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Greg Kappers

From: Erik Davido [Erik@dgcengr.com]
 Sent: Monday, January 21, 2008 3:04 PM
 To: Greg Kappers
 Subject: Maple Leaf Commons - Water System

Dept of Planning
& Development

Greg,

I summarize the main water system points below but preface that with an explanation of the terms and main considerations in water system design/analysis. The proposed water service and impacts to the surrounding water system should be considered in terms of domestic usage (every day usage in the units) and fire flow. The primary factor in system capacity in residential areas is typically fire flow because fire flow is typically relatively higher compared to domestic peak flows and will impact the system pressure more than domestic flow.

Without knowing the usage in the existing building it is difficult to determine the difference in domestic usage between the current building and the proposed project but I took a look at the system impacts assuming no existing flow and determined that there should be a nominal impact due to the domestic flow. Using industry standards, American Water Works Association (AWWA) Manual M22, to calculate the peak domestic flow for the 39 units, the peak instantaneous flow is approximately 150 gallons per minute (gpm). The flow is estimated using anticipated plumbing fixtures in the proposed units and extrapolating the probable demand from the graphs in the AWWA manual; the graphs are based on years of studies of different land uses and the recorded demand. In other words, even though there will be hundreds of plumbing fixtures in the proposed units, the probable peak flow is not based on every single plumbing fixture turned on at the same time (i.e., residents will be using various plumbing fixtures at different times of the day).

Available fire flow was tested by the City at the nearest hydrant to the site and the test showed that there is 1,100 gpm fire flow. The available fire flow is primarily a function of the City's storage (i.e., tank volume and elevation) and distribution system (i.e., the number and size of pipes) to the fire flow point. The City's hydrant test showed that the pressure dropped from approximately 50 psi to 42 psi due to the high flow from the hydrant.

The City is requiring a new 8-inch water main extension/loop on NE 85th St between 14th Ave NE and 15th Ave NE. We modeled the new water main and showed that it improves the fire flow in the area by approximately 150 gpm. We also modeled the existing system with zero domestic flow as compared to the 150 gpm future peak instantaneous flow with the new 8-inch water main and the pressure stays the same or slightly better. The fire flow test/modeling and the domestic flow modeling results show that new water main should offset the domestic flow impacts and improve fire flow.

It has been decided to install one larger master meter to serve the project which gives us control/flexibility on where to connect and minimize impacts to the surrounding neighborhood. The likely connection point will be either in the new main extended on NE 85th St or from 15th Ave NE providing the best/looped feed to the site (vs. connecting to the dead-end main on NE 86th St).

With that said, the main water system/impacts talking points are:

- 1) The new 8-inch main extension/loop on NE 85th St should improve overall flow/circulation in the area, offset domestic flow impacts, and improve fire flow.
- 2) Installing the one master meter to serve the site enables us to connect to the main on NE 85th St or 15th Ave NE where there will be better/looped flow to the site (i.e., versus installing on a dead end main such as NE 86th St) and minimize impacts to the neighborhood.
- 3) The peak instantaneous domestic flow for the site is a function of the maximum number of plumbing fixtures to be operating at the same time; not all plumbing fixtures in all of the units will be operating at the same time.

Please let me know if you have any questions.

Thanks

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