

Urban Form and Corporate Strategic Development
City Planning

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Drainage Servicing Report - Terms of Reference

Urban Form and Corporate Strategic Development | City Planning
City of Edmonton

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Introduction: Drainage Servicing Reports

Drainage servicing report submissions may be broken into two phases

Drainage servicing reports provide the framework for sanitary and stormwater servicing of site-specific land development applications in the City of Edmonton. They are typically required to support large-scale infill development proposals and proposed developments in areas with known drainage system limitations. Drainage servicing reports may also be required for site-specific developments within new neighbourhoods that do not warrant a full amendment to the neighbourhood design report.

Drainage servicing report submissions may be broken into two phases. Phase 1 should provide information on the site, the proposed development, and the impact to the existing drainage network. Opportunities to coordinate with City and EPCOR Drainage projects and strategies should also be explored. Phase 2, if required, should update the report to outline the drainage infrastructure upgrades required to support the proposed development.

Please contact drainageservicingreports@edmonton.ca to inquire about the need for a proposed development to submit a drainage servicing report, to obtain supporting information for a report, or to submit a report.

Requirements for a Drainage Servicing Report

Phase 1: Determining the Impact of the Proposed Development

1.0 Background Information and Outline of Proposed Development

This section of the drainage servicing report should contain the following plans:

- **Neighbourhood-level Key Plan**
- **Site Location Plan** that includes the site area (in hectares), an air photo, and relevant labeling such as street names

This section of the drainage servicing report should contain the following information:

- Description of the existing land use and proposed land use for the site
- Summary of any relevant planning and engineering documents:
 - Proposed zone information
 - Drainage planning reports (i.e. downtown intensification studies, neighbourhood design reports, etc.)
 - Engineering record drawings
- Project & Strategy Coordination: Upon request, City Planning (drainage) will collect and provide any available information regarding existing projects and strategies:
 - Other major developments proposed in the vicinity of the proposed development
 - Stormwater Integrated Resource Planning
 - Combined Sewer Overflow Control Strategy
 - City/ EPCOR Drainage Capital Projects
 - Neighbourhood Renewal
 - City Wide Odour Control
 - Condition Assessments and Rehabilitation Plans
 - PAC - Offsite Levies

Upon request, City Planning (drainage) will collect and provide any available information regarding existing projects and strategies...

The drainage servicing report should reflect how the above projects and strategies affect the proposed development and outline any opportunities to coordinate development with the City and EPCOR Drainage to achieve mutually beneficial outcomes.

2.0 Sanitary and Storm Design

Upon request, the City can coordinate with EPCOR Drainage to provide background information and as-built plans regarding the existing drainage network. The engineering consultant should verify pertinent as-built information prior to submitting the report.

Reducing combined sewer overflows to local watercourses is a top priority for both the City of Edmonton and EPCOR Drainage. Therefore, storm services for proposed developments must be connected to storm sewers wherever feasible.

...storm services for proposed developments must be connected to storm sewers wherever feasible.

This section of the drainage servicing report should contain the following plans:

- **Existing Drainage Site Plan** that shows existing servicing for the site. If storm servicing does not exist to the site, this plan should show the existing ground contours or drainage patterns for stormwater runoff routing towards catch basin inlets to the existing sewer system.
- **Proposed Sanitary and Storm Servicing Site Plan** that shows the proposed service connections to the existing drainage system and highlights key information such as tie-in invert elevations, on-lot stormwater management, stormwater release rate, existing pipe-full capacities of downstream sewers, etc.
- **Overall Drainage Network Plan** that highlights flow paths and shows the extents of engineering analysis.
 - Plans for sanitary and combined sewers should generally extend to a major trunk sewer or lift station.
 - Plans for storm sewers should generally extend to a major trunk sewer, SWMF, or outfall.

This section of the drainage servicing report should contain the following information:

- Proposed sanitary generation calculations (the maximum allowable under the zone)
 - Including residential flows, commercial flows, inflow and infiltration, total average flows, and total peak flows directed to the receiving sewer main(s) as per the City of Edmonton Drainage Design and Construction Standards

Runoff from large sites and industrial sites that discharge to a storm sewer should be treated for water quality before being released to a receiving watercourse.

- Existing sanitary generation calculations and comparison with proposed generation, if applicable
- Pre-development and post-development stormwater runoff calculations
 - Calculations for uncontrolled stormwater runoff in the 1:5 year and the 1:100 year design rainfall events
 - Any comparisons of pre-development flows to post-development flows for sites without existing storm servicing must account for overland stormwater routing from the site to the point of proposed storm servicing connection(s) with consideration for catchment splits, catch basin connection points to sewer mains, and catch basin inlet capacity limitations
 - Rationale for C value used in uncontrolled runoff calculations
- On-Site stormwater management requirements and required storage volume calculations (see Appendix A for details)
- Runoff from large sites and industrial sites that discharge to a storm sewer should be treated for water quality before being released to a receiving watercourse. The City of Edmonton and EPCOR Drainage strongly encourage the use of Low Impact Development to improve the quality of stormwater runoff from land development projects. Other Best Management Practices, such as mechanical oil and grit separators, may also be utilized.

3.0 Impact to Existing Drainage Network

Developments with proposed peak sanitary and storm flow contributions that are less than 10% of the receiving sewer main's **pipe-full** capacity may not require further hydraulic analysis. However, the impact must be analyzed on a case-by-case basis with consideration of upstream conditions and downstream limitations.

If feasible, the **available** capacity of the existing drainage system should be modelled or calculated from the top end of the system using existing drainage network information obtained from the City/ EPCOR Drainage with existing land use and population data and standard values from the City's Design and Construction standards.

In areas with combined sewer systems, the impact of increased sanitary peak flows may be mitigated by a reduced outflow rate from the on-lot stormwater management facilities.

Analysis of the proposed development's impact on the existing system should be related to the City's and EPCOR Drainage's service level goals.

- Sanitary system goals involve ensuring downstream pipes do not reach 86% of their pipe-full capacities in peak, wet weather flows. Analysis for sanitary sewers should generally extend to a major trunk sewer or lift station.
- Combined system goals involve keeping the hydraulic grade line below a depth of 2.0 m from the surface in the 1:100 year design rainfall event. Analysis for combined sewers should generally extend to a major trunk sewer or lift station.
- Storm drainage system goals involve minimizing surface ponding volumes and durations at sag locations for major and minor storm events - storm mains are designed to not reach their pipe-full capacities until the 1:5 year design rainfall event. Analysis for storm sewers should generally extend to a major trunk sewer, SWMF, or outfall.

In areas with combined sewer systems, the impact of increased sanitary peak flows may be mitigated by a reduced outflow rate from the on-lot stormwater management facilities.

The City will review the information provided in the drainage servicing report to assess the acceptability of the proposed development's impact to the existing drainage system. Major developments and developments in sensitive areas will be assessed by EPCOR Drainage's Systems Assessment group. If sanitary or combined sewers drain to a lift station, the City will confirm if the lift station has adequate capacity with EPCOR Drainage's Pumpwell Services group.

Phase 2: Drainage Upgrades Required to Support Proposed Development

4.0 Drainage Upgrades Required

Some developments may add flows that exceed acceptable limits of the existing drainage system...

Some developments may add flows that exceed the acceptable limits of the existing drainage system or require a storm main extension for feasible sewer separation. In these cases, the developer may enter into an agreement with the City of Edmonton or contract EPCOR Drainage directly to construct the upgrades necessary to support the development. The additional capacity from the upgrades must meet or exceed the total flows from the proposed development. System upgrades may include the following:

- Sewer separation (combined sewer areas)
 - Construct a new public storm sewer for the proposed development and connect to an existing downstream storm sewer or larger diameter downstream combined sewer
- Sewer upsizing
 - Remove an existing sewer main and replace with a larger diameter main
- Sewer twinning
 - A new sewer line may be installed and may act as storage for excess flows in the existing main

This section of the drainage servicing report should include the following:

- **Proposed Servicing Plan** (with proposed upgrades)
- Proposed servicing summary, including a description of the proposed upgrades
- Calculations to confirm that the additional capacity from the proposed upgrades meets or exceeds the total flows from the proposed development

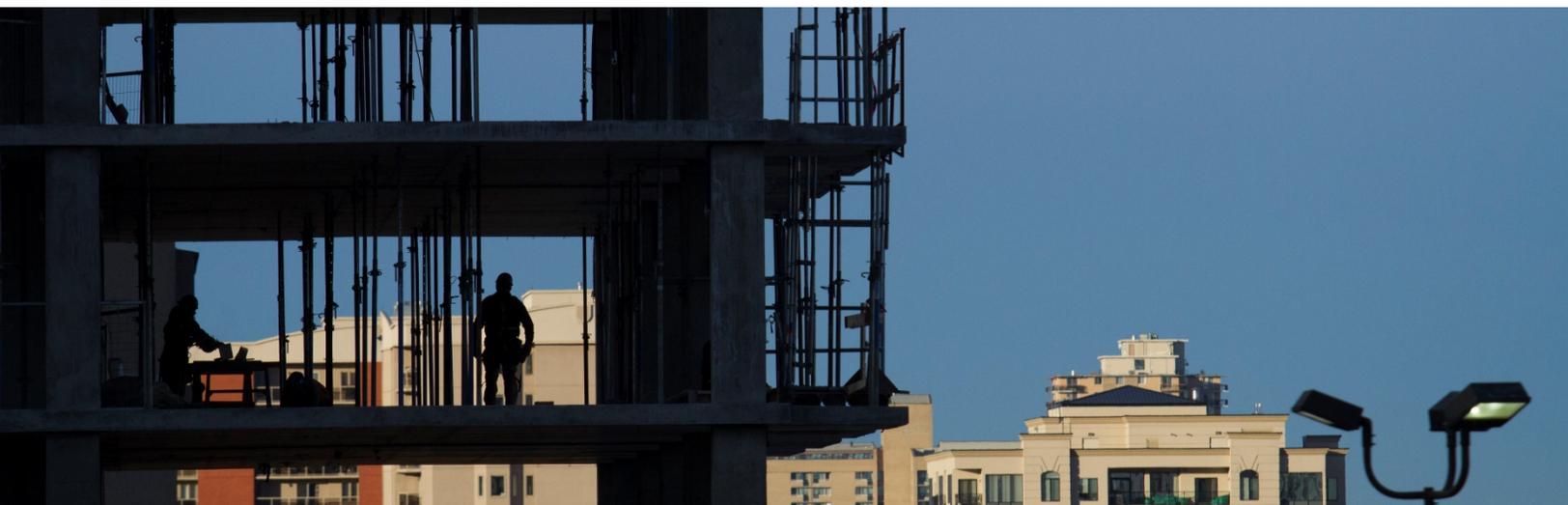
The City will review the information provided in the drainage servicing report to assess the acceptability of the proposed upgrades to mitigate the development's impact to the existing drainage system. Major developments and developments in sensitive areas will be assessed by EPCOR Drainage's Systems Assessment group.

Conclusion: Moving Forward

Once the associated bylaw is approved by City Council, the accepted drainage servicing report will continue to provide a basis for design and review at subsequent stages of development.

The final drainage servicing report must be stamped by a professional engineer or equivalent. Once the report is accepted by City Planning, it may be made available to the public and uploaded to the corresponding land development application page on the City's website. Therefore, it is the City's preference that drainage servicing reports only contain servicing information regarding sanitary and storm servicing. Complete utility servicing reports (including water, power, gas, etc.) can still be submitted to the City but must contain a disclaimer indicating that details of other utilities are provided for information purposes only.

The drainage servicing report must be accepted by City Planning (drainage) before City Planning can support land development applications proceeding to public hearing. Once the associated bylaw is approved by City Council, the accepted drainage servicing report will continue to provide the basis for design and review at subsequent stages of development.



Appendix A: On-Site Stormwater Management Requirements

On-site stormwater management requirements apply if the proposed development's storm drainage basin does not have an existing stormwater management facility. This is often the case for infill development scenarios in the City of Edmonton.

Small sites with areas less than 0.16 hectares are often exempt from on-site stormwater management requirements unless there are concerns regarding the available capacity of the existing drainage system.

Sites with areas between 0.16 hectares and 10 hectares usually require on-site stormwater management including storage provisions to accommodate runoff from the 1:100 year design storm event with an outflow rate of 35 litres per second per hectare with the following exceptions:

- The outflow rate may need to be reduced if there are any concerns regarding the available capacity of the existing drainage system;
- The required storage volume may decrease to account for the 1:5 year design storm event in cases where an adequate major drainage system and stormwater management facility exist; and
- The required storage volume may need to increase to account for the critical storm event at the proposed release rate if there are concerns regarding the existing major drainage system.

The critical storm event can be determined through analysis of the following rainfall events:

- 1:100 Year 4 Hour Chicago Distribution
- 1:100 Year 24 Hour Huff Distribution
- 1937 Storm
- 1978 Storm
- 2004 Storm
- 2012 Storm

Sites with areas greater than 10 hectares usually require on-site stormwater management including storage provisions to accommodate runoff from the critical storm event with an outflow rate reduced to the allowable basin rate of the receiving watercourse.

These requirements are summarized in Table 1: On-Site Stormwater Management Requirements:

| Site Area | On-Site Stormwater Management Required? | Release Rate | On-Site Storage Provisions |
|-------------------------|---|--------------------------------------|--------------------------------|
| $A < 0.16$ ha | Case-by-case | Case-by-case | Case-by-case |
| 0.16 ha $< A < 10$ ha | Yes | 35 L/s/ha or less | 1:100 year design storm event* |
| $A > 10$ ha | Yes | Basin rate for receiving watercourse | Critical storm event |

Table 1: On-Site Stormwater Management Requirements

* Storage provisions for the 1:5 year design storm event may be acceptable for areas with an adequate major drainage system and SWMF

* Storage provisions for the critical storm event may be required in areas without an adequate major drainage system

Further details regarding the proposed on-site stormwater management will be required by the Water and Sewer Servicing Section of EPCOR Drainage at the development permit stage.

Appendix B: Drainage Servicing Report Checklist

| PHASE 1 - Determining the Impact of the Proposed Development | | |
|--|-------|--|
| Item | Check | Details |
| Engineer's Stamp | | Stamped by professional engineer or equivalent |
| Drainage Specific Report | | Provide disclaimer if report contains information regarding other utilities and improvements |
| 1.0 Background Information and Outline of Proposed Development | | |
| Key Plan | | Neighbourhood-level |
| Site Location Plan | | Site area (ha), air photo, street names, etc. |
| Land Use Description | | Describe existing and proposed land uses |
| Summary of relevant documents | | Proposed zone, existing drainage servicing reports, NDRs, local area/ neighbourhood drainage studies (i.e. downtown intensification study), etc. |
| Strategy Coordination | | Comment on existing City and/or EPCOR Drainage Strategies with respect to the proposed development and outline opportunities to coordinate |
| 2.0 Sanitary and Storm Design | | |
| Existing Drainage Site Plan | | Show existing servicing for the site, existing ground contours, and drainage patterns to catch basins |
| Proposed Sanitary and Storm Servicing Site Plan | | Existing Drainage Site Plan with proposed service connections, key information highlighted (On-Lot SWM and release rate, existing capacities of downstream sewers). Storm services must be connected to storm sewers wherever feasible |
| Overall Drainage Network Plan | | Highlight flow path for sanitary and combined sewers to major trunk or lift station. Highlight flow path for storm sewers to major trunk, SWMF, or outfall |
| Sanitary Generation Calculations | | Residential flows, commercial flows, inflow/infiltration, peak factors, peak flows. Compare with existing, if applicable |
| Stormwater Runoff/ Discharge Calculations | | Calculations for pre-development and post-development for the 1:5 year and 1:100 year design rainfall event. Justify runoff coefficient 'C' determination |
| Stormwater Storage Volume Calculations | | Calculate for governing rainfall event at the allowable release rate |
| Stormwater Quality Considerations | | Proposed stormwater quality treatment, if applicable, including LID and oil and grit separators |
| 3.0 Impact to Existing Drainage Network | | |
| Direct Impact on Drainage System | | % of receiving pipe capacity utilization, % downstream pipe capacity utilization |
| Sanitary/ Storm Calculations | | If feasible, model or calculate from top end of system using existing land use information and City Design and Construction standard values |

| | | |
|---|--|---|
| Overall Impact on Drainage System | | Compare with service level goals for sanitary, combined, and storm and justify any reasonable deficiencies |
| Comment from Systems Assessment | | Include findings and modelling results from EPCOR Drainage's Systems Assessment group, if applicable |
| PHASE 2 - Drainage Upgrades Required to Support Proposed Development | | |
| 4.0 Drainage Upgrades Required | | |
| Proposed Sanitary and Storm Servicing Site Plan | | Proposed Sanitary and Storm Servicing Site Plan with proposed upgrades included |
| Proposed Servicing Summary | | Summary of proposed servicing, including proposed upgrades (Sewer separation, sewer upsizing, or sewer twinning) |
| Proposed Servicing Calculations | | Include calculations to confirm the additional capacity from the upgrades meets or exceeds the total flows from the proposed development. Update sanitary and storm calculations from Phase I report, if required |
| Comment from Systems Assessment | | Include findings and modelling results from EPCOR Drainage's Systems Assessment group, if applicable |