



August 26, 2019
Project 16134

Mr. Brandon Coleman, P.E.
City of Boulder
1739 Broadway
Boulder, CO 80302

**Re: South Boulder Creek Regional Detention Preliminary Design Project
Draft Contract Modification Request No. 7**

Dear Mr. Coleman:

RJH Consultants, Inc. (RJH) requests a modification to the existing contract between RJH and the City of Boulder (City) authorized on September 26, 2016, for the South Boulder Creek Regional Detention Preliminary Design Project (Project). As work on the Project has progressed, the City and RJH have identified the need to perform additional work to accommodate changes in the Project.

Background

Beginning in late 2017, RJH performed concept design evaluations of various alternatives to facilitate the City's selection of a preferred alternative to advance into preliminary design. Boulder City Council (City Council) ultimately selected the Variant 1, 500-year (V1-500) alternative to be advanced into preliminary design. The University of Colorado (CU) has stated that this alternative is not acceptable to CU because of the extent of flood inundation on their property. Subsequent to City Council's decision, the Colorado Department of Transportation (CDOT) has stated that the project must be built generally outside of the existing U.S. Highway 36 (US36) right-of-way. Constructing V1-500 with this constraint would require a permanent impact to Open Space and Mountain Parks (OSMP) property to the south of the existing US36 right-of-way.

Based on discussions with City staff, we understand that additional concept design evaluations are desired to identify a range of potential options for reducing the extent of flood inundation on CU property and relocating the floodwall. The intent of the additional concept design evaluations is to provide a similar level of detail to previous concept design evaluations to facilitate direct comparisons between alternatives. This may include performing hydraulic modeling, performing concept-level layouts, identifying potential environmental impacts, and developing Opinion of Probable Project costs.

RJH previously provided Contract Modification Request #4 to develop and analyze seven concept alternatives. Following discussions with the City, we understand that Contract Modification Request #4 will not be approved, and instead, the City desires to evaluate the four concept alternatives presented herein. Some of these alternatives have been previously evaluated by RJH to varying degrees, and some alternatives are new. The alternatives include:

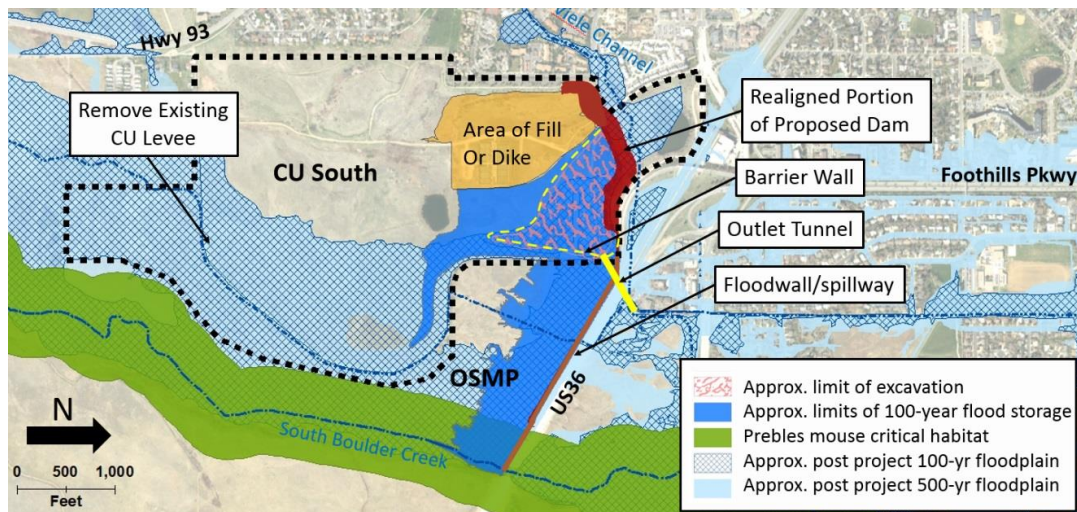
- Option 1 - Reducing the design event from the 500-year event to the 100-year event in conjunction with placing fill to remove the PUB land use from the floodplain.
- Option 2 – Maintaining the V1-500 configuration in conjunction with placing fill to remove a portion of the Open Space – Other (OS-O) land use from the floodplain and changing this land use to Public (PUB).
- Option 3 - Reducing the design event from the 500-year event to the 200-year event in conjunction with a) placing fill to remove the PUB land use from the floodplain and b) placing fill to remove a portion of the Open Space – Other (OS-O) land use from the floodplain and changing this land use to Public (PUB).
- Option 4 - Reducing the design event from the 500-year event to either between the 100-year and 200-year event or between the 200-year and 500-year event in conjunction with a) placing fill to remove the PUB land use from the floodplain and b) placing fill to remove a portion of the Open Space – Other (OS-O) land use from the floodplain and changing this land use to Public (PUB). The design event for this option will be selected by RJH and the City after hydraulic modeling results for Option 3 have been evaluated.

