

FLOOD REVIEW BOARD

Date: July 23, 2020

Time: 8:30 AM, MDT

Locations: Lake Estes Conference Room, 200 W. Oak St., Fort Collins, CO 80521 and remote via Zoom

Contact: Devin Traff, Larimer County Engineering Department

MEETING MINUTES

Staff Present: Devin Traff, Tina Kurtz (remote)

Board Members: Greg Koch (remote), John Hunt (remote), Chad Morris (remote), Mike Oberlander (remote), Christopher Thorton (remote), Elisabeth Ervin-Blankenheim (remote)

Applicants Present: Jason Walker (remote), Frank Roberts (remote), Laura Emerson (remote)

Mr. Koch opened the meeting at 8:35 a.m., MDT

Introductions

Item 1: West Creek Bridge CLOMR & FPSR

Mr. Traff provided an overview of the project.

This item is a petition on behalf of the Tri-Neighbor Bridge Association for a Floodplain Special Review and Conditional Letter of Map Revision (CLOMR) of a proposed bridge within the West Creek Flood Hazard Zoning District. The project is located about one mile upstream of Glen Haven near intersection of CR 43 and West Creek Road.

The proposed new bridge (21' span open-bottom pipe arch) will replace a bridge that was destroyed in the 2013 flood which will access three residential properties north of West Creek. The proposed bridge is designed to pass the 25-year flood. The bridge abutments will be protected with 18" riprap (D50). An existing pedestrian bridge upstream of the proposed bridge will be removed.





CHAMP is used as effective model for comparison with existing and proposed conditions. Proposed vs. existing condition shows BFE increases at five cross-sections, four of which are directly upstream of the proposed bridge. One small increase occurs downstream of bridge. The floodway both increases and decreases due to the project. No structures appear to be impacted by the floodplain and floodway modifications. Flow velocities decrease for the proposed condition.

Three property owners are impacted by increases in BFEs. Individual notifications of the floodplain impacts will be required by County & FEMA if CLOMR is approved by the FRB.

The Code section pertaining to Floodplain Special Reviews is located in Section 4.2.2.G.6.e

Mr. Walker followed with an overview of the project.

It is a 21-foot pipe arch which is designed to fully contain the 25-year flood event and is designed so that the approach from the southern side has a swale so that flows over the 25-year event have the capability to be bypassed around the culvert. This was an attempt to lower the amount of rise from the new crossing. A dip will be put in the approach to the road in order to alleviate flood water that may flow through the area. The concrete footings are designed to go below scour depth with one being longer than the other as it is on the outside of a bend. The existing footbridge will be removed and replaced with this proposed bridge.

Mr. Walker responded to a question regarding the rise and said the maximum rise was approx. 3 feet compared to the existing condition and approx. 2.25 feet compared to CHAMP. The rise is contained approx. 100 feet downstream about 349 feet upstream and is in 1 cross-section downstream and 4 cross-sections upstream. He noted this project does not create a rise on any insurable structures but it does create a rise on three properties.

Mr. Walker said that this crossing is an open bottom, corrugated galvanized steel arch with concrete footings. The northern footing is 7.3 feet deep and the southern footing is 3.5 feet deep. They didn't hit bedrock on the south bank of the river in their test hole, it was all alluvial material, and they couldn't get testing equipment to the north side of river, but they think there is bedrock on the N side. He said that if the builder encounters bedrock, the builder is instructed them to contact Mr. Walker so it is appropriately addressed.

There was a discussion on the existing condition versus the proposed condition 100-yr cross-sections. Mr. Walker shared a HEC-RAS cross-section showing this data. He said that the existing conditions is a little lower than CHAMP due to ground changes based on the survey done by Van Horn Engineering. He said the maximum increase proposed over the existing conditions is 3.09 feet at the upstream face of culvert. The culvert overtops in the 100-yr event but passes the 25-yr event. The culvert becomes pressurized in the 50-yr event and results in water starting to go around the sides of the culvert through the relief swale but it does not overtop it but it is about to crest the road.

There was a discussion on whether this is a private or public road and what standards would be applied. This is a private road that provides access for three residences, it's essentially a driveway. This is the



only access for these residences. Mr. Walker mentioned that they obtained easements from the surrounding property owners. Mr. Traff said that the County private access requirement is that it passes the 10-yr discharge and the overtopping requirement would not apply for this project.

Mr. Walker said that the three property owners have indicated that these residences will not be short-term rentals, only private residences. Mr. Hunt noted that it would be important for the owners to know about the overtopping situation and that it would be hard for the Board to approve a short-term rental application in the future unless the crossing was upsized.

Mr. Oberlander noted that the biggest rise is just upstream of where the driveway connects to West Creek Road and during a 100-yr event there would be water on top of West Creek Road and potentially a little more damage to the road, but there doesn't appear to be a solution to that situation. He noted that he would rather see a crossing that can pass the 25-yr versus a low water crossing that only passes the 10-yr. Mr. Walker noted that addition of the relief swale appears that it will reduce the impact to the road quite a bit resulting in less damage upstream of the culvert.

There was discussion on what topographic information was used in the study. Mr. Walker said that they used survey data Van Horn Engineering gathered in the project area along with the CHAMP survey and 2017 LiDAR data to produce the flood extents outside of the project area. He said that there is really not any differences between the existing conditions and the 2017 LiDAR data.

Mr. Koch asked about guardrails on the culvert as they are not shown in the plans. Mr. Traff will check on the requirements. He noted that other crossing like this do not have guardrails

Mr. Koch said that the project engineers might include profile comparisons that remove the non-applicable information because there are not cross-sections at the same location. He said that typically you would do a linear interpolation between cross-sections and then show the comparison as that's essentially what FEMA does when they are looking at profiles. He said it would be worth putting that information in the profiles to show the three-foot rise.

