



Agenda

Joint Work Session with the
Board of County Commissioners and Planning Commission

Wednesday, January 11, 2017

Dinner-5:30 p.m, Meeting- 6:00 p.m.
Carter Lake Conference Room - 200 W Oak, 1st Floor

Agenda Items:

I. Comprehensive Plan Introductions and Overview

II. Land Use Code Amendments – Section 4.2.2 - *Page 1*

*1. TITLE: LCLUC Section 4.2.2 Revision

REQUEST: The Larimer County Engineering Department is proposing revisions to the LCLUC Section 4.2.2 to allow repair or replacement of a flood related Substantially Damaged Structure in the FW Floodway Overlay Zone District subject to review and approval by the Larimer County Flood Review Board.

STAFF CONTACTS: Eric Tracy, Larimer County Engineering

In **July 1974**, Larimer County joined the FEMA National Flood Insurance Program (NFIP) and property owners became eligible to purchase flood insurance through that program. On December 1, 1975, Larimer County adopted its first floodplain regulations as a supplementary regulation to the Larimer County Comprehensive Zoning Regulation and also as an amendment to the County Building Code. (For more history of the Floodplain Regulation in Larimer County, please see the attached handout.)

Since that time, Larimer County has had higher (more restrictive) regulations than the minimum required by FEMA or the State of Colorado. One example of the higher, more restrictive regulation is the prohibition of repairing or replacing a legal non-conforming structure that has been Substantially Damaged (more than 50% of its value) within the FW Floodway Overlay Zone. (For definitions of Substantially Damaged and different Floodplain Overlay Zones, please see the attached handout)

Beginning in 2015 we received concerns from citizens in the Laporte Area regarding our higher zoning regulations within our floodplain overlay zones. More specifically in regards to the prohibition of repairing or replacing a structure within the Floodway Overlay Zone. These concerns did not arise from flood damage in 2013, but rather from someone trying to sell their home.

The general concern from the public is that the regulation reads that you cannot rebuild a home if it is Substantially Damaged by a flood. This causes mortgage lenders to not want to lend money on homes and makes it more difficult to sell a home located within a regulatory Floodway.

Since this discussion started....

- We've had multiple worksession & hearings including the Flood Review Board, Environmental and Science Advisory Board, Planning Commission and Board of County Commissioners
- Adopted new regulation that allows a Substantially Damaged structure to be rebuilt in the FW Floodway Overlay Zone if it was damaged by anything other than a flood. (June 2015)

- Explored options that would allow a Substantially Damaged structure to be rebuilt in the FW Floodway Overlay Zone even if the Substantial Damage is caused by flooding.
- Part of that was investigating ways to mitigate risk with rebuilding in the floodways. This included engineering studies related to erosion and stream stability and depth velocity product corridors (overlay zones). Those studies gave us invaluable insight on flood risk and mitigation options.
- In regards to the Depth/Velocity Product Study there were diverse opinions on:
 - o Which depth velocity product corridor was appropriate. Multiple iterations were completed ranging in risk from the potential for children to evacuate, to trained personnel being able to complete rescue missions, to physical structure damage.
 - o How much it would cost the County to produce the regulatory overlay zones within all the currently effective Floodway Overlay Zones.
 - o There were concerns about the burden this placed on the County to maintain the data as changes occur in the corridor
 - o There were concerns about the burden on property owners to have additional overlay zones placed on their property
- During a Flood Review Board worksession in 2016 on this topic, it was suggested that instead of adopting product corridor and erosion overlay zones, to simply adopt regulations that instead of reading “you can’t rebuilt” to “you can rebuild if you meet certain criteria”. Although the citizens would like Larimer County to simply adopt the “minimum” standards required by the State of Colorado and FEMA, this appeared to be an acceptable approach from both County Staff and the concerned public.
- There were many advantages to taking this approach.
 - o Eliminate the need to produce expensive engineering studies, thus saving the County thousands of dollars.
 - o Eliminate the requirement to maintain the engineering models as things change in the corridor
 - o Allow more flexibility for the property owners to mitigate the risk and comply with the regulation in the event of flood damage.
 - o Eliminate the complexity of recovery for most of the structures within the Floodway that the County wouldn’t be opposed to rebuilding anyway.
 - o Have the same conclusion (no rebuild or repair) for the structures that genuinely are a concern to the County if they were to be repaired or replaced in a high risk area.
- The idea was brought to the commissioners during a worksession later in 2016 and given the ok to move forward.

- Since then, we have had our flood review board hearing where the FRB has drafted proposed code changes that would eliminate the “you cannot rebuild” clause with a “you could rebuild if...” clause.
- Currently, the proposed criteria to allow a legal non-conforming structure Substantially Damaged in the FW Floodway Overlay Zone to be repaired or replaced include:
 - o additional freeboard (24 inches total)
 - o mitigation of erosion or stream instability
 - o not within a product corridor [depth (ft) x velocity (ft/sec)] greater than 8
 - o must meet all other federal, state and local floodplain regulations
 - o should follow guidance from standard engineering practices within FEMA documents

Since there have been major changes in the direction we are going with this code change, it was asked that staff bring this to you today in a joint PC/BCC worksession to discuss the changes and the process moving forward.

Attached to this summary are the proposed code changes as suggested by the Larimer County Flood Review Board. Our hope is that discussion tonight will focus on any areas of concern or additional questions that need to be addressed prior to taking this through the complete public process.

Potential hearing dates will be presented at the hearing to bring this code change forward.

4.2.2. - Floodplain overlay zones.

- A. *Purpose.* Certain areas in Larimer County are subject to periodic inundation, which can result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect the health, safety and general welfare of the public.

The purpose of the regulations set out in this section 4.2.2 are to:

1. Restrict or prohibit uses that are dangerous to health, safety or property in times of flood, or cause excessive increases in flood heights or velocities;
 2. Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
 3. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of flood waters;
 4. Control filling, grading, dredging and other development which may increase flood damage;
 5. Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands.
- B. *Applicability.* These regulations apply to all Federal Emergency Management Agency (FEMA) and local 100-year special flood hazard areas and the areas defined as the 500-year floodplain along the Poudre River within the GMA of Fort Collins along with areas removed from the floodplain by the issuance of a FEMA letter of map revision based on fill (LOMR-F).

The special flood hazard areas identified locally and by FEMA in the most recent scientific and engineering report entitled, "The Flood Insurance Study for Larimer County," with accompanying flood insurance rate maps (FIRM) and any revisions thereto are adopted by reference and declared to be a part of this code. These special flood hazard areas identified by the FIS and attendant mapping are the minimum areas of applicability of these regulations and are supplemented by studies designated and approved by Larimer County.

The six floodplain zoning districts set out in subsection F of this section 4.2.2 (FW—Floodway district, FF—Flood fringe district, FH—Flood hazard district, SF—Shallow flooding district, Cache La Poudre River GMA 100-year floodplain district, and Cache La Poudre River GMA 500-year floodplain district) are overlay zones. They are referred to collectively as the "floodplain overlay zone districts." The underlying zoning continues to apply in the floodplain overlay zone districts to the extent the underlying zoning has not been modified by or is inconsistent with this section. Uses followed by an (FPSR) require approval through the floodplain special review rules described in subsection 4.2.2.G.6.

The degree of flood protection required by this section of the code is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. On rare occasions greater floods can and will occur and flood heights may be increased by man-made or natural causes. These floodplain overlay zone districts do not imply that land outside the overlay zones or uses permitted within such areas will be free from flooding or flood damages. These floodplain overlay zone districts shall not create liability on the part of Larimer County or any official or employee thereof for any flood damages that result from reliance on this code or any administrative decision lawfully made thereunder.

- C. *Location of district.* The floodplain overlay zone districts are generally shown on the digital flood insurance rate maps (DFIRM) and are approximate. Anyone contesting that their property is within one of the six designated floodplain zoning districts may submit actual elevation of the ground surface as determined by a site survey performed by a licensed professional surveyor hired by the applicant. The information will be cross-referenced to the flood profile elevations where they exist. The floodplain administrator makes the final decision as whether or not the property is within one of the six designated floodplain zoning districts.

The electronic digital flood insurance rate map (DFIRM) prepared and published by FEMA and the digital version of the local floodplains shall be designated as an official map of the floodplain overlay zone districts.

Whenever FEMA issues a new edition of the DFIRM, the new electronic map in this edition shall become the official map of the floodplain overlay zone district.

D. *General standards.* The following requirements apply in all floodplain overlay zone districts, except the Cache La Poudre River Growth Management Area (GMA) 500-year floodplain district:

1. All new construction or substantial improvements shall:
 - a. Be designed (or modified) and adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
 - b. Be constructed by methods and practices that minimize flood damage.
 - c. Be constructed with materials resistant to flood damage.
 - d. Be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.
2. All manufactured homes shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not 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.
3. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.
4. New construction and substantial improvement of any residential structure shall have the lowest floor (including basement), elevated to the regulatory flood protection elevation. Upon completion of the structure, the elevation of the lowest floor, including basement, shall be certified by a professional land surveyor licensed in the State of Colorado. Such certification shall be submitted to the floodplain administrator before issuance of a certificate of occupancy.
5. With the exception of critical facilities, outlined in subsection 4.2.2.E, new construction and substantial improvements of any commercial, industrial, or other nonresidential structure shall either have the lowest floor (including basement) elevated to the regulatory flood protection elevation or, together with attendant utility and sanitary facilities, be designed so that at the applicable flood protection elevation the structure is watertight with walls and openings substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered Colorado Professional Engineer shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice. Such certification shall be submitted to the floodplain administrator before a building permit will be issued.
6. New construction and substantial improvements, including accessory buildings with fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access, or storage in an area other than a basement 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.
 - a. Designs for meeting this requirement must either be certified by a registered Colorado Professional Engineer or meet or exceed the following minimum criteria:
 1. 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 shall be provided.

2. The bottom of all openings shall be no higher than 1.0 foot above grade.
 - b. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
7. All manufactured homes that are placed or substantially improved within a special flood hazard area on sites outside of a manufactured home park or subdivision, in a new manufactured home park or subdivision, in an expansion to an existing manufactured home park or subdivision, or in an existing manufactured home park or subdivision in which a manufactured home has incurred "substantial damage" as a result of a flood, shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to the applicable flood protection elevation and shall be securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
 - a. All manufactured homes placed or substantially improved on sites in an existing manufactured home park or subdivision within a special flood hazard area that are not subject to the provisions of the above paragraph, shall be elevated so that either:
 1. The lowest floor of the manufactured home is above the flood protection elevation, or
 2. The manufactured home chassis is supported by reinforced piers or equivalent strength foundation elements no less than 36 inches in height above grade and is securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
8. All recreational vehicles placed on sites within a special flood hazard area shall:
 - a. Be on the site for a period not to exceed 180 days in any 12-month period,
 - 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, attached to the site only by quick disconnect type utilities and security devices, with no permanently attached additions, or
 - c. Meet the permit requirements of subsection 4.2.2.H, and the elevation and anchoring requirements for "manufactured homes" in subsection 4.2.2.D.
9. All proposed development shall:
 - a. Be made reasonably safe from flooding and provide adequate drainage to reduce exposure to flood hazards.
 - b. Have the base flood elevation generated if it is greater than 50 lots or five acres, whichever is less, if not otherwise provided.
 - c. Have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage.
 - d. Meet the floodplain development permit requirements of subsection 4.2.2.H.
10. Stream alteration projects shall appropriately consider issues of sediment transport, erosion, deposition, and channel migration, and shall properly mitigate potential problems through the project as well as upstream and downstream of any improvement activity. A detailed analysis of sediment transport and overall channel stability should be considered, when appropriate, to assist in determining the most appropriate design.
11. Stream alteration projects shall evaluate the residual 100-year floodplain.
12. Any proposed stream alteration activity must be evaluated for its impact on the regulatory floodplain and be in compliance with all applicable federal, state and local floodplain rules, regulations and ordinances.
13. Any stream alteration activity shall be designed and sealed by a registered Colorado Professional Engineer.

