JOHNSON STREET BRIDGE

CONDITION REPORT

PREPARED FOR

CITY OF VICTORIA

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Graeme & Murray Engineering Consultants Ltd

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APPENDICES

- Inspection Notes
- Levelton Engineering Report
- Erection Drawings Numbers 1 and 3 for reference purposes
- Ultrasonic test results
- Photos

1.0 TERMS OF REFERENCE

The investigation is required to include a structural evaluation and protective coating assessment on the highway bridge and approach spans as follows:

Structural Evaluation

1. An assessment of the level of corrosion in members resulting in reduced structural capacity. This is to include a program of ultrasonic measurement.

2. Give a load rating for the bridge.

3. Investigate the condition of the counterweight.

4. Record significant levels of corrosion on marked up copies of the erection drawings.

5. Prepare recommendations on maintenance and repairs.

6. Give budget cost estimates and priorization of the maintenance/repair work.

Paint System Evaluation

1. An assessment of the paint system including degree of active rusting, degree of paint breakdown, thickness and adhesion of existing paints.

2. An evaluation of current maintenance practices and practical life of the paint system.

3. Options and recommendations, including budget cost estimates to include, at a minimum, continued or upgraded maintenance and new coating systems.

2.0 METHODOLOGY

2.1 Prime Consultant (Graeme & Murray Consultants Ltd.)

1. The previous full inspection of the road bridge was undertaken by Graeme & Murray Consultants Ltd. in 1978 when a record of the level of corrosion for every member was made. Following this inspection a major restoration of both road and rail bridges was undertaken with many members being replaced, particularly on the railway bridge deck. The bridges were then painted the present blue by overcoating the previous black.

   Files and drawings of this 1978 investigation were retrieved from archives in order to repeat a similar methodology and to compare the results.

2. The field investigation was carried out by a team of two staff members. The below deck steel and concrete was inspected from existing platforms and gantries, from the flanges of the east approach girders and by climbing the girders and bracing members where necessary. The upper portion of the bascule bridge was inspected from existing platforms and by climbing over the individual members. The main difficulty was the east approach span which does not have

a below deck gantry, however by climbing on to the bacing tees close to the abutments a close up inspection of the upper beams was possible. Those close to the abutments appeared to be representative of the general condition.

It was found that the ultrasonic investigation was of limited value. The equipment was bulky and not easily moved into difficult places, however measurements were taken at similar locations to those taken in 1978. The results although very accurate are specific to a pinpoint location whereas visually it is easily seen that conditions vary greatly in short distances. By far the most useful tool is a small pick to remove the surface rust or laminations and then make a visual assessment.

Much of the conditions have been photographed and "representative" photographs have been chosen to illustrate the commentary.

3. The actual field notes are included in Appendix I to the report and give the level of corrosion in a tabular manner referenced to the member designation given on the erection drawings. To better describe the detailed observations summary statements are made which correspond to specific recommendations for repair.

4. An analysis of certain affected elements was made where necessary in order to prepare recommendations for repairs.

5. During the investigation it became obvious that severe corrosion of members directly supporting the concrete deck would result in some form of load restriction being required. This load restriction would have to be maintained until replacement of the concrete deck and steel members below was undertaken. Over time the load limit will have to be progressively reviewed and reduced as corrosion continues.

6. The construction cost and priorization has been made for the items of work recommended.

7. The investigation did not include the electrical system and machinery, nor the concrete piers and abutments.

2.2 Subconsultants (Levelton Engineering Ltd.)

A painting assessment has been made by Levelton Engineering Ltd. and their report is included as Appendix 2. This has included the following:

1. History of the painting on the Johnson Street Bridge.

2. Research and discussion of environmental restrictions.

3. Recent developments in paint technology for bridges.

4. Discussion of cleaning and preparation options.

5. Discussion of total removal and repainting versus overcoating the existing paint.