



Land Use

Courthouse Annex • 2045 13th Street • Boulder, Colorado 80302 • Tel: 303.441.3930 • Fax: 303.441.4856
Mailing Address: P.O. Box 471 • Boulder, Colorado 80306 • www.bouldercounty.org

**BOULDER COUNTY
BOARD OF COUNTY COMMISSIONERS**

September 28, 2016 – 11:30 A.M.

**Hearing Room, Third Floor
Boulder County Courthouse**

PUBLIC HEARING

Docket DC-15-0004: Proposed Boulder County Land Use Code Text Amendments to Floodplain Regulations and related provisions

STAFF PLANNER: Varda Blum, Floodplain Program Manager/Boulder County Transportation Department

BACKGROUND

This is the second Board of County Commissioners session for these proposed changes to the floodplain regulations in the existing Boulder County Land Use Code Article 4-400 (FO District), Article 18 (Definitions), and Article 4-800 (SPR). Proposed changes focus on creating transparent processes for use of best available data, clarifying existing regulations, making changes necessary to meet FEMA and CWCB minimum requirements, and associated changes to allow County staff to better protect the health, safety, and welfare of the residents and visitors to Boulder County. The Board of County Commissioners authorized staff to pursue these text amendments on September 17, 2015.

September 1, 2016 Board of County Commissioners Hearing:

At the Board of County Commissioners hearing on September 1, 2016, the Board acknowledged that the public and staff would likely benefit from additional time to review and refine the proposed amendments and voted to table the docket until September 28th at 11:30 a.m.

Since the September 1st hearing, staff has continued to perform outreach and solicit comments. Staff is very appreciative of the time and effort residents and referral agencies have committed to reviewing and providing feedback. This memorandum includes a listing

of the outreach performed since September 1st followed by a brief summary of the comments received in that time on proposed changes, and staff responses to those comments.

PUBLIC NOTICE AND INVOLVEMENT SINCE SEPTEMBER 1, 2016

Boulder County floodplain program staff sought public involvement and comment and provided notification of these proposed Land Use Code text amendments in the following ways:

1. A specific website focused on the proposed floodplain code updates and floodplain remapping has been active since May 2016 and continues to be active. www.bocofloodplainremapping.com .
2. September 1, 2016 – Public hearing before the Board of County Commissioners ('BOCC') to consider proposed floodplain code changes. Public comment was taken at this hearing.
3. September 9, 2016 - Public notice for the September 28, 2016 BOCC meeting was posted in the Daily Camera and the Times Call.
4. September 9, 2016 – Notice of the September 28, 2016 BOCC meeting was sent via email to five watershed coalitions representatives (Fourmile, St Vrain, Lefthand, Little Thompson, Coal Creek) to distribute to their members.
5. September 9, 2016– Notice of the September 28, 2016 BOCC meeting was sent via email to 2,041 email addresses comprising the Boulder County Commissioner's Agenda, Boulder County Commissioner's News, Boulder County Flood Recovery, Boulder County Floodplain Remapping, and Boulder County Land Use Code ListServs.
6. September 14, 2016 -- Meeting with representatives of Left Hand Ditch Company and Saint Vrain and Left Hand Water Conservancy District
7. September 14, 2016 – Meeting with members of Lower Left Hand Watershed Association ('LLWA') neighborhood group.
8. September 21, 2016 – Docket information including a draft of the text amendments and staff's formal recommendation to the BOCC was posted to the Boulder County Development Applications webpage at: <http://www.bouldercounty.org/property/build/Pages/lucodeupdatedc150004.aspx>
9. September 28, 2016 – BOCC meeting to consider proposed floodplain code changes. Written comment was taken at the hearing.

Regardless of the outcome of this September 28th meeting of the BOCC, staff will continue to work with stakeholders on floodplain regulation understanding. This effort will include development of a Frequently Asked Questions ('FAQ') document to be posted on the County web page as well as other outreach activities. Staff agrees with stakeholders that their collaboration on this effort with residents is very important.

SUMMARY OF PROPOSED CHANGES and COMMENTS RECEIVED:

This memo includes:

- Exhibit A – Existing adopted floodplain regulations in Articles 4-400.
- Exhibit B –September 1, 2016 proposed revised floodplain regulations. No redline.
- Exhibit C – Redline of changes made to Exhibit B. This version of the draft allows the BOCC and public to see the revisions to the proposed code changes that were made between September 1st and September 21st, as a result of additional review and public comment.
- Exhibit D – A clean version of the proposed revised floodplain regulations. No redline. This is the draft that will become the adopted regulations pending BOCC review of this docket and including any text modifications resulting from the September 28th BOCC meeting.
- Exhibit E – General Floodplain Development Permit 2016-1.
- Exhibit F –Written Comments received regarding Docket DC-15-0004 since September 1, 2016.

Below is a summary by topic of comments received since September 1st and text changes and staff responses associated with those comments.

Designation of Official Maps

The first step in planning a project that may be in the floodplain is to check the official maps to decide whether the proposed project is in the FO district. Proposed changes to the code related to official maps are in proposed Section 4-403 and include changes to what data makes up the official map of the FO district, and clarification of the processes for interpreting and amending that map.

Staff proposes to create a process to adopt best available data defining the 1% chance floodplain into a supplementary Boulder County floodplain. The County Engineer currently has the authority to use best available data, however there is no public process to adopt that data. The proposed change is intended to make the process of using best available data more transparent.

Comments Received and Responses to Comments

Comment Summary: ‘Establish a standard for Best Available Data. People need to understand that changes to the map will not be done based on just anything.’

Staff Response: A standard for interpretation and use of best available data already exists in 4-403.C.2 and 4-403.D.5 respectively.

Comment Summary: ‘Clarify the need for Actual Notice to affected Landowners’.

Staff Response: The proposed code changes require that a change in the boundary of the FO District which result in a portion (or all) of a parcel being added to or removed from the regulatory floodplain requires review and approval of a Zoning Map Amendment. Section 4-403.D.2. Zoning Map Amendments require notice and public hearings before the Planning Commission and the Board of County Commissioners, as further described in sections 4-1100 and 3-205.

The only exception to this requirement for notice and hearings is for changes to the DFIRM. Under the proposed code language in section 4-403.D.1, when FEMA issues a Letter of Final Determination associated with any map action, the FEMA Floodplain within the FO District will be deemed automatically updated. See also Section 4-403.A.1 (incorporating by reference the DFIRM, as amended, in effect on the date of complete permit application). Boulder County is required to adopt the DFIRM, so public hearings at the county level would have a predetermined outcome and, therefore, do not seem like an appropriate use of public resources. Property owners concerned about changes FEMA is making will, however, have notice and the opportunity to comment to FEMA prior to FEMA's final action.

Under Section 3-205 of the Land Use Code, notice of public hearings for comprehensive rezonings (e.g., changes to the FO District zoning map) and Land Use Code text amendments means publication in a newspaper of general circulation within Boulder County at least 14 days prior to the public hearing date. In any given instance where we are updating floodplain maps or text, we always have the option (even if not required in the Code) of mailing individual notices as public service.

Comment Summary: 'Require maps to show floodway and flood fringe separately'.

Staff Response: There are times when the mapping we have does not include floodway (e.g. A zone or AE without floodway). We agree that the difference between floodway and fringe should be shown wherever possible which is why floodway by definition is shown on the map currently; however, in some instances specific mapping is not available. Therefore, we are proposing in these instances an alternative approach to the current costly studies to determine whether a proposed project is within the floodway.

General and Individual Floodplain Development Permit

Boulder County would like to achieve the goal of protecting against adverse impacts to floodplain areas, while lessening the review required for minimal or no impact development within the floodplain.

Staff proposes to separate the existing FDP into a General FDP (4-404.1) and an Individual FDP (4-404.2) in a manner similar to the Clean Water Act Section 404 permit program administered by the U.S. Army Corps of Engineers. Individual FDPs will be required for development with potentially significant impacts to people and property and General FDPs will be issued for development that pose minimal or no impacts.

Comments Received and Responses to Comments

Comment Summary: Staff received verbal feedback that the concept of the General FDP has merit and should be retained, but that it did not make sense to attempt to list all specific uses and activities which fell within the General FDP within the Code. Rather, the Code should authorize the County Engineer to issue General FDPs from time to time, within certain parameters specified in the Code.

Staff Response: We agree with this comment. We have amended the language in section 4-404.1 such that it now lays out the process for the County Engineer to issue a General FDP. We also generated a first draft of the General FDP that the County Engineer proposes to issue immediately after the text amendments in this docket are

approved by the Board, which is Exhibit E to this staff recommendation. Exhibit E reflects the conversations staff has had with ditch companies, water districts, and others since the September 1st hearing.

Comment Summary: ‘I propose that the general permit be based on the types of impacts resulting from an activity. For example, if the concern is changing the physical contours of the floodway, this can be evaluated in terms of the amount of material being added, moved, or removed.’

Staff Response: Early on in the creation of the General FDP, staff considered this approach but concluded that it is too difficult to quantify impacts as suggested because of the variety of types of impacts potentially covered by the General FDP. Instead, staff created categories of activities and where there is doubt on application of the categories, required that the applicant notify the County of proposed work that might need verification that it is covered under the General FDP.

Comment Summary: Just prior to the September 1st hearing, staff received written comments indicating that water conveyance entities needs had not been adequately considered by staff in the creation of the General Permit. Representatives from these entities endorsed alternative language from what was proposed. Staff did not have time to consider fully the proposed replacement language before the September 1st hearing.

Staff Response: Following the hearing, staff toured various ditch facilities and met with ditch company and water district representatives. Staff and these representatives collaborated to draft language that addressed the concerns. These changes include amendments to the definition of Maintenance in section 4-414 and amendments to the description of the type of maintenance which is allowed under the General FDP depending on the nature and extent of the work, and how far it is from the nearest drainage system, water delivery, or ditch system structure or component. Because the actual General Permit is now separate from the code itself, additional changes to the General Permit will be more easily made as additional concerns arise.

General Comments and Comments Received on Unchanged Provisions of LUC 4-400

Comments Received and Responses to Comments

In addition to comments on the proposed changes to the floodplain regulations that are described in the sections above, staff received comments on floodplain management and current regulations that are not proposed for change.

Comment Summary: There have been throughout the process of revision to these floodplain regulations emailed comments and questions about the existing requirement that substantial improvement/ substantial damage (“SI/SD”) be calculated as a cumulative total since September 11, 2013. Residents requested that the cumulative nature of the calculation be reconsidered.

Staff Response: The existing adopted code provision for cumulative SI/SD is not new. Consideration of whether to change that provision was not within the scope of these floodplain regulation amendments. Staff did evaluate these regulations in Spring 2014 and decided to continue with the previously existing calculation method with a change to September 11, 2013 for the date on which the cumulative percentage starts accumulating. As discussed by the Board at the September 1st public hearing,

staff intends to re-evaluate the necessity and provisions of cumulative SI/SD regulations and evaluate the need for a future floodplain code amendment.

Comment Summary: Since September 1st, the following comment was received regarding the floodplain regulations' SI/SD provisions. 'In general my suggestion is that Substantial Improvement be limited to structural modifications to structures and that any proactive flood mitigation be credited. ... If this is intended to be addressed more definitively as a next step, this needs to be communicated and committed to. Then we can start working on how best to fix this portion of the code...'

Staff Response: The types of activities counted towards SI/SD are not chosen by Boulder County but by FEMA per SI/SD Desk Ref FEMA P-758.

Comment Summary: Since September 1st, staff has received several verbal comments about floodplain regulations for rebuilding after disasters and many requests have been received for post-disaster specific floodplain regulations.

Creating post-disaster specific floodplain regulations was not within the scope of this floodplain code amendment. Staff has noted these comments and will address this need in studies for future floodplain code amendments.

When disasters occur, the county can enact disaster declarations, to address immediate disaster recovery needs, and county code can be revised as appropriate, which occurred after the September 2013 flood event. Due to the difficulty in predicting the particular needs of future disaster recovery, it is likely that individual post-disaster code sections, similar to the Article 19 sections addressing the Fourmile and the September 2013 flooding, will be created as needed.

Additional Public Comment

Staff will summarize the nature and extent of public comments received after September 21st and prior to the September 28th BOCC session at the September 28th meeting.

PLANNING COMMISSION

Planning Commission held public hearings on this docket on June 15, 2016 and August 17, 2016. On August 17, 2016, the Planning Commission voted unanimously (6-0) to approve and recommend approval of the docket to the Board of County Commissioners.

TEXT AMENDMENT CRITERIA ANALYSIS

Article 16-100(B) contains the criteria for amending the text of the Land Use Code. Staff finds that these criteria are met in the context of this Docket, as follows:

1. The existing text is in need of amendment:

Staff has identified the goals of this docket and the reasons why these amendments should be made. Those goals are:

- To make more transparent and less cumbersome the use of best available floodplain data.

- To create a clear regulatory framework which better protects the health and safety of County residents and to address the public’s need for more easily understood floodplain regulations.
- To better address the impacts and potential hazards that have become evident since the 2013 flood in Boulder County.
- To revise the County’s local floodplain regulations to better align with state and federal requirements.

2. The amendment is not contrary to the intent and purpose of this Code:

The amendments are not contrary to the intent or purpose of the Code.

3. The amendment is in accordance with the Boulder County Comprehensive Plan:

The amendments are in accordance with the Boulder County Comprehensive Plan.

RECOMMENDATION

STAFF RECOMMENDS THAT THE BOARD OF COUNTY COMMISSIONERS APPROVE Docket DC-15-0004: Land Use Code Text Amendments to Floodplain Regulations and related provisions

Staff recommends an effective date of the new regulations of October 17, 2016.

Attachments:

- Exhibit A – Existing adopted floodplain regulations in Articles 4-400
- Exhibit B – Final September 1, 2016 proposed revised floodplain regulations in Articles 4-400, definitions in Article 18, and Site Plan Review regulations in Article 4-800. No redline.
- Exhibit C – Proposed September 28, 2016 proposed revised floodplain regulations in Articles 4-400, definitions in Article 18, and Site Plan Review regulations in Article 4-800 with redline comparison to Exhibit B, September 1, 2016 proposed floodplain regulations.
- Exhibit D – Final September 28, 2016 proposed revised floodplain regulations in Articles 4-400, definitions in Article 18, and Site Plan Review regulations in Article 4-800. No redline.
- Exhibit E – General Floodplain Development Permit 2016-1
- Exhibit F –Written Comments received regarding Docket DC-15-0004 since September 1, 2016.

DC-15-0004

EXHIBIT A

Existing adopted floodplain regulations (Article 4-400)

4-400 Floodplain Overlay District

Purpose: To provide land use controls necessary to qualify unincorporated areas of Boulder County for flood insurance under requirements of the National Flood Insurance Act of 1968, as amended, to protect human life and health; to avoid increasing flood levels or flood hazards or creating new flood hazard areas; to minimize public and private losses due to flooding; to reduce the need for expenditures of public money for flood control projects; to reduce the need for rescue and relief efforts associated with flooding; and to prevent or minimize damage to public facilities and utilities; and to aid the public in determining if a property is in a potential flood area.

4-401 Application and Liability

- A. The provisions and regulations of this section shall apply to all lands within the unincorporated area of Boulder County which are located within the Floodplain Overlay (FO) Zoning District. If a structure, lot, or other parcel of land lies partly within the FO district or the floodway, the part of such structure, lot, or parcel lying within the district or floodway shall meet all requirements for such district or floodway as set forth in this Code.
- B. The degree of flood protection intended to be provided by this section has been determined to be reasonable for regulatory purposes and is based on engineering and scientific methods of study. Floods of greater magnitude may occur and flood heights may be increased by man-made or natural causes, such as ice jams and bridge or culvert openings restricted by debris. This article does not imply that the areas outside floodplain area boundaries or land uses permitted within such areas will be free from flooding or flood damages or that compliance with these regulations will prevent any or all damages from flooding. Nor shall this article create a liability on the part of, or a cause of action against, the County of Boulder or any officer or employee thereof for any flood damages that may result from reliance on this article or any administrative decision.
- C. The floodplain regulations of this code are not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where these regulations and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

4-402 Designation of Official Maps

- A. The following reports designate the location and boundaries of the FO district.
 1. That portion of the Floodplain study entitled 'Floodplain Information/Boulder Creek and South Boulder Creek (Boulder County Volume II),' August 1969, prepared for the Denver Regional Council of Governments by the Department of the Army, Omaha District, Corps of Engineers, which includes all of South Boulder Creek and Boulder Creek in the unincorporated areas west of Valley View Road and east of the Boulder City Limits.
 2. 'Floodplain Information/Lower St. Vrain Creek (Boulder County Volume III),' June 1972, prepared for the Urban Drainage and Flood Control District/the City of Longmont/Boulder County by the U.S. Army Corps of Engineers (Omaha, Nebraska).
 3. 'Floodplain Information Report/Lefthand Creek, Volume 1 (Mouth to Foothills Highway),' December, 1981, prepared for Boulder County, City of Longmont and the Colorado Water Conservation Board by Gingery Associates, Consulting Engineers.
 4. 'Floodplain Information Studies/Upper Lefthand Creek, Volume II, (Foothills Highway to Peak to Peak Highway),' August, 1983, prepared for Boulder County and the Colorado Water Conservation Board by Simons, Li and Associates, Consulting Engineers.
 5. 'Floodplain Information Report/Upper Boulder Creek and Fourmile Creek,' December, 1981, prepared for Boulder County and the Colorado Water Conservation Board by Gingery Associates, Consulting Engineers.
 6. 'Flood Hazard Area Delineation/Lower Boulder Creek (Valley View Road to Boulder - Weld County Line),' March, 1983, prepared for Urban Drainage and Flood Control District, Colorado Water Conservation Board and Boulder County by Muller Engineering Company, Inc., Consulting Engineers.
 7. That portion of the floodplain study entitled, 'Flood Hazard Delineation/Boulder Creek and Dry Creek (Number Three),' June, 1975, for Urban Drainage and Flood Control District and Boulder County by Leonard Rice Consulting Water Engineers, Inc., which includes Dry Creek Number Three.
 8. 'Flood Hazard Analysis/Coal Creek and Rock Creek, Boulder and Weld Counties, Colorado,' October, 1976 prepared by U.S. Department of Agriculture, Soil Conservation Service in cooperation with the Colorado Water Conservation Board, Urban Drainage and Flood Control District, Coal Creek Water Users Association, Boulder County and Weld County.
 9. 'Floodplain Information/Dry Creek (Number Two) Boulder County - Weld County, Colorado,' June, 1978, prepared for Boulder County, Weld County and Colorado Water Conservation Board by the Department of the Army, Omaha District, Corps of Engineers.
 10. 'Floodplain Information, Flood Control and Floodplain Management Plan for St. Vrain Creek at Longmont, Colorado,' April, 1981, prepared for City of Longmont, Boulder County and the Colorado Water Conservation Board by Water Resource Consultants, Inc.

11. 'Floodplain Information and Flood Control and Drainage Plan/Dry Creek Number One,' April, 1980, prepared for Boulder County, City of Longmont and the Colorado Water Conservation Board by Water Resource Consultants.
 12. 'Floodplain Information Report/St. Vrain Canyon Upstream of Lyons, Boulder County, Colorado,' October, 1978, prepared for Boulder County and the Colorado Water Conservation Board by Camp, Dresser and McKee, Inc.
 13. That portion of the study entitled, 'Floodplain Information/Big Thompson River, Loveland to the Larimer - Weld County Line, Colorado/Little Thompson River, Boulder and Larimer Counties Near Berthoud, Colorado,' June, 1977, prepared for Larimer County, Boulder County, Larimer-Weld Council of Governments and the Colorado Water Conservation Board by the Department of the Army, Omaha District, Corps of Engineers, which includes the Little Thompson River in Boulder County.
 14. 'Floodplain Information, Flood Control and Floodplain Management Plan for Coal Creek at Erie, Colorado,' August, 1980, prepared for Boulder County, Weld County, and the Town of Erie and the Colorado Water Conservation Board by Water Resource Consultants.
 15. That the portion of the Floodplain study entitled 'South Boulder Creek Flood Hazard Delineation,' July 1986, prepared for the Urban Drainage and Flood Control District and Boulder County in cooperation with the Colorado Water Conservation Board, which includes South Boulder Creek from Eldorado Springs to the Colorado and Southern Railroad (C&S R.R.) crossing, approximately 1100' downstream from Arapahoe Road (S.H. 7).
- B.** The maps in these reports depicting the floodplain for the base flood shall be considered the official maps for the purposes of locating the FO district and establishing those areas affected by the provisions and regulations of this Section. These maps and reports, together with all amendments, explanatory matter, technical addenda, water surface elevations, profiles, cross sections where available, and the 'Flood Insurance Study,' effective December 18, 2012, and the Flood Insurance Rate Maps of Boulder County as prepared by the Federal Emergency Management Agency are incorporated by reference into this Code. The location and boundaries of the FO district established by this Section are also incorporated into this Code, and are depicted upon the official zoning district maps.
- C.** The County Engineer shall keep copies of the reports cited in Section 4-402(A) on file and open to public inspection.
- D. Interpretation of Official Maps**
1. Where interpretation is needed as to the exact location of the boundaries of the FO district, the County Engineer shall make the necessary interpretation by referring, as necessary, to the engineering study upon which the maps and elevations are based, to the professional engineers who prepare the study, to the Colorado Water Conservation Board, and/or the Federal Emergency Management Agency.
 2. The base flood water surface elevations, as shown on the flood profiles and in the elevation tables, shall be the governing factor in determining accurate boundaries.
- E. Review and Amendment due to Physical Change**
1. In the event that significant changes occur or are proposed within the FO district, such as flood control measures, channelization, stream improvements or any other alteration or change in the watercourse, there shall be an evaluation of the boundaries of the floodplain as follows:
 - a. The County Engineer, in conjunction with the Colorado Water Conservation Board and the Federal Emergency Management Agency, will study the magnitude of the apparent change and determine whether there is need for a full scale study of the boundaries with a view to possible revision.
 - b. Should the Planning Commission or any person or persons, as a result of such a study or for other reasons, desire to change the boundaries of any FO district, the procedure for rezoning set forth in Section 4-1100 shall be followed.
 2. In addition, proposed boundary changes of any FO district that has been approved and incorporated into the National Flood Insurance Program shall also conform with the Federal Emergency Management Agency's map revision/amendment process.
- F. Amendment Due to the Incorporation of New Studies**
1. If the Colorado Water Conservation Board officially designates and approves additional floodplain reports affecting any river or creek in the unincorporated area of Boulder County, and upon review by the Federal Emergency Management Agency, the County Engineer shall review such reports and make recommendations to the Planning Commission regarding necessary amendments or additions to the boundaries of the FO district.
 2. The procedure for such amendments is set forth in Article 16 of this Code.

4-403 Floodway

- A. No development, encroachment, use, or alteration in, on or over any part of the floodway shall be permitted which alone or cumulatively with other such uses would cause or result in:
1. the occupation of permanent or temporary structures;
 2. the development or use of overnight campgrounds;
 3. the storing or processing of materials that are buoyant, flammable, explosive, or otherwise potentially injurious to human, animal or plant life;
 4. solid waste disposal sites and central collection sewage treatment facilities and new or expanded individual on-site wastewater systems;
 5. the potential of solid debris (including, but not limited to garages, storage sheds, decks, fences, etc.) or waste (including, but not limited to on-site wastewater systems, etc.) being carried downstream; or
 6. an encroachment that would adversely affect the efficiency of the floodway or change the direction of flow or cause any increase in the base flood elevation.
- B. The following open uses shall be permitted within the floodway to the extent that they are not prohibited in a particular area by any underlying zoning district and only if they do not adversely affect the efficiency of the floodway, change the direction of flow or increase base flood heights:
1. agricultural uses such as general farming, grazing of livestock and horses, truck farming, sod farming and wild crop harvesting;
 2. uses accessory to residential uses, including, but not limited to lawns, open areas, gardens, driveways, and play areas;
 3. industrial or commercial uses such as loading areas, railroad rights-of-way (but not including freight yards or switching, storage or industrial sidings), parking areas, airport landing strips, and storage yards for equipment or machinery easily moved or not subject to flood damage (excluding junkyards and solid waste disposal facilities);
 4. recreational uses not requiring permanent or temporary structures designed for human habitation;
 5. utility facilities such as dams, power plants, spillways, transmission lines, pipelines, water monitoring devices, water supply ditches, irrigation ditches and laterals;
 6. open mining; or
 7. road and highway structures.
- C. Any development in the floodway shall be permitted only upon application to the County Engineer and the issuance of a floodplain development permit.
- D. The provisions of this Article 4-400 may be waived for properties within a floodway that require a repair or replacement of an existing on-site wastewater system, provided the County Engineer determines that the proposed repair or replacement is consistent with Subsections 1. through 3., below.
1. The property owner has demonstrated that connection to a central sewer system is not feasible by:
 - a. Providing a letter of denial from the closest sewer provider; or
 - b. Demonstrating other reasons why connection is not feasible, such as that there is no central sewer system reasonably close to the property or building to be served, or that easement restrictions exist that effectively prohibit connection. For properties within a Community Service Area, connection will be deemed not feasible if the cost of connection exceeds 25% of the most recent assessed value of the subject property.
 2. The proposed repair or replacement design must be protective of groundwater and appropriate for a floodway. In making this determination the County Engineer shall consider the following factors, among other pertinent information:
 - a. Whether it is practical to remove outbuildings or non-conforming additions to allow for increased soil availability so that the proposed repair or replacement can be located outside of the floodway;
 - b. Whether there is room for an at-grade recirculating sand filter, or similar treatment media, and the required absorption area;
 - c. What permit requirements might exist or be imposed for on-going operation and maintenance and advanced treatment; and
 - d. Whether placement in the hydraulic shadow of a legal, pre-existing structure is possible.
 3. In no event shall a proposed repair or replacement increase the overall capacity of the existing on-site wastewater system. In addition, the County Engineer may approve a raised absorption system or installation of a vault only as a last option within the floodway if this option meets the provisions of Article 4-407(B).
 4. The County Engineer may impose terms and conditions on any waiver that may be granted to ensure that the proposal meets the requirements of this Article 4-403.D.

4-404 Floodfringe

- A. Any use permitted by the underlying zoning regulations shall be permitted in the floodfringe, provided the use meets the floodproofing requirements of Paragraph 4-405 of this Section.
- B. Any development in the floodfringe shall be permitted only upon application to the County Engineer and the issuance of a floodplain development permit.

4-405 Floodproofing

- A. All insubstantial improvements where the lowest floor of the improvement is not above the flood protection elevation shall be floodproofed as follows:
 1. The improvement, including attendant and sanitary facilities, be designed so that the structure is watertight with walls substantially impermeable to the passage of water below the flood protection elevation; the structure is anchored to prevent flotation, collapse, or lateral movement of the structure; and the structure is constructed with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
 2. The improvement be certified by a Colorado Registered Professional Engineer that the floodproofing methods are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces, and other factors associated with the base flood. Such certification shall also state the specific elevation (in relation to mean sea level) to which the improvements are floodproofed.
- B. All new construction and substantial improvements shall be floodproofed as follows:
 1. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure and capable of resisting the hydrostatic and hydrodynamic loads.
 2. All new construction and substantial improvements of any building or other structure shall have the lowest floor (including basements and porches) elevated to or above the flood protection elevation, provided that:
 - a. Fully enclosed areas below the lowest floor that are subject to flooding and used solely for parking of vehicles, building access, or storage of materials in an area other than a basement shall be designed to equalize the hydrostatic pressure flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
 - (i) 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;
 - (ii) The bottom of all openings shall be no higher than one foot above grade; and
 - (iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
 - b. Accessory structures (detached garages, sheds, and barns) and agricultural structures (including grain bins, corn cribs, and barns) may be constructed at grade and wet-floodproofed by meeting the provisions for fully enclosed areas subject to flooding and subject to the following conditions:
 - (i) The building must be used only for the parking of vehicles or storage of tools, materials and equipment;
 - (ii) Agricultural structures (including grain bins, corn cribs, and barns) must be limited in use to agricultural purposes;
 - (iii) The structure shall not be designed or used for human habitation;
 - (iv) The accessory structure must represent a maximum investment of less than 10% of the value of the principal structure on the property, or a maximum floor area of 600 square feet;
 - (v) The structure must have low flood damage potential with respect to both the structure and its contents; and
 - (vi) Permanently affixed sanitary facilities and appliances (such as furnaces, heaters, washers, dryers, etc.) are prohibited.
 - c. Accessory structures that do not have at least two rigid walls (including carports, gazebos, and picnic pavilions) may be constructed at grade and do not require floodproofing.
 - d. Other accessory structures that do not meet the above requirements may be constructed at-grade and will only be permitted by a variance to this section, provided that:
 - (i) Accessory structures shall be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters; and
 - (ii) Service facilities such as electrical and heating equipment shall be elevated or floodproofed.
 3. All new construction and substantial improvements on a property removed from the floodplain by the issuance of a FEMA Letter of Map Revision Based on Fill (LOMR-F) shall have the lowest floor elevated to or above the flood protection elevation that existed prior to the placement of fill.

4. All new construction and substantial improvements of any building or other structure, within areas of shallow flooding, as specifically defined by the Federal Emergency Management Agency, shall have the lowest floor (including basements, garages, carports, and porches) elevated to or above the flood protection elevation.
 - a. For shallow flooding areas, the County Engineer may reduce the elevation requirement, upon evaluation of the floodplain on and around the proposed development.
 - b. Such a reduction shall have the lowest floor elevated to one foot above the base flood elevation, or the highest established adjacent grade plus at least one additional foot above the depth of flooding number specified in feet on the Flood Insurance Rate Maps, or at least three feet above the highest established adjacent grade if no depth number is specified.
 - c. Drainage improvements within a shallow flooding area, as specifically defined by the Federal Emergency Management Agency shall be constructed to allow floodwaters to flow around the perimeter of the structure in a controlled manner, without adversely impacting adjacent properties.
5. New construction and substantial improvement of any below-grade crawlspace shall:
 - a. Have the interior grade elevation, that is below base flood elevation, no lower than two feet below the lowest adjacent grade;
 - b. Have the height of the below-grade crawlspace measured from the interior grade of the crawlspace to the top of the foundation wall, not to exceed four feet at any point;
 - c. Have an adequate drainage system that allows floodwaters to drain from the interior area of the crawlspace following a flood;
 - d. Meet the provisions of Sections 4-405(B)(1), Anchoring; 4-405(B)(2)(a), Openings in Enclosures Below the Lowest Floor; and 4-405(C), Other Floodproofing Requirements.
6. Unsubstantial improvements, of any building or other structure, shall either have the lowest floor of the improvement elevated to or above the flood protection elevation or shall be designed and constructed according to the requirements of Paragraph 4-405(A).
7. As built lowest floor elevations (in relation to the 1988 North American Vertical Datum, or NAV88) for all new construction, substantial improvements, other improvements, or for new manufactured home stands, shall be certified by a Colorado Registered Professional Engineer or Colorado Registered Professional Land Surveyor. Elevation Certificates shall be submitted to the Building Division Inspector and County Engineer. Failure to submit an Elevation Certificate will result in suspension of work until proper certification is provided. To ensure compliance with floodproofing requirements during and after construction, completed Elevation Certificates shall be submitted at the following times:
 - a. For slab on grade foundation, a completed Elevation Certificate or a registered surveyor's certified statement (verifying the elevation) shall be submitted when foundation forms are completed and prior to final pour of foundation.
 - b. For buildings on elevated foundations, a completed Elevation Certificate shall be submitted when the foundation is completed and prior to rough framing.
 - c. For structures to be floodproofed, a completed floodproofing certificate shall be submitted when the floodproofing measures are completed. Accepted forms include the FEMA Floodproofing Certificate for Non-Residential Structures.
 - d. For structures that have achieved finished construction, a completed Elevation Certificate shall be submitted prior to the issuance of Certificate of Occupancy.
8. The storage or processing of materials that are buoyant, flammable, explosive, or in times of flooding could be injurious to human, animal, or plant life, shall be at or above the flood protection elevation.
9. Concerning manufactured home parks, for new parks commenced on or after February 1, 1979; expansions to existing parks; existing parks where the value of the repair, reconstruction, or improvement of the streets, utilities, and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement has commenced; an existing park on which a manufactured home has incurred substantial damage as the result of a flood; manufactured homes to be placed or substantially improved on-sites in existing parks; and for manufactured homes not placed in a park:
 - a. Stands or lots shall be elevated on compacted fill or on pilings so that the lowest floor of the manufactured home will be at or above the flood protection elevation. For homes placed on pilings:
 - (i) lots shall be large enough to permit steps;
 - (ii) piling foundations shall be placed in a stable soil no more than ten feet apart; and
 - (iii) reinforcements shall be provided for pilings more than six feet above the ground level.
 - b. Adequate surface drainage shall be provided.
 - c. New manufactured homes shall be anchored by providing over-the-top and frame ties to ground anchors as well as the following:
 - (i) over-the-top ties at each of the four corners, with two additional ties per side at intermediate locations, with the exception of manufactured homes less than 50 feet long which require only one additional tie per side;

- (ii) frame ties at each corner with five additional ties per side at intermediate points, with the exception of manufactured homes less than 50 feet long which require only four additional ties per side;
- (iii) all components of a manufactured home anchoring system shall be capable of carrying a force of 4800 pounds; and
- (iv) any additions to the manufactured home be similarly anchored.

10. Concerning recreational vehicles, at least one of the following provisions shall be met:

- a. The recreational vehicle shall be on the site for fewer than 180 consecutive days.
- b. The recreational vehicle shall be fully licensed and ready for highway use.
- c. The recreational vehicle shall meet the permit requirements and elevation and anchoring requirements for manufactured homes, in accordance with Section 4-405(B)(9) of this section.

C. Other Floodproofing Requirements

- 1. New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage up to the flood protection elevation.
- 2. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters.
- 3. Cutoff valves or the elimination of gravity drains below flood protection elevations in new and replacement sanitation or sewerage systems shall be used to minimize or eliminate infiltration of and discharge into flood waters.
- 4. The location of new and replacement on-site waste disposal systems shall be done in such a manner to avoid impairment to or contamination from the systems during flooding.
- 5. New and replacement electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be located at or above the flood protection elevation, unless exempted from floodplain development permit requirements under Section 4-407.F.
- 6. New buildings or other structures shall be placed with their longitudinal axes parallel to the predicted direction of flow of flood waters or be placed so that their longitudinal axes are on lines, parallel to those of adjoining structures, to the extent consistent with other provisions of this Code. This is intended to minimize the obstruction to flow caused by a building or structure.
- 7. For all new subdivision proposals and other developments, including proposals for manufactured home parks and subdivisions, greater than 50 lots or 5 acres, whichever is lesser, located within a designated A Zone that does not include a water surface elevation, shall include a base flood elevation as part of the proposal.

4-406 Responsibilities of the County Engineer

- A. The County Engineer or designee, is responsible for the administration and implementation of the requirements of this section. Such responsibilities include, but are not limited to:
 1. Review floodplain development permit applications, review and make floodway/floodfringe determinations, and issue permits if the applications are in compliance with the provisions and requirements of this Section. The requirements of this Section include the approval of all necessary local, state, or federal permits.
 2. Obtain, review, and reasonably utilize any base flood water surface elevation and floodway data available from state or federal agencies, or other reliable sources.
 3. Obtain and maintain for public inspection copies of all floodplain reports and maps, resolutions of official floodplain map amendments, and all records pertaining to floodplain developments.
 - a. These records include certified lowest floor elevations, elevation certificates of floodproofing methods and floodway encroachment, and records of all variance actions.
 - b. The County Engineer shall report variances issued on an annual basis to the Federal Emergency Management Agency.
 4. Notify adjacent communities, potentially affected property owners, and the Colorado Water Conservation Board prior to any alteration or relocation of a watercourse.
 - a. This is done through the publication of a notice of such proposed alteration or relocation once in a newspaper of general circulation in Boulder County.
 - b. The County Engineer shall also submit evidence of such notification to the Federal Emergency Management Agency.
 5. For any alteration or relocation of a watercourse, the County Engineer shall require that maintenance of the flood carrying capacity of the altered or relocated watercourse is provided.
 6. Make interpretations where needed, as to the exact location of the boundaries of the FO district where there appears to be a conflict between a mapped boundary and actual field conditions based upon an engineering study by the applicant.
 7. Review and transmit recommendations to the Board of Adjustment regarding requested variances and appeals pursuant to Section 4-409.
 8. Review floodplain reports approved by the Colorado Water Conservation Board and make recommendations to the Planning Commission and Board of County Commissioners regarding necessary amendments or additions to the FO district.

4-407 Floodplain Development Permit

- A. All building permit applications shall be reviewed by the Building Division to determine whether the proposed development may be within the floodplain, or is exempted from floodplain development permit requirements under Section 4-407.F. If it appears to the Building Division that any proposed development may be within the floodplain and is not exempted from floodplain development permit requirements under Section 4-407.F., then the Building Division shall refer the application to the County Engineer. The Building Division shall not issue a building permit when floodplain issues have been raised unless the County Engineer has issued a floodplain development permit or determined that no such permit is required.
- B. Applications for floodplain development permits are to be submitted to the County Engineer and shall include the following information as applicable:
1. A completed application form with all necessary information completed.
 2. a plan at a scale of 1' = 200' or larger, stamped by a engineer registered by the State of Colorado, which includes:
 - a. the site location;
 - b. a legal description of parcel;
 - c. base flood limits and water surface elevations;
 - d. floodway limits;
 - e. channel of watercourse;
 - f. existing and proposed contours or elevations at 2' intervals;
 - g. existing and proposed structures, with the lowest floor elevations (including basements and garages) of each structure;
 - h. proposed elevations to which structures will be floodproofed (if applicable);
 - i. location and elevations of existing streets, water supply, and sanitation facilities;
 - j. limits and total land area of all existing and proposed impervious surfaces, including structures; and
 - k. existing water supply ditches, irrigation ditches and laterals.
 3. A typical valley cross-section showing:
 - a. the channel of the watercourse;
 - b. limits of floodplain adjoining each side of channel;
 - c. cross-section area to be occupied by the proposed development;
 - d. existing and proposed base flood water surface elevations;
 4. Specifications for construction and materials of buildings, floodproofing, filling, dredging, grading, channel improvements, storage of materials, water supply, and sanitation facilities as applicable;
 5. Description of the extent to which any water course will be altered or relocated as a result of the proposed development;
 6. For development proposed within a floodway the following information is required:
 - a. A title report prepared by a licensed title insurance or abstract company containing the legal description of the subject property and identifying, listing and certifying the following:
 - (i) a listing of all owners of record of the subject property;
 - (ii) all owners and their addresses of real property adjacent to the subject property; and
 - (iii) all owners of any surface, subsurface, or above surface estates, rights, or interests in the land adjacent to the subject property (including easements and interests in the oil, gas, mineral or water estate) or any other real property associated therewith; the nature and description of each such estate, right, or interest; and the addresses of all owners.
 7. A floodway analysis by a Colorado Registered Professional Engineer using methodology acceptable to the Federal Emergency Management Agency and according to the following guidelines:
 - a. If a detailed hydraulic floodway analysis has not been performed, the responsibility for determining the floodway boundary rests with the floodplain development permit applicant. The need for a detailed hydraulic floodway analysis shall be the decision of the County Engineer.
 - b. The detailed hydraulic floodway analysis shall be based on the identical hydraulic model which was used to develop the engineering study currently adopted by the Board of County Commissioners. The applicant should obtain, through the County Engineer, a copy of the input data and card deck representing the HEC-2 computer model used for their effective flood hazard study.

