Permanent Private Bridges

General Information and Technical Guidance

Introduction

This document is intended to provide general information and technical guidance to the regulatory process for constructing a permanent private access crossing over a waterway. In the event of a conflict with an adopted regulation, e.g., on some technical detail or procedural question, the adopted regulation shall govern. Section I provides information regarding the overall process as well as important information to keep in mind as the applicant moves through the process. Section II provides technical floodplain modeling guidance.

Section I - Process

Community Development Block Grant – Disaster Recovery (CDBG-DR)

Residents may be eligible to receive Community Development Block Grant- Disaster Recovery (CDBG-DR) funds for home access repair or replacement. All owner-occupied homeowners and full-time rental properties owners are invited to apply for CDBG-DR Home Access funding assistance. CDBG-DR applicants may contact Kate Williams (720-564-2237, kwilliams@bouldercounty.org) or Matt Betz (303-4411723, mbetz@bouldercounty.org) regarding CDBG-DR funding eligibility and processes. Applicants are strongly encouraged to meet with Kate or Matt **before** starting any bridge or culvert project due to strict eligibility requirements associated with funding.

NOTE: Starting the bridge permitting process *before* being approved for CDGB-DR funds could make an applicant ineligible for reimbursement of the design and construction work.

Point of Contact Information

Various staff in Boulder County will review and evaluate the applications and engineering documents submitted to obtain permits for a permanent private bridge. In order to simplify the process for both applicant and staff, a point of contact (POC) will be designated for the applicant to coordinate, monitor and assist in evaluation of the application and supplemental documents.

Where CDBG-DR funds are being requested, the POC will be Kate Williams (720-564-2237, kwilliams@bouldercounty.org) or Matt Betz (303-441-1723, mbetz@bouldercounty.org). Where CDBG-DR funds are not being requested, the initial POC will be the Flood Recovery & Permit Information Center (FRPIC) at 303-441-1705. After initial contact, a specific POC for design and permitting will be designated.

Because information is often time sensitive and accuracy is important, it is important to maintain contact with the designated POC unless specifically directed to another one.

Engineering Consultants & Permit Applications

Permit applicants with a private access crossing located within a regulatory floodplain will need to hire a Professional Engineer (P.E.) that is registered in the State of Colorado. The P.E. will conduct the hydraulic modeling necessary to obtain a floodplain development permit. This work cannot be completed by the property owner. The floodplain development permit modeling and associated certifications must be stamped by a Colorado P.E. All bridge crossings, whether it is in a regulatory floodplain or not, will need to be designed by a structural engineer licensed in Colorado.

The following URL provides a link to permit applications, instructions and checklists needed to plan, design, and construct a permanent private bridge in unincorporated Boulder County: http://www.bouldercounty.org/roads/permits/pages/bridgeconstructionpermit.aspx

Preliminary Review of a Proposed Bridge

To determine the feasibility of a proposed bridge, a completed "Bridge Permit Application" form should be submitted to the FRPIC. The Transportation Department will perform an initial evaluation to determine if a permanent bridge may be built at this time. The permanent bridge evaluation and determination is dependent on the current status and future plans of the county road used to access the property. This preliminary review will identify any known special or unique requirements for a permanent bridge in the proposed location and ensure that the proposed location can meet the Multimodal Transportation Standards for access, such as sight distances, road edge clearance and approach grade from road to bridge, among others.

Potentially, a different access location on the property for the bridge may be required to meet standards. Once the preliminary review has been performed and the applicant has been cleared to proceed, floodplain modeling of the stream channel can begin for properties in a regulatory floodplain. For properties not in a regulatory floodplain, the standard permit and construction process may begin.

Floodplain Modeling

The P.E. should contact the POC in order to clarify the hydraulic modeling requirements and to receive any new data that may be available to help reduce engineering costs. The purpose of the modeling is to demonstrate that any structure placed within the regulatory floodplain will not have a negative impact to that floodplain. This can be an iterative process, with alternative locations, designs and channel work considered in order to meet floodplain regulations.

The Colorado Water Conservation Board, Colorado Department of Transportation, and Boulder County have some modeling data along streams. The Transportation Department will provide the most current modeling data, if available, for the area of the applicant's crossing, which could be incorporated into their model. Once the proposed private access water bridge has been successfully modeled, the final design of the bridge may begin.

For more technical guidance regarding this process, please see the two technical guidance sections below.

Bridge Permit Checklist Completion

When the bridge design is complete, review the "Bridge Permit Checklist" to ensure all of the requirements have been completed and necessary supporting documents are complete and accurate. The complete application package may be submitted at the counter in the Building Department for both a Floodplain Development Permit (FDP) and a Building Permit. Please refer to http://www.bouldercounty.org/roads/permits/pages/bridgeconstructionpermit.aspx for the checklist.

Permit Issuance, Construction, Inspection, and Approval

Once all applicable permits are approved and issued, construction of the bridge may begin. Upon completion of the bridge construction, the Transportation Department will perform an inspection of the bridge for development review and floodplain adherence. The Building Division will inspect the bridge for structural requirements. If all is approved, the FDP and Construction Permit will be closed out and the License Agreement and Access Permit will be signed off.

