Servicing study guidelines for development applications

Open configuration options

1. Introduction

1.1 Purpose and Use of Servicing Study Guidelines

The purpose of the Servicing Study Guidelines for Development Applications is to describe the requirements and scope of the servicing studies prepared and submitted to the City of Ottawa (City) to support the eventual approval of the servicing of a particular development application. Development servicing studies define the water, sanitary, and stormwater services that a proposed development will require to be accepted for operation by the City.

Under the Ontario Planning Act, and in accordance with Bill 51, the City has the responsibility and authority to define what constitutes a complete development application. Sufficient information is required by the City to complete a review of the servicing implications of development. Accordingly, this document describes the content of the development servicing studies that define a complete development application under the Planning Act.

These guidelines are intended to be used by City staff, developers, and consultants to clearly understand and communicate information required to bring about consistency, thoroughness, and sufficient content of development submissions.

These guidelines serve to define the content of servicing studies to enable City review staff to understand the constraints, servicing approach and implications of the servicing of new development. They are not intended to replace or supersede design guidelines and design criteria that are already in use. The guidelines will assist proponents in the preparation of development applications in applying consistent approaches to issues, thorough design, sound engineering principles, and the protection of natural and human environment in the City of Ottawa.

1.2 Types of Development Applications

Servicing studies are prepared for individual development applications. They are used to link higher level studies such as Master Servicing Studies to the individual development application. Servicing studies are required to justify and establish planning conditions for development related servicing. They define the scope of the detailed design of the development servicing, and apply to a variety of application types from re-zoning to subdivision and site plan applications.

1.3 Organization of the Guidelines Document

These guidelines are structured to provide the user a quick reference as to the expectations for the servicing studies as they apply to various types of development applications in the City. Section 1 provides an overview of the purpose and background of the development review process and the role of the Servicing Study. Section 2 describes the pre-consultation process between the developer, City reviewers, and approval agencies, and what kind of information is needed for the preparation of servicing studies. Section 3 describes the scope of the Servicing Study. Section 4 provides a checklist of items and their application to sanitary, water and stormwater servicing and the types of development applications. It will be the proponent’s

responsibility to ensure that the checklists are followed. It will be the City that will determine if the Servicing Study is sufficient for the application to be deemed complete for the purposes of initiating the review process.

1.4 Development Review Process

The submission and review of development servicing studies are part of the City's overall development review process, as described in Section 4 of the City of Ottawa Official Plan. This submission and review process will be subject to revision from time to time as the Official Plan is updated.

Under recent changes to the Planning Act in Bill 51, it was proposed that the definition of a "complete application" required under the Planning Act would include a planning justification report demonstrating that the application:

1. Is consistent with the Provincial Policy Statement, 2005 ("PPS");
2. Conforms to or does not conflict with the applicable provincial plan or plans;
3. Conforms to municipal Official Plans ("OPs") as well as any technical reports or studies needed to meet the PPS or provincial plan(s) requirements; and
4. Conforms to reports or studies related to the adequacy of infrastructure and noise attenuation and the identification of related planning applications.

It is the technical studies on the adequacy of infrastructure (4) that is the main subject of these guidelines.

Development Servicing Studies are submitted for review to the Development Review Branch of the Planning and Growth Management Department of the Infrastructure Services and Community Sustainability Portfolio. A pre-consultation meeting is required in order to identify issues and constraints that would have impact on the development. The Planning Act allows for a municipality to make pre-consultation mandatory and the City has adopted mandatory pre-consultation to make pre-consultation compulsory for applicants. In order for the pre-consultation to have maximum benefit to the applicant, adequate time is required in advance of the meeting to allow for City staff to research background information necessary to address questions on infrastructure. More detail concerning the information requirements and description of the pre-consultation meeting are provided in Section 2.

Based on the information provided by the proponent and the response received by the approval agencies and the City, the proponent proceeds to prepare the Development Servicing Study for review and approval. Review of applications for approval by the City requires the submission of a complete application that will address all relevant issues regarding the adequacy of water, sewer, and storm water services for the proposed development. Applications, including the Development Servicing Study, will undergo a preliminary review to ensure that the submission is complete. Applications deemed incomplete are not circulated and the development review process is not initiated.

