

**City of Carson City  
Agenda Report**

**Date Submitted:** August 5, 2011

**Agenda Date Requested:** August 18, 2011  
**Time Requested:** 10 minutes

**To:** Mayor and Supervisors

**From:** Public Works Department

**Subject Title:** For Possible Action: Action to introduce on First Reading Bill No. \_\_\_\_\_, An Ordinance amending Carson City Municipal Code Title 12 Water, Sewerage, and Drainage by revising Chapter 12.09 Flood Damage Prevention, by adding additional definitions and clarifying and modifying previous definitions of Section 12.09.020 Definitions, by amending Section 12.09.040 Declaration of Purpose, by correcting misused words and adding the additional purpose of maintaining qualifying standards for participation in the National Flood Insurance Program, and by clarifying the language of Section 12.09.050 Methods of Reducing Flood Losses, by amending Section 12.09.060 General Provisions, by adding three subsections: Declaration of Public Nuisance, Unlawful Acts, and Severability, by amending Section 12.09.070 Administration by changing the requirement of development approval to requiring a development permit before construction or development begins within any area of special flood hazard and by adding additional information which shall be on the application for a development permit and by adding the requirement of submission of new technical data to FEMA, by modifying the requirements of Section 12.09.080 by adding a freeboard requirement of two feet for lowest floor and new standards for recreational vehicles, standards for critical structures, and protection of floodplain storage capacity by amending Section 12.09.090 Variance Procedures, by clarifying the nature of variances, and by changing the name of Section 12.09.100 To Map Revision/Amendment Procedures, which clarifies and adds subsections consistent with FEMA procedures, and other matters properly related thereto. *(Robert Fellows)*

**Staff Summary:** This ordinance is to update the City's floodplain regulations to be consistent with FEMA guidelines and includes increasing floodplain standards.

**Type of Action Requested:** (check one)

Resolution                       Ordinance  
 Formal Action/Motion       Other (Specify)

**Does This Action Require A Business Impact Statement:**  Yes  No

**Recommended Board Action:** I move to introduce, on first reading, Bill No. \_\_\_\_\_, An Ordinance amending Carson City Municipal Code Title 12 Water, Sewerage, and Drainage by revising Chapter 12.09 Flood Damage Prevention, by adding additional definitions and clarifying and modifying previous definitions of Section 12.09.020 Definitions, by amending Section 12.09.040 Declaration of Purpose, by correcting misused words and adding the additional purpose of maintaining qualifying standards for participation in the National Flood Insurance Program, and by clarifying the language of Section 12.09.050 Methods of Reducing Flood Losses, by amending Section 12.09.060 General Provisions, by adding three subsections: Declaration of Public Nuisance, Unlawful Acts, and Severability, by amending Section 12.09.070 Administration by changing the requirement of development approval to requiring a development

permit before construction or development begins within any area of special flood hazard and by adding additional information which shall be on the application for a development permit and by adding the requirement of submission of new technical data to FEMA, by modifying the requirements of Section 12.09.080 by adding a freeboard requirement of two feet for lowest floor and new standards for recreational vehicles, standards for critical structures, and protection of floodplain storage capacity by amending Section 12.09.090 Variance Procedures, by clarifying the nature of variances, and by changing the name of Section 12.09.100 To Map Revision/Amendment Procedures, which clarifies and adds subsections consistent with FEMA procedures, and other matters properly related thereto.

**Explanation for Recommended Board Action:** To be in good standing with the State Floodplain guidelines and the National Floodplain Insurance Program, NFIP, each community must adopt a minimum floodplain management ordinance. As NFIP regulations change, so must each community ordinances change to be in compliance with the Federal rules.

The proposed Carson City ordinance amendment includes these higher standards: (a) the requirement for two (2) feet of freeboard from the base flood elevation to the lowest floor elevation; (b) a reduction in the allowable base flood elevation rise from one (1) foot to ninety-nine one hundredths (0.99) of a foot; and (c) the requirement for protection of flood volume capacity. Adopting higher standards has a two-fold effect, first effect is a reduction in flood damage to structures in flood zones. Less damage means less recovery time, less money spent to remove debris and make repairs. A faster recovery means citizens are able to get back to their normal routine which benefits the City in property and sales tax. The second effect is less money spent on flood insurance. Currently there are 658 policies in the City or \$504,109 in premiums for coverage of \$161,974,800. Structures in flood zones that have greater freeboard pay lower insurance rates plus get additional discounts based on the community's CRS rating.

Carson City participates in the Community Rating System, CRS, which rewards communities with insurance premium discounts. Currently, Carson City is a Class 6 community, (2040 points) which provide for 20 percent insurance premium discount. By adopting this amended Flood Damage Prevention ordinance with some higher regulatory standards, Carson City may receive an additional 370 points. To become a Class 5 community, 2500 points are needed which provides for a 25 percent insurance premium discount.

This ordinance update has been reviewed and presented to the public, engineers and contractors over the past several months with only one comment related to the cost of construction to comply with the freeboard requirement. Staff believes the long term benefits of reduced damage and less disruption outweigh the increased initial construction cost. The document was made available for public review at City Hall, the Library and the Permit Center as well as through the City's web site by emailed link.

**Applicable Statute, Code, Policy, Rule or Regulation:** NRS 278.020, 244A.057 and 543.020.

**Fiscal Impact:** No fiscal impact.

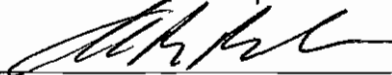
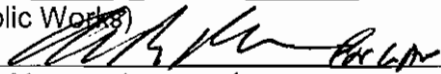
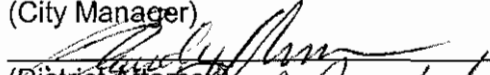
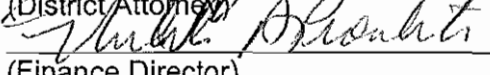
**Explanation of Impact:** N/A

**Funding Source:** N/A

**Alternatives:** Remove the modifications for higher regulatory standards and retain the minimum ordinance language.

**Supporting Material:** Proposed 12.09 Ordinance Update and the State Minimum Flood Plain Management Ordinance Document, (Model Ordinance), and email comment.

**Prepared By:** Robert Fellows, Floodplain Manager

**Reviewed By:**  Date: 8-9-11  
(Public Works)  
 Date: 8-9-11  
(City Manager)  
 Date: 8/9/11  
(District Attorney)  
 Date: 8/9/11  
(Finance Director)

**Board Action Taken:**

Motion: \_\_\_\_\_ 1) \_\_\_\_\_ Aye/Nay  
2) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Vote Recorded By)

Chapter 12.09 Flood Damage Prevention – Key to update

Words or text underlined is added text to the ordinance

~~[Words or text in brackets and strikethrough]~~ is deleted text from the ordinance

8/5/2011

ORDINANCE NO. \_\_\_\_\_  
BILL NO. \_\_\_\_\_

AN ORDINANCE AMENDING CARSON CITY MUNICIPAL CODE TITLE 12 WATER, SEWERAGE, AND DRAINAGE BY REVISING CHAPTER 12.09 FLOOD DAMAGE PREVENTION, BY ADDING ADDITIONAL DEFINITIONS AND CLARIFYING AND MODIFYING PREVIOUS DEFINITIONS OF SECTION 12.09.020 DEFINITIONS, BY AMENDING SECTION 12.09.040 DECLARATION OF PURPOSE, BY CORRECTING MISUSED WORDS AND ADDING THE ADDITIONAL PURPOSE OF MAINTAINING QUALIFYING STANDARDS FOR PARTICIPATION IN THE NATIONAL FLOOD INSURANCE PROGRAM, AND BY CLARIFYING THE LANGUAGE OF SECTION 12.09.050 METHODS OF REDUCING FLOOD LOSSES, BY AMENDING SECTION 12.09.060 GENERAL PROVISIONS, BY ADDING THREE SUBSECTIONS: DECLARATION OF PUBLIC NUISANCE, UNLAWFUL ACTS, AND SEVERABILITY, BY AMENDING SECTION 12.09.070 ADMINISTRATION BY CHANGING THE REQUIREMENT OF DEVELOPMENT APPROVAL TO REQUIRING A DEVELOPMENT PERMIT BEFORE CONSTRUCTION OR DEVELOPMENT BEGINS WITHIN ANY AREA OF SPECIAL FLOOD HAZARD AND BY ADDING ADDITIONAL INFORMATION WHICH SHALL BE ON THE APPLICATION FOR A DEVELOPMENT PERMIT AND BY ADDING THE REQUIREMENT OF SUBMISSION OF NEW TECHNICAL DATA TO FEMA, BY MODIFYING THE REQUIREMENTS OF SECTION 12.09.080 BY ADDING A FREEBOARD REQUIREMENT OF TWO FEET FOR LOWEST FLOOR AND NEW STANDARDS FOR RECREATIONAL VEHICLES, STANDARDS FOR CRITICAL STRUCTURES, AND PROTECTION OF FLOODPLAIN STORAGE CAPACITY BY AMENDING SECTION 12.09.090 VARIANCE PROCEDURES, BY CLARIFYING THE NATURE OF VARIANCES, AND BY CHANGING THE NAME OF SECTION 12.09.100 TO MAP REVISION/AMENDMENT PROCEDURES, WHICH CLARIFIES AND ADDS SUBSECTIONS CONSISTENT WITH FEMA PROCEDURES, AND OTHER MATTERS PROPERLY RELATED THERETO.

THE BOARD OF SUPERVISORS OF CARSON CITY, NEVADA, DO ORDAIN:

SECTION I:

That Title 12.09 of the Carson City Municipal Code is hereby amended as follows:

Chapter 12.09

FLOOD DAMAGE PREVENTION

Sections:

- 12.09.010 Short title.
- 12.09.020 Definitions.
- 12.09.025 Statutory Authorization
- 12.09.030 Findings of fact.
- 12.09.040 Declaration of purpose.
- 12.09.050 Methods of reducing flood losses.
- 12.09.060 General provisions.
- 12.09.070 Administration.
- 12.09.080 Provisions for flood hazard reduction.
- 12.09.090 Variance procedures.
- 12.09.100 ~~[Letter of map amendment.]~~Map Revision/Amendment Procedures.

12.09.010 Short title. This chapter of the Carson City Municipal Code shall be shown and cited as the Carson City Flood Damage Prevention Ordinance.

SECTION II:

That Title 12.09.020 of the Carson City Municipal Code is hereby amended as follows:

12.09.020 Definitions. As used in this chapter:

- 1. "Accessory use" means a use which is incidental and subordinate to the principal use of the parcel of land on which it is located.
- 2. "Alluvial fan" is an area subject to flooding when the floodplain is comprised of low flow channels where sediment accompanies the shallow flooding and the unstable soils scour and erode during a flooding event.
- 3. "Alluvial fan flooding" means flooding occurring on the surface of an alluvial fan or similar land form which originates at the apex and is characterized by high-velocity flows: active processes of erosion, sediment transport, deposition, and unpredictable flow paths.
- 4. "Anchoring" means a series of methods used to secure a structure to its footings or foundation wall so that it will not be displaced by flood or wind forces.
- 5. "Apex" means the highest point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.
- ~~[2-]~~6. "Appeal" is a request for a review of the Local Floodplain Administrator's interpretation of any provision of this chapter or a request for a variance.
- ~~[3-]~~7. "Area of shallow flooding" is a designated AO Zone on the Flood Insurance Rate Map. The base flood depths range from one (1') to three feet (3'); a clearly defined map

channel indeterminate; and, velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.

- [4.]8. "Base flood" is the flood having a one percent (1%) chance of being equalled or exceeded in any given year, also referred to as the "100-year flood."
- [5. ~~"Breakaway walls" are any type of walls, whether wood, metal, plastic or any other suitable building material which is not part of the structural support of the building and which is so designed as to break away under abnormally high tides or wave action without damage to the structural buildings to which they might be carried by floodwaters. A breakaway wall shall have a design safe loading resistance of not less than ten (10) and not more than twenty (20) pounds per square foot. Use of breakaway walls must be certified by a registered engineer or architect and shall meet the following conditions:~~
- ~~a. Breakaway wall collapse shall result from a water load less than that which would occur during the base flood;~~
  - ~~b. The elevated portion of the building shall not incur any structural damage due to the effects of wind and water loads acting simultaneously during a one hundred (100) year event.]~~
9. "Base flood elevation" (BFE) means the height in relation to mean sea level expected to be reached by the waters of the base flood at pertinent points in the floodplain of riverine areas.
10. "Basement" means any area of the building having its floor subgrade (below ground level) on all sides. A sub grade crawlspace is considered a basement unless it meets the minimum technical requirements defined in FEMA Technical Bulletin 11-01 (Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, 2001).
11. "Building" - See structure.
12. "Community" means any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or authorized native organization, which has authority to adopt and enforce flood plain management regulations for the areas within its jurisdiction.
13. "Community rating system" (CRS) means a program developed by FIA to provide incentives for those communities in the Regular Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.
14. "Conditional letter of map amendment" (CLOMA) means a letter from FEMA stating that a proposed structure that is not to be elevated by fill would not be inundated by the base flood if built as proposed.
15. "Conditional letter of map revision" (CLOMR) means procedures by which contractors, developers and communities can request review and determination by the Federal Insurance Administrator of scientific and technical data for a proposed project, when complete and functioning effectively would modify the elevation of individual structures and parcels of land, stream channels, and floodplains on the FIRM.
16. "Conditional letter of map revision (based on fill)" (CLOMR-F) means a letter from FEMA stating that a parcel of land or proposed structure that is to be elevated by fill would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.
17. "Critical structures" means any structure for which even a slight chance of flooding would reduce or eliminate its designed function of supporting a community in an emergency. Fire stations, hospitals, municipal airports, police stations, communication antennas or towers, elder care facilities (retirement homes) fuel storage facilities,

schools designated as emergency shelters, fresh water and sewage treatment facilities are some examples of critical structures.

18. “Date of construction” means the date that the building permit was issued provided the actual start of construction, repair, reconstruction, or improvement was within 180 days of the permit date.
19. “Designated floodway” means the channel of a stream and the portion of the adjoining floodplain designated by a regulatory agency to be kept free of further development to provide for unobstructed passage of flood flows.
- [6]20. ~~“Development” [is any man-made change to improved or unimproved real estate, filling, grading, paving, excavation or drilling operations located within the areas of special flood hazard.] means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within special flood hazard area.~~
21. “Digital flood insurance rate map” (DFIRM) means the official map, in digital format, on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community. The DFIRM is the legal equivalent of the FIRM in communities where a DFIRM is available (See Flood Insurance Rate Map).
22. “Dry floodproofing” means a floodproofing method used to design and construct buildings so as to prevent the entrance of floodwaters.
23. “Elevation certificate” means the elevation certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), for flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The elevation certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM Flood insurance rules.
24. “Enclosure” means that portion of an elevated building below the lowest elevated floor that is either partially or fully shut-in by rigid walls.
25. “Encroachment” means the advance or infringement of uses, plant growth, excavation, fill, buildings, permanent structures or development, storage of equipment and materials, or any other physical object placed in the floodplain, that hinders the passage of water or otherwise affects flood flows.
- [7]26. ~~“Existing manufactured home park or manufactured home subdivision” means a [parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale for which the construction of facilities for servicing the lots on which the manufactured home is to be affixed (including, at a minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets)] manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the ordinance codified in this chapter.~~
- [8]27. “Expansion to an existing manufactured home park or manufactured home subdivision” is the preparation of additional sites by the construction of facilities for serving the lots on which the manufactured homes are to be affixed (including the installation of utilities, either final site grading or pouring of concrete pads, or the construction of streets).
28. “Federal Emergency Management Agency” (FEMA) is the federal agency under which



- the National Flood Insurance Program (NFIP) is administered.
29. "Federal Insurance Administration" (FIA) is the government unit, a part of Federal Emergency Management Agency (FEMA), that administers the National Flood Insurance Program (NFIP).
30. "Flash flood" means a flood that crests in a short period of time and is often characterized by high velocity flows. It is often the result of heavy rainfall in a localized area.
- [9. ~~"Flood" or "flooding" is a general and temporary condition of partial or complete covering of normally dry land areas from:~~
- ~~a. The overflow of inland or tidal waters; and/or~~
- ~~b. The unusual and rapid accumulation of runoff of surface waters from any source.]~~
31. "Flood, flooding or flood waters" means a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of floodwaters; the unusual and rapid accumulation or runoff of surface waters from any source and mudslides (i.e., mudflows) and the condition resulting from flood-related erosion.
32. "Flood control" means keeping flood waters away from specific developments or populated areas, areas by the construction of flood storage reservoirs, channel alterations, dikes and levees, bypass channels, or other engineering works.
- [10. ~~"Flood Boundary Floodway Map" is the official map on which the Federal Insurance Administration has delineated both the areas of flood hazard and the floodway.]~~
33. "Flood Hazard Boundary Map" (FHBM) is an official map of a community, issued by the Administrator, where the boundaries of the flood, mudslide (i.e., mudflow) related erosion areas having special hazards have been designated as Zones A, M, and /or E.
- [11. ~~"Flood Insurance Rate Map (FIRM)" is the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.]~~
34. "Flood Insurance Rate Map" (FIRM) is the official map on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community. Includes Digital Flood Insurance Rate Map (DFIRM) in communities where a DFIRM is available (See Digital Flood Insurance Rate Map).
- [12]35. "Flood Insurance Study" is the official report provided by the Federal Emergency Management Agency that includes flood profiles, the Flood Insurance Rate Map (FIRM), the Flood Boundary Floodway Map, and the water surface elevation of the base flood.
36. "Floodplain and flood-prone area" means any land area susceptible to being inundated by waters from any source. (also See Flooding).
37. "Floodplain management" is the operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing, where possible, natural resources in the floodplain, including but not limited to emergency preparedness plans, flood control works and floodplain management plans, regulations and ordinances.
38. "Floodplain management regulations" means this chapter, and any federal, state or local regulations plus community zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a grading

and erosion control) and other applications of police power which control development in flood-prone areas to prevent and reduce flood loss and damage.