14. All activities shall meet all applicable federal, state and local floodplain requirements and regulations.
 15. Within the regulatory floodway, floodplain development activities shall not occur unless the applicant demonstrates through a floodway analysis, documented and sealed by a registered Colorado Professional Engineer, that not more than a 0.00-foot rise in the base flood elevation results from the proposed conditions compared to existing conditions, otherwise known as a no-rise certification, unless a CLOMR is first applied for by the applicant and approved by FEMA.
 16. A recorded maintenance agreement shall be required for any altered or relocated portions of watercourses so that the flood-carrying capacity is not diminished.
 17. Larimer County does not regulate typical agricultural wire and t-post fencing within the floodplain overlay zone districts.
 18. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
 19. Outdoor storage or processing of materials that in time of flooding are buoyant, flammable, explosive, or could be injurious to human, plant or animal life is prohibited.
 20. For waterways with base flood elevations for which a regulatory floodway has not been designated, no new construction, substantial improvements, or other development (including fill) shall not be permitted, unless it is 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 0.50 feet at any point.
 21. Railroads, streets, roads, bridges, flood and water control structures, above and below ground utilities (excluding service connections), pipelines, marinas, boat rentals, docks, piers, and wharves, if allowed by underlying zoning shall be processed as a floodplain special review.
- E. *Critical facilities.* In all floodplain overlay zone districts, the following provisions are required:
1. Critical facilities are classified under the following categories: Essential services; hazardous materials; at-risk populations; and vital to restoring normal services.
 2. Critical facilities that are designated as historical structures (determinations by the state historic preservation office) are exempt as critical facilities.
 3. Open space activities such as agriculture, horticulture, floriculture, recreation, and mineral extraction including oil and gas activities are exempt as critical facilities unless provisions within subsection 4.2.2.E apply.
 4. Critical facilities are not allowed within the Cache La Poudre River GMA 100- year floodplain district or the Cache La Poudre River GMA 500-year floodplain district regardless of any letter of map revision based on fill issued by FEMA.
 5. Essential services facilities include public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities, and transportation lifelines. These facilities consist of:
 - a. Public safety (police stations, fire and rescue stations, emergency vehicle and equipment storage, and, emergency operation centers).
 - b. Emergency medical (hospitals, ambulance service centers, urgent care centers having emergency treatment functions, and non-ambulatory surgical structures but excluding clinics, doctors offices, and non-urgent care medical structures that do not provide these functions);
 - c. Designated emergency shelters;
 - d. Communications (main hubs for telephone, broadcasting equipment for cable systems, satellite dish systems, cellular systems, television, radio, and other emergency warning systems, but excluding towers, poles, lines, cables, and conduits);

- e. Public utility plant facilities for generation and distribution (hubs, treatment plants, substations and pumping stations for water, electric and gas, but not including towers, poles, power lines, buried pipelines, transmission lines, distribution lines, and service lines); and
 - f. Air transportation lifelines (municipal and larger airports, helicopter pads and structures serving emergency functions, and associated infrastructure including aviation control towers, air traffic control centers, and emergency equipment aircraft hangars);
 - g. Specific exemptions to this category include wastewater treatment plants (WWTP), non-potable water treatment and distribution systems, and hydroelectric power generating plants and related appurtenances;
 - h. Public utility plant facilities may be exempted if it can be demonstrated to the satisfaction of the Larimer County Flood Review Board that the facility is an element of a redundant system for which service will not be interrupted during a flood. At a minimum, it shall be demonstrated that redundant facilities are available (either owned by the same utility or available through an intergovernmental agreement or other contract) and connected, the alternative facilities are either located outside of the 100-year floodplain or are compliant with the provisions of this code, and an operations plan is in effect that states how redundant systems will provide service to the affected area in the event of a flood. Evidence of ongoing redundancy shall be provided to the Larimer County Engineering Department on an as-needed basis upon request.
6. Hazardous materials facilities include facilities that produce or store highly volatile, flammable, explosive, toxic and/or water-reactive materials. These facilities may include:
- a. Chemical and pharmaceutical plants (chemical plant, pharmaceutical manufacturing);
 - b. Laboratories containing highly volatile, flammable, explosive, toxic and/or water-reactive materials;
 - c. Refineries;
 - d. Hazardous waste storage and disposal sites; and
 - e. Above-ground gasoline or propane storage or sales centers;
 - f. Specific exemptions to this category include:
 - 1. Finished consumer products within retail centers and households containing hazardous materials intended for household use, and agricultural products intended for agricultural use.
 - 2. Buildings and other structures containing hazardous materials for which it can be demonstrated to the satisfaction of the local authority having jurisdiction by hazard assessment and certification by a qualified professional (as determined by the county) that a release of the subject hazardous material does not pose a major threat to the public.
 - 3. Pharmaceutical sales, use, storage, and distribution centers that do not manufacture pharmaceutical products.
 - 4. These exemptions shall not apply to buildings or other structures that also function as critical facilities under another category outlined in this code.
7. At-risk population facilities include medical care, congregate care, and schools. These facilities consist of:
- a. Elder care (nursing homes);
 - b. Congregate care facilities and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a flood;

- c. Public and private schools (pre-schools, K—12 schools), before-school and after-school care serving 12 or more children); daycare facilities.
- 8. Facilities vital to restoring normal services including government operations. These facilities consist of:
 - a. Essential government operations (public records, courts, jails, building permitting and inspection services, community administration and management, maintenance and equipment centers);
 - b. Essential structures for public colleges and universities (dormitories, offices, and classrooms only);
 - c. Cemeteries;
 - d. These facilities may be exempted if it can be demonstrated to the satisfaction of the Larimer County Flood Review Board that the facility is an element of a redundant system for which service will not be interrupted during a flood. At a minimum, it shall be demonstrated that redundant facilities are available (either owned by the same entity or available through an intergovernmental agreement or other contract), the alternative facilities are either located outside of the 100-year floodplain or are compliant with this ordinance, and an operations plan is in effect that states how redundant facilities will provide service to the affected area in the event of a flood. Evidence of ongoing redundancy shall be provided to the Larimer County Engineering Department on an as-needed basis upon request.
- 9. Protection for critical facilities. All new and substantially improved critical facilities and new additions to critical facilities located within the floodplain overlay zone districts shall be regulated to a higher standard than structures not determined to be critical facilities. Protection shall include one of the following:
 - a. Location outside a special flood hazard area; or
 - b. Elevation or floodproofing of the structure to at least 2.0 feet above the base flood elevation.
- 10. Ingress and egress for new critical facilities. New critical facilities shall, except when impracticable as determined by the Larimer County Flood Review Board, have continuous non-inundated access (ingress and egress for evacuation and emergency services) during a 100-year flood event.

F. *Floodplain overlay zone districts.*

- 1. FW—Floodway district (comprised of FEMA floodway and local zone AE floodway).
 - a. Allowed uses can be found in the zoning table in section 4.1.
 - b. Requirements for uses in the FW—Floodway district:
 - 1. All uses must comply with subsection 4.2.2.D (General Standards) and the following:
 - 2. Larimer County regulates the 0.50-foot rise floodway except in mountainous areas where mountain floodway criteria is sometimes applicable.
 - 3. Encroachments are prohibited, including fill, new construction, substantial improvements and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed by a licensed Colorado professional engineer and in accordance with standard engineering practice that the proposed encroachment would result in less than a 0.00 foot increase (requires a no-rise certification) in base flood elevations within the community during the occurrence of the base flood discharge.
 - 4. In the event fill is allowed, it must be protected against erosion by the use of rip rap, bulk heading or vegetative cover appropriately designed and certified by a Colorado registered professional engineer.

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5. ~~Structures must not be intended or used for human habitation.~~
 6. ~~Structures must be constructed so the longer axis of the structure is parallel to the direction of the flood flow.~~
 7. ~~Whenever possible, the placement of the structure must be on the same flood-flow lines as those of adjoining structures.~~
 8. No new or expanded on-site wastewater treatment systems shall be installed in a floodway.
 9. Legal non-conforming Substantially damaged structures within a floodway the FW-Floodway District that are Substantially Damaged (defined in 4.2.2.K Definitions) where the damage was by any cause other than a flood event can be repaired or replaced in the same footprint floodway as long as the lowest floor is at or above the regulatory flood protection elevation and the repair and reconstruction meets all other applicable sections of 4.2.2.
 10. ~~Substantially damaged structures within a floodway where the damage was caused by a flood event can not be repaired or replaced in the floodway. Legal non-conforming structures within the FW-Floodway District that are Substantially Damaged by a flood event may only be repaired or replaced upon review and pre-approval by the Flood Review Board pursuant to 4.2.2.G.8.~~
 11. Legal non-conforming structures within the FW-Floodway District that sustain damage by any cause, but are not Substantially Damaged may be repaired/improved without meeting Lowest Floor Elevation requirements only if the cost of repairs and improvement combined do not constitute a Substantial Improvement (defined in 4.2.2.K Definitions). A Floodplain Development Permit is still required.
 12. Legal non-conforming structures within the FW-Floodway District may only be Substantially Improved (defined in 4.2.2.K Definitions) upon review and pre-approval by the Flood Review Board pursuant to 4.2.2.G.7
 13. New structures within the FW-Floodway District are prohibited.
2. FF—Flood fringe district (comprised of FEMA flood fringe and local zone AE flood fringe).
 - a. Allowed uses can be found in the zoning table in section 4.1.
 - b. Requirements for uses in the FF—Flood fringe district:
 1. All uses must comply with subsection 4.2.2.D (General Standards) and the following:.
 2. Legal non-conforming Substantially amaged structures within a floodfringe the FF-Flood Fringe District that are Substantially Damaged or propose to be Substantially Improved where the damage was by any cause can be repaired, or replaced and/or improved in the flood fringe as long as the Llowest Ffloor is at or above the Rregulatory Fflood Pprotection Eelevation and the repair and reconstruction repair, replacement and/or improvements meets all other applicable sections of 4.2.2.
 3. Legal non-conforming structures within the FF-Flood Fringe District that sustain damage by any cause, but are not Substantially Damaged may be repaired/improved without meeting Lowest Floor elevation requirements only if the cost of repairs and improvement combined do not constitute a Substantial Improvement (defined in 4.2.2.K Definitions). A Floodplain Development Permit is still required.
 3. FH—Flood hazard district (comprised of FEMA zone A flood hazard).
 - a. Allowed uses can be found in the zoning table in section 4.1.
 - b. Requirements for uses in the FH—Flood hazard district: are outlined in