Scope of Work Modifications

We have identified the following scope of work modifications to Task 6 – Concept Development and Evaluation.

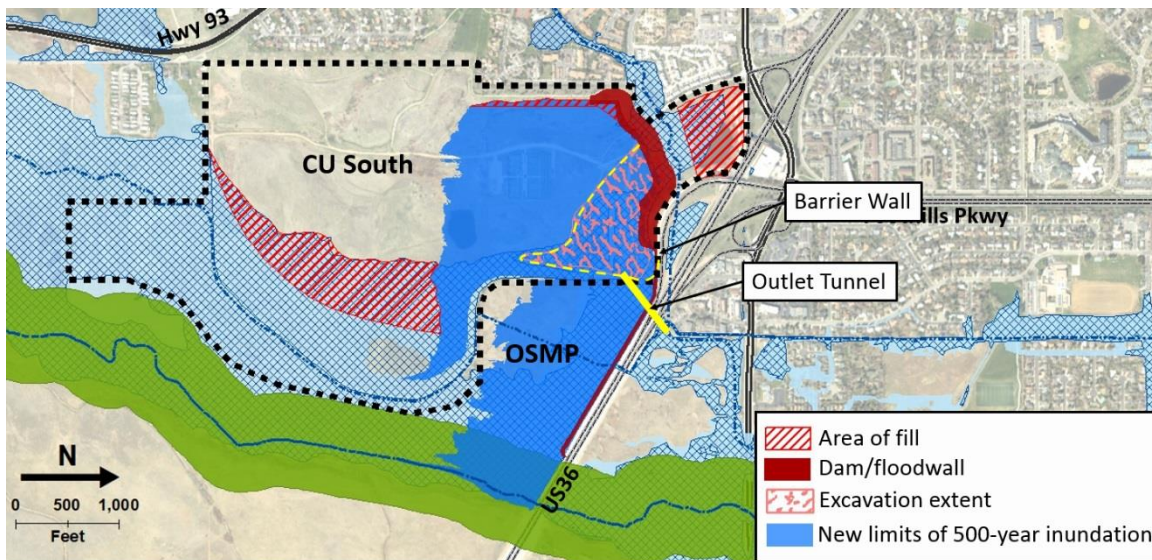
Tasks:

1. Option 1: This option was previously evaluated by RJH at a concept level and was previously referred to as Variant 1, 100-year. A general schematic of Option 1 is presented below. The results of our evaluation of this option are presented in the Concept Design Report (RJH, 2018). Additional work tasks will include: updating environmental assessments to reflect construction of the floodwall on OSMP property, identifying advantages and disadvantages relative to the other potential options discussed herein, updating figure callouts and labels, and updating the Class 4 Opinion of Probable Project Cost to include fill to protect the PUB area from flooding during a 100-year event. Hydraulic modeling, layouts, environmental assessments, and cost opinions were previously developed.