- c. The model must then be updated to existing hydraulic conditions to determine what surcharge levels have already been achieved by encroachments since the floodplain was established.
 - (i) Alternate floodway configurations may then be analyzed based on acceptable Encroachment Methods as outlined in the current 'U.S. Army Corps of Engineers HEC-2 Water Surface Profiles Users Manual' and submitted to the County Engineer for review and approval.
 - (ii) Approval will be based on demonstration that the cumulative effects of the proposed encroachment, plus the effects of encroachments since the original flood hazard area was established, does not cause more than a one foot rise in the established base flood water surface elevation.
 - (iii) At the County Engineer's discretion, where a regulatory floodway has been designated, it may not be necessary to determine the cumulative effects of existing encroachments.
 - d. Floodway boundary configurations will be examined and approved by the County Engineer. The following specific information, for the stream reach 1000 feet upstream and 1000 feet downstream from the proposed encroachment, must be submitted:
 - (i) A copy of the printout for the hydraulic computer model representing the unencroached base flood profile run for conditions existing at the time the currently effective floodplain was developed. The printout must include the full input and output listing.
 - (ii) A copy of the printout from the hydraulic computer model representing the floodway run for the proposed floodway configuration and including encroachments and other hydraulic changes within the floodplain since the currently effective floodplain was established. The printout must include the full input and output listing with all input changes from the original model highlighted.
 - (iii) A copy of the floodway data table representing data for the proposed floodway configuration.
 - (iv) A copy of the currently effective official engineering study showing the existing floodplain and the proposed floodway configuration.
 - (v) Certification from a Colorado Registered Professional Engineer that the proposed floodway configuration, in combination with current floodplain hydraulic conditions, meets established requirements when evaluated against flood elevations established for unencroached conditions when the original floodplain study was completed.
8. An engineering report addressing those standards set forth in Paragraph 4-407(B) of this Section.
- C. Standards for Permit Review
1. In reviewing an application for a floodplain development permit, the County Engineer shall determine the specific flood hazard at the site and shall evaluate the suitability of the proposed use in relation to the flood hazard.
 2. In addition, the County Engineer shall consider the following factors in reviewing permit applications:
 - a. the effect of the proposal upon the efficiency or capacity of the floodway;
 - b. the effect on lands upstream, downstream and in the immediate vicinity of the development including the potential danger to persons;
 - c. the effect of the proposal on the flood profile and flood heights;
 - d. the effect of the proposal on any tributaries to the main stream, drainage ditches, water supply and irrigation ditches, or any other drainage or irrigation facilities or systems;
 - e. the relationship of the proposed development to the flood management program for the area in question, including whether additional public expenditures for flood protection or prevention will be necessary;
 - f. whether the applicant would obtain an undue advantage compared to later applicants who might request a permit;
 - g. if the proposed use is for human occupancy;
 - h. the probability that materials may be swept onto other lands or downstream to the injury of others;
 - i. the susceptibility of the proposed facility and its contents to flood damage;
 - j. the safety of access to the property in times of flood for ordinary and emergency vehicles;
 - k. whether any proposed changes in a watercourse will have an environmental effect on the watercourse, including streambanks and streamside trees and vegetation;
 - l. the relationship of the proposed development to the Boulder County Comprehensive Plan and any applicable floodplain management programs;
 - m. whether the cumulative effect of the proposed development with other existing and anticipated uses will increase flood heights more than one foot; and
 - n. if the expected heights and velocities of the floodwaters expected at the site will adversely affect the development of surrounding property.

3. If the County Engineer determines that the application for floodplain development permit meets the purposes and requirements of this Section, the floodplain development permit shall be issued, with the attachment of any conditions as deemed necessary to further the purposes of this Section. Such conditions may include, but are not limited to, specifications for modification of waste disposal methods and facilities, landscaping, periods of operation, operational controls, sureties, deed restriction, and adequate floodproofing.

D. Board of Commissioners Review

1. In the event that the County Engineer determines that a floodplain development permit application for any development in the floodway meets the applicable standards for approval, the permit will not be effective until 14 days after the date of permit issuance.
 - a. At the time of permit approval, the County Engineer shall do the following:
 - (i) within seven days, publish a public notice of the proposed use and the permit issuance in a newspaper of general circulation in Boulder County;
 - (ii) shall transmit a copy of the notice to property owners adjacent to the property in question; and
 - (iii) forward to the Board of County Commissioners a written statement which shall include (1) the location and a description of the proposed use under the permit; (2) the reasons for approval of the permit; and (3) any conditions the County Engineer placed on the issuance of the permit.
 - b. Upon receiving the Director's statement, and before the effective date of the permit, the Board may call the permit up for review at a public hearing.
 - (i) This hearing shall constitute a revocation of the permit.
 - (ii) At the public hearing, the Board shall consider evidence related to the permit which may be presented by the County Engineer, the applicant, or interested members of the public.
 - (iii) The Board shall determine whether the application meets the requirements of this article, and if it so finds, shall issue the permit, with such conditions as the deemed appropriate.
2. During a declared local disaster emergency, for development in the floodway:
 - a. At the time of floodplain development permit application submittal, the County Engineer shall transmit a notice of the proposed use to, at a minimum, property owners adjacent to the property in question.
 - b. The permit will be effective on the date of permit issuance.
3. The County Engineer may waive any or all requirements listed in 4.407.D.1. and 4.407.D.2 for the following floodway development:
 - a. Emergency activities required for the immediate protection of life, safety, or property, or to restore essential public services,
 - b. Minor disaster recovery repair work that does not cause a rise in predicted 100-year water surface elevation as determined by a licensed engineer, and
 - c. Any development activities that take place entirely inside an existing building.

E. Permit Expiration, Certification Enforcement

1. The County Building Official shall not issue any building permit for, nor shall the Director issue any use permit involving any building, structure, or other development within the FO district unless a floodplain development permit has been granted for the development.
2. A floodplain development permit shall expire two years after the date of issuance if the permittee has not commenced construction under the permit.
3. Whenever the County Engineer has personal knowledge of any violation of the provisions of this section, written notice shall be given to the violator to correct such violation within thirty days after the date of such notice.
 - a. Should the violator fail to correct the violation within this 30 day period, the County Engineer may request that the sheriff of the County issue a summons and complaint to the violator, stating the nature of the violation with sufficient particularity to give notice of said charge to the violator.
 - b. The summons and complaint shall require that the violator appear in County Court at a definite time and place stated therein to answer and defend the charge.

- F. Minor Building Permits Exempted from Floodplain Development Permit Requirements**
1. The following types of building permits will not require a floodplain development permit unless they (alone, or in conjunction with a larger project of which they are an actual or logical part) increase the structure's floor area or footprint, cause a floodplain encroachment, under Section 18-159, or constitute a substantial improvement under Section 18-206:
 - a. Electrical repairs;
 - b. Furnace repairs or replacements;
 - c. Water heaters, boilers, and evaporative cooler repairs or replacements;
 - d. Air conditioner repairs or replacements;
 - e. Re-roofs;
 - f. Re-siding;
 - g. Insulation or simple weatherization or energy efficiency upgrades;
 - h. Roof-mounted or existing structure-mounted solar collectors;
 - i. Window and door replacements;
 - j. Renovation or remodel projects that cost less than \$750.
 2. The cost of any such exempted work shall not be included in the cumulative calculation required under Article 18-206 (definition of substantial improvement), unless part of a substantial damage calculation or estimate.

4-408 Nonconforming Structures and Uses

- A. Existing Structures and Uses**
1. The use of any structure on land within the FO district that was lawfully established before the adoption or amendment of this Article 4-400, but that does not conform to the requirements of this Article may be continued subject to the following conditions:
 - a. No such building structure may be expanded, improved, repaired, restored, or replaced unless the work complies with the floodproofing provisions of Section 4-405 of this Article.
 - (i) If the work does not constitute a substantial improvement, then only the constructed or reconstructed portion shall have to comply with Section 4-405 of this Article.
 - (ii) If the work qualifies as a substantial improvement, then the entire structure shall be protected as required in Section 4-405.
 - b. A change in the use of a building or structure, as defined in Article 18-206, will require that the entire building or structure to be protected pursuant to Section 4-405, unless a waiver is granted by the County Engineer. Floodproofing requirements may be waived for a change in use if the County Engineer determines there is no potential for any significant conflict with this Article 4-400 and the following circumstances are met:
 - (i) The existing structure is located outside of the floodway;
 - (ii) The existing structure is determined to be structurally sound by an engineer licensed in the state of Colorado;
 - (iii) The cost of compliance to this Article 4-400 is less than 50% of the current value of the structure; and
 - (iv) The proposed change in use is to a use that reduces, minimizes, or otherwise creates a less intensive use or decreases human occupation.
 2. No person shall store or process materials that are buoyant, flammable, hazardous, toxic or explosive, or that in times of flooding could be harmful to human, animal, or plant life except at or above the flood protection elevation.
- B. If a conflict arises between the requirements of this Section and the provisions of Section 4-1000, Nonconforming Structures and Uses, the requirements of this Section shall control.**

4-409 Appeals and Variances

- A. Appeals to the Board of Adjustment may be taken by any person aggrieved by his inability to obtain a floodplain development permit or by the decision of the County Engineer based upon or made in the course of the administration or enforcement of the provisions of this Section**
1. The Board of Adjustment shall hear and decide appeals and requests for variances from the requirements of this Section 4-400.
 2. The Board of Adjustment shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the County Engineer in the enforcement or administration of this Section 4-400.

3. The procedures and requirements for the filing of appeals and variance requests are set forth in Section 2-800 ("Boulder County Board of Adjustment"), the pertinent provisions of Article 3 ("Processes"), and Section 4-1200 ("Board of Adjustment") of this Code, in addition to this Section 4-409.
 4. In passing upon such applications, the Board of Adjustment shall consider all technical evaluations, all relevant factors and standards specified in other applicable sections of this Code, and:
 - a. the danger that materials may be swept onto other lands to the injury of others;
 - b. the danger to life and property due to flooding or erosion damage;
 - c. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
 - d. the importance of the services provided by the proposed facility to the community;
 - e. the necessity to the facility of a waterfront location, where applicable;
 - f. the availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
 - g. the compatibility of the proposed use with the existing and anticipated development;
 - h. the relationship of the proposed use to the Comprehensive Plan, any adopted intergovernmental agreement affecting land use, and any floodplain management program for the subject area;
 - i. the safety of access to the property in times of flood for ordinary and emergency vehicles;
 - j. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and,
 - k. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges.
 5. Upon consideration of the factors of Subsection 4-409(A)(4) and the purposes of this Section 4-400, the Board of Adjustment may attach such conditions to the granting of variances as it deems necessary to further the purposes of this Section 4-400.
 6. The County Engineer shall maintain the records of all appeal actions, including technical information, and report any variances to the Federal Emergency Management Agency.
- B. Conditions for Variances**
1. Generally, 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 items (i-xi) in Paragraph 4-409(A)(4) have been fully considered. As the lot size increases beyond the one-half acre, the technical justifications required for issuing the variance increases.
 2. Variances may be issued for the repair or rehabilitation of designated 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.
 3. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
 4. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
 5. Variances shall only be issued upon:
 - a. a showing of good and sufficient cause;
 - b. a determination that failure to grant the variance would result in exceptional hardship to the applicant; and
 - c. a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expenses, create nuisances, cause fraud on or victimization of the public as identified in Paragraph 4-409(A)(4) or conflict with existing local laws or ordinances.
 6. Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk from the reduced lowest floor elevation.

DC-15-0004

EXHIBIT B

**September 1, 2016 proposed revised floodplain
regulations (no redline)**

4-400 Floodplain Overlay District

4-401 Purpose

- A. To provide land use controls necessary to qualify unincorporated areas of Boulder County for flood insurance under requirements of the National Flood Insurance Act of 1968, as amended; to protect life, property, and health; to ensure the best available data is used in making development decisions; to avoid increasing flood levels or flood hazards or creating new flood hazard areas; to minimize public and private losses due to flooding; to reduce the need for expenditures of public money for flood control projects; to reduce the need for rescue and relief efforts associated with flooding; to prevent or minimize damage to public infrastructure, facilities, and utilities; and to meet or exceed FEMA and CWCB minimum standards for floodplain regulation.
- B. FEMA requires all communities that participate in the National Flood Insurance Program (“NFIP”) regulate “Development” that occurs within the Special Flood Hazard Area. FEMA defines Development as “any manmade change to improved and unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating or drilling operations.”

4-402 Applicability and Administration

- A. **Applicability.** The Article 4-400 applies to all lands in the Floodplain Overlay (“FO”) District. If a lot or other parcel of land lies partly within the FO District, this Article 4-400 applies to the part of such lot or parcel lying within the district. If a building or structure lies partly within the FO District, then this Article 4-400 applies to the entire building or structure.
- B. **County Engineer Role.** The County Engineer or his or her designee is responsible for the administration and implementation of the requirements of the FO District, including reviewing all development proposals to determine the applicability of this section, all Individual Floodplain Development Permit (“Individual FDP”) applications, and all notifications submitted for General Floodplain Development Permit (“General FDP”) consideration.
- C. **No Liability.** The degree of flood protection provided by this section has been determined to be reasonable for regulatory purposes and is based on engineering and scientific methods of study of the 1%-annual-chance (100-year) flood event. Floods of greater magnitude may occur. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge or culvert openings restricted by debris. This Article 4-400 does not imply that land areas outside of 100-year floodplain boundaries or land uses permitted within such areas will be free from flooding or flood damages, or that compliance with these regulations will prevent flood damage. Neither Boulder County nor any of its officers or employees shall be liable for any flood damages, including any damages that result from reliance on this article or any administrative decision.
- D. **More Restrictive Prevails.**

1. The Federal Emergency Management Agency (“FEMA”) and the Colorado Water Conservation Board (“CWCB”) have established certain minimum standards for regulatory floodplains. To the extent a FEMA or CWCB requirement conflicts with a provision in 4-400, the most restrictive controls.
2. This Article 4-400 does not repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. Where this Article 4-400 and another ordinance, easement, covenant, or deed restriction conflict or overlap, the more restrictive applies.

E. Permits Required.

3. All development in the FO District requires an Individual FDP or must be covered by the General FDP. Development in the FO District not covered by a General FDP or an Individual FDP may result in enforcement action under Article 17.
4. In addition to the Floodplain Development Permits required by this section, all required local, state, and federal permits must be issued prior to development in the FO District.

F. Referral from Other County Departments.

1. All development that requires a planning review process through the Boulder County Land Use Department and may be susceptible to flooding will be forwarded to the County Engineer for review and comment. The County Engineer must determine if the work is covered under a General FDP, requires an Individual FDP, or does not require any type of Floodplain Development Permit. Where the County Engineer indicates that the development will need a Floodplain Development Permit, the Land Use Department should note the requirement on any planning approval.
2. All building permit applications must be reviewed by the Building Division to determine whether the proposed development is potentially within the FO District and therefore may require a Floodplain Development Permit. If it appears to the Chief Building Official that any proposed development may be within the FO District, then the Chief Building Official must refer the application to the County Engineer. The Chief Building Official must not issue a building permit when floodplain issues have been raised unless the County Engineer has confirmed the development is approved under a General FDP or an Individual FDP or the County Engineer has determined that a Floodplain Development Permit is required.
3. All OWTS applications must be reviewed by Boulder County Public Health Department (“Public Health”) to determine whether the work, including new OWTS or repair/replacement of an existing OWTS, may be within the FO District. If it appears to Public Health that the proposed work may be within the FO District, then Public Health must refer the application to the County Engineer. Public Health must not issue an OWTS permit when floodplain issues have been raised unless the County Engineer has issued an Individual FDP or has determined that no such permit is required.

4-403 FO District Defined; Official Map

- A. **FO District.** The Boulder County FO District is defined as the FEMA Floodplain together with the Boulder County Floodplain, as those floodplains are defined below.
1. The December 18, 2012 Digital Flood Insurance Rate Map (“DFIRM”) and Flood Insurance Study (“FIS”) report published by FEMA, as amended, is incorporated by reference. The DFIRM and FIS in effect on the date of a property owner’s complete application for any permit or process in this Code, in particular those portions of the DFIRM and FIS that define the 100-year floodplain, is the foundational floodplain for the FO District (the “FEMA Floodplain”). The term “DFIRM” includes all flood risk zone designations and technical information displayed on the maps, explanatory matter, technical addenda, modeling and calculations, water surface elevations, profiles, and cross sections, and other underlying detailed study data, such as information published in the FIS report and supporting documentation, as well as approved Letters of Map Revision (“LOMR”), Letters of Map Amendment (“LOMA”), and Letters of Map Revision based on Fill (“LOMR-F”). The FEMA Floodplain includes Zone AE, A, AH, and AO flood risk zone designations, including both Floodway and Flood Fringe areas.
 2. To augment the FEMA Floodplain, the Board of County Commissioners may, after review and recommendation by the Planning Commission, adopt a “Boulder County Floodplain.” The purpose of adopting a Boulder County Floodplain is to facilitate use of best available data not adopted by FEMA to establish floodplain boundaries, Base Flood Elevations (“BFE”), and Flood Protection Elevations (“FPE”) to better protect residents of Boulder County from flood hazards.
 - a. The Boulder County Floodplain must be comprised of the same flood risk zone designations as the FEMA Floodplain.
 - b. In no instance may the Boulder County Floodplain remove from the FO District an area or property designated as within the FO District by the FEMA Floodplain.
 - c. The following reports, maps, and related information constitutes the initial location and boundaries of the current Boulder County Floodplain:
 - (i) Floodplain Re-analysis and Floodway Delineation, North St. Vrain and St. Vrain Creeks, Boulder County, CO, by Love & Associates, Inc., October, 1992; and
 - (ii) Any area included in the definition of Floodway per Section 4-414.
 - d. The maps in these reports, as well as the area described in the Floodway definition, depicting the floodplain for the base flood shall be considered the official maps for the purposes of locating the Boulder County Floodplain on the official zoning district maps. These maps and reports, together with all amendments, explanatory matter, technical addenda, water surface elevations, profiles and cross sections (where available) are incorporated by reference into this Code.

3. All records pertaining to floodplain development must be on file with the County and open to public inspection. These records include, but are not limited to, certified Lowest Floor Elevations, Elevation Certificates, commercial Floodproofing Certificates, LOMAs, LOMR-Fs, LOMRs, Floodplain Development Permits, boundary interpretations, and records of action on variance requests.
- B. Official Map.** The County Engineer shall maintain digital maps delineating the location and boundaries of the FEMA Floodplain and the Boulder County Floodplain. The FEMA Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as published by FEMA. The Boulder County Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as adopted by Boulder County. These maps of the FEMA Floodplain and the Boulder County Floodplain together establish the areas governed by the provisions of this Article 4-400 and constitute the Official Map of Boulder County’s FO District (“Official Map”).
1. The most current Official Map and supporting data shall be on file in the County Engineer’s Office in electronic format, available for public inspection during normal business hours, with electronic and paper copies available upon request. The Official Map must also be available to the public on the Boulder County website.
 2. The County Engineer shall maintain records of superseded versions of the Official Map for historical reference.
- C. Interpretation of Official Maps**
1. The County Engineer shall determine which uses, parcels, structures, or other facilities are located in a previously adopted FEMA Floodplain or a Boulder County Floodplain, including in situations where a mapped boundary appears to conflict with actual field conditions. In making such interpretations, the County Engineer shall refer, as necessary, to the best available data at that time.
 2. Sources of best available data for interpretations include the engineering study upon which the maps and elevations are based, the professional engineers who prepared the study, the most recent detailed terrain data certified by a P.E. or a P.L.S., survey data certified by a P.E. or a P.L.S., any BFE/water surface elevation, floodway, and other flood risk data available from state or federal agencies, and any other reliable source that the County Engineer finds meets an acceptable level of technical accuracy as determined through prevailing industry practices.
 3. The use of aerial photography to interpret FO District boundaries, but without the consideration of local terrain data, shall be for informational purposes only, and not for making determinations as to the exact location of the boundaries of the FO District.
 4. If the County Engineer makes a determination regarding the relationship of the Official Map to a use, parcel, structure, or other facility, the interpretation must be

noted in the records associated with any related permit(s) and available for public inspection.

5. The Engineer’s determinations under this section are interpretations of precisely where the existing regulatory boundary lies on the ground. A determination as to which uses, parcels, structures, or other facilities are located in or out of a previously adopted FEMA Floodplain or a Boulder County Floodplain does not itself contract or expand the boundaries of the FO District. Therefore, such determinations do not result in an amendment to the Official Map that requires review and approval by the Planning Commission and Board of County Commissioners.

D. Amendment of Official Map

1. The FEMA Floodplain within the FO District will be deemed updated when FEMA issues a Letter of Final Determination associated with any map action, or after the Effective Date of any Letter of Map Change (“LOMC”), without need for review or approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.
 - a. If FEMA provides notice of final BFEs and sets an effective FIRM revision date (through issuance of a Letter of Final Determination) for studies that had previously been adopted as Boulder County Floodplain, the following rules apply:
 - (i) If FEMA made no changes to the studies previously adopted by Boulder County, then from the Effective Date of FEMA’s map action forward, Boulder County will continue to regulate using those studies to partially define the FO District, but will treat the studies as FEMA Floodplain rather than Boulder County Floodplain. In this circumstance, the County Engineer is not required to obtain review and approval of Planning Commission or the Board of County Commissioners.
 - (ii) If prior to its official action FEMA makes changes to maps, data, or related documentation previously included only in the Boulder County Floodplain, the County Engineer must determine whether and how the Boulder County Floodplain should be amended.
2. Except for an automatically adopted DFIRM update, a change in the boundary of the FO District requires review by the Planning Commission and approval by the Board of County Commissioners of a Zoning Map Amendment in accordance with Section 4-1100. The County Engineer shall revise the Official Map upon approval of changes to the Official Map by the Board of County Commissioners.
3. If a property owner in the FO District believes that the provisions of this Section should not apply to some or all of the property owner’s property because the building or ground elevations are above the corresponding BFE, then (1) as to the Boulder County Floodplain, the owner may request a rezoning map amendment under the procedures of 4-1100, and (2) as to the FEMA Floodplain, the owner

may request FEMA approve a LOMA. LOMAs must be provided to the County Engineer.

4. The County Engineer may correct clerical errors in the Official Map as they are discovered, without need for approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.
5. The County Engineer may generate or receive draft and/or preliminary flood risk analyses and reports affecting the FO District. These analyses may be any flood risk analyses, including those designated by CWCB or distributed by FEMA, as well as any other water surface elevation and/or Floodway data available from state or federal agencies or any other reliable source. Upon notification of such new information, the County Engineer shall evaluate whether a change to the boundaries of the FO District is required. If so, the County Engineer will submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.
6. In accordance with 44 C.F.R. § 65.3 and the Rules and Regulations for Regulatory Floodplains in Colorado (the “CO Floodplain Rules”), project proponents must submit technical data to FEMA in the form of a map revision request within six months of the date of completion of a project that results in changes (either increases or decreases) in the 100-year water surface elevation greater than 0.3 foot.
7. The County Engineer will monitor large-scale natural physical changes as they occur. If the County Engineer deems it necessary to restudy a mapped floodplain or floodway as a result of such changes, the County Engineer shall coordinate with CWCB and FEMA and, as appropriate, submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.

4-404 Floodplain Development Permits

- A. **Minimum Federal and State Standards.** Development in the FO District must comply with the NFIP and State of Colorado minimum standards. These standards require applicants to demonstrate that development projects in the Floodway, when combined with all other existing and anticipated development, will not cause an increase in the modeled 1%-annual-chance water surface greater than 0.00 feet and, for projects in the Flood Fringe, will not cause an increase greater than 0.50 feet.
- B. **Uses Prohibited in Floodway.** The following activities and uses are prohibited within all mapped Floodways:
1. Construction of new permanent buildings (either residential or non-residential) with the exception of relocated nonconforming uses otherwise permitted by this Article 4-400;
 2. Construction of new temporary buildings (either residential or non-residential), unless the County Engineer reviews and approves a specific location in the Floodway in conjunction with a Special Event as defined in the Multimodal Transportation Standards, a Group Gathering / Special Event as defined in the Land Use Code, or another temporary activity permitted by county regulations;
 3. Construction of additions to existing buildings that increase the building's square footage, footprint, or Habitable Space;
 4. Conversion of existing accessory use space to living or primary use space;
 5. Overnight campgrounds;
 6. Dispersed camping, unless the camping is approved through the issuance of a Group Gathering / Special Event Permit as defined in the Land Use Code;
 7. Parking of Recreational Vehicles for the purposes of overnight habitation;
 8. Storing or processing of materials that are buoyant, flammable, explosive, or otherwise potentially injurious to human, animal or plant life;
 9. Solid waste disposal sites and central collection sewage treatment facilities;
 10. New or expanded individual on-site wastewater systems, unless the expanded system is required to bring existing buildings up to code or is allowed per 4-405(H)(4);
 11. Solid wood fences, chain link fences, or any fence that does not meet the Boulder County standards for fence installation;
 12. Any activity or use that would create the potential for downstream solid debris (including, but not limited to decks) waste, or rubbish;
 13. New or expanded Critical Facilities located on land lower than 6,000 feet in elevation; and
 14. Any encroachment (including filling and grading) that would adversely affect the efficiency of the Floodway or change the direction of flow, unless it conforms with section 4-404.2(D).

C. Uses Allowed in Floodway under Certain Conditions. The County Engineer may issue FDPs for the following development types and open uses within the Floodway unless the use (1) is prohibited in the underlying zoning district, (2) adversely affects the efficiency of the Floodway, (3) changes the direction of flow, (4) increases base flood heights without a FEMA-approved Conditional Letter of Map Revision (“CLOMR”), or (5) poses a significant safety hazard:

1. Agricultural uses involving the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising and grazing of livestock and horses, as well as temporary buildings associated with such use, as detailed in 4-405(C)(3)(c);
2. Uses accessory to residential uses, including, but not limited to lawns, open areas, gardens, driveways, and play areas;
3. Industrial or commercial uses such as loading areas, railroad rights-of-way (but not including freight yards or switching, storage, or industrial sidings), parking areas, and airport landing strips;
4. Recreational uses not requiring permanent or temporary buildings designed as habitable space, unless a special event permit has been issued for a temporary building;
5. Utility facilities such as dams, power plants, spillways, transmission lines, pipelines, water monitoring devices, water supply ditches, irrigation ditches and laterals; and open mining;
6. Hydraulic structures such as bridges, culverts, weirs, diversions, drop structures, and fish ladders, for access and flood or stormwater control; and
7. Critical Facilities above 6,000 feet in elevation, as described in 4-405(E).

D. Uses Allowed in Flood Fringe under Certain Conditions. Any use permitted by the underlying zoning regulations may be permitted in the Flood Fringe, provided the use meets the flood protection requirements of Section 4-405, and provided that:

1. New Critical Facilities are prohibited in the Flood Fringe below 6,000 feet (NAVD88) in elevation.
2. Wastewater treatment facilities serving more than two properties are prohibited in the Flood Fringe.
3. Individual Onsite Wastewater Treatment Systems (OWTS), when allowed, must conform to the requirements of 4-405(H).
4. Fences in the Flood Fringe are subject to all Boulder County Building Code and other fence requirements.

4-404.1 General Floodplain Development Permits

A. **Intent.** In order to avoid undue hardship to property owners within Boulder County, yet remain in compliance with FEMA regulations regarding Floodplain permitting, the County Engineer is authorized to create a General FDP, updated periodically, in accordance with the provisions of this Section 4-404.1. The intent of the General FDP is to allow certain limited uses and activities in the Floodplain without the need to apply for and gain approval of an Individual FDP, because the nature and extent of these uses and activities will likely not increase BFEs or have an adverse effect on neighboring properties, species, or ecosystems.

B. Notification Process.

1. Notification of the County Engineer is required for certain types of projects covered by the General FDP (listed in 4-404.1(C) below) in order for the County Engineer to consider individual and cumulative impacts, ensure minimum compliance with federal and state floodplain rules, and confirm that the work conforms with the intent of the General FDP. For those projects where the County Engineer receives notice as a referral required by a separate Land Use Code review process (such as Site Plan Review or Special Use Review), duplicative notification of the County Engineer is not required. For all other projects that require notification, the applicant must submit the following information to the County Engineer a minimum of 30 days prior to commencing work:

- a. Project Description, including materials description and a discussion on the expected impact to the channel and floodplain;
- b. Location Description (an accompanying location map is best); and
- c. Site Plan, if necessary to further describe the work.

2. If the work is consistent with the intent of the General FDP, the County Engineer will respond to the owner with this confirmation. If additional information is necessary or if the work requires issuance of an Individual FDP, the County Engineer will inform the owner within 14 days of notification submission, or through the Land Use Review referral process.

C. **Uses and Activities Eligible for a General FDP.** The County Engineer may in his professional judgment determine that the following activities will not result in increases to BFEs or have an adverse effect on neighboring properties, species, or ecosystems and, consequently, that such projects are deemed approved under a General FDP. Under the General FDP, for certain projects described below, owners must notify the County Engineer in accordance with the procedures in 4-404.1(B) above.

1. Activities that require notification 30 days prior to commencement:

- a. Road and trail widening, surface type changes, and overlays of greater than six inches (if fill is necessary for widening, an Individual FDP is required);
- b. New parking lots greater than 0.1-acre;

- c. New underground utilities that do not permanently alter topography and are :
 - (i) Greater than 250 feet in length and installed perpendicular to flood flows; or
 - (ii) Installed under a perennial stream channel.
 - d. Temporary in-stream diversions or dewatering (limited to temporary construction diversions and temporary diversions to maintain an adjudicated water right; under the General FDP, the dewatered reach must not exceed 300 feet, and may require additional permitting through the Colorado Department of Public Health and Environment);
 - e. In-Kind Replacement of storm drainage system or infrastructure components including but not limited to hydraulic structures such as culverts and check dams. An individual FDP is required for all replacement bridges. An individual FDP may also be required if: physical conditions of the channel have changed to the extent that in-kind replacement is not possible and/or Boulder County suggests replacement with a different design and/or size or new component;
 - f. Private storm drainage infrastructure repairs and Maintenance
 - g. Fences not in the Floodway;
2. Activities that do not require notification:
- a. Road, trail, parking area, and driveway patching, sealing, milling, dirt/gravel leveling, and repair of drainage-related damage to match adjacent grade (these activities must not increase grade by 6 inches or more);
 - b. New driveways, trails, sidewalks, roads and streets constructed completely at or below-grade;
 - c. Public drainage system and infrastructure repairs and Maintenance, including normal or regularly-scheduled maintenance to restore function and/or usability, not to exceed the previously-existing design. Sediment removal associated with this work is limited to culverts, bridges, and ditch headgates to restore normal function, limited to within the channel 300 feet upstream and downstream of these hydraulic structures. In all cases, repairs and Maintenance performed under the General FDP must not lower the normal channel invert elevation.
 - d. Replacement guardrails that are no taller than the previous guardrails, and that do not decrease the available open area for the passage of floodwaters; (new guardrails or replacement guardrails that do not meet the above criteria require an Individual FDP);
 - e. Flood-deposited sediment removal in the overbanks and floodplain areas, limited to 6 inches or less (greater than 6 inches requires Individual FDP)

- f. Debris removal limited to large, woody, unanchored or dead vegetation and rubbish as defined in Article 14;
- g. Routine maintenance of utility and ditch easements and ROWs;
- h. New overhead utilities, including supporting structures, as well as maintenance of overhead utilities;
- i. New underground utilities that do not permanently alter topography and are:
 - (i) Less than 250 feet in length; and
 - (ii) Installed parallel to flood flows
- j. Repair and Maintenance of underground utilities (work must not permanently alter topography);
- k. Installation of sign or mailbox posts, telephone poles, or similar elements, unless more than 5 such elements are located along a line of the same bearing that are not parallel to flow and could create an obstruction;
- l. Repair or replacement of existing piers or posts supporting a conforming deck;
- m. Activities associated with construction stormwater BMPs, including but not limited to temporary erosion control measures, etc.;
- n. General farming, pasture, horticultural activities, and forestry that do not involve earthwork that permanently alters the topography or any clearing/grubbing of an area greater than 0.1 acres;
- o. Temporary buildings or structures associated with general farming, pasture, horticulture, and forestry activities that do not exceed 120 square feet (200 square feet for loafing sheds) and are outside of the Floodway;
- p. Repairs necessary to correct existing violations of Boulder County health and safety codes or to ensure safe and healthy living conditions, such as:
 - (i) Electrical repairs;
 - (ii) Furnace repairs or replacements;
 - (iii) Water heaters, boilers, and evaporative cooler repairs or replacements;
 - (iv) Air conditioner repairs or replacements;
 - (v) Repairs or replacements to roof coverings; and
 - (vi) Insulation or simple weatherization or energy efficiency upgrades;
- q. Gardening and landscaping including planting vegetation, mulching, and raised beds less than 12 cubic yards total (but not hardscaping such as retaining walls, terraces, etc.); and
- r. Lawns and lawn maintenance activities.

D. No Permit Fees. If the County Engineer determines a use or activity falls under the approval granted in a General FDP, no permit fee will be charged to the owner.

E. Work Not Approved under a General FDP.

1. Any development within the floodplain that does not meet the criteria of a General FDP requires an Individual FDP prior to beginning the work or a determination by the County Engineer that no type of FDP is required at all.
2. Should any work commence that is assumed by an applicant to be covered by a General FDP, and the County Engineer determines it is not covered by a General FDP, a Stop Work order will be issued. The unpermitted work will be treated as a zoning violation under Article 17 until an approved Individual FDP is issued or the violation is otherwise resolved.
3. Anyone considering a project in the Floodplain that varies from those projects described above should contact the County Engineer to determine if an Individual FDP application is required. The County Engineer makes the final decision as to the applicability of a General FDP. Any project determined by the County Engineer to create a significant obstruction to flood flows will require an Individual FDP.

F. Other Permits. Eligibility for a General FDP does not eliminate the need for applicants to obtain all other required permits, including building, grading, access, construction, and/or stormwater permits from Boulder County, as well as other state and federal permits.

G. Updates to General FDP. To reflect changes to federal, state, or local regulations or guidance or for other good cause, the County Engineer may propose updates to the terms and conditions of the General FDP. A copy of the approved General FDP, including previous versions, will be kept on file in the County Engineer's office at all times and available for public review.

4-404.2 Individual Floodplain Development Permits

- A. **Floodplain Pre-Application Conference.** A Floodplain Pre-Application Conference (Floodplain Pre-App) between the applicant and the County Engineer (or his/her designee) is required for all Individual FDPs, unless waived in writing by the County Engineer as unnecessary under the circumstances. The Boulder County Land Use Department may require a Pre-Application Conference as defined in Section 3-201, which may be substituted for the Floodplain Pre-App requirement of this section. The Floodplain Pre-App should include discussion of conforming and nonconforming structures and uses on the subject property.
- B. **Submittal Requirements.** Applications for Individual FDPs are to be submitted to the Boulder County Land Use Department and are subject to the following submittal requirements, unless the County Engineer determines that a particular requirement does not apply.
1. For all Individual FDP submittals:
 - a. A completed Individual FDP application form;
 - b. A narrative describing the work to be performed; and
 - c. A location map, showing the specific areas and property(ies) where the work will be performed.
 2. For construction of new buildings or improvements to existing buildings, The County Engineer will obtain pertinent documents from the applicant's Building Permit submittal package. Building Permit/Individual FDP submittals should include and call out all elements for flood protection required per 4-405. In addition, the following items shall be included in the Building Permit/Individual FDP submittal:
 - a. Specifications for construction and building materials (including considerations for flood resistant materials when required, per FEMA *Technical Bulletin 2*);
 - b. Description and locations of any proposed site, filling, dredging, grading, and/or channel improvements
 - c. Location of any and all proposed materials storage and staging areas, as applicable;
 - d. Location of the current regulatory FO District boundaries, including both FEMA and/or Boulder County Floodplain information;
 - e. Plans must include the elevation, in feet referenced to the North American Vertical Datum of 1988, to which the flood protection measures apply. See 4-405(A), Flood Protection Elevation.
 - f. Certification that the building or improvement is designed in accordance with the flood protection measures outlined in 4-405(C) for new construction and conforming existing buildings and 4-413 for improvements to nonconforming existing buildings.

3. For bridges, culverts, other hydraulic structures, work within the channel banks, and stream restoration projects, in addition to the items listed above, the following items are required:
 - a. A plan at a scale of 1" = 200' or larger, stamped by a P.E. registered in the State of Colorado, which includes:
 - i. the site location;
 - ii. existing and proposed base flood limits and water surface elevations, if applicable;
 - iii. Floodway limits, if applicable;
 - iv. channel, watercourse or flowpath;
 - v. existing and proposed contours or elevations at 2' intervals;
 - vi. existing buildings
 - vii. location and elevations of existing streets, water supply, and sanitation facilities, if applicable;
 - viii. limits and total land area of all existing and proposed impervious surfaces, including buildings; and
 - ix. existing water supply ditches, irrigation ditches and laterals.
 - b. A typical valley cross-section showing:
 - i. channel, watercourse, or flowpath;
 - ii. limits of floodplain adjoining each side of channel;
 - iii. cross-section area to be occupied by the proposed development;
 - iv. existing and proposed base flood water surface elevations;
 - c. Documentation that addresses scour (if required) and other design requirements in accordance with The Boulder County Storm Drainage Criteria Manual;
 - d. Evidence of compliance with 4-404.2(D) of this section.
 - e. Evidence of compliance with Section 404 of the Clean Water Act and the Endangered Species Act.
4. For Onsite Wastewater Treatment Systems, a Site Plan that includes items 4-404.2(B)(3)(a)(1-7) above is required, in addition to the following:
 - a. A geotechnical report, certified by a P.E. registered in the State of Colorado, which includes specifications on the system type and layout, building connections, and the flood protection measures required under 4-405(H).
5. For underground utilities not covered by the General FDP, an analysis of the impacts of scour potential as well as design considerations to protect against scour must be provided.