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1. All uses must comply with subsection 4.2.2.D (General Standards) and the following:

- 2e. Encroachments are prohibited, including fill, new construction, substantial improvements and other development within the FH—Flood hazard district unless it has been demonstrated through hydrologic and hydraulic analyses performed by a licensed Colorado Professional Engineer and in accordance with standard engineering practice that the proposed encroachment is not within the area that is defined as the 0.50-foot floodway in the analysis performed by the engineer.
- 3d. Legal non-conforming structures Substantially damaged structures within the FH-Flood Hazard District that have been Substantially Damaged or propose to be Substantially Improved where the damage was by any cause can be repaired, or replaced and/or improved in the FH-Flood Hazard District as long as the Lowest Floor is at or above the Regulatory Flood Protection Elevation and the repair and reconstruction repair, replacement and/or improvements meets all other applicable sections of 4.2.2.
4. Legal non-conforming structures within the FH-Flood Hazard District that sustain damage by any cause, but are not Substantially Damaged may be repaired/improved without meeting Lowest Floor Protection requirements only if the cost of repairs and improvement combined do not constitute a Substantial Improvement (defined in 4.2.2.K Definitions). A Floodplain Development Permit is still required.
4. SF—Shallow flooding district (comprised of FEMA shallow flooding and local zone AO shallow flooding, and local zone AH shallow flooding).
- a. Allowed uses can be found in the zoning table in section 4.1.
- b. Requirements for uses in the SF—Shallow flooding district are outlined in

1. All uses must comply with subsection 4.2.2.D (General Standards) and the following:-

- e2. Residential construction—All new construction and substantial improvements of residential structures must have the lowest floor (including basement) elevated above the highest adjacent grade at least 1.5 feet above the depth number specified in feet on the FIRM (at least 3.0 feet if no depth number is specified). Upon completion of the structure, the elevation of the lowest floor, including basement, shall be certified by a registered Colorado Professional Land Surveyor. Such certification shall be submitted to the floodplain administrator.
- d3. Nonresidential construction—With the exception of critical facilities, outlined in subsection 4.2.2.E, all new construction and substantial improvements of nonresidential structures, must have the lowest floor (including basement) elevated above the highest adjacent grade at least 1.5 feet above the depth number specified in feet on the FIRM (at least 3.0 feet if no depth number is specified), or together with attendant utility and sanitary facilities be designed so that the structure is watertight to at least 1.5 feet above the base flood level with wall substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads of effects of buoyancy. A registered Colorado Professional Engineer shall submit a certification to the floodplain administrator that the standards of section 4.2.2 are satisfied.

4. Legal non-conforming structures within the SF-Shallow Flooding District that have been Substantially Damaged or propose to be Substantially Improved can be repaired, replaced and/or improved in the SF-Shallow Flooding District as long as the Lowest Floor is at or above the Regulatory Flood Protection Elevation and the repair, replacement and/or improvements meet all other applicable sections of 4.2.2.

4. Legal non-conforming structures within the FH-Flood Hazard District that sustain damage by any cause, but are not Substantially Damaged may be repaired/improved without meeting Lowest Floor Protection requirements only if the cost of repairs and improvement combined do not constitute a Substantial Improvement (defined in 4.2.2.K Definitions). A Floodplain Development Permit is still required.

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5. Cache La Poudre River GMA 100-year floodplain district.
 - a. Allowed uses can be found in the zoning table in section 4.1.
 - b. Requirements and procedures within the Cache La Poudre GMA 100-year floodplain zoning district shall be the same as requirements and procedures within the FF—Flood fringe and FW—Floodway zoning districts respectively, except as noted below.
 1. Any new structure excepting expansion of existing nonconforming structures placed in the Cache La Poudre River GMA 100-year floodplain zoning district shall have its lowest floor level placed at or above the GMA regulatory flood protection elevation.
 2. If any nonresidential structure or portions thereof are not constructed on fill, the structure or portion not on fill must be floodproofed to the GMA regulatory flood protection elevation.
 3. New critical facilities shall be prohibited within the Cache La Poudre River GMA 100-year floodplain zoning district, regardless of any letter of map amendment based on fill that may have been issued by the Federal Emergency Management Agency relative to the 100-year floodplain.
 4. Reconstruction, repair or enlargement of existing public and private utility facilities may be allowed as a floodplain special review use upon a showing that the design of the reconstruction, repair or enlargement is consistent with the need to maintain or restore normal services to flooded areas before, during and after a regulatory flood.

6. Cache La Poudre River GMA 500-year floodplain district.
 - a. New critical facilities shall be prohibited within the Cache La Poudre River GMA 500-year floodplain zoning district, regardless of any letter of map revision based on fill (LOMR-F) that may have been issued by the Federal Emergency Management Agency relative to the 100-year floodplain.
 - b. Reconstruction, repair or enlargement of existing public and private utility facilities may be allowed as a floodplain special review use upon a showing that the design of the reconstruction, repair or enlargement is consistent with the need to maintain or restore normal services to flooded areas before, during and after a regulatory flood.

G. *Flood review board.*

1. The flood review board:
 - a. Is appointed by the board of county commissioners.
 - b. Consists of five to seven members.
 - c. Selects a chairperson annually.
 - d. Must have a quorum of at least three members to conduct business.
2. Powers of the flood review board:
 - a. To review and make recommendations to the board of county commissioners regarding floodplain special review applications.
 - b. To grant variances from the terms and conditions of section 4.2.2 of the Larimer County Land Use Code.
 - c. To grant variances to allow the expansion of structures and uses that are nonconforming with respect to the requirements of section 4.2.2 of the Larimer County Land Use Code.
 - d. To review and make determinations of interpretations of section 4.2.2 of the Larimer County Land Use Code.

- e. To determine whether alternate methods of construction in the FW, FF and FH and shallow flooding districts are suitable or advisable, provided that those alternate methods withstand flood damage and do not restrict the flow capacity of the main channel or any related drainage.
3. Hearing procedure of the flood review board:
 - a. To initiate review by the flood review board, the applicant must file an application with the floodplain administrator on forms provided by him/her and pay any applicable fees.
 - b. The application must indicate the nature of the review and determination being sought (i.e., map changes, zoning district boundary locations, floodplain special review, variance, expansion of a nonconforming use or nonconforming structure, interpretation of floodplain sections of this code or alternate methods of construction).
 - c. A hearing before the flood review board must be scheduled within 60 days of the submittal of a complete application. The applicant will be notified in writing of the date, time and place of the hearing.
 - d. Notice of the hearing must be published at least 14 days prior to the hearing in a newspaper of general circulation within the county. The notice must designate the date, time and place of the hearing, location of the property that is the subject of the review, and the nature of the review and determination the applicant is applying for. Written notice may be mailed to any surrounding property owners if the county engineer deems appropriate in the interest of fairness. However, mailing of these notices is discretionary, and failure to receive a notice does not affect the validity of the hearing before the flood review board.
 - e. At the conclusion of the hearing, the flood review board will make its recommendation or decision for approval, approval with conditions, or denial of the application. The flood review board may also table an item to a future date to allow the applicant to resolve issues that have been identified. The flood review board will make its recommendation or decision based on the evidence and information presented and based on the applicable criteria, standards and requirements in section 4.2.2 of the Larimer County Land Use Code.
 4. Map changes:
 - a. The flood review board shall hear and render judgment on requests for map changes within the floodplain overlay zone districts.
 - b. Base mapping, topography and surveys, GIS, hydrology and hydraulic analyses, floodplain delineations, and special floodplain conditions (alluvial fan and debris flow, post-wildfire hydrology, ice jam flooding) shall be completed using protocols set forth in FEMA Guidelines and Specifications for Flood Hazard Mapping Partners.
 - c. Whenever a stream alteration activity is known or suspected to increase or decrease the established base flood elevation in excess of 0.3 feet, a letter of map revision showing such changes shall be obtained in order to accurately reflect the proposed changes on FEMA's regulatory floodplain map for the stream reach.
 - d. Larimer County may approve certain development which increases the base flood elevation by more than 0.5 feet, provided that the applicant applies for a conditional letter of map revision (CLOMR) through FEMA, fulfills the requirements for such revisions, and receives FEMA approval.
 - e. Where an applicant for a map change proposes a project which will result in changes to the location of a floodplain overlay zone district, the applicant shall be responsible for the cost of preparing maps and any technical studies necessary for submittal to FEMA for a conditional letter of map revision (CLOMR) and letter of map revision (LOMR). Prior to issuance of any floodplain development permit or building permit for the project, the applicant shall submit the required maps and technical studies to the floodplain administrator. No floodplain development permit or building permit shall be issued until FEMA has indicated

the information is acceptable and has issued a CLOMR. The applicant shall pay any costs incurred to revise information submitted to FEMA to make it acceptable.

5. Variances from floodplain regulations:
 - a. The flood review board shall hear and render judgment on requests for variances from the requirements of section 4.2.2 of the Larimer County Land Use Code.
 - b. Variances from section 4.2.2 does not relieve the requirements set forth in other sections of this code.
 - c. The flood review board shall hear and render judgment on an appeal only 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 section 4.2.2 of the Larimer County Land Use Code.
 - d. Any person or persons aggrieved by the decision of the flood review board may appeal such decision to the board of county commissioners as provided in section 22 of the Larimer County Land Use Code.
 - e. The floodplain administrator shall maintain a record of all actions involving an appeal and shall report variances to the Federal Emergency Management Agency upon request.
 - f. Variances may be issued for new construction and substantial improvements 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 the relevant factors in subsection 4.2.2.D have been fully considered. As the lot size increases beyond the one-half acre, the technical justification required for issuing the variance increases.
 - g. Upon consideration of the factors noted above and the intent of this code, the flood review board may attach such conditions to the granting of variances as it deems necessary to further the purpose and objectives of these regulations as stated in subsection 4.2.2.A.
 - h. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
 - i. Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
 - j. Variances shall only be issued upon:
 1. A determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
 2. Showing a good and sufficient cause;
 3. A determination that failure to grant the variance would result in exceptional hardship to the applicant, and
 4. 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 of the public, or conflict with existing local laws or ordinances.
 5. 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 floor elevation below the base flood elevation, and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.
 6. Variances may be issued for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided

that the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

7. Variances remain in effect for one year from the date granted unless the flood review board specifies otherwise. After one year, the board may review and grant an extension to the original variance as long as there are no significant changes to the proposed use of the lowest flood elevation of a proposed structure.
8. In its discretion, and depending on the nature of the variance request, the flood review board may require the applicant to be represented by a Colorado licensed Professional Engineer who can address technical matters.

