

Meeting: August, 10, 2017

Attendees: Xiangfe Li, City of Edmonton Drainage, Anne Stevenson, Jolene Brooks, Angela Vertzaya, Nicole Fraser, Chandra Tomaras, Jan Hardstaff, Bev Zubot, Cathy Mowat

RE: Landscaping & Comprehensive Multi Disciplinary Approach with LID Report Due Aug 22, 2017

Comprehensive Multi-Disciplinary Approach on Low Impact Development That Administration provide a report to Committee on a comprehensive multi-disciplinary approach to low impact development including naturalization and potential changes to appropriate bylaws including links with our climate change adaptation and resiliency work.	Sustainable Dev. Due by: Aug. 22, 2017 Exec. Committee

Ben Henderson made a motion at the April 24 meeting (where they decided on a 70% site coverage maximum), to do a more multidisciplinary review of issues related to landscaping, climate change adaptation, resiliency work and incorporating low impact development strategies to reduce the impact of development. Landscaping should be considered as an important system like a home's heating system or plumbing system. Landscaping includes components that protects the home from flooding, benefiting public infrastructure by reducing storm water runoff and make our communities more livable green spaces. When different components of this system are not in balance, things will not function properly and result in negative consequence. These are some of the landscaping components that must be considered together:

1. **Lot grading – Soil Depth:** Current lot grading requirements for rough grade allow a minimum of 10 up to 15 cm of topsoil. This shallow depth of soil provides very little water holding capacity and rooting depth for lawns and other softscaping and is not a sustainable, LID approach. The minimum of 10 mm is often the norm which discourages deeper rooting of plants required to encourage drought tolerance and reduce dependence on irrigation. Not only are the benefits of increased drought tolerance not realized, there will also be less storm water absorption and bioretention on site. **Sod is often used in softscaping** that is 80-90% Kentucky Blue Grass and has a very shallow root system and goes dormant unless regularly irrigated. Perhaps new home owners should be encouraged to seed a new lawn with a drought tolerant fescue mix.

Many infill sites originally had deeper topsoil. Often along with most or all of the plant material on a site this is removed and replaced with much shallower soil depth which is typical for new greenfield development also. Although shallow soil depth of 10 cm is more economic for developers it misses the opportunity to maximize LID strategies that would reduce storm water runoff and and also reduce potable water used for irrigation. The Alberta Low Impact Development Partnership (ALIDP) of which the City of Edmonton and Epcor are partners, recommends deeper soils 15 – 30 cm to significantly increase storm water absorption in the ever-shrinking softscaping area. This would support more intensive softscaping in a smaller area and absorb and reduce storm water more effectively. The Larch Park has greater depth of soils and City of Edmonton Forestry has noted a significant improvement of boulevard tree performance using soil cell technology that provides a greater root zone potential.

2. **Lot Grading – Drainage: Current requirements for a Lot Grading & Drainage plan when applying for a development permit** ensures homes are not at risk of surface flooding or ponding water and that neighbours of infill are not vulnerable to cross lot drainage from new infill development. This is important.

However, there are some infill properties that received development permits prior to the requirement of a Lot Grading and Drainage Plan whose owners have been left to resolve complicated grading and drainage issues to get final grade approval. Johnston's new infill home with front verandah, at 8932 – 76 Avenue NW, was moved 5 m forward on the lot from the original foundation and is supported on engineered screw piles. Excavated material was spread out over the original slope creating an even steeper grade and covering existing vegetation that previously held the slope. Downspouts at all four corners of the infill home discharge to the surface with the potential of saturating the soil during a catastrophic rain event and increase load at the top of the slope, causing the slope to slump forward. **It is unclear whether a DO did a site visit prior to the development permit being issued, but there should have been a recommendation to have the slope engineered and to have the downspouts directed to a drain that daylights further down the slope. Perhaps an engineer's report should have been required with the development permit to show lot grading and drainage requirements required to address the significant changes in slope.** Recently Johnston's property failed final grade inspection because of the slope with no direction provided regarding what needed to be done to pass.

3. **Storm Water Drainage directed to storm water system** - Some infill homes that previously discharged storm water to surface grade where there was potential for site absorption by softscaping on the lot prior to infill redevelopment have been required to connect directly to the storm water system (eg. 10535 52 Street and 8415 74 Avenue). These properties had potential for surface drainage, but instead valuable rain water is essentially being directed down the drain to the storm water system. What is the reason for converting newly developed infill homes to drain directly to the storm water system?
4. **Site Capture & Storm Water Storage – Are there goals and incentives for development to counter the huge increase in storm water runoff that results with the increase of Impermeable Site Coverage. If not, should there be?** In April 2017 Council approved the introduction of a 70% impermeable site coverage maximum that, although better than 100%, might be viewed as a target by developers. To reduce this impact the City should encourage developers to provide storm water reduction and mitigating measures to delay discharge from the roof so it is occurring after a rain event is over, promote green roofs to slow, absorb and reduce storm water runoff, capture and store storm water (grey water) on site in concrete cisterns (under garage slabs for example) to be used to water lawns, wash cars, flush toilets etc.
5. **Absorbable Site Coverage for Softscaping – Changes to softscaping requirements have resulted in a minimum number of trees and shrubs based on the width of the lot. There also needs to be public education on the importance of site absorption and guidelines that maximize the efficiency of softscaping to absorb and reduce of storm water runoff for a site which should be the objective.** As outlined above this starts with greater soil depth. It may be more sustainable to consider an alternative to increasing the development footprint by alternatively increasing the area of outdoor amenity or living space that can be used for 3 seasons and would include permeable hardscaping and more intensive softscaping. Consideration should be given to using plants with a higher transpiration efficiency and deeper rooting depth and more intensive spacing of plants to maximize storm water uptake.
6. **Consequence of Increased Impermeable Site Coverage** - There is a compound effect and potentially serious consequences that may result from changes to regulations that allow for