6. For Projects determined to be in the Floodway as defined in 4-414, an engineering analysis certified by a Colorado-registered P.E. in accordance with 4-404.2(D) and (E) below.
7. For any proposed Alteration or relocation of a watercourse, including stream restoration projects and engineered channelization projects, the County Engineer requires a description of the extent to which any watercourse will be altered or relocated, and that conveyance is not decreased as a result of the project, and that the flood carrying capacity of the watercourse is maintained over time.
 - a. All proposals for watercourse Alteration or relocation must include, in addition to all other applicable materials, pre- and post-project conveyance calculations to demonstrate that the flood carrying capacity has not been decreased.
 - b. For engineered channelization projects, including those types outlined in the Boulder County Storm Drainage Criteria Manual, permit applicants are required to submit, along with all other applicable materials, a maintenance plan that outlines the maintenance activities to be performed, the timing/schedule for those activities, and the agency or representative responsible for maintenance in order to ensure the flood carrying capacity is maintained.
 - c. Prior to any Alteration or relocation of a watercourse, the County Engineer must notify adjacent communities, potentially affected property owners, and the CWCB in the following manner:
 - i. Notification must be done through the publication of a notice of such proposed alteration or relocation once in a newspaper of general circulation in Boulder County.
 - ii. The County Engineer must keep on-file evidence of such notification.
 - d. Watercourse Alteration/relocation/channelization projects in the FO District are subject to the county's modeling requirements covered in 4-404.2(D) and 4-404.2(E) prior to permitting. In addition, at the discretion of the County Engineer, any watercourse alteration/relocation/channelization project that shifts the stream horizontally in any direction more than one bankfull width will require submittal and approval of a CLOMR from FEMA prior to permitting.
8. Adequate evidence of either direct ownership of the subject property or legal authority to act on behalf of the owner(s) of record;
9. Any additional information required by the County Engineer necessary to allow the review criteria in this Article 4-400 to be adequately evaluated.

C. Completeness Review by the County Engineer. Once an application for an FDP is filed, the County Engineer must review it for completeness.

1. The County Engineer may suspend processing an FDP application at any time at the request of the applicant or whenever the County Engineer determines that the

application is not complete. The County Engineer may deem the application incomplete, based on the application submittal requirements, at the County Engineer's initiative or at the request of a referral agency. In the event that the County Engineer deems an application incomplete, the County Engineer must immediately notify the applicant of the shortcomings. Once the requested information has been provided, the application must be deemed filed as of that date and the County Engineer must proceed to process the application and render a decision. If an application is not deemed complete within six months of the date of suspension, the County Engineer may declare the application withdrawn. The six month time frame may be extended should the County Engineer determine that circumstances beyond the control of the applicant prevent a timely completion of the application.

D. Application Review Criteria. In reviewing an application for a Floodplain Development Permit, the County Engineer must first determine the specific flood hazard at the site in accordance with 4-403 and evaluate the suitability of the proposed use or development in relation to the flood hazard. The County Engineer must then consider the following factors in reviewing Individual FDP applications:

1. the effect of the proposal upon the efficiency or capacity of the Floodway;
2. the effect on lands upstream, downstream and in the immediate vicinity of the development including, without limitation, utility and transportation facilities;
3. the probability that the proposal will result in unreasonable risk of harm to people or property – both onsite and in the surrounding area – from natural hazards;
4. the effect of the proposal on the flood profile and flood heights;
5. the effect of the proposal on any tributaries to the main stream, drainage ditches, water supply and irrigation ditches, storm drainage facilities, reservoirs, or any other drainage or irrigation facilities or systems;
6. the relationship of the proposed development to the flood management program for the area in question, including whether additional public expenditures for flood protection or prevention will be necessary;
7. whether the applicant would obtain an undue advantage compared to later applicants who might request a permit;
8. whether the proposed use is for human occupancy;
9. the susceptibility of the proposed facility and its contents to flood damage;
10. the safety of access to the property in times of flood for ordinary and emergency vehicles;
11. whether any proposed changes in a watercourse will have an environmental effect on the watercourse, including streambanks and streamside trees and vegetation;
12. the alignment of the proposed development with the Boulder County Comprehensive Plan, Watershed Master Plans, and any other planning-related documents pertaining to development in Boulder County;

13. whether the cumulative effect of the proposed development with other existing and anticipated uses will increase flood heights more than the allowances specified in 4-404(A);
 14. whether the heights and velocities of the floodwaters expected at the site will adversely affect the development of surrounding property; and
 15. whether additional flood protection is necessary based on historical flood evidence, increased development upstream, or other flood-related hazards such as flash flooding, debris flows, rockfalls, mudslides, landslides, avalanches, channel avulsions, alluvial fan hazards, erosion and deposition of material, debris dams, ice jams, and high flood depths or velocities.
- E. **Encroachments Prohibited; Exceptions.** Encroachments within the adopted FEMA Floodway, other than those listed in 4-404(C), are prohibited, unless it has been demonstrated through hydrologic and hydraulic analyses performed by a qualified P.E. licensed in Colorado and in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the Base Flood (a No-Rise Certification).
1. Under the provisions of 44 CFR Chapter 1, Section 65.12, of the NFIP Regulations, a community may permit encroachments within the adopted FEMA regulatory Floodway that would result in an increase in BFEs if the applicant first receives an approved CLOMR and/or Floodway revision from FEMA.
 2. Where there is a designated FEMA Floodplain but no designated FEMA Floodway, and there is a designated County Floodway, projects that result in increases greater than 0.5 foot in these areas must first receive an approved CLOMR from FEMA, and projects that result in increases between 0.0 and 0.5 foot in these areas must first receive an approved Boulder County CLOMR from the County Engineer.
 3. Where there is no designated FEMA Floodplain, but there is a designated County Floodway, projects that result in any increase in these areas must first receive an approved Boulder County CLOMR from the County Engineer.
 4. Where there is a designated FEMA Floodplain, and no FEMA or County Floodway, projects that result in increases greater than 0.5 foot must first receive an approved CLOMR from FEMA.
 5. Where there is no designated FEMA Floodplain, but there is a designated County Floodplain (but not a County Floodway), the procedure set forth in 4-404(C) must be followed.
 6. For all new subdivision proposals and other developments (including, but not limited to, manufactured home parks) greater than either 50 lots or 5 acres that are located in Zone A, this analysis must also depict, as a part of the development proposal, the BFEs that Boulder County will use to determine FPEs for the proposed development.
 7. In all instances, no increases in water surface elevation will be allowed that impact an insurable building.

8. Following project completion, FEMA Floodway encroachments that result in water surface elevation changes greater than those allowed under 4-404(C) must apply for a map revision from FEMA. See 44 C.F.R. Part 65.

F. Procedures for Modeling Proposed Development within the Floodway.

1. Unless one or more requirements below are modified by the County Engineer for good cause shown by the applicant, for all projects confirmed to be wholly or partially within the Floodway the applicant must submit an engineering report, including a Floodway analysis certified by a qualified engineer licensed in Colorado using the same type of model that was used to establish the current regulatory flood hazards. Applicants may obtain a copy of the applicable floodplain model from Boulder County. Models that differ from the type used to establish the regulatory flood hazards must first be approved for use by the County Engineer.
2. Modeling submitted to Boulder County in support of an Individual FDP must include the following:
 - a. Duplicate Effective (Regulatory) Model. This model is necessary to confirm that the regulatory water surface elevations can be reproduced to within 0.5 foot. When Boulder County regulates flood hazards that are more conservative than those identified by FEMA, it is the model that is associated with the Boulder County Floodplain.
 - b. Corrected Effective Model. The model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections, or incorporates more detailed topographic information than that used in the current effective model. Floodway limits should be manually set at the new cross-section locations by measuring from the effective FIRM. The cumulative reach lengths of the stream should also remain unchanged. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model.
 - c. Existing, or Pre-Project Conditions Model. The applicant must revise the duplicate effective or corrected effective model to reflect any modifications (including man-made encroachments) that have occurred within the floodplain since the date of the effective model but prior to construction of the proposed project. If no modifications have occurred since the date of the effective model, then the model would be identical to the duplicate effective or corrected effective model, and only one of these models is required. The results of this existing conditions analysis will indicate the 100-year elevations to be used for comparison to proposed conditions at the project site.
 - d. Proposed or Post-Project Conditions Model. The applicant must then modify the existing conditions model (or duplicate effective, or corrected effective, as appropriate) to reflect the proposed project. The overbank roughness coefficients should remain the same unless a reasonable explanation of how the proposed project will impact roughness values is

provided, with supporting data. The results of this analysis will indicate the 100-year elevation for proposed or post-project conditions at the project site. These results must demonstrate no impact (measured as 0.00) to the 100-year water surface elevations when compared to the existing conditions model (referred to as a “No-Rise Certification”).

- (i) Should this comparison result in water surface elevation increases that cannot be mitigated through project design changes, then the provisions of 4-404.2(D)(1) above must apply.

4-405 Flood Protection Measures

Flood Protection Measures apply to development within the FO District in Zones AE, A, AO, and AH.

- A. **Flood Protection Elevation ('FPE').** For the purposes of this section, the Boulder County FPE is equal to the following:
1. In areas depicted as Zone AE in the FO District, the FPE is equal to the BFE plus 2 feet. The BFE is the elevation of the 1%-annual-chance (typically referred to as 100-year) flood. In other words, it is the flood that has a 1% chance of occurring in any given year.
 2. In areas depicted as Zone A in the FO District, the following applies:
 - a. As required by 44 CFR 60.3(b)(4), Boulder County must obtain and reasonably utilize BFE and water surface elevation information from local, state, federal, or other reliable sources
 - b. In those Zone A areas where a BFE can be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 2 feet above the calculated BFE
 - c. In those Zone A areas where a BFE cannot be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 3 feet above the highest grade in the area of the proposed development.
 - (i) For buildings, the FPE will be 3 feet above the highest grade within the proposed building footprint, or the highest grade adjacent to the exterior of the existing building, unless the applicant supplies information sufficient to determine a BFE and subsequent FPE for the building, including data submitted as a part of identifying the Floodway boundary pursuant to the Floodway definition in 4-414.
 3. In shallow flooding areas (Zone AO), the FPE is equal to:
 - a. Two feet above the specified flood depth; or
 - b. If no flood depth is specified, 3 feet above the highest grade that exists within the proposed building footprint.

B. General Requirements

1. All development in the FO District must be adequately protected from flooding according to the requirements of this section.
2. No person may store or process materials that are buoyant, flammable, hazardous, toxic or explosive, or that in times of flooding could be harmful to human, animal, or plant life except at or above the FPE, unless the materials are stored in accordance with 4-405(I) governing storage tanks.

3. All construction (including new construction as well as improvements below the FPE) must be built with materials and utility equipment resistant to flood damage up to the FPE.
4. All new and replacement water supply systems must be designed to minimize or eliminate infiltration of flood waters into the system.
5. Lateral additions to any residential building must be elevated to the FPE and adequately anchored to prevent flotation, collapse, or lateral movement of the addition resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
6. Lateral additions to any commercial or accessory building or structure must be adequately protected from flooding in accordance with 4-405(C)(3)(a) and 4-405(C)(3)(b), respectively.

C. New Construction

1. General Requirements

- a. All New Construction must be built using methods and practices that minimize flood damage.
- b. New Construction in the Floodway is prohibited.
- c. New Basements in the Flood Fringe are prohibited.
- d. All New Construction must be designed and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, and must be certified by a P.E. registered in the State of Colorado that they have been constructed to withstand such forces and are adequately protected from flooding up to the FPE;
- e. New buildings or other structures must be placed with their longitudinal axes parallel to the predicted direction of flow of flood waters or be placed so that their longitudinal axes are on lines, parallel to those of adjoining structures, to the extent consistent with other provisions of this code. This is intended to minimize the obstruction to flow caused by a building or structure.
- f. New service equipment, including, but not limited to, electrical, heating, ventilation, plumbing, and air conditioning equipment, must be located at or above the FPE.
- g. New Construction in Zone AO or AH must be accompanied by site/property grading to accommodate drainage of floodwaters around the perimeter of the building in a controlled manner, without adversely impacting adjacent properties.
- h. New Construction on a property removed from the floodplain by issuance of a LOMR-F from FEMA must have the Lowest Floor elevated to or above the FPE that existed prior to the placement of fill.

2. Residential Buildings

- a. All new residential buildings constructed in the Flood Fringe or within Zones A, AO, or AH must have their Lowest Floors (including Basements, porches, and decks), as well as any and all service equipment (excepting the necessary connections to public utility), elevated to the FPE, either by the placement of fill or by construction on elevated foundation walls.
 - b. Fully enclosed areas below the lowest floor of a building in the FO District must be used solely for parking of vehicles, building access, or storage of materials. These areas must be designed to equalize the hydrostatic pressure flood forces on exterior walls by allowing for the entry and exit of floodwaters (known as ‘Wet Floodproofing’). Designs for meeting this requirement must either be certified by a registered Professional Engineer or must meet or exceed the following minimum criteria:
 - (i) A minimum of two openings on at least 2 walls having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding must be provided;
 - (ii) The bottom of all openings must be no higher than one foot above grade; and
 - (iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
 - i. Attached garages may be constructed at-grade but must comply with 4-405(C)(2)(b) above. Openings are permitted to be installed in garage doors; however, the garage door itself does not qualify as an opening for Wet Floodproofing purposes.
3. **Non-residential Buildings.** Non-residential buildings built in the Flood Fringe, or within Zones A, AO, or AH must conform with 4-405(C)(2) above, or must conform with the requirements below based on building type:

a. Commercial Buildings

- (i) Commercial buildings, including attendant and sanitary facilities and attached garages, must conform with 4-405(C)(2), or must be designed to be water-tight with walls substantially impermeable to the passage of water below the FPE.
- (ii) The building must be anchored to prevent flotation, collapse, or lateral movement.
- (iii) The building must be constructed using structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

- (iv) All flood protection measures for commercial buildings must be certified by a Colorado Registered Professional Engineer that the methods are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces, and other factors associated with the Base Flood. Such certification must also state the specific elevation (including vertical datum reference) to which the construction is protected from flooding.
- (v) For commercial buildings designed to be watertight, the FEMA Floodproofing Certificate for Non-Residential buildings should be completed, and must be reviewed and approved by the County Engineer.

b. Accessory Buildings and structures

- (i) Accessory buildings and structures, including but not limited to detached garages, sheds, barns, and any other structure considered accessory to the primary use or primary building, must conform with 4-405(C)(2) above, or may be constructed at grade but must meet the requirements of 4-405(C)(2)(b) above for fully-enclosed areas below the FPE, and are subject to the following conditions:
 - a. The building or structure must be used only for the parking of vehicles or storage of tools, materials, and equipment;
 - b. The building or structure must not be designed for or used as Habitable Space;
 - c. The accessory building or structure must represent a maximum investment of less than 10% of the value of the principal building on the property, or a maximum floor area of 600 square feet;
 - d. The building or structure must have low flood damage potential with respect to both the building and its contents; and
 - e. Permanently affixed appliances (such as furnaces, heaters, washers, dryers, etc.) are prohibited.
 - f. Prior to issuance of Certificate of Occupancy or final inspection, whichever occurs last, the property owner must execute a Non-Conversion Agreement and the County must record the agreement in the real estate records. The agreement will be in the form of a restrictive covenant or other County approved binding instrument, where the benefits of the covenant run in favor of the County. The covenant must be drafted to run with the land and bind successors, in perpetuity. The purpose of the covenant is to document the current owner's

understanding of the limitations on construction and use of the enclosed area in accordance with the provisions of this section 4-__ (Accessory Buildings and Structures), and to put prospective purchasers on notice of such restrictions. The covenant will also reference retrofitting criteria necessary to properly convert accessory buildings or structures to habitable space, should the owner choose to do so. In addition to any other enforcement mechanisms available, violation of the agreement will be considered a violation of this Article 4-400 and subject to all applicable zoning enforcement procedures.

(ii) Accessory structures that do not have at least two rigid walls, including but not limited to carports, gazebos, and picnic pavilions, may be constructed at grade and must use flood-resistant materials up to the FPE.

(iii) Accessory Dwelling Units (including detached garages designed with Habitable Space on the second floor) must meet the above requirements of 4-__ for residential buildings, which includes either elevation of the entire building above the FPE, or wet floodproofing of the lower level garage space.

c. Agricultural Buildings and Structures. New Construction of any Permanent agricultural building or structure in the Flood Fringe must be limited in use to agricultural purposes, in which the use is exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock. Types of buildings and structures that qualify under this section include farm storage structures (used exclusively for the storage of farm machinery and equipment), grain bins, corn cribs, and general purpose barns/loafing sheds.

(i) The building or structure must not be designed for or used as Habitable Space;

(ii) The building or structure must be wet-floodroofed according to 4-__

(iii) Service equipment must be elevated to the FPE, unless elevation of such equipment impedes its agricultural use.

(iv) Permanent agricultural buildings or structures are prohibited in the Floodway.

(v) Temporary agricultural buildings or structures are allowed in the floodway, but are required to be relocated outside of the FO District or deconstructed in the event of a flood warning. If relocation outside of the FO District is not possible, then relocation to the Flood Fringe will be allowed, so long as the temporary structure is properly anchored.

d. Crawlspace. New construction of any Below-Grade Crawlspace must:

- (i) Have the interior grade elevation, that is below BFE, no lower than two feet below the Lowest Adjacent Grade;
- (ii) Have the height of the Below-Grade Crawlspace measured from the interior grade of the Crawlspace to the top of the foundation wall, not to exceed four feet at any point;
- (iii) Have an adequate drainage system that allows floodwaters to drain from the interior area of the Crawlspace following a flood; and
- (iv) Meet the provisions 4-___, General Requirements.

D. Existing Buildings

- 1. See 4-413 for requirements applicable to nonconforming structures and buildings.
- 2. Improvements to conforming structures and buildings must meet all applicable requirements in section 4-405(B), (C), and (K).

E. Critical Facilities

- 1. New Critical Facilities are prohibited in the regulatory floodplain below 6,000 feet (NAVD88) in elevation.
- 2. In the mountain canyons above 6,000 feet (NAVD88), new Critical Facilities in the FO District will be considered on a case-by-case basis, and may require special design or flood protection considerations, including considerations of hydrodynamic flood forces and flood-induced erosion.
- 3. Improvements to existing Critical Facilities that are determined to be Substantial Improvements (in accordance with 4-___) require that the entire facility (including attendant utility and sanitary facilities) be elevated to the Boulder County FPE, or, if not prohibited elsewhere in this code, be retrofitted such that the building is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads, including the effects of buoyancy.

F. Manufactured Home Parks

- 1. General Requirements. All manufactured homes must be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated to the FPE and anchored to resist floatation, collapse, or lateral movement. All requirements below are in addition to applicable state and local requirements, including those to address wind loads.
- 2. For new parks commenced on or after February 1, 1979; expansions to existing parks; existing parks where the value of the repair, reconstruction, or improvement of the streets, utilities, and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or

improvement has commenced; an existing park on which a manufactured home has incurred Substantial Damage; manufactured homes to be placed or substantially improved on sites in existing parks; and for manufactured homes not placed in a park:

- a. Stands or lots must be elevated on compacted fill or on pilings so that the lowest floor of the manufactured home will be at or above the FPE. For homes placed on pilings:
 - (i) lots must be large enough to permit steps;
 - (ii) piling foundations must be placed in a stable soil no more than ten feet apart; and
 - (iii) reinforcements must be provided for pilings more than six feet above the ground level.
- b. Adequate surface drainage must be provided.
- c. New manufactured homes must be anchored by providing over-the-top and frame ties to ground anchors as well as the following:
 - (i) over-the-top ties at each of the four corners, with two additional ties per side at intermediate locations, with the exception of manufactured homes less than 50 feet long which require only one additional tie per side;
 - (ii) frame ties at each corner with five additional ties per side at intermediate points, with the exception of manufactured homes less than 50 feet long which require only four additional ties per side;
 - (iii) all components of a manufactured home anchoring system must be capable of carrying a force of 4800 pounds; and
 - (iv) Any additions to the manufactured home be similarly anchored.

G. Recreational Vehicles

1. At least one of the following provisions must be met:
 - a. The recreational vehicle must be on the site for fewer than 90 consecutive days;
 - b. The recreational vehicle must be fully licensed and ready for highway use;
or
 - c. The recreational vehicle must meet the permit requirements and elevation and anchoring requirements for manufactured homes, in accordance with Section 4-__ of this section.

H. Onsite Wastewater Treatment Systems

1. For the purposes of this section, ‘New OWTS’ is the first OWTS installed on a parcel.

2. The location of new and replacement On-site Wastewater Treatment Systems (OWTSs) must be done in such a manner as to avoid impairment to or contamination from the systems during flooding.
 - a.Placement of a new OWTS in the FO District (including both Floodway and Flood Fringe areas) is prohibited, unless the County Engineer determines that placement in the Flood Fringe cannot be avoided, in which case priority must be given to those locations on the subject property where flood depths and/or velocities are the lowest, and to the optimal location of the water supply.
3. New OWTS
 - a.All Tanks, including Septic Tanks, for new OWTS in the FO District must be made of concrete.
 - b.Tanks must be adequately anchored to protect against buoyant forces associated with flooding and high groundwater, which is typical during flood conditions.
 - (i) Tanks that are installed within the Boulder County or FEMA 500-year floodplain should be anchored to protect against uplift from high groundwater.
 - (ii) Boulder County requires that the FEMA-recommended calculation for determining buoyant forces (contained in FEMA P-348, or the latest FEMA guidance document covering building utilities) be used to adequately design buoyancy countermeasures. The equation is as follows:

$$F_b = 0.134V_t\gamma FS$$

<i>Where:</i>	F_b	is the buoyancy force exerted on the tank, in pounds.
	V_t	is the volume of the tank in gallons.
	0.134	is a factor to convert gallons to cubic feet.
	γ	is the specific weight of flood water surrounding the tank (generally 62.4 lb/ft ³ for fresh water and 64.1 lb/ft ³ for salt water.)
	FS	is a factor of safety to be applied to the computation, typically 1.3 for tanks.

- c.Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of septic effluent.
- d.Raised Soil Treatment Areas are required,. and must be designed such that the base of the distribution layer is a minimum of 2 feet above existing grade

- e. Connections to the house must be fitted with backflow prevention, unless it is demonstrated in the permit application that the connection pipe rises above the calculated FPE for the site.
- f. With the exception of the Soil Treatment Area, earthwork necessary for system installation must not exceed pre-construction grade.
- g. While not required, backup generators are recommended for any system fitted with electric pumps or controls.

4. Repair/Replacement OWTS

- a. For any OWTS in the Flood Fringe that requires replacement, the system must meet the requirements of 4-__.
- b. For any repair or replacement of an existing OWTS in the Floodway the County Engineer must determine that the proposed repair/replacement is consistent with Subsections i. through iii., below.

(i) The property owner has demonstrated that connection to a central sewer system is not feasible by:

- a. Providing a letter of denial from the closest sewer provider; or
- b. Demonstrating other reasons why connection is not feasible, such as that there is no central sewer system reasonably close to the property or building to be served, or that easement restrictions exist that effectively prohibit connection. For properties within a Community Service Area, connection will be deemed not feasible if the cost of connection exceeds 25% of the most recent assessed value of the subject property.

(ii) The proposed repair or replacement design must be protective of groundwater and appropriate for a Floodway. In making a proposal to the County Engineer, the applicant must address the following factors, among other pertinent information:

- a. Whether it is practical to remove outbuildings or non-conforming additions to allow for increased soil availability so that the proposed repair or replacement can be located outside of the Floodway;
- b. Whether there is room for an at-grade recirculating sand filter, or similar treatment media, and the required absorption area;
- c. Whether placement in the hydraulic shadow of a legal, existing structure is possible.

(iii) In no event must a proposed repair or replacement increase the overall capacity of the existing OWTS, unless the expansion is necessary to meet the Boulder County OWTS Regulations, as

administered by the Boulder County Public Health Department. In addition, the County Engineer may approve a raised absorption system or installation of a vault only as a last option within the Floodway and provided that this option meets the provisions of Article 4-__ (Nonconforming Uses).

I. Liquid Propane Gas (LPG) or Other Similar Storage Tanks

1. Placement of a new or replacement LPG or other similar storage tanks in the FO District is prohibited, unless the County Engineer determines that placement in the FO District cannot be avoided, in which case location decisions must prioritize those portions of the subject property where flood depths and/or velocities are the lowest, including, but not limited to the conveyance shadows of existing buildings.
2. When allowed, above-ground tanks must be placed on a concrete pad that extends to or above the FPE and is sufficiently-anchored. If elevation of the tank conflicts with IBC requirements, the IBC requirements must prevail; however, in all cases, sufficient protection must be provided to the tank such that it resists the expected hydrostatic and hydrodynamic flood forces.
3. When allowed, underground tanks must be designed and installed to resist the effects of buoyancy during high groundwater or flooding conditions. Buoyancy calculations must assume an empty tank and must use the same calculation outlined for Septic Tanks in 4-__ above. Anchoring of the tank is required if the empty tank alone will not counteract the calculated buoyant force.
4. All connections and components related to the tank or fuel system must be designed such that floodwaters cannot infiltrate or accumulate within any component of the system.
 - a. Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of tank contents, or must extend above the FPE..
 - b. Tanks located inside of a building must also meet all of the requirements of this section.

J. Historic Buildings and Structures Exempt. The repair or rehabilitation of buildings or other structures designated as historic through either the Boulder County Historic Landmark process or through a State of Colorado or national historical registry process is exempt from Flood Protection Requirements under Section 4-__. Entitlement to such an exemption requires the applicant to show:

1. Documentation that the building or structure is designated as a historic building or structure as defined by Article 18-203A; and
2. Documentation that confirms that the proposed work will not preclude the structure’s continued historic designation.

K. Elevation Certificate Requirements

1. As built Lowest Floor Elevations (referenced to the NAVD88 datum) for all New Construction, Substantial Improvements, other improvements, or for new

manufactured home stands, must be certified by a Colorado Registered Professional Engineer or Colorado Registered Professional Land Surveyor. Elevation Certificates must be submitted to the Building Division Inspector and County Engineer twice over the duration of the project. Failure to submit an Elevation Certificate will result in a Stop Work Order until proper certification is provided. To ensure compliance with flood protection requirements during and after construction, completed Elevation Certificates must be submitted at the following times:

- a. For slab-on-grade foundations, a FEMA Elevation Certificate must be submitted prior to final pour of foundation when foundation forms are completed.
 - b. For buildings on elevated foundations, such as extended foundation walls, stem walls, or piles, a FEMA Elevation Certificate must be submitted prior to rough framing when the foundation is completed.
 - c. For all buildings that have achieved finished construction, a final FEMA Elevation Certificate must be submitted prior to the issuance of Certificate of Occupancy or final inspection.
2. To convert another elevation reference datum to NAVD88, applicants are directed to datum conversion factors within the current effective FEMA FIS report for Boulder County, or to an online datum conversion program. Assumptions used for the datum conversion must be explicitly described to Boulder County on the Elevation Certificate. For datum requirements for permit submittals, see 4-404.2(B).

4-406 County Engineer’s Determination

- A. If the County Engineer finds in reviewing an Individual FDP application that the application meets the applicable standards set forth in Article 4-400, the County Engineer must approve the permit.
- B. If the County Engineer finds that the application can only meet all applicable standards if the FDP approval is conditioned, then the County Engineer must include all necessary and reasonable conditions when issuing the permit. Such conditions may include, but are not limited to, periods of operation, operational controls, sureties, deed restriction, and adequate flood protection. The County Engineer must specify when the conditions must be met.
- C. If the County Engineer finds that the application does not meet one or more applicable standards and that a reasonable basis for mitigation measures has not been demonstrated, the County Engineer must deny the application as proposed. The County Engineer’s determination must specify the reasons for the denial based upon the FDP review criteria in Section 4-404.2(C)(2).
- D. Any determination by the County Engineer to approve, conditionally approve, or deny a FDP must be in writing and mailed or otherwise provided to the applicant.
- E. For purposes of appeal to the Board of Adjustment, the County Engineer’s determination will be deemed final as of the date the FDP is issued. The applicant may begin work under an issued permit as of the date the permit is issued. If an applicant begins work during the 30-day appeal period to Board of Adjustment, the applicant does so at their own risk, as some or all of the work may need to be modified or removed at the applicant’s expense if the Board of Adjustment overturns the County Engineer’s decision to issue the permit.

4-407 Review of Permits Approved in Floodway

- A. In the event that the County Engineer determines that an Individual FDP application for any development in the Floodway meets the applicable standards for approval, within five business days of permit issuance the County Engineer must publish a notice of the proposed use and the permit issuance on the Boulder County website and transmit a copy of the notice to property owners adjacent to the subject property as well as a description of the process for appealing the decision to the Board of Adjustment.
- B. The County Engineer may waive or modify any requirement in 4-407(A) for the following Floodway development:
 - 1. Emergency activities required for the immediate protection of life, safety, or property, or to restore essential public services,
 - 2. Minor disaster recovery repair work that does not cause a rise in predicted 100-year water surface elevation as determined by a qualified engineer licensed in Colorado, and
 - 3. Any development activities that take place entirely inside an existing building.

4-408 Appeal of County Engineer Determination

- A. **Right to Appeal.** Any person aggrieved by a final written decision of the County Engineer based upon or made in the course of the administration or enforcement of the provisions of this Article 4-400 may appeal to the Board of Adjustment.
- B. **Appeal Application.** The procedures and requirements for filing an appeal may be found in Article 3 and in particular section 3-202(A)(1).
- C. **Public Hearing.** Upon receipt of a complete appeal application, the Board of Adjustment must hold a public hearing on the appeal application following the procedures specified in section 3-205(A).
- D. **Review Criteria.** In deciding upon an appeal of a County Engineer administrative decision or interpretation made under this Article 4-400, the Board of Adjustment must consider the factors specified in Section 4-1200(A)(1) as well as the additional factors listed below:
 - 1. the technical meaning of the provision being appealed;
 - 2. evidence as to the past interpretation of the provision;
 - 3. the principles of interpretation and rules of construction in Article 1 of this Code;
 - 4. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;
 - 5. the danger that materials may be swept onto other lands to the injury of others;

6. the danger to life and property due to flooding or erosion damage;
7. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
8. the importance of the services provided by the proposed facility to the community;
9. the necessity to the use or structure of a waterfront location, where applicable;
10. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;
11. the compatibility of the proposed use or structure with the existing and anticipated development;
12. the safety of access to the property in times of flood for ordinary and emergency vehicles;
13. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;
14. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and
15. the purposes of this Article 4-400.

E. **Decision of the Board.** The Board of Adjustment must make a record of its decision on the appeal in the same manner as other BOA appeals filed under Article 4-1200. The County Engineer must maintain records of the outcome of all appeals filed.

F. **Effect of Decision.** In no instance can a decision on an appeal to the Board of Adjustment result in a modification to the DFIRM. In order to modify the regulatory boundaries established by FEMA, interested parties must use FEMA’s LOMC process or consult FEMA on other options for modification.

4-409 Variances

- A. **Right to Request Variance.** Any person may request the Board of Adjustment grant a variance from the requirements in this Article 4-400 subject to the terms and conditions in this section 4-409.
- B. **Variance Application.** The procedures and requirements for filing a request for a variance may be found in Article 3 and in particular section 3-202(A)(19).
- C. **Public Hearing.** Upon receipt of a complete variance application, the Board of Adjustment must hold a public hearing on the request following the procedures specified in section 3-205(A).
- D. **Limitation on Board’s Authority.** In deciding upon a variance request made under this Article 4-400, the Board of Adjustment must comply with the limitations on its authority specified in section 4-1202(B)(1).
- E. **Review Criteria.**
 1. To grant a variance of a requirement imposed under this Article 4-400, the Board must find that all of the following criteria have been satisfied:
 - a.the strict application of this Code would create an exceptional or undue hardship upon the property owner;
 - b.the hardship is not self-imposed;
 - c.the variance, if granted, will not adversely affect the use of adjacent property as permitted under this Code;
 - d.the variance, if granted, will not change the character of the underlying zoning district in which the property is located, and is in keeping with the intent of this Code and the Boulder County Comprehensive Plan;
 - e.the variance, if granted, does not adversely affect the health, safety, and welfare of the citizens of Boulder County and is in accordance with the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development;
 - f. the variance is the minimum necessary, considering the flood hazard, to afford relief;
 - g.the variance, if granted, will not result in increased flood heights, additional threats to public safety, or extraordinary public expenses; and
 - h.the variance, if granted, will not create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
 2. Prior to granting a variance of a requirement imposed under this Article 4-400, the Board must also consider the following factors:
 - a.the technical meaning of the provision being appealed;
 - b.evidence as to the past interpretation of the provision;

- c. the principles of interpretation and rules of construction in Article 1 of this Code;
 - d. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;
 - e. the danger that materials may be swept onto other lands to the injury of others;
 - f. the danger to life and property due to flooding or erosion damage;
 - g. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
 - h. the importance of the services provided by the proposed facility to the community;
 - i. the necessity to the use or structure of a waterfront location, where applicable;
 - j. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;
 - k. the compatibility of the proposed use or structure with the existing and anticipated development;
 - l. the safety of access to the property in times of flood for ordinary and emergency vehicles;
 - m. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;
 - n. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and
 - o. the purposes of this Article 4-400.
3. Variances may be issued for new construction of and Substantial Improvements to residential buildings on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing buildings constructed below the FPE, so long as the criteria in section 4-409(E) above are met and subject to the following:
- a. As the lot size increases beyond the one-half acre, the technical justifications required for issuing the variance increases.
 - b. This type of variance may not be issued within any designated Floodway
 - c. Any applicant to whom such a variance is granted must be given written notice that the building will be permitted to be built with a Lowest Floor Elevation below the FPE and that the cost of flood insurance will be

commensurate with the increased risk associated with the reduced Lowest Floor Elevation.

- F. **Decision of the Board.** The Board must approve, conditionally approve, or deny the variance request. The Board may attach such reasonable conditions to the granting of variances as it deems necessary to further the purposes of this Article 4-400. The Board must make a record of its decision on the variance in the same manner as other BOA requests for variances filed under Article 4-1200. The County Engineer must report variances granted on an annual basis to FEMA.
- G. **Conflicts with 4-1200.** If a conflict arises between the requirements of this Section and the provisions of Section 4-1200, Board of Adjustment, the requirements of this Section control.

4-410 Final Inspection

All approved Individual FDPs are subject to final inspection by the County Engineer or his designee to verify that all conditions of approval have been satisfied.

4-411 Permit Expiration

An approved Individual FDP expires two years after the date of issuance if the permittee has not commenced construction under the permit.

4-412 Amendments to an Approved Individual FDP

Any proposal to change the nature or extent of work approved under an issued Individual FDP approved under this Article must require a request to the County Engineer to determine whether the proposed change constitutes a Substantial Modification to the approved plan. If the County Engineer determines that the change constitutes a Substantial Modification, no such change must be allowed to proceed until an application to amend the approved Individual FDP is filed with the County Engineer and approval granted in accordance with this Article. Any new application is subject to the Code in effect at the time of complete application. The applicant or its successor may appeal the County Engineer's decision to require an amended Individual FDP to the Board of Adjustment, provided that any such appeal must be in writing and must be filed with the County Engineer no later than 30 days following the date of the County Engineer's decision to require an FDP amendment.

4-413 Nonconforming Structures and Uses in the FO District

A. Principles of Construction. This Section is to be read in conjunction with Section 4-1000 (Nonconforming Structures and Uses). This section does not supersede 4-1000 in its entirety; rather, it establishes additional requirements for nonconforming structures and uses located in the FO District. If a conflict arises between the requirements of this Section 4-413 and the provisions of Section 4-1000, the requirements of this Section 4-413 control.

B. Nonconforming Structures, Generally.

1. Any building or structure within the FO District that was lawfully established before the adoption or amendment of this Article 4-400 but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1002.
2. Owners of existing nonconforming insurable buildings must track major repairs, remodeling, additions, and other improvements to determine when such work would constitute a Substantial Improvement. FEMA’s minimum requirements for the tracking of improvements and repairs within the Substantial Improvement/Substantial Damage Desk Reference (FEMA P-758), dated May 2010, as amended, is incorporated herein by this reference. Estimates for repair of damage that include additional improvement costs must apply the pre-damaged market value of the building to the sum of the repair and improvement costs.
3. If an amendment to the Official Map or this Article results in a higher BFE such that a building becomes nonconforming, the higher BFE will apply to all subsequent permit applications. All work proposed subsequent to the higher BFE must be evaluated to confirm whether it will be a Substantial Improvement.

C. Nonconforming Structures in the Flood Fringe.

1. A nonconforming building or structure (whether residential or non-residential) in the Flood Fringe may not be expanded, improved, repaired, relocated, restored, or replaced unless the work complies with this section.
2. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe proposes a Substantial Improvement or repair of Substantial Damage, the owner shall complete the following steps in the following order:
 - a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.
 - (i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.
 - (ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

(iii) Relocation to less hazardous locations is strongly encouraged, but not required.

b. Retrofitting Existing Buildings.

(i) The entire building or structure must be brought into compliance with the flood protection measures described in section 4-405.

(ii) All Flood Fringe retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).

3. Work on a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

D. Nonconforming Structures in the Floodway. A nonconforming building or structure (whether residential or non-residential) in the Floodway may be improved or repaired only if it complies with all of the following:

1. A nonconforming building or structure (whether residential or non-residential) in the Floodway may not be expanded by addition of square footage, footprint, or Habitable Space.
2. If the work to improve or repair a nonconforming building in the Floodway is the result of Substantial Damage to the building through a flood or other natural hazard event, the applicant will have five years from the date of loss to begin the work. At the expiration of the five-year period, the applicant may petition the County Engineer for a single one-year extension.
3. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Floodway proposes a Substantial Improvement or repair of Substantial Damage, the owner shall complete the following steps in the following order:

a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.

(i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.

(ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

(iii) Permanent removal of encroachments in the FEMA or Boulder County Floodway may qualify the owner for bonus Transferable Development Credits pursuant to section 4-1303.

- (iv) Relocation to less hazardous locations is strongly encouraged, but not required.

b. Retrofitting Existing Buildings.

- (i) In addition to requiring conformance with the flood protection measures in section 4-405, the County Engineer shall require one or more of the following retrofitting techniques to protect a residential building or structure from flood inundation as well as scour and erosion, debris impact, and other potential hazards associated with floodways:

- 1) Elevation using Posts, Columns, or Piles

- i. Posts or columns must be placed in drilled or excavated holes or piles must be driven into the ground.
- ii. Posts or columns must be encased in concrete and include a footer.
- iii. Posts, columns, and piles must be sufficiently anchored to resist the expected hydrodynamic and hydrostatic flood forces.
- iv. Access may be allowed to extend below the FPE.

- 2) Elevation using stem walls parallel to the direction of flow

- i. Water must be allowed to flow freely at high velocities between stem walls.
- ii. Footers must be designed and installed to account for potential scour associated with flooding.

- 3) Other techniques proposed by the applicant as determined by the County Engineer on a case-by-case basis.

- (ii) In all cases, the bottom of lowest horizontal structural member (floor joists) as well as all service equipment must be above the FPE.
- (iii) In all cases, a continuous load path from the retrofitted foundation to the elevated portion of the home is required.
- (iv) For non-residential buildings, the applicant must first consider the retrofit requirements for residential buildings in this subsection, but at a minimum, the requirements of 4-405(C) apply.
- (v) All Floodway retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. In addition to the Elevation Certificate requirements of 4-405(K), residential building retrofit projects require completion of the Boulder County Residential Floodway

Retrofit Certificate. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).

