



LSRCA ENGINEERING AND HYDROGEOLOGY REVIEW
 216 and 226 Brock St. E, Uxbridge (APID 223153 and 223097) (Westlane)
 May 21, 2019

#	Drawing	Section	Pg#	LSRCA Comment (May 21, 2019)	Applicant Response (April 14, 2021)
ENGINEERING REVIEW					
Documents Reviewed: Westlane Development Group Ltd., Functional Servicing and Stormwater Management Report Brock Street and Nelkydd Lane, Township of Uxbridge, dated March 2019, prepared by Cole Engineering Group Ltd.					
E1		General		Please provide preliminary Erosion and Sediment Control plans for the proposed development.	ESC Plans have been provided.
E2		General		The proposed SWM infiltration facilities will need to be within a municipal easement/agreement and include an appropriate maintenance access.	Noted. The infiltration facilities will be part of a municipal agreement and include appropriate maintenance access.
E3		1.2	2	Section 1.2 states that the site is bound by a residential subdivision to the east. It appears that at the east side of the proposed site, there is an access road to a Golf Course. Please check and update the text in the report accordingly.	Noted the text has been updated.
E4		2	2	The proposed development consists of a townhouse development with a 10m wide and a 15m wide headwater drainage feature. Please demonstrate that the proposed drainage feature can convey the combined flows from the stormwater management pond and flows from external area (EXT1) without impacting the proposed development.	Refer to the Geomorphix report in Appendix A for details of conveyance.
E5		3.1	2	Please provide Town of Uxbridge's IDF data.	The Town of Uxbridge's IDF data is shown in Appendix B.
E6		3.2,4.1	3, 5	Please note that the Volume control as per Section 2.2.2 (page 7) of the LSRCA Technical Guidelines for Stormwater Submissions (2016)	Volume control has been added in Section 3.4.4 of the Report and it has been added to the design criteria.



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				will be required for the proposed development. Please provide a functional design demonstrating how the volume control criteria will be achieved for the proposed development.	Volume control will be achieved via the infiltration trenches and the soak away pits.
E7		3.2, 4.1	3, 5	Please discuss erosion control requirements for the proposed development, within the Functional Servicing and Stormwater Management Report.	Erosion and sediment control requirements for the proposed development have been included in the Stormwater Management Report.
E8		3.2, 4.1	3, 5	Please note that the Lake Simcoe Phosphorus Offsetting Policy (LSPOP) will apply to the proposed development.	The LSPOP has been added to the design criteria and discussion on how it will be met is in Section 3.4.5 of the SWM report.
E9	DAP-1	4.2	5	Please identify the flow direction of flows from Coral Creek Homes (Existing SWM Pond and EXT1) on DAP-1	The flow direction from Coral Creek Homes (existing SWM Pond and EXT1) has been shown with Overland flow arrows on DAP 1.
E10	DAP-1	4.2	5	Table 4.1 shows the Runoff Coefficient as 0.3 for area A1Pre. Drawing DAP-1 shows runoff coefficient as 0.45 for Area A1Pre. Please update the text in the report, drawings and calculations accordingly.	Figure DAP1 has been corrected to show a runoff coefficient of 0.30.
E11		4.2	6	Please provide background information on the design of the existing Coral Creek Homes Stormwater Management Pond, including the uncontrolled and controlled flows from the existing SWM Pond.	Drawing ST-01 and Drawing SW-01 have been included in Appendix B that illustrate the controlled flows from the pond and the drainage areas. There are no other documents made available.
E12		4.2 Appendix B	6	The formula for calculating the rainfall intensity in Appendix B (A1 Post Flow Calculation) appears to be incorrect. Please check and update the formula, calculations and text in the report accordingly.	Noted the formula has added a negative sign in front of the C value.



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E13		4.3, 4.4.1	6, 7	Section 4.3 and 4.4.1, the Street name 'Brock Street S' appears to be incorrect, please check and update the Street name.	Noted this has been updated.
E14		4.3	6	Drainage area A2Post will discharge uncontrolled onto Brock Street. Please demonstrate that the flows from proposed development will not have any impact on the existing storm conveyance system along Brock Street.	The flow from A2 Post are in conformance with the Stormwater Conveyance Report for Brock Street. An excerpt of the conveyance report has been included in Appendix A. As the controlled flow is well below the target flow to the storm sewer the slight uncontrolled flow of 39 L/s will not have an impact on the existing storm conveyance system along Brock Street. The total flow is 860 L/s from the pond + 187 L/s from External Area + 278L/s from the site, which is 1325 L/s. 1325 L/s which includes the uncontrolled area is much less than 1505 L/s target flow to the storm sewer.
E15		4.3	6	Section 4.3 states that Drainage area A3Post will be discharged at a controlled rate to a storm sewer under Brock Street East that drains to a naturalized channel to the north. Please demonstrate that the storm sewer under Brock Street was designed to accommodate the controlled flows from the proposed development as well as the uncontrolled flows from external area and 100-year flows from the existing stormwater Management Pond.	The flow from A3 Post are in conformance with the Stormwater Conveyance Report for Brock Street. An excerpt of the conveyance report has been included in Appendix A.
E16	DAP-2	4.3	6	Please note that the information provided on DAP-1 and DAP-2 is consistent in terms of external areas and flows. Please update the text in the report and drainage area plans accordingly.	DAP2 has been updated to show the external area. Table 3.3 has been corrected to show A2 Post as runoff coefficient of 0.50.
E17	DAP-2	4.3	7	Table 4.3 shows the Runoff Coefficient as 0.25 for area A2Post. Drawing DAP-2 shows runoff coefficient as 0.5 for Area A2Post. Please	Table 3.3 has been updated to a runoff coefficient of 0.50.



