AMENDMENT NO. 1 TO L30022

Contract Start Date:	12/7/2017	Original Total Amount:	$44,378.00
Original Completion Date:	2/28/18	As Previously Amended:	$498,388.00
Amendment Completion Date:	12/31/2019	Current Amendment:	$225,122.00
Resolution:	18-0846R	New Total Contract Amount:	$767,888.00

This amendment, effective as of the date of attestation by the City Clerk (the "Effective Date"), by and between the City of Duluth, hereinafter referred to as "City", and TRC Environmental Corporation located at 230 West Monroe Street; Suite 2300, Chicago, IL 60606, hereinafter referred to as "Consultant", for the purpose of rendering services to the City.

WHEREAS, on December 7, 2017, City and Consultant entered into an agreement bearing City of Duluth Contract No. L30022 for professional engineering services for damage assessment and reconstruction recommendations for portions of the lakewalk and north shore, which contract has been amended once; and which contract and amendments are hereinafter referred to as the "Contract Agreement"; and

WHEREAS, both parties desire to amend the Contract.

NOW THEREFORE, in consideration of the mutual covenants and conditions hereinafter set forth, the parties hereto hereby agree as follows:

In this Amendment changes in the language of the Contract which delete language will be shown as stricken and language added to the contract language will be underlined.

Revision 1. The Estimated Compensation shown in Section V.C. Standard Payment is hereby modified to include the cost for each additional phase:

Section II	Description		Estimated Compensation	Revised Estimated Compensation
A.	Study and Report Phase	$	19,518.00	
B.	Preliminary Survey Phase	$	16,680.00	
C.	Preliminary Design Phase	$	8,180.00	
D.	Final Design Phase	$	~~320,027.00~~	411,819.00
E.	Bidding Phase	$	~~11,488.00~~	27,464.00
F.	Construction Survey and Layout Phase	$	~~40,956.00~~	58,930.00
G.	Construction Administration and Inspection Phase	$	~~125,917.00~~	225,297.00
	TOTAL	$	~~542,766.00~~	767,888.00

The maximum compensation for all phases A through G shall not exceed ~~Five Hundred Forty-Two Thousand Seven Hundred Sixty-Six~~ Seven Hundred Sixty-Seven Thousand Eight Hundred Eighty-Eight and no/100ths Dollars.

Revision 5. The Total Not to Exceed described in Section V.E. of the Contract is hereby amended as follows:

All payments under this Contract are not to exceed ~~$542,766.00~~ $767,888.00, payable as follows: $44,378.00 payable under fund 110-121-1217-2145-5310, ~~and~~ ~~$498,388.00~~ $655,973.40 payable under fund 225-125-1811-5310-STORM17, and $67,536.60 payable under fund 225-125-1813-5310-STORM18.

Revision 6. The Special Provisions described in Section VI of the Contract are hereby amended as follows:

4) Exhibit D, Engineer's Proposal dated December 6, 2018

In all other respects the contract, together with all of its terms, covenants and conditions, is hereby confirmed in its entirety.

IN WITNESS WHEREOF, the parties have hereunto set their hands as of the date of attestation shown below**:**

CITY OF DULUTH

By:

_____

Mayor

Attest:

_____

City Clerk

Date Attested: _____

Countersigned:

_____

City Auditor Date

Approved as to form:

_____

City Attorney Date

TRC ENVIRONMENTAL CORPORATION

By:

_____

Company Representative

Its:

_____

Title of Representative

Date: _____

230 W. Monroe Street
Suite 630
Chicago, IL 60606

312.800.5912 PHONE
312.578.0877 FAX

www.trcsolutions.com

December 6, 2018

Mr. Mike LeBeau
Construction and Energy Project Supervisor
City of Duluth
1532 West Michigan Street
Duluth, MN 55806

Subject: Shoreline Restoration Design, Contract Amendment No. 2
City of Duluth Agreement L30022, TRC Project 290622.0000.0000

Dear Mr. LeBeau:

We are pleased to submit this proposal for Professional Services for the City of Duluth Shoreline Restoration Design project. We are very well aware of the critical importance of immediately restoring the public access safety along the shoreline, and protecting the City infrastructure.

