

MEETING  
MEMORANDUM

MULLER ENGINEERING COMPANY, INC.

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**Project**

Newlin Gulch MDP and FHAD

**Meeting Date**

March 2, 2015

**Sponsors**

UDFCD / Douglas County / Town of Parker

**Issue Date**

March 13, 2015

**Meeting Location**

Town of Parker

**Muller Project No.**

12-050.01

**Attendees**

Shea Thomas, UDFCD  
Brad Robenstein, Douglas County  
Jacob James, Town of Parker  
Jim Swanson, CCBWQA  
Scott Barnett, Mulhern MRE (representing SVMMD)  
Derek Johns, Muller Engineering Company  
Melanie Chenard, Muller Engineering Company  
Sam Rogers, Muller Engineering Company

**Minutes Prepared By**

Sam Rogers/Melanie Chenard

**Purpose**

Newlin Gulch MDP and FHAD – Progress Meeting #5

*The following is our understanding of the subject matter covered in this meeting. If this differs with your understanding, please notify us as soon as possible.*

**ACTION ITEM SUMMARY:**

**Muller Action Items:**

1. Provide 30% rule graphic to UDFCD. *Complete.*
2. Add Terri Fead to the email distribution list. *Complete.*

**UDFCD Action Items:**

1. Schedule meeting with Muller and Terri Fead to discuss the FHAD. *Complete.*
2. Inquire about separation distance required to avoid pedestrian railing requirement.

**Town of Parker Action Items:**

1. Look for additional information on the pedestrian bridge near Cherry Creek. *Complete.*
2. Schedule potholing of gas line downstream of Recreation Drive. *Complete.*

**Douglas County Action Items:**

1. Obtain feedback from Douglas County roadway staff on necessity of guardrails or pedestrian railings at Recreation Drive low-flow crossing.
2. Obtain feedback from Douglas County park staff on desired design criteria for parking lot.

**Stonegate Village Metro District Action Items:**

1. Provide Muller with any available information on utility lines near Recreation Drive.

## DISCUSSION:

### 1. GENERAL

Melanie Chenard gave an update on the Baseline Hydrology Report progress. Comments from the project sponsors have been addressed and a final submittal of the report should be ready in the next couple of days.

Project stakeholders representing the Cherry Creek Basin Water Quality Authority (CCBWQA) and Stonegate Village Metro District (SVMD) were introduced to the team, and Derek Johns provided some background on the overall Master Plan project and introduced the next two components, the FHAD study and Alternatives Analysis study.

### 2. FHAD

Preliminary analysis for the Flood Hazard Area Delineation (FHAD) study has begun. The study area limits for the FHAD begin downstream at the confluence with Cherry Creek at Challenger Park, and end upstream of Hess Road, just below Rueter-Hess Reservoir. Particular issues and discussion items are outlined as follows:

- a. 30%, 0.5' Rule: The FHAD will be based on the future development hydrology. Muller compared the peak flow rates and BFEs based on future development to those based on existing development to verify that the FHAD will be eligible for adoption by FEMA as the regulatory floodplain. The results of this evaluation were plotted and presented to the team. Peak flow rates based on future development are less than 30% greater than peak flow rates based on existing development for the entire reach. BFEs based on future development are *more* than 0.5' higher than BFEs based on existing development for approximately the lower third of the reach. However, with the overall reduction in peak flow rates due to the baseline hydrology updates, no new structure impacts are anticipated. Shea will review this with UDFCD's floodplain group, but expects this will satisfy FEMA's requirements.
- b. Bridge Modeling: Melanie reviewed the planned approach for HEC-RAS modeling of bridges, as follows:
  - Lincoln Ave, Jordan Rd, Mainstreet, and Hess Rd: bridge routines from recent LOMRs will be imported into HEC-RAS model
  - Stonegate Pkwy: bridge routine from design floodplain model prepared by Muller will be imported into HEC-RAS model
  - Chambers Rd: LOMR for this work did not have a bridge routine; bridge data will be entered based on as-built drawings of the bridge previously provided to Muller by Jacob James
  - Muller does not have any information on the pedestrian bridge near the confluence of Newlin Gulch with Cherry Creek. Though it was supposedly constructed as a breakaway bridge, it should be modeled with the full height of the railings blocked. Jacob will look for any additional information on this bridge as there is no remaining project budget to get it surveyed.
- c. Upstream Limit of Model: Currently, Muller has the upstream limit of the FHAD model set near the crest section of the large grouted boulder drop structure just upstream of Hess Road. Muller inquired if this is sufficient or if it should be extended up to the primary reservoir spillway outlet works or, alternately, up the auxiliary spillway. Shea said that this limit should be fine but that Muller should review this with Terri Fead (UDFCD). Muller will also look at how the floodplain was modeled in the CLOMR for Rueter-Hess.