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				update the text in the report, drawings and calculations accordingly.	
E18		4.4.1	7	Table 4.4, please explain how the controlled release rate has been calculated.	The controlled release rate is from the orifice outlet and has been calculated using the modified rational method in combination with the orifice equation. It is the sum of the flows from both the 75 and 250 mm DIA orifice plates.
E19		4.4.1	7	Please provide a table summarizing the pre-development and post development flows at the downstream property limits.	This is shown in Table 3.4 the Target flow and the Total Site Release Rate.
E20		4.4.2	8	The proposed Jellyfish Unit is designed for %imperviousness of 64.7%. The flows are calculated based on runoff coefficient of 0.7. Please confirm the 64.7% imperviousness corresponds to runoff coefficient of 0.7.	The post development composite runoff coefficient calculation in Appendix B shows the imperviousness is less than 64.7% for drainage area A3 Post that drains to the Jellyfish Filter. Therefore, the Jellyfish unit has been conservatively sized.
E21	XS-01	4.4.4, Appendix B	9	<ol style="list-style-type: none"> 1. The effective TP removal for Area A1Post is considered as 100%. Please provide supporting documentation which shows TP removal by Enhanced swale as 100%. 2. A1Post is naturalized channel for conveying external flows; no TP removal to be applied. 3. Please provide supporting documentation which supports the 50% TP removal by roadside ditch. Drawing XS-01, sections H-H and I-I does not appear to show any roadside ditch. Please confirm the extents of the roadside ditch. 4. Please provide supporting calculation demonstrating the TP removal of 80% by using the proposed treatment train approach 	<ol style="list-style-type: none"> 1. The phosphorus removal for the swale has been updated to be 25%. 2. A1 Post is a naturalized channel with several riffle pools and has been updated with a phosphorus removal of 25%. 3. This has been removed from the calculation. 4. Supporting calculations have been added to Appendix B phosphorus calculations to illustrate the treatment train approach.



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				(infiltration trench, underground storage and jellyfish filter). Please update the Phosphorus calculations and update section 4.4.4 and Appendix B accordingly.	
E22		4.4.5	9	Please provide design details of the proposed infiltration trenches and enhanced grassed swales.	The detail drawings indicate the infiltration trenches there are also calculations in Appendix B.
E23		7.1, 7.2	12	Please check and update the Street name in Sections 7.1 and 7.2.	The street name has been updated.
E24		Appendix A		<ol style="list-style-type: none"> Please provide design details of the proposed bioswale. Bioswale cross-sections are provided, please provide typical sections including the bottom width side slopes etc. 	<ol style="list-style-type: none"> See detailed bioswale design drawings and design brief prepared by Geomorphix. Bioswale typical sections are included in the bioswale detailed design drawings prepared by Geomorphix.
E25	SG-01, XS-01	Appendix A		<p>Memo dated July 26, 2018, prepared by wsp: Summary of Infiltration tests-Westlane Development Group Ltd. 226 Brock Street East Uxbridge:</p> <ol style="list-style-type: none"> The Memo does not identify the seasonal high groundwater table. Please provide the seasonal high groundwater elevation. The observed groundwater elevation at TP18-4 is 271.40m. The proposed bio swale elevation in the vicinity appears to be 270.39m. Please explain if the groundwater elevation will impact the proposed bio swale design. The observed groundwater elevation at 	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) provides updated details regarding seasonally high groundwater elevations at the Site. Information is also provided to discuss the relative position of the bio swale and structures relative to the seasonal high groundwater elevation.



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				TP18-3 is 270.06m. The proposed bio swale elevation in the vicinity appears to be 269.21m. Please explain if the groundwater elevation will impact the proposed bio swale design.	
E26	SG-01	Appendix A		An Infiltration trench is proposed. Table 1 provided in Memo dated July 26, 2018, prepared by wsp: Summary of Infiltration tests-Westlane Development Group Ltd. 226 Brock Street East Uxbridge, shows stable rate of fall for the test pit in the vicinity as 0.00cm/m. Please demonstrate the feasibility of the proposed infiltration trench with design and details.	<p>TP18-2 is in the approximate position of the proposed infiltration trench. A stable rate of fall was not measured during the infiltration tests at this location. This result was due to saturation at the test depths. A design infiltration rate for the Site of 34.5 mm/hour was recommended based on results of the successful infiltration tests and a factor of safety of 3.5.</p> <p>The infiltration trench has been included on the detail drawings and sizing of the trench has been included in Appendix B of the SWM Report. The grades will be raised up to 2 m at the location of the infiltration trench. This will increase the depth to water and allow for soils to be placed that will meet the infiltration specifications to achieve the design drawdown times.</p>
<p>RESUBMISSION REQUIREMENTS:</p> <ol style="list-style-type: none"> 1. 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 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. 					



