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Harriet Beale
Municipal Stormwater Planner
Washington Department of Ecology
P.O. Box 47600
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Dear Ms. Beale,

On behalf of the 3,300 member companies of the Master Builders Association of King and Snohomish Counties ("MBA"), I am writing to provide comments on the Department of Ecology's ("Ecology") preliminary draft permit language on low impact development ("LID") for Phase I and Phase II municipal stormwater permits.

At the outset, I would like to re-state MBA's long-held position that we oppose mandatory LID, and we strongly disagree with the Pollution Control Hearings Board's rulings requiring LID throughout Western Washington.

Here in Washington, we already have some of the toughest regulations for stormwater in the country for new development. At the same time, we recognize LID techniques can be effective in naturally treating pollutants in stormwater and believe they should be encouraged where appropriate as a voluntary tool for managing stormwater. That is why we promote LID through our Built Green program and our educational offerings to association members. Instead of forcing even more regulations on builders, we believe there's a lot that can be done to advance LID in the absence of a costly new mandate, including educating builders and the public about LID techniques they could employ, incentivizing builders to use it and removing regulatory barriers to it.

We remain very concerned that mandating LID broadly will inevitably result in improper implementation, failed systems and reduced confidence in LID techniques by the engineering community, local governments, developers and the public.

Furthermore, focusing too much attention on LID as a mandate, ignores the ongoing stormwater runoff issues caused by existing development – that is, the majority of homes, businesses, industrial sites, roads that on the ground today – built prior to 1990, before today's regulatory framework for stormwater and flow control was in effect.

However, we recognize Ecology is obliged to follow the PCHB rulings, and we appreciate having this opportunity to provide input during the informal public comment period.

Section 3 – Applicability of the Minimum Requirements (p. 8 of the Phase II Appendix I – Minimum Technical Requirements…document).

The thresholds that Ecology proposed *previously* for the Phase II Municipal Permit would apply to "new development, redevelopment, and construction site activities that result in land disturbance of equal or greater than one acre." However, we note with much concern that the current Phase II site and subdivision proposal eliminates the one-acre threshold in applying the minimum requirements.

We do not agree that the current Phase II proposal should apply LID requirements to such small sites. Forcing LID requirements on small sites will dramatically increase engineering costs and require local jurisdictions to review the engineering design, implementation and maintenance. While cost is a significant issue for projects of all sizes, this is especially true of smaller projects.

Furthermore, we note that the draft permit language states "Compliance during this permit term shall be determined by achieving at least 80% of scheduled inspections." While we appreciate the fact that Ecology recognizes the significant challenge that will come from eliminating the one-acre threshold, we cannot help but wonder whether this would be setting up a situation in which some projects would be held to different standards than others?

We believe the appropriate action is to exempt smaller projects from LID requirements altogether so as not to impose these additional inspections, implementation and maintenance burdens on project applicants and local governments.

Amended M.R. #5 – On-site Stormwater Management (p. 20 of the Phase I Appendix I – Minimum Technical Requirements…document)

Ecology Text Box Question: Should permeable pavements be included in the…list of required on-site management BMP's that apply to projects subject only to requirements #1-#5?

MBA Comment:
Applying this requirement together with all the other listed BMPs for smaller projects that trigger only Minimum Requirements 1-5 would be excessive. If most or all of the rainwater can be addressed by one rain garden, a dispersion BMP and a soil quality BMP, for example, then no additional BMPs should be required when no additional benefit is realized.

In some cases, permeable pavement may be a better solution to a rain garden either for technical, aesthetic or other reasons. Just adding permeable pavement is a burden in general, but if it were added to a list of potential options, then it would be beneficial by offering more flexibility.

Requiring all five BMPs to be applied is not reasonable. When an applicant can show that stormwater can be managed through a select number of BMPs, then the goal has been achieved.

Amended M.R. #5 (p. 21 of the Phase I Appendix I – Minimum Technical Requirements…document)

Ecology Text Box Question: Should Ecology allow local governments to accept LID performance standard compliance as an option to the specific BMP requirements as listed below for projects in this size range?