Option 1 – General Schematic

2. Option 2: This option was previously evaluated by RJH at a feasibility level (i.e. less refined than concept level) and was previously referred to as Variant 1B – 500-year. A general schematic of Option 2 is presented below. Additional work tasks will include:
 - a. Perform hydraulic modeling using the MIKE FLOOD model for 500-year event to identify potential upstream flood impacts resulting from the fill. Modeling will not be performed for the 100-year event because the fill will not exceed the extents of the 100-year CU levee that has been previously modeled.
 - b. Develop a concept-level layout and initial grading for the fill area. Concept-level layouts for the flood mitigation facility will not change from previous V1, 500 configuration.
 - c. Develop quantity estimates for primary materials required to construct the fill. Update the Class 4 Opinion of Probable Project Cost to include the fill on the OS-O land use.
 - d. Identify potential for environmental impacts by a) identifying boundaries for wetlands, open water, and threatened and endangered (T&E) species habitat, and b) overlaying Project facilities over environmental boundaries to quantify the impacted area.



Option 2 – General Schematic

3. Option 3: This option has not been evaluated by RJH previously. Work tasks will include:
 - a. Perform hydraulic modeling using the MIKE FLOOD model for 200-year event to identify potential upstream flood impacts resulting from the fill. Modeling will not be performed for the 100-year event because the fill will not exceed the extents of the 100-year CU levee that has been previously modeled.
 - b. Develop a concept-level layout and initial grading for the flood mitigation facility.
 - c. Develop quantity estimates for primary materials required to construct the facility and fill. Develop a Class 4 Opinion of Probable Project Cost.
 - d. Identify potential for environmental impacts by a) identifying boundaries for wetlands, open water, and threatened and endangered (T&E) species habitat, and b) overlaying Project facilities over environmental boundaries to quantify the impacted area.

4. Option 4: This option has not been evaluated by RJH previously. Work tasks will include:
 - a. Perform hydraulic modeling using the MIKE FLOOD model for either an event between the 100-year and 200-year event or an event between the 200-year and 500-year event to identify potential upstream flood impacts resulting from the fill. Modeling will not be performed for the 100-year event because the fill will not exceed the extents of the 100-year CU levee that has been previously modeled.
 - b. Develop a concept-level layout and initial grading for the flood mitigation facility.
 - c. Develop quantity estimates for primary materials required to construct the facility and fill. Develop a Class 4 Opinion of Probable Project Cost.

- d. Identify potential for environmental impacts by a) identifying boundaries for wetlands, open water, and threatened and endangered (T&E) species habitat, and b) overlaying Project facilities over environmental boundaries to quantify the impacted area.
5. Miscellaneous Hydraulic Modeling: This task provides an allowance for miscellaneous hydraulic modeling using the MIKE FLOOD model. Work tasks could include: refining results for the 200-year event, evaluating the appropriateness of results for local basins, and correlating results to other City flood mitigation sites including the Hogan-Pancost property.
 6. Reporting, Meetings, and Management:
 - a. Prepare and submit a draft *Concept Design Report – Addendum Memorandum No. 2* that presents the methodology, results, and conclusions of the work for Options 1, 2, 3, and 4.
 - b. Incorporate City and UDFCD comments and submit a final memorandum.
 - c. Prepare graphics and other presentation materials to support City staff presentations. We have assumed two presentations.
 - d. Participate in six meetings at the City.
 - e. Manage and coordinate the work to be performed by the RJH Team.
 - f. Provide invoices and written monthly progress reports that include an overview of work accomplished during the previous month; summary of concerns or unanticipated issues; and contract budget, monthly invoiced amounts, cumulative amount invoiced by task, a summary of the hours by individual for the invoice period, and subcontract costs.

Deliverables:

- *Concept Design Report – Addendum Memorandum No. 2* in electronic .pdf format.