6. Floodplain special review:

- a. All floodplain special review (FPSR) uses require application to the flood review board. The flood review board will review the application and make a recommendation to the board of county commissioners.
- b. The county commissioners will conduct hearings for floodplain special reviews. Notice of the hearing must be published at least 14 days prior to the date of the hearing in a newspaper of general circulation within the county. The notice must designate the time and place of hearing, location of the proposed use and type of proposed use. Written notice of the hearing may also be mailed to all land owners within 500 feet of the location of the proposed use. Mailing of these notices is discretionary, and failure to mail or receive a notice does not affect the validity of any proceedings before the county commissioners.
- c. At the conclusion of the hearing, the county commissioners may approve the floodplain special review, approve the floodplain special review with conditions, or deny the floodplain special review after considering the recommendation of the flood review board and factors detailed below under review criteria for floodplain special review.
- d. The applicant must pay a fee for floodplain special review as established by the county commissioners.
- e. Review criteria for floodplain special review. To approve a floodplain special review, the county commissioners must find the following conditions exist:
 1. The proposal meets all applicable criteria outlined in the general standards.
 2. No danger to life and property may reasonably be expected to result from increased flood heights or velocities caused by encroachments upstream or downstream within the floodplain.
 3. No danger to life or property may reasonably be expected to result from substantial solid debris being carried down the stream by floodwaters.
 4. No danger of materials being swept away onto other lands or downstream to the injury of others in the event of a flood may reasonably be expected.
 5. Proposed water supply and sanitation systems have been designed to prevent disease, contamination and unsanitary conditions in the event of a flood.
 6. The proposed use is consistent with the flood management program for the area in question.
 7. The expected heights, velocity, duration, rate of the rise and sediment transport of floodwater at the proposed location is consistent with the proposed use.
 8. Any modification of the terrain within the FW—Floodway zoning district will not result in a rise in overall flood heights at any location.
 9. Any modification of the terrain within the FW—Floodway zoning district is environmentally sound.

10. Any modification of the terrain within the FW—Floodway zoning district will not result in reduced stability of the river channel or floodplain.
- f. Conditions that may be imposed on floodplain special reviews. In approving a floodplain special review, the flood review board may recommend and the county commissioners may impose the following conditions:
1. Modification of utility service facilities, such as electrical, water, and sewer.
 2. Limitations on periods of use of operation and the imposition of operational controls.
 3. Requirements for construction of channel modifications, dikes, levees, and other protective measures.
 4. Imposition of floodproofing measures.
 5. Access to the property is safe in times of a 100-year flood.
7. Expansion of legal non-conforming structures and uses:
- a. ~~For Structures that are legal non-conforming with respect to flood regulations in Section 4.2.2 of the Larimer County Land Use Code, the flood review board shall hear and render judgment on requests for expansion of such legal non-conforming structures and uses, from the requirements of section 4.2.2 of the Larimer County Land Use Code.~~
 - b. No such structure or use may be expanded, improved or enlarged unless the improvement expansion or enlargement itself complies with the provisions of section 4.2.2 and does not cumulatively (over a rolling ten year period) exceed 50 percent of the market value of the original structure excluding minor work and regular maintenance of existing buildings and facilities.
 - c. When a building or other structure, including but not limited to a manufactured home, has been damaged so that the market value of repair or replacement does not exceed 50 percent of the market value before the damage occurred, the structure may be restored to its size immediately before the damage occurred. Such reconstruction shall be constructed as required by section 4.2.2, and shall not be deemed to be a substantial improvement or enlargement. Any restoration or replacement of a structure, including, but not limited to, a manufactured home, damaged to an extent exceeding 50 percent of its market value before the damage occurred shall be deemed to be a substantial improvement or enlargement. ~~Any restoration or replacement of a substantially damaged structure shall only occur if the use is allowed within the applicable overlay zone.~~ All applicable general standards from section 4.2.2.D apply. Substantial damage is not cumulatively tracked. If a permit is applied for and the damage repair and improvement exceeds 50 percent, it shall be deemed a substantial improvement.
 - d. Whenever an existing manufactured home, which is legal non-conforming or is located in a nonconforming manufactured home park or subdivision in the floodplain overlay zone districts, is replaced by a new manufactured home, regardless of the reason for the replacement, the new manufactured home shall comply with the requirements of section 4.2.2.
 - e. If any person makes substantial improvement to any nonconforming building or structure or changes the use thereof, such person shall permanently change the building or structure or use to conform to the requirements of section 4.2.2.

8. Repair or Replacement of flood induced Substantially Damaged Structures within the Regulatory Floodway Overlay Zone:

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The Flood Review Board shall review and approve or deny all applications for repair or replacement of a legal non-conforming structure that has been Substantially Damaged (defined at 4.2.2.K Definitions) by a flood event in the FW-Floodway District based on the following criteria:

- a. The regulatory flood protection elevation for rebuilding a Substantially Damaged structure in the regulatory Floodway shall be 24 inches.
- b. It shall be shown by a Colorado licensed professional engineer that the depth velocity product (depth of flow (ft) x velocity(ft/sec)) surrounding the structure is less than or equal to 8.0.
- c. It shall be shown by a Colorado licensed professional engineer that the structure is not at risk, or the risk can be mitigated, for bank erosion and channel instability.
- d. The structure must meet all other applicable sections of 4. 2. 2
- e. Engineering design shall consider guidance outlined in the latest edition of FEMA technical document "P-259 Engineering Principles and Practices for Retrofitting Flood Prone Residential Structures".
- f. Access to the residence through areas greater than a product corridor of 8.0 shall be evaluated for safety

H. *Floodplain development permit.*

1. A floodplain development permit shall be required for any work within a regulatory the floodplain overlay zone districts including areas that have been removed from the floodplain by the issuance of a FEMA letter of map revision based on fill (LOMR-F).
2. Application for floodplain administrator on forms furnished by him/her and may include, but not be limited to, plans in duplicate drawn to scale showing the location, dimensions, and elevation of proposed landscape alterations, existing and proposed structures, including the placement of manufactured homes, and the location of the foregoing in relation to the floodplain overlay zone districts. Additionally, the following information is required:
 - a. Elevation using the North American Vertical Datum of 1988 (NAVD 88), of the lowest floor (including basement) of all new and substantially improved structures;

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- b. Elevation (NAVD 88) to which any nonresidential structure shall be floodproofed;
 - c. A certificate from a registered Colorado Professional Engineer that the nonresidential floodproofed structure shall meet the floodproofing criteria of this code;
 - d. Description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of proposed development.
3. A floodplain development permit shall not be issued for the construction of a new residential structure or addition to an existing residential structure on a property removed from the floodplain by the issuance of a FEMA letter of map revision based on fill (LOMR-F), with a lowest floor elevation placed below the applicable flood protection elevation.
4. Approval or denial of a floodplain development permit by the floodplain administrator shall be based on all of the applicable subsections of section 4.2.2 of this code and the following relevant factors:
- a. The danger to life and property due to flooding or erosion damage;
 - b. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
 - c. The danger that materials may be swept onto other lands to the injury of others;
 - d. The compatibility of the proposed use with existing and anticipated development;
 - e. The safety of access to the property in times of flood for ordinary and emergency vehicles;
 - f. The costs of providing governmental services during and after flood conditions including maintenance and repair of streets and bridges, and public utilities and facilities such as sewer, gas, electrical and water systems;
 - g. 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;
 - h. The necessity to the facility of a waterfront location, where applicable;
 - i. The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use;
 - j. The relationship of the proposed use to the adopted master plan for that area.
- I. *Floodplain administrator.*
1. Duties and responsibilities of the floodplain administrator shall include, but not be limited to, the following:
- a. Maintain and hold open for public inspection all records pertaining to section 4.2.2, including the actual elevation (in relation to NAVD 88) of the lowest floor (including basement) of all new or substantially improved structures and any floodproofing certificates.
 - b. Review, approve, or deny all applications for floodplain development permits.
 - c. Provide interpretation as needed regarding the exact location of the special flood hazard area (for example, where there appears to be a conflict between a mapped boundary and actual field conditions) the floodplain administrator shall make the necessary interpretation or may require an elevation certificate to make the determination.
 - d. Obtain, review and reasonably utilize any base flood elevation data and floodway data available from a federal, state, or other source, in order to administer the provisions of section 4.2.2.
 - e. May act as the staff liaison to the flood review board.
- J. *Building permits.*

1. Applications for building permits in the FF, FW, and FH districts must include surveys, plot plans, drawings, plans and other materials as necessary to show compliance of the proposed construction with this section. Applications will be reviewed by the floodplain administrator, who may require the following materials be included:
 - a. Four sets of plans drawn to scale showing the nature, location, dimensions, and elevation of the lot, existing or proposed structures, fill, storage of materials, floodproofing measures and the relationships of these to the location of the channel, floodway and the flood-protection elevation;
 - b. A typical valley cross section showing the stream channel, elevation of land areas adjoining each side of the channel, cross sectional areas to be occupied by the proposed development and high-water information;
 - c. Plans (surface view) showing elevations or contours of the ground; pertinent structure, fill, or storage elevations; size, location, and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets, water supply, sanitary facilities; photographs showing existing land uses and vegetation upstream and downstream, soil types, and other pertinent information;
 - d. A profile showing the slope of the bottom of the channel or flow line of the stream;
 - e. Specifications for building construction and materials, floodproofing, filling, dredging, grading, channel improvements, storage of materials, water supply, and sanitary facilities; and
 - f. A letter signed and stamped by a Colorado registered Professional Engineer certifying that he/she has reviewed all available information and conducted studies sufficient to demonstrate that, in his/her opinion, the improvements as designed will not be damaged in the event of a 100-year flood or that fill associated with the proposed improvements acting alone or in combination with existing or future floodplain uses will not cause a rise in floodwater surface elevations.

K. *Definitions.*

100-year flood. A flood having a recurrence interval that has a one-percent chance of being equaled or exceeded during any given year (one-percent-annual-chance flood). The terms "one-hundred-year flood" and "one-percent-chance flood" are synonymous with the term "100-year flood." The term does not imply that the flood will necessarily happen once every 100 years.

100-year floodplain. The area of land susceptible to being inundated as a result of the occurrence of a one-hundred-year flood. Also known as the special flood hazard area.

500-year flood. A flood having a recurrence interval that has a 0.2-percent chance of being equaled or exceeded during any given year (0.2-percent-chance-annual-flood). The term does not imply that the flood will necessarily happen once every 500 years.

500-year floodplain. The area of land susceptible to being inundated as a result of the occurrence of a 500-year flood.

Addition. Any activity that expands the enclosed footprint or increases the square footage of an existing structure.

Alluvial fan. A fan-shaped sediment deposit formed by a stream that flows from a steep mountain valley or gorge onto a plain or the junction of a tributary stream with the main stream. Alluvial fans contain active stream channels and boulder bars, and recently abandoned channels. Alluvial fans are predominantly formed by alluvial deposits and are modified by infrequent sheet flood, channel avulsions and other stream processes.

Base flood elevation (BFE). The elevation that indicates the water surface elevation resulting from a flood that has a one percent chance of equaling or exceeding that level in any given year.

Basement. Any area of a building having its floor sub-grade below ground level on all sides.