These guidelines and the development review process include the internal review process within the City, and the review by external agencies such as the Ministry of Environment and Conservation Authorities. The onus is on the developer to meet the requirements of both the City and the agencies external to the City. The City of Ottawa has adopted legislation to make pre-consultation a mandatory requirement of development applications.

Planning applications are required to be circulated to external agencies for comments, which are included in the conditions of approval for the development. The conditions of approval may include provisions that external agencies be satisfied with the resolution of issues under their jurisdiction. As part of the development review process, the City requires that clearance letters be issued by external agencies to ensure that the conditions have been addressed.

1.5 Roles and Responsibilities

The proponent of a development application is either the owner of the property or an agent of the owner. It is the responsibility of the development proponent to determine the potential servicing issues, confirm with City staff, and submit all necessary information for a complete development application. The proponent must identify all of the applicable permits and approvals that must be obtained to proceed with development.

Other engineers and designers may be involved in sub-disciplines working for the project applicant or the proponent. It is the responsibility of the proponent to provide engineering opinion and analysis for review by the City.

The City will appoint a project manager who will be responsible for communication with the proponent and who will coordinate the various departments and staff that will be involved in the review of the application. The City project manager will be requested to provide available information and data to the proponent for the preparation of the development Servicing Study, supporting analysis, and examination of servicing issues. Engineering plans and information on services in the location of the proposed development is subject to a fee in accordance to the Information Centre fee schedule. In cases where the information may not be available or does not exist, or if an approved Master Servicing Study is not available, it is the proponent's responsibility to identify and address gaps in available information or data.

1.6 Applicable Technical Guidelines

There are several technical guidelines available related to the design of water, sewer, and stormwater services for new development.

The following references can be consulted in the preparation of development servicing studies:

City of Ottawa Official Plan – Section 4 – Review of Development Applications

Geotechnical and Reporting Guidelines for Development Applications in the City of Ottawa

- City of Ottawa Sewer Design Guidelines
- Chapter 8 of the City of Ottawa Sewer Design Guidelines (Stormwater guidelines)
- City of Ottawa Stormwater Management Policies
- City of Ottawa Water Design Guidelines
- City of Ottawa Design Specifications
- Ministry of Environment (MOE) Guidelines for the Design of Water Distribution Systems and Design of Sanitary Sewage Systems
- Ministry of Natural Resources requirements for wetland and forestry protection or other designated protected areas
- Conservation Authority (CA) guidelines for the approval of the development and site alteration on lands that are subject to CA regulations made under the Section 28 of the Conservation Authorities Act

- Specific Conservation Authority guidelines
- Guidelines related to rural and private services
- Official Plan policies regarding protection of natural features and preservation of watercourses
- MOE Procedure D-5 Planning for Sewage and Water Services
- MOE Procedure D-5-1 Calculating and Reporting Uncommitted Reserve Capacity at Sewage and Water Treatment Plants, Servicing Options Statement
- Stormwater Management Planning and Design Manual 2003
- Ontario MOE: Understanding Stormwater Management: An Introduction to Stormwater Management Planning and Design
- Ontario Building Code
- MOE Procedures D-5-3, D-5-4 and D-5-5
- Applicable Watershed and Subwatershed Studies

These references are subject to revisions; Servicing Studies must make reference to the latest version available at the time.

2. Preliminary Investigation

The preliminary investigation stage allows the proponent to collect information and data for the preparation of the development servicing report. The onus is on the proponent to investigate potential constraints and opportunities or unique design challenges related to a particular development proposal before a development application is prepared and submitted to the City. To facilitate this, a pre-consultation session between the proponent and City staff must take place prior to the initiation of the application and the application review process. The process is particularly important prior to any proposed rezoning of properties because of the broad nature of issues that may have impact on a re-zoning decision.

The purpose for the pre-consultation is to share important and relevant information concerning the proposed development. This fosters a common understanding of the key servicing issues, available information, and constraints between the proponent, the City, and relevant review agencies. This assists the City staff and other agencies to develop comments on the application, and it serves to inform the applicant on particular areas of concern and potential constraints on the development proposal, at a point in time before significant investment is made in formulating the servicing approach and decisions. A summary of the pre-consultation is to be prepared and included in any subsequent submission of the Servicing Study.

