

February 7, 2022

Kari Parsons
Development Review Engineer
El Paso County
2880 International Circle, Suite 110
Colorado Springs, CO 80910

Re: CDR-20-004- Sterling Ranch – Sand Creek Channel Third Submittal Comment R

Hello Kari,

Please see the JR Engineering comment responses to the third submittal comments made on December 14, 2021 by El Paso County. The comment responses are in red italics.

General:

1. Resolved.
2. It is not clear if the bridges are proposed to be constructed initially. If they are, all construction design details and specifications need to be provided. If they are not, label them as “information only” on the CDs and also provide an “interim” plan showing the grading and stabilization proposed until the bridges are constructed. Partially resolved; provide complete design documents and specifications including applicable items from “Attachment A”, below. (Bridges will be submitted separately; tie-ins will need to be coordinated between the plans.)
3. Note: A CLOMR (Conditional Letter of Map Revision) is required prior to construction, with a final LOMR to be completed prior to County acceptance of channel improvements (if applicable) and recordation of the appropriate final plat(s).
4. See wetland mitigation plan (attached to USACE permit) redlines. Provide a complete, updated wetland mitigation plan coordinating with the channel design and maintenance attributes. Documentation regarding adherence to the mitigation plan shall be provided to the Planning and Community Development Department by December 31 of each year beginning at the time of initial ground disturbing activities (2019) continuing until the later of: three years, or until the permit is closed. Unresolved; the page provided only shows half of the channel project. Provide the complete report and plan. ***Provide when available.***
Response: JR is currently in the process of submitting documentation to the ACOE for permitting. Mitigation maps and documentation will be provided when complete.
5. Note: see City of Colorado Springs comments (also copied in this memo for response tracking), supplementary to these EPC-Engineering comments due to the potential for

annexation of this development into the City and the direct impacts to the City from rerouted flows, particularly from the outfall of Pond W5 (FSD6) to MDDP DP53A (DBPS DP60). Note: ECM Section 1.8 applies, allowing the use of City criteria.

6. Address State Engineer dam / embankment requirements for the area next to the large stock pond area. **Resolved. (design details and permitting to be verified)**
Response: Initial contact with the State Dam Engineer has been made and approval of the current design is expected based on that meeting.
7. Resolved.
8. Note: Reference Retreat at TimberRidge CDs and FDR regarding proposed improvements upstream: <https://epcdevplanreview.com/Public/ProjectDetails/111186>
9. Note: Branding Iron Filing 2 and Homestead Filing 2 have been approved and are almost ready to be recorded.
10. **See Parks comments dated November 23, 2021. The regional trail needs to be accommodated in the design, whether shared as part of the maintenance access road or separate.**
Response: Maintenance trail has been provided along both sides of the channel through the entire project.

MDDP Amendment:

1. **See MDDP Amendment redlines.**
Response: redlines have been addressed and commented on separately.
2. **See email dated December 13, 2021 from Doug Hollister regarding water rights and the proposed basin diversion. Address as appropriate.**
Response: Since no basin-to-basin transfer is allowed, WQ Pond routing has been revised to maintain existing routing conditions as well as the proposed drainage basins for the future developments in that area.
3. **Without a detailed review of the SWMM model, approval of the revisions to existing flows and increase in release rates and flow rates downstream is uncertain. Coordination with City staff is required.**
Response: JR Engineering will provide an electronic copy of the existing and proposed SWMM models prior to the next submittal.

Final Bridge and Channel Design Report (FDR):

1. **Resolved.**
2. There is no discussion on the Sand Creek DBPS channel recommendations and reasoning for any deviation/changes; provide narrative. Also provide a tabular comparison of DBPS improvement items with costs, escalated costs (based on drainage fee increases) and actual constructed items and costs. The final plat FDR for either the plat triggering completion of the channel improvements or an earlier plat desiring to document credits

upon construction will need to document the offset fees, costs, and potential credits.

Unresolved.

Response: Discussion about the DBPS recommendations has been included in the FDR.

3. Specifically address geotechnical hazards including unstable slopes and mitigation.

Unresolved; although the slopes were mentioned, no mitigation (for the purposes of the subdivisions, not the channel itself) were provided.

Response: Discussion about geotechnical hazards and mitigation around the subdivisions has been added to the report.

4. Address how the channel improvements will fit in with the designated wetlands mitigation areas. An overlay wetlands mitigation map will be required showing the proposed/required locations of mitigation (replacement areas) as overlapped with the necessary channel improvements. **Unresolved.**

Response: Discussion about wetland mitigation has been included in the report.

5. Per ECM Section 3.3.3.E.2, the minimum radius of curvature of the centerline of a channel shall be at least 2 times the top width of a trapezoidal channel to minimize development of spiral flow. This requirement does not appear to be met in multiple locations; revise as appropriate (all radii of concern were not redlined). **Unresolved.**

Verify based on final design.

Response: JR's design criteria was initially based on recommendations by a hydrogeomorphologist. The criteria called for centerline radii between 2.5 and 3.5 times bankfull width.

