

The 3D Cadastre for Underground Infrastructure: An Integrated, Reliable and Safety proposal from Land Surveyors in Canada

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SUMMARY

This paper explains one of the issues related to the approach to locate the underground infrastructure (UI) by utility companies themselves or by private contractors in Canada. This involves using tracing equipment to go find what is buried underground. Firstly, the as-built information is not complete. Sometimes it appears there is nothing to locate underground, when there may actually be an oil or gas line. Secondly, there is no standard for locating and no guarantee of liability insurance. Thirdly, even under the best circumstances, the equipment will map an underground infrastructure to within one meter horizontally and much worse vertically. Fourthly, underground infrastructure in Canada is located over and over again in the same areas, often in the same year. The locations done are in the horizontal plane but seldom in the vertical. This severely limits the usefulness of the captured data for future designs. Fifthly, no common system is updated, so even when a UI is located, the data is never accurately captured and updated.

The reality is that the UI in Canada is often not surveyed or mapped accurately, if at all. Compare this to above ground infrastructure such as roads and electrical transmission lines which are self-evident and have been mapped very accurately. The consequence of this lack of attention for mapping subsurface infrastructure creates an increased number of situations with costly impacts, such as interruption of utilities services in large areas of urban agglomerations, contamination of soils, destruction of ground infrastructure and the worst scenario is potential injuries and fatal human loss at the proximity of the scene of the accident.

Consequently, this paper details an approach defined by land surveyors to avoid the current convoluted solution toward a reliable, repeatable and relatable system that will benefit all users,

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significantly reduces cost and prevents accidents before they happen. The proposed system is designed to capture the cost associated with managing the system and change the business model to one that is responsive and reflective of the market. This approach also allows government to speed the process to a better system in a reliable, fair and transparent way. This benefits the public, the utility companies and municipalities by reducing duplication of services and enhances environmental protection.

Finally, this paper concludes with an analysis, from a surveyor point of view, about the benefits for the industry, government and the public of building a unique and comprehensive 3D Cadastre solution to manage underground utilities across Canada.

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