Basis for Scope of Work and Fee Estimate

We have developed the scope of work and fee estimate based on the following:

1. RJH will not perform civil layout or develop cost estimates to establish 30 acres of athletic fields for CU.
2. Hydraulic modeling will be performed using the existing MIKE FLOOD model.
3. Hydrologic analyses will not be performed to identify precipitation depths associated with flood events between the 100-year and 200-year event and between the 200-year and 500-year event. Precipitation depths for these events will be approximately estimated by interpolation.
4. Project meetings will require 6 hours each for the RJH Project Manager and Project Engineer to prepare for, participate in, and document the meeting; and 4 hours each for all other participants.

5. Meetings with CU and CDOT will not be required. The City will coordinate all discussions with CU and CDOT and inform RJH of key decisions.
6. Graphics for public meetings will generally consist of memorandum figures with minor modifications.
7. Costs for transportation access to the CU property will be based on constructing an earthfill ramp to convey traffic over the earthen embankment and installing two-lane asphalt paving similar to the Concept Design Report.

Fee Estimate

We have developed our fee estimate to complete the work described above in accordance with the terms of our contract for this project and 2019 rates previously approved to the City. Actual costs could be higher or lower than estimated based on the actual level of effort required to complete an individual task. We will not exceed the total estimated amount without prior authorization from the City and will invoice monthly based on the work completed. A summary of our fee estimate by task is provided in the attached table. Assuming approval of Change Request No. 6 (submitted separately), approval of Change Request No. 7 would increase the Conceptual Design Budget as shown in Table 1 below.

**TABLE 1
REVISED TOTAL CONCEPT DESIGN BUDGET**

Task	Concept Design Budget (\$) ¹	Requested Change Request No. 7 Additional Concept Design Budget (\$)	Revised Total Concept Design Budget (\$)
	A	B	C = A + B
Task 1 – Project Management	104,700.00	17,700.00	122,400.00
Task 2 – Meetings	120,200.00	18,800.00	139,000.00
Task 3 – Geotechnical Investigations	731,800.00		731,800.00
Task 4 – Groundwater Modeling	9,100.00		9,100.00
Task 5 – Environmental Permitting	38,800.00	10,500.00	49,300.00
Task 6 – Concept Development and Evaluation	694,500.00	65,700.00	760,200.00
Task 7 – Surveying	47,400.00		47,400.00
Task 8 – Landscape Architecture	2,400.00		2,400.00
Total	1,748,900.00	112,700.00	1,861,600.00

(1) Assuming approval of Change Request No. 6

Schedule

We estimate that we can submit a draft *Concept Design Report – Addendum Memorandum No. 2* within 3 months after receiving notice to proceed.

Please let me know if you have any questions. We look forward to continuing to assist the City in implementing the Project.

Sincerely,

A handwritten signature in black ink, appearing to read "Rodney W. Eisenbraun". The signature is written in a cursive style with a large, stylized initial 'R'.

Rodney W. Eisenbraun, P.E.
Project Manager

RWE/drs

Attachments: Attachment A – Change Request No. 7 Fee Estimate

ATTACHMENT A

CHANGE REQUEST NO. 7 FEE ESTIMATE

CHANGE REQUEST NO. 7 FEE ESTIMATE

RJH CONSULTANTS, INC.

PROJECT NAME:	South Boulder Creek
PHASE:	Concept Design - Addendum No. 2
DATE:	8/1/2019

