



LSRCA FIRST DETAILED DESIGN SUBMISSION ENGINEERING REVIEW

231 to 249 Reach St – Uxbridge (SD-222800-051618)

16-JUNE-2021

#	Report/ Drawing	Section	Pg#	LSRCA COMMENT (16-JUNE-2021)	APPLICANT RESPONSE (DATE)
<p>Documents Reviewed (16-JUNE-2021):</p> <ul style="list-style-type: none"> • SWM REPORT: Sabourin Kimble, “Stormwater Management Design Brief”, dated March 2021 • ENGINEERING DRAWINGS: Sabourin Kimble, Engineering Drawings, engineer stamp dated 26/03/2021 • GEOTECHNICAL REPORT: Sirati & Partners Consultants, “Report on Preliminary Geotechnical Investigation”, dated April 27, 2018 • HYDROGEOLOGY REPORT: Palmer, “Hydrogeological Assessment”, dated March 11, 2021 <p>Background Information:</p> <ul style="list-style-type: none"> • Not regulated • 2.7 Ha (Developable Area) • 2.27Ha (External Area) • Rear yard infiltration swales – into – perforated storm sewers – into – infiltration galleries (Stormtech Chambers) • OGS: STM MH5 – OGS FD-6HC STM MH18 – OGS FD-6HC STM MH17 – OGS FD-6HC • Storm sewer to capture all flows (up to and including the 100-year event) and releases controlled (via orifice plates) • Sandy Soils – proposing to infiltrate 40mm from all the impervious areas • Infiltration Rate of Soils – 72mm/hr (with the applied 2.5 factor it is 28.8mm/hr) • Site outlets into an existing storm sewer system which feeds into the existing Estates of Avonlea SWM pond • External drainage areas have not been accounted for in the LID design but were accounted for in the chamber sizing 					
E1	General			<p>Applicable Policies:</p> <p>Please note the Lake Simcoe Protection Plan policy 4.8DP and LSRCA’s Phosphorus Offsetting Policy are applicable.</p>	<p>Acknowledged.</p> <p>Noted.</p>
E2	Design Brief			<p>Existing Woodlots:</p> <p>Please clarify how the existing woodlots, at the northwest corner and eastern limits of the site, are and will be supported hydrologically (groundwater,</p>	<p>A memo from both Beacon Environmental and Palmer Environmental Consulting Group Inc. have been enclosed with this submission to support the post-development drainage area to the northwest woodland from both an</p>



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				<p>overland, etc.) in pre- and post-development conditions.</p> <p>Ideally, drainage to the woodlots must be maintained, as closely as possible, in post-development conditions to those in existing conditions.</p> <p>Please provide supporting documentation and calculations.</p>	<p>environmental and hydrogeological perspective. Both memos conclude that there are no concerns with the proposed post-development drainage conditions.</p> <p>With respect to the northeast woodlot, existing drainage conditions will be maintained, so no further analysis is required.</p>
E3	Design Brief	3.1	5	<p>Table 1:</p> <p>Please revise the phosphorus loading criteria outlined in Table 1.</p> <p>As per section 2.3.2 of the <i>LSRCA Technical Guidelines for Stormwater Management Submission, September 1, 2016</i> the removal of 80% of the annual Total Phosphorus load from the entire development is required. Plus, as per <i>LSRCA's Phosphorus Offsetting Policy, May 2019</i> a "zero export target" must be achieved. These two phosphorus criteria are applicable to the subject site.</p>	<p>Phosphorus loading criteria outlined in Table 1 has been revised to include the two phosphorus criteria from the LSRCA Technical Guidelines for Stormwater Management Submission and LSRCA's phosphorus Offsetting Policy.</p> <p>Detailed calculations regarding the phosphorus offsetting policy can be found in Palmer Environmental Consulting Group Inc.'s Hydrogeological report under Section 3.5.</p>
E4	Design Brief			<p>SWM Criteria:</p> <p>Please reference the "<i>Stormwater Management Master Plan – Uxbridge Urban Area and Hamlet of Coppin's Corners, Township of Uxbridge, ON</i>", prepared by Stantec dated May 2016 to ensure the subject site's stormwater design has considered all applicable criteria.</p> <p>The SWM report must reference the master SWM</p>	<p>The criteria outlined in the Uxbridge SWM Master Plan has been referenced in the SWM brief. The applicable criteria and discussion on how the criteria have been has been included in Section 3.0.</p>