Mr. Thorton noted that there is a discrepancy between the velocities for the scour and the rock sizing. He asked if there was a design for the 18" riprap and filter. Mr. Walker said they can add that information. Mr. Thorton said the velocity used for the rock sizing was more than the scour velocity, which doesn't match with the 10-yr or 25-yr. The calculations show 20" rock and the plans show 18" rock. Mr. Walker will check the calculations to address this item. Mr. Thorton said he would like to see the detail of the toe-in of the riprap in relation to the predicted scour depth.

Mr. Hunt discussed design countermeasures that are compliant with HEC-23, such as placing riprap across the entire channel bottom within the structure and the riprap requirements for abutments.

Mr. Koch mentioned once spills start there would be a good chance of scour on the downstream channel side of the crossing, and it would be good for them to be aware of this for design of riprap layout. He said that including a discussion of scour and protection in the text of the report would help with clarification.



Mr. Koch asked Mr. Traff about the specificity of the owner notification letters concerning rises and changes to the floodplain. Mr. Traff said that the County gets approval from FEMA prior to sending the letters and there may need to be additional specificity, but that will be worked through once this application is approved by the Board.

Mr. Koch noted the items the Board would like to see addressed by the engineer which include the addressing the Board comments regarding scour analysis and riprap design. It was discussed that the details should be worked out by Mr. Traff with review by Mr. Thorton and Mr. Hunt rather than bringing the items back to the Board.

There was a discussion on what flood event would be appropriate to use in this situation for the stability of the crossing. It was agreed that the 25-yr event would be appropriate to use as the design standard for stability features.

Mr. Hunt asked if the Board should apply HEC-23 standards to the stability protection design for the crossing. Mr. Thorton said he thinks that's what the Board should use for comparisons. He said that if someone wants to use a different procedure, the Board should compare it against HEC-23 as that is a defensible standard. Mr. Hunt and Mr. Koch agreed.

Motions:

Motion to approved the FPSR:

Mr. Koch made a motion to recommend approval of the crossing project with the condition that the scour and erosion protection analysis design and scour countermeasures be revisited and to meet HEC-23 standards and reviewed administratively by staff with assistance from Mr. Thorton. Mr. Thorton seconded. Motion passed 5-0.

Motion to approved the CLOMR:

Mr. Koch made a motion to approve the Conditional Letter of Map Amendment application with a condition that a few modifications are made, they are to make sure the interpolations of water surface elevations are accurate and making minor changes to the document text and working out the issue with property owner notification letters. Mr. Hunt seconded. Motion passes 5-0.

Item 2: Big Thompson Reach 28 Letter of Map Revision (LOMR) (Discussion)

Mr. Traff provided an overview of the project. This item is a petition filed on behalf of the Big Thompson Watershed Coalition to review a Letter of Map Revision (LOMR) for a reach of the Big Thompson River. The project is located along Big Thompson River west of Loveland and south of Devil's Backbone.

This project was brought before FRB in December 2019 and the Board required revisions to the model for a more accurate comparison between pre- and post-project conditions with an emphasis on cross-section placement and orientation.



The project realigned channel and completed stream restoration work along the Big Thompson channel. CHAMP was used as effective model. Post-project vs. pre-project condition shows one BFE increase at cross section 172732 with floodplain width increases of 5-20' in the vicinity of the rise. The floodway both increases and decreases due to the project. No new structures appear to impacted by the floodplain and floodway revisions, though a significant portion of land owned by the City of Loveland will be impacted by the revised floodway limits (more in accordance with the FEMA effective floodway prior to 2013 due to channel realignment). Six parcels are impacted by the floodplain and floodway revisions. Individual notifications and notarized affidavits from the impacted property owners will be required by County if LOMR is approved by the FRB.

Code section pertaining to Floodplain Special Reviews and map changes are located in Section 4.2.2.G.4 and Section 4.2.2.G.6

The engineer is planning to resubmit the application to be heard at the September Board meeting.

Mr. Traff gave an update on the project progress.

The project engineer provided updated information to Mr. Traff to present to the Board, including information regarding modified cross-sections and the changes in the water surface elevations between models. The engineer would like comments from the Board regarding the modified cross-sections.

Mr. Koch noted that this updated cross-section orientation is a big improvement over what was presented in December.

Mr. Hunt also said it is a big improvement over the December information. He said if this is the model presented at the upcoming September Board meeting that he will be pretty comfortable with the cross-section orientation.

There was a discussion on the origin of the floodway island that exists on Mr. Wild's property that is in the 2006 effective model and the CHAMP model. Mr. Traff is looking into the floodway island in more depth and will coordinate with FEMA to see if inclusion of the island is an acceptable approach. The landowner would like to see the island remain for future development potential.

There was additional discussion on computational methods used, potential grading impacts on the water surface elevation and minor discrepancies in the CHAMP model found when compared to the project model tie-ins.

The project engineer reached out to FEMA's map revision contractor, CDM Smith (Henry Poburka), for guidance, but has not received feedback. Mr. Traff will get involved to help coordinate getting feedback from agencies on this project.

Mr. Traff will contact the project engineer to relay the Board's comments on the revisions. Those comments are (1) there is a general consensus that there are improvements to the cross-sections and



their alignment; (2) will mention about using the parabolic method; and (3) look further into the floodplain widths on cross-sections.

Mr. Traff will keep the Board updated on the progress.

No action was taken on this item, as it was only meant for discussion on the upcoming revised application in September.

Meeting adjourned at 10:30 am, MDT