Part of the responsibility of the proponent is to identify all of the necessary permits and approvals required to facilitate the development. Information concerning required approvals can be obtained from direct consultation with City staff and other agencies such as the MOE and CA through pre-consultation.

Studies that may have relevance or impact on development servicing decisions may be in progress at the time of the development Servicing Study. There needs to be a reference made to any studies that may be in progress by the City or others that affect servicing of the particular property in question.

The proponent shall prepare information for the City at least two weeks prior to the pre-consultation meeting, which shall include a high level description of the site including the development proposal. This pre-application form will include among other things the size of the property, a proposed layout and uses of the development, as well as the proximity of the site to

existing infrastructure. A summary of the pre-consultation is to be prepared by the proponent and included in the Servicing Study submission.

A separate guideline for pre-consultation including the pre-application form is being developed by the City and will be available for review and comment to the development industry in the near future. The proponent is to refer to the pre-consultation guidelines when they are finalized.

Although the pre-consultation is intended to be comprehensive, information gaps may present themselves and as the approvals process proceeds, other items not noted at the pre consultation meeting, may be requested as the development design progresses and more information becomes available.

3. Description of Development Servicing Studies

3.1 Introduction

Development Servicing Studies provide information on the considerations and approach by which a development can be adequately serviced with water, sanitary sewer, and stormwater management. The servicing must meet City requirements and all other relevant regulations, as well as demonstrate good engineering practice for the protection of public safety, the environment, and sustainable operation.

Frequently, higher level studies such as Master Servicing Studies, Subwatershed Plans, Watershed Plans, Environment Assessments, and Community Design Plans provide the servicing context to which individual developments must be consistent with. It is the purpose of the Servicing Study to link the requirements outlined in the higher level servicing plans with an individual development applications and provide a greater level of detail on the servicing to guide the final design and the review and acceptance of the final design.

The scope of servicing studies is to be defined at the start of the project, in accordance with a reasonable approach to the issues that are relevant to the development application. In circumstances where higher level studies are not available, the scope may be required to include planning for servicing lands outside of the boundary of the development application. This would include issues such as downstream capacity requirements, facilities required for the development that may be required to service more than one development, the provision of interim facilities and the financing and implementation of the ultimate servicing scheme.

Transportation corridors also provide the links and rights of way for utility services. Therefore the Development Servicing Study will need to be integrated with the transportation aspects of the development, which will be covered under a separate study. This includes addressing implications of changes to the road network, minimizing crossings of watercourses, as well as other utility issues such as rights of way for access to utilities. The scope of this will depend on the existence of a Master Servicing Study for Official Plan Amendments, which will have addressed integration of transportation and utility needs.

3.2 Servicing Study Content

A Servicing Study shall contain sufficient information to inform the City on the overall requirements to provide acceptable municipal or private services for the proposed development. The content must provide information that can define the course of the subsequent detailed design of the development services. All technical analyses and results must be clearly

summarized in the main body of the report with reference to supporting detailed information in the appendices.

The content of the development Servicing Study needs to address all relevant guidelines. However, there may be circumstances or situations where one or more relevant guidelines are either in conflict with each other, or cannot be met by the proposed development. In this case, the development Servicing Study will clearly identify and justify the exceptions or the consideration for review by City of Ottawa staff.

The content must generally include the following:

- Identify the area under consideration including existing land use and adjacent land uses. This can be addressed by a current zoning map showing the location and extent of the application site and surrounding area.
- Establish the objectives of the Servicing Study.
- Provide a list of background studies referenced in the preparation of the Servicing Study including studies in progress by the City or others, and confirmation of their status.
- References and statement of conformance to higher level studies such as Environmental Assessments, Master Servicing Studies, and Community Design Plans). If no higher level study exists, the proponent shall develop, document and justify a defendable design criteria and servicing approach.
- Demonstration and documentation that requirements from the Environmental Assessment Process have been addressed, if applicable.
- Impacts analysis of the proposed servicing on the watershed environment, groundwater regime, and surface water features located in the vicinity of the services. This impact analysis can be based on the information taken from higher level studies if these studies have addressed these potential impacts.
- Identify any development constraints resulting from any studies e.g. poor soils, contamination, water quality, slope stability, fish habitat and any other relevant issue of interest.
- Plan of proposed development concept, description and adequacy of existing sanitary, water and storm services, if not already approved under a Master Servicing Plan.
- Summary of servicing design criteria and considerations.
- A summation of the information from pre-consultation with the City and relevant review agencies (i.e. City, MOE, CA, etc.) including permit and approval requirements. This includes issues, constraints and information gaps identified.
- Establishment of receiving stream criteria for water quality and quantity.
- If necessary, presentation and discussion of servicing proposals that may be deviating from the higher level studies or standard design approaches and methods.
- If deviating from higher level studies, the proponent is expected to provide justification, including requirements to update the higher level studies accordingly for future reference.
- If deviating from standards or policies, the proponent shall provide detailed description of methodologies and why alternative methods are necessary. The acceptance of methods deemed non-standard will be at the discretion of the City on a case-by-case basis.
- A justification and description of any proposed interim works to facilitate servicing including how the ultimate works will be provided, and what will trigger the provision of the ultimate works.

