



November 9, 2021

Mr. Chad Bartee, P.E.
City Engineer
City of Keller
P.O. Box 770
Keller, TX 76244

RE: Citywide Streambank Erosion Study

Dear Mr. Bartee:

O'Brien Engineering, Inc. (OEI) is pleased to present this proposal to provide engineering and related services for the above referenced project. The City of Keller (CLIENT) has engaged OEI to conduct a streambank erosion study. The study is to become a part of the overall Hazard Mitigation Plan.

CLIENT would like the study to focus on three reaches – Big Bear Creek, Little Bear Creek, and Marshall Branch – which total approximately 9 miles of stream. Big Bear Creek and a segment of Little Bear Creek are part of a detailed FEMA study area (Zone AE with a regulatory floodway). Upstream of its confluence with Stream LB-3, there is no FEMA study for Little Bear Creek; the unstudied section has a reach length of approximately 5,400 feet. Within the City of Keller, Marshall Branch is part of an approximate FEMA Study area (Zone A); the downstream reach, outside of city limits, is part of a detailed study (Zone AE). A LOMR (Effective December 2010) was issued for Marshall Branch within the City of Keller; although base flood elevations were not established, it is anticipated that backup data is available.

Additional hydraulic modeling conducted for this project will be for the purposes of assessing erosion and may not meet requirements for FEMA submittal. Reach lengths of each stream, based on FEMA stream centerlines, within City limits are as follows:

<i>Reach Name</i>	<i>Length (ft)</i>
Big Bear	33,478
Little Bear	8,583
Marshall Branch	4,588

The study will provide the City with information necessary to better assess erosion risks, and to plan mitigation projects accordingly. Evaluating erosion hazards will require a combination of field studies and hydrologic and hydraulic modeling. Results of the study will enable the City in selecting areas for future potential bank and stream stabilization projects, as well as in providing the framework for developing policies and regulations to

prevent recurring erosion issues and safeguard existing infrastructure.

Basic Services

OEI proposes the following Basic Services:

1. Project Management

- a. Data Collection** – Acquire GIS data from City and NCTCOG sources including contours, aerial photographs, utility locations, and floodplain data. Obtain City data on erosion and stream related complaints and maintenance histories. If needed, request record drawings of existing bridges and culverts from the City, County, and TxDOT. Obtain floodplain modeling and mapping data from the City, and if needed, FEMA. Should FEMA data requests be required, CLIENT is to pay fees (typically approximately \$500.00 per request if not waived by FEMA for participating communities in the National Flood Insurance Program).
- b. Status Reports** – Provide monthly progress reports to the City.
- c. Meetings** – Attend meetings as requested by CLIENT. The following meetings are anticipated:
 - i. Kickoff Meeting – Attend meeting with CLIENT to discuss project objectives, scope, schedule, data needs, and the submittals/review process.
 - ii. Preliminary Assessment – One meeting after the completion of field reconnaissance and initial data review.
 - iii. Review Meeting – One meeting following submission of the draft Erosion Hazard Report
 - iv. Final Meeting – One meeting following the submission of the final Erosion Hazard Report

2. Field Reconnaissance – Conduct field assessments using visual methods; record locations and the nature of erosion related issues found. Observe high velocity areas indicated by existing hydraulic models for consistency between field conditions and model output. No testing or surveying is expected for this phase of the project. Assess streams to identify existing erosion problems and apparent future problem areas. Field investigation will include assessment of outfalls for erosion related problems and bridges/culverts for scour and erosion.

3. Survey – OEI will contract with a surveyor to obtain cross sections at the locations that are identified during data collection and field reconnaissance as needed for more information. The survey will include eight days of work in field and/or office. Should additional survey be required due to field conditions, additional services and fees will be needed.