MBA Comment:
Yes, local governments should be allowed to accept the LID performance standard as an option for these projects. We should not limit the potential range of solutions for these projects to a pre-determined set of

allowable LID techniques. Effective LID implementation depends too much on individual site geology and characterization to be done responsibly through a checklist on sites requiring runoff treatment, flow control, wetlands protection, basin/watershed planning and operation and maintenance agreements. For these types of projects, we believe that cities and counties are best suited to determine how to meet the hydrologic performance standard in their jurisdictions. More flexibility is needed in these cases.

Sect. 7 – Basin/Watershed Planning (p. 32 of the Phase I Appendix I – Minimum Technical Requirements…document and pp. 12-17 of the Phase I Explanatory Notes)

MBA comment:
We remain concerned that a basin-planning requirement would be a costly burden to place on locals and would ultimately only serve to add another layer of costs and regulations on project applicants that are excessive, especially given the very stringent Performance Standard Ecology is proposing. In particular, the minimum requirements that would be imposed on locals to implement water quality and mitigation analyses of the basin scale approach would be costly to implement. Additionally, the proposal to use an 80-acre UGA expansion as a trigger for basin planning appears to us to be rather arbitrary.

We do not believe a basin planning requirement should be part of any new LID standards. The result of such a requirement would be to create another regulatory overlay that conflicts with key Growth Management Act ("GMA") and other land use requirements, creating confusion and thwarting our state and regional efforts to manage and plan for growth in a responsible manner. If a basin planning effort does remain in the permits, then we recommend a minimum of 160 acres (1/4 section) as a more reasonable size to trigger the plan.

Also, we are hoping Ecology could explain what is meant by "Growth Management Act public process" under the "Minimum performance measures" heading of the Basin/Watershed Planning Section? Does this refer to the process for adopting new LID standards, and that such development standards must be adopted under the local jurisdiction's GMA public process?

Sect. 8 – Feasibility Criteria for Selected LID BMPs (p. 33 of the Phase I Appendix I – Minimum Technical Requirements…document)

I.A. of this section states: *"Bioretention BMP's and Rain Gardens are considered infeasible where…the field testing indicates potential bioretention/rain garden sites have an initial native soil saturated hydraulic conductivity less than 0.15 inches per hour. In these instances bioretention/rain gardens can be built with an underdrain."*

MBA Comment:
The underlying infiltration rate of the native soil and effects to infiltration capacity due to construction activity are extremely important factors with regard to LID. Based on specific feedback we have received on this topic from MBA member and LID process participant Curtis Koger, L.G., L.E.G., L.Hg. of Associated Earth Sciences (see below), we are very concerned that the proposed infiltration rate of 0.15 inches per hour is too low. It is our understanding from Curtis that as rates go down, the potential for facility failures increases dramatically. We believe this threshold needs to be higher and urge Ecology to review and consider Curtis' thoughtful comments on this particular issue:

> *There are multiple concerns related to infiltration rates in general, and in many cases this is especially true when infiltration rates are low. Some of these include: 1) fundamental understanding of the geologic/hydrogeologic setting and fate of infiltrated storm water, 2) the test method used to determine an appropriate rate, 3) the impact of ground water*

mounding on assumed infiltration rates, 4) selection of appropriate correction factors for design, 5) bioretention soil characteristics, and 6) maintenance.

In low infiltration rate settings, the potential for shallow horizontal flow instead of deep vertical downward flow increases significantly. This can result in significantly more surface water flow in the shallow storm water system than assumed in the design since surface water models normally assume the ground water "lost" to infiltration will not re-emerge. The horizontal flow can adversely impact surrounding buildings/infrastructure or result in offsite slope failures. The Ballard rain-garden project failed in part due to the lack of recognition of the fundamental shallow flow characteristics (interflow) associated with very low permeability parent material (lodgement till). Field test results from the project indicated adequate flow rates for design of bioretention facilities. However, the analysis failed to account for the controlling infiltration rates of the underlying fresh unweathered lodgement till, the effect of ground water mounding during periods of extended rainfall, and interflow contributions from upslope areas. It is extremely important to understand that these facilities are being designed to perform a critical infiltration function. They must be designed with the care necessary to meet infiltration facility design criteria in order to avoid unintended adverse impacts. Infiltration into the underlying receptor horizon can also be adversely affected by the bioretention soils. The current design mix criteria contain a significant percentage of fines and organics. Multiple projects observed in the past 2 to 3 years have exhibited infiltration failures that can be traced directly to the bioretention soil mix, even though testing indicates the soil mix meets all of the current criteria for use in bioretention facilities. Transport of some of the fines through the amended soil combined with a buildup of biological "scum" has resulted in development of a flow barrier at the interface between in-situ sediments and the imported soil. This flow barrier can significantly reduce the effective infiltration rate, causing excessive ponding times which effectively results in failure of the infiltration system.

