

## REQUIREMENTS FOR GEODETIC ELEVATION PRIOR TO STRIPPING, GRADING AND REDEVELOPMENT

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### EXECUTIVE SUMMARY

Redevelopment of a parcel can lead to modifications to existing drainage patterns and stormwater runoff, which can subsequently impact neighbouring parcels. The introduction of new requirements for maintaining geodetic elevations will not alleviate the drainage concerns. Increased runoff to neighbouring parcels can occur even if the geodetic elevations are maintained. Redevelopment of a parcel is also an opportunity to redress poor grades and eliminate local flooding. Drainage concerns on the parcel being redeveloped, as well as on the neighbouring parcels, must be addressed by a comprehensive drainage solution. This solution must bring together the most appropriate best management practices, including but not limited to geodetic elevation considerations.

A review of the lot grading and drainage processes identified options to improve lot drainage. These options may require revisions to relevant bylaws (Lot Grading Bylaw, Drainage Bylaw, Community Standards Bylaw and Land Use Bylaw), as well as operational changes. The changes must balance the benefits achieved and the costs incurred by redevelopment projects. Engagement with the development and building industries will be pursued as part of the next steps towards improved drainage practices for all types of development.

### ADMINISTRATION RECOMMENDATION(S)

That the Planning and Urban Development Committee recommend that Council receive this report for information.

### RECOMMENDATION OF THE SPC ON PLANNING AND URBAN DEVELOPMENT, DATED 2014 OCTOBER 31:

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That Council:

1. Receive this report for information; **and**
2. **Direct Administration to report back to Council through the SPC on Planning and Urban Development on potential solutions to improvement of stormwater management including, but not limited to, Geodetic elevation concerns, permeability sequencing of applications, and related matters, no later than Q2 2015.**

Excerpt from the Minutes of the SPC on Planning and Urban Development held  
2014 October 31:

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“And further, that the distribution be attached to the Report prior to being forwarded to Council.”

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### **PREVIOUS COUNCIL DIRECTION / POLICY**

On 2013 September 16, Council adopted the recommendations of the Monitoring Report on Contextual Semi-Detached Dwellings, Supplementary Report (PUD2013-0629). Recommendation 3 directed Administration “to report through the SPC on Planning and Urban Development by Q1 2014. On establishing or clarifying requirements to ensure that geodetic elevations are accurately measured and recorded to ensure they are maintained prior to stripping, grading and redevelopment”.

On 2014 March 18, the SPC on Planning and Urban Development deferred the Report on the Requirements for Geodetic Elevation Prior to Stripping, Grading and Redevelopment, and directed Administration to report on the progress of a revised lot grading process, including requirements for geodetic elevations, no later than 2014 October 31.

### **BACKGROUND**

The Monitoring Report on Contextual Semi-Detached Dwellings (PUD2013-0030) provided information on the number and uptake of contextual semi-detached dwelling applications, the development permit processing time, compliance with approval conditions, and a summary of the community and industry consultation. The consultation process uncovered concerns and issues with drainage and lot grading.

The Lot Grading Bylaw has been in effect since 2004. The bylaw was enacted to ensure new residential and commercial buildings constructed in Calgary have a properly graded lot with surface drainage directed away from buildings in accordance with approved plans. The bylaw specifies limits for lot elevations and grades. It is the responsibility of the home builder to have a lot grading certificate produced and confirmed by a legal land surveyor, professional engineer or architect. A properly graded lot should ensure surface water flows away from buildings to avoid potential flooding problems and damage to neighbouring properties.

Although the Lot Grading Bylaw includes specifications regarding slopes and lot elevations, Water Resources has confirmed that the Lot Grading Bylaw does not address the discharging of storm drainage between neighbouring parcels. These concerns are not limited to contextual semi-detached dwellings, and apply to other redevelopment situations.

### **INVESTIGATION: ALTERNATIVES AND ANALYSIS**

Water Resources has completed a review of the Lot Grading Bylaw which evaluated the effectiveness of the bylaw. The Bylaw was also benchmarked against three Canadian municipalities (Surrey, Toronto and Edmonton). Three alternative approaches were outlined in the review:

1. Changes to the lot grading bylaw to include maintenance of geodetic elevations: This will not provide a long term solution to the true drainage issues.
2. Develop a two-step lot grading process: Used by Edmonton, this is an expensive solution that will require additional operating funds and FTEs, and may negatively impact development costs and timelines.