6. Per ECM Section 3.3.3.K.1: for channels 30 feet or more in top width, a minimum access road width of 15 feet shall be provided on each side of the channel; provide and discuss how maintenance access is provided in the report, including access to previously designed stormwater BMPs adjacent to the channel, and show on the plans. For channels with a depth greater than 10 feet and a length longer than 1,000 feet, access to the bottom of the channel in the form of a vehicular ramp shall be provided at an interval of 500 feet.

Unresolved (stated in the FDR but not found on the plans). Clearly show all maintenance access (and County Trail platform if separate) on the plans.

Response: Maintenance trail has been provided along both sides of the channel through the entire project. Discussion of the maintenance trail has been included with the FDR.

7. Per ECM Section 3.3.3.K.4, fencing is required for constructed channels steeper than 4:1 (side slope) where the design frequency storm provides a velocity that exceeds 5 feet per second and 2 feet in depth, or a combination thereof; address this requirement, especially in the areas between retaining walls and the channel. **Unresolved. Verify based on final design.**

Response: Fencing has been added where necessary.

8. The HEC-RAS sheets show that the majority of the channel has velocities over 9 feet per second (Q100) and 7 feet per second (Q10); this exceeds the criteria provided in the

report, the DBPS, DCM and City DCM. Revise the design to meet velocity, depth, and grade requirements. Also see City comments #1 and #3 (copied below). **Please discuss with Staff prior to resubmittal** to ensure efficient use of design and review time.

Unresolved. ***Partially resolved; see redlined areas of concern (supercritical flows) in the plans and the drainage report.***

Response: Areas showing velocities or shear outside of criteria will be revised in an attempt to reduce the number. In the event that they cannot, reinforcement with either soil riprap or turf reinforcement mat will be provided in areas that do not meet criteria.

9. Note: If the final design of the channel has areas of high velocities being dependent on maintenance of the vegetation, strict conditions requiring metro district maintenance of the vegetation (including wetlands) and being responsible for erosion repairs will be required.

Response: It is assumed that portions of the mitigation areas will require irrigation in order to establish wetlands before sufficient baseflows from the adjacent developments has been established. An irrigation plan has been included in the plans.

10. ***Resolved.***

11. Provide more HEC-RAS channel cross-sections as indicated on the redlines. Provide models for both the low-Manning's N value and high-Manning's N value (per UDFCD spreadsheet). ***Partially resolved (see redlines highlighting areas of concern).***

Response: Additional cross sections have been added to the HEC-RAS model. Analysis of both low and high manning's n flows has been included.

12. Submit an electronic copy of the HEC-RAS channel modeling with the next review, and the LOMR (electronic model only will be adequate) when available. Also helpful to expedite review would be an overall site PDF drawing not broken into windows, which can be provided separately (not in EDARP). ***Unresolved. Please also provide a separate whole sheet pdf for each plan and profile set/alignment, as was done in the plans emailed on October 5th. The layout of the work map in the drainage report is acceptable.***

Response: An electronic copy of the HEC-RAS model has been included with the submittal, as well as an overall plan/profile workmap.

13. Note: An O&M manual for the permanent stormwater measures and wetlands in the drainageways will need to be provided; the template for this document will be provided to you when available. ***(TBD)***

14. Response: An O&M manual will be completed for the project prior to completion.

15. See design report redlines. ***Partially resolved; see updated/remaining redlines.***

Response: additional redlines have been addressed and commented on separately.

16. ***Note: for reference see email dated 9/24/29.***

Channel Construction/GESC Plans:

1. Show all existing and proposed 100-year floodplains. Unresolved. **Revise per any channel design revisions.**

Response: floodplain linework has been updated on the plans.

2. Provide a complete channel plan and profile to include the applicable reaches down to the previous confluence between Sand Creek (SC-8/Reach 160) and tributary (Reach 159). See FDR comment #1. **Unresolved; the design needs to at least extend downstream of the Pond W5 and diversion outfall. Unresolved;**
 - a. Provide excerpts from the City project plans for that area. Are the calculated flows in compliance with the City's channel design?
 - b. Address the channel segment between Sterling Ranch and the City in general. An emergency maintenance agreement with the downstream property owners may be required.
 - c. Address the area along the proposed Homestead North subdivision to Poco Road (Is bank stabilization required?)
3. Regarding FDR comment #1b, provide complete plans and details to stabilize the area around Pond W-5 outfall. **Partially resolved.**
 - a. **Resolved (City approval).**
 - b. Show and label all maintenance access road/trails, including to Sand Creek at Pond W-5 outfall. **Unresolved.**

Response: Maintenance trails have been added to the plans

4. Expand the GEC plans to show all of the areas around and affected by the proposed grading (additional sheets will be needed). Please adjust the cut/fill plan to not chop up the channel into so many pieces and use an additional sheet(s) if necessary. **Unresolved.**

Response: GESC plans now encompass the entire site area.

5. See redlined CDs / GEC plans. **Partially resolved; see updated/remaining redlines.**
Response: additional redlines have been addressed and commented on separately.