4. Work on a nonconforming building or structure (whether residential or non-residential) in the Floodway that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

E. Nonconforming Uses.

1. The use of any structure or property within the FO District that was lawfully established before the adoption or amendment of this Article 4-400, but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1003.
2. A change in use (as uses are defined in Article 4-500) of a structure will require that the entire structure be flood-protected pursuant to Section 4-405; provided, however, that the County Engineer may modify or waive flood protection requirements for a change in use based on good cause shown by the applicant that all of the following conditions are met:
 - a. The entirety of the existing structure is located outside of the Floodway;
 - b. The existing structure is determined to be structurally sound by a qualified engineer licensed in Colorado;
 - c. The cost of compliance with this Article 4-400 is less than 50% of the current value of the structure;
 - d. The proposed change in use is to a use that is permitted in the zone district applicable to the property;
 - e. The proposed change in use is to a use that reduces, minimizes, or otherwise creates a less intensive use or decreases human occupation; and
 - f. There is no other potential for any significant conflict with this Article 4-400.

4-414 Definitions

Accessory Building or Structure. A building or structure which is on the same parcel of property as a principal or primary building and the use of which is incidental to the use of the principal or primary building. Examples include, but are not limited to, detached garages (but NOT ADUs), storage sheds, barns, boathouses, and pavilions.

Alteration of a Watercourse. Through man-made work, changing the the bankfull channel such that the post-project location, orientation, or flow direction of said channel extends three or more bankfull channel widths from the pre-project channel location, or outside of the pre-project regulatory floodplain.

Article 4-400. Sections 4-400 through 4-416 of the Boulder County Land Use Code.

Basement. Any area of a building having a finished floor subgrade on all sides, whereas the finished floor is greater than four feet below the top of the foundation walls or greater than 2 feet below the Lowest Adjacent Grade.

Below-Grade Crawlspace. The interior space between the elevated finished floor of a building and the finished interior grade, whereas the finished grade is no greater than 4 feet below the top of the foundation walls and no greater than 2 feet below the Lowest Adjacent Grade.

Crawlspace. The interior space between the elevated finished floor of a building and the interior finished grade.

Critical Facilities. See CWCB definition.

Effective Date. See FEMA definition.

Habitable Space. An enclosed area having more than 20 linear feet of finished interior walls (paneling, etc.) or used for any purpose other than solely for parking of vehicles, building access or storage.

Flood Fringe. The portions of the Floodplain Overlay District that are not in the Floodway.

Floodway. The floodway depicts the most hazardous portion of the floodplain, where flood depths and velocities are greatest and damages resulting from flooding are the most catastrophic. As such, Boulder County’s development restrictions in the floodway are stricter than those within the Flood Fringe. In Boulder County, Floodway means:

1. Those portions of the FO District required for the passage or conveyance of the base flood in which waters will flow at significant depths or with significant velocities, including the channel of a river or other watercourse and any adjacent floodplain areas that must be kept free of development and other encroachments to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
 - a. The Colorado statewide standard for the designated height to be used for all newly studied reaches is six inches.
 - b. For existing Floodway delineations in previously studied reaches, the designated height is that in place at the time of the study. This information is on file with the

County Engineer and available upon request. Letters of Map Revision to existing Floodway delineations may continue to use the floodway criteria in place at the time of the original delineation.

2. Areas identified as floodway by the Colorado Water Conservation Board or FEMA.
3. In the foothill canyons and in any drainage above 6,000 feet (NAVD88) in elevation, as a result of the expected high flow velocities, with reference to the best terrain data available as of the last FO District update, (a) the entirety of the 1%-annual-chance (100-year) flood hazard area, or (b) as reflected on an engineering study approved by the County Engineer and available upon request.
4. In Zone A or AE areas, where the proposed development does not involve buildings or structures, then in the absence of either a specific floodway designation by FEMA or an engineering study submitted by the applicant and approved in writing by the County Engineer, the Floodway is defined as the channel or flowpath of the river, stream, or other watercourse and areas of the floodplain where the product of flood depth (in feet) multiplied by flood velocity (in feet per second) is greater than four. This formula is derived from the 1987 Colorado State University flume study. Flow depth and velocity can be determined from a number of sources, including without limitation hydraulic modeling, water surface elevation information, terrain data, and flood risk products created specifically to display depth and/or velocity.
5. Where the proposed development involves buildings or structures in the FO District and the floodway has not been previously identified, the Floodway is those portions of the FO District determined to be floodway by an engineering study submitted by an applicant and approved by the County Engineer as further described in Section 4-404.2(E).

In-Kind Replacement. For storm drainage systems and system components, replacement of any system or system component with the same system or component. In-kind Replacement does not include projects that will change the size or function of the system or component.

Letter of Final Determination. See FEMA definition.

Letter of Map Change, Revision, Amendment. See FEMA definition.

Lowest Adjacent Grade. See FEMA definition.

Maintenance. Maintenance means any activity undertaken to repair or prevent the deterioration, impairment, or failure of any utility, structure, or infrastructure component, including, without limitation, the removal of sediment, debris, and vegetation, installation of erosion and sediment control devices, and the replacement of structural components, so long as the work does not expand the previously-permitted condition. Maintenance does not include expansion or enlargement of a building or structure, Substantial Modifications, Substantial Improvements, total replacement of existing facilities, or total reconstruction of a facility.

Permanent. Any change or alteration expected to remain for a substantial period of time, but at a minimum will remain after permitted work is complete.

Soil Treatment Area. See Boulder County OWTS Regulations (April 2015), as amended.

4-415 Interpretation

Certain terms used in this Article 4-400 are derived from FEMA and/or CWCB regulations. The federal and state definitions of these terms may not correspond precisely to county definitions of the same or similar terms as used elsewhere in the Land Use Code and related local regulations such as the Building Code. To the extent a term is not defined in this Article 4-400, and a conflict or inconsistency in the meaning of the term cannot be resolved by the principles listed in sections 1-900 and 1-1000, the County Engineer must determine the meaning of the term by examining the following sources in the following order of priority:

1. The meaning of the term as defined in Article 4-400.
2. The meaning of the term as defined in Article 18 of this Code.
3. The meaning of the term as defined by FEMA. See 44 C.F.R. § 59.1, as amended.
4. The meaning of the term as defined by CWCB. See 2 C.C.R. 408-1:4.
5. The meaning of the term as defined elsewhere in this Code, or in another adopted Boulder County publication such as the Multimodal Transportation Standards, the Storm Drainage Criteria Manual, or the Stormwater Quality Management Permit Requirements.
6. The meaning of the term as defined in any other official document deemed a reliable source of authority given the context.

4-416 Enforcement

Upon receiving a complaint that a violation of the requirements of this Article 4-400 has occurred, the County Engineer is authorized to enforce compliance with these floodplain regulations in the same manner as other violations of the Land Use Code are enforced, as detailed in Article 17.

Changes to other parts of the Code

4-1202(C) – Board of Adjustment – Standards of Review

Replace current text with: “Additional requirements for appeals and variances under Section 4-400 of this Code (“Floodplain Overlay District”) are set forth in Section 4-408 and 4-409, respectively.”

4-800 – Site Plan Review

4-802 Applicability and Scope of the Site Plan Review Process for Development

A. Site Plan Review shall be required for (unless not required or waived pursuant to sections B and C below):

[...]

8. Any development or earthwork requiring a floodplain development permit.

B. Site Plan Review shall not be required for:

[...]

3. Restoration of a structure that has been damaged or destroyed by causes outside the control of the property owner or their agent provided the restoration involves the original location, floor area, and height. Such restoration must comply with the current provisions of the Boulder County Land Use Code other than 4-800 (also see Nonconforming Structures & Uses, Article 4-1002(D) and 4-1003(F)).

a. Such restoration must be commenced within six months after the date on which the structure was damaged or destroyed, or a latent defect discovered and completed within one year after the date on which the restoration commenced. This limitation may be extended in the case of extenuating circumstances as determined by the Director.

b. Replacement of bridges, box culverts or low-water crossings or other hydraulic structures spanning a creek or other drainage within a mapped floodplain under Article 4-400, may also be exempt from Site Plan Review under this Subsection 3., subject to administrative approval by the County Engineer for compliance with the Boulder County Storm Drainage Criteria Manual. The County Engineer may impose conditions on the construction to assure basic safety, including but not limited to requiring construction of a replacement bridge or crossing that is compliant with the Land Use Code and the Storm Drainage Criteria Manual either as a temporary or Permanent replacement hydraulic structure.

c. The provisions of this Section 4-802(B)(3) shall not apply to Substantial Improvements to buildings in the Floodplain Overlay District as provided for in Section 4-400 of this Code.

[...]

6. Any development or earthwork which the County Engineer deems eligible for a General Floodplain Development Permit.

C. Site Plan Review may be waived for the following circumstances if the Land Use Director determines that there is no potential for any significant conflict with the criteria listed in Article 4-806 of this Code:

[...]

8. Any development or earthwork requiring an Individual Floodplain Development Permit, so long as the Director consults with the County Engineer before granting the waiver.

Article 18

- Delete definition of “**Floodway**”
- Delete definition of “**Floodproofing**”
- Replace section 18-178A “**Market Value**” with:

Market value is the price which a willing buyer would pay a willing seller under normal economic conditions, based on a representative body of comparable sales at or about the date for which the market value is sought to be determined, as calculated by an independent appraisal performed by a professional appraiser, or by other accepted authoritative source such as the County Assessor’s Office. In lieu of an independent appraisal, the market value of the structure as determined from the records of the County Assessor may be used. For purposes of floodplain regulations, market value may be set according to any method approved by FEMA and explained within FEMA P-758.

- Replace section 18-206 “**Substantial Improvement**” with:
 - A. Any cumulative combination of repairs, reconstruction, rehabilitation, expansion, or improvement of a building or other structure, the cost of which equals or exceeds 50 percent of the market value of the structure either before the improvement or repair is started, or if the structure has been damaged and is being restored, before the damage occurred. Substantial improvements are calculated on a cumulative basis, beginning with improvements commenced on or after September 11, 2013.
 1. The costs of the improvement shall include, but are not necessarily limited to, all materials, labor, built-in appliances, overhead, profit, and repairs to damaged portions of the building that are done concurrent with the subject improvements.
 2. The costs of the improvement shall not include those associated with post-storm debris removal; permitting; fees, preparation of surveys, costs, plans, and or specifications; or improvements outside of the structure, such as landscaping, sidewalks, fences, or detached structures; or work under a minor

building permit exempted from floodplain development permit requirements under Article 4-400 of this Code.

B. The term substantial improvement does not include:

1. Any alteration of a structure listed on the National Register of Historic Places or on the Colorado State Historical Society’s list of historic places.
 2. Any of the following types of improvements necessary to assure safe living conditions or bring a structure into compliance with state or local health, sanitation, safety, or building codes:
 - a. Electrical repairs;
 - b. Furnace repairs or replacements;
 - c. Water heaters, boilers, and evaporative cooler repairs or replacements;
 - d. Air conditioner repairs or replacements;
 - e. Repairs or replacements to roof coverings;
 - f. Insulation or simple weatherization or energy efficiency upgrades.
 3. Costs associated with renovations or remodeling projects totaling less than \$1,000.00, as increased annually starting January 1, 2018 by the Consumer Price Index inflation factor applicable to Boulder County.
 4. Note: even though not substantial improvements, the work described above may still require an Individual FDP.
- Replace section 18-205A “**Substantial Damage**” with:

Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before damage occurred.

DC-15-0004

EXHIBIT C

**Redlines showing changes made to regs since
September 1, 2016 hearing**

4-400 Floodplain Overlay District

4-401 Purpose

- A. To provide land use controls necessary to qualify unincorporated areas of Boulder County for flood insurance under requirements of the National Flood Insurance Act of 1968, as amended; to protect life, property, and health; to ensure the best available data is used in making development decisions; to avoid increasing flood levels or flood hazards or creating new flood hazard areas; to minimize public and private losses due to flooding; to reduce the need for expenditures of public money for flood control projects; to reduce the need for rescue and relief efforts associated with flooding; to prevent or minimize damage to public infrastructure, facilities, and utilities; and to meet or exceed FEMA and CWCB minimum standards for floodplain regulation.
- B. FEMA requires all communities that participate in the National Flood Insurance Program (“NFIP”) regulate “Development” that occurs within the Special Flood Hazard Area. FEMA defines Development as “any manmade change to improved and unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating or drilling operations.”

4-402 Applicability and Administration

- A. **Applicability.** The Article 4-400 applies to all lands in the Floodplain Overlay (“FO”) District. If a lot or other parcel of land lies partly within the FO District, this Article 4-400 applies to the part of such lot or parcel lying within the district. If a building or structure lies partly within the FO District, then this Article 4-400 applies to the entire building or structure.
- B. **County Engineer Role.** The County Engineer or his or her designee is responsible for the administration and implementation of the requirements of the FO District, including reviewing all development proposals to determine the applicability of this section, all Individual Floodplain Development Permit (“Individual FDP”) applications, and all notifications submitted for General Floodplain Development Permit (“General FDP”) consideration.
- C. **No Liability.** The degree of flood protection provided by this section has been determined to be reasonable for regulatory purposes and is based on engineering and scientific methods of study of the 1%-annual-chance (100-year) flood event-, also referred to as the base flood. Floods of greater magnitude may occur. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge or culvert openings restricted by debris. This Article 4-400 does not imply that land areas outside of 100-year floodplain boundaries or land uses permitted within such areas will be free from flooding or flood damages, or that compliance with these regulations will prevent flood damage. Neither Boulder County nor any of its officers or employees shall be liable for any flood damages, including any damages that result from reliance on this article or any administrative decision.

D. More Restrictive Prevails.

1. The Federal Emergency Management Agency (“FEMA”) and the Colorado Water Conservation Board (“CWCB”) have established certain minimum standards for regulatory floodplains. To the extent a FEMA or CWCB requirement conflicts with a provision in 4-400, the most restrictive controls.
2. This Article 4-400 does not repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. Where this Article 4-400 and another ordinance, easement, covenant, or deed restriction conflict or overlap, the more restrictive applies.

E. Permits Required.

1. All development in the FO District requires an Individual FDP or must be covered by the General FDP. Development in the FO District not covered by a General FDP or an Individual FDP may result in enforcement action under Article 17.
2. In addition to the Floodplain Development Permits required by this section, all required local, state, and federal permits must be issued prior to development in the FO District.

F. Referral from Other County Departments.

1. All development that requires a planning review process through the Boulder County Land Use Department and may be susceptible to flooding will be forwarded to the County Engineer for review and comment. The County Engineer must determine if the work is covered under a General FDP, requires an Individual FDP, or does not require any type of Floodplain Development Permit. Where the County Engineer indicates that the development will need a Floodplain Development Permit, the Land Use Department should note the requirement on any planning approval.
2. All building permit applications ~~must~~shall be reviewed by the Building Division to determine whether the proposed development is potentially within the FO District and therefore may require a Floodplain Development Permit. If it appears to the Chief Building Official that any proposed development may be within the FO District, then the Chief Building Official ~~must~~shall refer the application to the County Engineer. The Chief Building Official ~~must~~shall not issue a building permit when floodplain issues have been raised unless the County Engineer has confirmed the development is approved under a General FDP or an Individual FDP or the County Engineer has determined that a Floodplain Development Permit is required.
3. All Onsite Wastewater Treatment System (“OWTS”) applications ~~must~~will be reviewed by Boulder County Public Health Department (“Public Health”) to determine whether the work, including new OWTS or repair/replacement of an existing OWTS, may be within the FO District. If it appears to Public Health that the proposed work may be within the FO District, then Public Health must refer the application to the County Engineer. Public Health must not issue an OWTS permit when floodplain issues have been raised unless the County Engineer has issued an Individual FDP or has determined that no such permit is required.

*** ~~UPDATED~~-DRAFT – BOCC HEARING – SEPTEMBER 128, 2016 ***

4-403 FO District Defined; Official Map

A. **FO District.** The Boulder County FO District is defined as the FEMA Floodplain together with the Boulder County Floodplain, as those floodplains are defined below.

1. The December 18, 2012 Digital Flood Insurance Rate Map (“DFIRM”) and Flood Insurance Study (“FIS”) report published by FEMA, as amended, is incorporated by reference. The DFIRM and FIS in effect on the date of a property owner’s complete application for any permit or process in this Code, in particular those portions of the DFIRM and FIS that define the 100-year floodplain, is the foundational floodplain for the FO District (the “FEMA Floodplain”). The term “DFIRM” includes all flood risk zone designations and technical information displayed on the maps, explanatory matter, technical addenda, modeling and calculations, water surface elevations, profiles, and cross sections, and other underlying detailed study data, such as information published in the FIS report and supporting documentation, as well as approved Letters of Map Revision (“LOMR”), Letters of Map Amendment (“LOMA”), and Letters of Map Revision based on Fill (“LOMR-F”). The FEMA Floodplain includes Zone AE, A, AH, and AO flood risk zone designations, including both Floodway and Flood Fringe areas.
2. To augment the FEMA Floodplain, the Board of County Commissioners may, after review and recommendation by the Planning Commission, adopt a “Boulder County Floodplain.” The purpose of adopting a Boulder County Floodplain is to facilitate use of the best data available data not adopted by FEMA to the County to establish floodplain boundaries, Base Flood Elevations (“BFE”), and Flood Protection Elevations (“FPE”) to better protect residents of Boulderthe County from flood hazards.
 - a. The Boulder County Floodplain must be comprised of the same flood risk zone designations as the FEMA Floodplain.
 - b. In no instance may the Boulder County Floodplain remove from the FO District an area or property designated as within the FO District by the FEMA Floodplain.
 - c. The following reports, maps, and related information constitutes the initial location and boundaries of the current Boulder County Floodplain:
 - (i) Floodplain Re-analysis and Floodway Delineation, North St. Vrain and St. Vrain Creeks, Boulder County, CO, by Love & Associates, Inc., October, 1992; and
 - (ii) Any area included in the definition of Floodway per Section 4-414.
 - d. The maps in these reports, as well as the area described in the Floodway definition, depicting the floodplain for the base flood shall be considered the official maps for the purposes of locating the Boulder County Floodplain on the official zoning district maps. These maps and reports, together with all amendments, explanatory matter, technical addenda, water surface elevations, profiles and cross sections (where available) are incorporated by reference into this Code.

3. All records pertaining to floodplain development must be on file with the County and open to public inspection. These records include, but are not limited to, certified Lowest Floor Elevations, Elevation Certificates, commercial Floodproofing Certificates, LOMAs, LOMR-Fs, LOMRs, Floodplain Development Permits, boundary interpretations, and records of action on variance requests.

B. Official Map. The County Engineer shall maintain digital maps delineating the location and boundaries of the FEMA Floodplain and the Boulder County Floodplain. The FEMA Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as published by FEMA. The Boulder County Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as adopted by Boulder County. These maps of the FEMA Floodplain and the Boulder County Floodplain together establish the areas governed by the provisions of this Article 4-400 and constitute the Official Map of Boulder County’s FO District (“Official Map”).

1. The most current Official Map and supporting data shall be on file in the County Engineer’s Office in electronic format, available for public inspection during normal business hours, with electronic and paper copies available upon request. The Official Map must also be available to the public on the Boulder County website.
2. The County Engineer shall maintain records of superseded versions of the Official Map for historical reference.

C. Interpretation of Official Maps

1. The County Engineer shall determine which uses, parcels, structures, or other facilities are located in a previously adopted FEMA Floodplain or a Boulder County Floodplain, including in situations where a mapped boundary appears to conflict with actual field conditions. In making such interpretations, the County Engineer shall refer, as necessary, to the best available data at that time.
2. Sources of best available data for interpretations include the engineering study upon which the maps and elevations are based, the professional engineers who prepared the study, the most recent detailed terrain data certified by a P.E. or a P.L.S., survey data certified by a P.E. or a P.L.S., any BFE/water surface elevation, floodway, and other flood risk data available from state or federal agencies, and any other reliable source that the County Engineer finds meets an acceptable level of technical accuracy as determined through prevailing industry practices.
3. The use of aerial photography to interpret FO District boundaries, but without the consideration of local terrain data, shall be for informational purposes only, and not for making determinations as to the exact location of the boundaries of the FO District.
4. If the County Engineer makes a determination regarding the relationship of the Official Map to a use, parcel, structure, or other facility, the interpretation must be

noted in the records associated with any related permit(s) and available for public inspection.

5. The Engineer's determinations under this section are interpretations of precisely where the existing regulatory boundary lies on the ground. A determination as to which uses, parcels, structures, or other facilities are located in or out of a previously adopted FEMA Floodplain or a Boulder County Floodplain does not itself contract or expand the boundaries of the FO District. Therefore, such determinations do not result in an amendment to the Official Map that requires review and approval by the Planning Commission and Board of County Commissioners.

D. Amendment of Official Map

1. The FEMA Floodplain within the FO District will be deemed updated when FEMA issues a Letter of Final Determination associated with any map action, or after the ~~Effective Date~~effective date of any Letter of Map Change ("LOMC"), without need for review or approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.
 - a. If FEMA provides notice of final BFEs and sets an effective FIRM revision date (through issuance of a Letter of Final Determination) for studies that had previously been adopted as Boulder County Floodplain, the following rules apply:
 - (i) If FEMA made no changes to the studies previously adopted by Boulder County, then from the ~~Effective Date~~effective date of FEMA's map action forward, Boulder County will continue to regulate using those studies to partially define the FO District, but will treat the studies as FEMA Floodplain rather than Boulder County Floodplain. In this circumstance, the County Engineer is not required to obtain review and approval of Planning Commission or the Board of County Commissioners.
 - (ii) If prior to its official action FEMA makes changes to maps, data, or related documentation previously included only in the Boulder County Floodplain, the County Engineer must determine whether and how the Boulder County Floodplain should be amended.
2. Except for an automatically adopted DFIRM update, a change in the boundary of the FO District requires review by the Planning Commission and approval by the Board of County Commissioners of a Zoning Map Amendment in accordance with Section 4-1100. The County Engineer shall revise the Official Map upon approval of changes to the Official Map by the Board of County Commissioners.
3. If a property owner in the FO District believes that the provisions of this Section should not apply to some or all of the property owner's property because the building or ground elevations are above the corresponding BFE, then (1) as to the Boulder County Floodplain, the owner may request a rezoning map amendment under the procedures of 4-1100, and (2) as to the FEMA Floodplain, the owner

may request FEMA approve a LOMA. LOMAs must be provided to the County Engineer.

4. The County Engineer may correct clerical errors in the Official Map as they are discovered, without need for approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.
5. The County Engineer may generate or receive draft and/or preliminary flood risk analyses and reports affecting the FO District. These analyses may be any flood risk analyses, including those designated by CWCB or distributed by FEMA, as well as any other water surface elevation and/or Floodway data available from state or federal agencies or any other reliable source. Upon notification of such new information, the County Engineer shall evaluate whether a change to the boundaries of the FO District is required. If so, the County Engineer will submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.
6. In accordance with 44 C.F.R. § 65.3 and the Rules and Regulations for Regulatory Floodplains in Colorado (the “CO Floodplain Rules”), project proponents must submit technical data to FEMA in the form of a map revision request within six months of the date of completion of a project ~~that~~ if the project received a CLOMR from FEMA before construction or results in changes (either increases or decreases) in the 100-year water surface elevation greater than 0.3 foot.
7. The County Engineer will monitor large-scale natural physical changes as they occur. If the County Engineer deems it necessary to restudy a mapped floodplain or floodway as a result of such changes, the County Engineer shall coordinate with CWCB and FEMA and, as appropriate, submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.

4-404 Floodplain Development Permits

- A. **Minimum Federal and State Standards.** Development in the FO District must comply with the NFIP and State of Colorado minimum standards. These standards require applicants to demonstrate that development projects in the Floodway, when combined with all other existing and anticipated development, will not cause an increase in the modeled 1%-annual-chance water surface greater than 0.00 feet and, for projects in the Flood Fringe, will not cause an increase greater than 0.50 feet.
- B. **Uses Prohibited in Floodway.** The following activities and uses are prohibited within all mapped Floodways:
1. Construction of new permanent buildings (either residential or non-residential) with the exception of relocated nonconforming uses otherwise permitted by this Article 4-400;
 2. Construction of new temporary buildings (either residential or non-residential), unless the County Engineer reviews and approves a specific location in the Floodway in conjunction with a Special Event as defined in the Multimodal Transportation Standards, a Group Gathering / Special Event as defined in the Land Use Code, or another temporary activity permitted by county regulations;
 3. Construction of additions to existing buildings that increase the building's square footage, footprint, or Habitable Space;
 4. Conversion of existing accessory use space to living or primary use space;
 5. Overnight campgrounds;
 6. Dispersed camping, unless the camping is approved through the issuance of a Group Gathering / Special Event Permit as defined in the Land Use Code;
 7. Parking of Recreational Vehicles for the purposes of overnight habitation;
 8. Storing or processing of materials that are buoyant, flammable, explosive, or otherwise potentially injurious to human, animal or plant life;
 9. Solid waste disposal sites and central collection sewage treatment facilities;
 10. New or expanded individual on-site wastewater systems, unless the expanded system is required to bring existing buildings up to code or is allowed per 4-405(HG)(4);
 11. Solid wood fences, chain link fences, or any fence that does not meet the Boulder County standards for fence installation;
 12. Any activity or use that would create ~~the~~significant potential for downstream solid debris (including, but not limited to decks) waste, or rubbish;
 13. New or expanded Critical Facilities located on land lower than 6,000 feet in elevation; and
 14. Any encroachment (including filling and grading) that would adversely affect the efficiency of the Floodway or change the direction of flow, unless it conforms with section 4-404.2(D)(C).

C. Uses Allowed in Floodway under Certain Conditions.

1. The County Engineer may issue FDPs for the following development types and open uses within the Floodway unless the use (1) is prohibited in the underlying zoning district, (2) adversely affects the efficiency of the Floodway, (3) changes the direction of flow, ~~(4) increases base flood heights without a FEMA-approved Conditional Letter of Map Revision (“CLOMR”), or (5~~or (4) poses a significant safety hazard:
 - a. Agricultural uses involving the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising and grazing of livestock and horses, as well as temporary buildings associated with such use, as detailed in 4-405(C)(3)(c);
 - b. Uses accessory to residential uses, including, but not limited to lawns, open areas, gardens, driveways, and play areas;
 - c. Industrial or commercial uses such as loading areas, railroad rights-of-way (but not including freight yards or switching, storage, or industrial sidings), parking areas, and airport landing strips;
 - d. Recreational uses not requiring permanent or temporary buildings designed as habitable space, unless a special event permit has been issued for a temporary building;
 - e. Utility facilities such as dams, power plants, spillways, transmission lines, pipelines, water monitoring devices, water supply ditches, irrigation ditches and laterals; and open mining;
 - f. Hydraulic structures such as bridges, culverts, weirs, diversions, drop structures, and fish ladders, for access and flood or stormwater control; and
 - g. Critical Facilities above 6,000 feet in elevation, as described in 4-405(~~ED~~).

2. In addition, the County Engineer may not issue FDPs for the development types and uses listed in 4-404(C)(1) above that result in an encroachment within the Floodway unless the applicant has demonstrated through hydrologic and hydraulic analyses performed by a qualified P.E. licensed in Colorado and in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the Base Flood (a No-Rise Certification).

- a. Under the provisions of 44 CFR Chapter 1, Section 65.12, of the NFIP Regulations, a community may permit encroachments within the adopted FEMA regulatory Floodway that would result in an increase in BFEs if the applicant first receives an approved CLOMR and/or Floodway revision from FEMA.
- b. Where there is a designated FEMA Floodplain but no designated FEMA Floodway, and there is a designated County Floodway, projects that result in increases greater than 0.5 foot in these areas must first receive an approved CLOMR from FEMA, and projects that result in increases between 0.0 and 0.5 foot in these areas must first receive an approved Boulder County Floodway Review from the County Engineer.

- c. Where there is no designated FEMA Floodplain, but there is a designated County Floodway, projects that result in any increase in these areas must first receive an approved Boulder County Floodway Review from the County Engineer.
- d. Where there is a designated FEMA Floodplain, and no FEMA or County Floodway, projects that result in increases greater than 0.5 foot must first receive an approved CLOMR from FEMA.
- e. Where there is no designated FEMA Floodplain, but there is a designated County Floodplain (but not a County Floodway), the procedure set forth in 4-404.2(E) (Procedures for Modeling Proposed Development within the Floodway) must be followed.
- f. For all new subdivision proposals and other developments (including, but not limited to, manufactured home parks) greater than either 50 lots or 5 acres that are located in Zone A, this analysis must also depict, as a part of the development proposal, the BFEs that Boulder County will use to determine FPEs for the proposed development.
- g. In all instances, no increases in water surface elevation will be allowed that impact an insurable building.
- h. Following project completion, the County Engineer shall provide FEMA with all information required by 44 C.F.R. Part 65 relating to water surface elevation changes so that FEMA may determine whether a map revision is appropriate.

~~C.D.~~ **Uses Allowed in Flood Fringe under Certain Conditions.** Any use permitted by the underlying zoning regulations may be permitted in the Flood Fringe, provided the use meets the flood protection requirements of Section 4-405, and provided that:

1. New Critical Facilities are prohibited in the Flood Fringe below 6,000 feet (NAVD88) in elevation.
2. Wastewater treatment facilities serving more than two properties are prohibited in the Flood Fringe.
3. Individual ~~Onsite Wastewater Treatment Systems (OWTS)~~,₂ when allowed, must conform to the requirements of 4-405(HG).
4. Fences in the Flood Fringe are subject to all Boulder County Building Code and other fence requirements.

4-404.1 General Floodplain Development Permits

A. ~~Intent. In order to avoid~~To minimize undue hardship to property owners within Boulder County; yet remain in compliance with FEMA regulations regarding Floodplain permitting, the County Engineer is authorized to ~~create a General FDP, updated periodically, in accordance with the provisions of this Section 4-404.1.~~issue one or more General Floodplain Development Permits. The intent of the General FDP is to allow certain limited uses and activities in the Floodplain without the need ~~to apply for and gain approval of an approved~~ Individual FDP; because ~~the nature and extent of these specific~~ uses and activities ~~will likely not~~are unlikely to increase BFEs or have an adverse effect on neighboring properties, species, or ecosystems.

~~B. Notification Process.~~

~~B. Notification~~Content of a General FDP. If the County Engineer ~~is required for certain types of projects covered by~~determines it appropriate to issue a General FDP, he shall include the following information on the face of the permit.

1. A list of specific uses and activities deemed within the scope of the General FDP ~~(listed in 4-404.1(C) below) in order for,~~
2. Whether or not property owners must notify the County Engineer ~~to consider prior to beginning work on an activity included within the General FDP.~~

a. The County Engineer shall require such notification for development activities for which it is necessary to evaluate individual and cumulative impacts, ensure minimum compliance with federal and state floodplain rules, and confirm that the ~~work conforms with the intent of the General FDP.~~uses or activities are unlikely to increase BFEs or have an adverse effect on neighboring properties, species, or ecosystems.

~~a-b.~~ For those projects where the County Engineer ~~receives~~will receive notice ~~as a through~~ referral required by a separate Land Use Code review process (such as Site Plan Review or Special Use Review), ~~duplicative notification of the County Engineer is need not required.~~require duplicative notification. For all other projects ~~that~~where the County Engineer decides to require notification, the applicant must submit the following information to the County Engineer a minimum of ~~30~~21 days prior to commencing work:

- (i) Project ~~Description~~description, including materials description and a discussion on the expected impact to the channel and floodplain;
- (ii) Location ~~Description~~description (an accompanying location map is best); and
- (iii) Site ~~Plan~~plan, if necessary to further describe the work.

~~b-c.~~ If the work is consistent withwithin the ~~intents~~scope of the General FDP, the County Engineer will respond to the owner with ~~this~~ confirmationapproval to proceed. If additional information is necessary or if the work requires issuance of an Individual FDP, the County Engineer

will inform the owner within 14 days of notification submission, or through the Land Use Review referral process.

~~C. Uses and Activities Eligible for a General FDP. The County Engineer may in his professional judgment determine that the following activities will not result in increases to BFEs or have an adverse effect on neighboring properties, species, or ecosystems and, consequently, that such projects are deemed approved under a General FDP. Under the General FDP, for certain projects described below, owners must notify the County Engineer in accordance with the procedures in 4-404.1(B) above.~~

~~1. Activities that require notification 30 days prior to commencement:~~

- ~~a. Road and trail widening, surface type changes, and overlays of greater than six inches (if fill is necessary for widening, an Individual FDP is required);~~
- ~~b. New parking lots greater than 0.1 acre;~~
- ~~c. New underground utilities that do not permanently alter topography and are:
 - ~~(i) Greater than 250 feet in length and installed perpendicular to flood flows; or~~
 - ~~(ii) Installed under a perennial stream channel.~~~~
- ~~d. Temporary in-stream diversions or dewatering (limited to temporary construction diversions and temporary diversions to maintain an adjudicated water right; under the General FDP, the dewatered reach must not exceed 300 feet, and may require additional permitting through the Colorado Department of Public Health and Environment);~~
- ~~e. In-Kind Replacement of storm drainage system or infrastructure components including but not limited to hydraulic structures such as culverts and check dams. An individual FDP is required for all replacement bridges. An individual FDP may also be required if: physical conditions of the channel have changed to the extent that in-kind replacement is not possible and/or Boulder County suggests replacement with a different design and/or size or new component;~~
- ~~f. Private storm drainage infrastructure repairs and Maintenance~~
- ~~g. Fences not in the Floodway;~~

~~2. Activities that do not require notification:~~

- ~~a. Road, trail, parking area, and driveway patching, sealing, milling, dirt/gravel leveling, and repair of drainage-related damage to match adjacent grade (these activities must not increase grade by 6 inches or more);~~
- ~~b. New driveways, trails, sidewalks, roads and streets constructed completely at or below grade;~~

- ~~c. Public drainage system and infrastructure repairs and Maintenance, including normal or regularly scheduled maintenance to restore function and/or usability, not to exceed the previously existing design. Sediment removal associated with this work is limited to culverts, bridges, and ditch headgates to restore normal function, limited to within the channel 300 feet upstream and downstream of these hydraulic structures. In all cases, repairs and Maintenance performed under the General FDP must not lower the normal channel invert elevation.~~
- ~~d. Replacement guardrails that are no taller than the previous guardrails, and that do not decrease the available open area for the passage of floodwaters; (new guardrails or replacement guardrails that do not meet the above criteria require an Individual FDP);~~
- ~~e. Flood deposited sediment removal in the overbanks and floodplain areas, limited to 6 inches or less (greater than 6 inches requires Individual FDP)~~
- ~~f. Debris removal limited to large, woody, unanchored or dead vegetation and rubbish as defined in Article 14;~~
- ~~g. Routine maintenance of utility and ditch easements and ROWs;~~
- ~~h. New overhead utilities, including supporting structures, as well as maintenance of overhead utilities;~~
- ~~i. New underground utilities that do not permanently alter topography and are:
 - ~~(i) Less than 250 feet in length; and~~
 - ~~(ii) Installed parallel to flood flows~~~~
- ~~j. Repair and Maintenance of underground utilities (work must not permanently alter topography);~~
- ~~k. Installation of sign or mailbox posts, telephone poles, or similar elements, unless more than 5 such elements are located along a line of the same bearing that are not parallel to flow and could create an obstruction;~~
- ~~l. Repair or replacement of existing piers or posts supporting a conforming deck;~~
- ~~m. ——— Activities associated with construction stormwater BMPs, including but not limited to temporary erosion control measures, etc.;~~
- ~~n. General farming, pasture, horticultural activities, and forestry that do not involve earthwork that permanently alters the topography or any clearing/grubbing of an area greater than 0.1 acres;~~
- ~~o. Temporary buildings or structures associated with general farming, pasture, horticulture, and forestry activities that do not exceed 120 square feet (200 square feet for loafing sheds) and are outside of the Floodway;~~
- ~~p. Repairs necessary to correct existing violations of Boulder County health and safety codes or to ensure safe and healthy living conditions, such as:~~

- ~~(i) Electrical repairs;~~
- ~~(ii) Furnace repairs or replacements;~~
- ~~(iii) Water heaters, boilers, and evaporative cooler repairs or replacements;~~
- ~~(iv) Air conditioner repairs or replacements;~~
- ~~(v) Repairs or replacements to roof coverings; and~~
- ~~(vi) Insulation or simple weatherization or energy efficiency upgrades;~~
- ~~q. Gardening and landscaping including planting vegetation, mulching, and raised beds less than 12 cubic yards total (but not hardscaping such as retaining walls, terraces, etc.); and~~
- ~~r. Lawns and lawn maintenance activities.~~

3. Conditions of approval, if any, for work approved under the General FDP.

C. Process for Issuing, Amending, or Rescinding a General FDP.

1. If the County Engineer determines that a new General FDP is appropriate, he shall post the proposed General FDP on the Transportation Department website and also in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. No such new FDP shall become effective until 14 days after the date it is posted.
2. If the County Engineer determines that an amendment to an existing General FDP is appropriate, whether to reflect changes to federal, state, or local regulations or guidance or for other good cause, he shall post the revised General FDP on the Transportation Department website and also in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. No such revised FDP shall become effective until 14 days after the date the revision is posted.
3. If the County Engineer determines that an existing General FDP should be rescinded in its entirety, whether to reflect changes to federal, state, or local regulations or guidance or for other good cause, he shall post a notice to this effect on the Transportation Department website and in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. The General FDP shall be deemed rescinded 14 days after the date the rescission notice was posted.
4. Subject to the notice requirements described above, the County Engineer may issue, amend, or rescind a General FDP at any time, on his own initiative, without the need for public hearings before Planning Commission and Board of County Commissioners.
5. All General FDPs in effect at a given point in time must comply with all applicable provisions of this section 4-404.1.

D. No Permit Fees. If the County Engineer determines a use or activity falls under the approval granted in a General FDP, no permit fee will be charged to the owner.

~~E.~~ Work Not Approved under a General FDP.

~~F.E.~~ Any development within the ~~floodplain~~Floodplain that does not meet the criteria of a General FDP requires either approval of an Individual FDP prior to beginning the work or a determination by the County Engineer that no ~~type of~~ FDP is required at all.

1. Should any work commence that is assumed by an applicant to be covered by a General FDP, and the County Engineer determines it is not covered by a General FDP, a Stop Work order will be issued. The unpermitted work will be treated as a zoning violation under Article 17 until an approved Individual FDP is issued or the violation is otherwise resolved.
2. Anyone considering a project in the Floodplain that varies from ~~those~~the projects described ~~above~~in an issued General FDP should contact the County Engineer to determine if an Individual FDP application is required. The County Engineer makes the final decision as to the applicability of a General FDP. Any project determined by the County Engineer to create a significant obstruction to flood flows will require an Individual FDP.

~~G.F.~~ **Other Permits.** Eligibility for a General FDP does not eliminate the need for applicants to obtain all other required permits, including building, grading, access, construction, and/or stormwater permits from Boulder County, as well as other state and federal permits.

~~H.G.~~ **Updates to General FDP.** ~~To reflect changes to federal, state, or local regulations or guidance or for other good cause, the County Engineer may propose updates to the terms and conditions of the General FDP. A copy of the approved General FDP~~Records of Issued General FDPs. A copy of all issued General FDPs, including previous versions, will be kept on file in the County Engineer's office at all times and available for public review.