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				<p>plan.</p> <p>Please confirm if any additional SWM criteria are required or if any need adjusting based on the review of the Master Plan.</p>	
E5	Design Brief	Appendix B	86 of 223	<p>VO Modelling (Post-Development Model (SKA)):</p> <p>Please confirm and provide an explanation why soak-away pits are being accounted for in the overall modelling for the existing downstream SWM pond.</p> <p>Please refer to section 2.2.1 (Peak Flow Control) of the SWM guidelines as infiltration measures may be considered for peak flow control credits, subject to conditions as described in Appendix B.</p>	<p>Discussion supporting the use of the soak-away pits in accordance with Appendix B of the LSRCA's SWM guidelines has been provided in Appendix B of the SWM brief.</p>
E6	Design Brief	Appendix C	175 of 223	<p>Storm Sewer Design Sheet:</p> <p>According to the calculations in Appendix E the storm sewers and storage chambers have been sized to accommodate the external area of 2.27 in addition to the developable area of 2.7ha.</p> <p>As such, please consider showing the external drainage area of 2.27ha (as shown on the drainage area plan, page 174) on the storm sewer design sheet (page 175 of 223).</p>	<p>The 2.27ha of external drainage has been shown in the storm sewer design sheet.</p>
E7	Design Brief			<p>External Drainage:</p> <p>Please explain where (location) and how (infrastructure) the external contributing drainage area of 2.27ha will enter the minor and major storm sewer system.</p>	<p>The external drainage area will be captured in the rear yard catchbasins that are adjacent to the existing woodlot. All flows will be captured into the minor system. The receiving storm pipes have been sized appropriately to convey the 100-year flows from the external drainage area, as shown in the storm sewer design sheet.</p>



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				As previously mentioned in the FSR comments, please justify the reason for excluding the flows from external drainage areas from the LID design calculations for rear yard LID 1 and 2.	The infiltration targets for the subject site are based off of the LSRCA's volume control criteria, which pertains to drainage from within the development limits only. As no credit would be given for oversizing these facilities to infiltrate external drainage, an overflow has been provided to simply overflow any flows in excess of the infiltration gallery's capacity out to the storm sewer.
E8	Drawing SD-3 (LID Capture Boundaries) AND Appendix D			<p>LID Drainage Areas:</p> <p>Please ensure there is consistency between the values presented on drawing SD-3 and the LID calculations presented in Appendix D (pages 177 to 194).</p> <p>For example: Rear yard LID #1 shows a capture area of 0.14ha with a total area of imperviousness of 1050m² in Appendix D. However, the drawing indicates the total capture area is 0.12ha with a total impervious area of 0.09ha.</p> <p>In your response, please indicate which material has been adjusted and which page number to reference.</p>	Drawing SD-3 has been removed from the Drawing set and replaced with Figure 2 – LID Drainage in the SWM brief. All values shown on this drawing are consistent with the calculations in Appendix D, and a summary table has also been added to Figure 2. All the values have been modified slightly since first submission as the size of the infiltration galleries have been minorly adjusted.
E9	Appendix D			<p>Contributing Drainage Area to Rear Yard LIDs:</p> <p>It appears the contributing runoff (from the roof and grassed surfaces) will enter the perforated pipe system via rear lot catchbasins.</p> <p>Typically, LIDs are designed to capture the entire contributing drainage area. Based on the calculations in Appendix D only the impervious</p>	The LIDs are sized for the impervious areas only, as that is what the infiltration target volume is based off of. As mentioned previously in the response to comment #E7, if additional runoff from the pervious area were to drain towards the LIDs, an overflow to the storm sewer has been provided in all RLCBs.