significant increases to impermeable site coverage currently occurring with infill development. This needs to be looked at from a sustainable point of view that includes not just the economic benefits of infill, but the environmental consequences and the social change to communities.

Current infill development is allowed a maximum of 70% impermeable site coverage which double the 35% for an average lot.

While this is better than 100%, the consequences are: increased storm water runoff, reduction in the efficiency remaining absorbable landscaping area left over, greater impact on existing public storm water infrastructure – particularly in communities with storm water drainage capacity issues and higher risk of flooding and surface ponding.

A 50% impermeable coverage would be more realistic along with a 35% minimum area for softscaping, allowing for 15% of permeable hardsurfacing materials.

7. **Promote LID strategies that offset development pressures** - Currently Impermeable: Permeable ratios have changed from 1:2 to 2:1 doubling site coverage. The result is also a reduction by half of the absorbable landscaping in the area left which also impacts the potential site absorption of storm water runoff. Frequently development involves the removal of all trees, shrubs and lawns and reduction by more than half the original absorption area left for softscaping, hardly a LID strategy but more convenient and cost efficient from a development point of view. This is replaced by the minimum softscaping requirement to meet requirements of the changes made to the Landscaping Bylaw 55 but what should be required is more intensive and efficient softscaping that reduces storm water runoff and counters the increased site coverage.
8. **Provide education and incentives to ensure an increase in softscaping efficiency and storm water absorption on the site that reduces the impact of an increased development footprint with infill?**
This should include:
 - deeper soils, more absorbable area and more efficient softscaping
 - site capture and storage
 - bioretention swales and raingardens to slow, collect, absorb and reduce storm water,
 - use of technology to store storm water for discharge after a rain event is over,
 - promote green roofs as a viable option to absorb and reduce storm water runoff,
 - ensure the promotion of rain gardens is practical. There needs to be room for the minimum 3 m set back from foundation and with a maximum of 20% front setback and minimum of 3 m from the property line, this is an option that may no longer be practical on most infill sites or new development that has the minimum 3 m setback from the front property line.
9. **What are other economic benefits of making development greener** – softscaping shades, shelters and provides a cooling effect that reduces energy consumption and the heat island effect. Protecting and retaining original softscaping where possible or ensuring an inventory is done and plan to replace as many of the original trees and softscaping as possible. It is also important to preserve and protect boulevard trees to ensure their benefits are not lost which include carbon sequestration and reduction in extreme fluctuations in temperature. Finally, trees and softscaping have psychological benefits to people and ecological benefits to birds and animals who share our communities.

10. **Walk out basements and under grade garages** - a new development in Parkallen includes a walk out basement patio amenity space on 63 Avenue where there is a history of surface ponding and flooding. Flood maps for Parkallen do not reflect the actual flood occurrence in 2004 when most of the catch basins were clogged with hail and debris and there was surface ponding of 1.2 + m in places. Is the historical incidence of local flooding taken into account when permits applications are considered.
11. **How can infill development share solutions with neighbours to improve side yard drainage** – Many lots in mature neighbourhoods have poor original grading because roof leaders once were directed into the storm water drainage system and surface grading was not as much of an issue. Now infill development creates a moat and castle effect and requires some infill to install long retaining walls to create an internal swale that prevents cross lot drainage. **Is there a way for infill developers to work with neighbours to address side yard drainage for both properties at a shared cost similar to building a new fence?**

As a landscaper and horticulturist, I am concerned that development has not been encouraged to embrace LID principles and that sustainable development is not balancing economic, environmental and social benefits for all the citizens of Edmonton is not being promoted.

Instead what I see is a model that provides economic benefits to developers and ignores the other components of the sustainable development model if there is not “market appetite” for the alternative. Is this really the case? Do the residents of these communities want to reduce the environmental and social impact of development in their communities. The answer is: “Yes they do!” Are there people who would support a more sustainable model that promotes development with less environmental and social impacts? “Yes, there are?”

The City of Edmonton needs to determine how to ensure development in general and infill development in particular can be actually sustainable and significant impacts on existing communities and public infrastructure is reduced. The economic value of this in the big picture and in the long term must also be considered along with infill density targets and economic projections.

These are some of the issues I hope your report to City Council will address. I have also attached an earlier outline of this issue presented to Council, April 2017. I look forward to hearing from and eventually, I hope, meeting with you.

Jan Hardstaff
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Parkallen Civics Committee
ALIDP Board Member
EFCL Planning Committee