- d. Manning's n-Values: Sam Rogers showed photos representing various roughness values along Newlin Gulch. In general, Muller is proposing to err on the higher, more conservative range of appropriate n-values. Shea noted that values should not be increased based on expectations of future vegetation growth due to anticipated changes in channel conditions or base flows, but should be reflective of expected vegetation regrowth following construction or other disturbance. Proposed channel n-values range from 0.04 to 0.12; overbank n-values are generally 0.04 with select areas up to 0.08. Muller noted that a small reach near the confluence with the Jordan Road Tributary has little vegetation (n=0.04) though the areas immediately upstream and downstream have good willow and wetland growth (n=0.08), and inquired about matching the n-value for the adjacent area. Shea would like to keep the higher n-value here but is not sure if that will be acceptable; Muller will discuss this area with Terri Fead. Jacob noted that the current vegetative growth is artificially low between Lincoln Ave. and Recreation Drive due to clearing that was done following a recent oil spill. He requested that the channel n-value be increased from 0.04 to 0.05 in this reach. The team agreed with the rest of the n-values presented.
- e. Meeting with UDFCD Floodplain Group: Shea will set up a meeting in the next couple of weeks with Muller and Terri Fead to discuss the FHAD in more detail. Shea noted that Terri should be included in future progress meetings.

### 3. ALTERNATIVES ANALYSIS

Muller has begun work on an Alternatives Analysis study for Newlin Gulch within the same limits as the FHAD. Items discussed in the meeting are outlined below:

- a. Reach Breakdown: Design reaches for the project were identified and approved by the team as follows (local jurisdiction noted in parenthesis):
  - Reach 1: Cherry Creek to downstream side of Recreation Drive (Town of Parker)
  - Reach 2: Recreation Drive to Lincoln Avenue (inclusive of both crossings) (Douglas County)
  - Reach 3: Upstream of Lincoln Avenue to southern boundary of Stonegate (Douglas County)
  - Reach 4: Southern boundary of Stonegate to downstream side of Mainstreet (Douglas County)
  - Reach 5: Mainstreet to Chambers Road (inclusive of both crossings) (Town of Parker)
  - Reach 6: Upstream of Chambers Road to upstream study limit (Town of Parker)
- b. Problem Areas: A draft figure illustrating existing channel condition and problem areas was handed out, and photos of existing conditions were reviewed. Highlights include the following, by reach:
  - Reach 1: Generally stable channel, some scour at upstream approaches to of existing vertical drop structures.
  - Reach 2: Recreation Drive crossing is a ford crossing that requires road closure several times per year. Aggradation in the channel seems to have worsened the condition. The upstream channel is very shallow and flooding of the adjacent parking lot is common.
  - Reach 3: There is severe scour at the lower of two check structures between Lincoln Ave. and Jordan Road. Two storm sewer outfalls empty onto the trail near Jordan Road – per Scott, these frequently cause icing problems on the trail. Aggradation beneath the Jordan Road bridge is evident – per Scott, constant trail maintenance is required here. Some channel scour is evident near the Jordan Road Tributary confluence. Between Jordan Road and Stonegate parkway, the channel is stable; three projects have been completed by Muller

in recent years, and a preliminary design has been prepared for future stabilization. Upstream of Stonegate Parkway, some headcutting is evident.