- [13]39. "Floodproofing" means ~~[any combination of structural and nonstructural additions, changes or adjustments to nonresidential structures which reduce or eliminate flood damage to real estate or improved property.]~~ any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved property, water and sanitary facilities, structures and their contents. Refer to FEMA Technical Bulletins TB-1 (Openings in Foundation Walls and Walls of Enclosures, 2008), TB-3 (Non-residential Floodproofing – Requirements and Certification, 1993), and TB-7 (Wet Floodproofing Requirements, 1993) for Guidelines on dry and wet floodproofing.
- [14]40. "Flood-related erosion" is a condition that exists in conjunction with a flooding event that alters the composition of the shoreline or bank of a watercourse. It is a condition that increases the possibility of loss due to the erosion of the land area adjacent to the shoreline or watercourse.
- [15]41. "Floodway" means the channel or a river or other watercourse and the adjacent land area that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than ~~[one foot (1')]0.99 foot.~~ [The floodway is delineated on the Flood Boundary Floodway Map.]
42. "Flood Insurance Risk Zone Designations" are the zone designations indicating the magnitude of the flood hazard in specific areas of a community. See Special Flood Hazard Area.
43. "Zone A" means Special Flood Hazard Areas inundated by the 100-year flood; base flood elevations are not determined.
44. "Zone A1-30 and Zone AE" means Special Flood Hazard Areas inundated by the 100-year flood; base flood elevations are determined.
45. "Zone AO" means Special Flood Hazard Areas inundated by the 100-year flood; with flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths are determined. For areas of alluvial fan flooding, velocities are also determined.
46. "Zone AH" means Special Flood Hazard Areas inundated by the 100-year flood; flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations are determined.
47. "Zone AR" means Special Flood Hazard Areas that result from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection.
48. "Zones AR / A1-30, AR / AE, AR / AH, AR / AO, and AR / A" means Special Flood Hazard Areas that result from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection. After restoration is complete, these areas will still experience residual flooding from other flooding sources.
49. "Zone A99" means Special Flood Hazard Areas inundated by the 100-year flood to be protected from the 100-year flood by a Federal flood protection system under construction; no base flood elevations determined.
50. "Zone B and Zone X (shaded)" means Areas of 500-year flood; areas subject to the 100-year flood with average depths of less than 1 foot or with contributing drainage area less than 1 square mile; and areas protected by levees from the base flood.
51. "Zone C and Zone X (unshaded)" means Areas determined to be outside the 500-year floodplain.
52. "Zone D" means Areas in which flood hazards are undetermined.
53. "Footing" means the enlarged base of a foundation wall, pier, or column, designed to

- spread the load of the structure so that it does not exceed the soil bearing capacity.
54. “Foundation” means the underlying structure of a building usually constructed of concrete that supports the foundation walls, piers, or columns.
55. “Foundation walls” means a support structure that connects the foundation to the main portion of the building or superstructure.
56. “Freeboard” means a margin of safety usually expressed in feet above a flood level for purposes of flood plain management. Freeboard tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.
57. “Functionally dependent use” means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only marina facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and boat building and boat repair facilities, but does not include long-term storage or related manufacturing facilities.
58. “Governing body” means the local governing unit, county or municipality that is empowered to adopt and implement regulations to provide for public health, safety and general welfare of its citizenry.
59. “Hardship” is related to Variances of this chapter. The exceptional hardship would result from a failure to grant the requested variance. The Board of Supervisors requires the variance be exceptional, unusual, and pertain only to the property involved. Mere economic or financial hardship alone is not exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.
60. “Highest adjacent grade” means the highest natural elevation of ground surface prior to construction next to the proposed walls of a structure or the highest ground surface next to the structure.
61. “Historic structure” means any structure that is:
- a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
  - b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
  - c. Individually listed on a State inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or
  - d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either by an approved State program as determined by the Secretary of the Interior or directly by the Secretary of the Interior in states without approved programs.
62. “Hydrodynamic loads” are forces imposed on structures by floodwaters due to the impact of moving water on the upstream side of the structure, drag along its sides, and eddies or negative pressures on its downstream side.
63. “Hydrostatic loads” are forces imposed on a flooded structure due to the weight of the water.

64. “Letter of map amendment” (LOMA) is the procedure by which any owner or lessee of property who believes his property has been inadvertently included in a Special Flood Hazard Area can submit scientific and technical information to the Federal Insurance Administrator for review to remove the property from said area. The Administrator will not consider a LOMA if the information submitted is based on alteration of topography or new hydrologic or hydraulic conditions since the effective date of the FIRM.
65. “Letter of map revision” (LOMR) is an official revision to a currently effective FIRM. A LOMR officially changes flood zone, floodplain and floodway designations, flood elevations and planimetric features.
66. “Letter of map revision (based on fill)” (LOMR-F) is a letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the base flood.
67. “Levee” means a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.
- [16]68. “Lowest floor” means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure [is not built so as to render the structure in violation of the applicable nonelevation design requirements of this chapter.] does not violate applicable non-elevation design requirements.
- [17]69. “Hazard mitigation plan” is a plan that incorporates a process whereby the potential of future loss due to flooding can be minimized by planning and implementing alternatives to floodplain management community-wide.
- [18. ~~“Highest grade” means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.~~]
- [19. ~~“Manufactured home” means a structure, transportable in one (1) or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term “manufactured home” also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than one hundred eighty (180) consecutive days. For insurance purposes the term “manufactured home” does not include park trailers, travel trailers, and other similar vehicles placed on a site for less than one hundred eighty (180) days.~~]
70. “Manufactured home” (mobile home) means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term “manufactured home” does not include “recreational vehicles”.
71. “Manufactured home park or subdivision” means a parcel or contiguous parcels of land divided into two or more manufactured home lots for rent or sale.
72. “Market value” is for the purposes of determining substantial improvement, market value pertains only to the structure in question. It does not pertain to the land, landscaping or detached accessory structures on the property. For determining improvement, the value of the land must always be subtracted.

Acceptable estimates of market value can be obtained from the following sources:

- a. Independent appraisals by a professional appraiser; or
- b. Detailed estimates of the structure's Actual Cash Value (used as a substitute for

market value based on the preference of the community); or

c. Property appraisals used for tax assessment purposes (Adjusted Assessed Value; used as a screening tool); or

d. The value of buildings taken from NFIP claims data (used as a screening tool); or.

e. "Qualified estimates" based on sound professional judgment made by staff of the local building department or local or State tax assessor's office.

As indicated above, some market value estimates should only be used as screening tools to identify those structures where the substantial improvement ratios are obviously less than or greater than 50% (e.g., less than 40% or greater than 60%). For structures that fall between the 40% and 60% range, more precise market value estimates should be used.

~~[20. "Area of special flood hazard" means the land in the floodplain within Carson City subject to a one percent (1%) or greater chance of flooding in any given year. Designation on maps always includes the letters AO or AH.]~~

73. "Mobile home" has the same meaning as manufactured home.

74. "Natural grade" means the grade unaffected by construction techniques such as fill, landscaping, or berming.

~~[21]~~75. "New construction" means structures for which the "start of construction" commenced on or after the effective date of the ordinance codified in this chapter.

76. "New manufactured home (mobile home) subdivision" means a manufactured home park or subdivision for which the construction of construction of facilities for servicing the lots on which the manufactured homes are to be affixed including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads is completed on or after the effective date of these floodplain management regulation adopted by the Board of Supervisors.

~~[22. "New manufactured home park or manufactured home subdivision" is a parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale for which the construction of facilities or servicing the lot (including, at the minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets) is completed on or after the effective date of the ordinance codified in this chapter.]~~

77. "Non-residential" includes, but is not limited to: small business concerns, churches, schools, farm buildings (including grain bins and silos), poolhouses, clubhouses, recreational buildings, mercantile structures, agricultural and industrial structures, warehouses, and hotels or motels with normal room rentals for less than 6 months duration.

78. "Obstruction" includes, but is not limited to, any dam, wall, wharf, embankment, levee, dike, pile, abutment, protection, excavation, channelization, bridge, conduit, culvert, building, wire, fence, rock, gravel refuse, fill, structure, vegetation or other material in, along, across or projecting into any watercourse which may alter, impede, retard or change the direction and or velocity of the flow of water, or due to its location, its propensity to snare or collect debris carried by the flow of water, or its likelihood of being carried downstream.

79. "One-hundred year-flood" has the same meaning as base flood.

80. "Physical map revisions" (PMR) is a reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects large scope changes.

81. "Ponding hazard" is a flood hazard that occurs in flat areas when there are depressions in the ground that collect "ponds" of water. The ponding hazard is represented by the zone designation AH on the FIRM.
82. "Post-FIRM construction" means construction or substantial improvement that started on or after the effective date of the initial Flood Insurance Rate Map (FIRM) of the community or after December 31, 1974, whichever is later.
83. "Pre-FIRM construction" means construction or substantial improvement which started on or before December 31, 1974 or before the effective date of the initial Flood Insurance Rate Map (FIRM) of the community, whichever is later.
84. "Principal residence" is a single family dwelling in which at the time of loss, the named insured or the named insured's spouse has lived for either (1) 80 percent of the calendar year, or (2) 80 percent of the period of ownership, if less than 1 year.
85. "Proper openings for enclosures"(Applicable to Zones A, A1-A30, AE, AO, AH, AR, and AR Dual) relates to all enclosures below the lowest floor must be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. A minimum of two openings, with positioning on at least two walls, having a total net area of not less than 1 square inch for every square foot of enclosed area subject to flooding must be provided.
86. "Public safety" relates to granting of a variance, the variance must not result in anything which is injurious to safety or to health of people, neighborhoods or community.
87. "Public nuisance" relates to any person that unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, above or below ground channel, swale, stream, canal, or basin.
88. "Recreational vehicle" means a vehicle built on a single chassis, 400 square feet or less when measured at the largest horizontal projection, designed to be self-propelled or permanently towable by a light-duty track, and designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.
89. "Special Flood Hazard Area"(SFHA) is Darkly shaded area on a Flood Hazard Boundary Map (FHBM) or a Flood Insurance Rate Map (FIRM) that identifies an area that has a 1- percent chance of being flooded in any given year (100-year floodplain). Over a 30-year period, the life of most mortgages, there is at least a 26 percent chance that this area will be flooded. The FIRM identifies these shaded areas as FIRM Zones A, AO, AH, A1-A30, AE, A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO, V, V1-V30, and VE. See Flood Insurance Risk Zone Designations
- [23. "Start of construction" is the first placement of permanent construction of a structure (other than a manufactured home) on a site, such as the pouring of slabs or footings or any work beyond the state of excavation. Permanent construction does not include land preparation, such as clearing, grading, and filling, nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundation or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not as part of the main structure. For a structure (other than a manufactured home) without a basement or poured footings, the "start of construction" includes the first permanent framing or assembly of the structure or any part thereof on its piling or foundation. For manufactured homes not within a manufactured home park or manufactured home subdivision, "start of construction" means the affixing of the manufactured home to its permanent site. For manufactured homes within manufactured home parks or manufactured home subdivisions "start of construction" means the date

on which the construction of facilities for servicing the site on which the manufactured home is affixed (including, at a minimum the construction of streets, either final site grading, or the pouring of concrete pads, and installation of utilities) is completed.]

90. "Start of construction" includes substantial improvement and other proposed new development and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days from the date of the permit. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.
- [24]91. "Structure" is a walled and roofed building [~~or manufactured home that is principally above ground.~~] or manufactured home that is principally above ground. A structure may be a gas or a liquid storage tank.
92. "Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
- [25. "Substantial improvement" means any repair, reconstruction, or improvement to a structure, the cost of which equals or exceeds fifty percent (50%) of the market value of the structure either:
- a. Before the improvement or repair is started; or
  - b. If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. This term does not, however, include either:
    - (1) Any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions; or
    - (2) Any alteration of a structure listed on the National Register of Historic Places or State Inventory of Historic Places.]
93. "Substantial improvement" means any reconstruction, rehabilitation, addition, or other proposed new development of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include either:
- a. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum

- necessary to assure a safe living conditions, or
- b. Any alteration of a "historic structure" provided that the alteration will not preclude the structure's continued designation as a "historic structure."
- [26.]94. "Variances" means a grant of relief from the requirements of this chapter which permits construction in a manner that would otherwise be prohibited by this chapter.
95. "Violation" means the failure of a structure or other development to be fully compliant with this chapter. A structure or other development in a special flood hazard area, without an elevation certificate, other certifications or other evidence of compliance required in this chapter is presumed to be in violation until such time as that documentation is provided.
96. "Water surface elevation" means the height, in relation to the North American Vertical Datum (NAVD) of 1988, or (other datum, where specified) of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.
97. "Watercourse" means a lake, river, creek, stream, wash, arroyo, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.
98. "2010 Carson City Control Network" means the record of survey map recorded on August 11, 2010, as map number 2749, document number 403435 in the office of Recorder, Carson City, Nevada.

12.09.025 Statutory Authorization. The legislature of the State of Nevada in Nevada Revised Statutes 278.020, 244A.057, and 543.020 confers upon local government units authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the Board of Supervisors of Carson City does hereby adopt the following floodplain management regulations.

12.09.030 Findings of fact.

1. That the flood hazard areas of Carson City are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.
2. That these flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

SECTION III:

That Title 12.09.040 of the Carson City Municipal Code is hereby amended as follows:

- 12.09.040 Declaration of purpose. It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:
1. To protect human life and health;
  2. To minimize expenditure of public money for costly flood-control projects;
  3. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;



4. To minimize prolonged business interruptions;
5. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
6. To help maintain a stable tax base by providing for the ~~[second-]~~ sound use and development of areas of special flood hazard so as to minimize future blight areas;
7. To ~~[insure-]~~ ensure that potential buyers are notified that property is in an area of special flood hazard; and
8. To ~~[insure-]~~ ensure that those who occupy the areas of special flood hazard assume responsibility for their actions; and-
9. To maintain qualifying standards for participation in the National Flood Insurance Program.

#### SECTION IV:

That Title 12.09.050 of the Carson City Municipal Code is hereby amended as follows:

- 12.09.050      Methods of reducing flood losses. In order to accomplish its purposes, this chapter includes methods and provisions for:
1. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
  2. Requiring that land uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
  3. Controlling the alteration of natural floodplains, stream channels and natural protective barriers, which help accommodate or channel floodwaters;
  4. Controlling, filling, grading, dredging, and other development which may increase flood damage; and
  5. Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

#### SECTION V:

That Title 12.09.060 of the Carson City Municipal Code is hereby amended as follows:

- 12.09.060      General provisions. The general provisions of this chapter are as follows:
1. Lands to [W]which this Chapter Applies. This chapter shall apply to all areas of special flood hazards within the jurisdiction of Carson City.
  2. Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard identified by the Federal Insurance Administration, through the Federal Emergency Management Agency in the Flood Insurance Study (FIS), with the accompanying Flood Insurance Rate Maps (FIRM), dated ~~[October 16, 1996]~~ March 4, 1986 and all subsequent amendments and/or revisions, -are hereby adopted by reference and declared to be a part of this chapter. The Flood Insurance Study is on file at the Development Services - Engineering for Carson City in its offices of record for public reference and review.
  3. Compliance. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this

chapter and other applicable regulations. Violations of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this chapter or fails to comply with any of its requirements shall upon conviction be guilty of a misdemeanor of each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent Carson City from taking such other lawful actions as is necessary to prevent or remedy any violation.