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3. Integration of Lot Grading with Drainage: This is a balanced approach where we make changes to the bylaws and integrate lot grading within the drainage management solutions.

The recommendations require revisions to relevant bylaws (Lot Grading Bylaw, Drainage Bylaw, Community Standards Bylaw and Land Use Bylaw), as well as operational changes. The resulting process improvements would yield better stormwater management outcomes.

The review conducted in 2013 of the Lot Grading Bylaw considered whether requirements to maintain geodetic elevations would address lot drainage issues. The investigation concluded that such requirements might not yield the desired outcome of good drainage for a subject parcel and its neighbouring parcels for the following reasons:

- Pre-existing geodetic elevations may create drainage conditions that lead to poor drainage in the vicinity of the foundation and an elevated risk of property flooding.
- Unfavourable drainage patterns and increased runoff to neighbouring parcels can still occur during and after redevelopment, even if geodetic elevations are maintained through stripping, grading and redevelopment.
- Maintaining geodetic elevations prior, during and after redevelopment is one of many factors that can contribute to increased runoff to neighbouring parcels.

In addition, the review confirmed that the requirements defined by the Lot Grading Bylaw are not always sufficient to ensure properly graded lots for all new residential and commercial buildings constructed, as intended. The grading requirements of a parcel influence stormwater management and resulting runoff. However, these requirements are not defined within the context of a comprehensive stormwater management plan. Instead the grades are established in isolation and without regard for the other factors that influence drainage patterns and runoff. Adding new requirements to the Lot Grading Bylaw, such as requirements to maintain geodetic elevations, in the absence of a more comprehensive approach, would exacerbate the challenges with the current bylaws and practices.

## **NEXT STEPS**

Water Resources has initiated a lot drainage improvement project. The goal of the project is to achieve better stormwater management outcomes during and after redevelopment. The primary objectives are:

- Identify the revisions to the relevant bylaws (Lot Grading Bylaw, Drainage Bylaw, Community Standards Bylaw and Land Use Bylaw) needed to meet the intent of the Drainage Bylaw;
- Define changes to stormwater management practices that balance the benefits achieved and the costs incurred by redevelopment projects; and
- Identify the revisions to the development application process needed to support the changes in stormwater management practices.

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Important elements of the lot drainage improvement project will be the review of staffing requirements and impacts on operating budgets. The impacts to the development and building industries will also have to be evaluated in terms of approval processing times and financial impacts.

### **Stakeholder Engagement, Research and Communication**

Stakeholders across Water Resources, Water Services and other key Business Units across The Corporation, such as Local Area Planning and Implementation, participated in the review of the Lot Grading Bylaw. A workshop was also held in April 2014 to identify opportunities to align efforts in drainage and find efficiencies in the current process. This multi-Departmental engagement will continue with the lot drainage improvement project.

The lot drainage improvement project will include engagement with the development and building industries. This engagement will solicit input to both the approvals process and the technical requirements and guidance necessary to achieve better stormwater management solutions. The solutions must address the concerns of lot drainage during and after redevelopment, while not creating barriers to redevelopment.

### **Strategic Alignment**

The lot drainage improvement project is aligned with the goals of the Municipal Development Plan to create high quality, liveable communities. The project will adhere to the Engagement and Triple Bottom Line policies.

### **Social, Environmental, Economic (External)**

These factors will be identified in future reports, according to the selected approach to manage and administer lot drainage.

### **Financial Capacity**

#### **Current and Future Operating Budget:**

Water Resources has sufficient funds to proceed with the lot drainage improvement project. Additional operating funds may be required to operationalize changes to the lot drainage process and practices. The level of funding required will depend on the final choice of process used to manage and administer lot drainage.

#### **Current and Future Capital Budget:**

N/A

### **Risk Assessment**

A risk assessment will be completed as part of the lot drainage improvement project. Identified risks will be communicated.

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**REASON(S) FOR RECOMMENDATION(S):**

Water Resources has completed the review of the lot grading and drainage process. The inclusion of requirements for geodetic elevations alone will not resolve drainage issues. A balanced approach that addresses drainage using the most appropriate best management practices, including but not limited to geodetic elevation considerations, is preferred. Engagement with the development and building industries will be pursued as part of the creation of improved drainage practices for all types of development.

**ATTACHMENT(S)  
Distribution**