

EXHIBIT "A"
WORK ORDER FORM
PURSUANT TO AN AGREEMENT BETWEEN
THE CITY OF FORT COLLINS
AND
Anderson Consulting Engineers

Dated: 12/10/2019

Work Order Number: _____
Purchase Order Number: _____
Project Title: Whitewater Park / Poudre River Downtown Project
Commencement Date: 12/10/2019
Completion Date: 12/31/2020
Maximum Fee: (time & reimbursable direct costs): \$58,043.00
Project Description: Poudre River Downtown Project Amendment 1: Task 12 LOMR
Scope of Services: See attached Scope of Work, Dated September 13, 2019 and Professional Services Agreement 7490 Poudre River Downtown Project, Dated 4/28/17

Acceptance MAD
Matthew Day, Park Planning and Development

Service Provider agrees to perform the services identified above and on the attached forms in accordance with the terms and conditions contained herein and in the Services Agreement between the parties. In the event of a conflict between or ambiguity in the terms of the Services Agreement and this work order (including the attached forms) the Services Agreement shall control.

The attached forms consisting of eleven (11) pages are hereby accepted and incorporated herein by this reference, and Notice to Proceed is hereby given.

Service Provider
By: [Signature]
Date: 12/10/2019

City of Fort Collins
By: _____
Date: _____

CC: Purchasing

Director of Purchasing and Risk Management
if over \$60,000

SCOPE OF WORK
for the
LETTER OF MAP REVISION APPLICATION FOR THE
OXBOW LEVEE – POUDRE WHITEWATER PARK PROJECTS

At a joint meeting of Stormwater, Park Planning and Natural Areas (NA) staff, it was established that a combined Letter of Map Revision (LOMR) application would be prepared for the Oxbow Levee and Poudre Whitewater Park Projects. As part of this combined LOMR, direction was also given to tie into the hydraulic models and mapping associated with both the Woodward-Homestead NA LOMR and McMurray-Shields Street LOMR. Further discussion with Stormwater staff clarified that the combined LOMR would tie to the upstream end of the Woodward LOMR and the downstream end of the McMurray LOMR, thereby limiting the combined LOMR to a reach extending from a point between Mulberry Street and Lincoln Avenue to a point downstream of Shields Street. It is noted that the recent Lincoln Avenue Bridge-Udall NA improvements have not yet been included in a regulatory hydraulic model; consequently, as-built survey data representing those improvements will be incorporated into the combined LOMR. In addition, the Stormwater Department has recently requested that previous grading work associated with the open lot located directly west of Innosphere, as well as riverbank repairs and stabilization at the BNSF Railroad Bridge, be included in the combined LOMR. It is assumed that as-built survey information for each component of the LOMR, including electronic data and 11"x17" PDFs showing as-built survey points stamped by a PLS, will be provided by the respective projects (under separate contract). However, one combined electronic base map for all identified projects will be prepared as part of this scope of work.

Commensurate with the manner in which the 500-year event was handled in both the Oxbow and Whitewater CLOMRs, the combined LOMR will model the 500-year flow through the main channel only within the study reach. The eastern boundary of the revised condition 500-year floodplain will tie to the effective 500-year floodplain near Redwood Street, while no downstream mapping tie-in identified for this event.

This scope of work identifies the tasks associated with the combined LOMR application. This scope of work also outlines the anticipated work effort associated with providing documentation previously requested by the USACE in order to complete documentation associated with the Oxbow Levee improvement work. The accompanying budget provides a breakdown of costs apportioned to the two projects.

Task 1. Base Map Preparation

As-built survey data for the projects referenced above will be combined into one AutoCAD file to create a single electronic base map. Since this base map will be used for floodplain mapping purposes, all survey information will be horizontally referenced to Colorado State Plane North (NAD1983) and to the North American Vertical Datum of 1988 (NAVD88).

Task 2. Geotechnical Evaluation and Documentation

During construction of the elevated portion (south end) of the Oxbow Levee, CTL Thompson (CTL) conducted compaction testing of the embankment soils. CTL will update their geotechnical investigation report to include the construction testing work and assist ACE in completing the portion of the LOMR application related to levee stability (Subsections 5, 6 and 7 of Section E – Levee/Floodwall).

Task 3. Corrected Effective Modeling, Mapping and Documentation

The Corrected Effective hydraulic models for the Oxbow Levee and Poudre Whitewater Park CLOMRs will be combined into a single model. The downstream end of the resulting Corrected Effective model will be modified to tie into the Woodward LOMR model. The 10-year, 50-year, 100-year and 500-year

events, as well as the ½-foot rise floodway, will be re-analyzed for the Corrected Effective condition. Changes to floodplain delineations associated with the 100-year and 500-year events and the ½-foot rise floodway boundaries will be reflected on the Corrected Effective flood hazard work maps. All tabular data, graphical flood profiles and report text associated with the Corrected Effective condition will be revised.

Task 4. As-Built Modeling, Mapping, Documentation and Application

The Proposed Condition hydraulic models prepared for both the Oxbow Levee and Poudre Whitewater Park CLOMRs will be modified to reflect revised conditions defined by the as-built topographic site mapping prepared for the two projects. The resulting Revised Condition hydraulic model will be further modified to include as-built topographic data for the Lincoln Avenue Bridge, the Udall Natural Area improvements, the open lot west of Innosphere, and the recent river bank repair and stabilization near the BNRR Bridge.

The two-dimensional (2D) model prepared in support of the CLOMR will be revised to reflect as-built conditions. The as-built 2D model will be used to re-evaluate post-construction flow distribution and define discharges to be used in the 1D model, as well as inform the delineation of flood fringe areas north of the river in the vicinity of College Avenue.