4. Abrogation and Greater Restrictions. This chapter is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. However, where the ordinance codified in this chapter and another chapter, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.
5. Interpretation. In the interpretation and application of this chapter, all provisions shall be:
  - a. Considered as minimum requirements;
  - b. Liberally construed in favor of the governing body; and
  - c. Deemed neither to limit nor repeal any other powers granted under state statutes.
6. Warning and Disclaimer of Liability. The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man--made or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such area will be free from flooding or flood damages. This chapter shall not create liability on the part of Carson City, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result reliant on this chapter or any administrative decision lawfully made[~~thereunder~~]hereunder.
7. Declaration of Public Nuisance. Every new structure, building, fill, excavation or development located or maintained within any area of special flood hazard after March 4, 1986 is in violation of this chapter and considered a public nuisance per se and may be abated, prevented or restrained by action of this political subdivision.
8. Unlawful Acts. It is unlawful for any person to divert, retard or obstruct the flow of waters in any watercourse whenever it creates a hazard to life or property without securing the appropriate local, state and/or Federal permit(s). Any person violating the provisions of this section shall be guilty of a misdemeanor.
9. Severability. This chapter and the various parts thereof are hereby declared to be severable. Should any section of this ordinance be declared by the courts to be unconstitutional or invalid, such decisions shall not affect the validity of the chapter as a whole, or any portion thereof other than the section so declared to be unconstitutional or invalid.

#### SECTION VI:

That Title 12.09.070 of the Carson City Municipal Code is hereby amended as follows:

## 12.09.070

Administration. This chapter shall be administered as follows:

1. Establishment of Development [~~Approval~~]Permit. A development [~~approval~~] permit shall be obtained before construction or development begins within any area of special flood hazard established pursuant to this chapter. The [~~approval~~] permit shall be for all structures including manufactured homes, and for all development including fill and other activities.  
Application for a development [~~approval~~]permit shall be made on forms furnished by the [~~Local Floodplain Administrator~~]Permit Center and may include, but not be limited to: plans in duplicate scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:
  - a. Proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all residential and non-residential structures whether new or substantially improved to be located in Zones A, AI-A30, AE, and AH, if base flood elevations data are available[Proposed elevation in relation to mean sea level of the lowest floor (including basement) of all structures; in Zone AO elevation of existing grade and proposed elevation of lowest floor of all structures];
  - b. Proposed elevation in relation to mean sea level to which any new or substantially improved non-residential structure will be floodproofed;
  - c. Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure and/or any utility meets the floodproofing criteria; [and]
  - d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development. When a watercourse will be altered or relocated as a result of the proposed development, the applicant must submit the maps, computations, and other materials required by the Federal Emergency Management Agency (FEMA) to process a Letter of Map Revision (LOMR) and pay any fees or other costs assessed by FEMA for processing the revision;
  - e. In Zone AO the proposed elevation in relation to mean sea level, of the lowest floor (including basement) and the elevation of the highest adjacent grade of all residential and non-residential structures whether new or substantially improved;
  - f. A technical analysis, by a professional engineer licensed in the State of Nevada, showing the proposed development located in the special flood hazard area will not cause physical damage to any other property; and
  - g. When there is no base flood elevation data available for Zone A from any source, the base flood elevation data will be provided by the permit applicant for all proposed development of subdivisions, manufactured home and recreational vehicle parks in the special flood hazard areas, for all developments of 50 lots or 5 acres, whichever is less.
  - h. Basis of elevation for floodplain analysis and certificates shall use the 2010 Carson City Control Network vertical data.
2. Designation of the Local Floodplain Administrator. The City Engineer or his designee [-]is hereby appointed to administer and implement this chapter by granting or denying development applications in accordance with its provisions.
3. Duties and Responsibilities of the Administrator. The duties and responsibilities

of the administrator shall include, but not be limited to:

- a. Permit Review.
  - (1) Review of development applications to determine that the requirements of this chapter have been satisfied;:-
  - (2) Review of all applications to determine that the site is reasonably safe from flooding;:-
  - (3) Review of all development applications to determine if the proposed development in the Special Flood Hazard Area may result in physical damage to any other property to include stream bank erosion and any increase in velocities or that it does not adversely affects the flood-carrying capacity of the area where base flood elevations have been determined but a floodway has not been designated.~~[of special flood hazard.]~~ For purposes of this chapter, "adversely affected" means that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than ~~[one-]0.99~~ foot~~[-(1)]~~ at any point. To assist the Local Floodplain Administrator in making this determination, the permit applicant may be required to submit additional technical analyses;
  - (4) Review of all proposals for the development of five (5) parcels or more to assure that the flood discharge exiting the development after construction is equal to or less than the flood discharge at the location prior to development;:-
  - (5) Review all development applications to determine that all necessary permits have been obtained from those federal, state, or local governmental agencies from which prior approval is required;:- and
  - (6) Verify that vertical elevations used for any analysis or certificate is from the 2010 Carson City Control Network vertical data.
- b. Use of Other Base Flood Data.
  - (1) When base flood elevation data has not been provided, the -Local Floodplain Administrator shall obtain, review, and reasonably utilize the best base flood data available from any source: federal, state, or other; such as high water marks(s), floods of record, or private engineering reports, in order to administer this chapter and provide the developer with an estimated base flood elevation.
  - (2) Multiple parcels (five (5) or more) will be required to have all proposals establish the 100-year base flood elevation before consideration of the tentative plan for development. The Local Floodplain Administrator may, at his/her discretion, require standards exceeding those identified in this chapter. Any higher standards above those in this chapter shall be adopted by the Board of Supervisors.
- c. Information to be Obtained and Maintained. The Local Floodplain Administrator shall obtain and retain for public inspection and have

available for the National Flood Insurance Program coordinator or the Federal Emergency Management Agency representative conducting a Community Assistance Visit, the following: ~~[The Local Floodplain Administrator shall obtain and maintain for public inspection and make available as needed for flood insurance policies:]~~

- (1) ~~Floodplain development permits and certificates of compliance. [The certification required in this chapter; and]~~
- (2) ~~Elevation Certificates with record of certification required by for Lowest Floor Certification. [Certification of the elevation of the lowest floor, floodproofed elevation, or the elevation of the structure's lowest horizontal member is required at that point where the footings are set and slab poured. Failure to submit elevation certification shall be cause to issue a stop work order for the project. As-built plans certifying the elevation of the lowest adjacent grade are also required.]~~
- (3) ~~Certifications required for Nonresidential Floodproofing. [If fill is used to elevate a structure above the base flood elevation, the permit holder may wish to apply for a letter of map amendment (LOMA), as set forth in this chapter.]~~
- (4) ~~Elevation Certificates with record of certification required for Areas Below the Lowest Floor.~~
- (5) ~~Elevation Certificates with record of certification of elevation required for Subdivisions.~~
- (6) ~~Certification required for Floodways.~~
- (7) ~~Variances issued pursuant to Variance Procedures.~~
- (8) ~~Notices required under Alteration of Watercourses.~~

d. ~~Alteration of Watercourse. Prior to issuing a permit for any alteration or relocation of watercourse the Local Floodplain Administrator must: [It is the responsibility of the Local Floodplain Administrator to:]~~

- (1) ~~Notify all adjacent communities, Nevada's National Flood Insurance Program Coordinator, and submittal of evidence of such notification to the Federal Insurance Administration, and the Federal Emergency Management Agency; [Notify adjacent communities, when applicable, and the state of Nevada Water Resources Division prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency.]~~
- (2) ~~Determine that the potential permit recipient has provided for maintenance within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished; and [It is required that the flood carrying capacity of the altered or relocated portion of said watercourse be maintained by the community.]~~
- (3) ~~Have received a Conditional Letter of Map Revision (CLOMR) determination from FEMA.~~
- (4) ~~Provide funds from the Developer to the City for processing the Letter of Map Revision (LOMR).~~
  - a. ~~Funds shall be in United States currency.~~
  - b. ~~The amount of the funds shall be determined by an~~

independent professional firm and shall include data collection, modeling, document research and preparation, FEMA processing fees, and filing of FEMA forms. The cost of the estimate will be split by the City and the Developer.

- c. Once the funds are agreed upon and collected by the City, there will be no further obligation from the Developer for the LOMR.
- e. Interpretation of Flood Insurance Rate Map (FIRM) Boundaries. The Local Floodplain Administrator or his designee ~~[will]~~may provide interpretations, where needed, as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). ~~[The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in this chapter.]~~
- f. Maintenance of Flood Protection Measures. The maintenance of any and all flood protection measures (levees, dikes, dams, or reservoirs) will be required of the jurisdiction where such measures provide protection. If these measures are privately owned, an operation or maintenance plan will be required of the owner to be on file with Development Services. Carson City is required to acknowledge all maintenance plans by the adoption of such plans by ordinance.
- g. Hazard Mitigation Plan. The planning commission and board of supervisors shall be responsible for reviewing all proposals for new development and shall weigh all requests for future floodplain development against the city's master plan. Consideration of the following elements are required before approval:
- (1) Determination of whether or not a proposed development is in or affects a known floodplain.
  - (2) Inform the public of the proposed activity.
  - (3) Determine if there is a practicable alternative or site for the proposed activity.
  - (4) Identify impact of the activity on the floodplain.
  - (5) Provide a plan to mitigate the impact of the activity.
- h. Submission of New Technical Data to FEMA. When Carson City base flood elevations either increase or decrease resulting from physical changes affecting flooding conditions, as soon as practicable, but not later than six months after the date such information becomes available, Carson City will submit the technical or scientific data to FEMA. Such submissions are necessary so that upon confirmation of the physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.

#### SECTION VII:

That Title 12.09.080 of the Carson City Municipal Code is hereby amended as follows:

- 12.09.080      Provisions for flood hazard reduction.  
 1.            Standards for Construction. In all areas of special flood hazard, the following

standards are required:

- a. Anchoring.
  - (1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy; and
  - (2) All manufactured homes shall meet the anchoring standards for Manufactured Homes.~~[All manufactured home units shall be anchored to prevent flotation, collapse or lateral movement, and shall be installed using methods and practices that minimize flood damage.]~~
- b. Construction Materials and ~~[methods]~~Methods.
  - (1) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
  - (2) All new construction and substantial improvements shall use methods and practices that minimize flood damage.
  - (3) All elements that function as a part of the structure, such as electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities shall be located so as to prevent water from entering or accumulating within the components during conditions of flooding~~[such as furnace, hot water heater, air conditioner, etc., shall be elevated to or above the base flood elevation or depth number specified on the Flood Insurance Rate Map (FIRM).]~~
  - (4) Within Zones AH or AO, improvements shall provide adequate drainage paths around structures on slopes to guide flood waters around and away from proposed structures.
- c. Elevation ~~[and Floodproofing.]~~Requirements for Lowest Floor
  - (1) In Zone AO, elevated above the highest adjacent grade to a height 2 feet above the depth number specified in feet on the FIRM, or elevated at least three feet above the highest adjacent grade if no depth number is specified.~~[New construction and substantial improvement of any structure shall have the bottom of the lowest floor beam or basement floor elevated to or above the base flood elevation. Nonresidential structures will meet the standards in this chapter. New construction or substantial improvements for residential and nonresidential construction shall be approved by the director of public works. Upon completion of the structure, the elevation of the lowest floor, including the basement, shall be certified by a registered professional surveyor that the elevation requirements have been met. Notification of compliance shall be required as set forth in this chapter.]~~
  - (2) In Zone A, elevated 2 feet above the base flood elevation, as determined by Local Floodplain Administrator.~~[New construction and substantial improvement to any residential structure in an area of shallow flooding including a Zone AO shall have the bottom of the lowest floor beam or basement floor elevated to or above the depth number specified on the Flood Insurance Rate Map (FIRM). If there is no depth number on the Flood Insurance Rate Map (FIRM), the bottom of the lowest floor beam~~

or basement floor shall be elevated to a depth of one foot (W) above the highest adjacent grade. Nonresidential structures will meet standards in this chapter. Upon completion of the structure, compliance to the elevation requirement shall be certified by a registered surveyor. Notification of compliance shall be recorded as set forth in this chapter.]

- (3) In all other zones, elevated at least 2 feet above the base flood elevation. [Nonresidential construction shall either be elevated in conformance with this chapter or together with attendant utility and sanitary facilities, be floodproofed to the base flood elevation.
- (a) Where a structure is floodproofed:
- (1) Either a registered professional engineer or architect shall certify that the design and methods of construction are in accordance with accepted standards of practice for floodproofing;
  - (2) A record of such certificates which includes the specific elevation in relation to mean sea level to which such structures are floodproofed shall be maintained as set forth in Section 12.09.070(3)(c).
- (b) Where a structure is elevated, compliance to the elevation requirement shall be certified as set forth in subsection (1)(c)(2) of this section.

Examples of floodproofing include, but are not limited to:

- (a) Installation of watertight doors, bulkheads, and shutters;
- (b) Reinforcement of walls to resist water pressure;
- (c) Use of paints, membranes, or mortars to reduce seepage through walls;
- (d) Addition of mass or weight to structure to resist flotation;
- (e) Armour protection of all fill materials from scour and/or erosion;
- (f) Certification by a registered professional engineer or architect that the standards of this subsection are satisfied. Such certification shall be provided to the official set forth in this chapter.

(4) Manufactured homes shall meet the above standards and also the standards in this section.]

- d. Lowest Floor Certification Requirements. Upon completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional engineer or surveyor and verified by the community building inspector to be properly elevated. The certification shall be provided to the Floodplain Administrator using the current FEMA Elevation Certificate.
- e. Nonresidential Floodproofing Requirements. Nonresidential construction shall either be elevated to conform with Elevation Requirements for Lowest Floor or together with attendant utility and sanitary facilities:
- (1) Will be floodproofed below the elevation recommended under Elevation Requirements for Lowest Floor so that the structure is watertight with walls substantially impermeable to the passage of water;
  - (2) Will have the structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
  - (3) Will be certified by a registered professional engineer or architect that the standards of Elevation Requirements for Lowest Floor are satisfied.



The certification shall be provided to the Local Floodplain Administrator.

- f. Requirements for Areas Below the Lowest Floor. All new construction and substantial improvements with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement shall follow the guidelines in FEMA Technical Bulletins TB-1 (Openings in Foundation Walls and Walls of Enclosures, 2008) and TB-7 (Wet Floodproofing Requirements, 1993) and must either be certified by a licensed professional engineer or architect to meet or exceed the following minimum criteria:
- (1) Must have a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding; and
  - (2) The bottom of all such openings will be no higher than one foot above the lowest adjacent finished grade.
- Openings may be equipped with louvers, valves, screens or other coverings or devices provided they permit the automatic entry and exit of floodwaters.
2. Standards for Alluvial Fans. Areas subject to alluvial-fan flooding have irregular flow paths that result in erosion of existing channels and the undermining of fill material. Those areas are identified on the Flood Insurance Rate Map (FIRM) as AO Zones with velocities.
- a. All structures must be securely anchored to minimize the impact of the flood and sediment damage.
  - b. All new construction and substantial improvements must be elevated on pilings, columns, or armoured fill so that the bottom lowest floor beam is elevated at or above the depth number.
  - c. Use of all fill materials must be armoured to protect the material from the velocity of the flood flow.
  - d. All proposals for subdivision development must provide a mitigation plan that identifies the engineering methods used to:
    - (1) Protect structures from erosion and scour caused by the velocity of the flood flow;
    - (2) Capture or transport flood and sediment flow through the subdivision to a safe point of disposition.
  - e. All manufactured homes shall be prohibited within the identified hazard area except within existing manufactured home parks or subdivisions.
  - f. Approval by the director of public works is required.
3. Standards for Utilities.
- a. All new and replacement water supply [and sanitary sewage] systems shall be designed to minimize or eliminate infiltration of floodwaters into the system[ and discharge from systems into floodwaters].
  - b. on-site waste disposal system shall be located to avoid impairment to them or contamination from them during flooding.
  - c. All new and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters or discharge from the systems into flood waters. Sanitary sewer and storm drainage systems for buildings that have openings below the base flood elevation shall be provided with automatic

backflow valves or other automatic backflow devices that are installed in each discharge line passing through a building's exterior wall

4. Standards for Subdivisions.

- a. All preliminary subdivision proposals shall identify the flood hazard area and the elevation of the base flood.
- b. All final subdivision plans will provide the elevation of proposed structure(s), pads, and adjacent grade. If the site is filled above the base flood, the final pad elevation shall be certified by a registered professional or surveyor and provided to the official as set forth in this chapter.
- c. All subdivision proposals shall be consistent with the need to minimize flood damage.
- d. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
- e. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage as set forth in this chapter. Certification of compliance shall be required of the developer and the project's engineer.
- f. Additionally all subdivision proposals will demonstrate, by providing a detailed hydrologic and hydraulic analyses that the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the Special Flood Hazard Area.