Channel. The physical confine of a natural or artificial stream or waterway consisting of a bed and stream banks, existing in a variety of geometries.

Channelization. The artificial creation, enlargement or realignment of a stream channel.

Code of Federal Regulations (CFR). The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. It is divided into 50 titles that represent broad areas subject to federal regulation.

Conditional letter of map revision (CLOMR). FEMA's comment on a proposed project, which does not revise an effective floodplain map, that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodplain.

Critical facility. A structure or related infrastructure, but not the land on which it is situated, as specified in section 4.2.2.F, that if flooded may result in significant hazards to public health and safety or interrupt essential services and operations for the community at any time before, during and after a flood.

Development. Any man-made change in improved and 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. "Development" does not include "minor projects" or "routine maintenance of existing buildings and facilities" as defined in this section. It also does not include gardening, plowing, and similar practices that do not involve filling, grading.

Digital flood insurance rate map (DFIRM) database. Database containing data and analyses that accompany DFIRMs.

Digital flood insurance rate map (DFIRM). FEMA digital floodplain map. These digital maps serve as "regulatory floodplain maps" for insurance and floodplain management purposes.

Elevated building. A building that does not contain a basement (i) built, in the case of a building in zones AE, A, AO, AH, X to have the top of the lowest elevated floor above the ground level by means of pilings, columns (posts and piers), or shear walls parallel to the flow of the water and (ii) adequately anchored so as not to impair the structural integrity of the building during a flood of up to the magnitude of the base flood. In the case of zones AE, A, AO, AH, and X "elevated building" also includes a building elevated by means of fill or solid foundation perimeter walls with openings sufficient to facilitate the unimpeded movement of floodwaters.

Existing manufactured home park or subdivision. 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 Larimer County.

Expansion to an existing manufactured home park or subdivision. 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, the construction of streets, and either final site grading or the pouring of concrete pads).

Federal Register. The official daily publication for rules, proposed rules, and notices of federal agencies and organizations, as well as executive orders and other presidential documents.

FEMA. Federal Emergency Management Agency, the agency responsible for administering the National Flood Insurance Program.

Fill. A deposit of materials of any kind placed by artificial means.

Flood or flooding. A general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of water from channels and reservoir spillways;
2. The unusual and rapid accumulation or runoff of surface waters from any source; or

3. Mudslides or mudflows that occur from excess surface water that is combined with mud or other debris that is sufficiently fluid so as to flow over the surface of normally dry land areas (such as earth carried by a current of water and deposited along the path of the current).

Flood insurance rate map (FIRM). An official map of a community, on which the Federal Emergency Management Agency has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

Flood insurance study (FIS). The official report provided by the Federal Emergency Management Agency which contains the flood insurance rate map as well as flood profiles for studied flooding sources that can be used to determine base flood elevations for some areas.

Floodplain or floodprone area. Any land area susceptible to being inundated as the result of a flood, including the area of land over which floodwater would flow from the spillway of a reservoir.

Floodplain administrator. The community official designated by title to administer and enforce the floodplain management regulations.

Floodplain development permit. A permit required before construction or development begins within any special flood hazard area (SFHA). Permits are required to ensure that proposed development projects meet the requirements of the NFIP and this floodplain management ordinance.

Floodplain management. The operation of an overall program of corrective and preventive measures for reducing flood damage, including, but not limited to, emergency preparedness plans, flood control works and floodplain management regulations.

Floodplain management regulations. Zoning ordinances, subdivision regulations, building codes, health regulations, special purpose regulations (such as a floodplain regulations, grading regulations and erosion control regulations) and other state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Flood control structure. A physical structure designed and built expressly or partially for the purpose of reducing, redirecting, or guiding flood flows along a particular waterway. These specialized flood modifying works are those constructed in conformance with sound engineering standards.

Floodproofing. Any combination of structural and/or nonstructural additions, changes, or adjustments to structures, which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Floodway (regulatory floodway). The channel of a river or other watercourse and adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than 0.5 feet. Letters of map revision to existing floodway delineations may continue to use the floodway criteria in place at the time of the existing floodway delineation.

Freeboard. The vertical distance in feet above a predicted water surface elevation intended to provide a margin of safety to compensate for unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood such as debris blockage of bridge openings and the increased runoff due to urbanization of the watershed. See "regulatory flood protection elevation."

Functionally dependent use. A use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

Growth management area (GMA) regulatory flood protection elevation. The elevation 2.0 feet above the regulatory flood datum, regardless of any letter of map amendment based on fill that may have been issued by the Federal Emergency Management Agency relative to the 100-year floodplain for the location in question.

Highest adjacent grade. The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure. Any structure that is:

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;
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;
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
4. Individually listed on a local inventory or historic places in communities with historic preservation programs that have been certified either:
 - a. By an approved state program as determined by the Secretary of the Interior or;
 - b. Directly by the Secretary of the Interior in states without approved programs.

Levee. A man-made embankment, usually earthen, 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. For a levee structure to be reflected on the FEMA FIRMs as providing flood protection, the levee structure must meet the requirements set forth in 44 CFR 65.10.

Levee system. 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.

Letter of map revision (LOMR). FEMA's official revision of an effective flood insurance rate map (FIRM), or flood boundary and floodway map (FBFM), or both. LOMRs are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective base flood elevations (BFEs), or the special flood hazard area (SFHA).

Letter of map revision based on fill (LOMR-F). FEMA's modification of the special flood hazard area (SFHA) shown on the flood insurance rate map (FIRM) based on the placement of fill outside the existing regulatory floodway.

Lowest floor. The lowest floor of the lowest enclosed area (including basement). Any floor used for living purposes which includes working, storage, sleeping, cooking and eating, or recreation or any combination thereof. This includes any floor that could be converted to such a use such as a basement or crawl space. The lowest floor is a determinant for the flood insurance premium for a building, home or business. An unfinished or flood resistant enclosure, usable solely for parking or 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 non-elevation design requirement of Section 60.3 of the National Flood Insurance Program regulations.

Manufactured home. 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 connected to the required utilities. The term "manufactured home" does not include a "recreational vehicle".

Manufactured home park or subdivision. A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

Mean sea level. For purposes of the National Flood Insurance Program, the North American Vertical Datum (NAVD) of 1988 or other datum, to which base flood elevations shown on a flood insurance rate map are referenced.

Material safety data sheet (MSDS). A form with data regarding the properties of a particular substance. An important component of product stewardship and workplace safety, it is intended to provide workers and emergency personnel with procedures for handling or working with that substance in a safe manner, and includes information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures.

Minor work. Small development activities (except for filling, grading and excavating) valued at less than \$2,000.00.

Mountain flood fringe criteria. As established by Larimer County and FEMA's FIS studies, the flood fringe is defined as that part of the 100-year floodplain where flood depths are less than 1.5 feet and average flood velocities are less than 3.0 feet per second. This is only applicable in the Big Thompson Canyon.

Mountain floodway criteria. As established by Larimer County and FEMA's FIS studies, the floodway is defined as that part of the 100-year floodplain where depths are equal to or greater than 1.5 feet or velocities are equal to or greater than 3.0 feet per second. This is only applicable in the Big Thompson Canyon.

National Flood Insurance Program (NFIP). FEMA's program of flood insurance coverage and floodplain management administered in conjunction with the Robert T. Stafford Relief and Emergency Assistance Act. The NFIP has applicable federal regulations promulgated in Title 44 of the Code of Federal Regulations. The U.S. Congress established the NFIP in 1968 with the passage of the National Flood Insurance Act of 1968.

New construction. Structures for which "start of construction" commenced on or after the effective date of this code.

New manufactured home park or subdivision. 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 on or after the effective date of floodplain management regulations adopted by Larimer County.

No-rise certification. A record of the results of an engineering analysis conducted to certify a project will not increase flood heights in a floodway. A no-rise certification must be supported by technical data and signed by a registered Colorado Professional Engineer. The supporting technical data should be based on the standard step-backwater computer model used to develop the 100-year floodway shown on the flood insurance rate map (FIRM) or flood boundary and floodway map (FBFM).

Obstruction. Any dam, wall, wharf, embankment, levee, dike, pile abutment, projection, excavation, channel rectification, bridge structure or matter located in, along, across or projecting into any channel, watercourse or regulatory flood hazard area that may impede, retard, or change the direction of water flow, either in itself or by catching or collecting debris carried by such water, or that is located where the flow of water might carry debris downstream to the damage of life and property elsewhere.

Physical map revision (PMR). FEMA's action whereby one or more map panels are physically revised and republished. A PMR is used to change flood risk zones, floodplain and/or floodway delineations, flood elevations, and/or planimetric features.

Recreational vehicle. A vehicle which is:

1. Built on a single chassis;
2. Four hundred square feet or less when measured at the largest horizontal projections;
3. Designed to be self-propelled or permanently towable by a light duty truck; and
4. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Regulatory flood protection elevation. The elevation 1.5 feet above the base flood elevation. See also "GMA regulatory flood protection elevation."

Routine maintenance of existing buildings and facilities. Repairs necessary to keep a structure in a safe and habitable condition that do not trigger a building permit, provided they are not associated with a general improvement of the structure or repair of a damaged structure. Such repairs include:

- a. Normal maintenance of structures such as re-roofing, replacing roofing tiles and replacing siding;

- b. Exterior and interior painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work;
- c. Basement sealing;
- d. Repairing or replacing damaged or broken window panes;
- e. Repairing plumbing systems, electrical systems, heating or air conditioning systems and repairing wells or septic systems.

Shallow flooding. A designated zone AO or AH on a 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.

Special flood hazard area. The land in the regulatory floodplain subject to a one percent or greater chance of flooding in any given year, i.e., the 100-year floodplain.

Start of construction. The date the building permit was issued for new structures, additions and substantial improvements, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days of the permit date. 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, the installation of streets and/or walkways, excavation for basement, footings, piers or foundations or the erection of temporary forms, the installation on the property of detached accessory buildings, such as garages or sheds not occupied as dwelling units. For substantial improvements, 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.

Structure. A walled and roofed building, including a gas or liquid storage tank, which is principally above ground, as well as a manufactured home.

Substantial damage. 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 just prior to when the damage occurred.

Substantial improvement. Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before "start of construction" of the improvement. The value of the structure shall be determined by the local jurisdiction having land use authority in the area of interest. This includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not, however, include either:

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 conditions or
2. Any alteration of a "historic structure" provided that the alteration will not preclude the structure's continued designation as a "historic structure."

Threshold planning quantity (TPQ). A quantity designated for each chemical on the list of extremely hazardous substances that triggers notification by facilities to the state that such facilities are subject to emergency planning requirements.

Variance. A grant of relief to a person from the requirement of this ordinance when specific enforcement would result in unnecessary hardship. A variance, therefore, permits construction or development in a manner otherwise prohibited by this ordinance. (For full requirements see Section 60.6 of the National Flood Insurance Program regulations).

Water surface elevation. 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.

Waterway. A natural or artificial land surface depression with or without perceptibly defined beds and banks to which surface runoff gravitates and collectively forms a flow of water continuously or intermittently in a defined direction.