- Discussion and evaluation of servicing options, if not already completed under an OPA, Class Environmental Assessment, or Master Servicing Study. Any private services are to be flagged with justification as to why private services are the most appropriate option.

3.2.1 Capacity Analysis

One key element of the development Servicing Study is the analysis and demonstration that there is sufficient capacity in the wastewater and stormwater system to accommodate flows from the proposed development.

If a Master Servicing Plan has been previously completed to support the proposed land use relevant to the proposed application, then the capacity analysis must confirm that the development specifics are consistent with the Master Servicing Study.

In the case where there is insufficient existing capacity available in the existing wastewater or stormwater system, the report must outline what specific system upgrades are required to service the development.

The triggering mechanism for a capacity analysis downstream would depend on the size of the development, the proposed change in land use or site characteristics, and the known sensitivity of the downstream system to changes in discharge. The City does not have capacity data for all systems throughout the City. It is the responsibility of the applicant to demonstrate that the downstream system has the capacity to accommodate the future flows from the proposed development. The analysis of servicing requirements for the development shall include the following data and information with respect to the analysis of available capacity to serve the proposed development:

- Calculations of the peak wastewater flows generated by the development including land use and population, and employment statistics, if applicable, including the source of the data.
- Comparison of peak flows with the capacity of existing sewers and pumping stations.
- Interpretation of analyses.
- All technical analyses and results should be summarized clearly in the main body of the report – proponent to provide interpretation of results for City review.
- Appendices are intended to include supporting/detailed information that is referenced in the report.
- State explicitly that the design adheres to all City Guidelines/Policies and provide explanation and justification in the event of a deviation for the City’s consideration.
    - If exempt from the requirements for a MOE Certificate of Approval, provide a detailed rationale.
    - Define the triggers for the provision of off-site infrastructure.
    - Distinction between operational requirements and growth related requirements. This relates to recommendations to improve the reliability of the existing system that could be achieved effectively in conjunction with required increase in capacity. (For example, upgrades to existing sanitary lift stations can include operational improvements, as well as additional pumping and conveyance capacity).

3.3 Phasing and Financing of Infrastructure

Most services required to service an individual development application are to be financed and implemented by the proponent to City standards and approvals. In some cases, the optimal servicing scheme will involve off-site infrastructure or infrastructure within the development that will be needed to serve more than one development.

In these latter cases, the Servicing Study will need to provide a discussion on the phasing of the infrastructure, what the triggers are for the infrastructure, as well as any required interim works. This is required to answer the fundamental questions as to what services are required, where it is required, when it will be required, and who is responsible for implementing the services.

Interim works are proposed where the provision of the ultimate servicing works is not currently feasible. In this case, the proponent is responsible to finance any required interim works as well as the operational costs associated with the interim works while they are in operation.

Another issue is the financing of infrastructure that is either servicing more than one development application, or is identified as an item to be financed under the development charge by-law. In this case, the financing of the infrastructure needs to be defined as to how and who pays for the planning, design and construction of the facility. This generally applies to major infrastructure such as trunk sewers and major collector sewers, transmission and feeder water-mains, pumping stations, stormwater control facilities, and reservoirs.

The City may not be in a position to construct infrastructure that is planned for in the Long Range Financial Plan (LRFP). In this case, the developer may need to consider other options for servicing and financing.