5. Standards for Manufactured Homes ~~and Manufactured Home Parks and Subdivisions~~.

- a. All manufactured homes that are placed or substantially improved, within Zones A, AH, AE, and on the community's Flood Insurance Rate Map, on sites located:~~[All new manufactured homes and additions to manufactured homes shall be set on permanent foundation by anchoring the unit to resist flotation, collapse, or lateral movement by one of the following methods:]~~
  - (1) Outside of a manufactured home park or subdivision;~~[By providing an anchoring system designed to Carson City standards, which may include the use of over-the-top or frame ties to ground anchors; or]~~
  - (2) In a new manufactured home park or subdivision;~~[By the anchoring of the unit's system, designed to be in compliance to the Department of Housing and Urban Development Manufactured Home Construction and Safety Standards; or]~~
  - (3) In an expansion to an existing manufactured home park or subdivision;~~or [By bolting the frame or undercarriage to a reinforced, permanent foundation such as a retaining wall or storm wall used to set the unit.]~~
  - (4) In an existing manufactured home park or subdivision on a site upon which a manufactured home has incurred "substantial damage" as a result of a flood;~~[This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces.]~~
    - a. Shall be elevated on a permanent foundation so that the lowest floor will be elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local

anchoring requirements for resisting wind forces.

~~[As set forth in this chapter, certification meeting the standards above is required of the installer or state agency responsible for regulating the placement, installation, and anchoring of individual manufactured home units.]~~

- b. All manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A, AH, and AE on the community's Flood Insurance Rate Map that are not subject to the provisions for the Standards for Critical Structures will be elevated so that either the:~~[Manufactured homes not placed in manufactured home parks or subdivisions, new manufactured home parks or subdivisions, expansions to existing manufactured home parks or subdivisions, and repair, reconstruction or improvements to existing manufactured home parks or subdivisions that equals or exceeds fifty percent (50%) of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced, must have the lowest floor elevated to or above the base flood elevation. The following standards are required for (a) manufactured homes not placed in manufactured home parks or subdivisions, (b) new manufactured home parks or subdivisions, (c) expansions to existing manufactured home parks or subdivisions, and (d) repair, reconstruction, or improvements to existing manufactured home parks or subdivisions that equals or exceeds fifty percent (50%) of the value of the streets, utilities, and pads before the repair, reconstruction, or improvement commenced.]~~
- (1) The bottom of structural frame or the lowest point of the manufactured home is at least 2 feet above the base flood elevation; or~~[Adequate surface drainage and access for a hauler shall be provided.]~~
- (2) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade plus freeboard and securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.~~[All manufactured homes shall be placed on pads or lots elevated on compacted fill or on pilings so that the lowest floor of the manufactured home is at or above the base flood level. If elevated on pilings:~~
- (a) ~~The lots shall be large enough to permit the structure and pillars;~~
- (b) ~~The pilings shall be placed in stable soil no more than ten feet (10') apart; and~~
- (c) ~~Reinforcement shall be provided for pilings more than six feet (6') above ground level;~~
- (d) ~~All zoning requirements shall be complied with.]~~
- c. Within Zone A, when no base flood elevation data is available, new and substantially improved manufactured homes shall have the floor elevated at least three feet above the highest adjacent grade.~~[No manufactured home shall be placed in a floodway, except in an existing manufactured home park or existing manufactured home subdivision.]~~
- d. Within Zone AO, the floor for all new and substantially improved manufactured homes will be elevated above the highest adjacent grade at least as high as the depth number specified on the Flood Insurance Rate Map, or at least two feet if

no depth number is specified. Upon the completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional.~~[Certification of compliance is required of the developer and engineer responsible for the plan and/or manufactured home placement.]~~

6. Floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters, which carry debris, potential projectiles, and erosion potential, the following provisions apply.~~[Located within areas of special flood hazard established in this chapter are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:]~~
- a. If a floodway has not been designated within the special flood hazard areas established in Basis for Establishing Areas of Special Flood Hazard, no new construction, substantial improvement, or other development (including fill) shall be permitted within Zones A1-30 and AE, unless it has been demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than 0.99 foot at any point within the community.~~[Prohibit encroachments, including fill, new construction, substantial improvements and other development, unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge;]~~
  - b. In designated floodways located within the special flood hazard areas established in Basis for Establishing Areas of Special Flood Hazard encroachment shall be prohibited, including fill, new construction, substantial improvements, storage of equipment or supplies, and any other development within the adopted regulatory floodway; unless it has been demonstrated through hydrologic and hydraulic analyses, performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge, and the Federal Emergency Management Agency has issued a Conditional Letter of Map Revision (CLOMR).~~[If no floodway is identified, the permit holder shall provide an engineering study for the project area that establishes a setback where no encroachment of any new development will be allowed that would increase the water surface elevation of the base flood plus one foot (1'); or~~  
establish a setback from the stream bank equal to five (5) times the width of the stream at the top of the bank or twenty feet (20') on each side from the top of the bank, whichever is greater;]
  - c. If the above "a and b" in Floodways have been satisfied; all proposed new development and substantial improvements will comply with all other applicable flood hazard reduction provisions of Provisions for Flood Hazard Reduction.
  - ~~[e]d.~~ No manufactured homes shall be placed in a floodway except in existing manufactured home parks or existing manufactured home subdivisions.
7. Standards for Recreational Vehicles. All recreational vehicles placed on sites within the floodplain on the community's Flood Insurance Rate Map will either;
- a. Be on the site for fewer than 180 consecutive days;
  - b. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only

by quick disconnect type utilities and security devices, and has no permanently attached additions, or:

- c. Will meet the permit requirements for Permit Application and the elevation and anchoring requirements for manufactured homes for Standards for Manufactured Homes.

8. Standards for Critical Structures. Critical structures are not authorized in a Special Flood Hazard Area, unless:

- a. All alternative locations in Flood Zone X have been considered and rejected.
- b. All alternative locations in Flood Zone Shaded X have been considered and rejected.

If the Local Floodplain Manager determines the only practical alternative location for the development of a new or substantially improved critical structure is in a Special Flood Hazard Area he must:

- a. Give public notice of the decision and reasons for the elimination of all alternative locations.

9. Protection of Floodplain Storage Capacity. Whenever any portion of a floodplain is authorized for use, the space occupied by the authorized fill or structure below the base flood elevation shall be compensated for and balanced by a hydraulically equivalent volume of excavation taken from below the base flood elevation. All such excavations shall be constructed to drain freely to the watercourse.

SECTION VIII:

That Title 12.09.090 of the Carson City Municipal Code is hereby amended as follows:

12.09.090 Variance procedures. The variance procedures are as follows:

- 1. Nature of Variances. The variance criteria set forth in this chapter of the ordinance are based on the general principal of zoning law that variances pertain to a piece of property and are not personal in nature. A variance may be granted for a parcel of property with physical characteristics so unusual that complying with the requirements of this ordinance would create an exceptional hardship to the applicant or the surrounding property owners. The characteristics must be unique to the property and not be shared by adjacent parcels. The unique characteristic must pertain to the land itself, not to the structure, its inhabitants, or the property owners.

It is the duty of the Board of Supervisors to help protect its citizens from flooding. This need is so compelling and the implications of the cost of insuring a structure built below flood level are so serious that variances from the flood elevation or from other requirements in the flood ordinance are quite rare. The long-term goal of preventing and reducing flood loss and damage can only be met if variances are strictly limited. Therefore, the variance guidelines provided in this ordinance are more detailed and contain multiple provisions that must be met before a variance can be properly granted. The criteria are designed to screen out those situations in which alternatives other than a variance are more appropriate.

If, upon review, the Administrator of FEMA determines that community practices indicate a pattern of issuing variances that is inconsistent with the objectives of sound flood plain management, the community may be suspended from the National Flood

Insurance Program.[+]. Appeal Board.

- a. The [b]Board of [s]Supervisors, as established by Title 18 of this code, shall hear and decide appeals and requests for variances from the requirements of this chapter.
- b. The [b]Board of [s]Supervisors shall hear and decide appeals, if filed within thirty (30) days from any decision or determination, when it is alleged there is an error in any requirement, decision or determination made by the administrator of this chapter.
- c. Those aggrieved by the decision of the [b]Board of [s]Supervisors may appeal such decision to the appropriate court as provided in the Nevada Revised Statutes.
- d. In passing upon such applications, the [b]Board of [s]Supervisors shall consider all technical evaluations, all relevant factors, standards, etc., specified in other sections of this chapter, and:
  - (1) The danger that materials may be swept onto other lands to the injury of others;
  - (2) The danger to life and property due to flooding or erosion damage;
  - (3) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
  - (4) The importance of the services provided by the proposed facility to the community;
  - (5) The necessity to the facility of a riverfront location, where applicable;
  - (6) The availability of alternative locations for the proposed uses that are not subject to flooding or erosion damage;
  - (7) The compatibility of the proposed use with existing and anticipated development;
  - (8) The relationship of the proposed use to the city's master plan and floodplain management program for that area;
  - (9) The safety of access to the property in times of flood for ordinary and emergency vehicles;
  - (10) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;
  - (11) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water system, and streets and bridges.
- e. Any applicant to whom a variance is granted shall be given written notice over the signature of a community official that:
  - (1) The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage;
  - (2) Such construction below the base flood level increases risks to life and property. It is recommended that a copy of the notice shall be recorded by the Local Floodplain Administrator in the Office of the Carson City Recorder and shall be recorded in a manner so that it appears as an exception on the title of the affected parcel of land.
- f. The Local Floodplain Administrator will maintain a record of all variance

actions, including justification for their issuance, and report such variances issued in its biennial report submitted to the Federal Insurance Administration, Federal Emergency Management Agency.

- ~~[e. — Generally, variances may be issued for new construction and substantial improvements to be erected on a lot of one-half (1/2) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items (1-11) in subsection (1)(d) of this section have been fully considered. As the lot size increases beyond the one-half (1/2) acre, the technical justification required for issuing the variance increases.]~~
- ~~[f. — Upon consideration of the factors of subsection (1)(d) of this section and the purpose of this chapter, the board of supervisors may attach such conditions to the granting of variances as it deems necessary to further the purpose of this chapter.]~~
- ~~[g. — The Local Floodplain Administrator shall maintain the records of all appeal actions and report any variances to the Federal Emergency Management Agency upon a request.]~~

## 2. Conditions for Variances.

- a. Generally, variances may be issued for new construction, substantial improvements, and other proposed new development to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing that the procedures of Administration and Provisions for Flood Hazard Reduction of the ordinance have been fully considered. As the lot size increases beyond one-half acre, the technical justification required for issuing the variance increases.
- b. Variances may be issued for the repair or rehabilitation of "historic structures," as defined in Definitions, upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as an historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
- c. Variances shall not be issued within any mapped regulatory floodway if any increase in flood levels during the base flood discharge would result.
- d. Variances shall only be issued upon a determination that the variance is the "minimum necessary" considering the flood hazard, to afford relief. "Minimum necessary" means to afford relief with a minimum of deviation from the requirements of this ordinance. For example, in the case of variances to an elevation requirement, this means the Board of Supervisors need not grant permission for the applicant to build at grade, or even to whatever elevation the applicant proposed, but only to that elevation which the Board of Supervisors believes will both provide relief and preserve the integrity of the local ordinance.
- ~~[a. — Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, without regard to the procedures set forth in the remainder of this section.]~~
- ~~[b. — Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result. Documentation in support of the variance shall be submitted to the Local Floodplain Administrator to substantiate the above request.]~~

- [c. — ~~Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.~~
- [d]e. Variances shall only be issued upon:
- (1) ~~Showing of good and sufficient cause; [A showing of good and sufficient cause such as renovation, rehabilitation or reconstruction. Variances issued for economic considerations, aesthetics, or because variances have been used in the past, are not good and sufficient cause;]~~
  - (2) ~~1. A determination that failure to grant the variance would result in exceptional "hardship," as defined in Definitions, to the applicant; [A determination that failure to grant the variance would result in exceptional hardship to the applicant;]~~
  - (3) ~~A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense, create a nuisance, as defined in Definitions, "Public Safety/ Nuisance"), cause fraud or victimization, as defined in Definitions of the public, or conflict with existing local laws or ordinances. [A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization to the public, or conflict with existing local laws or ordinances.]~~
- [e]f. ~~Variances may be issued for new construction, substantial improvement, and other proposed new development necessary for the conduct of a functionally dependent use provided that the provisions of Conditions for Variances Subsections a through e are satisfied and that the structure or other development is protected by methods that minimize flood damages during the base flood and does not result in additional threats to public safety and does not create a public nuisance. [Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with the lowest flood elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the lowered floor elevation.]~~
- g. ~~Upon consideration of all the factors of Appeal Board and the purposes of this ordinance, the Board of Supervisors may attach such conditions to the granting of, variances as it deems necessary to further the purposes of this ordinance.~~

## SECTION IX:

That Title 12.09.100 of the Carson City Municipal Code is hereby amended as follows:

- 12.09.100 ~~[Letter of map amendment]~~ Map Revision/Amendment Procedures.
1. ~~Letter of Map Revision/Amendment, National Flood Insurance Program regulations provide procedures to remove property from the 100-year floodplain or from a Special Flood Hazard Area. Amendments and revisions to community Flood Insurance Rate Maps can not adversely impact the floodplain or floodway delineation's of the level of the 100-year flood.~~



There are several procedures provided whereby the Federal Insurance Administrator will review information from the community, an owner, or a lessee of property where it is believed the property should not be included in a Special Flood Hazard Area.

Submissions to FEMA for revisions to effective Flood Insurance Studies (FISs) by individual and community requesters will require the signing of application/certification forms. These forms will provide FEMA with assurance that all pertinent data relating to the revision is included in the submittal. They will also assure that: (a) the data and methodology are based on current conditions; (b) qualified professional have assembled data and performed all necessary computations; and (c) all individuals and organizations impacted by proposed changes are aware of the changes and will have an opportunity to comment on them. FEMA procedures permit the following types of request:

A request for a revision to the effective FIS information (FIRM, FBFM, and / or FIS report) is usually a request that FEMA replace the effective floodplain boundaries, flood profiles, floodway boundaries, etc., with those determined by the requester. Before FEMA will replace the effective FIS information with the revised, the requester must: (a) provide all of the data used in determining the revised floodplain boundaries, flood profiles, floodway boundaries, etc.; (b) provide all data necessary to demonstrate that the physical modifications to the floodplain have been adequately designed to withstand the impacts of the 1% annual chance flood event and will be adequately maintained; (c) demonstrate that the revised information (e.g., hydrologic and hydraulic analyses and the resulting floodplain and floodway boundaries) are consistent with the effective FIS information.

Requests for amendments or revisions to FEMA maps must be reviewed and submitted to FEMA by Carson City with the applicant for a map amendment or revision required to prepare all the supporting information and appropriate FEMA forms.

The scientific or technical information to be submitted with these requests may include, but is not limited to the following: [There are two (2) methods of appeal that exempt a structure from the purchase of flood insurance, both must be supported by the items listed below:

a. Appeal to Elevation Requirements.

- (1) An actual stamped copy of the recorded plat map of the property showing official recordation and proper citation, or a photocopy of property's legal description (e.g., lot, block and plot number, etc.);
- (2) A copy of the Flood Hazard Boundary Map (FHBM) and/or Flood Insurance Rate Map (FIRM). Both must identify the location of the property;
- (3) A certification of a registered professional land surveyor stating:
 
  - (a) The type of structure,
  - (b) The elevation of the lowest finished grade adjacent to the structure, and
  - (c) The elevation of the bottom of the lowest floor beam.

b. Appeal of Location.

- (1) ~~An actual stamped copy of the recorded plat map of the property showing official recordation and proper citation, or a photocopy of property's legal description (e.g., lot, block, and plot number, etc.);~~
- (2) ~~A copy of the Flood Hazard Boundary Map (FHBM) and/or Flood Insurance Rate Map (FIRM). Both must identify the location of the property as not within Zone A;~~
- (3) ~~Verification by Local Floodplain Administrator as to the property's location.]~~
- a. An actual copy of the recorded plat map bearing the seal of the appropriate recordation official County Clerk or Recorder of Deeds indicating the official recordation and proper citation, Deed or Plat Book Volume and Page Number, or an equivalent identification where annotation of the deed or plat book is not the practice.
- b. A topographical map showing:
- (1) Ground elevation contours in relation to the NVGD (National Geodetic Vertical Datum).
- (2) The total area of the property in question.
- (3) The location of the structure or structures located on the property in question.
- (4) The elevation of the lowest adjacent grade to a structure or structures.
- (5) An indication of the curvilinear line which represents the area subject to inundation by a base flood. The curvilinear line should be based upon information provided by an appropriate authoritative source, such as a Federal Agency, Department of Water Resources, a County Water Control District, a County or City Engineer, a Federal Emergency Management Agency Flood Insurance Study, or a determination by a Registered Professional Engineer.
- c. A copy of the FHBM or FIRM indicating the location of the property in question.
- d. A certification by a Registered Professional Engineer or Licensed Land Surveyor that the lowest grade adjacent to the structure is above the base flood elevation.
- e. The completion of the appropriate forms in the Federal Emergency Management Agency's Packets, Amendments and Revisions To National Flood Insurance Program Maps (MT-1 FEMA FORM 81-87 Series and MT-2 FEMA FORM 81-89 Series).