(Res. No. 04102007R009 Exh. A, 4-10-2007; Res. No. 12242013R008, Exh. A, 12-24-2013; Res. No. [09152015R001](#), Exh. A, 9-15-2015)



Eric Tracy <tracyel@co.larimer.co.us>

Flood Review Board Minutes - April 28, 2016

Eric Tracy <tracyel@co.larimer.co.us>
Draft

Tue, Jun 7, 2016 at 11:07 AM

Flood Review Board Minutes - April 28, 2016

LAKE ESTES CONFERENCE ROOM - 8:30 AM

Staff Members Present: Eric Tracy, Crystal Lesmeister

Board Members Present: Greg Koch, Chris Carlson, Chris Thornton, Mike Oberlander, Bets Ervin-Blankenheim, John Hunt

Public Present: Scott Tally, David Thompson, Ronnie Thompson, Elisha Bigge, Kathleen Bigge, Debbie Bakel, Judy Reed, Callin Kling, Tish Hines, Max Thornton

Mr. Koch called the meeting to order at 8:40 AM

Introductions

DAVID THOMPSON VARIANCE

Mr. Tracy gave some background. Property address is 5420 W Highway 34. The property did sustain some damage in the 2013 flood. The Thompson's have elevated their residence even though it wasn't required. During that process, it was found that an addition was added to the detached garage without a permit. They are here to request a variance to allow the structure to remain.

Mr. Thompson noted the engineering prints prepared by Van Horn Engineering show the garage is in the hydraulic shadow. The area in question was the least damaged during the flood. It appears the concrete was poured at the same time as the garage, but the shingles do not match. There is a date etched into the concrete of 1980.

Mr. Tracy noted that even if the addition was put on before it was mapped in a floodway, they need to meet today's regulation since it was never permitted. Mr. Tracy noted that the residence and garage with exception of the addition are considered legal non-conforming with regards to floodplain regulations.

Dr. Thornton moved to approve the David Thompson Variance. Ms. Ervin-Blankenheim seconded the motion.

Mr. Koch noted the shadows shown on the plans are somewhat generous.

The motion passed 6-0

FLOOD REGULATION DISCUSSION

Mr. Tracy gave general background on the process to date. During the last FRB meeting recommendations for criteria were made by Mr. Carlson and it was decided that the sample criteria would be presented to the Board of County Commissioners during a worksession for their approval to move forward. With permission to proceed from the Board of County Commissioners, the item is back to the Flood Review Board for final recommendations.

Mr. Koch and Mr. Tracy discussed the general purpose of the meeting.

Mr. Tracy presented "FEMA P-259, Engineering Principles and Practices of Retrofitting Floodprone Residential Structures, Third Edition (2012)" to the board for consideration in adoption of criteria.

Mr. Hunt wanted clarification if these criteria would apply to non-flood damaged properties.

Mr. Tracy noted that Larimer County has already adopted regulations related to non-flood damaged homes in the Floodway overlay zone and they are already allowed to rebuild.

Mr. Hunt said he was not inclined to go back on the non-flood related damage regulation.

Mr. Hunt noted he likes depth velocity product of 8. It's not overly restrictive and to allow anything other than that would be irresponsible. Mr. Hunt asked if access needs to meet the depth/velocity criteria.

Mr. Tracy clarified that if these regulations move forward, the County will not be remapping depth/velocity zones at this time. In the event of a flood, available data could be used if it represents the existing situation, or new modeling/mapping can be done. That may need to be done by the property owner. These regulations would not apply to new structures. New structures will continue to be prohibited in the regulatory Floodway Overlay Zone.

Mr. Hunt noted that in variances we allow a lot of latitude. The applicant has to have a registered engineer make the case. The engineer has to make the case in a way that satisfies them and the Flood Review Board. He suggested that prescriptive criteria be placed in the regulations describing how the depth/product number would be determined. There will be cases where a one dimensional model will not satisfy the requirement and a two dimensional model should be used.

Dr. Thornton said prescribing how they do the analysis isn't right. The board should set criteria and how they get to it is up to them.

Ms. Ervin-Blankenheim noted that being too prescriptive would hamstring us and the homeowners

Mr. Carlson noted that putting it into code locks the engineer into how they do the analysis. His position is to keep it more generic.

Mr. Koch noted it would create a lot for the board to review in the event of a flood, but it's impossible to foresee every situation. It needs to be reviewed on a case-by-case basis.

Mr. Koch asked the board their opinion on whether the criteria should be applicable for the non-flood damage situation.

Ms. Ervin-Blankenheim has concerns with the requirements not being consistent.

Mr. Carlson and Dr Thornton don't want to go back on the non-flood related damage regulation.

Dr. Thornton asked if there has been any dialog with the search and rescue group.

The Emergency Manager was part of the discussion early on, but direct communication with the Search and Rescue has not been done.

Mr. Carlson said the discussion in the last meeting was based on the studies and documentation that had been performed on the subject.

Mr. Oberlander noted that Poudre Fire Authority doesn't like their trucks wet over the axles. Past the middle of the wheels starts to damage their equipment. He thinks a product number of 8 is ok from the building to the public road.

Mr. Oberlander asked what process this criteria would go through.

Mr. Tracy suggested that any application for rebuilding a flood damaged structure and needing to meet this criteria should be reviewed and approved by the Flood Review Board.

Dr. Thornton noted the purpose of this is safety. Instead of 8 being "go-no-go" make it be a trigger that makes the product corridor be an item that needs to have additional data prepared and be reviewed by the board if it exceeds the number. The item still goes to the Board, but additional data would not be needed specific to the product corridor.

Mr. Hunt asked again about access. He doesn't know how PFA would get to people into some of those areas that need help. It is the emergency responders we are thinking about. Leads him to think the rule has to say something about access to property.

Dr. Thornton said we don't have the emergency personnel at the table to make that decision. We will have the benefit of hindsight. When someone comes to the board with a request, we will know what happened and how they got there. Instead of prescribing criteria for access, look at it after the fact.

Ms. Ervin-Blankenheim agrees it would be difficult to include entire access, but believes we need to go beyond the footprint of the building with the requirements.

Mr. Tracy noted some people live on the other side of the river and it would be impossible to meet the depth/product criteria across the channel.

Mr. Koch tends to think we should be looking at access in some degree, but unsure on how we would regulate it.

Mr. Carlson noted examples of rescues from the 2013 flood and said every case will be different. In the canyons, they were able to string cables across the river and save people. Out of canyon, it was harder because of the width and you simply could not access people.

Mr. Oberlander said the access is what it is unless you have major reconstruction efforts that are changing the situation.

Mr. Hunt said he has been persuaded that we should not tie this up with prescriptive rules on access. However, he believes that access should still be considered.

Mr. Hunt asked about the CWCB erosion hazard study. That study will be a very valuable resource. Dr. Thornton noted that study could be used to make a case.

The board discussed the additional freeboard criteria.

The Flood Review Board shall review and approve or deny all applications for rebuilding a legal non-conforming structure that has been substantially damaged by a flood event in the Floodway Overlay Zone based on the following criteria:

- 1) The regulatory flood protection elevation for rebuilding a substantially damaged structure in the regulatory Floodway shall be 24 inches.
- 2) It shall be shown by a licensed professional engineer that the depth velocity product surrounding the structure is less than or equal to 8.
- 3) It shall be shown by a licensed professional engineer that the structure is not at risk, or the risk will be mitigated for bank erosion and channel instability.
- 4) The structure must meet other applicable sections of 4.2.2 and show no-rise.
- 5) Engineering design shall consider guidance outlined in the latest edition of FEMA technical document "P-259 Engineering Principles and Practices for Retrofitting Flood Prone Residential Structures".
- 6) Access to the residence through areas greater than a product corridor of 8 shall be evaluated.

The board discussed adding a condition for an evacuation plan, but decided that it could be discussed on a site-by-site basis at the time of application.

Mr. Koch opened the meeting for public comment:

Mr. Tally noted his frustration with the status and progress of the process. He says he agrees with most everything the board has come up with. Mr. Tally noted it sounds more restrictive than what was discussed before. Now the way it's worded, it sounds like everyone has to have plans stamped by engineers and go to Flood Review Board before they can rebuild. Mr. Tally discussed the comparison with rebuilding after a fire and how flood properties are being held to a higher standard. Mr. Tally requested that the Flood Review Board members attend the Commissioner Hearings.

Mr. Tracy said the proposed code change will go to Planning Commission for a recommendation, then to the Board of County Commissioners for approval considering both the Flood Review Board and Planning Commission recommendations.

Mr. Koch noted that these requirements are no stricter than before. It still required a design from a professional engineer. The only difference may be that now the recommendation is that it goes before the Flood Review Board for approval. If there is an extra burden, it would be time to come to the Board.

Mr. Greenwell claims that FEMA design criteria manual is the code that must be complied to within all the jurisdictions he works in. He said it [the manual] complies with the "I-codes" and claimed that the county staff and board members have never seen them or read through them. He noted nobody was in the meeting from the building department.

Mr. Tracy clarified that the building codes [Larimer County Amendments to the 2015 International Building Code and the 2015 International Building Code] refers to the Larimer County Overlay Zoning Regulations for floodplain regulations.

Mr. Greenwell insisted that the document [FEMA TB P-259] refers to the "I-codes". He asked "do we want more or less". The document delineates and dictates all the ways you can do things. We want to talk about access to the street, what about access to the house... we can go on and on and on. The question is, how involved does the board want to be in this regard. He suggested the Flood Review Board simply state that the property owner follow the book [FEMA TB P-259] and then let the building department decide from there.

Dr. Thornton noted that if the engineer used the book [FEMA TB P-259], it would make the board's job easier and that is why they referenced to use it as a guideline. But for scour for instance, there are hundreds of ways to look at scour. Maybe the one equation the book references isn't appropriate in every situation. The book however creates a "checklist" to follow and will make the Boards job easier.

Mr. Greenwell said everthing is covered in the manual.

Mr. Tracy noted that access isn't covered, the 24 inch freeboard isn't covered, etc.

Mr. Greenwell noted that if a community wants Federal Funding in the case of a disaster, they have to follow the "I-codes". The question is, do we want local regulations to be higher and supersede federal regulations. Building two feet above covers most of it already.

Ms. Bakel said there have been two major floods that people have gone through. What happened to all the people in those floods. She suggested coming up with a questionnaire asking the citizens who were in the flood to state how they got out, was there erosion on the property, how much erosion was on the property, were you walking in the flood areas, how much do you weigh how tall are you, did you fall down? You could get an overall view of this mammoth problem we are facing. Did the police come down, did the fire trucks come, how fast did the water go down? If you knew the human factor, it could help the board be sure when someone is coming in for a variance.

A citizen [didn't state name during comment, but was one listed as in attendance] asked if the regulation was going to state "variance" or if it was going to state that you "can rebuild".

Mr. Hunt said if you can't meet the criteria, it will be a variance. If you can meet the criteria, the board will be reviewing the application from a technical perspective to make sure they concur with the results.

Mr. Koch noted that bank erosion is a little more subjective than elevation and product corridor.

