

# SUE Research Proposal

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Prepared and submitted by:  
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## **1.0 OVERVIEW**

CATT is proposing to complete two tasks to better understand the state of Subsurface Utility Engineering (SUE) in Canada and North America.

The first task is to develop and conduct an online survey that will provide an understanding with respect to the current industry SUE practices, barriers and acceptance across Canada. This survey can also be implemented in the USA to get an understanding of the state-of-practice across North America.

The second task, to be completed after the first task, will be to review previous SUE cost value studies and to create a new updated CANADA SUE cost value analysis study. Details on each task are noted below.

## **2.0 BACKGROUND**

Subsurface Utility Engineering (SUE) was introduced in Canada around 2002. The first project of record that followed the ASCE 38-02 guideline was completed for the Region of Durham on Harmony Road in Oshawa Ontario.

Since that first project, the use of SUE and the ASCE 38-02 standard has spread as municipalities, consultants and other users recognize the benefits that are realized by standardizing a repeatable reliable process under the guidance of a Professional Engineer.

The overall goals of this study will be to obtain qualitative data as to the state and use of SUE in Canada and possibly North America and help provide owners, governments, and policy makers with qualitative and quantitative data to support the decision on how SUE can be utilized to reduce construction risks and costs as well as improve workers safety.

## **3.0 DEVELOP AND CONDUCT AN ONLINE SUE SURVEY**

Our goal is to develop an industry accepted and approved Online annual SUE survey that can be used for:

- 1) Establishment of an industry baseline with respect to SUE knowledge, application, usage, barriers, value, and cost.
- 2) Tracking of small, medium and large utilities', contractors', and consultants' perspectives across Canada over time.
- 3) Differentiation in the practice of SUE for open cut and trenchless projects.

To meet this goal it is critical to have key industry stakeholder participation in the development, testing and funding of the survey.

Project tasks will include:

- 1) Development of survey framework and questions
- 2) Testing the survey with partners
- 3) Conducting and promoting the survey across Canada (and the US if desired)

## SUE CANADA STUDY

- 4) Survey data analysis
- 5) Draft report preparation
- 6) Host workshop to discuss draft report
- 7) Finalize report

This project is anticipated to take 18 to 24 months to complete at an estimated cost of \$10,000 per year for a total cost of \$20, 000.

To cover CATT's hard costs to develop and complete this survey we are looking for industry partners to commit \$1000 to \$2000 per year for two years. Industry funding partners will be expected to provide additional in-kind personnel support to provide feedback on the developed survey, to test the survey, and to promote completion of the survey.

The target start date is January 1, 2018. To meet this goal we will need funding commitments in place by December 08, 2017.

### **4.0 SUE COST VALUE STUDY**

Following the completion of the survey development we proposed to extend and update the previous SUE studies such as the Purdue University (US), University of Toronto Return on Investment (ROI), and the Penn State / PENNDOT SUE studies. These studies are dated, and in the case of the U of T study there were only limited projects at the time that could be investigated. Also many technology changes have occurred in the industry such as high precision Survey and Data Display capabilities (GPS /GIS e.g.) that reduce the cost of completion of field work.

The goal of this phase II work will be to replicate, update and extend these ROI studies. Task to be completed include:

- 1) Review previous ROI studies
- 2) Develop the framework for the new study
- 3) Hold and host a workshop with partners to review/approve study framework.
- 4) Implement the ROI study
- 5) Complete draft report
- 6) Host workshop to review findings with partners
- 7) Finalize Report

This project is anticipated to take 18 to 24 months to complete.

### **5.0 PROJECT TEAM**

This project will be led by Dr. Mark Knight, Associate Professor in the University of Waterloo Department of Civil and Environmental Engineering. Dr Knight is also the Executive Director for the Centre for the Advancement of Trenchless Technology (CATT), also located at the University of Waterloo.

## SUE CANADA STUDY

Assisting Dr. Knight will be Dr. Rizwan Younis CATT's research engineer. Dr Younis has extensive experience in research, development of surveys and project management. Co-op students and graduate students will be hired to complete tasks at the direction and under the guidance of Drs Knight and Younis.

### **7.0 PROJECT CONDITIONS.**

1. The following payment schedule:
  - a. \$10,000 to commence the Online survey work by November 30, 2017
  - b. \$10,000 at November 2018.

Please feel free to contact me with any questions or concerns surrounding the proposal.

Respectfully submitted

Mark Knight PhD, P.Eng.

## **CENTRE FOR ADVANCEMENT OF TRENCHLESS TECHNOLOGIES (CATT)**

CATT is a grouping of university, municipal, industrial, business and governmental representatives committed to the advancement of knowledge, materials, methods and equipment used in trenchless technologies. CATT was founded at the University of Waterloo in 1994. CATT's mandate is to address underground infrastructure needs faced by the public sector, end users and industry by providing a forum for research, education and technology transfer in the areas of trenchless technology. Since its formation, CATT has been supported by the University of Waterloo, National Research Council of Canada, City of Waterloo, and its industry partners.

Over the past 15 plus years CATT has developed an international reputation in municipal underground infrastructure research and education. Evidence of this is the awarding to CATT the 5 and 10 year awards for outstanding contribution to the trenchless industry by the North American Society of Trenchless Technologies. CATT is financially supported by members who pay an annual fee, voluntary contributions, research and industry contracts, and revenue from educational workshops, conferences and seminars.

The University of Waterloo is renowned for the high calibre of its graduates in science, mathematics and engineering and is a leader in Canadian University contract research. It is also affiliated with six provincial Centres of Excellence and six federal Networks of Centres of Excellence including: Canadian Water Network, Advanced Materials, Information Technologies, Robotics and Intelligent Systems, and Groundwater.

CATT has extensive experience in the third party testing of GRP materials used for the rehabilitation of water and waste water networks in North America, the development of non-standard testing procedures for product development and material characterization, and the development of buried infrastructure research programs. More information on CATT can be found at [www.catt.ca](http://www.catt.ca).