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				<p>area has been accounted for.</p> <p>Please provide an explanation why the entire catchment area (plus the external drainage area) were not accounted for in the LID design.</p>	
E10	Drawing SD-3 (LID Capture Boundaries) AND Appendix D			<p>Inconsistency Information:</p> <p>On page 182 (perforated pipe #2 calculations) – the LID capture area is 0.12Ha however on the drawing SD-3 the area is shown as 1.58ha. Please confirm and check for consistency.</p> <p>Perhaps two LID catchment capture boundaries drawings are necessary to display all the information appropriately (one for rear yard LIDs and perforated pipes, and one for the storm chambers).</p> <p>Unfortunately, it is very challenging for LSRCA staff to confirm numbers, calculations, etc. as such we will further review this information upon resubmission.</p>	<p>Drawing SD-3 has been removed from the Drawing set and replaced with Figure 2 – LID Drainage in the SWM brief. All values shown on this drawing are consistent with the calculations in Appendix D, and a summary table has also been added to Figure 2.</p> <p>Drainage to rear yard infiltration galleries have been highlighted in blue, drainage to the perforated pipes in pink and drainage to the StormTech Chambers in green. It should be noted that these facilities are all in series. Rear yard infiltration galleries are the most upstream facility and all drain into a perforated pipe system within the ROW, which all drain into a StormTech Chamber.</p>
E11	Drawing SD-3 (LID Capture Boundaries) AND Appendix D			<p>Catchment Area Information:</p> <p>Please provide the total impervious area and total internal area values for all the perforated pipes.</p> <p>For example, on drawing SD-3 the reader does not know how much area is draining into the perforated pipe system #3 (rear lots of blocks 7, 8, and 9).</p> <p>Please revise drawing SD-3 for all the applicable areas / LIDS.</p> <p>Please ensure the information presented on the</p>	<p>Drawing SD-3 has been removed from the Drawing set and replaced with Figure 2 – LID Drainage in the SWM brief. The area and runoff coefficient for each subcatchment has been noted on the Figure and a summary table has also been added that lists the total impervious area tributary to each facility.</p>



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				drawing matches the calculations and tables within Appendix D.	
E12	Design Brief			<p>ETV Stormceptor Sizing:</p> <p>As per section 3.3.4.1 of <i>LSRCA Technical Guideline for Stormwater Management Submission</i> (September 1, 2016) only oil / grit separators units verified and <u>sized</u> through the Canadian ETV (Environmental Technology Verification Program) are allowed.</p> <p>The units must provide 80% TSS removal, as per LSRCA's criteria.</p> <p>Please ensure the proposed OGS units are sized according to ETV standards. Please submit supporting sizing calculations.</p>	ETV standards and OGS sizing calculations have been included in the appendix. It should be noted, however, that the OGS is for pre-treatment to promote the longevity of the storm chamber system only, all quality control will be treated at the downstream pond which has been sized for 80% TSS removal.
E13	Design Brief			<p>External Drainage:</p> <p>As per section 2.2.4 of the SWM guideline, where there is an external drainage area flowing through a site, it is the developer's responsibility to demonstrate safe conveyance of the Regulatory storm, through the development site to a sufficient outlet.</p> <p>Please provide supporting documentation, design, and calculations demonstrating safe conveyance of the external land, 2.27Ha.</p>	<p>A VO model was developed for the external drainage area to model the external drainage area under Regional Storm Event conditions. This model shows that the peak flow is 0.241m³/s. Supporting calculations and the model output has been included in Appendix C.</p> <p>The 100-year flow calculated in the storm sewer design sheet for the external drainage area is 0.451m³/s. Therefore, the 100-year storm event is the governing Regulatory Storm event for this drainage area.</p> <p>The storm sewer system has been sized to capture and convey this 100-year flow as shown in the storm sewer</p>



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					design sheet which is included in Appendix C. Therefore, safe conveyance has been provided for the Regulatory storm.
E14	Drawing SG (Overall Site Grading Plan)			<p>Reach Street:</p> <p>It appears that some grading works within the road right-of-way (ROW) of Reach Street will be carried out as a part of the proposed development. Please discuss the proposed grading within the ROW and demonstrate that the proposed grading will not impact the road drainage and/or adjacent properties.</p>	The proposed works will not impact any existing drainage patterns. The Reach Street ditch is to be maintained at existing elevations with the removal/addition of several culverts to maintain conveyance.
E15	ESC Drawing			<p>Erosion and Sediment Control:</p> <p>Please place LSRCA ESC-1 detail as per Appendix G of <i>LSRCA Technical Guidelines for SWM</i> on the erosion and sediment control plan.</p>	The detail has been added as requested.
E16	Hydrogeological Assessment & Design Brief	Appendix E	Page 79 out of 109	<p>Phosphorous Loading:</p> <p>LSRCA agrees with the computed post-development (with BMPs) phosphorus loading of 0.22 kg/yr (as outlined in the design brief, page 13).</p> <p>As per LSRCA's <i>Phosphorus Offsetting Policy, May 2019</i> a "zero export target" must be achieved.</p> <p>Where the phosphorus load cannot be met or demonstrated in a post-development scenario to achieve the Zero phosphorus, the developer or proponent shall be required to provide phosphorus offsetting to the LSRCA.</p>	<p>Detailed calculations regarding the phosphorus offsetting policy can be found in Palmer Environmental Consulting Group Inc.'s Hydrogeological report under Section 3.5.</p> <p>Reference to these calculations has been made in the SWM brief in Section 3.8.</p>