4-404.2 Individual Floodplain Development Permits

- A. **Floodplain Pre-Application Conference.** A Floodplain Pre-Application Conference (Floodplain Pre-App) between the applicant and the County Engineer (or his/her designee) is required for all Individual FDPs, unless waived in writing by the County Engineer as unnecessary under the circumstances. The Boulder County Land Use Department may require a Pre-Application Conference as defined in Section 3-201, which may be substituted for the Floodplain Pre-App requirement of this section. The Floodplain Pre-App should include discussion of conforming and nonconforming structures and uses on the subject property.
- B. **Submittal Requirements.** Applications for Individual FDPs are to be submitted to the Boulder County Land Use Department and are subject to the following submittal requirements, unless the County Engineer determines that a particular requirement does not apply.
1. For all Individual FDP submittals:
 - a. A completed Individual FDP application form;
 - b. A narrative describing the work to be performed; and
 - c. A location map, showing the specific areas and property(ies) where the work will be performed.
 2. For construction of new buildings or improvements to existing buildings, The County Engineer will obtain pertinent documents from the applicant's Building Permit submittal package. Building Permit/Individual FDP submittals should include and call out all elements for flood protection required per 4-405. In addition, the following items shall be included in the Building Permit/Individual FDP submittal:
 - a. Specifications for construction and building materials (including considerations for flood resistant materials when required, per FEMA *Technical Bulletin 2*);
 - b. Description and locations of any proposed site, filling, dredging, grading, and/or channel improvements
 - c. Location of any and all proposed materials storage and staging areas, as applicable;
 - d. Location of the current regulatory FO District boundaries, including both FEMA and/or Boulder County Floodplain information;
 - e. Plans must include the elevation, in feet referenced to the North American Vertical Datum of 1988, to which the flood protection measures apply. See 4-405(A), Flood Protection Elevation.
 - f. Certification that the building or improvement is designed in accordance with the flood protection measures outlined in 4-405(C) for ~~new construction~~New Floodplain Construction and conforming existing

buildings and 4-413 for improvements to nonconforming existing buildings.

3. For bridges, culverts, other hydraulic structures, work within the channel banks, and stream restoration projects, in addition to the items listed above, the following items are required:

- a. A plan at a scale of ~~1"=200'~~ 1"=200' or larger, stamped by a P.E. registered in the State of Colorado, which includes:

- i. the site location;
- ii. existing and proposed base flood limits and water surface elevations, if applicable;
- iii. Floodway limits, if applicable;
- iv. channel, watercourse or flowpath;
- v. vertical and horizontal datum;
- ~~v.~~vi. existing and proposed contours or elevations at 2' intervals;
- ~~vi.~~vii. existing buildings
- ~~vii.~~viii. location and elevations of existing streets, water supply, and sanitation facilities, if applicable;
- ~~viii.~~ix. limits and total land area of all existing and proposed impervious surfaces, including buildings; and
- ~~ix.~~x. existing water supply ditches, irrigation ditches and laterals.

- b. A typical valley cross-section showing:

- i. channel, watercourse, or flowpath;
 - ii. limits of floodplain adjoining each side of channel;
 - iii. cross-section area to be occupied by the proposed development;
 - iv. existing and proposed base flood water surface elevations;
- c. Documentation that addresses scour (if required) and other design requirements in accordance with The Boulder County Storm Drainage Criteria Manual;

- d. Evidence of compliance with 4-404.2(D) of this section.

- e. Evidence of compliance with Section 404 of the Clean Water Act and the Endangered Species Act.

4. For ~~Onsite Wastewater Treatment Systems~~OWTS, a Site Plan that includes items 4-404.2(B)(3)(a)(~~1-7i-viii~~) above is required, in addition to the following:

- a. A geotechnical report, certified by a P.E. registered in the State of Colorado, which includes specifications on the system type and layout, building connections, and the flood protection measures required under 4-405(~~HG~~).

5. For underground utilities not covered by the General FDP, an analysis of the impacts of scour potential as well as design considerations to protect against scour must be provided.
6. For Projects determined to be in the Floodway as defined in 4-414, an engineering analysis certified by a Colorado-registered P.E. in accordance with 4-404.2(~~D~~) and (E) below E.
7. For any proposed Alteration or relocation of a watercourse, including stream restoration projects and engineered channelization projects, the County Engineer requires a description of the extent to which any watercourse will be altered or relocated, and that conveyance is not decreased as a result of the project, and that the flood carrying capacity of the watercourse is maintained over time.
 - a. All proposals for watercourse Alteration or relocation must include, in addition to all other applicable materials, pre- and post-project conveyance calculations to demonstrate that the flood carrying capacity has not been decreased.
 - b. For engineered channelization projects, including those types outlined in the Boulder County Storm Drainage Criteria Manual, permit applicants are required to submit, along with all other applicable materials, a maintenance plan that outlines the maintenance activities to be performed, the timing/schedule for those activities, and the agency or representative responsible for maintenance in order to ensure the flood carrying capacity is maintained.
 - c. Prior to any Alteration or relocation of a watercourse, the County Engineer must notify adjacent communities, potentially affected property owners, and the CWCB in the following manner:
 - i. Notification must be done through the publication of a notice of such proposed alteration or relocation once in a newspaper of general circulation in Boulder County.
 - ii. The County Engineer must keep on-file evidence of such notification.
 - d. Watercourse Alteration/relocation/channelization projects in the FO District are subject to the county's modeling requirements covered in 4-404.2(~~D~~) and 4-404.2(E) prior to permitting. In addition, at the discretion of the County Engineer, any watercourse alteration/relocation/channelization project that shifts the stream horizontally in any direction more than one bankfull width will require submittal and approval of a CLOMR from FEMA prior to permitting.
8. Adequate evidence of either direct ownership of the subject property or legal authority to act on behalf of the owner(s) of record;
9. Any additional information required by the County Engineer necessary to allow the review criteria in this Article 4-400 to be adequately evaluated.

C. **Completeness Review by the County Engineer.** Once an application for an FDP is filed, the County Engineer must review it for completeness.

1. The County Engineer may suspend processing an FDP application at any time at the request of the applicant or whenever the County Engineer determines that the application is not complete. The County Engineer may deem the application incomplete, based on the application submittal requirements, at the County Engineer's initiative or at the request of a referral agency. In the event that the County Engineer deems an application incomplete, the County Engineer mustwill immediately notify the applicant of the shortcomings. Once the requested information has been provided, the application must be deemed filed as of that date and the County Engineer mustwill proceed to process the application and render a decision. If an application is not deemed complete within six months of the date of suspension, the County Engineer may declare the application withdrawn. The six month time frame may be extended should the County Engineer determine that circumstances beyond the control of the applicant prevent a timely completion of the application.

D. **Application Review Criteria.** In reviewing an application for a Floodplain Development Permit, the County Engineer must first determine the specific flood hazard at the site in accordance with 4-403 and evaluate the suitability of the proposed use or development in relation to the flood hazard. The County Engineer must then consider the following factors in reviewing Individual FDP applications:

1. the effect of the proposal upon the efficiency or capacity of the Floodway;
2. the effect on lands upstream, downstream and in the immediate vicinity of the development including, without limitation, utility and transportation facilities;
3. the probability that the proposal will result in unreasonable risk of harm to people or property – both onsite and in the surrounding area – from natural hazards;
4. the effect of the proposal on the flood profile and flood heights;
5. the effect of the proposal on any tributaries to the main stream, drainage ditches, water supply and irrigation ditches, storm drainage facilities, reservoirs, or any other drainage or irrigation facilities or systems;
6. the relationship of the proposed development to the flood management program for the area in question, including whether additional public expenditures for flood protection or prevention will be necessary;
7. whether the applicant would obtain an undue advantage compared to later applicants who might request a permit;
8. whether the proposed use is for human occupancy;
9. the susceptibility of the proposed facility and its contents to flood damage;
10. the safety of access to the property in times of flood for ordinary and emergency vehicles;
11. whether any proposed changes in a watercourse will have an environmental effect on the watercourse, including streambanks and streamside trees and vegetation;

12. the alignment of the proposed development with the Boulder County Comprehensive Plan, Watershed Master Plans, and any other planning-related documents pertaining to development in Boulder County;
13. whether the cumulative effect of the proposed development with other existing and anticipated uses will increase flood heights more than the allowances specified in 4-404(A);
14. whether the heights and velocities of the floodwaters expected at the site will adversely affect the development of surrounding property; and
15. whether additional flood protection is necessary based on historical flood evidence, increased development upstream, or other flood-related hazards such as flash flooding, debris flows, rockfalls, mudslides, landslides, avalanches, channel avulsions, alluvial fan hazards, erosion and deposition of material, debris dams, ice jams, and high flood depths or velocities.

~~2.1. **Encroachments Prohibited; Exceptions.** Encroachments within the adopted FEMA Floodway, other than those listed in 4-404(C), are prohibited, unless it has been demonstrated through hydrologic and hydraulic analyses performed by a qualified P.E. licensed in Colorado and in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the Base Flood (a No Rise Certification).~~

~~a. Under the provisions of 44 CFR Chapter 1, Section 65.12, of the NFIP Regulations, a community may permit encroachments within the adopted FEMA regulatory Floodway that would result in an increase in BFEs if the applicant first receives an approved CLOMR and/or Floodway revision from FEMA.~~

~~1. Where there is a designated FEMA Floodplain but no designated FEMA Floodway, and there is a designated County Floodway, projects that result in increases greater than 0.5 foot in these areas must first receive an approved CLOMR from FEMA, and projects that result in increases between 0.0 and 0.5 foot in these areas must first receive an approved Boulder County CLOMR from the County Engineer.~~

~~b.a. Where there is no designated FEMA Floodplain, but there is a designated County Floodway, projects that result in any increase in these areas must first receive an approved Boulder County CLOMR from the County Engineer.~~

~~e.a. Where there is a designated FEMA Floodplain, and no FEMA or County Floodway, projects that result in increases greater than 0.5 foot must first receive an approved CLOMR from FEMA.~~

~~d.a. Where there is no designated FEMA Floodplain, but there is a designated County Floodplain (but not a County Floodway), the procedure set forth in 4-404(C) must be followed.~~

~~e.a. For all new subdivision proposals and other developments (including, but not limited to, manufactured home parks) greater than either 50 lots or 5 acres that are located in Zone A, this analysis must also depict, as a part of the~~

~~development proposal, the BFEs that Boulder County will use to determine FPEs for the proposed development.~~

~~f.a. In all instances, no increases in water surface elevation will be allowed that impact an insurable building.~~

~~2. Following project completion, FEMA Floodway encroachments that result in water surface elevation changes greater than those allowed under 4-404(C) must apply for a map revision from FEMA. See 44 C.F.R. Part 65.~~

E. Procedures for Modeling Proposed Development within the Floodway.

1. Unless one or more requirements below are modified by the County Engineer for good cause shown by the applicant, for all projects confirmed to be wholly or partially within the Floodway the applicant must submit an engineering report, including a Floodway analysis certified by a qualified engineer licensed in Colorado using the same type of model that was used to establish the current regulatory flood hazards. Applicants may obtain a copy of the applicable floodplain model from Boulder County. Models that differ from the type used to establish the regulatory flood hazards must first be approved for use by the County Engineer.
2. Modeling submitted to Boulder County in support of an Individual FDP must include the following:
 - a. Duplicate Effective (Regulatory) Model. This model is necessary to confirm that the regulatory water surface elevations can be reproduced to within 0.5 foot. When Boulder County regulates flood hazards that are more conservative than those identified by FEMA, it is the model that is associated with the Boulder County Floodplain.
 - b. Corrected Effective Model. The model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections, or incorporates more detailed topographic information than that used in the current effective model. Floodway limits should be manually set at the new cross-section locations by measuring from the effective FIRM. The cumulative reach lengths of the stream should also remain unchanged. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model.
 - c. Existing, or Pre-Project Conditions Model. The applicant must revise the duplicate effective or corrected effective model to reflect any modifications (including man-made encroachments) that have occurred within the floodplain since the date of the effective model but prior to construction of the proposed project. If no modifications have occurred since the date of the effective model, then the model would be identical to the duplicate effective or corrected effective model, and only one of these models is required. The results of this existing conditions analysis will indicate the 100-year elevations to be used for comparison to proposed conditions at the project site.

d. Proposed or Post-Project Conditions Model. The applicant must then modify the existing conditions model (or duplicate effective, or corrected effective, as appropriate) to reflect the proposed project. -The overbank roughness coefficients should remain the same unless a reasonable explanation of how the proposed project will impact roughness values is provided, with supporting data. -The results of this analysis will indicate the 100-year elevation for proposed or post-project conditions at the project site. -These results must demonstrate no impact (measured as 0.00) to the 100-year water surface elevations when compared to the existing conditions model (referred to as a “No-Rise Certification”).

(i) Should this comparison result in water surface elevation increases that cannot be mitigated through project design changes, then the provisions of 4-404.~~(C)(2)(D)(1)~~~~above~~(a) must apply.

e. All models must use the most current regulatory hydrology.

4-405 Flood Protection Measures

Flood Protection Measures apply to development within the FO District in Zones AE, A, AO, and AH.

- A. **Flood Protection Elevation** (~~“FPE”~~), (“FPE”). For the purposes of this section, the Boulder County FPE is equal to the following:
1. In areas depicted as Zone AE in the FO District, the FPE is equal to the BFE plus 2 feet. The BFE is the elevation of the 1%-annual-chance (typically referred to as 100-year) flood. In other words, it is the flood that has a 1% chance of occurring in any given year.
 2. In areas depicted as Zone A in the FO District, the following applies:
 - a. As required by 44 CFR 60.3(b)(4), Boulder County must obtain and reasonably utilize BFE and water surface elevation information from local, state, federal, or other reliable sources
 - b. In those Zone A areas where a BFE can be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 2 feet above the calculated BFE
 - c. In those Zone A areas where a BFE cannot be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 3 feet above the highest grade in the area of the proposed development.
 - (i) For buildings, the FPE will be 3 feet above the highest grade within the proposed building footprint, or the highest grade adjacent to the exterior of the existing building, unless the applicant supplies information sufficient to determine a BFE and subsequent FPE for the building, including data submitted as a part of identifying the Floodway boundary pursuant to the Floodway definition in 4-414.
 3. In shallow flooding areas (Zone AO), the FPE is equal to:
 - a. Two feet above the specified flood depth; or
 - b. If no flood depth is specified, 3 feet above the highest grade that exists within the proposed building footprint.

B. General Requirements

1. All development in the FO District must be adequately protected from flooding according to the requirements of this section.
2. No person may store or process materials Prior to submitting an application, applicants shall confirm with the County Engineer all conforming and nonconforming structures and uses on the subject property. Improvements to conforming structures and buildings must meet all applicable requirements in section 4-405. Improvements to nonconforming structures and buildings must meet all applicable requirements in section 4-413.

~~2.3.~~ Materials that are buoyant, flammable, hazardous, toxic, or explosive, or that in times of flooding could be harmful to human, animal, or plant life, may not be stored or processed except at or above the FPE, unless the materials are stored in accordance with 4-405(~~H~~) governing storage tanks.

~~3.4.~~ All construction (including ~~new construction~~ New Floodplain Construction as well as improvements below the FPE) must be built with materials and utility equipment resistant to flood damage up to the FPE.

~~4.5.~~ All new and replacement water supply systems must be designed to minimize or eliminate infiltration of flood waters into the system.

~~5.6.~~ Lateral additions to any residential building must be elevated to the FPE and adequately anchored to prevent flotation, collapse, or lateral movement of the addition resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.

~~6.7.~~ Lateral additions to any commercial or accessory building or structure must be adequately protected from flooding in accordance with 4-405(C)(3)(a) and 4-405(C)(3)(b), respectively.

C. New Floodplain Construction

1. General Requirements

- a. All New Floodplain Construction must be built using methods and practices that minimize flood damage.
- b. New Floodplain Construction in the Floodway is prohibited.
- c. New Basements in the Flood Fringe are prohibited.
- d. All New Floodplain Construction must be designed and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, and must be certified by a P.E. registered in the State of Colorado that they have been constructed to withstand such forces and are adequately protected from flooding up to the FPE;
- e. New buildings or other structures must be placed with their longitudinal axes parallel to the predicted direction of flow of flood waters or be placed so that their longitudinal axes are on lines, parallel to those of adjoining structures, to the extent consistent with other provisions of this code. This is intended to minimize the obstruction to flow caused by a building or structure.
- f. New service equipment, including, but not limited to, electrical, heating, ventilation, plumbing, and air conditioning equipment, must be located at or above the FPE.

- g. New Floodplain Construction in Zone AO or AH must be accompanied by site/property grading to accommodate drainage of floodwaters around the perimeter of the building in a controlled manner, without adversely impacting adjacent properties.
- h. New Floodplain Construction on a property removed from the floodplain by issuance of a LOMR-F from FEMA must have the Lowest Floor elevated to or above the FPE that existed prior to the placement of fill.

2. Residential Buildings

- a. All new residential buildings constructed in the Flood Fringe or within Zones A, AO, or AH must have their Lowest Floors (including Basements, porches, and decks), as well as any and all service equipment (excepting the necessary connections to public utility), elevated to the FPE, either by the placement of fill or by construction on elevated foundation walls.
- b. Fully enclosed areas below the lowest floor of a building in the FO District must be used solely for parking of vehicles, building access, or storage of materials. These areas must be designed to equalize the hydrostatic pressure flood forces on exterior walls by allowing for the entry and exit of floodwaters (known as “Wet Floodproofing”). Designs for meeting this requirement must either be certified by a registered Professional Engineer or must meet or exceed the following minimum criteria:
 - (i) A minimum of two openings on at least 2 walls having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding must be provided;
 - (ii) The bottom of all openings must be no higher than one foot above grade; and
 - (iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
- c. Attached garages may be constructed at-grade but must comply with 4-405(C)(2)(b) above. Openings are permitted to be installed in garage doors; however, the garage door itself does not qualify as an opening for Wet Floodproofing purposes.

3. Non-residential Buildings. Non-residential buildings built in the Flood Fringe, or within Zones A, AO, or AH must conform with 4-405(C)(2) above, or must conform with the requirements below based on building type:

a. Commercial Buildings

- (i) Commercial buildings, including attendant and sanitary facilities and attached garages, must conform with 4-405(C)(2), or must be designed to be water-tight with walls substantially impermeable to the passage of water below the FPE.

- (ii) The building must be anchored to prevent flotation, collapse, or lateral movement.
- (iii) The building must be constructed using structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
- (iv) All flood protection measures for commercial buildings must be certified by a Colorado Registered Professional Engineer that the methods are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces, and other factors associated with the Base Flood. Such certification must also state the specific elevation (including vertical datum reference) to which the construction is protected from flooding.
- (v) For commercial buildings designed to be watertight, the FEMA Floodproofing Certificate for Non-Residential buildings should be completed, and must be reviewed and approved by the County Engineer.

b. Accessory Buildings and structures

- (i) Accessory buildings and structures, including but not limited to detached garages, sheds, barns, and any other structure considered accessory to the primary use or primary building, must conform with 4-405(C)(2) above, or may be constructed at grade but must meet the requirements of 4-405(C)(2)(b) above for fully-enclosed areas below the FPE, and are subject to the following conditions:
 - a. The building or structure must be used only for the parking of vehicles or storage of tools, materials, and equipment;
 - b. The building or structure must not be designed for or used as Habitable Space;
 - c. The accessory building or structure must represent a maximum investment of less than 10% of the value of the principal building on the property, or a maximum floor area of 600 square feet;
 - d. The building or structure must have low flood damage potential with respect to both the building and its contents; and
 - e. Permanently affixed appliances (such as furnaces, heaters, washers, dryers, etc.) are prohibited.
 - f. Prior to issuance of Certificate of Occupancy or final inspection, whichever occurs last, the property owner must execute a Non-Conversion Agreement and the County must record the agreement in the real estate

records. The agreement will be in the form of a restrictive covenant or other County approved binding instrument, where the benefits of the covenant run in favor of the County. The covenant must be drafted to run with the land and bind successors, in perpetuity. The purpose of the covenant is to document the current owner's understanding of the limitations on construction and use of the enclosed area in accordance with the provisions of this section ~~4—405(C)(3)(b)~~ (Accessory Buildings and Structures), and to put prospective purchasers on notice of such restrictions. The covenant will also reference retrofitting criteria necessary to properly convert accessory buildings or structures to habitable space, should the owner choose to do so. In addition to any other enforcement mechanisms available, violation of the agreement will be considered a violation of this Article 4-400 and subject to all applicable zoning enforcement procedures.

- (ii) Accessory structures that do not have at least two rigid walls, including but not limited to carports, gazebos, and picnic pavilions, may be constructed at grade and must use flood-resistant materials up to the FPE.
 - (iii) Accessory Dwelling Units (including detached garages designed with Habitable Space on the second floor) must meet the above requirements of ~~4—405(C)(2)~~ for residential buildings, which includes either elevation of the entire building above the FPE, or wet floodproofing of the lower level garage space.
- c. Agricultural Buildings and Structures. New Floodplain Construction of any Permanent agricultural building or structure in the Flood Fringe must be limited in use to agricultural purposes, in which the use is exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock. Types of buildings and structures that qualify under this section include farm storage structures (used exclusively for the storage of farm machinery and equipment), grain bins, corn cribs, and general purpose barns/loafing sheds.
- (i) The building or structure must not be designed for or used as Habitable Space;
 - (ii) The building or structure must be wet-floodroofed according to ~~4—405(C)(2)(b)~~.
 - (iii) Service equipment must be elevated to the FPE, unless elevation of such equipment impedes its agricultural use.

- (iv) Permanent agricultural buildings or structures are prohibited in the Floodway.
- (v) Temporary agricultural buildings or structures are allowed in the floodway, but are required to be relocated outside of the FO District or deconstructed in the event of a flood warning. If relocation outside of the FO District is not possible, then relocation to the Flood Fringe will be allowed, so long as the temporary structure is properly anchored.

d. Crawlspaces. New ~~construction~~Floodplain Construction of any Below-Grade Crawlspace must:

- (i) Have the interior grade elevation, that is below BFE, no lower than two feet below the Lowest Adjacent Grade;
- (ii) Have the height of the Below-Grade Crawlspace measured from the interior grade of the Crawlspace to the top of the foundation wall, not to exceed four feet at any point;
- (iii) Have an adequate drainage system that allows floodwaters to drain from the interior area of the Crawlspace following a flood; and

~~(iv)~~ Meet the provisions ~~4—, 405(C)(1)~~, General Requirements.

~~D.~~ Existing Buildings

~~1. See 4-413 for requirements applicable to nonconforming structures and buildings.~~

~~(v)(iv) Improvements to conforming structures and buildings must meet all applicable requirements in section 4-405(B), (C), and (K).~~

~~E.D.~~ Critical Facilities

1. New Critical Facilities are prohibited in the regulatory floodplain below 6,000 feet (NAVD88) in elevation.
2. In the mountain canyons above 6,000 feet (NAVD88), new Critical Facilities in the FO District will be considered on a case-by-case basis, and may require special design or flood protection considerations, including considerations of hydrodynamic flood forces and flood-induced erosion.
3. Improvements to existing Critical Facilities that are determined to be Substantial Improvements (~~in accordance with 4—~~) require that the entire facility (including attendant utility and sanitary facilities) be elevated to the Boulder County FPE₇ or, if not prohibited elsewhere in this code, be retrofitted such that the building is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads, including the effects of buoyancy.

~~F.E.~~ Manufactured Home Parks

1. General Requirements. All manufactured homes must be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated to the FPE and anchored to resist floatation, collapse, or lateral movement. All requirements below are in addition to applicable state and local requirements, including those to address wind loads.
2. For new parks commenced on or after February 1, 1979; expansions to existing parks; existing parks where the value of the repair, reconstruction, or improvement of the streets, utilities, and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement has commenced; an existing park on which a manufactured home has incurred Substantial Damage; manufactured homes to be placed or substantially improved on sites in existing parks; and for manufactured homes not placed in a park:
 - a. Stands or lots must be elevated on compacted fill or on pilings so that the lowest floor of the manufactured home will be at or above the FPE. For homes placed on pilings:
 - (i) lots must be large enough to permit steps;
 - (ii) piling foundations must be placed in a stable soil no more than ten feet apart; and
 - (iii) reinforcements must be provided for pilings more than six feet above the ground level.
 - b. Adequate surface drainage must be provided.
 - c. New manufactured homes must be anchored by providing over-the-top and frame ties to ground anchors as well as the following:
 - (i) over-the-top ties at each of the four corners, with two additional ties per side at intermediate locations, with the exception of manufactured homes less than 50 feet long which require only one additional tie per side;
 - (ii) frame ties at each corner with five additional ties per side at intermediate points, with the exception of manufactured homes less than 50 feet long which require only four additional ties per side;
 - (iii) all components of a manufactured home anchoring system must be capable of carrying a force of 4800 pounds; and
 - (iv) Any additions to the manufactured home be similarly anchored.

G.F. Recreational Vehicles

1. At least one of the following provisions must be met:
 - a. The recreational vehicle must be on the site for fewer than 90 consecutive days;

- b. The recreational vehicle must be fully licensed and ready for highway use;
or
- c. The recreational vehicle must meet the permit requirements and elevation and anchoring requirements for manufactured homes, in accordance with Section 4—~~405~~(E) of this section.

H.G. Onsite Wastewater Treatment Systems

1. For the purposes of this section, ~~“New OWTS”~~ “New OWTS” is the first OWTS installed on a parcel.
2. The location of new and replacement ~~On-site Wastewater Treatment Systems (OWTSs)~~ OWTS must be done in such a manner as to avoid impairment to or contamination from the systems during flooding.
 - a. Placement of a new OWTS in the FO District (including both Floodway and Flood Fringe areas) is prohibited, unless the County Engineer determines that placement in the Flood Fringe cannot be avoided, in which case priority must be given to those locations on the subject property where flood depths and/or velocities are the lowest, and to the optimal location of the water supply.
3. New OWTS
 - a. All Tanks, including Septic Tanks, for new OWTS in the FO District must be made of concrete.
 - b. Tanks must be adequately anchored to protect against buoyant forces associated with flooding and high groundwater, which is typical during flood conditions.
 - (i) Tanks that are installed within the Boulder County or FEMA 500-year floodplain should be anchored to protect against uplift from high groundwater. Where the 500-year floodplain is not shown, the anchoring requirement will apply if the lowest elevation of the tank is at or below the 100-year base flood elevation adjacent to the tank location.
 - (ii) Boulder County requires that the FEMA-recommended calculation for determining buoyant forces (contained in FEMA P-348, or the latest FEMA guidance document covering building utilities) be used to adequately design buoyancy countermeasures. The equation is as follows:

$$F_b = 0.134V_t\gamma FS$$

Where:	F_b	is the buoyancy force exerted on the tank, in pounds.
	V_t	is the volume of the tank in gallons.
	0.134	is a factor to convert gallons to cubic feet.
	γ	is the specific weight of flood water surrounding the tank (generally 62.4 lb/ft ³ for fresh water and 64.1 lb/ft ³ for salt water.)
	FS	is a factor of safety to be applied to the computation, typically 1.3 for tanks.

- c. Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of septic effluent.
- d. Raised Soil Treatment Areas are required, and must be designed such that the base of the distribution layer is a minimum of 2 feet above existing grade
- e. Connections to the house must be fitted with backflow prevention, unless it is demonstrated in the permit application that the connection pipe rises above the calculated FPE for the site.
- f. With the exception of the Soil Treatment Area, earthwork necessary for system installation must not exceed pre-construction grade.
- g. While not required, backup generators are recommended for any system fitted with electric pumps or controls.

4. Repair/Replacement OWTS

- a. For any OWTS in the Flood Fringe that requires replacement, the system must meet the requirements of ~~4-405(G)(3)~~. 405(G)(3).
- b. ~~For~~ In addition to the requirements of 4-405(G)(4)(a), for any repair or replacement of an existing OWTS in the Floodway the County Engineer must determine that the proposed repair/replacement is consistent with Subsections ~~(i-)~~ through ~~(iii-)~~, below.
 - (i) The property owner has demonstrated that connection to a central sewer system is not feasible by:
 - a. Providing a letter of denial from the closest sewer provider; or
 - b. Demonstrating other reasons why connection is not feasible, such as that there is no central sewer system reasonably close to the property or building to be served, or that easement restrictions exist that effectively prohibit connection. For properties within a Community Service Area, connection will be deemed not feasible if the cost of connection exceeds 25% of the most recent assessed value of the subject property.

- (ii) The proposed repair or replacement design must be protective of groundwater and appropriate for a Floodway. In making a proposal to the County Engineer, the applicant must address the following factors, among other pertinent information:
 - a. Whether it is practical to remove outbuildings or non-conforming additions to allow for increased soil availability so that the proposed repair or replacement can be located outside of the Floodway;
 - b. Whether there is room for an at-grade recirculating sand filter, or similar treatment media, and the required absorption area;
 - c. Whether placement in the hydraulic shadow of a legal, existing structure is possible.
- (iii) In no event must a proposed repair or replacement increase the overall capacity of the existing OWTS, unless the expansion is necessary to meet the Boulder County OWTS Regulations, as administered by the Boulder County Public Health Department. In addition, the County Engineer may approve a raised absorption system or installation of a vault only as a last option within the Floodway and provided that this option meets the provisions of Article 4—~~413~~ (Nonconforming Uses).

I.H. Liquid Propane Gas (LPG) or Other Similar Storage Tanks

1. Placement of a new or replacement LPG or other similar storage tanks in the FO District is prohibited, unless the County Engineer determines that placement in the FO District cannot be avoided, in which case location decisions must prioritize those portions of the subject property where flood depths and/or velocities are the lowest, including, but not limited to the conveyance shadows of existing buildings.
2. When allowed, above-ground tanks must be placed on a concrete pad that extends to or above the FPE and is sufficiently-anchored. If elevation of the tank conflicts with IBC requirements, the IBC requirements must prevail; however, in all cases, sufficient protection must be provided to the tank such that it resists the expected hydrostatic and hydrodynamic flood forces.
3. When allowed, underground tanks must be designed and installed to resist the effects of buoyancy during high groundwater or flooding conditions. Buoyancy calculations must assume an empty tank and must use the same calculation outlined for Septic Tanks in 4—~~405(G)(3)~~ above. Anchoring of the tank is required if the empty tank alone will not counteract the calculated buoyant force.
4. All connections and components related to the tank or fuel system must be designed such that floodwaters cannot infiltrate or accumulate within any component of the system.

- a. Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of tank contents, or must extend above the FPE.
- b. Tanks located inside of a building must also meet all of the requirements of this section.

J.I. Historic Buildings and Structures Exempt. The repair or rehabilitation of buildings or other structures designated as historic through either the Boulder County Historic Landmark process or through a State of Colorado or national historical registry process is exempt from Flood Protection Requirements under Section 4-~~404~~.405. Entitlement to such an exemption requires the applicant to show:

1. Documentation that the building or structure is designated as a historic building or structure as defined by Article 18-203A; and
2. Documentation that confirms that the proposed work will not preclude the structure's continued historic designation.

K.J. Elevation Certificate Requirements

1. As built Lowest Floor Elevations (referenced to the NAVD88 datum) for all New Floodplain Construction, Substantial Improvements, other improvements, or for new manufactured home stands, must be certified by a Colorado Registered Professional Engineer or Colorado Registered Professional Land Surveyor. Elevation Certificates must be submitted to the Building Division Inspector and County Engineer twice over the duration of the project. Failure to submit an Elevation Certificate will result in a Stop Work Order until proper certification is provided. To ensure compliance with flood protection requirements during and after construction, completed Elevation Certificates must be submitted at the following times:
 - a. For slab-on-grade foundations, a FEMA Elevation Certificate must be submitted prior to final pour of foundation when foundation forms are completed.
 - b. For buildings on elevated foundations, such as extended foundation walls, stem walls, or piles, a FEMA Elevation Certificate must be submitted prior to rough framing when the foundation is completed.
 - c. For all buildings that have achieved finished construction, a final FEMA Elevation Certificate must be submitted prior to the issuance of Certificate of Occupancy or final inspection.
2. To convert another elevation reference datum to NAVD88, applicants are directed to datum conversion factors within the current effective FEMA FIS report for Boulder County, or to an online datum conversion program. Assumptions used for the datum conversion must be explicitly described to Boulder County on the Elevation Certificate. For datum requirements for permit submittals, see 4-404.2(B).

4-406 County Engineer's Determination

- A. If the County Engineer finds in reviewing an Individual FDP application that the application meets the applicable standards set forth in Article 4-400, the County Engineer must approve the permit.
- B. If the County Engineer finds that the application can only meet all applicable standards if the FDP approval is conditioned, then the County Engineer must include all necessary and reasonable conditions when issuing the permit. Such conditions may include, but are not limited to, periods of operation, operational controls, sureties, deed restriction, and adequate flood protection. The County Engineer must specify when the conditions must be met.
- C. If the County Engineer finds that the application does not meet one or more applicable standards and that a reasonable basis for mitigation measures has not been demonstrated, the County Engineer must deny the application as proposed. The County Engineer's determination must specify the reasons for the denial based upon the FDP review criteria in Section 4-404.2(~~C~~)(2D).
- D. Any determination by the County Engineer to approve, conditionally approve, or deny a FDP must be in writing and mailed or otherwise provided to the applicant.
- E. For purposes of appeal to the Board of Adjustment, the County Engineer's determination will be deemed final as of the date the FDP is issued. The applicant may begin work under an issued permit as of the date the permit is issued. If an applicant begins work during the 30-day appeal period to Board of Adjustment, the applicant does so at their own risk, as some or all of the work may need to be modified or removed at the applicant's expense if the Board of Adjustment overturns the County Engineer's decision to issue the permit.

4-407 Review of Permits Approved in Floodway

- A. In the event that the County Engineer determines that an Individual FDP application for any development in the Floodway meets the applicable standards for approval, within five business days of permit issuance the County Engineer must publish a notice of the proposed use and the permit issuance on the Boulder County website and transmit a copy of the notice to property owners adjacent to the subject property as well as a description of the process for appealing the decision to the Board of Adjustment.
- B. The County Engineer may waive or modify any requirement in 4-407(A) for the following Floodway development:
 - 1. Emergency activities required for the immediate protection of life, safety, or property, or to restore essential public services,
 - 2. Minor disaster recovery repair work that does not cause a rise in predicted 100-year water surface elevation as determined by a qualified engineer licensed in Colorado, and
 - 3. Any development activities that take place entirely inside an existing building.

4-408 Appeal of County Engineer Determination

- A. **Right to Appeal.** Any person aggrieved by a final written decision of the County Engineer based upon or made in the course of the administration or enforcement of the provisions of this Article 4-400 may appeal to the Board of Adjustment.
- B. **Appeal Application.** The procedures and requirements for filing an appeal may be found in Article 3 and in particular section 3-202(A)(1).
- C. **Public Hearing.** Upon receipt of a complete appeal application, the Board of Adjustment must hold a public hearing on the appeal application following the procedures specified in section 3-205(A).
- D. **Review Criteria.** In deciding upon an appeal of a County Engineer administrative decision or interpretation made under this Article 4-400, the Board of Adjustment must consider the factors specified in Section 4-1200(A)(1) as well as the additional factors listed below:
 - 1. the technical meaning of the provision being appealed;
 - 2. evidence as to the past interpretation of the provision;
 - 3. the principles of interpretation and rules of construction in Article 1 of this Code;
 - 4. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;
 - 5. the danger that materials may be swept onto other lands to the injury of others;

6. the danger to life and property due to flooding or erosion damage;
7. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
8. the importance of the services provided by the proposed facility to the community;
9. the necessity to the use or structure of a waterfront location, where applicable;
10. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;
11. the compatibility of the proposed use or structure with the existing and anticipated development;
12. the safety of access to the property in times of flood for ordinary and emergency vehicles;
13. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;
14. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and
15. the purposes of this Article 4-400.

E. **Decision of the Board.** The Board of Adjustment must make a record of its decision on the appeal in the same manner as other BOA appeals filed under Article 4-1200. The County Engineer must maintain records of the outcome of all appeals filed.

F. Effect of Decision.

1. In no instance can a decision on an appeal to the Board of Adjustment result in a modification to the DFIRM. In order to modify the regulatory boundaries established by FEMA, interested parties must use FEMA's LOMC process or consult FEMA on other options for modification.
2. In no instance can a decision on an appeal to the Board of Adjustment result in a modification to the lateral extent of the Boulder County Floodplain. In order to modify the regulatory boundaries established by the County, the owner must request a rezoning map amendment under the procedures of 4-1100.

4-409 Variances

- A. **Right to Request Variance.** Any person may request the Board of Adjustment grant a variance from the requirements in this Article 4-400 subject to the terms and conditions in this section 4-409.
- B. **Variance Application.** The procedures and requirements for filing a request for a variance may be found in Article 3 and in particular section 3-202(A)(19).
- C. **Public Hearing.** Upon receipt of a complete variance application, the Board of Adjustment must hold a public hearing on the request following the procedures specified in section 3-205(A).

D. Limitation on Board's Authority.

- 1. In deciding upon a variance request made under this Article 4-400, the Board of Adjustment must comply with the limitations on its authority specified in section 4-1202(B)(1).

- 2. Variances may be issued for New Floodplain Construction of and Substantial Improvements to residential buildings on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing buildings constructed below the FPE, but only if the criteria in section 4-409(E) below are met and subject to the following:

- a. Such a variance may not be issued within any designated Floodway.

- b. Any applicant to whom such a variance is granted must be given written notice that the building will be permitted to be built with a Lowest Floor Elevation below the FPE and that the cost of flood insurance will be commensurate with the increased risk associated with the reduced Lowest Floor Elevation.

D-E. Review Criteria.

- 1. To grant a variance of a requirement imposed under this Article 4-400, the Board must find that all of the following criteria have been satisfied:
 - a. the strict application of this Code would create an exceptional or undue hardship upon the property owner;
 - b. the hardship is not self-imposed;
 - c. the variance, if granted, will not adversely affect the use of adjacent property as permitted under this Code;
 - d. the variance, if granted, will not change the character of the underlying zoning district in which the property is located, and is in keeping with the intent of this Code and the Boulder County Comprehensive Plan;
 - e. the variance, if granted, does not adversely affect the health, safety, and welfare of the citizens of Boulder County and is in accordance with the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development;

- f. the variance is the minimum necessary, considering the flood hazard, to afford relief;
 - g. the variance, if granted, will not result in increased flood heights, additional threats to public safety, or extraordinary public expenses; and
 - h. the variance, if granted, will not create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
2. Prior to granting a variance of a requirement imposed under this Article 4-400, the Board must also consider the following factors:
- a. the technical meaning of the provision being appealed;
 - b. evidence as to the past interpretation of the provision;
 - c. the principles of interpretation and rules of construction in Article 1 of this Code;
 - d. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;
 - e. the danger that materials may be swept onto other lands to the injury of others;
 - f. the danger to life and property due to flooding or erosion damage;
 - g. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
 - h. the importance of the services provided by the proposed facility to the community;
 - i. the necessity to the use or structure of a waterfront location, where applicable;
 - j. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;
 - k. the compatibility of the proposed use or structure with the existing and anticipated development;
 - l. the safety of access to the property in times of flood for ordinary and emergency vehicles;
 - m. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;
 - n. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and

o.the purposes of this Article 4-400.