6. The proposed revisions to Homestead Filing 2 (additional water quality ponds) and appurtenances ~~are not~~ **need to be clearly** shown. Verify that the designs have been coordinated.

Response: Homestead Filing 2 appurtenances are now shown on the plans.

Forms/Other:

1. Note: The FAE will be reviewed with the next submittal. (next submittal)

Response: Noted

City Comments (binding)

1. The proposed longitudinal slopes are too steep, based on City criteria, the max slopes would be 0.17% (DCM Volume 1, Ch. 12 Figure 12-4). If this is stricter than County Criteria, it is recommended to follow City Criteria. Unresolved.
Response: It is JR's opinion that the 0.17% is not relevant to this project. The 0.17% slope requirement is for the sandy bottom soils typically found further downstream along Sand Creek. In order to meet this requirement, a significant number of drops will have to be added to the project. One of the goals of the proposed design is to preserve as many wetlands as possible. To achieve this while still creating a new thalweg, channel slopes need to be fairly similar existing grade so that the existing thalweg can be part of the new floodplain. Large changes in grade between existing and proposed will damage or destroy existing wetlands and require more mitigation, potentially causing issues with ACOE permitting.
2. Maximum drop height should not exceed 4ft (DCM Vol 1 Ch 12 Table 12-7). The project summary states the maximum drop height is 7ft and the plans show drops up to 9ft. Unresolved.
Response: Country criteria states that max drops can higher if a geotechnical analysis confirms it. With the goal of keep grades close to existing in as many areas as possible, larger, less frequent drops were used. A geotechnical analysis will be done to confirm the design is possible. If that is not the case, additional, short drops will be done instead.
3. The max velocity should not exceed 7fps as stated in the project summary, the HEC RAS model shows several areas exceeding 7fps in between drops. Unresolved.
Response: The criteria provided to us stated that maximum velocity was 9fps during the 100-YR and 7fps during the 10-YR storm. Areas showing velocities or shear outside of criteria will be revised in an attempt to reduce the number. In the event that they cannot, reinforcement with either soil riprap or turf reinforcement mat will be provided in areas that do not meet criteria.
4. **Resolved.**
5. Various sheets – extend riffle to channel limits
Response: The current design shows armoring of the drop areas with slopes greater than 10%. Additional armoring can be provided to ensure long term stability.

Comments for reference from SF-16-013:

Final Drainage Report (FDR) / Drainage Plans

1. Regarding drainage improvements in Sand Creek, the DBPS-required improvements, which appear to have been shown in the Preliminary Drainage Report, need to be addressed with this plat and the Final Drainage Report. Per EA-15-102 meeting minutes, platting of the drainageways is required and the Financial Assurances Estimate shall include these facilities. LDC 6.3.2(B)1(d) states that "When specific improvements are required, the construction drawings and specifications shall be submitted for review with the final drainage plan, and any improvements included in the construction financial assurance required by the ECM."

- a. The plat should include the entire adjacent drainageway to avoid future ownership and maintenance access issues. At a minimum, provide an easement for the offsite portion of the adjacent drainageway as appropriate for access and maintenance. Provide easement documents for review. *Comment remains (legal description and exhibit not received). Provide when available. Partially resolved; the agreement only references Exhibit A, but the attached Exhibit B is the easement area. Either clarify the references or remove Exhibit A and rename Exhibit B. Resolved; the easement is required to be recorded prior to construction of the channel improvements.*
Response: Easement documentation will be provided during the final design process.
2. Resolved
3. Address statements in the Preliminary Drainage Report regarding:
 - a. Additional subsurface exploration and geotechnical engineering necessary for final design. Have these been completed? *Resolved; provide the reports when available, including for the proposed ponds as applicable.*
Response: Additional geotechnical analysis will be done during the next phase of design and included in the next submittal.
 - b. Wetland mitigation; address what this filing is mitigating, including requirements for the Sand Creek improvements. *Partially resolved; provide an updated report and USACE documentation to include the areas downstream of proposed Pond W-5. Provide a separate map showing areas of wetland mitigation. Provide when available.*
Response: JR is currently in the process of submitting documentation to the ACOE for permitting. Mitigation maps and documentation will be provided when complete.
13. Final Drainage Plan:
 - g. Provide all details and calculations for onsite flows exiting the site including at the proposed east end of Marksheffel, Tract E, and the south end of Dines Road with this filing. *Comment remains Partially resolved; the response letter indicates that TSBs will be provided at two locations but are only shown at one on the drainage plan; revise as appropriate and provide copies of the offsite easements when available. Resolved; provide copies of any necessary offsite easements when available.*

Construction Plans/Geotechnical Issues:

1. Provide copies of all required off-site utility, drainage, and construction easements. **Provide when available and add reception numbers to the blanks provided on the plans with the as-built plans when complete.**

Response: Noted

Please contact me should you have any questions or concerns regarding this response letter at 303-267-6240.

Sincerely,

Mike Bramlett, PE
JR Engineering