between the community and FEMA. The coordinator should know the operations of all departments that deal with floodplain management and public information. And the coordinator should be able to speak for the community's chief executive officer.

To begin the application process, your community submits a letter of interest to your FEMA Regional Office and documents that you are implementing floodplain management activities that warrant at least 500 CRS credit points. On the CRS Resources website (www.CRSresources.org) you can find a sample letter; the CRS Quick Check, a tool that helps you assess your community's possible credit points; and further instructions.

You may also want to download from that website a copy of the *CRS Coordinator's Manual,* which describes the program in full and provides specific information, including eligible activities, required documentation, and resources for assistance.

Help is also available through the contact information below.

CRS-related materials and many more resources are available at the CRS Resources website and on FEMA's website (https://www.fema.gov/national-flood-insurance-program-community-rating-system).

After your community applies for a CRS classification, the CRS will verify the information and arrange for flood insurance premium discounts.

For more info, write, phone, or fax:

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