

MUNICIPALITY OF CHATHAM-KENT
INFRASTRUCTURE AND ENGINEERING SERVICES

TO: Mayor and Members of Council

FROM: Leo Denys, P. Eng.
General Manager, Infrastructure and Engineering Services

DATE: July 24, 2008

SUBJECT: Bridge Evaluations

RECOMMENDATION

It is recommended that:

1. Administration implements the recommendations as presented in the July 25, 2008 Stantec report Re: Bridge Failure Investigation and Proposed Guidelines for Bridge Condition Survey and Evaluation.

BACKGROUND

As a result of the bridge deck collapse on Seventh Line over the Cooper Finn Drain, the municipality retained Todgham & Case (T&C) to review similar structures as designated by Engineered Management Systems Inc. (EMSI), and report on the process Chatham-Kent uses to design and replace structures.

Shortly there after it was announced the Dillon Consultants had purchased T&C. The scope of the work was then modified to have Dillon continue with the review of the designated structures but to have Stantec perform the review of the structure replacement process as Dillon was the detail design consultant on the Seventh Line structure.

The reports are now complete and this report is the intended update for Council on the findings.

COMMENTS

Dillon report on Bridge evaluations

On June 23, 2008, Dillon consultants submitted their report on the bridge evaluations (copy available in Council Lounge).

EMSI had identified 70 structures to be reviewed for structural or load posting purposes.

Two of the structures identified were closed to traffic prior to the start of the study. The study recommended that an additional six structures be closed to traffic, which has been implemented. The study recommended that 19 structures have a load posting implemented. Council has already passed the appropriate bylaws for the postings and signs have been erected.

The Dillon Report (available in Council Lounge) lists the structures reviewed with associated recommendations.

Stantec Report on bridge replacement process

On July 25, 2008, Stantec consultants submitted their report on "Bridge Failure Investigation and Proposed Guidelines for bridge Condition Survey and Evaluation" (copy available in Council Lounge).

The cause of the bridge failure was badly corroded steel girders of the southern half of the bridge failed due to inadequate structural capacity followed by a shear failure of the concrete deck.

A number of factors contributed to the failure:

- Prior to the bridge inventory program of 2001 there was no regularly scheduled condition survey performed on the structure.
- Over time the physical condition of the steel girder was so badly deteriorated due to corrosion that the structural capacity of the structure was compromised.
- The decision to tender Seventh Line with Drake Road bridge as one project significantly delayed repairs to Seventh Line. Additionally the decision to apply for Comrif funding and the time required to receive all required approvals delayed the work.
- The lack of communications among all parties (EMSI, Dillon and C-K) was also a contributing factor.
- Another possible factor contributing to the bridge collapse is the possibility an over weight loads. However there is not sufficient information to determine whether or not this is the case.

Stantec's Comments and Recommendations include:

In order to ensure structural safety of bridges and culverts, it is important to implement a bridge monitoring and maintenance program, provide sufficient budget for capital work and establish a framework for adequate communications between the Municipality, inspection agency and design engineers.

Stantec recommended that the following policies and protocol be adopted by the municipality:

Structural Inventory system (EMSI)

1. Prior to conducting the visual inspection, a list of structures and work schedule shall be submitted to the municipality for review
2. in addition to updating the web site information after each inspection, the municipality shall be provided a "Check List" that identifies key action items
3. the Municipality shall notify EMSI on any work done to the bridges so that the information can be recorded
4. All unverified statements such as "air void ratio" and "concrete compressive strength" be removed from the database.

Structure Capacity Assessment (Consultants)

1. Once a bridge is identified to be structurally deficient by EMSI or Municipal staff, an Engineering Consultant shall be retained within a reasonable time frame. The engaged Consultant shall perform the structural assessment work within 4 weeks after receiving authorization. The Consultant to communicate with EMSI regarding regular monitoring if the rehabilitation can not be started within one year.
2. Depending on the complexity of the structure, the Consultant shall perform the required analytic and testing works within a reasonable time (suggested max 3 months) and discuss results with Municipality.
3. Consultant to meet with Municipality to review:
 - a. State of structural deterioration
 - b. Closing of bridge for traffic if necessary
 - c. Suggest posting loads if possible
 - d. Temporary shoring and/or strengthening system if required
 - e. Proposed rehabilitation work or structure replacement
 - f. Design, regulatory approvals and construction schedules
4. The municipality to determine the funding mechanism, and provide tentative tendering date.

Municipality's responsibility

1. Engineering Department shall provide approval and direction to the Consultant in a timely manner.
2. Improve communication between Public Works and Engineering departments. If Public Works provides temporary support and improvements to a bridge site, they are partially responsible to monitor and maintain the temporary installations.

3. In order to ensure public safety, the Engineering Department should have no reservations in recommending to Council that certain bridges need to be posted or closed as per the consultants recommendations.
4. It is of prime importance that Council of the Municipality of Chatham-Kent recognizes the need for on going maintenance, rehabilitation, and re-construction for the bridges and culverts. Therefore adequate amounts of funds should be set aside every year for this purpose.

COMMUNITY STRATEGIC PLAN

The recommendation in this report supports the following objectives and strategic directions:

B: Economy – We are a prosperous community

B3: Maintain and enhance new and existing infrastructure to support economic and smart growth opportunities

CONSULTATION

EMSI, Dillon, Public Works, and Engineering were consulted in the preparation of the Stantec report.

FINANCIAL IMPLICATIONS

The cost of the Dillon study was \$50,000 and the Stantec report was \$11,000 both of which were funded from the Bridge Lifecycle.

Prepared by:

Reviewed by:

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Attachment(s): None