SECTION X:

That no other provisions of Title 12.09 of the Carson City Municipal Code are affected by this ordinance.

PROPOSED this \_\_\_ day of \_\_\_\_\_, 2011

PROPOSED BY Supervisor \_\_\_\_\_

PASSED on the \_\_\_ day of \_\_\_\_\_, 2011

VOTE: AYES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NAYES: \_\_\_\_\_  
\_\_\_\_\_

ABSENT: \_\_\_\_\_

\_\_\_\_\_  
Robert Crowell, Mayor

ATTEST:

\_\_\_\_\_  
Alan Glover, Clerk Recorder

This Ordinance shall be in force and effect from and after the \_\_\_ day of \_\_\_\_\_, 2011.

# FLOODPLAIN MANAGEMENT ORDINANCE

(Model)

## SECTION 1.0

### STATUTORY AUTHORIZATION, FINDINGS OF FACTS, PURPOSE AND METHODS

#### 1.1 STATUTORY AUTHORIZATION

The legislature of the State of Nevada in Nevada Revised Statutes 278.020, 244A.057, and 543.020 confers upon local government units authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the *{governing body}* of *{county or municipality}* does hereby adopt the following floodplain management regulations.

#### 1.2 FINDING OF FACT

- A. The flood hazard areas of *{county or municipality}* are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.
- B. These flood losses are caused by structures that are inadequately elevated, floodproofed, or protected from flood damage. The cumulative effects of obstructions in areas of special flood hazards, which increase flood heights and velocities, also contribute to flood losses.

#### 1.3 STATEMENT OF PURPOSE

It is the purpose of this ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- A. Protect human life and health;
- B. Minimize expenditure of public money for costly flood control projects;
- C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- D. Minimize prolonged business interruptions;

- E. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, and streets and bridges located in areas of special flood hazards;
- F. Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- G. Ensure potential buyers are notified of property located in areas of special flood hazards;
- H. Ensure those who occupy the areas of special flood hazards assume responsibility for their actions; and
- I. Maintain qualifying standards for participation in the National Flood Insurance Program.

#### **1.4 METHODS OF REDUCING FLOOD LOSSES**

To accomplish its purposes, this ordinance includes methods and provisions to:

- A. Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- B. Require that land uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- C. Control the alteration of natural floodplains, alluvial fans, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- D. Control filling, grading, dredging, and other development which may increase flood damage; and
- E. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

## **SECTION 2.0 DEFINITIONS**

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application. A local ordinance need only include definitions of words actually used in the ordinance.

<b>Accessory Use</b>	A use which is incidental and subordinate to the principal use of the parcel of land on which it is located.
<b>Alluvial Fan</b>	A geomorphologic feature characterized by a cone or fan-shaped deposit of clay, silt, sand, gravel, and boulders that have been eroded from mountain slopes, transported by flood flows, and deposited on the valley floor.
<b>Alluvial Fan Flooding</b>	Flooding occurring on the surface of an alluvial fan or similar land form which originates at the apex and is characterized by high-velocity flows: active processes of erosion, sediment transport, deposition, and unpredictable flow paths.
<b>Anchoring</b>	A series of methods used to secure a structure to its footings or foundation wall so that it will not be displaced by flood or wind forces.
<b>Apex</b>	The highest point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.
<b>Appeal</b>	A request for a review of the local Floodplain Administrator's interpretation of any provisions of this ordinance.
<b>Area of Shallow Flooding</b>	Designated Zones AO and AH on a community's Flood Insurance Rate Map (FIRM) with a one-percent or greater annual chance of flooding to an average depth of one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.
<b>Area of Special Flood Hazard</b>	See "Special Flood Hazard Area."
<b>Base Flood</b>	A flood which has a one percent chance of being equaled or exceeded in any given year. (Also called the "100-year flood").
<b>Base Flood Elevation</b>	The height in relation to mean sea level expected to be reached by the waters of the base flood at pertinent points in the floodplain of riverine areas.
<b>Basement</b>	Any area of the building having its floor subgrade (below ground level) on

all sides. A sub grade crawlspace is considered a basement unless it meets the minimum technical requirements defined in FEMA Technical Bulletin 11-01 (Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, 2001) **and** the community has adopted the standards of

<b>Building</b>	See structure.
<b>Community</b>	Any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or authorized native organization, which has authority to adopt and enforce flood plain management regulations for the areas within its jurisdiction.
<b>Community Rating System (CRS)</b>	A program developed by FIA to provide incentives for those communities in the Regular Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.
<b>Conditional Letter of Map Amendment (CLOMA)</b>	A letter from FEMA stating that a proposed structure that is not to be elevated by fill would not be inundated by the base flood if built as proposed.
<b>Conditional Letter of Map Revision (CLOMR)</b>	Procedures by which contractors, developers and communities can request review and determination by the Federal Insurance Administrator of scientific and technical data for a proposed project, when complete and functioning effectively would modify the elevation of individual structures and parcels of land, stream channels, and floodplains on the FIRM.
<b>Conditional Letter of Map Revision (Based on Fill) (CLOMR-F)</b>	A letter from FEMA stating that a parcel of land or proposed structure that is to be elevated by fill would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.
<b>Critical Structures</b>	Any structure for which even a slight chance of flooding would reduce or eliminate its designed function of supporting a community in an emergency. Fire stations, hospitals, municipal airports, police stations, communication antennas or towers, elder care facilities (retirement homes) fuel storage facilities, schools designated as emergency shelters, fresh water and sewage treatment facilities are some examples of critical structures.
<b>Date of Construction</b>	The date that the building permit was issued provided the actual start of construction, repair, reconstruction, or improvement was within 180 days of the permit date.
<b>Designated Floodway</b>	The channel of a stream and the portion of the adjoining floodplain designated by a regulatory agency to be kept free of further development to provide for unobstructed passage of flood flows.
<b>Development</b>	Any man-made change to improved or unimproved real estate, including

but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within the area of special flood hazard.

<b>Digital Flood Insurance Rate Map (DFIRM)</b>	The official map, in digital format, on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community. The DFIRM is the legal equivalent of the FIRM in communities where a DFIRM is available (see Flood Insurance Rate Map).
<b>Dry Floodproofing</b>	A floodproofing method used to design and construct buildings so as to prevent the entrance of floodwaters.
<b>Elevation Certificate</b>	The Elevation Certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), for flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The Elevation Certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM Flood insurance rules.
<b>Enclosure</b>	That portion of an elevated building below the lowest elevated floor that is either partially or fully shut-in by rigid walls.
<b>Encroachment</b>	The advance or infringement of uses, plant growth, excavation, fill, buildings, permanent structures or development, storage of equipment and materials, or any other physical object placed in the floodplain, that hinders the passage of water or otherwise affects flood flows.
<b>Erosion</b>	The process of the gradual wearing away of any landmass. This peril is not per se covered under the program. (See Flood-related erosion).
<b>Existing Manufactured Home (mobile Home) Park Or Subdivision</b>	A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by a community.
<b>Expansion to a Manufactured Home (mobile Home) Park</b>	The preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, construction of streets, and either final site grading or the pouring of concrete pads).
<b>Federal Emergency Management</b>	The federal agency under which the National Flood Insurance Program (NFIP) is administered.



**Agency (FEMA)**

**Federal Insurance Administration (FIA)** The government unit, a part of Federal Emergency Management Agency (FEMA), that administers the National Flood Insurance Program (NFIP).

**Flash Flood** A flood that crests in a short period of time and is often characterized by high velocity flows. It is often the result of heavy rainfall in a localized area.

**Flood, Flooding Or Flood Waters** A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of floodwaters; the unusual and rapid accumulation or runoff of surface waters from any source and mudslides (i.e., mudflows) and the condition resulting from flood-related erosion.

**Flood Control** Keeping flood waters away from specific developments or populated areas, areas by the construction of flood storage reservoirs, channel alterations, dikes and levees, bypass channels, or other engineering works.

**Flood Hazard Boundary Map (FHBM)** An official map of a community, issued by the Administrator, where the boundaries of the flood, mudslide (i.e., mudflow) related erosion areas having special hazards have been designated as Zones A, M, and /or E.

**Flood Insurance Rate Map (FIRM)** Official map on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community. Includes Digital Flood Insurance Rate Map (DFIRM) in communities where a DFIRM is available (see Digital Flood Insurance Rate Map).

**Flood Insurance Study (FIS)** The official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Insurance Rate Map, and the water surface elevation of the base flood.

**Floodplain and Flood-Prone Area** Any land area susceptible to being inundated by waters from any source. (See Flooding).

**Floodplain Administrator** The community official designated by title to administer and enforce the floodplain management regulations. The Floodplain Administrator for *{community, governing body}* is defined in Sub-section 4.1 (Designation of the Local Floodplain Administrator) of this ordinance to be the *{position title}*.

**Floodplain Management** The operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing, where possible, natural resources in the floodplain, including but not limited to emergency preparedness plans, flood control works and

floodplain management plans, regulations and ordinances.

**Floodplain  
Management  
Regulations**

This ordinance, and any federal, state or local regulations plus community zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a grading and erosion control) and other applications of police power which control development in flood-prone areas to prevent and reduce flood loss and damage.

**Floodproofing**

Any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved property, water and sanitary facilities, structures and their contents. Refer to FEMA Technical Bulletins TB-1 (Openings in Foundation Walls and Walls of Enclosures, 2008), TB-3 (Non-residential Floodproofing – Requirements and Certification, 1993), and TB-7 (Wet Floodproofing Requirements, 1993) for Guidelines on dry and wet floodproofing.

**Floodway**

The channel of a river or other watercourse and the adjacent land area that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation. Also referred to a "Regulatory Floodway."

**Flood Insurance  
Risk Zone  
Designations**

The zone designations indicating the magnitude of the flood hazard in specific areas of a community. See Special Flood Hazard Area.

**Zone A**

Special Flood Hazard Areas inundated by the 100-year flood; base flood elevations are not determined.

**Zone A1-30  
and Zone AE**

Special Flood Hazard Areas inundated by the 100-year flood; base flood elevations are determined.

**Zone AO**

Special Flood Hazard Areas inundated by the 100-year flood; with flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths are determined. For areas of alluvial fan flooding, velocities are also determined.

**Zone AH**

Special Flood Hazard Areas inundated by the 100-year flood; flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations are determined.

**Zone AR**

Special Flood Hazard Areas that result from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection.

**Zones AR / A1-30,  
AR / AE, AR / AH,**

Special Flood Hazard Areas that result from the decertification of a previously accredited flood protection

<b>AR / AO, and AR / A</b>	system that is in the process of being restored to provide a 100-year or greater level of flood protection. After restoration is complete, these areas will still experience residual flooding from other flooding sources.
<b>Zone A99</b>	Special Flood Hazard Areas inundated by the 100-year flood to be protected from the 100-year flood by a Federal flood protection system under construction; no base flood elevations determined.
<b>Zone B and Zone X (shaded)</b>	Areas of 500-year flood; areas subject to the 100-year flood with average depths of less than 1 foot or with contributing drainage area less than 1 square mile; and areas protected by levees from the base flood.
<b>Zone C and Zone X (unshaded)</b>	Areas determined to be outside the 500-year floodplain.
<b>Zone D</b>	Areas in which flood hazards are undetermined.
<b>Footing</b>	The enlarged base of a foundation wall, pier, or column, designed to spread the load of the structure so that it does not exceed the soil bearing capacity.
<b>Foundation</b>	The underlying structure of a building usually constructed of concrete that supports the foundation walls, piers, or columns.
<b>Foundation Walls</b>	A support structure that connects the foundation to the main portion of the building or superstructure.
<b>Fraud/ Victimization</b>	Related to Variances of this ordinance, the variance granted must not cause fraud on or victimization to the public. In examining this requirement, the <i>{community, governing body}</i> will consider the fact that every newly constructed building adds to government responsibilities, and remains a part of the community for fifty to one hundred years. Buildings permitted to be constructed below the base flood elevation are subject during all those years to increased risk of damage from floods, while future owners of the property and the community as a whole are subject to all the costs, inconvenience, danger, and suffering that those increased flood damages bring. Additionally future owners may be unaware of the risk potential to the property due to flood damage and the extremely high rates for flood insurance.
<b>Freeboard</b>	A margin of safety usually expressed in feet above a flood level for purposes of flood plain management. Freeboard tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.
<b>Functionally</b>	Means a use which cannot perform its intended purpose unless it is

<b>Dependent Use</b>	located or carried out in close proximity to water. The term includes only marina facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and boat building and boat repair facilities, but does not include long-term storage or related manufacturing facilities.
<b>Governing Body</b>	The local governing unit, county or municipality that is empowered to adopt and implement regulations to provide for public health, safety and general welfare of its citizenry.
<b>Hardship</b>	Related to Variances of this ordinance. The exceptional hardship would result from a failure to grant the requested variance. The <i>{governing body}</i> requires the variance be exceptional, unusual, and pertain <u>only</u> to the property involved. Mere economic or financial hardship alone is <u>not</u> exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.
<b>Highest Adjacent Grade</b>	The highest natural elevation of ground surface prior to construction next to the proposed walls of a structure.
<b>Historic Structure</b>	Any structure that is: <ol style="list-style-type: none"> <li>1. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;</li> <li>2. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;</li> <li>3. Individually listed on a State inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or</li> <li>4. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either by an approved State program as determined by the Secretary of the Interior or directly by the Secretary of the Interior in states without approved programs.</li> </ol>
<b>Hydraulics</b>	The science that deals with practical applications of water in motion.
<b>Hydrodynamic</b>	Forces imposed on structures by floodwaters due to the impact of

<b>Loads</b>	moving water on the upstream side of the structure, drag along its sides, and eddies or negative pressures on its downstream side.
<b>Hydrology</b>	The science of the behavior of water in the atmosphere, on the earth's surface and underground.
<b>Hydrostatic Loads</b>	Forces imposed on a flooded structure due to the weight of the water.
<b>Letter of Map Amendment (LOMA)</b>	The procedure by which any owner or lessee of property who believes his property has been inadvertently included in a Special Flood Hazard Area can submit scientific and technical information to the Federal Insurance Administrator for review to remove the property from said area. The Administrator will not consider a LOMA if the information submitted is based on alteration of topography or new hydrologic or hydraulic conditions since the effective date of the FIRM.
<b>Letter of Map Revision (LOMR)</b>	An official revision to a currently effective FIRM. A LOMR officially changes flood zone, floodplain and floodway designations, flood elevations and planimetric features.
<b>Letter of Map Revision (Based On Fill) (LOMR-F)</b>	A letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the base flood.
<b>Levee</b>	A man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.
<b>Levee System</b>	A flood protection system, which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.
<b>Lowest Floor</b>	Means the lowest floor of the lowest enclosed area, including basement. An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor, provided that the enclosure does not violate applicable non-elevation design requirements.
<b>Manufactured Home (mobile home)</b>	A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term " <i>manufactured home</i> " does not include " <i>recreational vehicles</i> ".
<b>Manufactured Home Park or Subdivision</b>	A parcel or contiguous parcels of land divided into two or more manufactured home lots for rent or sale.

**Market Value** For the purposes of determining substantial improvement, market value pertains only to the structure in question. It does not pertain to the land, landscaping or detached accessory structures on the property. For determining improvement, the value of the land must always be subtracted.

Acceptable estimates of market value can be obtained from the following sources:

1. Independent appraisals by a professional appraiser.
2. Detailed estimates of the structure's Actual Cash Value (used as a substitute for market value based on the preference of the community).
3. Property appraisals used for tax assessment purposes (Adjusted Assessed Value: used as a screening tool).
4. The value of buildings taken from NFIP claims data (used as a screening tool).
5. "Qualified estimates" based on sound professional judgment made by staff of the local building department or local or State tax assessor's office.

As indicated above, some market value estimates should only be used as screening tools to identify those structures where the substantial improvement ratios are obviously less than or greater than 50% (e.g., less than 40% or greater than 60%). For structures that fall between the 40% and 60% range, more precise market value estimates should be used.

**Mobile Home** Having the same meaning as manufactured home.

**North American Vertical Datum (NAVD)** A vertical control used as a reference for establishing various elevations within the floodplain based upon the General Adjustment of the North American Datum of 1988. Flood elevations on Digital Flood Insurance Rate Maps for Nevada communities are referenced to NAVD 88.

**National Geodetic Vertical Datum (NGVD)** As corrected in 1929, is a vertical control used as a reference for establishing various elevations within the floodplain. Flood elevations on Flood Insurance Rate Maps published for Nevada communities prior to 2007 were typically referenced to NGVD 29.