A significant storm was documented in October 2017, which produced extensive shoreline damages; our Shoreline Assessment Study (completed in March 2018) identified priorities for repairs and a proposal for final design, regulatory permitting and construction administration was prepared and submitted, based on the results of the study. In April 2018, a second significant storm was recorded, which resulted in the need to take a different approach for our on-going final design phase. Our proposal includes additional work that is the direct result of the April 2018 storm, as an adjustment to the existing contract, per your directions.

We appreciate the opportunity to submit this proposal. Please let us know if you have any questions.

Sincerely,

TRC

Dan Veriotti, PE
Chicago Office Principal Engineer
312.800.5916

Kris Krause, PE
Vice President Midwest Unit
608.826.3637

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1.0 Project Understanding

The City of Duluth (City) initiated a Shoreline Assessment Study to quantify the damages produced by a very significant storm on October 26/27, 2017 (which met, or exceeded typical Coastal design conditions). The TRC Team was commissioned to conduct the study (completed March 15, 2018), which recommended priority near-term repairs, to restore the shoreline to pre-storm conditions in four project areas (Canal Park and Harbor, Lakewalk and the North Shore, Park Point, and the Lake Superior & Mississippi Railroad).

As expected, it was found that most of the storm damages occurred along the Canal Park and Lakewalk, as these two areas are the most exposed to the Lake Superior waves and surge.

A second significant storm was recorded in April 2018, which produced additional shoreline erosion. A summary of the two recorded storms is provided below:

- During October 26 and 27, 2017, sustained winds at 40 to 49 miles per hour (mph) from the NE produced significant waves up to 15.7 feet in deep water, while the water level increase (storm surge) was 1.3 feet, superimposed on a Lake Superior high water level (604.4 feet total). This storm met, or exceeded the typical design criteria used for design of shoreline protection structures, and resulted in significant Canal Park shoreline erosion, damage to existing coastal stone revetment, boardwalk, and residential basement flooding;

- On April 14, 2018, another significant storm was documented, with sustained 40 to 50 mph winds from the NE and significant waves up to 15 feet, with a storm surge of 0.8 feet Lake Superior high water level (603.14 ft total). This resulted in additional shoreline erosion and damage to the existing Canal Park stone revetment and boardwalk, and residential basement flooding. Some additional new erosion areas were identified at various Lakeshore locations.

To date, the TRC project team has completed the following:

- Data collection;
- Coastal analysis;
- Design development for the Lakewalk area;
- Preliminary design development for Canal Park;
- Regulatory coordination (meetings, site visits, preparation of regulatory permit materials and submittals for: Lakewalk Phase I, Phase II, and Canal Park);
- Construction documents (plans and specifications) for Lakewalk Phase I and bidding.

We are currently providing full-time construction administration services for the on-going Lakewalk Phase I.

This proposal includes additional tasks that are needed due to the following:

- Project increased complexity after the April 2018 storm damages;
- The initial project approach and direction provided by the City of Duluth was to use the following:
    - One permit application for all the project areas,
    - One construction document and bid form for all the repairs;
    - Work with a Construction Manager (CM) overseeing the work full-time. Our TRC team was tasked to perform periodic, independent construction observations and participate in weekly progress meetings with the CM;
- The new directions provided by the City of Duluth now included multiple (four) phased projects based on identified priorities (Lakewalk Phase I and Phase II), Canal Park, and miscellaneous repairs, which results in an increase of project man-hours; in addition, a General Contractor will not be hired, and the TRC team will provide more construction observation/documentation services, over an extended/increased period of time (as the four projects have been phased out).