~~3. Variances may be issued for new construction of and Substantial Improvements to residential buildings on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing buildings constructed below the FPE, so long as the criteria in section 4-409(E) above are met and subject to the following:~~

~~a. As the lot size increases beyond the one-half acre, the technical justifications required for issuing the variance increases.~~

~~b. This type of variance may not be issued within any designated Floodway~~

~~a. Any applicant to whom such a variance is granted must be given written notice that the building will be permitted to be built with a Lowest Floor Elevation below the FPE and that the cost of flood insurance will be commensurate with the increased risk associated with the reduced Lowest Floor Elevation.~~

~~E.F.~~ **Decision of the Board.** The Board must approve, conditionally approve, or deny the variance request. The Board may attach such reasonable conditions to the granting of variances as it deems necessary to further the purposes of this Article 4-400. The Board must make a record of its decision on the variance in the same manner as other BOA requests for variances filed under Article 4-1200. The County Engineer must report variances granted on an annual basis to FEMA.

~~F.G.~~ **Conflicts with 4-1200.** If a conflict arises between the requirements of this Section and the provisions of Section 4-1200, Board of Adjustment, the requirements of this Section control.

4-410 Final Inspection

All approved Individual FDPs are subject to final inspection by the County Engineer or his designee to verify that all conditions of approval have been satisfied.

4-411 Permit Expiration

An approved Individual FDP expires two years after the date of issuance if the permittee has not commenced construction under the permit.

4-412 Amendments to an Approved Individual FDP

Any proposal to change the nature or extent of work approved under an issued Individual FDP approved under this Article must require a request to the County Engineer to determine whether the proposed change constitutes a Substantial Modification to the approved plan. If the County Engineer determines that the change constitutes a Substantial Modification, no such change must be allowed to proceed until an application to amend the approved Individual FDP is filed with the County Engineer and approval granted in accordance with this Article. Any new application is subject to the Code in effect at the time of complete application. The applicant or its successor may appeal the County Engineer's decision to require an amended Individual FDP to the Board of Adjustment, provided that any such appeal must be in writing and must be filed with the County Engineer no later than 30 days following the date of the County Engineer's decision to require an FDP amendment.

4-413 Nonconforming Structures and Uses in the FO District

A. Principles of Construction. This Section is to be read in conjunction with Section 4-1000 (Nonconforming Structures and Uses). This section does not supersede 4-1000 in its entirety; rather, it establishes additional requirements for nonconforming structures and uses located in the FO District. If a conflict arises between the requirements of this Section 4-413 and the provisions of Section 4-1000, the requirements of this Section 4-413 control.

B. Nonconforming Structures, Generally.

1. Any building or structure within the FO District that was lawfully established before the adoption or amendment of this Article 4-400 but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1002.
2. Owners of existing nonconforming insurable buildings must track major repairs, remodeling, additions, and other improvements to determine when such work would constitute a Substantial Improvement. FEMA's minimum requirements for the tracking of improvements and repairs within the Substantial Improvement/Substantial Damage Desk Reference (FEMA P-758), dated May 2010, as amended, is incorporated herein by this reference. Estimates for repair of damage that include additional improvement costs must apply the pre-damaged market value of the building to the sum of the repair and improvement costs.
3. If an amendment to the Official Map or this Article results in a higher BFE such that a building becomes nonconforming, the higher BFE will apply to all subsequent permit applications. All work proposed subsequent to the higher BFE must be evaluated to confirm whether it will be a Substantial Improvement.

C. Nonconforming Structures in the Flood Fringe.

1. A nonconforming building or structure (whether residential or non-residential) in the Flood Fringe may not be expanded, improved, repaired, relocated, restored, or replaced unless the work complies with this section.
2. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe proposes a Substantial Improvement or repair of Substantial Damage, the owner shall complete the following steps in the following order:
 - a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.
 - (i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.
 - (ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

(iii) Relocation to less hazardous locations is strongly encouraged, but not required.

(iv) If a nonconforming building or structure is relocated to a less hazardous location, the retrofitting requirements below may be reduced or eliminated at the discretion of the County Engineer.

b. Retrofitting Existing Buildings.

(i) The entire building or structure must be brought into compliance with the flood protection measures described in section 4-405.

(ii) All Flood Fringe retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).

3. Work on a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

D. Nonconforming Structures in the Floodway. A nonconforming building or structure (whether residential or non-residential) in the Floodway may be improved or repaired only if it complies with all of the following:

1. A nonconforming building or structure (whether residential or non-residential) in the Floodway may not be expanded by addition of square footage, footprint, or Habitable Space.
2. If the work to improve or repair a nonconforming building in the Floodway is the result of Substantial Damage to the building through a flood or other natural hazard event, the applicant will have five years from the date of loss to begin the work. At the expiration of the five-year period, the applicant may petition the County Engineer for a single one-year extension.
3. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Floodway proposes a Substantial Improvement or repair of Substantial Damage, the owner shall complete the following steps in the following order:

a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.

(i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.

(ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

- (iii) Permanent removal of encroachments in the FEMA or Boulder County Floodway may qualify the owner for bonus Transferable Development Credits pursuant to section 4-1303.
- (iv) Relocation to less hazardous locations is strongly encouraged, but not required.
- (v) If a nonconforming building or structure is relocated to a less hazardous location, the retrofitting requirements below may be reduced or eliminated at the discretion of the County Engineer.

b. Retrofitting Existing Buildings.

- (i) In addition to requiring conformance with the flood protection measures in section 4-405, the County Engineer shall require one or more of the following retrofitting techniques to protect at the entire residential building or structure from flood inundation as well as scour and erosion, debris impact, and other potential hazards associated with floodways:
 - 1) Elevation using Posts, Columns, or Piles
 - i. Posts or columns must be placed in drilled or excavated holes or piles must be driven into the ground.
 - ii. Posts or columns must be encased in concrete and include a footer.
 - iii. Posts, columns, and piles must be sufficiently anchored to resist the expected hydrodynamic and hydrostatic flood forces.
 - iv. Access may be allowed to extend below the FPE.
 - 2) Elevation using stem walls parallel to the direction of flow
 - i. Water must be allowed to flow freely at high velocities between stem walls.
 - ii. Footers must be designed and installed to account for potential scour associated with flooding.
 - 3) Other techniques proposed by the applicant as determined by the County Engineer on a case-by-case basis.
- (ii) In all cases, the bottom of lowest horizontal structural member (floor joists) as well as all service equipment must be above the FPE.
- (iii) In all cases, a continuous load path from the retrofitted foundation to the elevated portion of the home is required.
- (iv) For non-residential buildings, the applicant must first consider the retrofit requirements for residential buildings in this subsection, but at a minimum, the requirements of 4-405(C) apply.

(v) All Floodway retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. In addition to the Elevation Certificate requirements of 4-405(~~KJ~~), residential building retrofit projects require completion of the Boulder County Residential Floodway Retrofit Certificate. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).

4. Work on a nonconforming building or structure (whether residential or non-residential) in the Floodway that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

E. Nonconforming Uses.

1. The use of any structure or property within the FO District that was lawfully established before the adoption or amendment of this Article 4-400, but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1003.
2. A change in use (as uses are defined in Article 4-500) of a structure will require that the entire structure be flood-protected pursuant to Section 4-405; provided, however, that the County Engineer may modify or waive flood protection requirements for a change in use based on good cause shown by the applicant that all of the following conditions are met:
 - a. The entirety of the existing structure is located outside of the Floodway;
 - b. The existing structure is determined to be structurally sound by a qualified engineer licensed in Colorado;
 - c. The ~~cost~~value of ~~compliance~~any work associated with ~~this Article 4-400~~the change of use is less than 50% of the current value of the structure;
 - d. The proposed change in use is to a use that is permitted in the zone district applicable to the property;
 - e. The proposed change in use is to a use that reduces, minimizes, or otherwise creates a less intensive use or decreases human occupation; and
 - f. There is no other potential for any significant conflict with this Article 4-400.

4-414 Definitions

Accessory Building or Structure. A building or structure which is on the same parcel of property as a principal or primary building and the use of which is incidental to the use of the principal or primary building. Examples include, but are not limited to, detached garages (but NOT ADUs), storage sheds, barns, boathouses, and pavilions.

Alteration of a Watercourse. Through man-made work, changing the the bankfull channel such that the post-project location, orientation, or flow direction of said channel extends three or more bankfull channel widths from the pre-project channel location, or outside of the pre-project regulatory floodplain.

Article 4-400. Sections 4-400 through 4-416 of the Boulder County Land Use Code.

Basement. Any area of a building having a finished floor subgrade on all sides, ~~whereas~~where the finished floor is greater than four feet below the top of the foundation walls or greater than 2 feet below the Lowest Adjacent Grade.

Below-Grade Crawlspace. The interior space between the elevated finished floor of a building and the finished interior grade, ~~whereas~~where the finished grade is no greater than 4 feet below the top of the foundation walls and no greater than 2 feet below the Lowest Adjacent Grade.

Crawlspace. The interior space between the elevated finished floor of a building and the interior finished grade.

Critical Facilities. ~~See CWCB definition. A structure or related infrastructure, but not the land on which it is situated, as specified in CWCB's Rules and Regulations for Regulatory Floodplains in Colorado at 2 CCR 408-1:6, 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.~~

Effective Date. ~~See FEMA definition.~~

Habitable Space. An enclosed area having more than 20 linear feet of finished interior walls (paneling, etc.) or used for any purpose other than solely for parking of vehicles, building access or storage.

Flood Fringe. The portions of the Floodplain Overlay District that are not in the Floodway.

Floodway. The floodway depicts the most hazardous portion of the floodplain, where flood depths and velocities are greatest and damages resulting from flooding are the most catastrophic. As such, Boulder County's development restrictions in the floodway are stricter than those within the Flood Fringe. In Boulder County, Floodway means:

1. Those portions of the FO District required for the passage or conveyance of the base flood in which waters will flow at significant depths or with significant velocities, including the channel of a river or other watercourse and any adjacent floodplain areas that must be kept free of development and other encroachments to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

- a. The Colorado statewide standard for the designated height to be used for all newly studied reaches is ~~six inches~~ 0.5 foot.
 - b. For existing Floodway delineations in previously studied reaches, the designated height is that in place at the time of the study. This information is on file with the County Engineer and available upon request. Letters of Map Revision to existing Floodway delineations may continue to use the floodway criteria in place at the time of the original delineation.
2. Areas identified as floodway by the Colorado Water Conservation Board or FEMA.
 3. In the foothill canyons and in any drainage above 6,000 feet (NAVD88) in elevation, as a result of the expected high flow velocities, with reference to the best terrain data available as of the last FO District update, (a) the entirety of the 1%-annual-chance (100-year) flood hazard area, or (b) as reflected on an engineering study approved by the County Engineer and available upon request.
 4. In Zone A or AE areas, where the proposed development does not involve buildings or structures, then in the absence of either a specific floodway designation by FEMA or an engineering study submitted by the applicant and approved in writing by the County Engineer, the Floodway is defined as the channel or flowpath of the river, stream, or other watercourse and areas of the floodplain where the product of flood depth (in feet) multiplied by flood velocity (in feet per second) is greater than four. This formula is derived from the 1987 Colorado State University flume study. Flow depth and velocity can be determined from a number of sources, including without limitation hydraulic modeling, water surface elevation information, terrain data, and flood risk products created specifically to display depth and/or velocity.
 5. Where the proposed development involves buildings or structures in the FO District and the floodway has not been previously identified, the Floodway is those portions of the FO District determined to be floodway by an engineering study submitted by an applicant and approved by the County Engineer as further described in Section 4-404.2(E).

In-Kind Replacement. For storm drainage systems and system components, replacement of any system or system component with the same system or component. In-kind Replacement does not include projects that will change the size or function of the system or component.

Letter of Final Determination. ~~See FEMA definition~~ A letter FEMA sends to the Chief Executive Officer of a community stating that a new or updated FIRM or DFIRM will become effective in 6 months. The letter also notifies each affected floodprone community participating in the NFIP that it must adopt a compliant floodplain management ordinance by the map effective date to remain participants in good standing in the NFIP.

Letter of Map ~~Change, Revision, Amendment.~~ ~~See (“LOMA”).~~ FEMA definition term meaning an amendment to the currently effective FEMA map, issued only by FEMA, which establishes that a property is not located in a Special Flood Hazard Area.

Letter of Map Revision (“LOMR”). FEMA term meaning an official amendment to the currently effective FEMA map, issued by FEMA, which changes flood zones, delineations and elevations.

Lowest Adjacent Grade. ~~See FEMA definition.~~ The lowest point of the ground level immediately next to a building.

Maintenance. Maintenance means any routine or regularly-scheduled activity undertaken to repair or prevent the deterioration, impairment, or failure of any utility, structure, or infrastructure component, ~~including.~~ Maintenance includes activities to restore or preserve function and/or usability of a storm drainage, water delivery, or ditch system. Such activities may include, without limitation, the removal or movement of sediment, debris, and vegetation, installation of erosion and sediment control devices, stabilization of stream channel and/or water delivery channel (ditch) banks, and the replacement of structural components, so long as the work ~~does not expand~~ substantially conforms to the previously-permitted most recent County-approved design, flow condition-, and vertical grade, as applicable. Maintenance does not include expansion or enlargement of a building or structure, Substantial Modifications, Substantial Improvements, total replacement of existing facilities, or total reconstruction of a facility.

Permanent. Any change or alteration expected to remain for a substantial period of time, but at a minimum will remain after permitted work is complete.

Soil Treatment Area. See Boulder County OWTS Regulations (April 2015), as amended.

4-415 Interpretation

Certain terms used in this Article 4-400 are derived from FEMA and/or CWCB regulations. The federal and state definitions of these terms may not correspond precisely to county definitions of the same or similar terms as used elsewhere in the Land Use Code and related local regulations such as the Building Code. To the extent a term is not defined in this Article 4-400, and a conflict or inconsistency in the meaning of the term cannot be resolved by the principles listed in sections 1-900 and 1-1000, the County Engineer must determine the meaning of the term by examining the following sources in the following order of priority:

1. The meaning of the term as defined in Article 4-400.
2. The meaning of the term as defined in Article 18 of this Code.
3. The meaning of the term as defined by FEMA. See 44 C.F.R. § 59.1, as amended.
4. The meaning of the term as defined by CWCB. See 2 C.C.R. 408-1:4, as amended.
5. The meaning of the term as defined elsewhere in this Code, or in another adopted Boulder County publication such as the Multimodal Transportation Standards, the Storm Drainage Criteria Manual, or the Stormwater Quality Management Permit Requirements.
6. The meaning of the term as defined in any other official document deemed a reliable source of authority given the context.

4-416 Enforcement

Upon receiving a complaint that a violation of the requirements of this Article 4-400 has occurred, the County Engineer is authorized to enforce compliance with these floodplain regulations in the same manner as other violations of the Land Use Code are enforced, as detailed in Article 17.

Changes to other parts of the Code

4-1202(C) – Board of Adjustment – Standards of Review

Replace current text with: “Additional requirements for appeals and variances under Section 4-400 of this Code (“Floodplain Overlay District”) are set forth in Section 4-408 and 4-409, respectively.”

4-800 – Site Plan Review

4-802 Applicability and Scope of the Site Plan Review Process for Development

A. Site Plan Review shall be required for (unless not required or waived pursuant to sections B and C below):

[...]

8. Any development or earthwork requiring a floodplain development permit.

B. Site Plan Review shall not be required for:

[...]

3. Restoration of a structure that has been damaged or destroyed by causes outside the control of the property owner or their agent provided the restoration involves the original location, floor area, and height. Such restoration must comply with the current provisions of the Boulder County Land Use Code other than 4-800 (also see Nonconforming Structures & Uses, Article 4-1002(D) and 4-1003(F)).

a. Such restoration must be commenced within six months after the date on which the structure was damaged or destroyed, or a latent defect discovered and completed within one year after the date on which the restoration commenced. This limitation may be extended in the case of extenuating circumstances as determined by the Director.

b. Replacement of bridges, box culverts or low-water crossings or other hydraulic structures spanning a creek or other drainage within a mapped floodplain under Article 4-400, may also be exempt from Site Plan Review under this Subsection 3., subject to administrative approval by the County Engineer for compliance with the Boulder County Storm Drainage Criteria Manual. The County Engineer may impose conditions on the construction to assure basic safety, including but not limited to requiring construction of a replacement bridge or crossing that is compliant with the Land Use Code and the Storm Drainage Criteria Manual either as a temporary or Permanent replacement hydraulic structure.

c. The provisions of this Section 4-802(B)(3) shall not apply to Substantial Improvements to buildings in the Floodplain Overlay District as provided for in Section 4-400 of this Code.

[...]

6. Any development or earthwork which the County Engineer deems eligible for a General Floodplain Development Permit.

C. Site Plan Review may be waived for the following circumstances if the Land Use Director determines that there is no potential for any significant conflict with the criteria listed in Article 4-806 of this Code:

[...]

8. Any development or earthwork requiring an Individual Floodplain Development Permit, so long as the Director consults with the County Engineer before granting the waiver.

Article 18

- Delete definition of “**Floodway**”
- Delete definition of “**Floodproofing**”
- Replace section 18-178A “**Market Value**” with:

Market value is the price which a willing buyer would pay a willing seller under normal economic conditions, based on a representative body of comparable sales at or about the date for which the market value is sought to be determined, as calculated by an independent appraisal performed by a professional appraiser, or by other accepted authoritative source such as the County Assessor’s Office. In lieu of an independent appraisal, the market value of the structure as determined from the records of the County Assessor may be used. For purposes of floodplain regulations, market value may be set according to any method approved by FEMA and explained within FEMA P-758.

- Replace section 18-206 “**Substantial Improvement**” with:
 - A. Any cumulative combination of repairs, reconstruction, rehabilitation, expansion, or improvement of a building or other structure, the cost of which equals or exceeds 50 percent of the market value of the structure either before the improvement or repair is started, or if the structure has been damaged and is being restored, before the damage occurred. Substantial improvements are calculated on a cumulative basis, beginning with improvements commenced on or after September 11, 2013.
 1. The costs of the improvement shall include, but are not necessarily limited to, all materials, labor, built-in appliances, overhead, profit, and repairs to damaged portions of the building that are done concurrent with the subject improvements.
 2. The costs of the improvement shall not include those associated with post-storm debris removal; permitting; fees, preparation of surveys, costs, plans, and or specifications; or improvements outside of the structure, such as landscaping, sidewalks, fences, or detached structures; or work under a minor

building permit exempted from floodplain development permit requirements under Article 4-400 of this Code.

B. The term substantial improvement does not include:

1. Any alteration of a structure listed on the National Register of Historic Places or on the Colorado State Historical Society’s list of historic places.
 2. Any of the following types of improvements necessary to assure safe living conditions or bring a structure into compliance with state or local health, sanitation, safety, or building codes:
 - a. Electrical repairs;
 - b. Furnace repairs or replacements;
 - c. Water heaters, boilers, and evaporative cooler repairs or replacements;
 - d. Air conditioner repairs or replacements;
 - e. Repairs or replacements to roof coverings;
 - f. Insulation or simple weatherization or energy efficiency upgrades.
 3. Costs associated with renovations or remodeling projects totaling less than \$1,000.00, as increased annually starting January 1, 2018 by the Consumer Price Index inflation factor applicable to Boulder County.
 4. Note: even though not substantial improvements, the work described above may still require an Individual FDP.
- Replace section 18-205A “**Substantial Damage**” with:

Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before damage occurred.

DC-15-0004

EXHIBIT D

Proposed new floodplain regulations (28 Sep 2016)

4-400 Floodplain Overlay District

4-401 Purpose

- A. To provide land use controls necessary to qualify unincorporated areas of Boulder County for flood insurance under requirements of the National Flood Insurance Act of 1968, as amended; to protect life, property, and health; to ensure the best available data is used in making development decisions; to avoid increasing flood levels or flood hazards or creating new flood hazard areas; to minimize public and private losses due to flooding; to reduce the need for expenditures of public money for flood control projects; to reduce the need for rescue and relief efforts associated with flooding; to prevent or minimize damage to public infrastructure, facilities, and utilities; and to meet or exceed FEMA and CWCB minimum standards for floodplain regulation.
- B. FEMA requires all communities that participate in the National Flood Insurance Program (“NFIP”) regulate “Development” that occurs within the Special Flood Hazard Area. FEMA defines Development as “any manmade change to improved and unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating or drilling operations.”

4-402 Applicability and Administration

- A. **Applicability.** The Article 4-400 applies to all lands in the Floodplain Overlay (“FO”) District. If a lot or other parcel of land lies partly within the FO District, this Article 4-400 applies to the part of such lot or parcel lying within the district. If a building or structure lies partly within the FO District, then this Article 4-400 applies to the entire building or structure.
- B. **County Engineer Role.** The County Engineer or his or her designee is responsible for the administration and implementation of the requirements of the FO District, including reviewing all development proposals to determine the applicability of this section, all Individual Floodplain Development Permit (“Individual FDP”) applications, and all notifications submitted for General Floodplain Development Permit (“General FDP”) consideration.
- C. **No Liability.** The degree of flood protection provided by this section has been determined to be reasonable for regulatory purposes and is based on engineering and scientific methods of study of the 1%-annual-chance (100-year) flood event, also referred to as the base flood. Floods of greater magnitude may occur. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge or culvert openings restricted by debris. This Article 4-400 does not imply that land areas outside of 100-year floodplain boundaries or land uses permitted within such areas will be free from flooding or flood damages, or that compliance with these regulations will prevent flood damage. Neither Boulder County nor any of its officers or employees shall be liable for any flood damages, including any damages that result from reliance on this article or any administrative decision.

D. More Restrictive Prevails.

1. The Federal Emergency Management Agency (“FEMA”) and the Colorado Water Conservation Board (“CWCB”) have established certain minimum standards for regulatory floodplains. To the extent a FEMA or CWCB requirement conflicts with a provision in 4-400, the most restrictive controls.
2. This Article 4-400 does not repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. Where this Article 4-400 and another ordinance, easement, covenant, or deed restriction conflict or overlap, the more restrictive applies.

E. Permits Required.

1. All development in the FO District requires an Individual FDP or must be covered by the General FDP. Development in the FO District not covered by a General FDP or an Individual FDP may result in enforcement action under Article 17.
2. In addition to the Floodplain Development Permits required by this section, all required local, state, and federal permits must be issued prior to development in the FO District.

F. Referral from Other County Departments.

1. All development that requires a planning review process through the Boulder County Land Use Department and may be susceptible to flooding will be forwarded to the County Engineer for review and comment. The County Engineer must determine if the work is covered under a General FDP, requires an Individual FDP, or does not require any type of Floodplain Development Permit. Where the County Engineer indicates that the development will need a Floodplain Development Permit, the Land Use Department should note the requirement on any planning approval.
2. All building permit applications shall be reviewed by the Building Division to determine whether the proposed development is potentially within the FO District and therefore may require a Floodplain Development Permit. If it appears to the Chief Building Official that any proposed development may be within the FO District, then the Chief Building Official shall refer the application to the County Engineer. The Chief Building Official shall not issue a building permit when floodplain issues have been raised unless the County Engineer has confirmed the development is approved under a General FDP or an Individual FDP or the County Engineer has determined that a Floodplain Development Permit is required.
3. All Onsite Wastewater Treatment System (“OWTS”) applications will be reviewed by Boulder County Public Health Department (“Public Health”) to determine whether the work, including new OWTS or repair/replacement of an existing OWTS, may be within the FO District. If it appears to Public Health that the proposed work may be within the FO District, then Public Health must refer the application to the County Engineer. Public Health must not issue an OWTS permit when floodplain issues have been raised unless the County Engineer has issued an Individual FDP or has determined that no such permit is required.

4-403 FO District Defined; Official Map

- A. **FO District.** The Boulder County FO District is defined as the FEMA Floodplain together with the Boulder County Floodplain, as those floodplains are defined below.
1. The December 18, 2012 Digital Flood Insurance Rate Map (“DFIRM”) and Flood Insurance Study (“FIS”) report published by FEMA, as amended, is incorporated by reference. The DFIRM and FIS in effect on the date of a property owner’s complete application for any permit or process in this Code, in particular those portions of the DFIRM and FIS that define the 100-year floodplain, is the foundational floodplain for the FO District (the “FEMA Floodplain”). The term “DFIRM” includes all flood risk zone designations and technical information displayed on the maps, explanatory matter, technical addenda, modeling and calculations, water surface elevations, profiles, and cross sections, and other underlying detailed study data, such as information published in the FIS report and supporting documentation, as well as approved Letters of Map Revision (“LOMR”), Letters of Map Amendment (“LOMA”), and Letters of Map Revision based on Fill (“LOMR-F”). The FEMA Floodplain includes Zone AE, A, AH, and AO flood risk zone designations, including both Floodway and Flood Fringe areas.
 2. To augment the FEMA Floodplain, the Board of County Commissioners may, after review and recommendation by the Planning Commission, adopt a “Boulder County Floodplain.” The purpose of adopting a Boulder County Floodplain is to facilitate use of the best data available to the County to establish floodplain boundaries, Base Flood Elevations (“BFE”), and Flood Protection Elevations (“FPE”) to better protect residents of the County from flood hazards.
 - a. The Boulder County Floodplain must be comprised of the same flood risk zone designations as the FEMA Floodplain.
 - b. In no instance may the Boulder County Floodplain remove from the FO District an area or property designated as within the FO District by the FEMA Floodplain.
 - c. The following reports, maps, and related information constitutes the initial location and boundaries of the current Boulder County Floodplain:
 - (i) Floodplain Re-analysis and Floodway Delineation, North St. Vrain and St. Vrain Creeks, Boulder County, CO, by Love & Associates, Inc., October, 1992; and
 - (ii) Any area included in the definition of Floodway per Section 4-414.
 - d. The maps in these reports, as well as the area described in the Floodway definition, depicting the floodplain for the base flood shall be considered the official maps for the purposes of locating the Boulder County Floodplain on the official zoning district maps. These maps and reports, together with all amendments, explanatory matter, technical addenda, water surface elevations, profiles and cross sections (where available) are incorporated by reference into this Code.

3. All records pertaining to floodplain development must be on file with the County and open to public inspection. These records include, but are not limited to, certified Lowest Floor Elevations, Elevation Certificates, commercial Floodproofing Certificates, LOMAs, LOMR-Fs, LOMRs, Floodplain Development Permits, boundary interpretations, and records of action on variance requests.
- B. Official Map.** The County Engineer shall maintain digital maps delineating the location and boundaries of the FEMA Floodplain and the Boulder County Floodplain. The FEMA Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as published by FEMA. The Boulder County Floodplain map shall depict in plan view the horizontal boundary of the flood hazards described in the underlying flood studies, as adopted by Boulder County. These maps of the FEMA Floodplain and the Boulder County Floodplain together establish the areas governed by the provisions of this Article 4-400 and constitute the Official Map of Boulder County’s FO District (“Official Map”).
1. The most current Official Map and supporting data shall be on file in the County Engineer’s Office in electronic format, available for public inspection during normal business hours, with electronic and paper copies available upon request. The Official Map must also be available to the public on the Boulder County website.
 2. The County Engineer shall maintain records of superseded versions of the Official Map for historical reference.
- C. Interpretation of Official Maps**
1. The County Engineer shall determine which uses, parcels, structures, or other facilities are located in a previously adopted FEMA Floodplain or a Boulder County Floodplain, including in situations where a mapped boundary appears to conflict with actual field conditions. In making such interpretations, the County Engineer shall refer, as necessary, to the best available data at that time.
 2. Sources of best available data for interpretations include the engineering study upon which the maps and elevations are based, the professional engineers who prepared the study, the most recent detailed terrain data certified by a P.E. or a P.L.S., survey data certified by a P.E. or a P.L.S., any BFE/water surface elevation, floodway, and other flood risk data available from state or federal agencies, and any other reliable source that the County Engineer finds meets an acceptable level of technical accuracy as determined through prevailing industry practices.
 3. The use of aerial photography to interpret FO District boundaries, but without the consideration of local terrain data, shall be for informational purposes only, and not for making determinations as to the exact location of the boundaries of the FO District.
 4. If the County Engineer makes a determination regarding the relationship of the Official Map to a use, parcel, structure, or other facility, the interpretation must be

noted in the records associated with any related permit(s) and available for public inspection.

5. The Engineer’s determinations under this section are interpretations of precisely where the existing regulatory boundary lies on the ground. A determination as to which uses, parcels, structures, or other facilities are located in or out of a previously adopted FEMA Floodplain or a Boulder County Floodplain does not itself contract or expand the boundaries of the FO District. Therefore, such determinations do not result in an amendment to the Official Map that requires review and approval by the Planning Commission and Board of County Commissioners.

D. Amendment of Official Map

1. The FEMA Floodplain within the FO District will be deemed updated when FEMA issues a Letter of Final Determination associated with any map action, or after the effective date of any Letter of Map Change (“LOMC”), without need for review or approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.
 - a. If FEMA provides notice of final BFEs and sets an effective FIRM revision date (through issuance of a Letter of Final Determination) for studies that had previously been adopted as Boulder County Floodplain, the following rules apply:
 - (i) If FEMA made no changes to the studies previously adopted by Boulder County, then from the effective date of FEMA’s map action forward, Boulder County will continue to regulate using those studies to partially define the FO District, but will treat the studies as FEMA Floodplain rather than Boulder County Floodplain. In this circumstance, the County Engineer is not required to obtain review and approval of Planning Commission or the Board of County Commissioners.
 - (ii) If prior to its official action FEMA makes changes to maps, data, or related documentation previously included only in the Boulder County Floodplain, the County Engineer must determine whether and how the Boulder County Floodplain should be amended.
2. Except for an automatically adopted DFIRM update, a change in the boundary of the FO District requires review by the Planning Commission and approval by the Board of County Commissioners of a Zoning Map Amendment in accordance with Section 4-1100. The County Engineer shall revise the Official Map upon approval of changes to the Official Map by the Board of County Commissioners.
3. If a property owner in the FO District believes that the provisions of this Section should not apply to some or all of the property owner’s property because the building or ground elevations are above the corresponding BFE, then (1) as to the Boulder County Floodplain, the owner may request a rezoning map amendment under the procedures of 4-1100, and (2) as to the FEMA Floodplain, the owner

may request FEMA approve a LOMA. LOMAs must be provided to the County Engineer.

4. The County Engineer may correct clerical errors in the Official Map as they are discovered, without need for approval by the Planning Commission or the Board of County Commissioners, regardless of how many parcels are affected.
5. The County Engineer may generate or receive draft and/or preliminary flood risk analyses and reports affecting the FO District. These analyses may be any flood risk analyses, including those designated by CWCB or distributed by FEMA, as well as any other water surface elevation and/or Floodway data available from state or federal agencies or any other reliable source. Upon notification of such new information, the County Engineer shall evaluate whether a change to the boundaries of the FO District is required. If so, the County Engineer will submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.
6. In accordance with 44 C.F.R. § 65.3 and the Rules and Regulations for Regulatory Floodplains in Colorado (the “CO Floodplain Rules”), project proponents must submit technical data to FEMA in the form of a map revision request within six months of the date of completion of a project if the project received a CLOMR from FEMA before construction or results in changes (either increases or decreases) in the 100-year water surface elevation greater than 0.3 foot.
7. The County Engineer will monitor large-scale natural physical changes as they occur. If the County Engineer deems it necessary to restudy a mapped floodplain or floodway as a result of such changes, the County Engineer shall coordinate with CWCB and FEMA and, as appropriate, submit a proposed Zoning Map Amendment to Planning Commission and the Board of County Commissioners for review and approval.

4-404 Floodplain Development Permits

- A. **Minimum Federal and State Standards.** Development in the FO District must comply with the NFIP and State of Colorado minimum standards. These standards require applicants to demonstrate that development projects in the Floodway, when combined with all other existing and anticipated development, will not cause an increase in the modeled 1%-annual-chance water surface greater than 0.00 feet and, for projects in the Flood Fringe, will not cause an increase greater than 0.50 feet.
- B. **Uses Prohibited in Floodway.** The following activities and uses are prohibited within all mapped Floodways:
1. Construction of new permanent buildings (either residential or non-residential) with the exception of relocated nonconforming uses otherwise permitted by this Article 4-400;
 2. Construction of new temporary buildings (either residential or non-residential), unless the County Engineer reviews and approves a specific location in the Floodway in conjunction with a Special Event as defined in the Multimodal Transportation Standards, a Group Gathering / Special Event as defined in the Land Use Code, or another temporary activity permitted by county regulations;
 3. Construction of additions to existing buildings that increase the building's square footage, footprint, or Habitable Space;
 4. Conversion of existing accessory use space to living or primary use space;
 5. Overnight campgrounds;
 6. Dispersed camping, unless the camping is approved through the issuance of a Group Gathering / Special Event Permit as defined in the Land Use Code;
 7. Parking of Recreational Vehicles for the purposes of overnight habitation;
 8. Storing or processing of materials that are buoyant, flammable, explosive, or otherwise potentially injurious to human, animal or plant life;
 9. Solid waste disposal sites and central collection sewage treatment facilities;
 10. New or expanded individual on-site wastewater systems, unless the expanded system is required to bring existing buildings up to code or is allowed per 4-405(G)(4);
 11. Solid wood fences, chain link fences, or any fence that does not meet the Boulder County standards for fence installation;
 12. Any activity or use that would create significant potential for downstream solid debris (including, but not limited to decks) waste, or rubbish;
 13. New or expanded Critical Facilities located on land lower than 6,000 feet in elevation; and
 14. Any encroachment (including filling and grading) that would adversely affect the efficiency of the Floodway or change the direction of flow, unless it conforms with section 4-404(C).

C. Uses Allowed in Floodway under Certain Conditions.

1. The County Engineer may issue FDPs for the following development types and open uses within the Floodway unless the use (1) is prohibited in the underlying zoning district, (2) adversely affects the efficiency of the Floodway, (3) changes the direction of flow, or (4) poses a significant safety hazard:
 - a. Agricultural uses involving the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising and grazing of livestock and horses, as well as temporary buildings associated with such use, as detailed in 4-405(C)(3)(c);
 - b. Uses accessory to residential uses, including, but not limited to lawns, open areas, gardens, driveways, and play areas;
 - c. Industrial or commercial uses such as loading areas, railroad rights-of-way (but not including freight yards or switching, storage, or industrial sidings), parking areas, and airport landing strips;
 - d. Recreational uses not requiring permanent or temporary buildings designed as habitable space, unless a special event permit has been issued for a temporary building;
 - e. Utility facilities such as dams, power plants, spillways, transmission lines, pipelines, water monitoring devices, water supply ditches, irrigation ditches and laterals, and open mining;
 - f. Hydraulic structures such as bridges, culverts, weirs, diversions, drop structures, and fish ladders, for access and flood or stormwater control; and
 - g. Critical Facilities above 6,000 feet in elevation, as described in 4-405(D).
2. In addition, the County Engineer may not issue FDPs for the development types and uses listed in 4-404(C)(1) above that result in an encroachment within the Floodway unless the applicant has demonstrated through hydrologic and hydraulic analyses performed by a qualified P.E. licensed in Colorado and in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the Base Flood (a No-Rise Certification).
 - a. Under the provisions of 44 CFR Chapter 1, Section 65.12, of the NFIP Regulations, a community may permit encroachments within the adopted FEMA regulatory Floodway that would result in an increase in BFEs if the applicant first receives an approved CLOMR and/or Floodway revision from FEMA.
 - b. Where there is a designated FEMA Floodplain but no designated FEMA Floodway, and there is a designated County Floodway, projects that result in increases greater than 0.5 foot in these areas must first receive an approved CLOMR from FEMA, and projects that result in increases between 0.0 and 0.5 foot in these areas must first receive an approved Boulder County Floodway Review from the County Engineer.

- c. Where there is no designated FEMA Floodplain, but there is a designated County Floodway, projects that result in any increase in these areas must first receive an approved Boulder County Floodway Review from the County Engineer.
 - d. Where there is a designated FEMA Floodplain, and no FEMA or County Floodway, projects that result in increases greater than 0.5 foot must first receive an approved CLOMR from FEMA.
 - e. Where there is no designated FEMA Floodplain, but there is a designated County Floodplain (but not a County Floodway), the procedure set forth in 4-404.2(E) (Procedures for Modeling Proposed Development within the Floodway) must be followed.
 - f. For all new subdivision proposals and other developments (including, but not limited to, manufactured home parks) greater than either 50 lots or 5 acres that are located in Zone A, this analysis must also depict, as a part of the development proposal, the BFEs that Boulder County will use to determine FPEs for the proposed development.
 - g. In all instances, no increases in water surface elevation will be allowed that impact an insurable building.
 - h. Following project completion, the County Engineer shall provide FEMA with all information required by 44 C.F.R. Part 65 relating to water surface elevation changes so that FEMA may determine whether a map revision is appropriate.
- D. Uses Allowed in Flood Fringe under Certain Conditions.** Any use permitted by the underlying zoning regulations may be permitted in the Flood Fringe, provided the use meets the flood protection requirements of Section 4-405, and provided that:
1. New Critical Facilities are prohibited in the Flood Fringe below 6,000 feet (NAVD88) in elevation.
 2. Wastewater treatment facilities serving more than two properties are prohibited in the Flood Fringe.
 3. Individual OWTS, when allowed, must conform to the requirements of 4-405(G).
 4. Fences in the Flood Fringe are subject to all Boulder County Building Code and other fence requirements.

4-404.1 General Floodplain Development Permits

- A. **Intent.** To minimize undue hardship to property owners within Boulder County yet remain in compliance with FEMA regulations regarding Floodplain permitting, the County Engineer is authorized to issue one or more General Floodplain Development Permits. The intent of the General FDP is to allow certain limited uses and activities in the Floodplain without the need for an approved Individual FDP because these specific uses and activities are unlikely to increase BFEs or have an adverse effect on neighboring properties, species, or ecosystems.
- B. **Content of a General FDP.** If the County Engineer determines it appropriate to issue a General FDP, he shall include the following information on the face of the permit.
1. A list of specific uses and activities deemed within the scope of the General FDP.
 2. Whether or not property owners must notify the County Engineer prior to beginning work on an activity included within the General FDP.
 - a. The County Engineer shall require such notification for development activities for which it is necessary to evaluate individual and cumulative impacts, ensure minimum compliance with federal and state floodplain rules, and confirm that the uses or activities are unlikely to increase BFEs or have an adverse effect on neighboring properties, species, or ecosystems.
 - b. For projects where the County Engineer will receive notice through referral required by a separate Land Use Code review process (such as Site Plan Review or Special Use Review), the County Engineer need not require duplicative notification. For all other projects where the County Engineer decides to require notification, the applicant must submit the following information to the County Engineer a minimum of 21 days prior to commencing work:
 - (i) Project description, including materials description and a discussion on the expected impact to the channel and floodplain;
 - (ii) Location description (an accompanying location map is best); and
 - (iii) Site plan, if necessary to further describe the work.
 - c. If the work is within the scope of the General FDP, the County Engineer will respond to the owner with approval to proceed. If additional information is necessary or if the work requires issuance of an Individual FDP, the County Engineer will inform the owner within 14 days of notification submission, or through the Land Use Review referral process.
 3. Conditions of approval, if any, for work approved under the General FDP.
- C. **Process for Issuing, Amending, or Rescinding a General FDP.**
1. If the County Engineer determines that a new General FDP is appropriate, he shall post the proposed General FDP on the Transportation Department website and also in the manner described in Article 3 by which the public is given notice of

comprehensive rezonings, so that the public may review and comment. No such new FDP shall become effective until 14 days after the date it is posted.