Section II – Technical Guidance

Floodplain Modeling

An applicant for a floodplain development permit for development in the floodway must either provide a "no-rise" comparison between existing (see definitions below) and proposed post-project conditions or receive a Conditional Letter of Map Revision (CLOMR) from FEMA. Both demonstrating "no-rise" and applying for a CLOMR generally require a hydraulic computer model that compares existing and proposed conditions and conforms with Boulder County Land Use Code Section 4-407.B.7.

The Transportation Department is also applying for CLOMRs for portions of the new road projects. There is a possibility that some bridge crossings could be included in the County initiated CLOMRs. If a particular assumed new bridge crossing was included in the County initiated CLOMR, as long as the actual proposed bridge is designed to meet the dimensions referenced in the CLOMR application, then additional hydraulic modeling may not be necessary. Please contact the FRPIC at 303-441-1705 to help determine if the proposed bridge location has already been included in a hydraulic model.

Creating the Model

In general, a hydraulic model will be needed for permit approval of permanent bridge construction in the floodway. The applicant's P.E. is encouraged to work with Boulder County floodplain staff to ensure that the most current data and regulations will be used for the floodplain modeling and floodplain development permit application.

In general, the model will simulate 1,000 feet upstream and 1,000 feet downstream of the proposed bridge location. If the applicant's P.E. believes a shorter analysis reach is sufficient, the P.E. will need to present justification for the shorter extents.

In the rare cases where the applicant can be demonstrate that the pre-flood and post-flood topography are the same 1,000 feet upstream and 1,000 feet downstream of the former bridge's location, a bridge of identical dimensions to the previous bridge can be rebuilt without modeling.

The hydraulic model will include both an existing conditions simulation and a proposed condition simulation.

A. Existing Conditions Model:
   i. For flood recovery "no-rise" modeling analysis, FEMA has approved using either 2012 pre-flood or current on the ground conditions as existing conditions. If pre-flood conditions are used, the previously existing crossing must be included in the model. If using on the ground conditions, the model must reflect current conditions.
   ii. In the event that a CLOMR is needed, an effective, corrected effective, existing condition and proposed condition models will be required.
   iii. Pre-Flood Topography: 2012 LiDAR data may be used as a starting point to create the pre-flood geometry. To obtain the 2012 LiDAR data, please go to https://geodata.co.gov/
   iv. Pre-Flood Crossing: The dimensions of the previously existing crossing destroyed or damaged by the 2013 floods can be obtained from the original bridge plans, the building permit for the bridge, past county bridge inventory data, past photos of the bridge, etc.

The Transportation Department must approve the data and method used for obtaining the previous bridge's dimensions.

v. Flow Rate and Roughness: The pre-flood simulation shall use the flow rate and roughness from the most current effective model.

B. Proposed Conditions Model:

i. Proposed Conditions Topography: October 2013 LiDAR data may be used as a starting point to create the proposed conditions model. This LiDAR data may be downloaded from: https://geodata.co.gov.

ii. Proposed Conditions Surveying: A survey of the bridge location as well as additional cross-sections upstream and downstream must be completed. The number of additional cross sections will depend upon the given channel geometry, but should be sufficient in number to accurately complete the model. The survey must also include the approved extents of the model where changes to the stream channel have occurred since the October 2013 LiDAR collection. Use of other local post-flood surveys or models can be incorporated into the applicant's model with the approval of the Transportation Department.

iii. Proposed Bridge: The dimensions of the proposed bridge and any other proposed improvements need to be included in the proposed conditions model.

iv. Flow Rate and Roughness: The applicant's P.E. should determine roughness ("*n*") based on engineering judgment, according to post-flood existing field conditions. The applicant's P.E. should check with the FRPIC at 303-441-1705 for a review of the flow rate chosen and the rationale.

C. If a Rise is Unavoidable:

i. The bridge must be designed in such a manner that the design results in the least amount of rise feasible.

ii. The applicant must apply to FEMA for a CLOMR. FEMA reviews CLOMR applications and decides if the rise is permissible relying largely on whether the rise affects an insurable structure.

iii. If the CLOMR is approved, the applicant must also obtain a Letter of Map Revision (LOMR) once the bridge has been constructed.

D. Freeboard:

i. The Storm Drainage Criteria Manual (SDCM) contains the specific freeboard requirements for proposed bridges. Please note that the bridge criteria in Sections 100 & 1000 were recently revised and may be found here: http://www.bouldercounty.org/property/flood/pages/stormdrainagemanual.aspx

Once the Transportation staff has determined that the hydraulic modeling is sufficient and that the proposed bridge location is feasible, the applicant may proceed with the structural design of the bridge. Please note that there may be some very specific instances where a proposed bridge may not be feasible. In that event, the Transportation staff will work with the applicant and their P.E. on an alternative solution.