1.1 TRC Team: Knowledgeable, Qualified, Experienced

The project will continue to be led by TRC in the Chicago, IL office (Dan Veriotti, PE), with a local presence (Scott Weyandt, PE). TRC will provide the overall project management, Coastal analysis and design, lead the regulatory coordination, preparation of construction documents, construction cost estimates, and share the construction administration phase role. AMI Consulting Engineers will assist with regulatory coordination (document electronic submittal, site meetings), construction administration, survey, design development assistance, and structural design. Resolution Studio will assist with aerial survey, data post-processing and calculations, construction document preparation, construction quantities, and landscape architecture design.

2.0 Project Scope

2.1 Assessment-Data Collection, Analysis and Reporting

This task includes the following:

- Collecting aerial survey data in the project areas (collected in May, 2018); survey data processing, creating a surface and a computer volumetric analysis performed to quantify the net shoreline changes.
- Site visit to document the shoreline damages, led by a coastal engineer (performed in May, 2018). Visual Priorities for repairs were identified with updated construction cost estimates. The impact of the April 2018 storm was quantified (construction cost estimates), by revising the initial project estimates due to the October 2017 storm.
- Data reporting and coordination meetings with the City of Duluth. Identifying strategies and project implementation phases, based on storm damage priorities.

2.2 Coastal Analysis

The project preliminary Coastal analysis performed for the Shoreline Assessment Study, has to be refined as follows:

- Verify and update the stone sizing requirements for protection against surge and waves; smaller exposed materials were documented in the upper layer after the April 2018 storm;
- Calculate the required median armor stone size D50 and armor stone layer size range; structure slope, crest and width, transition requirements from two layers to one close to the boardwalk and concrete wall; required gradation for the core and filter stone-compare against the existing materials after the April 2018 storm; wave overtopping rates based on lower crest elevations.
- Perform and revise calculations for Lakewalk, Canal Park and other shoreline areas.

2.3 Design Development

Based on the increased project complexity (additional shoreline damages), additional engineering man-hours are needed for the Lakewalk (Phase I and II), Canal Park and the various areas identified after the April 2018 storm. Our team will revise the design elements to be compatible with the original concepts developed after the October 2017 storm, specifically related to:

- Structural concrete wall requirements (thickness, depth, elevation) for the boardwalk and alignment;
- Boardwalk design details; elevation, gravel base, drainage alternatives though the concrete wall;
- Lakewalk revetment, bluff restoration;
- Armor stone revetment re-using (to the practical extent) the existing stone materials;
- Providing separate Design Development reports for Lakewalk and Canal Park.

We will provide a summary of construction-related items such as: equipment requirements and current means of material placing.

2.4 Regulatory Coordination

The following items are part of this task:

- Two site meetings and coordination conference calls with the regulatory agencies (MnDNR and USACE) to discuss emergency repairs and priorities for each of the four projects, up to eight meetings total;
- Preparation of four total individual permit application reports and forms (Lakewalk Phase I, Lakewalk Phase II, Canal Park, and other shoreline repair areas);

- Responding to regulatory agencies' questions and provide additional information as needed. Preparation of additional design details for the Lakewalk Phase I and Phase II to be incorporated in the permit application, at the MnDNR request.

2.5 Construction Documents

This task includes the following:

- Construction drawing preparation with an updated and detailed Engineering Opinion of Probable Construction Cost for the new existing conditions;
- Prepare technical specifications and include supplementary contract conditions not part of the Construction Drawings or in the City of Duluth front end bid and construction documents. Also prepare a project description and bid sheet for the bid documents.

The TRC team will attend up to three (3) meetings with the City for each of the four projects (up to twelve total), to discuss project progress and items with input needed at 50%, 75% and 90% document completion. The project deliverables will include the following:

- Bid ready construction documents (1 hard copy and digital set);
- Copies of permit applications and permitting reports;
- Construction Cost Estimates and milestones;
- List of qualified contractors.