Revised Condition hydraulic analyses for the Poudre River will include the 10-year, 50-year, 100-year and 500-year events, as well as the ½-foot rise floodway. As with the CLOMR analysis, it is assumed that the Revised Condition will not reflect a 100-year split flow path along Vine Drive east of the BNSFRR. Even if the Revised Condition analyses indicate that a nominal portion of the 100-year flow would be directed east on Vine Drive, the Poudre River modeling will assume that all flows up to and including the 100-year discharge will remain within the river corridor. It is also assumed that the Revised Condition will demonstrate compliance with levee freeboard requirements, while also meeting all floodplain regulations.

For the Revised Condition, floodplain boundaries for the 100-year and 500-year events will be revised, as necessary, through the study reach, along with the ½-foot rise floodway boundaries. The resulting Revised Condition 100-year WSELs and floodway widths will be compared to the Corrected Effective results, the Duplicate Effective HEC-RAS results and Effective values. Revised Condition flood hazard mapping will be prepared, including the 100-year and 500-year floodplains, and ½-foot rise floodway.

The hydraulic modeling/flood hazard mapping reports prepared for both the Oxbow Levee and Poudre Whitewater Park CLOMRs will be merged and revised to include Revised Condition as-built data, hydraulic modeling and flood hazard mapping, along with a description of all analyses and assumptions, water surface profile comparisons, comparative flood hazard mapping, graphical flood profiles, floodway data tables, and Flood Insurance Study text.

A GIS database will be prepared that identifies changes in 100-year flood levels and floodplain/floodway limits for each property within the effective 100-year floodplain. Using the information in this database, ACE will assist Stormwater Staff to prepare up to thirty (30) property owner notification letters identifying actual changes in regulatory flood conditions for the affected properties. It is assumed that the property owner notification letters will be formatted to match the notification letters prepared as part of the CLOMRs. Public notification that meets FEMA requirements will be accomplished through publication of a newspaper notification in the Fort Collins Coloradoan.

A LOMR application will be prepared, along with the required supporting documentation. The LOMR will be submitted to the City for review. Upon approval by the City, the LOMR application will be submitted to FEMA for review. *It is noted that addressing foreseeable review comments from either the City or FEMA, as indicated by the allowance provided in the associated budget, is included as part of this task. If review comments are more extensive than accommodated by the allowance, additional revisions to modeling, mapping or documentation would need to be conducted under a supplemental scope of work and budget.*

Task 5. Prepare Updated Levee O&M Manual and Submit to USACE

Pursuant to the USACE comment letter dated May 16, 2018, the Oxbow Levee Operation and Maintenance Manual will be updated to include as-built drawings and survey information (to be included in Appendix F.2 of the manual). Also included in Appendix F.2 will be background information (narrative and pertinent data) associated with the levee improvements. The updated O&M Manual, as well as CAD files of the as-built drawings and survey data, and a PDF file of the revised O&M Manual will be submitted to the City for review and approval. Upon approval by the City, three copies of the updated O&M Manual, with electronic files, will be submitted to the USACE. *It is noted that addressing foreseeable review comments from either the City or USACE, as indicated by the allowance provided in the associated budget, is included as part of this task. If review comments are more extensive than accommodated by the allowance, additional revisions to modeling, mapping or documentation would need to be conducted under a supplemental scope of work and budget.*

**BUDGET
for
LETTER OF MAP REVISION APPLICATION FOR THE
OXBOW LEVEE—POUDRE WHITEWATER PARK PROJECTS**

<i>PROJECT: LOMR for Oxbow Levee-Poudre Whitewater Projects</i> <i>CLIENT: City of Fort Collins Utilities & Park Planning</i>	<i>Anderson Consulting Engineers, Inc.</i> <i>Direct Labor</i>							<i>ODC's</i>	<i>Totals</i>		<i>Oxbow Project</i>	<i>Poudre WW Project</i>
<i>ACE PROJECT NO.: COFC2015.03F & COFC2018.04</i> <i>PREPARED BY: GJK</i> <i>DATE: 09/13/2019</i>	Principal Engineer \$160/hr	Project Manager \$115/hr	Project Engineer II \$96/hr	Project Engineer I \$87/hr	Senior GIS/CADD Technician \$80/hr	Admin. \$65/hr	Admin. Assistant \$60/hr	Other Direct Costs				
Task/Description	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Hours	Cost		
1. Base Map Preparation	4	4	6	6	4				24	\$2,518	\$1,200	\$1,318
2. Geotechnical Evaluation and Documentation	3		4						7	\$864	\$864	
3. Corrected Effective Modeling, Mapping & Documentation	2	14	16	14	4	2	2		54	\$5,254	\$3,900	\$1,354
4. As-Built Modeling, Mapping, Documentation & LOMR Application ^A	44	116	138	398	60	20	16	\$8,900	792	\$84,214	\$32,843	\$51,371
5. Prepare Updated Levee O&M Manual and Submit to USACE ^B	28		42	8		12	20	\$2,800	110	\$13,988	\$13,988	
Outside Services												
CTL Thompson								\$2,500		\$2,500	\$2,500	
City Review Fee								\$0		\$0	\$0	\$0
FEMA Review Fee								\$8,000		\$8,000	\$4,000	\$4,000
TOTAL PROJECT HOURS	81	134	206	426	68	34	38		987			
TOTAL PROJECT BUDGET	\$12,960	\$15,410	\$19,776	\$37,062	\$5,440	\$2,210	\$2,280	\$22,200		\$117,338	\$59,295	\$58,043

^A Includes \$8,000 allowance for addressing City and FEMA review comments.

^B Includes \$2,000 allowance for addressing City and USACE review comments.