REGIONAL MUNICIPALITY OF OTTAWA CARLETON | MEMORANDUM

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TO/DEST. The Chair and Members of Council

FROM/EXP. Director Engineering Division
Environment and Transportation Department

SUBJECT/OBJET **1995 TRANSPORTATION ASSOCIATION OF CANADA ENVIRONMENTAL ACHIEVEMENT AWARD HUNT CLUB ROAD EXTENSION - GRAHAM CREEK REHABILITATION AND STORMWATER MANAGEMENT FACILITY**

PURPOSE

This submission is for information purposes of the above-noted subject.

The new Hunt Club Road Extension, Graham Creek Rehabilitation and Stormwater Management Pond (see attached pictures), was placed third and rated an honourable-mention project in the 1995 Transportation Association of Canada (TAC) Environmental Achievement Award by the TAC Board of Directors.

Projects nominated were evaluated on the following:

- Contribution made to the protection and enhancement of the environment
- Degree of innovation shown in the approach used to solve or address an environmental problem or issue
- Financial implications associated with the initiative, in particular, consideration was given to those submissions which indicated an alternative procedure which was more cost effective than the traditional technique normally used, and
- Overall applicability to transportation and the need for the technique or concept to be disseminated to other TAC members and the transportation community as a whole.

BACKGROUND

The Hunt Club Road Extension, from Cedarview Road to Merivale Road, was divided into three parts. The stormwater drainage of the third part between Cedarview Road and Greenbank Road was designed to drain to Graham Creek which crosses this part of the Hunt Club Road Extension.

The RMOC retained the consulting firm of McNeely Engineering Consultants Limited, to complete the preliminary and detailed design of this project. The project management team that was involved in the design and construction management of this project were the staff of RMOC, McNeely Engineering Consultants Limited and the sub-consultant, Corush Sunderland Wright Ltd., as the landscape architect. The phased construction of the project began in 1994 and was completed in the spring of 1996.

The construction of the roadway required that approximately 100 metres of the creek south of the roadway be disturbed and that a roadway drainage area of approximately eight hectares be discharged to the creek.

Environmental concerns were identified early in the design phase in consultation with various agencies, including the Ministry of Natural Resources, Rideau Valley Conservation Authority, National Capital Commission and Agriculture Canada.

The enhancement measures that were implemented are described below.

Stormwater Management Facility

- A stormwater management facility capable of capturing 25 mm of rainfall was constructed to treat roadway drainage. The facility captures the first flush of a storm, contains it for a period of 24 hours and releases it to the creek through a filter media. The discharge enters the creek through an oxbow lake, formerly a natural creek meander, to further enhance treatment.

- A priority of the design was to ensure that the grading, surface treatments and landscaping of the facility blended aesthetically to the greatest extent possible with the natural surroundings while meeting operational and maintenance requirements. The slopes of the facility were re-vegetated with low maintenance seed and vegetation. Rehabilitation, including tree and shrub planting and re-forestation, was carefully selected. The bottom of the lower pond area was vegetated with aquatic varieties creating a small wetland area.

Graham Creek Enhancement Measures

- Approximately 100 metres of the creek, upstream of the culvert, was in a state of advanced erosion. Major beaver activity had resulted in destruction of wooded areas and beaver dam failures had caused severe bank erosion directly upstream of the construction limits. As well, side slopes of the valley were in an advanced state of failure and sloughing due to unstable soil conditions. The eroded and bare slopes were contributing to sediment loadings downstream in the creek.

- The design team recognized an opportunity to provide enhancement to the creek while meeting project objectives and regulatory requirements of the various agencies. The Ministry of Natural Resources enthusiastically supported the proposal to enhance the existing conditions in conjunction with the Hunt Club Road project.

The following creek enhancement measures were therefore proposed and ultimately constructed in conjunction with the roadworks:

- Unstable, completely eroded valley slopes were stabilized using engineered crushed rock and geotextile. To provide a natural appearance and encourage vegetative re-growth, the rock was infilled with topsoil and a wildflower seed mix applied. One year after construction the rip-rap is no longer visible and vegetative growth is well established.

- The creek was stabilized using a combination of rip-rap, bank re-vegetation, tree roots with stump revetment and riparian edge treatment. Where possible, the existing creek meander alignment was followed with the enhancement works. Also meanders cut-off by the grading were retained and stabilized to produce an oxbow lake for fish habitat.

- The tree roots with stump revetment consisted of burying trees into the banks with their roots protruding into the creek. Boulders and vegetation were used to fill the voids between the root clusters. The area above the root was graded and re-vegetated. With time, the voids will eventually silt in and vegetation will take hold provided a natural looking overhanging bank for fish habitat.

- In areas of high velocity, the creek was stabilized using rip-rap. Boulder clusters were used to create vortex rock weirs in the creek bed. These weirs create a small rapids section reducing the creek gradient and creating a pool riffle system. One year after construction the rip-rap is beginning to silt in and some vegetation is taking root. It is expected that vegetation will begin to take hold this year and produce a natural looking bank.

- A pool area upstream of the culvert was created for fish habitat purposes. The banks of the pool area were lined using tree roots with stump revetment. The pool is naturally maintained with a boulder/rock deflector placed immediately upstream which directs the flow in a manner that discourages sedimentation.

- A large diameter culvert required to convey the creek beneath the new roadway was constructed with a formed low flow channel consisting of rock to enhance fish passage.

- Large mature trees adjacent to the creek, which were preserved to the greatest extent possible, provide summer shading which is critical to fish habitat. Rehabilitation of areas disturbed by construction consisted of wildflower seed and selective tree plantings with local species.

- During construction, the downstream channel was protected from construction sediments by creating a by-pass channel and sediment trap. The sediment trap consisted of creating a pool (which later became the pool mentioned above) directly upstream of the new culvert. A check dam was added downstream of the pool reducing velocities to filter out sediments. To further discourage sediment transport, in-stream work was limited to periods of low flow. The Contractor was also required to ensure minimal disturbance to adjacent areas and provide protection to the trees.

Co-operation between everybody involved in the design and construction of the project and the regulatory agencies provided a unique opportunity to utilize conventional creek stabilization measures in conjunction with new stabilization and fish habitat enhancement measures which, at that time, were new to this area. The Ministry of Natural Resources was particularly supportive encouraging the enhancement measures and the use of the new methods of stabilization proposed for this project. We will watch with great interest as nature continues to re-establish itself in this section of Graham Creek.

Approved
J. Miller, P.Eng.

JT/al