Mr. Tally noted that this process [going to the Flood Review Board] would add two months onto someone getting back into their house.

Dr. Thornton noted that now it is not allowed, so it would be a huge improvement.

There was discussion about mitigation efforts prior to a flood event.

Mr. Tracy noted that things could change during a flood event which would change the requirements for mitigation.

Mr. Greenwell again suggested that the property owners follow the book [FEMA TB P-259] and the "I-codes" and let the building department handle it.

Mr. Tracy noted that the building department staff are not the technical experts in flood regulation and they refer flood regulation to the Engineering Department.

Mr. Hunt clarified that the role of the board is to review and concur with the results of the engineer's analysis.

Mr. Tracy re-read the proposed language emphasizing that the approval is "based on the following criteria..."

Mr. Tally said that is different than saying you "can rebuild" if you meet the criteria.

Mr. Hunt moved to recommend approval of the proposed code change.

Mr. Carlson seconded the motion.

Mr. Tracy read the proposed wording for the proposed language one last time.

The Flood Review Board shall review and approve or deny all applications for rebuilding a legal non-conforming structure that has been substantially damaged by a flood event in the Floodway Overlay Zone based on the following criteria:

- 1) The regulatory flood protection elevation for rebuilding a substantially damaged structure in the regulatory Floodway shall be 24 inches.
- 2) It shall be shown by a Colorado licensed professional engineer that the depth velocity product surrounding the structure is less than or equal to 8.
- 3) It shall be shown by a Colorado licensed professional engineer that the structure is not at risk, or the risk can be mitigated for bank erosion and channel instability.
- 4) The structure must meet other applicable sections of 4.2.2 and show no-rise.
- 5) Engineering design shall consider guidance outlined in the latest edition of FEMA technical document "P-259 Engineering Principles and Practices for Retrofitting Flood Prone Residential Structures".
- 6) Access to the residence through areas greater than a product corridor of 8 shall be evaluated.

Mr. Tally asked if there was a way to get an approval before all the engineering and house design is complete.

Mr. Tracy said if an applicant were to come in, he would list the criteria. He would suggest not spending money on full building plans before approval from the floodplain viewpoint. The board only needs to see the footprint and elevation requirements. If the house got taken out by erosion, you will need to have an engineer look at it. Even if you didn't have erosion, you still would need to have an engineer look at it, but it would be more likely to meet the criteria.

Motion passed 6-0.

Dr. Thornton moved to approve the minutes of the March 2016 Flood Review Board Meeting.

Ms. Ervin-Blankenheim seconded the motion. Motion passed 6-0.

The meeting adjourned at 10:50.



ENGINEERING DEPARTMENT

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Larimer County Floodplains

Frequently Asked Questions:

How did Larimer County become involved in regulating floodplains?

In 1968, Congress created the National Flood Insurance Program (NFIP) through the National Flood Insurance Act, making flood insurance available for the first time. In 1973, the Flood Disaster Protection Act amended the program by making flood insurance a mandatory condition for receiving Federal financial assistance or a federally backed loan if the building is located in a Special Flood Hazard Area. That same year, House Bill 1041 was passed by the Colorado Legislature, and provided alternative authority for counties to regulate floodplains. These statutes along with the Zoning Enabling Act were the basis for administration of floodplains.

In July 1974, Larimer County joined the NFIP. This provided the opportunity for property owners in Larimer County to become eligible to purchase flood insurance at subsidized rates.

When did Larimer County first adopt Floodplain Regulations?

On December 1, 1975, Larimer County adopted floodplain regulations as an amendment to the County Building Code and the Flood Review Board was created.

Where can I find current Floodplain Regulations for Larimer County?

Floodplains are an overlay zone in Larimer County. The most current floodplain regulations can be found in this Larimer County [Land Use Code Section 4.2.2](#).

What is the purpose of floodplain regulations?

The purpose of floodplain regulations are defined in Section 4.2.2 of the Larimer County Land Use Code. In general, floodplain regulations are intended reduce flood damage and protect life, property and the alteration of natural floodplains.

What is a Flood?

A flood is a general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of water from channels and reservoir spillways;
2. The unusual and rapid accumulation or runoff of surface waters from any source; or
3. Mudslides or mudflows that occur from excess surface water that is combined with mud or other debris that is sufficiently fluid so as to flow over the surface of normally dry land areas (such as earth carried by a current of water and deposited along the path of the current).

Floods occur for many reasons, such as long-lasting rainfall over a broad area, locally intense thunderstorm generated rainfall, or rapid melting of a large snow pack with or without accompanying rainfall. Because floods result from many different circumstances, not all floods are equal in magnitude, duration, or effect.

So what is a "100-year flood" and how is it determined?

In the 1960's, the United States government decided to use the 1-percent annual exceedance probability (AEP) flood as the basis for the National Flood Insurance Program. The 1-percent AEP flood was thought to be a fair balance between protecting the public and overly stringent regulation. Because the 1-percent AEP flood has a 1 in 100 chance of being equaled or exceeded in any 1 year, it is also referred to as the "100-year flood."

We have seen multiple "100-year floods" in Larimer County in my lifetime. Why?

Floods happen irregularly. The "100-year flood" is an estimate of the long-term average recurrence interval, which does not mean that we really have 100 years between each flood of greater or equal magnitude. The "100-year flood" is also known as the 1-percent annual chance flood, which means that a flood of this magnitude has a 1-percent chance of occurring in any given year. A home in the 1-percent (100-year) floodplain has a *26-percent* chance of being flooded at least once during the span of a 30-year mortgage.

What is the difference between the terms [Floodplain, Flood Fringe and Floodway](#)?

The floodplain is any area that is susceptible to being inundated by surface water from any source. Mostly, this is the area adjacent to a river, creek, lake, stream, or other waterway that is subject to flooding when there is a significant run-off event.

The floodplain is typically divided into a floodway zone and a flood fringe zone. The floodway is the channel of a river and adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. These areas are expected to have the fastest and deepest flows during a flood. The flood fringe areas are the outer edges of the floodplain where flows are shallower and slower moving.

Can I build in the flood fringe or floodway portions of the floodplain?

Certain uses are limited or even prohibited within the floodplain. In general, new structures, or substantial modifications or improvements to existing structures within the floodway overlay zone are difficult. The floodway is highly restricted for development purposes since this area should be reserved in order to convey the expected flows within these limits. There are fewer restrictions within the flood fringe areas and new structures and development is generally allowed as long as the development meets the County floodplain regulations including proper elevation requirements.

You must be issued a [Floodplain Development Permit](#) from Larimer County before you start any work, including grading, excavation or filling, in any portion of the floodplain.

What is an Approximate Zone A Floodplain?

Certain Special Flood Hazard Areas within Larimer County are designated as "Approximate Zone A" floodplains. Approximate Zone A floodplains are developed using limited flowrate and topographic information rather than more detailed information that includes Base Flood Elevations (BFEs). Generally, there is not a distinction between the floodway and flood fringe in Approximate Zone A floodplains.

Before a building permit can be issued or development can occur within an Approximate Zone A floodplain, the property owner is required to provide a small, detailed study specific to that property outlining the limits of the floodplain. This requires hiring a licensed professional engineer and surveyor to better define the site topography and the flowrates and then use the detailed information to define the limits of the floodway, flood fringe and provide BFEs that can be used to meet minimum elevation requirements. No new development is allowed within the determined floodway zone of an Approximate Zone A floodplain.

How do I determine if my property is within a floodplain?

To determine if your property is within a FEMA or locally designated floodplain, you can contact the Larimer County Engineering Department or view the flood zone information through the County's interactive map at maps.larimer.org/fil/. Floodplain areas designated by FEMA on the Flood Insurance Rate Maps (FIRMS) are also available online through FEMA's [Map Service Center](#).

Keep in mind that even if your property is not shown in a regulatory floodplain, it does not mean that there is no risk of flooding. There are many areas in Larimer County that are not shown within a regulated floodplain but have undetermined flood hazards.

What do I need to know if my structure is in the floodplain?

Structures in a floodplain may be damaged when flooding occurs. Some structures flood frequently, while others get damaged only by the more severe events.

Flood insurance may be required. If you receive a mortgage or loan from a federally regulated or insured lender, you are required to have flood insurance if the structure is located in a floodplain. Generally, flood insurance can be purchased by contacting your regular homeowner's insurance agent. Even if you are not required to have flood insurance, it can still be a good investment if you live in or near a floodplain.

Structures in the floodplain must comply with floodplain regulations. Larimer County requires permits for remodeling, improving, expanding or rebuilding any structure in a floodplain. In order to reduce long-term flood damage, structures that are substantially improved or substantially damaged are required to become compliant with current floodplain regulations. Substantially damaged structures in a floodway cannot be repaired or replaced within the floodway if the damage was due to flooding. In Larimer County, the cost of improvements is tracked over a 10-year rolling period. Certain items defined under Routine Maintenance or Minor Work can be excluded. Please see the separate sections regarding Routine Maintenance, Minor Work, and Substantial Damage for detailed descriptions of these definitions.

What is Routine Maintenance?

Routine maintenance are repairs necessary to keep a structure in a safe and habitable condition, do not trigger a building permit, and are not associated with a general improvement of the structure or repair of a damaged structure. Such repairs include:

- a. Normal maintenance of structures such as re-roofing, replacing roofing tiles and replacing siding;
- b. Exterior and interior painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work;
- c. Basement sealing;
- d. Repairing or replacing damaged or broken window panes;
- e. Repairing plumbing systems, electrical systems, heating or air conditioning systems and repairing wells or septic systems.

What is Minor Work?

Small development activities (except for filling, grading and excavating) valued at less than \$2000.

What is the definition of Substantial Damage?

Substantial damage is 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 just prior to when the damage occurred.

My home is in the floodplain. What happens if my home is substantially damaged?

It depends on which overly zone the structure is located in. Any building that was constructed prior to implementation of the floodplain regulations has a non-conforming use designation and can remain in place indefinitely unless it is substantially damaged or substantially improved. Once it is substantially damaged or substantially improved, the structure must comply with current regulations, which prohibit certain uses.

Within the floodway (critical zone), a substantially damaged structure may not be repaired or rebuilt per the Larimer County Land Use Code if the damage was caused by flooding. If the damaged was caused by something other than a flood or if the structure was located within the flood fringe (less critical zone), a substantially damaged structure may be repaired or rebuilt as long as it is elevated to the regulatory flood protection elevation.

How do I maintain the floodplain on my property?

General maintenance such as clearing debris or excessive vegetation may be done without obtaining a floodplain development permit. Any bank restoration, armoring, channel improvements, etc. requires approval from Larimer County through the issuance of a floodplain development permit.

Do not dump or throw anything into ditches or streams or within the floodplain: Trash and vegetation dumped into a stream degrades water quality and every piece of trash contributes to flooding.

Report Violations: Report any observations of dumping debris or vegetation clearing within the floodplain to Larimer County at (970) 498-5729.

How do I obtain a Floodplain Development Permit?

