

August 1, 2023

Matt LeCerf, Town Manager
Town of Johnstown, Colorado
450 S Parish Ave. PO Box 609
Johnstown, CO 80534

RE: Country Acres/Hillsboro Ditch Drainage Mitigation Study

Dear Mr. LeCerf:

We are pleased to submit this proposal for the development of the Country Acres/Hillsboro Ditch Drainage Mitigation Study. The goal of this study is to identify potential solutions to separate drainage discharges from the Country Acres Subdivision from the Hillsboro Ditch and identify mitigation options to minimize or prevent flooding/ponding that occurred earlier this year for future events.

SCOPE OF BENESCH WORK

This scope of work is for the mitigation of flooding in Johnstown across the Hillsboro Ditch. Mitigation will address impacts to Johnstown property owners in the vicinity of ditch flooding including the Country Acres neighborhood, Great Western Railroad Company and Hillsboro Ditch. Mitigation options will consist of a sub-regional hydrology and hydraulics analysis for the specific Little Thompson Creek sub-basin and development of a conceptual drainage plan options to mitigate the flooding effects across the ditch reported by Johnstown officials. Conceptual mitigation drainage alternatives, conceptual hydrology and hydraulics will be documented in the Country Acres/Hillsboro Ditch Drainage Mitigation Study along with project rankings and identification of a preferred alternative. The conceptual mitigation plan design criteria will be based on Johnstown, Weld County, Mile High Flood District, and other highly developing small-town criteria similar to Johnstown.

1. Project Initiation and Continuing Requirements

- Meetings. Benesch will prepare an agenda, attend and prepare minutes for the following meetings:
 - Kickoff meeting (at Town of Johnstown office)
 - Scoping meeting with Johnstown and Hillsboro Ditch Representatives
 - Two meetings with the ditch company (on site or at Johnstown office)
 - Country Acres HOA Coordination Meeting – led by Johnstown
 - Meetings with other property owners impacted by upper basin/ditch flooding
 - Alternatives review meeting – in-person. The purpose of this meeting is to review alternatives, brainstorm additional ideas, and discuss potential fatal flaws.
 - Monthly virtual progress meetings with Johnstown – assume 4
 - Concept review meeting for preferred alternative – (Johnstown office)
- Project Schedule. Develop a project schedule and assign tasks that detail the project milestones and completion dates. Update this schedule as needed. Review the schedule during the bi-weekly update calls.
- Project Management. The Benesch PM will coordinate the work tasks being accomplished by the entire Project Team to ensure project work completion stages are on schedule. Project staffing and assigning tasks, scheduling and invoicing are included within this task.
- Project Contact List. The Consultant will create and maintain a Project Contact List of stakeholder individuals and entities.

2. Data Collection/Base Mapping/Research

The following will be used in the development of mitigation options for short-term and long-term solutions:

- Develop Base Mapping. Alternatives and concept design will be illustrated on USGS mapping & CWCB LiDar which will be obtained from the Hazard Mapping & Risk Map Portal
- Previous drainage reports if available
- Flood history from Johnstown, ditch company, and other stakeholders
- Field reconnaissance
- Existing structures inventory
- Floodplain/FEMA research
- Develop design criteria and obtain approval from Johnstown

3. Alternatives Development

Benesch will identify short-term and long-term options to mitigate future flooding. The project team will try to identify short-term solutions that could be implemented in the near term in addition to considering long-term plans that could be implemented in a phased approach with developer support.

Options for consideration may include:

1. Detention
2. Irrigation Ditches
 - a. Hillsboro Ditch parallel ditch system
 - b. Linear infiltration channels
 - c. Irrigation ditch diversion with headgate to storm sewer system to Little Thompson River.
3. Major Drainage Open Channels (>130 acres)
4. Storm Sewer System
5. Accommodate minor storm as a short-term solution
6. A combination of items listed above

Hydrology/Hydraulics:

Assumptions:

- There will be no anticipated floodplain impacts to Little Thompson River in the vicinity of the mitigation area.
- Concepts including basin areas and hydraulic profiles will be based on best available USGS & LiDAR data.
- Includes only conceptual alignment and profile recommendations in report/ memorandum format.
- Does not include environmental permitting, stormwater management and erosion control plans or recommendations.