- Reach 4: This reach is currently pretty stable, though there are indications that additional grade control might be needed as upstream development continues.
- Reach 5: Upstream of Mainstreet, the private landowner has livestock corrals adjacent to and in the channel, and appears to be spreading manure and wood chips in the overbank. Besides preventing any vegetative growth, this practice has water quality impacts that should be considered. There is scour at a fairly new check structure downstream of Chambers, near the future crossing of the East-West Regional Trail.
- Reach 6: There is active degradation in this reach downstream of the proposed trail crossing at Parker Homestead, and also just downstream of Hess Road.

- c. Channel Slope: Derek summarized the design slopes used for previous projects along the reach, which ranged from 0.13% to 0.40%, and the channel condition for each project area. With this information, he has developed recommended stable channel slopes for the reach, varying from 0.15% to 0.30%. Shea commented that UDFCD generally uses 0.2% for sandy channels and 0.4% for non-sandy channels, but given the observations was ok with the proposed flatter slopes. The rest of the group concurred.
- d. Grade Control Options: Derek inquired about comparing lower-height drop structures (1.5-2') to larger (4') drops in the alternative analysis. Per Shea, with the forthcoming revisions to the open channel chapter of the USDCM, she would like to limit drops to a maximum of 3' height in planning documents. She said there is no need to look at different options for grade control, and that aside from Recreation Drive (discussed below), there may not be much in the way of alternatives for this project.
- e. Recreation Drive: This will be the primary focus of the alternative analysis. Existing conditions and considerations include the following:
- Per Jacob, the Town of Parker currently closes the road whenever flows exceed 50 cfs.
  - The large grouted boulder drop structure downstream has limited bank height at the crest and it appears that high flows spill around the south end of the drop.
  - Lowering the drop crest would help provide grade separation at the crossing as well as address the capacity concerns at the drop; however, there is a buried high-pressure gas line just upstream of the drop that may not be deep enough to accommodate a lowered drop.
  - The parking lot adjacent to Newlin Gulch upstream of Recreation Drive is less than 1' above the channel invert. Flooding in the lot is common.
  - Aggradation in the channel appears to have worsened the general condition at the crossing.
  - Any proposed improvements would have to avoid floodplain impacts to the adjacent commercial development.

Upon discussion with the team, it was decided that Muller will look at a low-flow option that maintains the existing downstream drop structure invert and a low-flow option with a lowered channel invert. No 100-year option will be considered. Additional discussion of the crossing included the following points:

- Jacob will have the gas line potholed. Muller will inquire about encasement and relocation costs.
- Brad would like to get 10-year capacity at the crossing if possible
- Any railings required may negatively impact the floodplain upstream of the crossing. Per Shea, UDFCD criteria requires pedestrian railing for any drop greater than 3'. Extending the culvert well beyond the edge of road may be a way to avoid either pedestrian railing or guardrail requirements. Shea will check what separation distance would be required

between the drop and any pedestrian walkways to avoid a need for railings. Brad will solicit feedback from the County roadway staff. Jacob would prefer that we account for guardrail in the hydraulic model (if possible); then they could decide during final design whether to include it.

- Brad will review desired design criteria for the parking lot with the County Parks staff. Several park structures appear to be within the 100-year floodplain; our plan should aim to get the restrooms out of the 100-year floodplain.
- Scott noted that there are multiple SVMD utility lines in the vicinity, including return flow from the WWTP, a sanitary force main, and water lines. These may be a hindrance to design of a low-flow crossing. He will send Muller whatever information he can find.

- f. Other Topics: Scott mentioned that SVMD has their effluent discharge line in Cherry Creek under Lincoln Avenue, and that they would like to move it to Newlin Gulch if possible. Effluent flow rates are 2-3 MGD.

#### **4. PROJECT SCHEDULE**

Muller is still working according to the schedule presented in December, with target milestone dates of March 31<sup>st</sup> for the FHAD preliminary submittal and April 14<sup>th</sup> for the draft Alternative Analysis.

#### **5. PUBLIC MEETING**

No public meeting is planned for this project. Instead, UDFCD will prepare and send a mailing after submittal of the draft alternatives. The mailing will be a simple postcard format and will direct people to the project website.

#### **6. NEXT MEETING**

Further coordination on the alternatives will be handled via email. The next project meeting will be held following submittal and sponsor review of the draft Alternative Analysis.

**END OF MINUTES**