In my opinion the low end of the "Required" bioretention system design should be in soils capable of 0.5 in/hr or higher. At the minimum it should be allowable to design subdrains into the bioretention systems for conveyance of excess flows to a suitable detention facility or other "centralized" system as needed to avoid unintended adverse impacts.

Bioretention facilities form the backbone for the future of flow control as currently proposed. They must be treated as critical facilities, and the designs must be based on adequate and realistic technical data beginning with proper characterization of subsurface conditions. Short cuts are not recommended.

It should also be noted that the soil testing method used is a very important consideration. There is a fairly significant difference between testing that occurs in a soil's pre-development/pre-disturbance state vs. native soil that has been excavated, moved, placed for a road, etc. and then tested. The resulting rate of infiltration for the latter testing method will be significantly less. If a post-disturbance soil is tested to show a 0.15"/hour or greater infiltration rate in the post construction state, then the criteria might be considered more reasonable.

Expecting a soil to behave the same before and after disturbance from development or other actions simply isn't physically possible. The criteria needs to be either increased in the pre-disturbance state, or the state of the testing must be changed.

Curtis Koger offers his rationale for why large-scale in-situ testing is more representative of infiltration rates, as follows, which we urge Ecology to consider:

Large-scale in-situ testing is more representative of infiltration rates. Reasoning includes:

1) In-situ testing avoids disaggregation of the receptor horizon. The inherent sediment density, small scale laminations, bedding, cementation, pore throat connectivity and other physical elements remain intact. Disaggregation during sampling and testing using grain size methods means the in-situ stratification, including very small scale laminae or "thin bed" permeability barriers are completely destroyed by sample collection and testing. In addition the implications of effective pore throat size and shape in glacially consolidated deposits and cemented units is lost.

2) The scale of the test is important. Small scale EPA or ASTM Double Ring Tests use small volumes of water and have a small radius of influence. They are suitable for determining agricultural irrigation applications or for design of drainfields when the water source is limited and supplied in discrete doses. Large scale testing expands the area of influence and uses much larger volumes of water. Small scale tests typically use only a few tens of gallons of water. Large scale testing commonly uses hundreds to thousands of gallons of water. The larger radius of influence is more representative of average in-situ conditions and can "feel" the effects of shallow or other "near field" flow barriers. This is especially important when used in fine to medium sand units or when testing in the interflow zone above low permeability units such as lodgement till since flow barriers can restrict vertical downward flow resulting in significant horizontal flow. Since mid-winter multi-day storm systems generate large volumes of runoff with saturated antecedent soil conditions, field test methods using large volumes of water are needed to provide an initial estimate of likely full scale performance.

3) Once the large scale in-situ test has been completed it is important to over-excavate the test pit and observe the location and degree of perched water resulting from the test. This provides direct visual information regarding the degree of heterogeneity of the receptor horizon. The amount of water used in small-scale tests is too limited to provide a realistic evaluation of test induced flow barriers.

4) Comparison testing proves small-scale tests are inadequate. We have completed field infiltration rate comparison tests using both small-scale methods (EPA falling head and/or ASTM Double Ring) and large-scale test methods. The in-situ rate for the large scale method was typically in the range of 2 to 10 times LOWER than the EPA or Double Ring method.

5) Volume III Figure 3.28 of the Ecology Manual clearly demonstrates it is not unusual for grain size methods or small-scale test methods to indicate unrealistically high infiltration rates relative to actual full-scale performance. The large scale test method, especially when combined with a realistic understanding of deeper subsurface soil and ground water conditions, can provide a reasonable estimate of long term performance with less uncertainty in the amount of correction needed to determine final design rates.

