



MEMORANDUM

TO: Elizabeth Nijkamp, Engineer Review Manager, El Paso County

FROM: Paul Brown for Kendra Gabbert and Alivia Plankis, FHU

DATE: 09/09/2021

SUBJECT: **On-Call Contract #17-067H-1; PO # 8113073**
Bridge Reviews
Task Order #6: Mesa Top Bridge Submittal - Fifth Review

This memorandum provides a list of comments for the 5th Submittal of the Mesa Top Bridge, based on requirements in the County's Engineering Criteria Manual (ECM), 2019 CDOT Standard Specifications for Road and Bridge Construction, Current CDOT Bridge Design Manual and the Current CDOT M&S Standards Plans.

Summary

The applicant provided a 4th submittal on July 22, 2021, which did not address many of our comments on the third submittal. Based on our discussions with you, we did not complete a full review of the 4th submittal.

The applicant provided a 5th submittal on August 26, 2021, which included new material and a detailed comment response letter, which was appreciated. The submittal also included a separate DropBox submittal of HEC-RAS hydraulics files that FHU downloaded and reviewed. This memo documents our review of this most recent submittal.

Structures Submittal

1. The applicant's comment response letter outlines how FHU's previous comments have been addressed. We have reviewed the supporting 5th submittal documentation and find that the comments have been addressed in accordance with the letter. No further structures comment.

Hydraulic Submittal

HEC-RAS Output and Scour Calculation comments:

1. Comments 1 and 2 have been addressed per the comment response letter.
2. The HEC-RAS files do not appear to have considered contraction scour. Is this correct?

Hydraulic Report:

1. We were unable to find the riprap sizing calculations in the appendix. Please provide a page reference or an updated document if the calculations were omitted.
2. Remaining comments on the hydraulics report have been addressed per the comment response letter.

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Mesa Top Bridge Submittal – Fifth Review

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Bridge Hydraulic Information Plan Sheet:

1. It still does not appear that the horizontal limits of the riprap have been shown. If the information is provided elsewhere or it is not a concern, please reply accordingly.
2. Please provide scour limits on the section view or in a note on the bridge hydraulic sheets.

Conclusions

As described above, FHU does not have significant remaining design concerns, and we appreciate the applicant's efforts to provide detailed comment responses. However, there are still hydraulic items that are unclear or could lead to issues during construction. Therefore, we feel that the hydraulic report and Bridge Hydraulic Information Plan Sheet should be updated and resubmitted. We have attached a marked-up copy of the applicant's comment response letter for their use as they address these final comments.



MEMORANDUM

TO: Elizabeth Nijkamp, Engineer Review Manager, El Paso County

FROM: Kyle R. Campbell, P.E. – Division Manager

DATE: Comments 7/28/21

SUBJECT: **On-Call Contract #17-067H-1; PO#8113073**
Bridge Reviews
Task Order #6: Mesa Top Bridge Submittal – Third Review

This memorandum provides a list of comments for the 3rd Submittal of the Mesa Top Bridge, based on requirements in the County's Engineering Criteria Manual (ECM), 2019 CDOT Standard Specifications for Road and Bridge Construction, Current CDOT Bridge Design Manual and the Current CDOT M&S Standards Plans.

Please find below the responses to the aforementioned comment letter. Responses to review comments are shown in **BOLD** below the comment.

COMMENTS

There were multiple comments from the second submittal which were not addressed. The remainder of the comments on this third submittal apply to the new HEC-RAS model which was not previously provided.

Per El Paso County's list of documents typically required for the Structure Record, the following documents have still not been submitted as previously requested:

- Project Provisions – It was noted with the 2nd submittal that no Project Provisions were required for the bridge structure. A similar note or the applicable project provisions for the superstructure and channel work needs to be provided.

RESPONSE: See letters provided from **Contech** and **Classic Consulting** with resubmittal.

Hydraulic Submittal

HEC-RAS Output and Scour Calculation comments:

1. Proposed conditions section 700 shows encroachment for both Qs (3123 and 1932) on the left overbank.
✓ The contraction coefficient for that section should be increased. A typical value of 0.3 is often used.
RESPONSE: A 0.3 contraction coefficient was used as reflected in the modeling provided to Elizabeth.
2. Pier width is shown as 4 feet in the contraction scour calc which does not match the plans. (Comment 7 from this section in Second Review memo).
✓ **RESPONSE: A 3' rounded pier was modeled as provided to Elizabeth.**
3. The ground geometry in the bridge cross-section shown in the contraction scour does not match the ground geometry of the same section in the HEC-RAS model. Please make sure the correct geometry is used in the scour calculations. In general, confirm proposed ground geometry at the bridge. The Bridge Hydraulic sheet shows sections at the bridge with a high point in the middle of the channel, but the pier scour calc and the HEC-RAS model shows those high points removed at the bridge sections. Also, see next comment about the Q100s. The contraction scour should be run with the higher Q if that is the design flow.
✓ **RESPONSE: HEC-RAS modeling provided to Elizabeth separately from EDARP due to files not allowed in EDARP.** According to the HEC-RAS model, it appears there is only pier scour and no contraction scour. Is this correct?

Hydraulic Report:

1. Where did the soil D50 come from that was used in the contraction scour calculations? How was the riprap sized? Please provide riprap sizing calculations.
RESPONSE: Rip-rap sizing provided in Appendix of report. Riprap sizing calculations were not found in the appendix of the report, please provide a page number if they are in the report.
2. Add discussion about increase in water surface elevation at section 700 from 7056.80 ft (existing conditions) to 7056.89 (developed conditions). Is this increase within the criteria to not require a CLOMR for this project?
RESPONSE: The elevated El Paso County flows used for modeling the bridge reflect water surface elevation changes. When using the much lower FEMA flows, no impact warranting FEMA engagement is shown.
3. Make sure the final version of the report includes all calculations and supporting documentation like the complete scour calcs, riprap sizing, HEC-RAS print outs, etc.
RESPONSE: See included HEC-RAS section print-outs and owner info in the revised report. Did not see riprap sizing calculations in the report. All other information appears to be accounted for.

Bridge Hydraulic Information Plan Sheet:

1. How are the plan view limits of riprap being defined? What is the riprap size? Is there bedding or geotextile proposed? (Comment 1 from this section in Second Review memo).
RESPONSE: As reflected on the "Bridge Hydraulic Information" sheet in the Appendix, 24" rip-rap is proposed over Mirifi fabric to a point 5' horizontally from the toe of slope and with 1' off freeboard as reflected in the sections. Still don't see horizontal limits of the riprap. This comment is provided because it does not appear the contractor will know the horizontal limits of where to place the riprap. If this information is provided somewhere else or this is not a concern for some reason, please just provide that response to the comment.
2. Show scour limits (Comment 2 from this section in Second Review memo).
RESPONSE: Scour limits are provided within Scour Analysis section of report. We can add to Plan View sheet if desired. Typically scour limits are shown on the bridge hydraulic sheets. The scour limits can be shown on the section view or the scour depth can be called out in a note.

Contech Superstructure Calculations and Plans:

1. Dimensions of inside top flange splice plate does not match calculations. Update calculations or plans for applicable correct dimensions.

RESPONSE: Documents provided. ✓

2. Bottom longitudinal reinforcing in deck on plans doesn't match calls.

RESPONSE: See revised documents provided. ✓

Please do not hesitate to contact me with any further questions or concerns you may have regarding this project.

Sincerely,



Kyle R. Campbell, P.E.
Division Manager

Sm/117560/Letters/Response to Memo dated 062921