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Briefing Note: For Information

To: Building Investment, Finance and Audit Committee (“BIFAC”)

From: Allen Murray, Vice President, Facilities Management
Catarina Pires, Senior Director, Design and Engineering

Date: October 11, 2023

Re: BIFAC Meeting of July 17, 2023 – Vendor Award: Program Roster for Building Condition Assessments [Report BIFAC:2023-73] (Public Action Item #2 re: Non-Destructive Testing’s Role in Building Condition Assessments)

At the July 17, 2023 BIFAC meeting, BIFAC:2023-73 was presented regarding a vendor award for the program roster for Building Condition Assessments. After considering the report, management were asked to report back as to the benefits and feasibility of the use of technology (e.g. scanning) in preventive maintenance measures, and whether there is value in establishing a protocol as it relates to preventive structural review and testing, separate and distinct from Building Condition Assessments (“BCA”). This briefing note is in response to that request.

BACKGROUND

Information from BCAs is used to project capital needs, establish sustainability targets and determine funding levels required to address the backlog of capital repairs and anticipated renewal in order to maintain an acceptable Facility Condition Index (“FCI”). BCAs help to ensure that TCHC has fulfilled its duties in ensuring diligence on its oversight of capital planning replacement and budget estimates over short and long-term periods.

The purpose of a BCA is to review the major capital components of a facility to determine its general condition, and to provide recommendations for repair and/or replacement and budget estimates

over short and long-term periods. BCAs establish an organized record of all the component conditions within a building, and are based on visual inspections and engineering investigative methods.

NON-DESTRUCTIVE TESTING

Visual inspections are the most commonly used non-destructive testing (“NDT”) methods and are regularly used to discover flaws that are visible to the naked eye. Visual inspection allows for a cost-effective first step in identifying and monitoring issues and potential deficiencies.

Many tools can be used during the visual inspections which have the advantages of:

- Early detection of potential issues and needed repairs;
- Reduction in repair costs because of constant monitoring and early detection;
- Understanding of different degradation phenomena;
- Documentation of the observations using measurement tools; and
- Being a cost effective and quick technique.

Visual inspection as an NDT method has no physical or chemical damage to the structures. The tests are repeatable and can be done very quickly. Visual inspections are the first step in helping to inform the next steps in assessing repair work and assisting in allocating capital.

Should it be determined that additional investigation is required, there are a variety of NDT methodologies available, each with their own unique benefits and associated costs including:

- Ultrasonic Pulse Velocity (“UPV”) Method;
- Half Cell Potential Method (evaluates corrosion of reinforcement);
- Linear Polarization (“LR”) Method;
- Stress Wave Propagation Method;
- Infrared Thermographic Techniques;
- Acoustic Emission Method;
- Ground Penetrating Radar (“GPR”) Method;
- Eddy Current Method;

- Magnetic and Electric Methods;
- Nuclear (Radioactive) Methods;
- Radiometric Methods;
- Radiography Method;
- Penetrability Method; and
- Resonant Frequency Method.

At this time, additional NDT methods are deployed on an as-needed basis based on the results from visual inspections that are completed. When any deficiencies or issues are discovered (regarding either products, materials or vendors), TCHC takes all necessary steps to prioritize and rectify the work to improve the quality of our buildings and ensure the comfort and safety of our tenants.

There is no single NDT that will provide a report on the 'health' of a building.

Costs for NDTs vary. Typically, scanning service fees are based on time (mobilization, on-site, data analysis and reporting) plus expenses, which include standard equipment fees for each of the test methods. Additional costs may also be incurred if the project requires the use of sophisticated data processing and analysis. Depending on the types of NDT method selected, a range of daily rate is estimated to be between \$10,000.00-\$15,000.00 CAD per day.

TCHC's Facilities Management Division is currently deploying industry recognized best practices when it comes to maintaining and monitoring the conditions of our buildings, and in delivering our capital budget.

SIGNATURES:

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and

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