**Natural Grade** The grade unaffected by construction techniques such as fill, landscaping, or berming.

**New Construction** Buildings for which the "start of construction" commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, including any subsequent improvements.

<b>New Manufactured Home (mobile home) Subdivision</b>	A manufactured home park or subdivision for which the construction of construction of facilities for servicing the lots on which the manufactured homes are to be affixed including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads is completed on or after the effective date of these floodplain management regulation adopted by <i>{community or governing body}</i> .
<b>Non-Residential</b>	Includes, but is not limited to: small business concerns, churches, schools, farm buildings (including grain bins and silos), poolhouses, clubhouses, recreational buildings, mercantile structures, agricultural and industrial structures, warehouses, and hotels or motels with normal room rentals for less than 6 months duration.
<b>Obstruction</b>	Includes, but is not limited to, any dam, wall, wharf, embankment, levee, dike, pile, abutment, protection, excavation, channelization, bridge, conduit, culvert, building, wire, fence, rock, gravel refuse, fill, structure, vegetation or other material in, along, across or projecting into any watercourse which may alter, impede, retard or change the direction and or velocity of the flow of water, or due to its location, its propensity to snare or collect debris carried by the flow of water, or its likelihood of being carried downstream.
<b>One-Hundred Year-flood</b>	Having the same meaning as base flood.
<b>Physical Map Revisions (PMR)</b>	A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects large scope changes.
<b>Ponding Hazard</b>	A flood hazard that occurs in flat areas when there are depressions in the ground that collect “ponds” of water. The ponding hazard is represented by the zone designation AH on the FIRM.
<b>Post-FIRM Construction</b>	Construction or substantial improvement that started on or after the effective date of the initial Flood Insurance Rate Map (FIRM) of the community or after December 31, 1974, whichever is later.
<b>Pre-FIRM Construction</b>	Construction or substantial improvement which started on or before December 31, 1974 or before the effective date of the initial Flood Insurance Rate Map (FIRM) of the community, whichever is later.
<b>Principal Residence</b>	A single family dwelling in which at the time of loss, the named insured or the named insured’s spouse has lived for either (1) 80 percent of the calendar year, or (2) 80 percent of the period of ownership, if less than 1 year.
<b>Principal Structure</b>	A structure used for the principal use of the property as distinguished from an accessory use.

<b>Program Deficiency</b>	A defect in a community's floodplain management regulations or administrative procedures that impairs effective implementation of those floodplain management regulations.
<b>Proper Openings For Enclosures (Applicable to Zones A, A1-A30, AE, AO, AH, AR, and AR Dual)</b>	All enclosures below the <b>lowest floor</b> must be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. A minimum of two openings, with positioning on at least two walls, having a total net area of not less than 1 square inch for every square foot of enclosed area subject to flooding must be provided. The
<b>Public Safety/ Nuisance</b>	Related to Variances of the ordinance. The granting of a variance must not result in anything which is injurious to safety or health of the entire community or neighborhood, or any number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay stream, canal, or basin.
<b>Recreational Vehicle</b>	A vehicle built on a single chassis, 400 square feet or less when measured at the largest horizontal projection, designed to be self-propelled or permanently towable by a light-duty truck, and designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.
<b>Riverine</b>	Relating to, formed by, or resembling a river including tributaries, stream, brook, etc.
<b>Sheet Flow Area</b>	Having the same meaning as Area of Shallow Flooding.
<b>Special Flood Hazard Area (SFHA)</b>	Darkly shaded area on a Flood Hazard Boundary Map (FHBM) or a Flood Insurance Rate Map (FIRM) that identifies an area that has a 1- percent chance of being flooded in any given year (100-year floodplain). Over a 30-year period, the life of most mortgages, there is at least a 26 percent chance that this area will be flooded. The FIRM identifies these shaded areas as FIRM Zones A, AO, AH, A1-A30, AE, A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO, V, V1-V30, and VE. See Flood Insurance Risk Zone Designations.
<b>Start of Construction</b>	Includes substantial improvement and other proposed new development and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days from the date of the permit. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and or walkways; nor does it include excavation for a



basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

<b>Structure</b>	A walled and roofed building that is principally above ground and includes gas or liquid storage tanks and manufactured homes.
<b>Substantial Damage</b>	Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
<b>Substantial Improvement</b>	<p>Any reconstruction, rehabilitation, addition, or other proposed new development of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "<i>start of construction</i>" of the improvement. This term includes structures which have incurred "<i>substantial damage</i>," regardless of the actual repair work performed. The term does not, however, include either;</p> <ol style="list-style-type: none"><li>1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure a safe living conditions, or</li><li>2. Any alteration of a "<i>historic structure</i>" provided that the alteration will not preclude the structure's continued designation as a "<i>historic structure</i>."</li></ol>
<b>Variance</b>	A grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by this ordinance.
<b>Violation</b>	The failure of a structure or other development to be fully compliant with this ordinance. A structure or other development in a special flood hazard area, without an elevation certificate, other certifications or other evidence of compliance required in this ordinance is presumed to be in violation until such time as that documentation is provided.
<b>Water Surface Elevation</b>	The height, in relation to the North American Vertical Datum (NAVD) of 1988, or (other datum, where specified) of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.
<b>Watercourse</b>	A lake, river, creek, stream, wash, arroyo, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage

may occur.

## **SECTION 3 GENERAL PROVISIONS**

### **3.1 LANDS TO WHICH THIS ORDINANCE APPLIES**

This ordinance shall apply to all areas of special flood hazards within the jurisdiction of *{county or municipality}*.

### **3.2 BASIS FOR ESTABLISHING AREAS OF SPECIAL FLOOD HAZARD**

The areas of special flood hazard identified by the Federal Insurance Administration (FIA) of the Federal Emergency Management Agency (FEMA) in the Flood Insurance Study (FIS) dated *{date}* and accompanying Flood Insurance Rate Maps (FIRM) and Flood Boundary and Floodway Maps (FBFM), dated *{date}*, and all subsequent amendments and or revisions, are hereby adopted by reference and declared to be a part of the ordinance. The FIS and attendant mapping is the minimum area of applicability of this ordinance and may be supplemented by studies for other areas which allow implementation of this ordinance and which are recommended to the *{governing body}* by the Floodplain Administrator. The FIS, FIRMs and FBFBMs are on file at *{address, City Hall, County Administration Building, Department of Public Works, or other}*.

### **3.3 COMPLIANCE**

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this ordinance and other applicable regulations. Violations (including violations of conditions and safeguards established in connection with conditions) shall constitute a *{type of offense}*. Nothing herein shall prevent the *{governing body}* from taking such lawful action as is necessary to prevent or remedy any violation.

### **3.4 ABROGATION AND GREATER RESTRICTIONS**

This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance and other ordinances, easement, covenant, or deed restriction conflict or overlap, whichever imposed the more stringent restrictions or that imposing the higher standards, shall prevail.

### **3.5 INTERPRETATION**

The interpretation and application of this ordinance, all provisions shall be:

- A. Considered as minimum requirements;
- B. Liberally construed in favor of the governing body; and
- C. Deemed neither to limit nor repeal any other powers granted under state statutes.

### **3.6 WARNING AND DISCLAIMER OF LIABILITY**

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of *{governing body}*, any officer or employee thereof, the State of Nevada, or the Federal Insurance Administration, Federal Emergency Management Agency, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

### **3.7 DECLARATION OF PUBLIC NUISANCE.**

Every new structure, building, fill, excavation or development located or maintained within any area of special flood hazard after *{date of first FIRM}* in violation of this ordinance is a public nuisance per se and may be abated, prevented or restrained by action of this political subdivision.

### **3.8 ABATEMENT OF VIOLATIONS**

Within 30 days of discovery of a violation of this ordinance, the Floodplain Administrator shall submit a report to the *{governing body}* which shall include all information available to the Floodplain Administrator which is pertinent to said violation. Within 30 days of receipt of this report, the *{governing body}* shall either:

- A. Take any necessary action to effect the abatement of such violation; or
- B. Issue a variance to this ordinance in accordance with the provisions of Section 6.0 (Variance Procedures) herein; or
- C. Order the owner of the property upon which the violation exists to provide whatever additional information may be required for their determination. Such information must be provided to the *{administering body}* within 30 days of such order, and he shall submit an amended report to the Floodplain board with 20 days. At their next regularly scheduled public meeting, the governing body shall either order the abatement of said violation or they shall grant a variance in accordance with the provisions of Section 6.0 (Variance Procedures) herein.
- D. Submit to the Administrator of Federal Insurance Administration a declaration for denial of insurance, stating that the property is in violation of a cited statute or local law, regulation or ordinance, pursuant to section 1316 of the National Flood Insurance Act of 1968 as amended.

### **3.9 UNLAWFUL ACTS**

- A. It is unlawful for any person to divert, retard or obstruct the flow of waters in any watercourse whenever it creates a hazard to life or property without securing the written authorization of the *{administering body}*. Where the watercourse is a delineated floodplain, it is unlawful to excavate or build any structure affecting the flow of waters without securing written authorization of the Floodplain Administrator.
- B. Any person violating the provisions of this section shall be guilty of a class 2 misdemeanor.

### **3.10 SEVERABILITY**

This ordinance and the various parts thereof are hereby declared to be severable. Should any section of this ordinance be declared by the courts to be unconstitutional or invalid, such decisions shall not affect the validity of the ordinance as a whole, or any portion thereof other than the section so declared to be unconstitutional or invalid.

## SECTION 4 ADMINISTRATION

### 4.1 DESIGNATION OF THE LOCAL FLOODPLAIN ADMINISTRATOR

*{Name of administrator and title}* is here by appointed Local Floodplain Administrator to administer and implement this local ordinance by granting or denying floodplain development permits in accordance with its provisions.

### 4.2 ESTABLISHMENT OF DEVELOPMENT PERMIT

A floodplain development permit is hereby established for all construction and other development to be undertaken in areas of special flood hazard in *{county or municipality}* for the purpose of protecting its citizens from increased flood hazards and ensuring new development is constructed in a manner that minimizes its exposure to flooding. It shall be unlawful to undertake any development in an area of special flood hazard, as shown on the Flood Insurance Rate Map enumerated in Sub-section 3.2 (Basis for Establishing Areas of Special Flood Hazard), without a valid floodplain development permit. Applications for a permit shall be made on forms furnished by the Local Floodplain Administrator and may include, but not be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question, existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing.

### 4.3 PERMIT APPLICATION

The applicant shall provide at least the following information, where applicable. Additional information may be required on the permit application forms.

- A. The proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all residential and non-residential structures whether new or substantially improved to be located in Zones A, A1-A30, AE, and AH, if base flood elevations data are available.
- B. In Zone AO the proposed elevation in relation to mean sea level, of the lowest floor (including basement) and the elevation of the highest adjacent grade of all residential and nonresidential structures whether new or substantially improved.
- C. The proposed elevation in relation to mean sea level, to which any new or substantially improved non-residential structure will be floodproofed.
- D. A certificate from a licensed professional engineer or architect in the State of Nevada that any utility floodproofing meets the criteria in Sub-section 5.2 (Standards for Utilities).
- E. A certificate from a licensed professional engineer or architect in the State of Nevada that any non-residential floodproofed structures meet the criteria in Sub-section 5.1.5 (Nonresidential Floodproofing Requirements).

- F. When a watercourse will be altered or relocated as a result of the proposed development, the applicant must submit the maps, computations, and other materials required by the Federal Emergency Management Agency (FEMA) to process a Letter of Map Revision (LOMR) and pay any fees or other costs assessed by FEMA for processing the revision.
- G. A technical analysis, by a professional engineer licensed in the State of Nevada, showing the proposed development located in the special flood hazard area will not cause physical damage to any other property.
- H. When there is no base flood elevation data available for Zone A from any source, the base flood elevation data will be provided by the permit applicant for all proposed development of subdivisions, manufactured home and recreational vehicle parks in the special flood hazard areas, for all developments of 50 lots or 5 acres, whichever is less.

#### **4.4 DUTIES AND RESPONSIBILITIES OF THE LOCAL FLOODPLAIN ADMINISTRATOR**

Duties and responsibilities of the Local Floodplain Administrator shall include, but not limited to the following:

##### **4.4.1 PERMIT APPLICATION REVIEW**

The floodplain development permit will not be issued by the Local Floodplain Administrator until the following has been accomplished:

- A. Review all applications for completeness, particularly with the requirements of Sub-section 4.3 (Permit Application), and for compliance with the provisions and standards of this ordinance.
- B. Review all subdivision and other proposed new development, including manufactured home and recreational vehicle parks to determine whether the proposed development site will be reasonably safe from flooding. When the proposed building site is located in the Special Flood Hazard Area, all new construction and substantial improvements will meet the applicable standards of Sub-section 5.1 (Standards of Construction).
- C. Determine whether any proposed development in the Special Flood Hazard Area may result in physical damage to any other property to include stream bank erosion and any increase in velocities or that it does not adversely affect the carrying capacity of the areas where base flood elevations have been determined but a floodway has not been designated. For purposes of the ordinance, "adversely affects" means the cumulative effect of the proposed development when combined with all other existing and anticipated development will increase the water surface elevation of the base flood more than one foot at any point. To assist the Local

Floodplain Administrator in making this determination, the permit applicant may be required to submit additional technical analyses.

- D. Ensure all other required State and Federal permits have been received.
- E. For construction on an existing structure, determine if proposed construction constitutes substantial improvement or repair of a substantially damaged structure.

#### **4.4.2 USE OF OTHER FLOOD DATA**

- A. When the Federal Emergency Management Agency has designated Special Flood Hazard Areas on the community's Flood Insurance Rate Maps (FIRM) but has neither produced water surface elevation data nor identified a floodway, the Local Floodplain Administrator shall attempt to obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, including data developed pursuant to Paragraph 4.4.6.I (Retaining Floodplain Development Documentation), as criteria for requiring new construction, substantial improvements or other proposed development meets the requirements of this ordinance.
- B. When base flood elevations are not available, the Local Floodplain Administrator may use flood information from any other authoritative source, such as historical data, to establish flood elevations within the Special Flood Hazard Areas. This information shall be submitted to the *{governing body}* for adoption.

#### **4.4.3 ALTERATION OF WATERCOURSES**

Prior to issuing a permit for any alteration or relocation of watercourse the Local Floodplain Administrator must:

- A. Have processed Letter of Map Revision (LOMR).
- B. Notify all adjacent communities, Nevada's National Flood Insurance Program Coordinator, and submittal of evidence of such notification to the Federal Insurance Administration, and the Federal Emergency Management Agency.
- C. Determine that the potential permit recipient has provided for maintenance within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

#### **4.4.4 INSPECTIONS**

The Local Floodplain Administrator or designee shall make periodic inspections throughout the period of construction to monitor compliance with the requirements of the floodplain development permit or any variance provisions.

#### **4.4.5 STOP WORK ORDERS**



The Local Floodplain Administrator shall issue, or cause to be issued, a stop work for any floodplain development found non-compliant with the provisions of this ordinance or conditions of the development permit and all development found ongoing without a floodplain development permit. Disregard of a stop work order shall subject the violator to the penalties described in Sub-section 3.3 (Compliance) of this ordinance.

#### **4.4.6 RETAINING FLOODPLAIN DEVELOPMENT DOCUMENTATION**

The Local Floodplain Administrator shall obtain and retain for public inspection and have available for the National Flood Insurance Program coordinator or the Federal Emergency Management Agency representative conducting a Community Assistance Visit, the following:

- A. Floodplain development permits and certificates of compliance.
- B. Elevation Certificates with record of certification required by Sub-section 5.1.4 (Lowest Floor Certification Requirements).
- C. Certifications required by Sub-section 5.1.5(Nonresidential Floodproofing Requirements).
- D. Elevation Certificates with record of certification required by Sub-section 5.1.6 (Requirements for Areas Below the Lowest Floor)
- E. Elevation Certificates with record of certification of elevation required by Sub-section 5.3 (Standards for Subdivisions).
- F. Certification required by Sub-section 5.7 (Floodways)
- G. Variances issued pursuant to Section 6.0 (Variance Procedures).
- H. Notices required under Sub-section 4.4.3 (Alteration of Watercourses).

#### **4.4.7 MAP DETERMINATIONS**

The Local Floodplain Administrator may make map interpretations where needed, in writing with appropriate documentation, as to the exact location of the boundaries of the areas of special flood hazard and where there appears to be a conflict between a mapped boundary and actual field conditions.

#### **4.4.8 APPEALS**

The *{governing body}* of *{county or municipality}* shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the Floodplain Administrator in the enforcement or administration of this ordinance.