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				Please submit the offsetting calculation as per section 4.4.3 of the LSRCA's <i>Phosphorus Offsetting Policy, May 2019</i> .	
E17	General			General Info: Please ensure that a complete response to each comment is to be provided with the next submission outlining how each comment has been addressed and where in the text of the report or appendices the comment has been addressed.	Provided in this response matrix.
E18	General			General Info: Please note that additional information has been requested as noted above for LSRCA to further review the application. Once this information has been provided, additional comments will be forthcoming.	Acknowledged.
Submission/Resubmission Requirements: <ol style="list-style-type: none">1. A completed response matrix which includes a detailed response outlining how each of the comments above have been addressed with reference to applicable reports/drawings (i.e. specific sections/pages/details or tab identifiers).2. The response matrix is to also include a summary of any additional changes to the design (i.e. in addition to those not identified in the detailed response to comments, and includes changes to reports, drawings, details, facility design, etc.).3. All drawings are to be folded (8.5 x 11).4. Reports and engineering drawings/details are to be signed and sealed by a Professional Engineer.5. Reports are to include a digital copy of applicable models on a Data CD or USB Thumb Drive.6. All submissions/reports are to include applicable technical components which achieve the minimum requirements outlined in the LSRCA Technical Guidelines for Stormwater Management Submissions, September 2016.					
Important Notes and References:					



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1.				Please contact the LSRCA to scope any required Environmental Impact Study or Natural Heritage Evaluation	
2.				The stormwater management submission is required to be prepared in accordance with “LSRCA Technical Guidelines for SWM Submissions” https://www.lsrca.on.ca/Shared%20Documents/permits/swm_guidelines.pdf	
3.				Submissions are to be in accordance with the LSRCA Watershed Development Guidelines https://www.lsrca.on.ca/Shared%20Documents/permits/watershed-development-guidelines.pdf?pdf=Watershed-Development-Guidelines	
4.				The hydrogeological analysis is required to be prepared in accordance with “Hydrogeological Assessment Submissions: Conservation Authority Guidelines for Development Applications” https://www.lsrca.on.ca/Shared%20Documents/permits/hydrogeological%20_guidelines.pdf?pdf=Hydrogeological-Guidelines	
5.				Where the LSPOP applies, submissions are to be in accordance with the LSPOP found here: https://www.lsrca.on.ca/watershed-health/phosphorus	
6.				Low Impact Development Treatment Train Tool can be found here: https://www.lsrca.on.ca/Pages/LIDTTTool.aspx	
7.				LSRCA Review Fees can be found here: https://www.lsrca.on.ca/permits/permit-fees	



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| RESERVOIR(0085) |
| IN= 2---> OUT= 1 |
DT= 1.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.2560	0.0427
0.0390	0.0003	0.3340	0.0542
0.0650	0.0049	0.3650	0.0594
0.0830	0.0142	0.3770	0.0614
0.0880	0.0193	0.3880	0.0634
0.1330	0.0285	0.3990	0.0652
0.1720	0.0336	0.4140	0.0679
0.2210	0.0393	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0095)	4.760	0.285	6.27	19.34
OUTFLOW: ID= 1 (0085)	4.760	0.088	6.83	19.34

PEAK FLOW REDUCTION [Qout/Qin](%)= 30.94
TIME SHIFT OF PEAK FLOW (min)= 34.00
MAXIMUM STORAGE USED (ha.m.)= 0.0193

**** WARNING : HYDROGRAPH WAS CUT. CHECK VOLUME.