COST ITEMS	RATE		TASK 1		TASK 2		TASK 3		TASK 4		TASK 5		TASK 6		TASK 7		TASK 8		TOTAL # or HOURS for THIS PHASE	TOTAL BUDGET FOR THIS PHASE
			Option 1 - V1 100		Option 2 - V1 500 + Fill on OSO		Option 3 - V1 200 + Fill on OSO		Option 4 - V1 150/300 + Fill on OSO		Miscellaneous Hydraulic Modeling		Reporting		Meetings		Project Management			
			TOTAL # or HOURS	TOTAL BUDGET	TOTAL # or HOURS	TOTAL BUDGET	TOTAL # or HOURS	TOTAL BUDGET	TOTAL # or HOURS	TOTAL BUDGET	TOTAL # or HOURS	TOTAL BUDGET	TOTAL # or HOURS	TOTAL BUDGET	TOTAL # or HOURS	TOTAL BUDGET	TOTAL # or HOURS	TOTAL BUDGET		
LABOR COSTS																				
Senior Professional-Grade 8	\$ 234.00	HR	3	\$ 702	5	\$ 1,170	12	\$ 2,808	12	\$ 2,808	6	\$ 1,404	8	\$ 1,872	36	\$ 8,424	40	\$ 9,360	122	\$ 28,548
Senior Professional-Grade 7	\$ 217.00	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Senior Professional - Grade 6	\$ 191.00	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Grade 5	\$ 177.00	HR	6	\$ 1,062	14	\$ 2,478	18	\$ 3,186	18	\$ 3,186	8	\$ 1,416	24	\$ 4,248	36	\$ 6,372	40	\$ 7,080	164	\$ 29,028
Grade 4	\$ 147.00	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Grade 3	\$ 132.00	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Grade 2	\$ 121.00	HR	14	\$ 1,694	26	\$ 3,146	36	\$ 4,356	36	\$ 4,356	6	\$ 726	8	\$ 968	0	\$ -	6	\$ 726	132	\$ 15,972
Grade 1	\$ 111.00	HR	0	\$ -	4	\$ 444	4	\$ 444	4	\$ 444	0	\$ -	0	\$ -	0	\$ -	0	\$ -	12	\$ 1,332
CADD Designer	\$ 112.00	HR	6	\$ 672	4	\$ 448	8	\$ 896	8	\$ 896	0	\$ -	0	\$ -	0	\$ -	0	\$ -	26	\$ 2,912
Word Processing/Administration	\$ 87.00	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	8	\$ 696	0	\$ -	6	\$ 522	14	\$ 1,218
TOTAL LABOR COSTS			29	\$ 4,130	53	\$ 7,686	78	\$ 11,690	78	\$ 11,690	20	\$ 3,546	48	\$ 7,784	72	\$ 14,796	92	\$ 17,688	470	\$ 79,010
SUBCONTRACT COSTS																				
CORVUS Environmental	\$ 150.00	HR	4	\$ 600	12	\$ 1,800	12	\$ 1,800	12	\$ 1,800	0	\$ -	18	\$ 2,700	12	\$ 1,800.00	0	\$ -	70	\$ 10,500
Architerra - Landscape Architect	\$ -	EA	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
DHI - Hydraulic Modeling	\$ 198.00	EA	0	\$ -	18	\$ 3,564	24	\$ 4,752	24	\$ 4,752	24	\$ 4,752	16	\$ 3,168	6	\$ 1,188.00	0	\$ -	112	\$ 22,176
Muller Engineering	\$ -	EA	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Kimley Horn	\$ -	EA	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
TOTAL SUBCONTRACT COSTS			\$ 600	\$ 5,364	\$ 6,552	\$ 6,552	\$ 4,752	\$ 5,868	\$ 2,988.00	\$ -	\$ 32,676									
TRAVEL																				
AIRFARE	\$ -	EA	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
MOTEL	\$ -	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
MEALS	\$ -	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
RENTAL CAR	\$ -	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
MILEAGE	\$ 0.55	MI	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	1800	\$ 990.00	0	\$ -	1800	\$ 990
PARKING	\$ -	HR	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
TOTAL TRAVEL COSTS			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 990.00	\$ -	\$ 990			
TOTAL PROJECT COSTS			\$ 4,700	\$ 13,100	\$ 18,200	\$ 18,200	\$ 8,300	\$ 13,700	\$ 18,800	\$ 17,700	\$ 112,700									