#### **4.4.9 SUBMISSION OF NEW TECHNICAL DATA TO FEMA**

When *{community or municipality}* base flood elevations either increase or decrease resulting from physical changes affecting flooding conditions, as soon as practicable, but not later than six months after the date such information becomes available, *{community or municipality}* will submit the technical or scientific data to FEMA. Such submissions are necessary so that upon confirmation of the physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.

## **SECTION 5 PROVISIONS FOR FLOOD HAZARD REDUCTION**

### **5.1 STANDARDS OF CONSTRUCTION**

In all areas of special flood hazard areas the following standards are required.

#### **5.1.1 ANCHORING**

- A. All new construction and substantial improvements shall be adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
- B. All manufactured homes shall meet the anchoring standards of Sub-section 5.5 (Standards for Manufactured Homes).

#### **5.1.2 CONSTRUCTION MATERIALS AND METHODS**

All new construction and substantial improvements shall be constructed;

- A. With materials and utility equipment resistant to flood damage;
- B. Using methods and practices that minimize flood damage;
- C. Ensure electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities are designed or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
- D. Within Zones AH or AO, so that there are adequate drainage paths around structures on slopes to guide flood waters around and away from proposed structures.

#### **5.1.3 ELEVATION REQUIREMENTS FOR LOWEST FLOOR**

Residential construction, new or substantial improvements, shall have the lowest floor, including basement;

- A. In Zone AO, elevated above the highest adjacent grade to a height equal to or exceeding the depth number specified in feet on the FIRM, or elevated at least two feet above the highest adjacent grade if no depth number is specified.
- B. In Zone A, elevated to or above the base flood elevation, as determined by this community.
- C. In all other zones, elevated to or above the base flood elevation.

#### **5.1.4 LOWEST FLOOR CERTIFICATION REQUIREMENTS**

Upon completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional engineer or surveyor and verified by the community building inspector to be properly elevated. The certification shall be provided to the Floodplain Administrator using the current FEMA Elevation Certificate.

### **5.1.5 NONRESIDENTIAL FLOODPROOFING REQUIREMENTS**

Nonresidential construction shall either be elevated to conform with Sub-section 5.1.3 (Elevation Requirements for Lowest Floor) or together with attendant utility and sanitary facilities;

- A. Will be floodproofed below the elevation recommended under Sub-section 5.1.3 (Elevation Requirements for Lowest Floor) so that the structure is watertight with walls substantially impermeable to the passage of water:
- C. Will have the structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy:
- C. Will be certified by a registered professional engineer or architect that the standards of Sub-section 5.1.3 (Elevation Requirements for Lowest Floor) are satisfied. The certification shall be provided to the Floodplain Administrator.

### **5.1.6 REQUIREMENTS FOR AREAS BELOW THE LOWEST FLOOR**

All new construction and substantial improvements with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement shall follow the guidelines in FEMA Technical Bulletins TB-1 (Openings in Foundation Walls and Walls of Enclosures, 2008) and TB-7 (Wet Floodproofing Requirements, 1993) and must either be certified by a licensed professional engineer or architect to meet or exceed the following minimum criteria;

- A. Must have a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
- B. The bottom of all such openings will be no higher than one foot above the lowest adjacent finished grade.

Openings may be equipped with louvers, valves, screens or other coverings or devices provided they permit the automatic entry and exit of floodwaters.

## **5.2 STANDARDS FOR UTILITIES**

- A. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.

- B. All new and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters or discharge from the systems into flood waters. Sanitary sewer and storm drainage systems for buildings that have openings below the base flood elevation shall be provided with automatic backflow valves or other automatic backflow devices that are installed in each discharge line passing through a building's exterior wall.
- C. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

### 5.3 STANDARDS FOR SUBDIVISIONS

- A. All preliminary subdivision proposals shall identify the flood hazard area and the elevation of the base flood.
- D. All subdivision plans will provide the elevation of proposed structures and pads. If the site is filled above the base flood, the final lowest floor and pad elevation shall be certified by a registered professional engineer or surveyor and provided to the Floodplain Administrator.
- E. All subdivision proposals shall be consistent with the need to minimize flood damage.
- D. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
- E. All subdivisions shall provide adequate drainage to reduce exposure to flood hazards.
- F. Additionally all subdivision proposals will demonstrate, by providing a detailed hydrologic and hydraulic analyses that the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the

#### 5.2.1 STANDARDS FOR CRITICAL STRUCTURES

Critical structures are not authorized in a Special Flood Hazard Area, unless:

- A. All alternative locations in Flood Zone X have been considered and rejected.
- B. All alternative locations in Flood Zone Shaded X have been considered and rejected.

If the floodplain manager determines the only practical alternative location for the development of a new or substantially improved critical structure is in a Special Flood Hazard Area he **must**:

- A. Give public notice of the decision and reasons for the elimination of all alternative locations.

## **5.5 STANDARDS FOR MANUFACTURED HOMES**

- A. All manufactured homes that are placed or substantially improved, within Zones A, AH, AE, and on the community's Flood Insurance Rate Map, on sites located:
  - 1. Outside of a manufactured home park or subdivision;
  - 2. In a new manufactured home park or subdivision;
  - 3. In an expansion to an existing manufactured home park or subdivision; or
  - 4. In an existing manufactured home park or subdivision on a site upon which a manufactured home has incurred "substantial damage" as a result of a flood:
    - a. Shall be elevated on a permanent foundation so that the lowest floor will be elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.
- B. All manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A, AH, and AE on the community's Flood Insurance Rate Map that are not subject to the provisions of Sub-section 5.4 (Standards for Critical Structures) will be elevated so that either the:
  - 1. The bottom of structural frame or the lowest point of the manufactured home is at or above the base flood elevation; or
  - 2. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
- C. Within Zone A, when no base flood elevation data is available, new and substantially improved manufactured homes shall have the floor elevated at least three feet above the highest adjacent grade.
- G. Within Zone AO, the floor for all new and substantially improved manufactured homes will be elevated above the highest adjacent grade at least as high as the depth number specified on the Flood Insurance Rate Map, or at least two feet if no

depth number is specified. Upon the completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional.

## **5.6 STANDARDS FOR RECREATIONAL VEHICLES**

All recreational vehicles placed on sites within the floodplain on the community's Flood Insurance Rate Map will either;

- A. Be on the site for fewer than 180 consecutive days;
- B. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions, or;
- C. Will meet the permit requirements of Sub-section 4.3 (Permit Application) and the elevation and anchoring requirements for manufactured homes in Sub-section 5.5 (Standards for Manufactured Homes).

## **5.7 FLOODWAYS**

Since the floodway is an extremely hazardous area due to the velocity of floodwaters, which carry debris, potential projectiles, and erosion potential, the following provisions apply.

- A. If a floodway has not been designated within the special flood hazard areas established in Sub-section 3.2 (Basis for Establishing Areas of Special Flood Hazard), no new construction, substantial improvement, or other development (including fill) shall be permitted within Zones A1-30 and AE, unless it has been demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.
- B. In designated floodways located within the special flood hazard areas established in Sub-section 3.2 (Basis for Establishing Areas of Special Flood Hazard) encroachment shall be prohibited, including fill, new construction, substantial improvements, storage of equipment or supplies, and any other development within the adopted regulatory floodway; unless it has been demonstrated through hydrologic and hydraulic analyses, performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge, and the Federal Emergency Management Agency has issued a Conditional Letter of Map Revision (CLOMR).
- C. If Sub-sections 5.7 A and B (Floodways) have been satisfied; all proposed new development and substantial improvements will comply with all other applicable flood hazard reduction provisions of Section 5 (Provisions for Flood Hazard Reduction).

## SECTION 6.0 VARIANCE PROCEDURES

### 6.1 NATURE OF VARIANCES

The variance criteria set forth in this section of the ordinance are based on the general principal of zoning law that variances pertain to a piece of property and are not personal in nature. A variance may be granted for a parcel of property with physical characteristics so unusual that complying with the requirements of this ordinance would create an exceptional hardship to the applicant or the surrounding property owners. The characteristics must be unique to the property and not be shared by adjacent parcels. The unique characteristic must pertain to the land itself, not to the structure, its inhabitants, or the property owners.

It is the duty of the *{governing body}* to help protect its citizens from flooding. This need is so compelling and the implications of the cost of insuring a structure built below flood level are so serious that variances from the flood elevation or from other requirements in the flood ordinance are quite rare. The long-term goal of preventing and reducing flood loss and damage can only be met if variances are strictly limited. Therefore, the variance guidelines provided in this ordinance are more detailed and contain multiple provisions that must be met before a variance can be properly granted. The criteria are designed to screen out those situations in which alternatives other than a variance are more appropriate.

If, upon review, the Administrator of FEMA determines that community practices indicate a pattern of issuing variances that is inconsistent with the objectives of sound flood plain management, the community may be suspended from the National Flood Insurance Program.

### 6.2 APPEAL BOARD

- A. In passing upon requests for variances, the *{governing body}* shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and;
1. The danger of materials being swept onto other lands and injuring others;
  2. The danger to life and property due to flooding or erosion damage;
  3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the existing individual owner and future owners of the property;
  4. The importance of the services provided by the proposed facility to the community;
  5. The necessity to the facility of a waterfront location, where applicable;



6. The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
  7. The compatibility of the proposed use with existing and anticipated development;
  8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
  9. The safety of access to the property in time of flood for ordinary and emergency vehicles;
  10. The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site;
  11. The cost of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water system, and streets and bridges.
- B. Any applicant to whom a variance is granted shall be given written notice over the signature of a community official that;
1. The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage;
  2. Such construction below the base flood level increases risks to life and property. It is recommended that a copy of the notice shall be recorded by the Floodplain Administrator in the Office of the *{county}* Recorder and shall be recorded in a manner so that it appears as an exception on the title of the affected parcel of land.
- C. The Floodplain Administrator will maintain a record of all variance actions, including justification for their issuance, and report such variances issued in its biennial report submitted to the Federal Insurance Administration, Federal Emergency Management Agency.

### **6.3 CONDITIONS FOR VARIANCES**

- A. Generally, variances may be issued for new construction, substantial improvements, and other proposed new development to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing that the procedures of Sections 4 (Administration) and 5 (Provisions for Flood Hazard Reduction) of the ordinance have been fully considered. As the lot size increases beyond one-half acre, the technical justification required for issuing the variance increases.
- B. Variances may be issued for the repair or rehabilitation of "historic structures," as

defined in Section 2 (Definitions), upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as an historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

- C. Variances shall not be issued within any mapped regulatory floodway if any increase in flood levels during the base flood discharge would result.
- D. Variances shall only be issued upon a determination that the variance is the "minimum necessary" considering the flood hazard, to afford relief. "Minimum necessary" means to afford relief with a **minimum** of deviation from the requirements of this ordinance. For example, in the case of variances to an elevation requirement, this means the *{governing body}* **need not grant** permission for the applicant to build at grade, or even to whatever elevation the applicant proposed, but only to that elevation which the *{governing body}* believes will both provide relief and preserve the integrity of the local ordinance.
- E. Variances shall only be issued upon a;
  - 1. Showing of good and sufficient cause;
  - 1. A determination that failure to grant the variance would result in exceptional "hardship," as defined in Section 2 (Definitions), to the applicant;
  - 3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense, create a nuisance, as defined in Section 2 (Definitions), "Public Safety/ Nuisance"), cause fraud or victimization, as defined in Section 2 (Definitions) of the public, or conflict with existing local laws or ordinances.
- F. Variances may be issued for new construction, substantial improvement, and other proposed new development necessary for the conduct of a functionally dependent use provided that the provisions of Sub-section 6.3 A through E (Conditions for Variances) are satisfied and that the structure or other development is protected by methods that minimize flood damages during the base flood and does not result in additional threats to public safety and does not create a public nuisance.
- G. Upon consideration of all the factors of Section 6.2 (Appeal Board) and the purposes of this ordinance, the *{governing body}* may attach such conditions to the granting of, variances as it deems necessary to further the purposes of this ordinance.

## SECTION 7.0 MAP REVISION/AMENDMENT PROCEDURES

### 7.1 LETTERS OF MAP REVISION/AMENDMENT

National Flood Insurance Program regulations provide procedures to remove property from the 100-year floodplain or from a Special Flood Hazard Area. Amendments and revisions to community Flood Insurance Rate Maps can not adversely impact the floodplain or floodway delineation's of the level of the 100-year flood.

There are several procedures provided whereby the Federal Insurance Administrator will review information from the community, an owner, or a lessee of property where it is believed the property should not be included in a Special Flood Hazard Area.

Submissions to FEMA for revisions to effective Flood Insurance Studies (FISs) by individual and community requesters will require the signing of application/certification forms. These forms will provide FEMA with assurance that all pertinent data relating to the revision is included in the submittal. They will also assure that: (a) the data and methodology are based on current conditions; (b) qualified professional have assembled data and performed all necessary computations; and (c) all individuals and organizations impacted by proposed changes are aware of the changes and will have an opportunity to comment on them. FEMA procedures permit the following types of request:

A request for a revision to the effective FIS information (FIRM, FBFM, and / or FIS report) is usually a request that FEMA replace the effective floodplain boundaries, flood profiles, floodway boundaries, etc., with those determined by the requester. Before FEMA will replace the effective FIS information with the revised, the requester must: (a) provide all of the data used in determining the revised floodplain boundaries, flood profiles, floodway boundaries, etc.; (b) provide all data necessary to demonstrate that the physical modifications to the floodplain have been adequately designed to withstand the impacts of the 1% annual chance flood event and will be adequately maintained; (c) demonstrate that the revised information (e.g., hydrologic and hydraulic analyses and the resulting floodplain and floodway boundaries) are consistent with the effective FIS information.

Requests for amendments or revisions to FEMA maps must be reviewed and submitted to FEMA by the *{governing body}* of *{county or municipality}* with the applicant for a map amendment or revision required to prepare all the supporting information and appropriate FEMA forms.

The scientific or technical information to be submitted with these requests may include, but is not limited to the following:

- A. An actual copy of the recorded plat map bearing the seal of the appropriate recordation official County Clerk or Recorder of Deeds indicating the official recordation and proper citation, Deed or Plat Book Volume and Page Number, or an equivalent identification where annotation of the deed or plat book is not the practice.

- B. A topographical map showing;
  - 1. Ground elevation contours in relation to the NVGD (National Geodetic Vertical Datum).
  - 2. The total area of the property in question.
  - 3. The location of the structure or structures located on the property in question.
  - 4. The elevation of the lowest adjacent grade to a structure or structures.
  - 5. An indication of the curvilinear line which represents the area subject to inundation by a base flood. The curvilinear line should be based upon information provided by an appropriate authoritative source, such as a Federal Agency, Department of Water Resources, a County Water Control District, a County or City Engineer, a Federal Emergency Management Agency Flood Insurance Study, or a determination by a Registered Professional Engineer.
- C. A copy of the FHBM or FIRM indicating the location of the property in question.
- D. A certification by a Registered Professional Engineer or Licensed Land Surveyor that the lowest grade adjacent to the structure is above the base flood elevation.
- E. The completion of the appropriate forms in the Federal Emergency Management Agency's Packets, Amendments and Revisions To National Flood Insurance Program Maps (MT-1 FEMA FORM 81-87 Series and MT-2 FEMA FORM 81-89 Series).

## APPENDIX

### Appendices

#### 1.0 ALLUVIAL FAN ADVISORY

##### Hazards of Alluvial Fan Development

Alluvial fans present a unique flood hazard environment where the combination of sediment, slope, and topography create an ultra hazardous condition for which elevation on fill will not provide reliable protection. Active alluvial fan flooding is characterized by flow path uncertainty combined with abrupt deposition and erosion. As a result, any area of an alluvial fan may be subject to intense flood hazards.

The technology of mathematically modeling the hydrodynamics of water and debris flows for alluvial fans is still in the early development stage. The Federal Emergency Management Agency (FEMA) has formulated a mapping procedure for the purpose of defining the likelihood of flood hazards on inundated alluvial fan zones to be used for flood insurance purposes and general floodplain regulation, referred to as the FEMA alluvial fan methodology.

An active alluvial fan flooding hazard is indicated by three related criteria:

- a. Flow path uncertainty below the hydrographic apex;
- b. Abrupt deposition and ensuing erosion of sediment as a stream or debris flow loses its competence to carry material eroded from a steeper, upstream source area; and
- c. An environment where the combination of sediment availability, slope, and topography creates an ultra hazardous condition for which elevation on fill will not reliably mitigate the risk.

Inactive alluvial fan flooding is similar to traditional riverine flood hazards, but occurs only on alluvial fans. It is characterized by flow paths with a higher degree of certainty in realistic assessments of flood risk or in the reliable mitigation of the hazard. Counter to active alluvial fan flooding hazards, an inactive alluvial fan flooding hazard is characterized by relatively stable flow paths. However, areas of inactive alluvial fan flooding, as with active alluvial fan flooding, may be subject to sediment deposition and erosion, but to a degree that does not cause flow path instability and uncertainty.

