

---

**November 28, 2008**

## **Work Plan to Establish a Stormwater Management and Drainage Plan for the Mattamy Homes Richmond Development**

### **Purpose**

David Schaeffer Engineering Ltd. is pleased to provide this work plan Preliminary Stormwater Management and Drainage Plan for the Mattamy Richmond Lands.

David Schaeffer Engineering Ltd. has extensive experience in completing Master Servicing projects in the greater Toronto area. Combining this experience with our local Ottawa staff provides a strong team that can bring a range of expertise and innovation to the project.

The development of a Stormwater management plan will be complicated by the flat existing topography, coupled with the sensitivity of the existing Van Gaal Drain and shallow ditches which currently traverse the site.

This assignment is part of a larger study currently being completed by Mattamy Homes in support of their required Official Plan Amendment for this site. An existing conditions report has been completed which will be the starting point of this assignment with the ongoing works forming an integral part of this assignment.

This assignment will endeavor to answer questions posed by the City including:

- The grade raise requirements for the development given the flat topography and a desire by the city to avoid submerged sewers;
- The possibility of utilizing different storm conveyance systems other than traditional storm sewers, including ditches and shallow infiltration trenches;
- What the requirements are to ensure no increase in flood risk to the existing village; and
- How the existing man-made berm is integrated into the approved Stormwater Management Scheme.

The City and Rideau Valley Conservation Authority also have other ongoing projects within the tributary area that will influence this assignment. These include: an RVCA flood plain study for the upper reaches of the Van Gaal drain by J. F. Sabourin and Associates Inc., and a Drainage Act Petition undertaken by the City of Ottawa for drainage improvements to the Van Gaal drain from Perth Street south to the Jock River.

Below is a proposed work plan for the assignment.

### Scope of Work

1. Establish existing drainage patterns within the limits of Mattamy's site including off site drainage areas traveling through the site
2. Calculate existing flows:
  - Utilize the Natural resources assessment to establish existing condition parameters
  - Develop computer models using SWMHYMO with 25mm 4 hour Chicago storm,2,5,and 100 year 24 hour SCS Type II and a rain on snow event.
3. Prepare an existing conditions Water budget:
  - Assess water balance for existing conditions and assess needs for proposed future conditions
  - Include assessment (completed by Golder) on impact of development on off-site water wells on adjacent properties;
  - Golder and Associates to Identify potential impact of SWM facilities on groundwater function and identify mitigating measures;
  - Delineate areas where there may be constraints to the construction of underground services and identify mitigating measures.
4. Confirm the following assumptions in the existing conditions Analysis:
  - No Quantity control storage requirement on the Jock River
  - Review the impacts on downstream conditions through changes to site release rates established.
  - Establish Quantity control requirements within the existing channels other than the Jock River to maintain or improve the existing level of service. The existing (RVCA) hydrologic model (Summer Event) for the Jock River will be used as a starting point to determine whether there is a need for post- to pre- control for discharge to the Jock River. RVCA will provide the approved model and it will be adjusted (discretized/calibrated to the nearest appropriate node from RVCA's model, etc.) for both existing and future development conditions to analyze post-development impacts on flows within the Jock River. The analysis will be undertaken for the full range of frequencies (2 year to 100 year return periods inclusive) based upon suitable design events (refer to Hydrology Report: Jock River Flood Risk Mapping, prepared for the Rideau Valley Conservation Authority by PSR Group Ltd. and J.F. Sabourin Associates Inc. for direction).
  - No erosion control requirement on the Jock River

- Establish Erosion control Requirements to maintain the stability and geomorphic function of the existing receiving streams.
  - Water Quality: SWM facilities will be designed to meet the enhanced level (80% TSS removal) of treatment as per the MOE SWM Planning and Design Manual (2003). As per the Lower Rideau Watershed Strategy, an integrated approach to stormwater management is to be demonstrated to the satisfaction of MOE to preclude the application of the current non-degradation policy.
  - On receipt of the RVCA flood plain study for the upper reaches of the Van Gaal drain by J. F. Sabourin and Associates Inc., and the Drainage Act Petition undertaken by the City of Ottawa for drainage improvements to the Van Gaal drain from Perth Street south to the Jock River review the terms of reference and access whether amendments are required to the work program
5. Establish stormwater management criteria for future development
  6. Summarize constraint information from other disciplines and create a stormwater constraints plan including geotechnical constraints established in the Jacques Whitford Report. This plan will incorporate works completed Parish Geomorphic including meander belt information, and information contained in the recently completed Natural Environment Existing conditions report completed by Kilgour and Associates.
  7. Review potential storm water outlets for the development.
  8. Develop stormwater management options for the site including:
    - System of ditches and shallow infiltration trenches
    - Dual drainage system with end of Pipe treatment facilities
    - For each option review Hydraulic gradeline and grade raise impacts
    - Identify potential impact of SWM facilities on groundwater function;
    - Delineate areas where there may be constraints to the construction of underground services and identify mitigating measures.
    - Assess opportunities and constraints for each of the options based on fish habitat and existing natural features working with Kilgour associates optimize the options to protect and enhance significant environmental features
    - As the Jock River is a Policy 2 River due to existing Phosphorous levels each of the options will be reviewed with respect to their ability to meet the provincial policy guidelines
  9. Prepare cost estimates to each option
  10. Evaluate options using the pairwise comparison and weighting criteria established by the development team

11. Prepare Preliminary Grade control Plans with the preferred option
12. Prepare a draft report
13. Review the class EA process to ensure conformity with the proposed SWM plan
14. Prepare a Public open House Submission
15. Develop an Implementation Plan
16. Prepare the Final Draft Report

### The Team

In the delivery of the project David Schaeffer Engineering will be the prime consultant, Hydrologic modeling and the phosphorous analysis will be completed by AECOM as a sub consultant to DSEL.

The DSEL project team will be made up of the following personnel

Project Manager	Stephen J. Pichette, P.Eng.
Principal Designer	Zhenyong Li, P.Eng.
Senior Engineer	Jennifer Ailey, P.Eng.
Hydrologic onsite modeling	Adam Fobert, P. Eng.
Costing	Jeffery Pappin, P.Eng.
Subdivision Grading (Cut & Fill Review)	Kaca Mitic
Graphics	Stefan Kolesar
Design Technician	John Nguyen
Review	David Schaeffer, P.Eng.

AECOM

Hydrologic offsite modeling	Paul Frigon, P. Eng.
-----------------------------	----------------------