2.6 Bid Phase Services

The TRC team will provide the following services:

- Request for Clarification (RFC);
- Preparation of addenda if needed;
- Attendance at pre-bid meeting;
- Attendance at bid opening;
- Evaluation of the bids and written recommendation for contract award.

2.7 Construction Phase Services

TRC will provide the following:

- Full time construction observations for the Lakewalk Phase I project (13 weeks, 42 hours per week in the field and 30 hours in the office). This is a total of 936 man-hours;
- Part time construction observations for the Lakewalk Phase II project Canal Park; currently, it is assumed that the Lakewalk Phase II and Canal Park will be bid at the same time, and construction for both projects will occur over a 6-month period (24 weeks), with 20 hours of field observations and 16 hours of office time per week, for a total of 864 hours;
- Part time construction observations for miscellaneous shoreline repairs; currently, it is assumed that the construction for these repairs will occur over a 3-month period (12 weeks), with 20 hours of field observations and 20 hours of office time per week, for a total of 480 hours;
- The total estimated construction man-hours after the April 2018 storm needed (without a General Contractor) is 2,280, while the original contract had a total of 820 man-hours for construction-related activities. The total net difference (increase) is 1,460 man-hours;
- Up to five quarry visits and strategy for purchasing the stone materials (by the City, with contractor placing the stockpiled materials);
- Attend the pre-construction meetings;
- Inspect test revetment sections and concrete walls built by contractor for construction drawings conformance;
- Provide responses and clarifications to Contractor questions;
    - Evaluate Contractor request for Charge Orders;
    - Preparation of Change Orders, if approved;
- Weekly construction progress report, (2 hours per week for 49 weeks, and 98 total hours)
- The performance of a walk-through and preparation of a punch list upon the Contractor's request for a determination of Substantial Completion;
- A determination of completion and recommendation for final payment upon satisfaction of the project punch list and completion of all Work;
- Project close-out.

3.0 Proposed Fees and Schedule

3.1 Fees

Our team will complete all services described in this proposal for a lump sum cost of $225,122.00, including all direct work and associated expenses. The following table summarizes the cost breakdown by task:

Item	Fee
2.1 Assessment, Data Collection, Analysis and Reporting	$17,974
2.2 Coastal Analysis	$8,140
2.3 Design Development	$41,328
2.4 Regulatory Coordination	$19,524
2.5 Construction Documents	$22,800
2.6 Bid Phase	$15,976
2.7 Construction Phase	$99,380
Total	**$225,122**

The following shows the proposed fee increase by each of the approved contract tasks:

D. Final Design Phase $91,792.00

E. Bidding Phase $15,976.00

F. Construction Survey and Layout Phase $17,974.00

G. Construction Administration and Inspection Phase $99,380.00

TOTAL **$225,122.00**

3.2 Schedule

The following is a tentative deadline schedule, for the project main tasks:

Task	Estimated Completion*
2.1. Assessment, Data Collection, Reporting	May 2018
2.2.Coastal Analysis	December 2018
2.3. Design Development	January 2019
2.4. Regulatory Coordination	March 2019
2.5, 2.6. Construction Documents, Bidding Phase *(Advertise for Bids/Contact Contractors, Bid Period, Contract Award)*	March/April 2019
7. Construction Phase Services	April-September 2019
**Note: the proposed schedule is dependent upon securing all regulatory permitting approvals. We will monitor the permit process closely, and inform the City of necessary schedule revisions.*	

3.3 Assumptions

The following is a list of assumptions used for the development of this proposal:

- New data collection such as new or verification surveys is not needed;
- Detailed new additional analyses such as Coastal, geo-technical, structural are not required;
- The proposed construction schedule will not exceed the total number of weeks (49) presented; The construction documents and bid packages will not exceed the total number projects listed (four);
- Boundary or legal surveys are not required;
- Coordination meetings with the City personnel and regulatory agencies will be local in Duluth;
- Permitting submittal fees are not included.