An alluvial fan may exhibit both active alluvial fan flooding and inactive alluvial fan flooding hazards. The hazards may vary spatially or vary at the same location, contingent on the level of flow discharge. Spatially, for example, upstream inactive portions of the alluvial fan may distribute flood flow to active areas at the distal part of the alluvial fan. Hazards may vary at the same location, for example, with a flow path that may be stable for lower flows, but become unstable at higher flows.

More detailed information can be found at FEMA's website: "Guidelines for Determining Flood Hazards on Alluvial Fans" at [http://www.fema.gov/fhm/ft\\_afgd2.shtm#1](http://www.fema.gov/fhm/ft_afgd2.shtm#1).

### **Alluvial Fans and LOMR's**

The NFIP does not allow for the removal of land from the floodplain based on the placement of fill (LOMR-F) in alluvial fan flood hazard areas. The NFIP will credit a major structural flood control project, through the LOMR process, that will effectively eliminate alluvial fan flood hazards from the protected area. Details about map revisions for alluvial fan areas can be found in the Code of Federal Regulations at Title 44, Part 65.13.

## **2.0 HIGHER STANDARDS RECOMMENDED BY THE STATE OF NEVADA**

This model ordinance meets the minimum standards required to participate in the National Flood Insurance Program. Community adoption of higher standards can be applied towards credit under the Community Rating System (CRS) program and result in reduced premiums for all flood insurance policy holders within the entire community. The State of Nevada recommends:

### **A. Daily Fine**

In Sub-section 3.3 (Compliance), it is recommended that the penalties include a substantial daily fine for each day the violation continues. Each day the violation continues is a separate violation and subject to the same fine for each violation.

### **B. Determining BFE's in Unnumbered A Zones.**

Insert/add to Subsection 4.4.2 (Use of Other Flood Data) the following:

“C. When base flood elevations are not available from any other source, base flood elevations shall be obtained using one of two methods from the FEMA publication, FEMA 265, “Managing Floodplain Development in Approximate Zone A Areas – A Guide for Obtaining and Developing Base (100-year) Flood elevations,” dated July 1995.”

### **C. Limiting Increase in Base Flood Elevation**

Replace “one foot” with “one-half (0.5) foot” in Sub-section 4.4.1 C (Permit Application Review) to read:

“. . . For purposes of the ordinance, “adversely affects” means the cumulative effect of the proposed development when combined with all other existing and anticipated development will increase the water surface elevation of the base flood more than one-half foot at any point. . . .”

### **D. Freeboard**

The State of Nevada recommends that the lowest floor be elevated above the highest adjacent grade to a height exceeding the depth number specified in feet on the FIRM by at least two feet, or elevated at least four feet above highest adjacent grade if no depth number is specified.

To elevate at least two feet above the minimum required base flood elevation, make the following changes:

1. Replace Sub-section 5.1.3 A (Elevation Requirements for Lowest Floor) with:

“In Zone AO, elevated above the highest adjacent grade to a height 2 feet above the depth number specified in feet on the FIRM, or elevated at least three feet above the highest adjacent grade if no depth number is specified.”

2. Modify Sub-sections 5.1.3 B and 5.1.3 C (Elevation Requirements for Lowest Floor) by

replacing “elevated to or above” with “elevated 2 feet above.”

3. Modify Sub-section 5.5 A 4 a (Standards for Manufactured Homes) by replacing “to or above” with “at least 2 feet above.”
4. Modify Sub-section 5.5 B (Standards for Manufactured Homes) by replacing “at or above” with “at least 2 feet above.”
5. Replace Sub-section 5.5 D (Standards for Manufactured Homes) with:  
  
“Within Zone AO, the floor of all new and substantially improved manufactured homes will be elevated above the highest adjacent grade at least two feet above the depth number specified on the FIRM, or at least three feet above the highest adjacent grade if no depth number is specified.”

**E. Determining Market Value of Existing Structures.**

Replace the “Market value” definition in Section 2 (Definitions) with:

**“Market Value** For the purposes of determining substantial improvement, market value pertains only to the structure in question. It does not pertain to the land, landscaping or detached accessory structures on the property. For determining improvement, the value of the land must always be subtracted.

Market Value shall be determined by estimating the cost to replace the structure in new condition and adjusting that cost figure by the amount of depreciation which has accrued since the structure was constructed.

1. The cost of replacement of the structure shall be based on a square foot cost factor determined by reference to a building cost estimating guide recognized by the building construction industry.
2. The amount of depreciation shall be determined by taking into account the age and physical deterioration of the structure and functional obsolescence as approved by the floodplain administrator, but shall not include economic or other forms of external obsolescence.

Use of replacement costs or accrued depreciation factors different from those contained in recognized building cost estimating guides may be considered only if such factors are included in a report prepared by an independent professional appraiser and supported by a written explanation of the differences.”

**F. Increased Cost of Compliance (ICC) Coverage—Repetitive Loss Provisions.**

This provision allows communities the opportunity for flood insurance policy holders to have ICC coverage made available in repetitive loss situations.



Modify the definition of “Substantial damage” in Section 2 (Definitions) as follows:

**“Substantial  
Damage**

Substantial Damage includes:

1. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred; or
2. Flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such event, on the average, equals or exceeds 25 percent of the market value of the structure before the damage occurred. This is also known as “repetitive loss.”

**G. Non-conversion of Enclosed Areas below the Lowest Floor.**

Insert/add the following section after Section 4.4.9 (Submission of New Technical Data to FEMA):

**“4.4.10 NON-CONVERSION OF ENCLOSED AREAS BELOW THE LOWEST FLOOR**

To ensure that the areas below the BFE shall be used solely for parking vehicles, limited storage, or access to the building and not be finished for use as human habitation without first becoming fully compliant with the floodplain management ordinance in effect at the time of conversion, the Floodplain Administrator shall:

- A. Determine which applicants for new construction and/or substantial improvements have fully enclosed areas below the lowest floor that are 5 feet or higher;
- B. Enter into a “NON-CONVERSION AGREEMENT FOR CONSTRUCTION WITHIN FLOOD HAZARD AREAS” or equivalent with the *{name of county or municipality}*. The agreement shall be recorded with the *{name of county}* County Recorder as a deed restriction. The non-conversion agreement shall be in a form acceptable to the Floodplain Administrator and County Counsel; and
- C. Have the authority to inspect any area of a structure below the base flood elevation to ensure compliance upon prior notice of at least 72 hours.”

### 3.0 SPECIAL REQUIREMENTS

#### A. Crawlspace Construction

Communities with construction practices that result in crawl spaces with interior floors below grade have historically been in violation of the NFIP requirements. FEMA Technical Bulletin 11-01 (Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, 2001) now provides accommodation for these practices. The following section provides for adoption of the minimum crawlspace construction standards defined in FEMA Technical Bulletin 11-01.

Note that even after adopting these construction standards, buildings that have below-grade crawlspaces will continue to have higher flood insurance premiums than buildings with interior elevation at or above the lowest adjacent grade.

Add the following section after Section 5.1.6 (Requirements for Areas below the Lowest Floor):

#### “5.1.[X] CRAWLSPACE CONSTRUCTION

This sub-section applies to buildings with crawl spaces up to 2 feet below grade. Below-grade crawl space construction in accordance with the requirements listed below will not be considered basements.

- A. The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Crawl space construction is not allowed in areas with flood velocities greater than 5 feet per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer;
- B. The crawl space is an enclosed area below the BFE and, as such, must have openings that equalize hydrostatic pressures by allowing for the automatic entry and exit of floodwaters. For guidance on flood openings, see FEMA Technical Bulletin TB-1 (Openings in Foundation Walls and Walls of Enclosures, 2008);
- F. Crawl space construction is not permitted in V zones. Open pile or column foundations that withstand storm surge and wave forces are required in V zones;
- G. Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawl space used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE; and
- H. Any building utility systems within the crawl space must be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions.
- I. Requirements for all below-grade crawl space construction, in addition to the

above requirements, to include the following:

- J. The interior grade of a crawl space below the BFE must not be more than 2 feet below the lowest adjacent exterior grade (LAG), shown as D in figure 3 of FEMA Technical Bulletin 11-01 (Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, 2001);
- K. The height of the below-grade crawl space, measured from the interior grade of the crawl space to the top of the crawl space foundation wall must not exceed 4 feet (shown as L in figure 3 of Technical Bulletin 11-01, Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, 2001) at any point;
- L. There must be an adequate drainage system that removes floodwaters from the interior area of the crawl space within a reasonable period of time after a flood event, not to exceed 72 hours; and
- M. The velocity of floodwaters at the site should not exceed 5 feet per second for any crawl space. For velocities in excess of 5 feet per second, other foundation types should be used.”

**B. Garages and Accessory Structures**

The Standards of Construction defined in Section 5 (Provisions for Flood Hazard Reduction) apply to all structures built in special flood hazard areas including garages or any accessory structures. Addition of this section to a community’s floodplain management ordinance contains the definition for accessory structures and construction requirements to allow for the permitting of an accessory structure or detached garage within special flood hazard areas without a variance.

Add the following definitions to Section 2 (Definitions):

“**Accessory Structure**                    A structure used solely for parking (two-car detached garages or smaller) or limited storage (small, low-cost sheds).”

Add the following section after Section 5.1.6 (Requirements for Areas below the Lowest Floor):

**“5.1.[X]            GARAGES AND LOW COST ACCESSORY STRUCTURES**

- A. Attached Garages
  - 2. A garage attached to a residential structure, constructed with the garage floor slab below the BFE, must be designed to allow for the automatic entry of flood water in accordance with Section 5.1.6 (Requirements for Areas below the Lowest Floor). Areas of the garage below the BFE must be constructed with flood resistant material in accordance with 5.1.2.A.
  - 3. A garage attached to a nonresidential structure must meet the above requirements or be floodproofed. For guidance on below grade parking

areas, see FEMA Technical Bulletin TB-6 (Below-Grade Parking Requirements, 1993).

B. Detached garages and accessory structures.

1. Accessory structures” used solely for parking (2 car detached garages or smaller) or limited storage (small, low-cost sheds), as defined in Section 2 (Definitions), may be constructed such that its floor is below the base flood elevation (BFE), provided the structure is designed and constructed in accordance with the following requirements:
  - b) Use of the accessory structure must be limited to parking or limited storage;
  - c) The portions of the accessory structure located below the BFE must be built using flood-resistant materials;
  - d) The accessory structure must be adequately anchored to prevent flotation, collapse and lateral movement;
  - e) Any mechanical and utility equipment in the accessory structure must be elevated or floodproofed to or above the BFE;
  - f) The accessory structure must comply with floodplain encroachment provisions in Section 5.7 (Floodways); and
  - g) The accessory structure must be designed to allow for the automatic entry of flood waters in accordance with Section 5.1.6 (Requirements for Areas below the Lowest Floor).
2. Detached garages and accessory structures not meeting the above standards must be constructed in accordance with all applicable standards in Section 5.1.6 (Requirements for Areas below the Lowest Floor).”

C. **Mudslide (i.e., Mudflow) Prone Areas (Zone M)**

Add the following definitions to Section 2 (Definitions):

<b>“Area of Special Mudslide (i.e. Mudflow) Hazard</b>	The area subject to severe mudslides (i.e., mudflows). This area is designated as Zone M on the Flood Insurance Rate Map (FIRM).”
<b>“Flood Insurance Risk Zone Designations</b>	<b>Zone M</b> Area of special mudslide or mudflow hazards.”
<b>“Mudslide (i.e., Mudflow</b>	Is a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the

ground preceded by a period of unusually heavy or sustained rain. A mudslide may occur as a distinct phenomenon while a landslide is in progress, and will be recognized as such by the Federal Insurance Administrator only if the mud flow, and not the landslide, is the proximate cause of damage that occurs.”

**“Mudslide Prone Area** An area with land surfaces and slopes of unconsolidated material where the history, geology, and climate indicate a potential for mudflows.”

Add the following to Section 4.4.6 (Retaining Floodplain Development Documentation):

“I. Reports required by Sub-section 5.[X] (Mudslide Prone Areas).”

Add the following section after Section 5.7 (Floodways):

**“5.[X] MUDSLIDE (i.e., MUDFLOW) PRONE AREAS**

- A. All permit applications will be reviewed by the Floodplain Administrator to determine if the proposed development will be located within a mudslide area.
- B. The reviewing process will determine if the proposed site and improvements will be reasonably safe from mudslide hazards. Factors to be considered in making this determination include but are not limited to the following;
  - 1. Type and quality of soils.
  - 2. Evidence of ground water or surface water problems.
  - 3. Depth and quality of any fill.
  - 4. The overall slope of the site.
  - 5. The weight that any proposed structure will impose on the slope.
- C. When a proposed development is located in an area that may have mudslide hazards, the following will be the minimum requirements;
  - 2. A site investigation and further review be made by persons qualified in geology and soils engineering.
  - 2. The proposed grading, excavations, new construction, and substantial improvements are adequately designed and protected against mudslide damages.
  - 3. The proposed grading, excavations, new construction and substantial improvements do not aggravate the existing hazard by creating either on-site or off-site disturbances.

4. Drainage, planting, watering, and maintenance be such as not to endanger slope stability.
- N. When a proposed development is determined to be within a mudslide hazard area, the following requirements will include but not be limited to;
1. Adopting and enforcing a grading ordinance in accordance with data supplied by the Federal Emergency Management Agency.
  2. Regulate the location of foundation systems and utility systems of new construction and substantial improvements.
  3. Regulate the location, drainage and maintenance of all excavations, cuts and fills and planted slopes.
  4. Provide special requirements for protective measures including but not necessarily limited to retaining walls, buttress fills, sub drains, diverted terraces, and benching.
  5. Require engineering drawings and specifications to be submitted for all corrective measures, accompanied by supporting soils engineering and geology reports.”

**D. Erosion Prone Areas (Zone E)**

Add the following definitions to Section 2 (Definitions):

<b>“Area of Special Flood-related Erosion Hazard</b>	The land within a community which is most likely to be subject to severe flood related erosion losses. This area may be designated as Zone E on the Flood Insurance Rate Map (FIRM). “
<b>‘Flood Insurance Risk Zone Designations</b>	<b>Zone E</b> Area of special flood-related erosion hazards.”
<b>“Flood-related Erosion</b>	The collapse or subsidence of land along a stream or wash, the shore of a lake or other body of water as a result of undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding.”
<b>“Flood-related Erosion Prone Area</b>	A land area adjoining the shore of a lake or other body of water, which due to the composition of the shoreline or bank and high water levels or wind-driven currents, is likely to suffer flood-related erosion damage.”

Add the following section after Section 5.7 (Floodways):

**“5.[X] FLOOD-RELATED EROSION-PRONE AREAS**

- A. All permit applications will be reviewed by the Floodplain Administrator to determine if the proposed development will be located within a special flood-related erosion hazard area.
- B. The reviewing process will determine if the proposed site alterations and improvements will be reasonably safe from flood-related erosion and will not cause flood-related erosion hazards or otherwise aggravate the existing flood-related erosion hazard.
- C. When the proposed development is found to be in the path of flood-related erosion or to increase the erosion hazard, require the improvement to be relocated or adequate protective measures to be taken which will not aggravate the existing erosion hazard.
- D. When it has been determined the proposed development is in a special flood-related erosion hazard, as delineated Zone E on the community FIRM, require;
  - 1. A setback for all new development from the lake, bay, riverfront or other body of water, to create a safety buffer consisting of a natural vegetative or contour strip. This buffer will be designated according to the flood-related erosion hazard and erosion rate, in conjunction with the anticipated "useful life" of structures, and depending upon the geologic, hydrologic, topographic and climatic characteristics of the community's land. The buffer may be used for suitable open spaces purposes, such as for agricultural, forestry, outdoor recreation and wildlife habitat areas, and for other activities using temporary and portable structures only.”

**From:** "Kent R. Neddenriep" <kneddenriep@roanderson.com>  
**To:** "StormWaterHotline@carson.org" <StormWaterHotline@carson.org>  
**Date:** 4/18/2011 9:33 AM  
**Subject:** Comments on proposed ordinance

I have done a cursory review of the proposed ordinance and wish to comment on two items:

\* I believe that your definition of Highest Adjacent Grade should be expanded to cover the following conditions that I expect will come up

- o If fill is placed immediately prior to construction of the walls of a structure.
- o If fill is placed prior to construction as part of a development of a commercial or residential subdivision.
- o If fill was placed after the effective date of the FIRM.
- o If fill was placed after the topo for the study that determined the base flood elevation presented on the FIRM.

\* The requirement of Finished floors being 2' above the base flood elevation, although safer and more conservative, may result in a significant number of variances; increased construction costs; and visual impacts. Keep in mind that with conventional crawl space construction the ground surface of the crawl space is considered the lowest floor.

Thanks for your consideration,

Kent Neddenriep, P.E.

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