Benesch will perform the following:

Sub-regional Hydrology Analysis

Peak flow runoff rates will be determined on a subregional basis for the subject Little Thompson River water shed. Drainage basin areas will be large enough for estimating conveyance system sizes at key design points for storm sewer and open channels. Basin parameters will be determined to include land cover coefficients, time of concentration, NOAA Atlas 14 rainfall data collection, and estimating of hydrologic soil group information. Approved hydrology design

software will be used such as CUHP 2005/ UDSWMM 2000, calibrated for the Johnstown region and TR-55 as appropriate. Peaks will be determined assuming a 5-year minor storm, 10-year major, and 100-year major storm event.

Attached is a TR-55 analysis completed for the subject Johnstown sub-basin for the existing 100-year peak flow rate of 266 CFS. As development occurs this peak value will easily double or triple in future developed condition. Benesch will identify areas, from a planning level, for subdivision level sub-regional detention ponds. Incorporating select detention in the basin will keep flow rates at existing or predeveloped condition.

Conceptual Hydraulics Analysis

The conceptual hydraulics analysis includes development of a minor and major storm conveyance system designed to mitigate the existing flooding effects across the Hillsboro Ditch. Approved drainage design software will be used such as Storm-cad, Hydra-flow, and Hydrology Suite proprietary software. Storm sewer conceptual design will be based on a minimum 5-year event and channel conceptual design will be based on minimum 10-year storm conditions. Conceptual hydraulic grade line profiles will be determined for the conceptual design. Alternative may include an Interim (band-aid) Condition. Interim is a temporary solution for the Town and will be subject to change when builder development occurs. Therefore the interim design and implementation is subject to change, if necessary to meet final design criteria.

Conceptual Hydrology and Hydraulics Memorandum

Prepare Hydrology & Hydraulics to document and summarize assumptions, criteria, interim design recommendations, calculations, relevant design aids, and maps.

4. Alternatives Analysis

Once the project team has identified options for consideration and ran preliminary hydrology, the alternatives analysis phase will determine feasibility of the options considering:

- Cost
- ROW/Drainage Easement requirements
- Ease of implementation
- Permitting requirements
- Other factors as identified by the project team (Benesch, Johnstown, stakeholders)

The alternatives will be evaluated and scored, with ranking methods determined in consultation with Johnstown. A preferred alternative will be identified based on the ranking and Town feedback.

Deliverables

- Draft Drainage Mitigation Study to document and summarize assumptions, criteria, design recommendations, calculations, relevant design aids, and maps. The following items will be provided in an appendix to support the study:
 - Meeting Minutes
 - Document research
 - Graphics/Exhibit to illustrate options.
 - Conceptual cost estimates
 - Project alternatives write-ups
 - Project Rankings – identification of preferred alternative
 - Maintenance discussion

- Final Drainage Mitigation Study – The agreed upon preferred alternative will be identified for future scoping and implementation.

EXCLUSIONS

The following are not included in the scope of work and their inclusion is subject to a change in scope, schedule and/or fee: Environmental studies, survey, SUE, permitting and clearances, Value Engineering studies, bridge design, floodplain modeling, CLOMR/LOMR preparation, utility design, railroad coordination and submittals, traffic counts, preliminary design, final design, construction plans and permit applications. Services after bidding including pre-construction meetings, shop drawing review, field observations and as-built plans are not included and will be included in separate task orders.

FEE

See the attached fee estimate.

Sincerely,

A handwritten signature in blue ink that reads "John Sabo".

