Appendix G – Drainage and Stormwater Management Concept Memorandum

URS

Memorandum

Date: April 13, 2005

To: File

From: Paul Collins

c.c.

Reference: TTC Bus Lanes

Subject: Drainage and Stormwater Management Concept

The records available for the study area were examined to identify storm sewer design flows and capacities.

Sewers within Dufferin Avenue were able to handle the increases in flow that would result from the marginal increases in pavement. There is little or no opportunity for stormwater quantity or quality treatment through the Dufferin Avenue portion of the study area. All drainage from Dufferin throughout the study area would be eventually captured within the Reservoir, which will provide some general quantity (flood) and quality control.

Sewers that cross the Hydro corridor within the study area currently have no significant excess capacity. All of these sewers release into the watershed that flows through the Reservoir. As these systems have to accept the excess runoff generated by any new impervious area within the corridor, quantity control will have to be provided for all design storms. As well, TRCA has expressed concern about sediment entering the sewer and eventually ending up in the Reservoir, quantity control will also be required for the corridor drainage.

The new roadway will introduce a 10 metre wide strip of impervious area. Excess runoff generated by this roadway was calculated using the modified Rational method. The roadway was subdivided into sections based on vertical alignment (high and low points).

Post-to-pre analysis was carried out to determine required storage volumes for each section of roadway. These are tabulated below:

Start Station	End Station	Release Station	Release Description	Volume (m^3)
0+000	0+180	0+000	Sewer at Dufferin	36.6
0+180	0+245	0+210	Creek	13.2
0+245	0+865	0+360	Sewer at Allness	126.2
0+865	1+556	1+420	Sewer at 1+600	141.1
1+556	1+957	1+680	Sewer at 1+600	81.4

As Hydro has explicitly prohibited any wet pond facilities on their property, the drainage strategy adopted is to capture runoff in roadside grassed swales, direct the runoff to a widened flat-bottomed swale near the

URS Canada Inc.
75 Commerce Valley Drive East
Markham, ON Canada L3T 7N9
Tel: 905.882.4401
Fax: 905.882.4399
www.urs.ca

release station, and store excess runoff in this swale and release it at predevelopment rates. Control structures will be installed at the outlet of these swales. Quantity control will be accomplished by means of the combination of grassed swales and oil/grit separators such as Stormceptors.

Storage swales were designed to be essentially flat and to be approximately 7 metres wide, with 3:1 side slopes and 4 metres of flat bottom. The maximum storage under the 100 year storm would be to approximately 0.5 metres of depth. As such, the storage capacity for these swales is 2.25 m^3/m of swale.

Locations of widened swales are tabulated below:

Release Station	Side of Roadway	Length of Swale
0+000	Both	30 (x2)
0+210	Neither	-
0+360	South	60
1+420	South	70
1+680	North	40

The roadway in the region of release station 0+210 is graded away from the creek, and it was determined that the most efficient way to control the runoff was to direct the excess toward release station 0+360 (and to a lesser extent 0+000).

It is noted that the swale capacity for Release Station 0+000 is not based on the m^3/m calculation detailed above, as the swale could not be made to be flat bottomed. The actual capacity for swales of the design cross section was calculated with a 1% gradient.