

Corporate Report

NO: R262

COUNCIL DATE: December 15,

2003

REGULAR COUNCIL

TO: **Mayor & Council** DATE: **December 11,
2003**

FROM: **General Manager,
Engineering** PROJECT **4802-206**
FILE:

SUBJECT: **Duprez Ravine Drainage Works**
Cost-Sharing with the City of White Rock

RECOMMENDATIONS

1. That Council approve a 50% cost-sharing with the City of White Rock for construction of the Duprez Ravine diversion to a maximum of \$450,000, subject to an agreement with the City of White Rock that will keep the City of Surrey harmless for flooding and erosion problems associated with the Duprez Ravine system.
2. That Council direct the Engineering Department to review the design and tendering process associated with the proposed project, but to allow the City of White Rock engineering department to take the lead role on the project.

BACKGROUND

Duprez Ravine runs through Centennial Park in the City of White Rock as an open channel from 16 Avenue at approximately 146 Street to Magdalen Avenue. The channel is enclosed and flows are piped from this point to an outfall at White Rock Beach as shown on the attached Map. Approximately 140 ha of the ravine's contributing drainage area falls within the City of Surrey, while 20 ha falls within White Rock. Historically Surrey's portion of the Duprez catchment was 107 ha with the remaining 33 ha flowing to Anderson Ravine east of Duprez.

A large portion of the catchment in Surrey (i.e., east of 148 Street) underwent development beginning in 1978. It was essential at that time that downstream conveyance issues be dealt with by the proponents as part of the development process. Downstream works in White Rock, as well as on-site ponds in Surrey (the Southmere Ponds), were accepted by White Rock as the most appropriate solution. Further downstream improvements consisting of storm sewers along 16 Avenue and enclosing the lower section of Duprez Ravine were completed in 1993 as part of this approved mitigation approach. In summary, the City of White Rock had accepted the proposed mitigation measures associated with development of the area.

In June of 1999, an extreme rainfall event lead to significant erosion in the Duprez Ravine channel where the creek bed was altered up to several metres during this event. The eroded material clogged the debris basin at the downstream end of the channel, limiting the inlet capacity of the storm sewer at Magdalen Avenue and the resulting overflow was one of the main contributors to the floodwaters which inundated Marine Drive during that storm.

DISCUSSION

In response to the 1999 event described above, the City of White Rock began a re-evaluation of the Duprez system. A detailed hydrologic analysis of the system led to the development of a flow diversion strategy that would limit flows to the ravine to small frequent storms while diverting away flows from larger storms. A number of options to achieve this were evaluated and the best solution was a 1000 mm diameter pipe diversion running the length of the ravine along its east side from 16 Avenue to Magdalen Avenue, as shown on the attached map.

The estimated total cost of constructing this diversion is \$900,000 (including engineering and GST). Since the majority (i.e., almost 90%) of the catchment being conveyed through Duprez Ravine originates in Surrey, White Rock has approached the City to share in the cost of construction. As a result, we have been working cooperatively with staff from the City of White Rock to review the issue.

A review of the hydrology of the entire catchment has revealed that existing ponds within the City of Surrey (sports fields at 20 Avenue and 148 Street, and Southmere Ponds at 148 Street and 16 Avenue) do not fully deal with creek erosion and stability for larger storms; however, they are effective in reducing the impact of development and reduce the overall cost of the new proposed downstream improvements by approximately \$800,000. Further, the proposed works will convey a portion of the runoff that would have been directed to Anderson Ravine historically thus reducing the impacts on that system.

Cost-Sharing Principles

Over the last few years, Council has approved two Inter-Municipal Drainage Agreements for the Coldicutt and Knudson systems which were based on sharing costs according to each municipality's share of the contributing runoff. In the case of Duprez Ravine, although the City of Surrey has almost 90% of the catchment to Duprez Ravine, previous sign-off by the City of White Rock for existing mitigative measures plus the impact of the measure (i.e., series of detention ponds) in reducing peak flows must be accounted for. Additionally, the offsetting benefits provided by diverting flows from the Anderson Ravine System need to be considered. The proposed diversion strategy results from current best management practices and understanding of the impacts of land use changes on channel morphology and more specifically, a much better understanding of hydraulic conditions at Duprez Ravine. For these reasons, it is proposed to limit our contribution to this project to 50%.

If the City of Surrey were to contribute \$450,000 for the proposed diversion works (50% of cost), our effective contribution to the total Duprez drainage system would be approximately \$1,250,000 when the benefits from the previously constructed ponds are accounted for.

The City of White Rock originally made a case for Surrey to contribute based on a percent of catchment size alone. Following a review of past decisions and discussions with staff at White Rock, it was agreed that the 50/50 cost-share is a reasonable approach. The City of White Rock has budgeted for their 50% share of the works in 2004.

Keeping in line with the existing agreement with White Rock on Duprez Ravine, a new agreement that will continue to keep the City of Surrey harmless for flooding or erosion problems associated with Duprez Ravine must be obtained as a condition of funding. We will also review the design and tendering process to ensure a cost effective approach and that the City's interests are served.

CONCLUSION

Although the City of White Rock was involved in the drainage strategy to deal with past development and endorsed the associated mitigation plans within the Duprez Ravine catchment, it is appropriate for the two municipalities to work cooperatively in dealing with the new problems in the Ravine by developing a solution that reflects a better understanding of the system.

Based on the circumstances outlined in this report and the problems being experienced in the system, a cooperative solution is being proposed whereby Surrey would contribute 50% of the required funding for the proposed storm sewer diversion works.

Paul Ham, P.Eng.
General Manager, Engineering

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Attachment

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