4. **Hydrology and Hydraulics** – Develop models to use as a basis for understanding the flows, velocities, and shear stresses experienced by the streams in the study area.
 - a. **Hydrology** – Where available, review existing models for accuracy and validity for use in the study. Use existing hydrologic models to extrapolate higher frequency flows (1- year and 10 year) or if the model is functioning enter precipitation data for higher frequency flows from NOAA Atlas 14 for use in the erosion study. Use existing models as a basis to determine ultimate flows based on a fully developed watershed. It is anticipated that the existing model for the Little Bear and Big Bear watershed can be used as a basis, and that a model will need to be created for Marshall Branch. Should a model need to be created for Little Bear and Big Bear Creeks, additional services and fees will be required.
 - b. **Hydraulics** – Where available, review existing models for accuracy and validity for use in the study; incorporate updated topography into model. The updated geometry will consist of survey supplemented with LiDAR data. It is anticipated that an existing model is available for Big Bear Creek. For Little Bear Creek, the model will be extended to include additional reach length. For Marshall Branch, it is anticipated that the existing model will need to be extended upstream to include the section within the City of Keller. Hydraulic models for the three study areas will include flow data for higher frequency storms, as well as ultimate flows calculated in Task 4a.
 - c. **Scour Analysis** – Analyze potential scour depths at bridge abutments and piers using output from hydraulic models and methodology from HEC-23 Bridge Scour and Stream Instability. Evaluate potential countermeasures and present viable options for consideration in future.
5. **Streambank Stabilization BMPs** – Prepare a menu of the various streambank stabilization Best Management Practices (BMPs) along with a narrative of situations where each method would be appropriate. Methods include measures such as gabion walls and drop structures.
6. **Priority Repair List** – Provide a prioritized list of repairs based on severity and impacts to safety. These areas will be identified based on the field study and hydrologic and hydraulic evaluation.
7. **Cost Estimates** – Prepare construction cost estimates for priority projects. Up to 10 cost estimates will be prepared.
8. **Policy Recommendations** – Make policy recommendations to prevent recurring erosion issues and to safeguard existing infrastructure, such as utilities, from erosion hazards. These recommendations could include adding erosion hazard setbacks to City development ordinances.
9. **Streambank Stability and Erosion Hazard Report** – Prepare a report of findings from field assessments and hydrologic and hydraulic evaluation. The report will

provide a narrative of existing and potential erosion hazards. Based on the results of the hydraulic models, velocity profile and grid map exhibits will be created for higher frequency events, as well as for the 100-year event. Additionally, the report will include the menu of various streambank repair methodologies, prioritization list of repairs, cost estimates for priority projects, suggestions for future projects, and policy recommendations. A draft and final submission will be prepared. Additional rounds of comments and submittals beyond the draft and final report will require additional services and fees.

Exclusions

The following services are not included as a part of this proposal. Should it be requested by CLIENT, a separate proposal can be provided for one or more of the tasks.

1. Water of the U.S. delineation
2. Environmental Services
3. Subsurface Utility Engineering
4. FEMA submittals, including CLOMRs, LOMRs and the like
5. Storm sewer and other closed system analysis

Compensation

Compensation to O'Brien Engineering, Inc. for services described herein shall be according to the following schedule.

- A. Basic Services, Item 1 for a fee of **\$12,800.00**
- B. Basic Services, Item 2 for a fee of **\$16,000.00**
- C. Basic Services, Item 3, for a fee of **\$13,200.00**
- D. Basic Services, Items 4 for a fee of **\$23,000.00**
- E. Basic Services, Items 5 - 9 for a fee of **\$33,000.00**
- F. Additional Services - on an hourly basis as requested by the CLIENT. Our current hourly rate schedule is attached. A separate proposal will be provided on any additional services item at CLIENT's request.

In addition to compensation for specified services, O'Brien Engineering, Inc. will be reimbursed for direct project expenses incurred during the course of the project which are requested by the CLIENT or required for the work, such as copies, scans, photographs, printing, travel outside the Metroplex, messenger services, digital data, and the like. This amount is not to exceed **\$1,500** without prior approval. CLIENT is also responsible for all fees normally imposed by the City, FEMA, and others with jurisdiction related to this project.

This proposal shall be valid for 90 days after the date of this letter. The terms of the contract will be valid for a period of twelve (12) months from the date of the executed contract. The contract term may be extended by specific written mutual agreement of both parties. If work

is suspended for a period of 60 days or more, OEI shall have the right to amend the contract by fee, scope, and schedule.

Thank you for your consideration of this proposal. We look forward to serving you.

Sincerely,
O'BRIEN ENGINEERING, INC.
TBPE Firm No. 3758

A handwritten signature in black ink, appearing to read "Garry Kraus". The signature is stylized with a large initial "G" and a long horizontal stroke.

Garry Kraus, PE
Vice President of Operations