John Sabo, PE
Vice President/Transportation Group Manager

Attachment: Fee Estimate

Town of Johnstown - Country Acres/Hillsboro Ditch Drainage Mitigation Study



8/2/2023	PIC	Senior PM	Drainage	Base Mapping	Base Mapping	Drainage	Drainage	Erosion	Asst					
	Sabo	Olson	Fuentes	Salek	Stahr	Sanchez	Fling	Floyd	Kenny					
	Principal	Senior Project Manager	Principal	Senior Project Manager	Project Engineer II	Designer I	Designer I	Designer II	Project Assistant II	Benesch Total Hours	Benesch Labor Fee	Benesch Mileage & Other Direct Costs	Sub Consultants	Sub-Task Fees
Hourly Rates:	\$ 250	\$ 215	\$ 250	\$ 215	\$ 132	\$ 102	\$ 102	\$ 115	\$ 89					

Benesch

1) Project Initiation and Continuing Requirements

a) Meetings										0	\$0			\$ -
Kick-Off Meeting		2	2	2		2				8	\$1,564	\$ 75		\$ 1,639
Scoping Meeting		2	2	2		2				8	\$1,564	\$ 75		\$ 1,639
Ditch Company Meetings (2 meetings on site)		2	2	2		2				8	\$1,564	\$ 149		\$ 1,713
Country Acres HOA Coordination Meeting		2	2	2						6	\$1,360	\$ 75		\$ 1,435
Property Owner Meetings		4	4							8	\$1,860	\$ 149		\$ 2,009
Alternatives Review Meeting		3	3	3		3				12	\$2,346	\$ 75		\$ 2,421
Monthly Progress Meetings	4	4	4	4		4				20	\$4,128			\$ 4,128
Concept Review Meeting	2	2	2	2		2				10	\$2,064	\$ 75		\$ 2,139
b) Project Schedule		1								1	\$215			\$ 215
c) Project Management	4	8	8							20	\$4,720			\$ 4,720
d) Project Contact List		1								1	\$215			\$ 215

2) Data Collection/Base Mapping/Research

Develop Base Mapping				16						16	\$3,440			\$ 3,440
Review previous reports, floodplain/FEMA research			8							8	\$2,000			\$ 2,000
Field Reconnaissance		4	8	8		8				28	\$5,396			\$ 5,396
Develop existing structures inventory				8						8	\$1,720			\$ 1,720
Develop design criteria			2			4				6	\$908			\$ 908

3) Alternatives Development

Develop Alternatives/Brainstorming	2	4	8	8		8				30	\$5,896			\$ 5,896
Hydrology/Hydraulics										0	\$0			\$ -
i) Sub-regional Hydrology Analysis	4		8			60	20			92	\$11,160			\$ 11,160
ii) Conceptual Hydraulics Analysis	4		16			60	20			100	\$13,160			\$ 13,160
iii) H&H Memorandum	4		8			48	16			76	\$9,528			\$ 9,528
										0	\$0			\$ -

3) Alternatives Analysis

Develop alternatives ranking matrix	1	1	4	4		8				18	\$3,141			\$ 3,141
Draft Drainage Mitigation Study										0	\$0			\$ -
Graphics/Exhibits to illustrate options			8	16						24	\$5,440			\$ 5,440
Conceptual Cost Estimates				12						12	\$2,580			\$ 2,580
Alternatives write-ups			8			16				24	\$3,632			\$ 3,632
Project Rankings			2	8		16				26	\$3,852			\$ 3,852
Final Drainage Mitigation Study	1	1	8	8		8				26	\$5,001			\$ 5,001

Subtotals	26	41	117	105	0	251	56	0	0	596	\$ 98,454	\$ 672	-	\$ 99,126
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TOTAL FEE \$ 99,126