2. If the County Engineer determines that an amendment to an existing General FDP is appropriate, whether to reflect changes to federal, state, or local regulations or guidance or for other good cause, he shall post the revised General FDP on the Transportation Department website and also in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. No such revised FDP shall become effective until 14 days after the date the revision is posted.
3. If the County Engineer determines that an existing General FDP should be rescinded in its entirety, whether to reflect changes to federal, state, or local regulations or guidance or for other good cause, he shall post a notice to this effect on the Transportation Department website and in the manner described in Article 3 by which the public is given notice of comprehensive rezonings, so that the public may review and comment. The General FDP shall be deemed rescinded 14 days after the date the rescission notice was posted.
4. Subject to the notice requirements described above, the County Engineer may issue, amend, or rescind a General FDP at any time, on his own initiative, without the need for public hearings before Planning Commission and Board of County Commissioners.
5. All General FDPs in effect at a given point in time must comply with all applicable provisions of this section 4-404.1.

D. No Permit Fees. If the County Engineer determines a use or activity falls under the approval granted in a General FDP, no permit fee will be charged to the owner.

E. Work Not Approved under a General FDP. Any development within the Floodplain that does not meet the criteria of a General FDP requires either approval of an Individual FDP prior to beginning the work or a determination by the County Engineer that no FDP is required at all.

1. Should any work commence that is assumed by an applicant to be covered by a General FDP, and the County Engineer determines it is not covered by a General FDP, a Stop Work order will be issued. The unpermitted work will be treated as a zoning violation under Article 17 until an approved Individual FDP is issued or the violation is otherwise resolved.
2. Anyone considering a project in the Floodplain that varies from the projects described in an issued General FDP should contact the County Engineer to determine if an Individual FDP application is required. The County Engineer makes the final decision as to the applicability of a General FDP. Any project determined by the County Engineer to create a significant obstruction to flood flows will require an Individual FDP.

F. Other Permits. Eligibility for a General FDP does not eliminate the need for applicants to obtain all other required permits, including building, grading, access, construction, and/or stormwater permits from Boulder County, as well as other state and federal permits.

- G. **Records of Issued General FDPs.** A copy of all issued General FDPs, including previous versions, will be kept on file in the County Engineer’s office at all times and available for public review.

4-404.2 Individual Floodplain Development Permits

- A. **Floodplain Pre-Application Conference.** A Floodplain Pre-Application Conference (Floodplain Pre-App) between the applicant and the County Engineer (or his/her designee) is required for all Individual FDPs, unless waived in writing by the County Engineer as unnecessary under the circumstances. The Boulder County Land Use Department may require a Pre-Application Conference as defined in Section 3-201, which may be substituted for the Floodplain Pre-App requirement of this section. The Floodplain Pre-App should include discussion of conforming and nonconforming structures and uses on the subject property.
- B. **Submittal Requirements.** Applications for Individual FDPs are to be submitted to the Boulder County Land Use Department and are subject to the following submittal requirements, unless the County Engineer determines that a particular requirement does not apply.
1. For all Individual FDP submittals:
 - a. A completed Individual FDP application form;
 - b. A narrative describing the work to be performed; and
 - c. A location map, showing the specific areas and property(ies) where the work will be performed.
 2. For construction of new buildings or improvements to existing buildings, The County Engineer will obtain pertinent documents from the applicant's Building Permit submittal package. Building Permit/Individual FDP submittals should include and call out all elements for flood protection required per 4-405. In addition, the following items shall be included in the Building Permit/Individual FDP submittal:
 - a. Specifications for construction and building materials (including considerations for flood resistant materials when required, per FEMA *Technical Bulletin 2*);
 - b. Description and locations of any proposed site, filling, dredging, grading, and/or channel improvements
 - c. Location of any and all proposed materials storage and staging areas, as applicable;
 - d. Location of the current regulatory FO District boundaries, including both FEMA and/or Boulder County Floodplain information;
 - e. Plans must include the elevation, in feet referenced to the North American Vertical Datum of 1988, to which the flood protection measures apply. See 4-405(A), Flood Protection Elevation.
 - f. Certification that the building or improvement is designed in accordance with the flood protection measures outlined in 4-405(C) for New Floodplain Construction and conforming existing buildings and 4-413 for improvements to nonconforming existing buildings.

3. For bridges, culverts, other hydraulic structures, work within the channel banks, and stream restoration projects, in addition to the items listed above, the following items are required:
 - a. A plan at a scale of 1" = 200' or larger, stamped by a P.E. registered in the State of Colorado, which includes:
 - i. the site location;
 - ii. existing and proposed base flood limits and water surface elevations, if applicable;
 - iii. Floodway limits, if applicable;
 - iv. channel, watercourse or flowpath;
 - v. vertical and horizontal datum;
 - vi. existing and proposed contours or elevations at 2' intervals;
 - vii. existing buildings
 - viii. location and elevations of existing streets, water supply, and sanitation facilities, if applicable;
 - ix. limits and total land area of all existing and proposed impervious surfaces, including buildings; and
 - x. existing water supply ditches, irrigation ditches and laterals.
 - b. A typical valley cross-section showing:
 - i. channel, watercourse, or flowpath;
 - ii. limits of floodplain adjoining each side of channel;
 - iii. cross-section area to be occupied by the proposed development;
 - iv. existing and proposed base flood water surface elevations;
 - c. Documentation that addresses scour (if required) and other design requirements in accordance with The Boulder County Storm Drainage Criteria Manual;
 - d. Evidence of compliance with 4-404.2(D) of this section.
 - e. Evidence of compliance with Section 404 of the Clean Water Act and the Endangered Species Act.
4. For OWTS, a Site Plan that includes items 4-404.2(B)(3)(a)(i-viii) above is required, in addition to the following:
 - a. A geotechnical report, certified by a P.E. registered in the State of Colorado, which includes specifications on the system type and layout, building connections, and the flood protection measures required under 4-405(G).

5. For underground utilities not covered by the General FDP, an analysis of the impacts of scour potential as well as design considerations to protect against scour must be provided.
6. For Projects determined to be in the Floodway as defined in 4-414, an engineering analysis certified by a Colorado-registered P.E. in accordance with 4-404.2(E).
7. For any proposed Alteration or relocation of a watercourse, including stream restoration projects and engineered channelization projects, the County Engineer requires a description of the extent to which any watercourse will be altered or relocated, and that conveyance is not decreased as a result of the project, and that the flood carrying capacity of the watercourse is maintained over time.
 - a. All proposals for watercourse Alteration or relocation must include, in addition to all other applicable materials, pre- and post-project conveyance calculations to demonstrate that the flood carrying capacity has not been decreased.
 - b. For engineered channelization projects, including those types outlined in the Boulder County Storm Drainage Criteria Manual, permit applicants are required to submit, along with all other applicable materials, a maintenance plan that outlines the maintenance activities to be performed, the timing/schedule for those activities, and the agency or representative responsible for maintenance in order to ensure the flood carrying capacity is maintained.
 - c. Prior to any Alteration or relocation of a watercourse, the County Engineer must notify adjacent communities, potentially affected property owners, and the CWCB in the following manner:
 - i. Notification must be done through the publication of a notice of such proposed alteration or relocation once in a newspaper of general circulation in Boulder County.
 - ii. The County Engineer must keep on-file evidence of such notification.
 - d. Watercourse Alteration/relocation/channelization projects in the FO District are subject to the county's modeling requirements covered in 4-404.2(E) prior to permitting. In addition, at the discretion of the County Engineer, any watercourse alteration/relocation/channelization project that shifts the stream horizontally in any direction more than one bankfull width will require submittal and approval of a CLOMR from FEMA prior to permitting.
8. Adequate evidence of either direct ownership of the subject property or legal authority to act on behalf of the owner(s) of record;
9. Any additional information required by the County Engineer necessary to allow the review criteria in this Article 4-400 to be adequately evaluated.

C. Completeness Review by the County Engineer. Once an application for an FDP is filed, the County Engineer must review it for completeness.

1. The County Engineer may suspend processing an FDP application at any time at the request of the applicant or whenever the County Engineer determines that the application is not complete. The County Engineer may deem the application incomplete, based on the application submittal requirements, at the County Engineer's initiative or at the request of a referral agency. In the event that the County Engineer deems an application incomplete, the County Engineer will immediately notify the applicant of the shortcomings. Once the requested information has been provided, the application must be deemed filed as of that date and the County Engineer will proceed to process the application and render a decision. If an application is not deemed complete within six months of the date of suspension, the County Engineer may declare the application withdrawn. The six month time frame may be extended should the County Engineer determine that circumstances beyond the control of the applicant prevent a timely completion of the application.

D. **Application Review Criteria.** In reviewing an application for a Floodplain Development Permit, the County Engineer must first determine the specific flood hazard at the site in accordance with 4-403 and evaluate the suitability of the proposed use or development in relation to the flood hazard. The County Engineer must then consider the following factors in reviewing Individual FDP applications:

1. the effect of the proposal upon the efficiency or capacity of the Floodway;
2. the effect on lands upstream, downstream and in the immediate vicinity of the development including, without limitation, utility and transportation facilities;
3. the probability that the proposal will result in unreasonable risk of harm to people or property – both onsite and in the surrounding area – from natural hazards;
4. the effect of the proposal on the flood profile and flood heights;
5. the effect of the proposal on any tributaries to the main stream, drainage ditches, water supply and irrigation ditches, storm drainage facilities, reservoirs, or any other drainage or irrigation facilities or systems;
6. the relationship of the proposed development to the flood management program for the area in question, including whether additional public expenditures for flood protection or prevention will be necessary;
7. whether the applicant would obtain an undue advantage compared to later applicants who might request a permit;
8. whether the proposed use is for human occupancy;
9. the susceptibility of the proposed facility and its contents to flood damage;
10. the safety of access to the property in times of flood for ordinary and emergency vehicles;
11. whether any proposed changes in a watercourse will have an environmental effect on the watercourse, including streambanks and streamside trees and vegetation;

12. the alignment of the proposed development with the Boulder County Comprehensive Plan, Watershed Master Plans, and any other planning-related documents pertaining to development in Boulder County;
13. whether the cumulative effect of the proposed development with other existing and anticipated uses will increase flood heights more than the allowances specified in 4-404(A);
14. whether the heights and velocities of the floodwaters expected at the site will adversely affect the development of surrounding property; and
15. whether additional flood protection is necessary based on historical flood evidence, increased development upstream, or other flood-related hazards such as flash flooding, debris flows, rockfalls, mudslides, landslides, avalanches, channel avulsions, alluvial fan hazards, erosion and deposition of material, debris dams, ice jams, and high flood depths or velocities.

E. Procedures for Modeling Proposed Development within the Floodway.

1. Unless one or more requirements below are modified by the County Engineer for good cause shown by the applicant, for all projects confirmed to be wholly or partially within the Floodway the applicant must submit an engineering report, including a Floodway analysis certified by a qualified engineer licensed in Colorado using the same type of model that was used to establish the current regulatory flood hazards. Applicants may obtain a copy of the applicable floodplain model from Boulder County. Models that differ from the type used to establish the regulatory flood hazards must first be approved for use by the County Engineer.
2. Modeling submitted to Boulder County in support of an Individual FDP must include the following:
 - a. Duplicate Effective (Regulatory) Model. This model is necessary to confirm that the regulatory water surface elevations can be reproduced to within 0.5 foot. When Boulder County regulates flood hazards that are more conservative than those identified by FEMA, it is the model that is associated with the Boulder County Floodplain.
 - b. Corrected Effective Model. The model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections, or incorporates more detailed topographic information than that used in the current effective model. Floodway limits should be manually set at the new cross-section locations by measuring from the effective FIRM. The cumulative reach lengths of the stream should also remain unchanged. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model.
 - c. Existing or Pre-Project Conditions Model. The applicant must revise the duplicate effective or corrected effective model to reflect any modifications (including man-made encroachments) that have occurred within the floodplain since the date of the effective model but prior to construction of the proposed project. If no modifications have occurred

since the date of the effective model, then the model would be identical to the duplicate effective or corrected effective model, and only one of these models is required. The results of this existing conditions analysis will indicate the 100-year elevations to be used for comparison to proposed conditions at the project site.

d. Proposed or Post-Project Conditions Model. The applicant must then modify the existing conditions model (or duplicate effective, or corrected effective, as appropriate) to reflect the proposed project. The overbank roughness coefficients should remain the same unless a reasonable explanation of how the proposed project will impact roughness values is provided, with supporting data. The results of this analysis will indicate the 100-year elevation for proposed or post-project conditions at the project site. These results must demonstrate no impact (measured as 0.00) to the 100-year water surface elevations when compared to the existing conditions model (referred to as a “No-Rise Certification”).

(i) Should this comparison result in water surface elevation increases that cannot be mitigated through project design changes, then the provisions of 4-404(C)(2)(a) must apply.

e. All models must use the most current regulatory hydrology.

4-405 Flood Protection Measures

Flood Protection Measures apply to development within the FO District in Zones AE, A, AO, and AH.

A. **Flood Protection Elevation (“FPE”).** For the purposes of this section, the Boulder County FPE is equal to the following:

1. In areas depicted as Zone AE in the FO District, the FPE is equal to the BFE plus 2 feet. The BFE is the elevation of the 1%-annual-chance (typically referred to as 100-year) flood. In other words, it is the flood that has a 1% chance of occurring in any given year.
2. In areas depicted as Zone A in the FO District, the following applies:
 - a. As required by 44 CFR 60.3(b)(4), Boulder County must obtain and reasonably utilize BFE and water surface elevation information from local, state, federal, or other reliable sources
 - b. In those Zone A areas where a BFE can be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 2 feet above the calculated BFE
 - c. In those Zone A areas where a BFE cannot be determined from the sources outlined in 4-405(A)(2)(a), the FPE will be 3 feet above the highest grade in the area of the proposed development.
 - (i) For buildings, the FPE will be 3 feet above the highest grade within the proposed building footprint, or the highest grade adjacent to the exterior of the existing building, unless the applicant supplies information sufficient to determine a BFE and subsequent FPE for the building, including data submitted as a part of identifying the Floodway boundary pursuant to the Floodway definition in 4-414.
3. In shallow flooding areas (Zone AO), the FPE is equal to:
 - a. Two feet above the specified flood depth; or
 - b. If no flood depth is specified, 3 feet above the highest grade that exists within the proposed building footprint.

B. General Requirements

1. All development in the FO District must be adequately protected from flooding according to the requirements of this section.
2. Prior to submitting an application, applicants shall confirm with the County Engineer all conforming and nonconforming structures and uses on the subject property. Improvements to conforming structures and buildings must meet all applicable requirements in section 4-405. Improvements to nonconforming structures and buildings must meet all applicable requirements in section 4-413.
3. Materials that are buoyant, flammable, hazardous, toxic, or explosive, or that in times of flooding could be harmful to human, animal, or plant life, may not be

stored or processed except at or above the FPE, unless the materials are stored in accordance with 4-405(H) governing storage tanks.

4. All construction (including New Floodplain Construction as well as improvements below the FPE) must be built with materials and utility equipment resistant to flood damage up to the FPE.
5. All new and replacement water supply systems must be designed to minimize or eliminate infiltration of flood waters into the system.
6. Lateral additions to any residential building must be elevated to the FPE and adequately anchored to prevent flotation, collapse, or lateral movement of the addition resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
7. Lateral additions to any commercial or accessory building or structure must be adequately protected from flooding in accordance with 4-405(C)(3)(a) and 4-405(C)(3)(b), respectively.

C. New Floodplain Construction

1. General Requirements

- a. All New Floodplain Construction must be built using methods and practices that minimize flood damage.
- b. New Floodplain Construction in the Floodway is prohibited.
- c. New Basements in the Flood Fringe are prohibited.
- d. All New Floodplain Construction must be designed and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, and must be certified by a P.E. registered in the State of Colorado that they have been constructed to withstand such forces and are adequately protected from flooding up to the FPE;
- e. New buildings or other structures must be placed with their longitudinal axes parallel to the predicted direction of flow of flood waters or be placed so that their longitudinal axes are on lines, parallel to those of adjoining structures, to the extent consistent with other provisions of this code. This is intended to minimize the obstruction to flow caused by a building or structure.
- f. New service equipment, including, but not limited to, electrical, heating, ventilation, plumbing, and air conditioning equipment, must be located at or above the FPE.
- g. New Floodplain Construction in Zone AO or AH must be accompanied by site/property grading to accommodate drainage of floodwaters around the perimeter of the building in a controlled manner, without adversely impacting adjacent properties.

- h. New Floodplain Construction on a property removed from the floodplain by issuance of a LOMR-F from FEMA must have the Lowest Floor elevated to or above the FPE that existed prior to the placement of fill.

2. Residential Buildings

- a. All new residential buildings constructed in the Flood Fringe or within Zones A, AO, or AH must have their Lowest Floors (including Basements, porches, and decks), as well as any and all service equipment (excepting the necessary connections to public utility), elevated to the FPE, either by the placement of fill or by construction on elevated foundation walls.
- b. Fully enclosed areas below the lowest floor of a building in the FO District must be used solely for parking of vehicles, building access, or storage of materials. These areas must be designed to equalize the hydrostatic pressure flood forces on exterior walls by allowing for the entry and exit of floodwaters (known as “Wet Floodproofing”). Designs for meeting this requirement must either be certified by a registered Professional Engineer or must meet or exceed the following minimum criteria:
 - (i) A minimum of two openings on at least 2 walls having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding must be provided;
 - (ii) The bottom of all openings must be no higher than one foot above grade; and
 - (iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
- c. Attached garages may be constructed at-grade but must comply with 4-405(C)(2)(b) above. Openings are permitted to be installed in garage doors; however, the garage door itself does not qualify as an opening for Wet Floodproofing purposes.

3. Non-residential Buildings. Non-residential buildings built in the Flood Fringe, or within Zones A, AO, or AH must conform with 4-405(C)(2) above, or must conform with the requirements below based on building type:

a. Commercial Buildings

- (i) Commercial buildings, including attendant and sanitary facilities and attached garages, must conform with 4-405(C)(2), or must be designed to be water-tight with walls substantially impermeable to the passage of water below the FPE.
- (ii) The building must be anchored to prevent flotation, collapse, or lateral movement.

- (iii) The building must be constructed using structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
- (iv) All flood protection measures for commercial buildings must be certified by a Colorado Registered Professional Engineer that the methods are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces, and other factors associated with the Base Flood. Such certification must also state the specific elevation (including vertical datum reference) to which the construction is protected from flooding.
- (v) For commercial buildings designed to be watertight, the FEMA Floodproofing Certificate for Non-Residential buildings should be completed, and must be reviewed and approved by the County Engineer.

b. Accessory Buildings and structures

- (i) Accessory buildings and structures, including but not limited to detached garages, sheds, barns, and any other structure considered accessory to the primary use or primary building, must conform with 4-405(C)(2) above, or may be constructed at grade but must meet the requirements of 4-405(C)(2)(b) above for fully-enclosed areas below the FPE, and are subject to the following conditions:
 - a. The building or structure must be used only for the parking of vehicles or storage of tools, materials, and equipment;
 - b. The building or structure must not be designed for or used as Habitable Space;
 - c. The accessory building or structure must represent a maximum investment of less than 10% of the value of the principal building on the property, or a maximum floor area of 600 square feet;
 - d. The building or structure must have low flood damage potential with respect to both the building and its contents; and
 - e. Permanently affixed appliances (such as furnaces, heaters, washers, dryers, etc.) are prohibited.
 - f. Prior to issuance of Certificate of Occupancy or final inspection, whichever occurs last, the property owner must execute a Non-Conversion Agreement and the County must record the agreement in the real estate records. The agreement will be in the form of a restrictive covenant or other County approved binding instrument,

where the benefits of the covenant run in favor of the County. The covenant must be drafted to run with the land and bind successors, in perpetuity. The purpose of the covenant is to document the current owner's understanding of the limitations on construction and use of the enclosed area in accordance with the provisions of this section 4-405(C)(3)(b) (Accessory Buildings and Structures), and to put prospective purchasers on notice of such restrictions. The covenant will also reference retrofitting criteria necessary to properly convert accessory buildings or structures to habitable space, should the owner choose to do so. In addition to any other enforcement mechanisms available, violation of the agreement will be considered a violation of this Article 4-400 and subject to all applicable zoning enforcement procedures.

- (ii) Accessory structures that do not have at least two rigid walls, including but not limited to carports, gazebos, and picnic pavilions, may be constructed at grade and must use flood-resistant materials up to the FPE.
 - (iii) Accessory Dwelling Units (including detached garages designed with Habitable Space on the second floor) must meet the above requirements of 4-405(C)(2) for residential buildings, which includes either elevation of the entire building above the FPE, or wet floodproofing of the lower level garage space.
- c. Agricultural Buildings and Structures. New Floodplain Construction of any Permanent agricultural building or structure in the Flood Fringe must be limited in use to agricultural purposes, in which the use is exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock. Types of buildings and structures that qualify under this section include farm storage structures (used exclusively for the storage of farm machinery and equipment), grain bins, corn cribs, and general purpose barns/loafing sheds.
- (i) The building or structure must not be designed for or used as Habitable Space.
 - (ii) The building or structure must be wet-floodroofed according to 4-405(C)(2)(b).
 - (iii) Service equipment must be elevated to the FPE, unless elevation of such equipment impedes its agricultural use.
 - (iv) Permanent agricultural buildings or structures are prohibited in the Floodway.

- (v) Temporary agricultural buildings or structures are allowed in the floodway, but are required to be relocated outside of the FO District or deconstructed in the event of a flood warning. If relocation outside of the FO District is not possible, then relocation to the Flood Fringe will be allowed, so long as the temporary structure is properly anchored.

d. Crawlspaces. New Floodplain Construction of any Below-Grade Crawlspace must:

- (i) Have the interior grade elevation, that is below BFE, no lower than two feet below the Lowest Adjacent Grade;
- (ii) Have the height of the Below-Grade Crawlspace measured from the interior grade of the Crawlspace to the top of the foundation wall, not to exceed four feet at any point;
- (iii) Have an adequate drainage system that allows floodwaters to drain from the interior area of the Crawlspace following a flood; and
- (iv) Meet the provisions 4-405(C)(1), General Requirements.

D. Critical Facilities

1. New Critical Facilities are prohibited in the regulatory floodplain below 6,000 feet (NAVD88) in elevation.
2. In the mountain canyons above 6,000 feet (NAVD88), new Critical Facilities in the FO District will be considered on a case-by-case basis, and may require special design or flood protection considerations, including considerations of hydrodynamic flood forces and flood-induced erosion.
3. Improvements to existing Critical Facilities that are determined to be Substantial Improvements require that the entire facility (including attendant utility and sanitary facilities) be elevated to the Boulder County FPE or, if not prohibited elsewhere in this code, be retrofitted such that the building is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads, including the effects of buoyancy.

E. Manufactured Home Parks

1. General Requirements. All manufactured homes must be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated to the FPE and anchored to resist floatation, collapse, or lateral movement. All requirements below are in addition to applicable state and local requirements, including those to address wind loads.
2. For new parks commenced on or after February 1, 1979; expansions to existing parks; existing parks where the value of the repair, reconstruction, or

improvement of the streets, utilities, and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement has commenced; an existing park on which a manufactured home has incurred Substantial Damage; manufactured homes to be placed or substantially improved on sites in existing parks; and for manufactured homes not placed in a park:

- a. Stands or lots must be elevated on compacted fill or on pilings so that the lowest floor of the manufactured home will be at or above the FPE. For homes placed on pilings:
 - (i) lots must be large enough to permit steps;
 - (ii) piling foundations must be placed in a stable soil no more than ten feet apart; and
 - (iii) reinforcements must be provided for pilings more than six feet above the ground level.
- b. Adequate surface drainage must be provided.
- c. New manufactured homes must be anchored by providing over-the-top and frame ties to ground anchors as well as the following:
 - (i) over-the-top ties at each of the four corners, with two additional ties per side at intermediate locations, with the exception of manufactured homes less than 50 feet long which require only one additional tie per side;
 - (ii) frame ties at each corner with five additional ties per side at intermediate points, with the exception of manufactured homes less than 50 feet long which require only four additional ties per side;
 - (iii) all components of a manufactured home anchoring system must be capable of carrying a force of 4800 pounds; and
 - (iv) Any additions to the manufactured home be similarly anchored.

F. Recreational Vehicles

1. At least one of the following provisions must be met:
 - a. The recreational vehicle must be on the site for fewer than 90 consecutive days;
 - b. The recreational vehicle must be fully licensed and ready for highway use;
or
 - c. The recreational vehicle must meet the permit requirements and elevation and anchoring requirements for manufactured homes, in accordance with Section 4-405(E) of this section.

G. Onsite Wastewater Treatment Systems

1. For the purposes of this section, “New OWTS” is the first OWTS installed on a parcel.
2. The location of new and replacement OWTS must be done in such a manner as to avoid impairment to or contamination from the systems during flooding.
 - a.Placement of a new OWTS in the FO District (including both Floodway and Flood Fringe areas) is prohibited, unless the County Engineer determines that placement in the Flood Fringe cannot be avoided, in which case priority must be given to those locations on the subject property where flood depths and/or velocities are the lowest, and to the optimal location of the water supply.
3. New OWTS
 - a.All Tanks, including Septic Tanks, for new OWTS in the FO District must be made of concrete.
 - b.Tanks must be adequately anchored to protect against buoyant forces associated with flooding and high groundwater, which is typical during flood conditions.
 - (i) Tanks that are installed within the Boulder County or FEMA 500-year floodplain should be anchored to protect against uplift from high groundwater. Where the 500-year floodplain is not shown, the anchoring requirement will apply if the lowest elevation of the tank is at or below the 100-year base flood elevation adjacent to the tank location.
 - (ii) Boulder County requires that the FEMA-recommended calculation for determining buoyant forces (contained in FEMA P-348, or the latest FEMA guidance document covering building utilities) be used to adequately design buoyancy countermeasures. The equation is as follows:

$F_b = 0.134V_t\gamma FS$		
<i>Where:</i>	F_b	is the buoyancy force exerted on the tank, in pounds.
	V_t	is the volume of the tank in gallons.
	0.134	is a factor to convert gallons to cubic feet.
	γ	is the specific weight of flood water surrounding the tank (generally 62.4 lb/ft ³ for fresh water and 64.1 lb/ft ³ for salt water.)
	FS	is a factor of safety to be applied to the computation, typically 1.3 for tanks.

- c.Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of septic effluent.

- d. Raised Soil Treatment Areas are required, and must be designed such that the base of the distribution layer is a minimum of 2 feet above existing grade
- e. Connections to the house must be fitted with backflow prevention, unless it is demonstrated in the permit application that the connection pipe rises above the calculated FPE for the site.
- f. With the exception of the Soil Treatment Area, earthwork necessary for system installation must not exceed pre-construction grade.
- g. While not required, backup generators are recommended for any system fitted with electric pumps or controls.

4. Repair/Replacement OWTS

- a. For any OWTS in the Flood Fringe that requires replacement, the system must meet the requirements of 4-405(G)(3).
- b. In addition to the requirements of 4-405(G)(4)(a), for any repair or replacement of an existing OWTS in the Floodway the County Engineer must determine that the proposed repair/replacement is consistent with Subsections (i) through (iii), below.

(i) The property owner has demonstrated that connection to a central sewer system is not feasible by:

- a. Providing a letter of denial from the closest sewer provider; or
- b. Demonstrating other reasons why connection is not feasible, such as that there is no central sewer system reasonably close to the property or building to be served, or that easement restrictions exist that effectively prohibit connection. For properties within a Community Service Area, connection will be deemed not feasible if the cost of connection exceeds 25% of the most recent assessed value of the subject property.

(ii) The proposed repair or replacement design must be protective of groundwater and appropriate for a Floodway. In making a proposal to the County Engineer, the applicant must address the following factors, among other pertinent information:

- a. Whether it is practical to remove outbuildings or non-conforming additions to allow for increased soil availability so that the proposed repair or replacement can be located outside of the Floodway;
- b. Whether there is room for an at-grade recirculating sand filter, or similar treatment media, and the required absorption area;

- c. Whether placement in the hydraulic shadow of a legal, existing structure is possible.

(iii) In no event must a proposed repair or replacement increase the overall capacity of the existing OWTS, unless the expansion is necessary to meet the Boulder County OWTS Regulations, as administered by the Boulder County Public Health Department. In addition, the County Engineer may approve a raised absorption system or installation of a vault only as a last option within the Floodway and provided that this option meets the provisions of Article 4-413 (Nonconforming Uses).

H. Liquid Propane Gas (LPG) or Other Similar Storage Tanks

1. Placement of a new or replacement LPG or other similar storage tanks in the FO District is prohibited, unless the County Engineer determines that placement in the FO District cannot be avoided, in which case location decisions must prioritize those portions of the subject property where flood depths and/or velocities are the lowest, including, but not limited to the conveyance shadows of existing buildings.
2. When allowed, above-ground tanks must be placed on a concrete pad that extends to or above the FPE and is sufficiently-anchored. If elevation of the tank conflicts with IBC requirements, the IBC requirements must prevail; however, in all cases, sufficient protection must be provided to the tank such that it resists the expected hydrostatic and hydrodynamic flood forces.
3. When allowed, underground tanks must be designed and installed to resist the effects of buoyancy during high groundwater or flooding conditions. Buoyancy calculations must assume an empty tank and must use the same calculation outlined for Septic Tanks in 4-405(G)(3) above. Anchoring of the tank is required if the empty tank alone will not counteract the calculated buoyant force.
4. All connections and components related to the tank or fuel system must be designed such that floodwaters cannot infiltrate or accumulate within any component of the system.
 - a. Inspection Ports and access covers must be sealed to prevent the entry of floodwaters or the exit of tank contents, or must extend above the FPE.
 - b. Tanks located inside of a building must also meet all of the requirements of this section.

I. Historic Buildings and Structures Exempt. The repair or rehabilitation of buildings or other structures designated as historic through either the Boulder County Historic Landmark process or through a State of Colorado or national historical registry process is exempt from Flood Protection Requirements under Section 4-405. Entitlement to such an exemption requires the applicant to show:

1. Documentation that the building or structure is designated as a historic building or structure as defined by Article 18-203A; and

2. Documentation that confirms that the proposed work will not preclude the structure’s continued historic designation.

J. Elevation Certificate Requirements

1. As built Lowest Floor Elevations (referenced to the NAVD88 datum) for all New Floodplain Construction, Substantial Improvements, other improvements, or for new manufactured home stands, must be certified by a Colorado Registered Professional Engineer or Colorado Registered Professional Land Surveyor. Elevation Certificates must be submitted to the Building Division Inspector and County Engineer twice over the duration of the project. Failure to submit an Elevation Certificate will result in a Stop Work Order until proper certification is provided. To ensure compliance with flood protection requirements during and after construction, completed Elevation Certificates must be submitted at the following times:
 - a. For slab-on-grade foundations, a FEMA Elevation Certificate must be submitted prior to final pour of foundation when foundation forms are completed.
 - b. For buildings on elevated foundations, such as extended foundation walls, stem walls, or piles, a FEMA Elevation Certificate must be submitted prior to rough framing when the foundation is completed.
 - c. For all buildings that have achieved finished construction, a final FEMA Elevation Certificate must be submitted prior to the issuance of Certificate of Occupancy or final inspection.
2. To convert another elevation reference datum to NAVD88, applicants are directed to datum conversion factors within the current effective FEMA FIS report for Boulder County, or to an online datum conversion program. Assumptions used for the datum conversion must be explicitly described to Boulder County on the Elevation Certificate. For datum requirements for permit submittals, see 4-404.2(B).

4-406 County Engineer’s Determination

- A. If the County Engineer finds in reviewing an Individual FDP application that the application meets the applicable standards set forth in Article 4-400, the County Engineer must approve the permit.
- B. If the County Engineer finds that the application can only meet all applicable standards if the FDP approval is conditioned, then the County Engineer must include all necessary and reasonable conditions when issuing the permit. Such conditions may include, but are not limited to, periods of operation, operational controls, sureties, deed restriction, and adequate flood protection. The County Engineer must specify when the conditions must be met.
- C. If the County Engineer finds that the application does not meet one or more applicable standards and that a reasonable basis for mitigation measures has not been demonstrated, the County Engineer must deny the application as proposed. The County Engineer’s determination must specify the reasons for the denial based upon the FDP review criteria in Section 4-404.2(D).
- D. Any determination by the County Engineer to approve, conditionally approve, or deny a FDP must be in writing and mailed or otherwise provided to the applicant.
- E. For purposes of appeal to the Board of Adjustment, the County Engineer’s determination will be deemed final as of the date the FDP is issued. The applicant may begin work under an issued permit as of the date the permit is issued. If an applicant begins work during the 30-day appeal period to Board of Adjustment, the applicant does so at their own risk, as some or all of the work may need to be modified or removed at the applicant’s expense if the Board of Adjustment overturns the County Engineer’s decision to issue the permit.

4-407 Review of Permits Approved in Floodway

- A. In the event that the County Engineer determines that an Individual FDP application for any development in the Floodway meets the applicable standards for approval, within five business days of permit issuance the County Engineer must publish a notice of the proposed use and the permit issuance on the Boulder County website and transmit a copy of the notice to property owners adjacent to the subject property as well as a description of the process for appealing the decision to the Board of Adjustment.
- B. The County Engineer may waive or modify any requirement in 4-407(A) for the following Floodway development:
 - 1. Emergency activities required for the immediate protection of life, safety, or property, or to restore essential public services,
 - 2. Minor disaster recovery repair work that does not cause a rise in predicted 100-year water surface elevation as determined by a qualified engineer licensed in Colorado, and
 - 3. Any development activities that take place entirely inside an existing building.

4-408 Appeal of County Engineer Determination

- A. **Right to Appeal.** Any person aggrieved by a final written decision of the County Engineer based upon or made in the course of the administration or enforcement of the provisions of this Article 4-400 may appeal to the Board of Adjustment.
- B. **Appeal Application.** The procedures and requirements for filing an appeal may be found in Article 3 and in particular section 3-202(A)(1).
- C. **Public Hearing.** Upon receipt of a complete appeal application, the Board of Adjustment must hold a public hearing on the appeal application following the procedures specified in section 3-205(A).
- D. **Review Criteria.** In deciding upon an appeal of a County Engineer administrative decision or interpretation made under this Article 4-400, the Board of Adjustment must consider the factors specified in Section 4-1200(A)(1) as well as the additional factors listed below:
 - 1. the technical meaning of the provision being appealed;
 - 2. evidence as to the past interpretation of the provision;
 - 3. the principles of interpretation and rules of construction in Article 1 of this Code;
 - 4. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;
 - 5. the danger that materials may be swept onto other lands to the injury of others;
 - 6. the danger to life and property due to flooding or erosion damage;
 - 7. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
 - 8. the importance of the services provided by the proposed facility to the community;
 - 9. the necessity to the use or structure of a waterfront location, where applicable;
 - 10. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;
 - 11. the compatibility of the proposed use or structure with the existing and anticipated development;
 - 12. the safety of access to the property in times of flood for ordinary and emergency vehicles;
 - 13. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;

14. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and

15. the purposes of this Article 4-400.

E. **Decision of the Board.** The Board of Adjustment must make a record of its decision on the appeal in the same manner as other BOA appeals filed under Article 4-1200. The County Engineer must maintain records of the outcome of all appeals filed.

F. **Effect of Decision.**

1. In no instance can a decision on an appeal to the Board of Adjustment result in a modification to the DFIRM. In order to modify the regulatory boundaries established by FEMA, interested parties must use FEMA's LOMC process or consult FEMA on other options for modification.
2. In no instance can a decision on an appeal to the Board of Adjustment result in a modification to the lateral extent of the Boulder County Floodplain. In order to modify the regulatory boundaries established by the County, the owner must request a rezoning map amendment under the procedures of 4-1100.

4-409 Variances

- A. **Right to Request Variance.** Any person may request the Board of Adjustment grant a variance from the requirements in this Article 4-400 subject to the terms and conditions in this section 4-409.
- B. **Variance Application.** The procedures and requirements for filing a request for a variance may be found in Article 3 and in particular section 3-202(A)(19).
- C. **Public Hearing.** Upon receipt of a complete variance application, the Board of Adjustment must hold a public hearing on the request following the procedures specified in section 3-205(A).
- D. **Limitation on Board’s Authority.**
 - 1. In deciding upon a variance request made under this Article 4-400, the Board of Adjustment must comply with the limitations on its authority specified in section 4-1202(B)(1).
 - 2. Variances may be issued for New Floodplain Construction of and Substantial Improvements to residential buildings on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing buildings constructed below the FPE, but only if the criteria in section 4-409(E) below are met and subject to the following:
 - a. Such a variance may not be issued within any designated Floodway.
 - b. Any applicant to whom such a variance is granted must be given written notice that the building will be permitted to be built with a Lowest Floor Elevation below the FPE and that the cost of flood insurance will be commensurate with the increased risk associated with the reduced Lowest Floor Elevation.
- E. **Review Criteria.**
 - 1. To grant a variance of a requirement imposed under this Article 4-400, the Board must find that all of the following criteria have been satisfied:
 - a. the strict application of this Code would create an exceptional or undue hardship upon the property owner;
 - b. the hardship is not self-imposed;
 - c. the variance, if granted, will not adversely affect the use of adjacent property as permitted under this Code;
 - d. the variance, if granted, will not change the character of the underlying zoning district in which the property is located, and is in keeping with the intent of this Code and the Boulder County Comprehensive Plan;
 - e. the variance, if granted, does not adversely affect the health, safety, and welfare of the citizens of Boulder County and is in accordance with the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development;

- f. the variance is the minimum necessary, considering the flood hazard, to afford relief;
 - g. the variance, if granted, will not result in increased flood heights, additional threats to public safety, or extraordinary public expenses; and
 - h. the variance, if granted, will not create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
2. Prior to granting a variance of a requirement imposed under this Article 4-400, the Board must also consider the following factors:
- a. the technical meaning of the provision being appealed;
 - b. evidence as to the past interpretation of the provision;
 - c. the principles of interpretation and rules of construction in Article 1 of this Code;
 - d. the effect of the interpretation on the intent of this Code and the implementation of the Comprehensive Plan and any applicable intergovernmental agreement affecting land use or development, and any floodplain management program for the subject area;
 - e. the danger that materials may be swept onto other lands to the injury of others;
 - f. the danger to life and property due to flooding or erosion damage;
 - g. the susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners;
 - h. the importance of the services provided by the proposed facility to the community;
 - i. the necessity to the use or structure of a waterfront location, where applicable;
 - j. the availability of alternative locations for the proposed use or structure which are not subject to flooding or erosion damage;
 - k. the compatibility of the proposed use or structure with the existing and anticipated development;
 - l. the safety of access to the property in times of flood for ordinary and emergency vehicles;
 - m. the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site;
 - n. the costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets and bridges; and

o.the purposes of this Article 4-400.