You must submit a [Floodplain Development Permit Application](#) and required plans and documentation to Larimer County Engineering Department. Some projects within the floodplain will require approval from the Flood Review Board and/or the Board of County Commissioners. Formal Map changes will also require approval from FEMA. The application includes a checklist that outlines all required documentation and approval steps. The Floodplain Manager will review your application for compliance with the Flood Hazard Overlay Zone Districts. For information on the floodplain development permit, contact Eric Tracy with the County Engineering Department at etracy@larimer.org or at (970) 498-5729 or Crystal Lesmeister at clesmeister@larimer.org or at (970) 498-5732.

Will I need to obtain permits from any other agencies?

State and federal agencies may also require permits prior to approval of your floodplain development permit application with the County. It is your responsibility to obtain any necessary permits and approvals prior to submitting an application with Larimer County. Other agencies that may have applicable permits include, U.S. Army Corps of Engineers, Colorado Division of Water Resources, Environmental Protection Agency, Water Quality Control Division of the State Health Department, etc.

Can I get a building permit now?

You may apply for a building permit at the same time you apply for your floodplain development permit but a building permit will not be issued until the Floodplain Manager has approved your floodplain development permit. Therefore, it is recommended that you contact the County Floodplain Manager, Eric Tracy at etracy@larimer.org or at (970) 498-57295729 or Crystal Lesmeister at clesmeister@larimer.org or at (970) 498-5732 prior to submitting your application. This helps address any areas of concern that may cease or delay the building permit process.

Be sure to check your building permit for any conditions of approval that will need to be addressed during the construction phase and prior to a certificate of occupancy or letter of completion. Elevation and no-rise certificates are often required and must be completed by registered professional land surveyors and engineers licensed in the State of Colorado

What is an elevation certificate?

An elevation certificate is an official record showing that a structure or addition located within a regulatory floodplain is properly elevated. The FEMA form must be completed by a registered professional land surveyor licensed in the State of Colorado and must provide all necessary information to ensure the structure is elevated in accordance with the building requirements. If an elevation certificate is listed as condition on your building permit, a certificate of occupancy will not be issued until this is received.

What is a no-rise certification?

When work is proposed in a regulatory floodway, a no-rise certificate with supporting documentation is required. The no-rise certificate must be prepared by a professional engineer who is licensed in the State of Colorado. This certificate demonstrates that a proper engineering study has been conducted and verifies that the proposed work will not increase flood heights. The no-rise certificate is required to be submitted with your floodplain development permit application. This process generally requires Flood Review Board approval.

When do I need to go to the Flood Review Board?

If your project includes a map change request, a variance from Section 4.2.2 of the Larimer County Land Use Code, an expansion of a non-conforming use, a stream alteration, etc., approval from the Larimer County Flood Review Board is required.

Project such as railroads, streets, roads, bridges, flood and water control structures, above and below ground utilities (excluding service connections), pipelines, marinas, boat rentals, docks, piers, and wharves that are located within a regulatory floodplain are processed as a Floodplain Special Review. These projects go to the Flood Review Board for a recommendation, and then go to the Board of County Commissioners for final approval.

My property is in the mapped floodplain, but my house sits on higher ground. I believe I am incorrectly shown in the floodplain. What are FEMA's requirements for being removed from the 100-year flood hazard area?

To be removed from the floodplain shown on the Flood Insurance Rate Map (FIRM), a structure must be on land that is not subject to flooding by a 100-year flood. Remember, more severe floods, erosion, debris blockages, etc. can and do happen, so even if your home is found to be on high ground, it may still be damaged by an extreme flood event.

If your lot or building site is on natural ground that is higher than the Base Flood Elevation (BFE) shown on the FIRM, then you may request a Letter of Map Amendment (LOMA). To support your request, you will need to have a land surveyor or engineer determine the elevation of the ground next to your building and complete a FEMA Elevation Certificate. If the ground is higher than the BFE, then FEMA may issue a LOMA.

If your home was built on fill that was placed after the FIRM was prepared (within the flood fringe overlay zone), you may request a Letter of Map Revision Based on Fill (LOMR-F). As with a LOMA, a FEMA Elevation Certificate will need to be completed by a land surveyor or engineer. If the filled ground is higher than the BFE, and if you do not have a basement, then FEMA may issue a LOMR-F.

I have a legal non-conforming structure in the floodplain. What does that mean?

Any building that was constructed prior to implementation of the floodplain regulations has a legal non-conforming use designation and can remain in place indefinitely unless it is substantially damaged or substantially improved. Once it is substantially damaged or substantially improved, the structure must comply with current regulations.

Floodplain Regulation History in Larimer County

In **July 1974**, Larimer County joined the National Flood Insurance Program (NFIP) and property owners became eligible to purchase flood insurance through that program. On December 1, 1975, Larimer County adopted its first floodplain regulations as a supplementary regulation to the Larimer County Comprehensive Zoning Regulation and also as an amendment to the County Building Code. The Flood Review Board was created within these regulations. The regulations were structured by listing allowed uses within the floodplain zones and conditions and other restrictions within those zones.

Uses allowed without Special Permits included agricultural uses, recreational uses and residential accessory uses. For allowed uses without a Special Permit, there were conditions including "No structure, fill, storage of materials or equipment shall be permitted. (*Larimer County Flood Plain Regulations 4.2.3, December 1, 1975*)"

Uses permitted by Special Permit, included temporary uses such as circuses, carnivals or temporary roadside stands and functionally dependent uses such as marinas, boat rentals, docks piers, wharves, roads streets, bridges, etc. (*Larimer County Flood Plain Regulations 4.3, December 1, 1975*) The uses permitted by Special Permit could have allowed accessory type structures. Where structures were allowed, certain restrictions were listed such as "Structures shall not be designed for human habitation. (*Flood Plain Amendment to the Larimer County Building Code 3.2.a, December 1, 1975*)"

Uses or structures that existed prior to the adoption of the regulation, or prior to the designation of the flood zone were considered non-conforming uses and were allowed to continue as such with certain restrictions and regulations. "A structure or use within a structure or use of premises which is lawful before the passage of this supplementary regulation but which is not in conformity with the provisions hereof, may be continued without compliance with the supplementary regulation..." (*Larimer County Floodplain Regulations 7.1, December 1, 1975*) Repairs, expansion or alterations were only allowed if approved by the Board of Review and did not exceed 25% of the structures actual value. Discontinued or vacated uses for a period of 12 months were required to comply with the regulations.

Non-conforming structures that were substantially damaged were also required to meet the regulations. "...If any non-conforming structure is damaged to the extent of 50% of its actual value by flood, said non-conforming structure shall be restored only in compliance with this supplementary regulation and floodplain amendment to the Larimer County Building Code" (*Larimer County Floodplain Regulations 7.2, December 1, 1975*)

The Board of Review (Flood Review Board) was given the power to grant variances and allow expansion of non-conforming uses within the floodplain. "... Variances may only be allowed upon a showing that the strict application of any provisions of this Supplementary Regulation would result in a peculiar and exceptional and undue hardship upon the owner of such property. Variances shall not impair the intent and purpose of this Supplementary Regulation. Furthermore, use variances from the uses set forth in the FW and FF zoning districts may be allowed or conditionally allowed after review of said use variance in accordance with the applicable factors set forth in Section 6.2 hereof."(*Larimer County Floodplain Regulation 8.2.c, December 1, 1975*)

On **March 20, 1979** the Board of County Commissioners moved to amend the code to define Substantial Damage to include damage from any means. Larimer County had received notice of changes that were necessary to conform with Federal guidelines and was threatened with suspension from the NFIP on April 2, 1979 if it did not comply. The new definition was adopted and read as follows, "A non-conforming structure damaged by any means whose market value after damage has occurred is less than 50% of it's market value at the time of damage may not be restored, except in conformance with this supplementary regulation and the Flood Plain Amendment to the Building Code."

On **March 3, 1987** and **March 18, 1996** the floodplain resolutions were adopted. There didn't appear to be any changes in the regulations themselves.

On **January 1, 2000** the Floodplain regulations were incorporated into the Larimer County Land Use Code as overlay zones upon it's original inception. The format and wording changed, but the overall intent of the regulations themselves remained constant.

Revisions to the Land Use Code were adopted on **December 24, 2013** largely to incorporate mandated state regulations. On January 14, 2011, the Colorado Water Conservation Board adopted their amended Floodplain Rules and Regulations and required all communities within Colorado to adopt the higher regulations within 3 years from that date. Major changes within the State level regulations included a minimum of 12 inches of freeboard, 1/2 foot floodway designations and the requirement to regulate critical facilities within the 100-year regulatory floodplain. Larimer County had always regulated a minimum of 18 inches of freeboard, and has also regulated the 1/2 foot floodway so no change was necessary for those two items. Prior to the code change, Larimer County had only regulated critical facilities within the limits of the Poudre River floodplain within the growth management area of Fort Collins. Changes to the code were necessary to meet this new minimum standard from the State. As a part of the code revision, County staff took the opportunity to utilize verbiage from the CWCB Model Floodplain Ordinance and to format the code to be more similar to the state language. The list of allowed uses as existed prior to this code change did not align with the list of uses under the Zoning portion of the Land Use Code. Effort was taken to try to align allowed uses for the floodplain overlay zones with the list of uses in the zoning section and was done by adding three columns to the zoning table for Floodway, Floodfringe and Cache-La Poudre GMA. Staff also took the opportunity to ease the regulation that tracked substantial improvement over the lifetime of the structure. The adopted language stated that it would be tracked over a ten-year rolling period and certain items such as routine maintenance and minor work would be excluded from the substantial improvement total. It was also stated that substantial damage would not be tracked against substantial improvement.

On **June 15, 2015** in response to citizen concern about the strictness of Larimer County's Floodplain Regulations, the Floodway Overlay Zone section of the Land Use Code was amended to read, "Substantially damaged structures within a floodway where the damage was by any cause other than a flood event can be repaired or replaced in the floodway as long as the lowest floor is at or above the regulatory flood protection elevation and the repair and reconstruction meets all other applicable sections of 4.2.2. To clarify the regulation, a section was added also that read, "Substantially damaged structures within a floodway where the damage was caused by a flood event can not be repaired or replaced in the floodway." Sections were added to the Flood Fringe district, and FH Flood Hazard District stating that a Substantially Damaged Structure could be repaired or replaced as long as it met elevation requirements and other sections of the code.

From **2015-2017**, at the request of local residents, Larimer County is considering changes to the Larimer County Land Use Code - Section 4.2.2 (Floodplain Regulations) that could potentially allow repair or replacement of a legal non-conforming structure that has been Substantially Damaged by a flood event in the regulatory Floodway Overlay Zone if certain criteria are met.

Currently, the proposed criteria include:

- additional freeboard (24 inches total)
- mitigation of erosion or stream instability
- not within a product corridor [depth (ft) x velocity (ft/sec)] greater than 8
- must meet all other federal, state and local floodplain regulations
- should follow guidance from standard engineering practices within FEMA documents
- The proposed revisions are expected to go to a joint work session with the Planning Commission and Board of County Commissioners. A joint public hearing will follow the work session. Meeting dates have not yet been scheduled.

Floodway vs. Flood Fringe