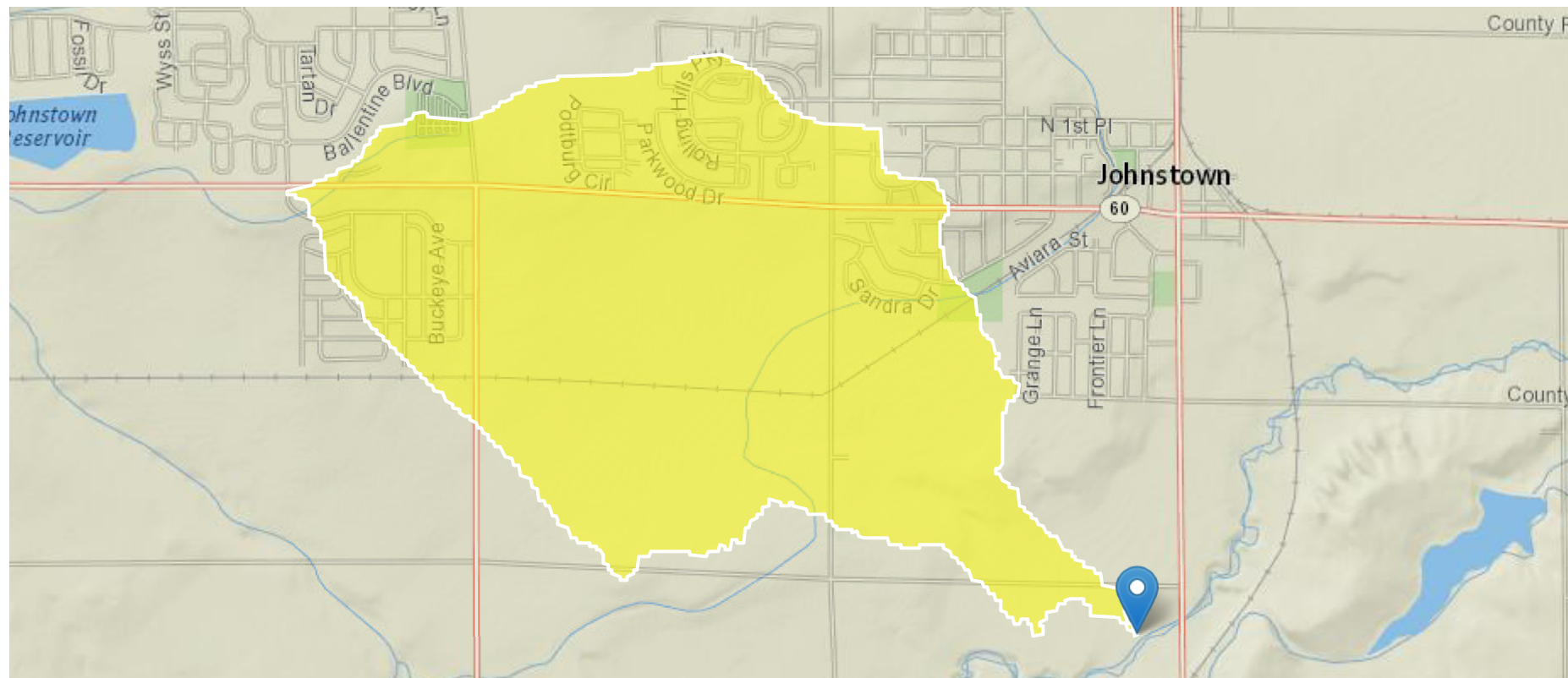
StreamStats Report

Region ID: CO

Workspace ID: C020230727200431276000

Clicked Point (Latitude, Longitude): 40.31821, -104.90821

Time: 2023-07-27 14:04:55 -0600



 Collapse All



Study Area Storm Event Runoff Summary for 24 Hour 100 Year Precipitation (TR55)

Parameters

Precipitation (inches):	4.95
Drainage Area (square miles):	1.85
Runoff-Curve Number (dimensionless):	80.08

Summary

Peak runoff (cubic feet per second):	266
Total infiltration (inches):	2.09
Total excess precip (inches):	2.86

Runoff hydrograph from 24 Hour 100 Year Precipitation