3.3.1 Regulatory Approvals

There are a number of external agencies that issue permits and approvals that are necessary for a given development application to proceed. This includes certificates of approval for development and site alteration of lands that are subject to the CA regulations made under Section 28 of the Conservation Authorities Act, Ministry of Environment approval and issuance of certificates of authorization for water, sewer and stormwater infrastructure, in addition to permits under the Lakes and Rivers Improvement Act, Permit to take water, and review and approval from Department of Fisheries and Oceans for works that could create a Harmful Alteration Disruption or Destruction (HADD) of fish habitat.

In cases of development and site alteration on lands that are outside of regulated areas, Conservation Authority involvement in the development and approval process can be advisory in nature. When performing their review and advisory role, Conservation Authorities will make reference to technical guidelines for development that are published by the Province or the municipality in which the development is occurring, or that have been recommended in approved subwatershed or watershed studies for use in specifically defined areas.

Interpretation of the Provincial Policy Statement is reflected in the Official Plan. Provincial guidelines such as Natural Hazards Guidelines, Ministry of Environment D-5-3, D-5-4, and D-5-5 can be utilized and referenced by the applicant.

3.4 Rural Development Requirements

In order for the City to be able to support an application on private services, an adequate Hydrogeological Investigation and Terrain Analysis as well as a Servicing Options Report must

be completed. Development proposals within the City are defined as “rural developments” when they are not planned to be connected to the urban services of the City. Therefore, there is a need for the applicant to complete a Servicing Options Report in accordance with Bill 51, the City's Official Plan and other provincial requirements. This will include reviewing options for provision of water, stormwater, and sanitary servicing, as well as completing a Hydrogeological Investigation and Terrain Analysis. The applicant can also refer to Ministry of the Environment Procedure D-5-3 for guidance. The Servicing Options Report shall include the Hydrogeological Investigation and Terrain Analysis as well as make reference to a number of important issues and considerations such as geotechnical considerations, water quality issues (ODWQS), Best Management Practices, Stormwater Management considerations, Wellhead protection issues, impacts on or from adjacent land uses (for example: local wells, agricultural uses, etc.). Also, the applicant must refer to the Ontario Ministry of Environment (MOE) Procedures D-5-4 and D-5-5.

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

Development Servicing Study Checklist [PDF 245 KB]

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- Executive Summary (for larger reports only).
- Date and revision number of the report.
- Location map and plan showing municipal address, boundary, and layout of proposed development.
- Plan showing the site and location of all existing services.
- Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- Summary of Pre-consultation Meetings with City and other approval agencies.
- Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- Statement of objectives and servicing criteria.
- Identification of existing and proposed infrastructure available in the immediate area.
- Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).

- Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- Proposed phasing of the development, if applicable.
- Reference to geotechnical studies and recommendations concerning servicing.
- All preliminary and formal site plan submissions should have the following information:
    - Metric scale
    - North arrow (including construction North)
    - Key plan
    - Name and contact information of applicant and property owner
    - Property limits including bearings and dimensions
    - Existing and proposed structures and parking areas
    - Easements, road widening and rights-of-way
    - Adjacent street names

4.2 Development Servicing Report: Water

- Confirm consistency with Master Servicing Study, if available
- Availability of public infrastructure to service proposed development
- Identification of system constraints
- Identify boundary conditions
- Confirmation of adequate domestic supply and pressure
- Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
- Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
- Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
- Address reliability requirements such as appropriate location of shut-off valves
- Check on the necessity of a pressure zone boundary modification.
- Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range
- Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.

- Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- Confirm consistency with Master Servicing Study and/or justifications for deviations.
- Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix ‘C’) format.
- Description of proposed sewer network including sewers, pumping stations, and forcemains.
- Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- Analysis of available capacity in existing public infrastructure.
- A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- Description of the stormwater management concept with facility locations and descriptions with references and supporting information.

- Set-back from private sewage disposal systems.
- Watercourse and hazard lands setbacks.
- Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- Any proposed diversion of drainage catchment areas from one outlet to another.
- Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- Identification of potential impacts to receiving watercourses
- Identification of municipal drains and related approval requirements.
- Descriptions of how the conveyance and storage capacity will be achieved for the development.
- 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.
- Inclusion of hydraulic analysis including hydraulic grade line elevations.
- Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

- Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.
- Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.
- Changes to Municipal Drains.

- Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

- Clearly stated conclusions and recommendations
- Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario