

MUNICIPAL SCAN - DRAINAGE REGULATION PRACTICES

March 2021



Best Practices Review Summary

A review of drainage regulation practices for western Canadian cities including Edmonton, Calgary and Winnipeg was undertaken. The processes and regulations used by each city are summarized in this document. The initiatives proposed as part of the City of Saskatoon's drainage project are consistent with these regulations and processes utilized by cities studied under this review.

City of Edmonton

The City of Edmonton Drainage Bylaw regulates lot grading on all forms of new development. The City requires the submission of a Lot Grading Plan prior to any new construction, addition, or alteration of surface drainage. Lot grading approval must be obtained at two stages – rough grade and final grade. The rough grade stage includes backfilling the foundation walls and shaping the lot to conform to the design of the approved Lot Grading Plan. The final grade stage includes the placement of topsoil, sod, crushed rock, wood chips, or other decorative material. The City approves a Lot Grade Certificate and performs an inspection upon completion of each stage to ensure compliance with the Lot Grading Plan and Drainage Bylaw. Lot Grading inspections are performed between spring and fall and are suspended during the winter months or when there is significant snow cover.

Residential, Commercial, and Multi-Family Development

The approval process is the same for both the rough grade stage and the final grade stage. The Grading Approval Process is outlined below:

1. The applicant has a Lot Grading Certificate prepared by an Alberta Land Surveyor. The Lot Grading Certificate shows as-built elevations along with design elevations.
2. The Lot Grading Certificate is then submitted to the City of Edmonton for approval. The applicant must provide information for their preferred method of contact (fax, email, or mail) to receive a Lot Grading Inspection Report.
3. A Lot Grading Inspector will conduct a site inspection to verify the lot is graded in accordance with the approved Lot Grading Plan and Drainage Bylaw. The inspection is usually done within five working days from receipt of the certificate, depending on workload and weather conditions.
4. The applicant will receive an Inspection Report indicating whether the lot grading has passed (approved) or failed (deficiencies exist).
5. The builder must correct any deficiencies within 60 days and call 311 to arrange for a reinspection. If resubmission of a Lot Grading Certificate is indicated, reinspection cannot occur until a new Lot Grading Certificate is received.

6. If the Inspection Report indicates a failure, it will identify the deficiencies and their locations.
7. The applicant and property owner are both notified when the lot grading is approved. This approval is based on the site conditions observed at the time of the lot grading inspection.
 - Regardless of who applies for grade approval, the property owner is ultimately responsible for all activities and approvals related to their property.
 - The rough grade approval procedure should occur within 60 days of the initial site grading or within 18 months of issuing a building permit.
 - The rough grade must be left approximately 7-20 cm below final grade to allow for topsoil placement.
 - If rocks, wood chips or other porous decorative material is planned, the clay base (rough grade) must be raised to final grade before placing the decorative material. Rocks or wood chips do not make up for the 7-20 cm of final grade since surface water can flow through those materials.
 - Final grading must be completed within 12 months of the rough grade approval or 60 days of the final grading being completed or 30 months of the building permit being issued for the premises.
 - Final grade tolerance for finished landscaping is ± 10 cm from design grade.

The City does not require an inspection at the 'rough grade' stage for commercial or multi-family developments; the City only requires a Lot Grade Certificate to be submitted after final grading. A commercial or multi-family development should be graded to conform to the approved Lot Grading Plan within 18 months of the issuance of the building permit.

Infill Development

An infill developer is required to submit a proposed Infill Lot Grading Plan to the City along with an Infill Development and Building Permit application for review and approval for all locations where an approved Lot Grading plan does not exist. After the City approves the plan, the Residential Grading Approval Process is used to ensure compliance with the approved Infill Lot Grading Plan.

Fees

The City collects lot grading inspection fees when an applicant applies for a Building Permit. The fee covers the cost of the first two rough grade and first two final grade inspections. If a re-inspection is required, the applicant must pay the fees in advance. Lot grading inspection fees are as follows:

- Single-detached housing: \$148
- Semi-detached housing (per dwelling unit) \$148
- Multi-family residential: \$240, plus \$60 per dwelling unit located on the first level
- Any other premises type (including commercial and industrial): \$240 per hectare, subject to a minimum of \$240
- Re-inspection Fee: \$160

Drainage Complaints & Enforcement

- When the City receives a drainage complaint, the complainant is first referred to the lot grading information available online. A Lot Grading Inspector may also send related lot grading information and a Witness Statement Form to the complainant.
- After a witness statement has been provided to the City, a Lot Grading Inspector opens an investigation and performs a site inspection to determine any potential Drainage Bylaw violations.
- The Lot Grading Inspector examines the surface drainage conditions on the involved properties and confirms compliance with the approved Lot Grading Plans.
- The City sends non-compliance notices and/or written orders to the respective property owners if any Drainage Bylaw contraventions exist. Property owners must then take steps to remedy the contravention and re-establish proper lot grading.
- If the property owner refuses to comply with a written order, a fine may be issued in accordance with the Drainage Bylaw.
- For infill lot grading concerns with potential to cause flooding on an adjacent property, the City first makes the following recommendations to the complainant:
 - Review and repair foundation grading to re-establish the slope away from their own house.
 - Ensure downspout extensions or splash pads are in place to convey roof and foundation water at least two metres away from the house.
 - Consult with the adjacent property owner to create a lot grading design that works for both properties.
 - Ensure a positive and consistent slope along the shared property line.
- The City encourages homeowners to address common drainage concerns with their neighbour(s). The City does not provide lot grading consultancy services or solutions nor do they respond to urgent surface runoff complaints. The City does not have the mandate to resolve disputes between neighbours.

- For areas that do not have a detailed Lot Grading Plan (designed prior to 1989), the City uses the Alberta Building Code requirements to ensure properties are correctly graded.

Rear Property Line Drainage Regulation

According to the City of Edmonton Drainage Design and Construction Standards Section 18.2.5 (iv) Rear to front drainage is preferred in alley-less subdivisions. Split drainage in alley-less subdivisions is permitted only if all of the following conditions are met:

- it is not feasible to achieve rear-to-front drainage due to extreme natural topography.
- the receiving downstream lot has an overall grade of 3.0% or more.
- there is no concentration of flow from upstream lots to downstream lots.
- only one lot drains to another lot.
- runoff from the roof of the upstream lot is directed to a storm service or the upstream lot's grading is designed with the ridge as close to the rear property line as possible.

In situations where split drainage may be problematic due to the above conditions not being met, the use of a concrete swale for the interception of split drainage and its conveyance directly to a public right of way is permitted. Rear property line drainage issues are largely mitigated through these design standards. When concrete swales are implemented, the Drainage Design and Construction Standards outline the required sizes and other parameters. In addition, the Drainage Bylaw regulates the interference or alteration of drainage infrastructure on private properties.

City of Calgary

The City of Calgary Lot Grading Bylaw ensures all new residential, commercial, and multi-family developments are correctly graded with surface water drainage directed away from buildings. The City of Calgary approves lot grading through the submission of a "Plot Plan" (prior to development) and an "As-Constructed Grade Certificate" (upon completion). These documents are reviewed and approved by the City to confirm appropriate lot grading – site inspections are not performed.

Residential, Commercial, and Multi-Family Development

The City of Calgary lot grading approval process is outlined below:

1. Builders submit a Plot Plan to the developer for approval. The Plot Plan provides grading information for a residential lot and is required to follow the design lot grades, elevations and drainage patterns as set out on the approved Lot Grading Plan.

2. Builders are then required to submit the Plot Plan to the City as part of the Building Permit application.
3. For multi-family residential developments, the builder is required to submit a “Development Site Servicing Plan” (DSSP) that complies with the City DSSP Guidelines. This plan must show the locations and elevations of buildings, utilities, and any significant surface drainage features for the lot. It will also identify any stormwater storage, quality management or flow restriction devices (where required).
4. When the lot grading is completed, builders submit an As-Constructed Grade Certificate to the developer. The certificate confirms the surface elevations of the lot are within the lot grading tolerances outlined in the Lot Grading Bylaw. The certificate must be signed by a professional land surveyor, engineer, or architect.
 - The As-Constructed Grade Certificate must be submitted within 12 months of issuance of the “Permission to Occupy” (within 12 months of the last Permission to Occupy for multi-family and commercial developments with more than one building).
 - Property owners are responsible for establishing and maintaining positive lot drainage.
 - During construction, the builder is required to adhere to the requirements set out in the Lot Grading Bylaw.

Infill Development

For infill development sites, a similar approval process is used, however, three additional requirements are outlined below:

1. The Plot Plan is required to show additional information including the lot elevations at each of the lot corners, building corners and the adjacent backs of sidewalks and curbs, minimum design slopes, and locations of any swales or other surface drainage features.
2. The City issues Grade Slips to builders which identify the minimum building entrance elevations (where applicable) to protect the property from overland storm water flooding.
3. Based on the Grade Slip information and existing surface grades of the lot, the builder must develop a lot grading design that will provide positive lot drainage while maintaining existing elevations at the property boundaries.

Fees

The City collects a Lot Grading Permit fee at the time of Building Permit application. Lot grading permit fees are as follows:

- Single-detached, semi-detached, and multi-family developments comprised of less than 10 units – \$20.00 per ground floor dwelling unit

- Multi-family developments comprised of 10 or more units, up to and including 3 storeys – \$100.00 + \$10.00 per ground floor unit
- Apartment Buildings (greater than 3 storeys); Commercial and Industrial Developments – \$80.00 per hectare (minimum \$80.00)

Drainage Complaints & Enforcement

- Following the completion of a new development, the City has a limited role in lot grading unless it relates to a specific bylaw infraction.
- The City of Calgary does not mediate neighbour disputes between property owners nor monitor lot grading or landscape modifications after the development process is complete.
- The City refers property owners to the “Guidelines for Homeowners: Resolving a Lot Drainage Issue” document available from the City of Calgary website. This document recommends cooperating with the neighbour, contacting a professional, or contacting Calgary Mediating Services to resolve the drainage issue, unless there is a clear bylaw infraction.
- In the event of a clear bylaw infraction, a property owner may contact 311 to report the infraction and have it addressed by a Bylaw Enforcement Officer.
- Enforcement provisions within the City of Calgary Drainage Bylaw include issuance of Remedial Orders and violation tickets.

Rear Property Line Drainage Regulation

- The City of Calgary regulates and enforces the maintenance of all registered drainage easements within their Drainage Bylaw.
- Most rear property registered drainage easements are in the form of concrete swales, which have been in place since the 1980’s.
- Concrete swales are used to convey flow from the back of lot drainage. They are required at locations where the overland escape route is not along a roadway or paved pathway/walkway.
- A fence constructed above a Surface Drainage Facility (swale) must maintain a vertical clearance of 150mm (6 inches) from the Surface Drainage Facility.

City of Winnipeg

The City of Winnipeg Lot Grading Bylaw regulates lot grading on all forms of new development through submission of both a Lot Grading Plan and a (rough) Lot Grade Certificate. A Lot Grading Permit must be obtained prior to any new development or large addition or before proceeding with any lot grading changes that may alter the existing drainage patterns. The applicant must apply for a lot grading permit at least five working days prior to starting work.

Residential, Commercial and Multi-Family Development

The City of Winnipeg lot grading approval process is outlined below:

1. A Lot Grading Plan must be prepared by a professional Engineer, Architect or Landscape Architect and must be submitted to the City along with the Lot Grading Permit Application.
2. The City issues the Lot Grading Permit indicating the approved lot grade elevations for the lot.
3. The rough grading must then be completed in accordance with the City's Lot Grading Requirements and be certified by a professional engineer or Manitoba Land Surveyor.
4. Property owners who wish to complete the final grading and landscaping on their own, must request a copy of the signed Lot Grade Certificate and Deposit Refund forms from the builder.
5. After confirming that the lot grading has been certified, the property owner may proceed with final grading and landscaping. The City does not provide any inspections before completion of this work.
 - Rough grading of a lot must be completed within 12 months of the issuance of the Lot Grading Permit.
 - Rough grading is recommended to be left approximately 100 mm below the design grade to allow for placement of topsoil and sod or other decorative landscaping material.
 - It is the property owner's responsibility to maintain the lot grades established on the Lot Grading Plan.

Infill Development

For infill development sites, a similar approval process is used, however, the builder/developer must consider the elevation of the existing properties to ensure that the new construction does not adversely affect neighbouring properties. Often a retaining wall must be constructed along the property line to contain the surface water.

Fees

The City of Winnipeg requires lot grading permit fees and deposits be paid prior to issuance of lot grading permits. Fees and deposits are outlined below:

- Residential lot grading permit fee – \$172.00
- Non-residential lot grading permit fee – \$339.00
- Residential lot grading deposit – \$1130.00
- Non-residential lot grading deposit – \$1670.00
- The City will process the lot grading deposit release upon receiving the completed Lot Grade Deposit Refund form and signed Lot Grade Certificate.

- An applicant who anticipates building more than four houses within the City boundaries in any given year may, by written request, enter into an agreement with the City to provide letters of credit in place of lot grading deposits.

Drainage Complaints & Enforcement

- Property owners experiencing drainage issues are encouraged to first contact their builder or surveyor or visit the City website for answers to questions about common drainage problems.
- Property owners are also encouraged to resolve the issue with their neighbours if possible and contact a professional for assistance if required.
- If drainage problems persist, the property owner may contact the City to request an inspection to determine any Lot Grading Bylaw contraventions.
- In the event of non-compliance, the City has a designated City Administrator provide written bylaw violation notice by registered mail to the applicant, directing the completion or correction of lot grading.
- The City may require a new Lot Grading Plan be prepared as part of the corrective measures.

Rear Property Line Drainage Regulation

- The City of Winnipeg Lot Grading Bylaw requires that storm water be able to flow along lot lines in accordance with the Lot Grading Permit.
- The Standard Construction Specifications provide criteria for both grass and concrete swales.
- Grass swales are required to be graded in accordance with the approved Lot Grading Plan and maintained by the property owner.
- Fences must maintain a vertical clearance of 150 mm (6 inches) from the swale.