I.B. Permeable Pavements… (p. 34 of the Phase I Appendix I – Minimum Technical Requirements…document)

MBA Comment: The use of permeable pavement should be determined on a case-by-case basis. There are an endless combination of soil type, ground water, road gradient, utility, adjacent property, traffic load and other requirements/constraints that will make required application of permeable pavement an unwise choice.

Road designs require a certain level of compaction to preserve the pavement section and must be able to support wheel loads without creating possible settlement and pavement failure. It is also very difficult to control future damage to the infiltration system by utility crews. How can soil that is compacted to 95 percent density possibly infiltrate even if it only infiltrated at 0.15" hour in its native un-compacted state?

We are very concerned about requiring storm water to be infiltrated below pavement without careful consideration of all of the above factors on a case-by-case basis.

Sect. 8: II. – Competing Needs (p. 36 of the Phase I Appendix I – Minimum Technical Requirements…document)

Text Box Question: Ecology would appreciate comments concerning the type of competing needs that can be considered as a defensible reason to forego use of an on-site stormwater management BMP.

MBA Comment: The list of competing needs that would allow applicants to forego use of an on-site stormwater management BMP should be expanded to include economic considerations. Any significant increase in cost due to LID requirements can mean the difference between whether a project moves forward or not and should be taken into consideration.

In many cases, it might be technologically "feasible" to meet higher water quality standards to reduce pollutant discharges. But what if the required technology is 10 percent, 50 percent or 100 percent more expensive than applying traditional storm water management techniques? At what point does something that is technologically feasible become financially impracticable? The draft permit language currently does not address this issue, and we believe it should.

Another issue related to cost that should be considered is the potential impacts to Growth Management Act compliance. What if it is determined that meeting the new LID standards is 30 percent more expensive and, as a result, projects are not developed (because they don't "pencil")? That could potentially impact whether properties designated for future growth actually get developed and make it more challenging to meet density objectives and provide housing necessary to meet growth.

We urge Ecology to create a user-friendly waiver or exception process that allows project applicants to justify why LID is not practical or feasible on a given site. Project proponents must have the ability to address economic considerations and other site-specific concerns.

On a related note, Section 4 on page 2 of the Phase II Preliminary Draft Language indicates that LID requirements will apply also to "public developments, including roads." Now, at a time of reduced revenues and budget shortfalls, we are concerned about further increasing the cost of public projects by mandating more expensive LID requirements on these projects. We believe Ecology should consider allowing a cost benefit analysis to determine the economic feasibility of requiring LID for these projects.

Implementation Issues

We are concerned that private utilities (and perhaps some of the public utilities) – sewer, water, electrical, phone, cable, etc. – 1) are uninformed about pending LID requirements and 2) when they do hear of them, will be unwilling/reluctant to change their own construction policies and standards to conform to the new reality.

We are also concerned that the easy answer for utilities when they accept the fact that their lines will be placed under LID roadways, sidewalks, and so on will be to require additional sheathing/different

placement or design of their lines, and/or some other expensive new standards for development to have to follow. This would result in more expense for the homebuilding industry (and ultimately homebuyers) and unnecessary confusion and frustration.

Additionally, we are concerned that the new LID requirement will add multiple inspections that are not currently required. This could drive up inspection fees charged to property owners and developers, further increasing the costs of developing within designated urban growth areas.

Records of Inspections and Enforcement Actions:

The draft permit states that "*Permittees shall keep records of all projects of any size that are part of a common plan of development or sale that is greater than one acre that are approved after the effective date of this Permit.*"

As a point of clarification, we would like to know what is meant by "projects of any size that are part of a larger common plan of development or sale?" Is Ecology suggesting with this language that permittees should require a cumulative impacts analysis? What if a developer has projects located ¼ mile away from each other. Would they be considered part of a "larger common plan of development or sale"?

If Ecology is, in fact, contemplating a cumulative effects requirement with this language (at least for stormwater) that otherwise does not exist under SEPA, then we would strongly oppose this section.

Thank you for your consideration of our comments on this important issue. We appreciate the opportunity to provide feedback on LID. Please do not hesitate to contact Allison Butcher at (425) 460-8223 or abutcher@mbaks.com, or Jennifer Jerabek at (425) 460-8240 or jjerabek@mbaks.com, should you have any questions.

Sincerely,

Samuel L. Anderson
Executive Officer