- F. **Decision of the Board.** The Board must approve, conditionally approve, or deny the variance request. The Board may attach such reasonable conditions to the granting of variances as it deems necessary to further the purposes of this Article 4-400. The Board must make a record of its decision on the variance in the same manner as other BOA requests for variances filed under Article 4-1200. The County Engineer must report variances granted on an annual basis to FEMA.
- G. **Conflicts with 4-1200.** If a conflict arises between the requirements of this Section and the provisions of Section 4-1200, Board of Adjustment, the requirements of this Section control.

4-410 Final Inspection

All approved Individual FDPs are subject to final inspection by the County Engineer or his designee to verify that all conditions of approval have been satisfied.

4-411 Permit Expiration

An approved Individual FDP expires two years after the date of issuance if the permittee has not commenced construction under the permit.

4-412 Amendments to an Approved Individual FDP

Any proposal to change the nature or extent of work approved under an issued Individual FDP approved under this Article must require a request to the County Engineer to determine whether the proposed change constitutes a Substantial Modification to the approved plan. If the County Engineer determines that the change constitutes a Substantial Modification, no such change must be allowed to proceed until an application to amend the approved Individual FDP is filed with the County Engineer and approval granted in accordance with this Article. Any new application is subject to the Code in effect at the time of complete application. The applicant or its successor may appeal the County Engineer’s decision to require an amended Individual FDP to the Board of Adjustment, provided that any such appeal must be in writing and must be filed with the County Engineer no later than 30 days following the date of the County Engineer’s decision to require an FDP amendment.

4-413 Nonconforming Structures and Uses in the FO District

A. Principles of Construction. This Section is to be read in conjunction with Section 4-1000 (Nonconforming Structures and Uses). This section does not supersede 4-1000 in its entirety; rather, it establishes additional requirements for nonconforming structures and uses located in the FO District. If a conflict arises between the requirements of this Section 4-413 and the provisions of Section 4-1000, the requirements of this Section 4-413 control.

B. Nonconforming Structures, Generally.

1. Any building or structure within the FO District that was lawfully established before the adoption or amendment of this Article 4-400 but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1002.
2. Owners of existing nonconforming insurable buildings must track major repairs, remodeling, additions, and other improvements to determine when such work would constitute a Substantial Improvement. FEMA’s minimum requirements for the tracking of improvements and repairs within the Substantial Improvement/Substantial Damage Desk Reference (FEMA P-758), dated May 2010, as amended, is incorporated herein by this reference. Estimates for repair of damage that include additional improvement costs must apply the pre-damaged market value of the building to the sum of the repair and improvement costs.
3. If an amendment to the Official Map or this Article results in a higher BFE such that a building becomes nonconforming, the higher BFE will apply to all subsequent permit applications. All work proposed subsequent to the higher BFE must be evaluated to confirm whether it will be a Substantial Improvement.

C. Nonconforming Structures in the Flood Fringe.

1. A nonconforming building or structure (whether residential or non-residential) in the Flood Fringe may not be expanded, improved, repaired, relocated, restored, or replaced unless the work complies with this section.
2. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe proposes a Substantial Improvement or repair of Substantial Damage, the owner shall complete the following steps in the following order:
 - a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.
 - (i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.
 - (ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

- (iii) Relocation to less hazardous locations is strongly encouraged, but not required.
- (iv) If a nonconforming building or structure is relocated to a less hazardous location, the retrofitting requirements below may be reduced or eliminated at the discretion of the County Engineer.

b. Retrofitting Existing Buildings.

- (i) The entire building or structure must be brought into compliance with the flood protection measures described in section 4-405.
 - (ii) All Flood Fringe retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).
3. Work on a nonconforming building or structure (whether residential or non-residential) in the Flood Fringe that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

D. Nonconforming Structures in the Floodway. A nonconforming building or structure (whether residential or non-residential) in the Floodway may be improved or repaired only if it complies with all of the following:

- 1. A nonconforming building or structure (whether residential or non-residential) in the Floodway may not be expanded by addition of square footage, footprint, or Habitable Space.
- 2. If the work to improve or repair a nonconforming building in the Floodway is the result of Substantial Damage to the building through a flood or other natural hazard event, the applicant will have five years from the date of loss to begin the work. At the expiration of the five-year period, the applicant may petition the County Engineer for a single one-year extension.
- 3. Where an owner of a nonconforming building or structure (whether residential or non-residential) in the Floodway proposes a Substantial Improvement or repair of Substantial Damage, the owner shall complete the following steps in the following order:

a. Relocation Evaluation. The owner must first evaluate the feasibility of relocating the nonconforming building or structure to a less hazardous location on the property.

- (i) Any relocation must be reviewed and approved by the County Engineer to ensure it reduces the risks associated with future flood events and other known natural hazard areas.
- (ii) Relocation is subject to other provisions of this Code, including without limitation setback and zoning requirements.

- (iii) Permanent removal of encroachments in the FEMA or Boulder County Floodway may qualify the owner for bonus Transferable Development Credits pursuant to section 4-1303.
- (iv) Relocation to less hazardous locations is strongly encouraged, but not required.
- (v) If a nonconforming building or structure is relocated to a less hazardous location, the retrofitting requirements below may be reduced or eliminated at the discretion of the County Engineer.

b. Retrofitting Existing Buildings.

- (i) In addition to requiring conformance with the flood protection measures in section 4-405, the County Engineer shall require one or more of the following retrofitting techniques to protect the entire residential building or structure from flood inundation as well as scour and erosion, debris impact, and other potential hazards associated with floodways:
 - 1) Elevation using Posts, Columns, or Piles
 - i. Posts or columns must be placed in drilled or excavated holes or piles must be driven into the ground.
 - ii. Posts or columns must be encased in concrete and include a footer.
 - iii. Posts, columns, and piles must be sufficiently anchored to resist the expected hydrodynamic and hydrostatic flood forces.
 - iv. Access may be allowed to extend below the FPE.
 - 2) Elevation using stem walls parallel to the direction of flow
 - i. Water must be allowed to flow freely at high velocities between stem walls.
 - ii. Footers must be designed and installed to account for potential scour associated with flooding.
 - 3) Other techniques proposed by the applicant as determined by the County Engineer on a case-by-case basis.
- (ii) In all cases, the bottom of lowest horizontal structural member (floor joists) as well as all service equipment must be above the FPE.
- (iii) In all cases, a continuous load path from the retrofitted foundation to the elevated portion of the home is required.
- (iv) For non-residential buildings, the applicant must first consider the retrofit requirements for residential buildings in this subsection, but at a minimum, the requirements of 4-405(C) apply.

(v) All Floodway retrofitting techniques will require the certification of a P.E. that demonstrates the technique and associated components will withstand the loads associated with a 1%-annual-chance flood event. In addition to the Elevation Certificate requirements of 4-405(J), residential building retrofit projects require completion of the Boulder County Residential Floodway Retrofit Certificate. Non-residential buildings require completion of a Floodproofing Certificate in accordance with 4-405(C)(3)(a)(v).

4. Work on a nonconforming building or structure (whether residential or non-residential) in the Floodway that is not a Substantial Improvement or repair of Substantial Damage must comply with the flood protection measures described in section 4-405 and all other applicable requirements of this Article.

E. Nonconforming Uses.

1. The use of any structure or property within the FO District that was lawfully established before the adoption or amendment of this Article 4-400, but that does not conform to the requirements of this Article may be continued subject to the provisions of this Section 4-413 and Section 4-1003.
2. A change in use (as uses are defined in Article 4-500) of a structure will require that the entire structure be flood-protected pursuant to Section 4-405; provided, however, that the County Engineer may modify or waive flood protection requirements for a change in use based on good cause shown by the applicant that all of the following conditions are met:
 - a. The entirety of the existing structure is located outside of the Floodway;
 - b. The existing structure is determined to be structurally sound by a qualified engineer licensed in Colorado;
 - c. The value of any work associated with the change of use is less than 50% of the current value of the structure;
 - d. The proposed change in use is to a use that is permitted in the zone district applicable to the property;
 - e. The proposed change in use is to a use that reduces, minimizes, or otherwise creates a less intensive use or decreases human occupation; and
 - f. There is no other potential for any significant conflict with this Article 4-400.

4-414 Definitions

Accessory Building or Structure. A building or structure which is on the same parcel of property as a principal or primary building and the use of which is incidental to the use of the principal or primary building. Examples include, but are not limited to, detached garages (but NOT ADUs), storage sheds, barns, boathouses, and pavilions.

Alteration of a Watercourse. Through man-made work, changing the the bankfull channel such that the post-project location, orientation, or flow direction of said channel extends three or more bankfull channel widths from the pre-project channel location, or outside of the pre-project regulatory floodplain.

Article 4-400. Sections 4-400 through 4-416 of the Boulder County Land Use Code.

Basement. Any area of a building having a finished floor subgrade on all sides, where the finished floor is greater than four feet below the top of the foundation walls or greater than 2 feet below the Lowest Adjacent Grade.

Below-Grade Crawlspace. The interior space between the elevated finished floor of a building and the finished interior grade, where the finished grade is no greater than 4 feet below the top of the foundation walls and no greater than 2 feet below the Lowest Adjacent Grade.

Crawlspace. The interior space between the elevated finished floor of a building and the interior finished grade.

Critical Facilities. A structure or related infrastructure, but not the land on which it is situated, as specified in CWCB’s Rules and Regulations for Regulatory Floodplains in Colorado at 2 CCR 408-1:6, 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.

Habitable Space. An enclosed area having more than 20 linear feet of finished interior walls (paneling, etc.) or used for any purpose other than solely for parking of vehicles, building access or storage.

Flood Fringe. The portions of the Floodplain Overlay District that are not in the Floodway.

Floodway. The floodway depicts the most hazardous portion of the floodplain, where flood depths and velocities are greatest and damages resulting from flooding are the most catastrophic. As such, Boulder County’s development restrictions in the floodway are stricter than those within the Flood Fringe. In Boulder County, Floodway means:

1. Those portions of the FO District required for the passage or conveyance of the base flood in which waters will flow at significant depths or with significant velocities, including the channel of a river or other watercourse and any adjacent floodplain areas that must be kept free of development and other encroachments to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
 - a. The Colorado statewide standard for the designated height to be used for all newly studied reaches is 0.5 foot.

- b. For existing Floodway delineations in previously studied reaches, the designated height is that in place at the time of the study. This information is on file with the County Engineer and available upon request. Letters of Map Revision to existing Floodway delineations may continue to use the floodway criteria in place at the time of the original delineation.
2. Areas identified as floodway by the Colorado Water Conservation Board or FEMA.
3. In the foothill canyons and in any drainage above 6,000 feet (NAVD88) in elevation, as a result of the expected high flow velocities, with reference to the best terrain data available as of the last FO District update, (a) the entirety of the 1%-annual-chance (100-year) flood hazard area, or (b) as reflected on an engineering study approved by the County Engineer and available upon request.
4. In Zone A or AE areas, where the proposed development does not involve buildings or structures, then in the absence of either a specific floodway designation by FEMA or an engineering study submitted by the applicant and approved in writing by the County Engineer, the Floodway is defined as the channel or flowpath of the river, stream, or other watercourse and areas of the floodplain where the product of flood depth (in feet) multiplied by flood velocity (in feet per second) is greater than four. This formula is derived from the 1987 Colorado State University flume study. Flow depth and velocity can be determined from a number of sources, including without limitation hydraulic modeling, water surface elevation information, terrain data, and flood risk products created specifically to display depth and/or velocity.
5. Where the proposed development involves buildings or structures in the FO District and the floodway has not been previously identified, the Floodway is those portions of the FO District determined to be floodway by an engineering study submitted by an applicant and approved by the County Engineer as further described in Section 4-404(E).

In-Kind Replacement. For storm drainage systems and system components, replacement of any system or system component with the same system or component. In-kind Replacement does not include projects that will change the size or function of the system or component.

Letter of Final Determination. A letter FEMA sends to the Chief Executive Officer of a community stating that a new or updated FIRM or DFIRM will become effective in 6 months. The letter also notifies each affected floodprone community participating in the NFIP that it must adopt a compliant floodplain management ordinance by the map effective date to remain participants in good standing in the NFIP.

Letter of Map Amendment (“LOMA”). FEMA term meaning an amendment to the currently effective FEMA map, issued only by FEMA, which establishes that a property is not located in a Special Flood Hazard Area.

Letter of Map Revision (“LOMR”). FEMA term meaning an official amendment to the currently effective FEMA map, issued by FEMA, which changes flood zones, delineations and elevations.

Lowest Adjacent Grade. The lowest point of the ground level immediately next to a building.

Maintenance. Maintenance means any routine or regularly-scheduled activity undertaken to

repair or prevent the deterioration, impairment, or failure of any utility, structure, or infrastructure component. Maintenance includes activities to restore or preserve function and/or usability of a storm drainage, water delivery, or ditch system. Such activities may include, without limitation, the removal or movement of sediment, debris, and vegetation, installation of erosion and sediment control devices, stabilization of stream channel and/or water delivery channel (ditch) banks, and the replacement of structural components, so long as the work substantially conforms to the most recent County-approved design, flow condition, and vertical grade, as applicable. Maintenance does not include expansion or enlargement of a building or structure, Substantial Modifications, Substantial Improvements, total replacement of existing facilities, or total reconstruction of a facility.

Permanent. Any change or alteration expected to remain for a substantial period of time, but at a minimum will remain after permitted work is complete.

Soil Treatment Area. See Boulder County OWTS Regulations (April 2015), as amended.

4-415 Interpretation

Certain terms used in this Article 4-400 are derived from FEMA and/or CWCB regulations. The federal and state definitions of these terms may not correspond precisely to county definitions of the same or similar terms as used elsewhere in the Land Use Code and related local regulations such as the Building Code. To the extent a term is not defined in this Article 4-400, and a conflict or inconsistency in the meaning of the term cannot be resolved by the principles listed in sections 1-900 and 1-1000, the County Engineer must determine the meaning of the term by examining the following sources in the following order of priority:

1. The meaning of the term as defined in Article 4-400.
2. The meaning of the term as defined in Article 18 of this Code.
3. The meaning of the term as defined by FEMA. See 44 C.F.R. § 59.1, as amended.
4. The meaning of the term as defined by CWCB. See 2 C.C.R. 408-1:4, as amended.
5. The meaning of the term as defined elsewhere in this Code, or in another adopted Boulder County publication such as the Multimodal Transportation Standards, the Storm Drainage Criteria Manual, or the Stormwater Quality Management Permit Requirements.
6. The meaning of the term as defined in any other official document deemed a reliable source of authority given the context.

4-416 Enforcement

Upon receiving a complaint that a violation of the requirements of this Article 4-400 has occurred, the County Engineer is authorized to enforce compliance with these floodplain regulations in the same manner as other violations of the Land Use Code are enforced, as detailed in Article 17.

Changes to other parts of the Code

4-1202(C) – Board of Adjustment – Standards of Review

Replace current text with: “Additional requirements for appeals and variances under Section 4-400 of this Code (“Floodplain Overlay District”) are set forth in Section 4-408 and 4-409, respectively.”

4-800 – Site Plan Review

4-802 Applicability and Scope of the Site Plan Review Process for Development

A. Site Plan Review shall be required for (unless not required or waived pursuant to sections B and C below):

[...]

8. Any development or earthwork requiring a floodplain development permit.

B. Site Plan Review shall not be required for:

[...]

3. Restoration of a structure that has been damaged or destroyed by causes outside the control of the property owner or their agent provided the restoration involves the original location, floor area, and height. Such restoration must comply with the current provisions of the Boulder County Land Use Code other than 4-800 (also see Nonconforming Structures & Uses, Article 4-1002(D) and 4-1003(F)).

a. Such restoration must be commenced within six months after the date on which the structure was damaged or destroyed, or a latent defect discovered and completed within one year after the date on which the restoration commenced. This limitation may be extended in the case of extenuating circumstances as determined by the Director.

b. Replacement of bridges, box culverts or low-water crossings or other hydraulic structures spanning a creek or other drainage within a mapped floodplain under Article 4-400, may also be exempt from Site Plan Review under this Subsection 3., subject to administrative approval by the County Engineer for compliance with the Boulder County Storm Drainage Criteria Manual. The County Engineer may impose conditions on the construction to assure basic safety, including but not limited to requiring construction of a replacement bridge or crossing that is compliant with the Land Use Code and the Storm Drainage Criteria Manual either as a temporary or Permanent replacement hydraulic structure.

c. The provisions of this Section 4-802(B)(3) shall not apply to Substantial Improvements to buildings in the Floodplain Overlay District as provided for in Section 4-400 of this Code.

[...]

6. Any development or earthwork which the County Engineer deems eligible for a General Floodplain Development Permit.

C. Site Plan Review may be waived for the following circumstances if the Land Use Director determines that there is no potential for any significant conflict with the criteria listed in Article 4-806 of this Code:

[...]

8. Any development or earthwork requiring an Individual Floodplain Development Permit, so long as the Director consults with the County Engineer before granting the waiver.

Article 18

- Delete definition of “**Floodway**”
- Delete definition of “**Floodproofing**”
- Replace section 18-178A “**Market Value**” with:

Market value is the price which a willing buyer would pay a willing seller under normal economic conditions, based on a representative body of comparable sales at or about the date for which the market value is sought to be determined, as calculated by an independent appraisal performed by a professional appraiser, or by other accepted authoritative source such as the County Assessor’s Office. In lieu of an independent appraisal, the market value of the structure as determined from the records of the County Assessor may be used. For purposes of floodplain regulations, market value may be set according to any method approved by FEMA and explained within FEMA P-758.

- Replace section 18-206 “**Substantial Improvement**” with:
 - A. Any cumulative combination of repairs, reconstruction, rehabilitation, expansion, or improvement of a building or other structure, the cost of which equals or exceeds 50 percent of the market value of the structure either before the improvement or repair is started, or if the structure has been damaged and is being restored, before the damage occurred. Substantial improvements are calculated on a cumulative basis, beginning with improvements commenced on or after September 11, 2013.
 1. The costs of the improvement shall include, but are not necessarily limited to, all materials, labor, built-in appliances, overhead, profit, and repairs to damaged portions of the building that are done concurrent with the subject improvements.
 2. The costs of the improvement shall not include those associated with post-storm debris removal; permitting; fees, preparation of surveys, costs, plans, and or specifications; or improvements outside of the structure, such as landscaping, sidewalks, fences, or detached structures; or work under a minor

building permit exempted from floodplain development permit requirements under Article 4-400 of this Code.

B. The term substantial improvement does not include:

1. Any alteration of a structure listed on the National Register of Historic Places or on the Colorado State Historical Society’s list of historic places.
 2. Any of the following types of improvements necessary to assure safe living conditions or bring a structure into compliance with state or local health, sanitation, safety, or building codes:
 - a. Electrical repairs;
 - b. Furnace repairs or replacements;
 - c. Water heaters, boilers, and evaporative cooler repairs or replacements;
 - d. Air conditioner repairs or replacements;
 - e. Repairs or replacements to roof coverings;
 - f. Insulation or simple weatherization or energy efficiency upgrades.
 3. Costs associated with renovations or remodeling projects totaling less than \$1,000.00, as increased annually starting January 1, 2018 by the Consumer Price Index inflation factor applicable to Boulder County.
 4. Note: even though not substantial improvements, the work described above may still require an Individual FDP.
- Replace section 18-205A “**Substantial Damage**” with:

Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before damage occurred.

DC-15-0004

EXHIBIT E

**Proposed form of
General Floodplain Development Permit 2016-1**



Transportation Department

Tel: 303.441.3900 • Fax: 303.441.4594 • transportation@bouldercounty.org
Mailing Address: P.O. Box 471 • Boulder, Colorado 80306-0471 • www.bouldercounty.org

GENERAL FLOODPLAIN DEVELOPMENT PERMIT 2016-1

Date posted: _____

Effective date (14 days after posting): _____

Signature of County Engineer: _____

Printed name: _____

By virtue of the authority granted in the County floodplain regulations, Section 4-404.1 of the Boulder County Land Use Code, the County Engineer hereby determines that the following activities are unlikely to result in increases to base flood elevations or have an adverse effect on neighboring properties, species, or ecosystems. Consequently, such projects are deemed approved under this General FDP if completed in conformance with the provisions contained herein. For definitions of terms used herein, e.g., "Maintenance," see Section 4-414.

* * *

1. Activities Requiring Notice. The following activities require written notification of the County Engineer 21 days prior to commencement, which notification must comply with the requirements of Section 4-404.1(B)(2)(b):
 - a) Road and trail widening, surface type changes, and overlays of greater than six inches measured vertically (if fill is necessary for widening, an Individual FDP is required).
 - b) New parking lots greater than 0.1-acre.
 - c) New underground utilities that do not permanently alter topography and are:
 - i. Greater than 250 feet in length and installed perpendicular to flood flows; or
 - ii. Installed under a perennial stream channel.
 - d) Temporary in-stream diversions or dewatering (limited to temporary construction diversions and temporary diversions to maintain an adjudicated water right; under the General FDP, the dewatered reach must not exceed 300 feet, and may require additional permitting through the Colorado Department of Public Health and Environment).
 - e) In-kind replacement of public and private storm drainage system or infrastructure components including but not limited to hydraulic structures such as culverts and

check dams. An Individual FDP is required for all replacement bridges. An Individual FDP may also be required if physical conditions of the channel have changed to the extent that in-kind replacement is not possible and/or if Boulder County requires replacement with a different design, size, and/or new component.

- f) In-kind replacement of public and private water delivery and ditch system infrastructure components to maintain water rights including but not limited to headgates, measuring devices, diversions, flumes, sand gates, and fish ladders; provided, however, that an Individual FDP may also be required if physical conditions of the channel have changed to the extent that in-kind replacement is not possible or if Boulder County requires replacement with a different design, size, and/or new component.
 - g) Conversion of open ditches to buried pipeline.
 - h) Maintenance of public drainage system infrastructure and components, including but not limited to bridges, culverts, and check dams, where such work occurs more than 300 feet upstream or downstream of the nearest drainage system structure or component.
 - i) Maintenance by special districts or ditch companies of water delivery or ditch system infrastructure and components, including but not limited to diversions, headgates, sand gates, measuring devices, flumes, siphons, wells, pumps, and fish ladders, where such work occurs more than 300 feet upstream or downstream of the nearest water delivery/ditch system structure or component.
 - j) Private storm drainage infrastructure Maintenance.
 - k) Fences not in the Floodway.
 - l) Activity related to oil and gas operations.
2. Activities Not Requiring Notice. The following activities do not require notification of the County Engineer prior to commencement:
- a) Maintenance and/or repair of at-grade transportation infrastructure that matches the grade of adjacent facilities within 6 inches, measured vertically, where transportation infrastructure includes paved and gravel roadways along with associated roadside ditches, cross culverts of less than 48 inches, driveway approaches, and parking areas.
 - b) New driveways, trails, sidewalks, roads and streets constructed completely at-or-below existing grade.
 - c) Maintenance of public drainage system infrastructure and components, including but not limited to bridges, culverts, and check dams, where such work occurs within 300 feet upstream or downstream of the nearest drainage system structure or component.
 - d) Maintenance by special districts or ditch companies of water delivery or ditch system infrastructure and components, including but not limited to diversions, headgates, sand gates, measuring devices, flumes, siphons, wells, pumps, and fish ladders, where such work occurs within 300 feet upstream or downstream of the nearest water delivery/ditch system structure or component.

- e) Maintenance of utility and ditch easements and ditch ROWs in order to restore and/or preserve proper functional access including, for example, access road repairs or resurfacing.
- f) Replacement guardrails that are no more than 4-inches taller than the previous existing or designed guardrails, and that do not decrease the available conveyance of floodwaters; (new guardrails or replacement guardrails that do not meet the above criteria require an Individual FDP).
- g) Removal of flood-deposited sediment in the overbanks and floodplain areas of an amount 6 inches or less in height (greater than 6 inches requires Individual FDP).
- h) Removal of debris limited to large, woody, unanchored or dead vegetation and rubbish as defined in Article 14.
- i) New overhead utilities, including supporting structures, as well as maintenance of overhead utilities.
- j) New underground utilities that do not permanently alter topography and are:
 - i. Less than 250 feet in length; and
 - ii. Installed parallel to flood flows.
- k) Maintenance of underground utilities (work must not permanently alter topography).
- l) Installation of sign or mailbox posts, telephone poles, or similar elements covering an area of ground no greater than 10 square feet, unless more than 5 such elements are located along a line of the same bearing that are not parallel to flow and could create an obstruction.
- m) Repair or replacement of existing piers or posts supporting a conforming deck.
- n) Activities associated with construction stormwater BMPs, including but not limited to temporary erosion control measures, etc.
- o) General farming, pasture, horticultural activities, and forestry that do not involve earthwork that permanently alters the topography or any clearing/grubbing of an area greater than 0.1 acres.
- p) Temporary buildings or structures associated with general farming, pasture, horticulture, and forestry activities that do not exceed 120 square feet (200 square feet for loafing sheds) and are outside of the Floodway.
- q) Repairs necessary to correct existing violations of Boulder County health and safety codes or to ensure safe and healthy living conditions, such as:
 - i. Electrical repairs;
 - ii. Furnace repairs or replacements;
 - iii. Water heaters, boilers, and evaporative cooler repairs or replacements;
 - iv. Air conditioner repairs or replacements;
 - v. Repairs or replacements to roof coverings; and
 - vi. Insulation or simple weatherization or energy efficiency upgrades.

- r) Gardening and landscaping including planting vegetation, mulching, and raised beds less than 12 cubic yards total (but not hardscaping such as retaining walls, terraces, etc.).
 - s) Lawns and lawn maintenance activities.
3. Conditions Applicable to Activities Authorized Under this General FDP.
- a) All required local, state, and federal permits must be obtained prior to beginning work, which may include: the Boulder County Land Use Code, the Boulder County Storm Drainage Criteria Manual, and the Boulder County Multimodal Transportation Standards Manual. It is the Permittee's responsibility to comply with the requirements of Section 404 of the Clean Water Act and Sections 7 and 9 of the Endangered Species Act of 1973, or with any other applicable Federal, State, or local laws or regulations
 - b) Permanent placement or storage of materials may not occur in the regulatory Floodway without the issuance of an Individual FDP.
 - c) Construction equipment, material, and waste should be located outside the regulatory floodplain when not in use.
 - d) Maintenance of public drainage system infrastructure and components and water delivery / ditch system infrastructure and components must match the most recent County-approved design, flow condition, and vertical grade.
 - e) Maintenance must not lower the normal channel invert elevation.
 - f) In the event of any change or modification to a use or activity permitted hereunder that is likely to result in increases to base flood elevations or have an adverse effect on neighboring properties, species, or ecosystems, the County Engineer must be notified of the change and the modification approved prior to continuing work. Modifications may require an Individual FDP as determined by the County Engineer.
4. Duration. This General FDP remains in effect until further notice.

DC-15-0004

EXHIBIT F

**Written comments received from the public regarding
DC-15-0004 since September 1, 2016**

Blum, Varda

From: Blum, Varda
Sent: Wednesday, September 21, 2016 11:03 AM
To: Blum, Varda
Subject: FW: LLWA Metting September 8, 2016,

From: F. Yates Oppermann [yateso@comcast.net]
Sent: Saturday, September 03, 2016 10:44 AM
To: john Brown; Maya MacHamer; Carroll, Ryan; McKay, Julie
Cc: Chuck Oppermann
Subject: LLWA Metting September 8, 2016,

John, Chuck, Maya, Ryan, and Julie,

I would like to propose a working LLWA meeting for the evening of **September 8. 7:00 PM at 7194 Strath Blvd., Longmont, CO 80503**. The Oppermann Hacienda. Four Mile and Boulder County are included here because I hope they will join us. We should invite someone from the ditch companies as well, Lefthand? Does someone have a contact to forward this to? I realize that some of you might get this with only a day or so notice, I apologize. Unfortunately the Commission did not leave us with a lot of time to breathe.

This meeting would be to look at how we could change the proposed amendments to the floodplain code in a way that works for all parties. I don't think that this would need to take a long time, maybe an hour and a half to two hours.

Here is how I can see the changes working.

Official Map:

1. Establish a standard for Best Available Data. People need to understand that changes to the map will not be done based on just anything.
2. Clarify the need for Actual Notice to affected Landowners: Based on my conversations after the commission meeting it sounds like this was intended. It should be clear in the code that any landowner whose property will be affected by change to the FOD will receive actual notice of those changes. I see this as applying to basically three kinds of changes:
 - a. When all or a portion of a property is added to the map,
 - b. When all or a portion of property will be removed from the map, and
 - c. When all or a portion of a property is changed between parts of the map. (floodway and flood fringe)
3. Require maps to show floodway and flood fringe separately. If the maps cannot demonstrate the differences, this means permit applicants have to figure this out before knowing how the code apply to them. That an be a HUGE cost and most people won't bother, they'll just ignore the code. This commitment would address a lot of the frustration that people have with the system now and as proposed.

NOTE I made the comment at the Commissioner's Meeting that I don't understand the rush to have this in place before the new mapping data is made available. It seems to me that the County can choose a more transparent process without having to codify it before hand. I suspect that if the staff simply proposed a process while the details in terms of code are finished that few people would be in opposition.

General Permit

1. Simplify how the general permit is intended to work. The problem with listing activities is that once you start, you better cover everything or else people become confused and everyone lobbies for their particular activity. Instead, I propose that the general permit be based on the types of impacts resulting from an activity. For example, if the concern is changing the physical contours of the floodway, this can be evaluated in terms of the amount of material being added, moved, or removed. So, to be fully covered by the general permit, it might be that less than 50 cubic yards of material is being moved, to require public notice is between 50 and 200 cubic yards, anything more would require the full permit process. (Don't get caught up in the numbers here, I'm just using something for an example.) Highest level of permit requirements applicable to the project is the process required. I've developed this sort of process before, as has George Gerstle, I know we can make it work.
2. Identify what kicks you out of the general permit. If the general permit would apply to a project, are there aspects that would make the general permit no longer applicable. Installation of permanent structures as an example. If so, these need to be identified.
3. Bulk Activities Permit. This one is aimed at the ditch companies. Provide a mechanism for a permit that can apply across multiple projects/years. This would allow ditch companies to go through the full permitting process on a regular basis while still allowing them to operate quickly for most situations. Nothing similar to this is in here now and I can see that it would take some time to hash out, but I think it could be a meaningful way for the county to manage the floodplains and the ditch companies to operate effectively.
4. Guidance Document: Commit to developing and maintaining a Floodplain Users Guide (better titled though) that helps people understand how it works and provides examples of what would fall into what category and how to get assistance.
5. Regular Review. Require a review of the general code on a regular basis (5 years?) to evaluate its effectiveness and to make any necessary changes.

NOTE the wetland permitting process starts with an assumption regarding whether the project is something that must occur in a wetland. The assumption being that a if the activity doesn't have to be in a wetland, it probably shouldn't be there. I'm not sure if/how this could be used in this instance, but might be worth thinking about.

Substantial Damage/Substantial Improvement:

I know that this isn't really a part of these proposed amendments. But changes to this section are being proposed (monetary limits, types of activities counted, etc.). If this is intended to be addressed more definitively as a next step, this needs to be communicated and committed to. Then we can start working on how best to fix this portion of the code.

In general my suggestion is that Substantial Improvement be limited to structural modifications to structures and that any proactive flood mitigation be credited.

Please let me know if you will be able to attend this meeting. I cannot promise the high level of hospitality while Chuck is out of town, but I will try.

F. Yates Oppermann

President

Oppermann Environmental

673 S. Carr
Lakewood, CO 80226

303-594-8300

yateso@comcast.net

Blum, Varda

From: Sarah Holloway <saholloway@gmail.com>
Sent: Wednesday, September 21, 2016 8:41 AM
To: Martin, Christian P.; Blum, Varda
Cc: Sarah Holloway; Boulder County Board of Commissioners; Paul Ingersoll
Subject: Re: My letter...
Attachments: DAU5LEN9JXTAD9e2K69tFe5A.jpg; Flood Cert for 8422 N County Line Rd.pdf

Please find the correct attachments that should have been included with my recent letter in response to DC 15-004.

Sincerely,

Sarah
Holloway
720-291-3795

On Tue, Sep 20, 2016 at 11:08 PM, Sarah Holloway <saholloway@gmail.com> wrote:
RE: DC 15-004

Dear Boulder County Planning Team,

This letter provides you with additional information and documentation specific to my home as Boulder County determines new boundaries and changes to the Floodplain Overlay District discussed at the September 1st Public Hearing.

Like many other Boulder County residents that are still recovering from the Sept 11th 2013 flood I would like to express concerns with specific proposed changes/restrictions to Land Use Code 4-400 that would impose an unforeseen financial burden and a lower property valuation on existing homes as they are placed in the revised Floodplain Overlay District.

I've attached our Flood Certification completed in June 2016 which indicates our home is not in the floodplain, along with documented information from Jeff Crane sharing his recommendations on preventative measures to eliminate future flood waters as Boulder County Transportation constructs the new North 83rd bridge.

As we all realized after the 2013 flood, the movement of the water to the north on North 83rd is what caused much of the damage to our property (see attached letter). This damage and destruction occurred specifically because the old bridge did not perform. It immediately clogged with debris which forced all the water to the north and the east, carving a new channel the whole way.

As you consider the new Floodplain Overlay District for my property, I would like to ask that you base the new floodplain boundaries on reasonable predictions and bridge improvements to determine where and how future floodwaters will behave. As Boulder County Transportation Dept completes the new larger bridge being built over the little Thompson River on 83rd St. one can reasonably assume that any future flood waters will behave very differently than in the past and should allow the water to stay in its proper channel.

In closing, I appreciate all your time and energy Boulder County has dedicated in working with homeowners to allow us an affordable and sustainable recovery process.

Sincerely,
Sarah Holloway
[720-291-3795](tel:720-291-3795)

ELEVATION CERTIFICATE

OMB No. 1660-0008
 Expiration Date: July 31, 2015

Important: Read the instructions on pages 1-9.

SECTION A - PROPERTY INFORMATION

FOR INSURANCE COMPANY USE

A1. Building Owner's Name Ingersoll PS Trust

Policy Number:

A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.
8422 North County Line Road

Company NAIC Number:

City Longmont

State CO

ZIP Code 80503

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
 Tax Parcel #120506000023

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) Residential

A5. Latitude/Longitude: Lat. 40.2608 Long. -105.1565 Horizontal Datum: NAD 1927 NAD 1983

A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number 2

A8. For a building with a crawlspace or enclosure(s):

- a) Square footage of crawlspace or enclosure(s) 1000 sq ft
- b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade 0
- c) Total net area of flood openings in A8.b 0 sq in
- d) Engineered flood openings? Yes No

A9. For a building with an attached garage:

- a) Square footage of attached garage _____ sq ft
- b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____
- c) Total net area of flood openings in A9.b _____ sq in
- d) Engineered flood openings? Yes No

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number
Boulder County-080023

B2. County Name
Boulder

B3. State
Colorado

B4. Map/Panel Number
08013C0125

B5. Suffix
J

B6. FIRM Index Date
12-18-2012

B7. FIRM Panel Effective/Revised Date
12-18-2012

B8. Flood Zone(s)
X

B9. Base Flood Elevation(s) (Zone AO, use base flood depth)

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.

- FIS Profile FIRM Community Determined Other/Source: _____

B11. Indicate elevation datum used for BFE in Item B9: NGVD 1929 NAVD 1988 Other/Source: _____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? Yes No
 Designation Date: _____ CBRS OPA

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: Construction Drawings* Building Under Construction* Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations - Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: LL1069

Vertical Datum: NAVD88

Indicate elevation datum used for the elevations in items a) through h) below. NGVD 1929 NAVD 1988 Other/Source: _____

Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

- a) Top of bottom floor (including basement, crawlspace, or enclosure floor) 5092.85 feet meters
- b) Top of the next higher floor 5093.68 feet meters
- c) Bottom of the lowest horizontal structural member (V Zones only) _____ feet meters
- d) Attached garage (top of slab) _____ feet meters
- e) Lowest elevation of machinery or equipment servicing the building 5093.68 feet meters
 (Describe type of equipment and location in Comments)
- f) Lowest adjacent (finished) grade next to building (LAG) 5096.33 feet meters
- g) Highest adjacent (finished) grade next to building (HAG) 5096.93 feet meters
- h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support 5096.33 feet meters

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

- Check here if comments are provided on back of form. Were latitude and longitude in Section A provided by a licensed land surveyor? Yes No
- Check here if attachments.

Certifier's Name Lonnie A Sheldon

License Number 26974

Title Owner/Principal

Company Name Van Horn Engineering and Surveying

Address 1043 Fish Creek Road

City Estes Park

State CO ZIP Code 80517

Signature [Signature]

Date 6/27/14

Telephone 970-586-9388



IMPORTANT: In these spaces, copy the corresponding information from Section A.	FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 8422 North County Line Road	Policy Number:
City Longmont State CO ZIP Code 80503	Company NAIC Number:

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments Structure is located in Zone X. BFE determined is 0.28 feet below LAG. Machinery is located at the lowest floor elev and is typical of single family residential.

Signature  Date 6/27/14

SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
 - a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ feet meters above or below the HAG.
 - b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ feet meters above or below the LAG.
- E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 8–9 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ feet meters above or below the HAG.
- E3. Attached garage (top of slab) is _____ feet meters above or below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is _____ feet meters above or below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? Yes No Unknown. The local official must certify this information in Section G.

SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner's or Owner's Authorized Representative's Name Lonnie Sheldon for Ingersoll PS Trust

Address 1043 Fish Creek Road City Estes Park State CO ZIP Code 80517

Signature _____ Date _____ Telephone 970-586-9388

Comments _____ Check here if attachments.

SECTION G – COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.

- G1. The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2. A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3. The following information (Items G4–G10) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate Of Compliance/Occupancy Issued
-------------------	------------------------	---

- G7. This permit has been issued for: New Construction Substantial Improvement
- G8. Elevation of as-built lowest floor (including basement) of the building: _____ feet meters Datum _____
- G9. BFE or (in Zone AO) depth of flooding at the building site: _____ feet meters Datum _____
- G10. Community's design flood elevation: _____ feet meters Datum _____

Local Official's Name _____ Title _____

Community Name _____ Telephone _____

Signature _____ Date _____

Comments _____ Check here if attachments.

83rd St bridge

From : Jeff Crane <jeff@craneassociates.net> Wed, Jan 13, 2016 05:26 PM

Subject : 83rd St bridge

To : Denise Grimm
<dgrimm@bouldercounty.org>

Cc : Erin Cooper <erin@ltwrc.org>, Deirdre
Daly <d2daly@yahoo.com>, Doug
Spence <doug@desiderata.org>,
parrishranch@centurylink.net

Denise-

The coalition asked me to go out to the 83rd St bridge today and look at the problem on the Ingersol place. I was surprised to find such a large drainage that was cut by the 2013 flood and again by the 2015 runoff. This was primarily caused by the plugging of the existing culverts and Doug Spence told me that the County was going to excavate the channel under the bridge down to the pre flood elevation. If this is true, how far will that extend downstream? I also noticed nearly every tree along the river was flagged. Does this indicate that they are to be removed? Any chance we can speak with the engineer and review plans there? The coalition needs to understand what will and will not be accomplished by the bridge work and if repairs there will alleviate the chronic flooding on the Ingersol's place.

Thanks for your help.

Jeff