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HYDROGEOLOGY REVIEW					
Documents Reviewed:					
<ul style="list-style-type: none"> • Functional Servicing and Stormwater Management Report; Cole engineering; August 2018 • Hydrogeological Assessment; WSP; August 2018 					
H-1		4.4.3 Water Balance	9	Under LUP-12 and the guidelines established the post-development infiltration rate is to match pre-development infiltration rates, therefore the initial infiltration of 6994 m ³ is to be met in the post development scenario.	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) presents the updated water balance calculations based on the most recent grading and servicing plans provided by IBI. Under the revised post-development scenario, an infiltration trench is proposed in the rear yard of the central development block. Additional enhanced infiltration is also considered through roof-top disconnect. The estimated infiltration rate in the post development scenario is 5,610 m ³ /yr, a decrease of 1,385 m ³ /yr from the pre-development scenario. In consultation with IBI, additional opportunities to further enhance infiltration at the Site were not identified due to high water table. Therefore cash in lieu is being pursued to meet the deficit.
H-2				Infiltration facilities are to show a drawdown of 24-48 hours. Continuous drawdown as proposed for the soakaway pits alongside the drainage feature will not be accepted as infiltration facilities.	Noted. The soakaway pits have been removed from the design.
H-3		In-situ percolation testing		<i>In-situ</i> infiltration testing has been carried out with a rate of 121 mm/hr. Only one test was successfully completed due to shallow groundwater levels. (TP18-4) at the southern boundary of the property. <i>In-situ</i> infiltration testing should be carried out in the vicinity of and at the base of proposed LID facilities. It is understood that an attempt has been made previously, further attempts should be made to collect this data.	The grades are to be raised up to 2 m at the location of the infiltration trench. This will increase the depth to water and allow for soils to be placed that will meet the infiltration specifications to achieve the design drawdown times. A design infiltration rate for the Site of 34.5 mm/hour was recommended based on results of the successful infiltration tests and a factor of safety of 3.5.



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H-4		Groundwater Monitoring		Three monitoring wells have been installed, data has been collected May 28, June 21 and July 18, the data collected May 28 shows the highest groundwater levels ranging from 0.18 to 1.52 mbgs. It is not clear if this is truly representative of the seasonal high groundwater level due to there being no previous data collected. Groundwater monitoring should continue until at least 30 June 2019 (monthly) to ensure a seasonal high level is captured.	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) provides details regarding seasonally high groundwater elevations at the Site based on monthly monitoring over a period of 1 year (between May 2018 and May 2019).
h-5		Headwater Drainage Feature		It is proposed to realign the headwater drainage feature to the west side of the property and then to run it through a ditch/culvert along Brock St E, this form of realignment is not supported due to potential contamination from de-icing salts and the disturbance to the hydrologic function of the headwater drainage. A preferred realignment would be along the east side of the property and then a culvert across Brock St East to match up with the realigned feature on the north side of Brock St East. The hydrologic function of the headwater drainage feature would be less disturbed and potential contamination would be minimized. Connectivity (if any) with the Uxbridge Bog would be better maintained.	The channel is now realigned along the south and east property boundaries.
H-6		4.3		The private septic systems are to be decommissioned according to best practices.	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) includes recommendations to decommission the private septic systems according to best practices. Noted. They will be decommissioned.



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H-7		4.3		The private water supply wells are to be decommissioned according to <i>O.reg</i> 903.	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) includes recommendations to decommission onsite private water supply wells according to O.Reg.903. Noted. They will be decommissioned.
H-8		4.3.1.		There appear to be 11 private water supply wells in the area. It is to be demonstrated that there will be no negative impact to the private drinking water supply wells.	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) provides further discussion of the water supply wells within the Study Area. Based on the proposed construction dewatering activities at the site, minimal impacts to the wells are anticipated.
H-9		5.3 Water Budget-Post Development and Table 4		The swales/soakaway pits proposed alongside the realigned headwater drainage feature will not be accepted for infiltration/recharge purposes.	Noted. The swales/soakaway pits have been removed from the LID design and the updated water balance calculations.
H-10		Table E-1 and Table F-1		Pre-development infiltration: 6365 m ³ . Post development infiltration is 2864 m ³ . From WSP Table 5-1 there is an area totaling 1143.1 m ² draining to the infiltration trench. This will generate about 810 m ³ of runoff for infiltration in the trench. Demonstrate the catchment area for this trench such that the runoff volume is the 1988 m ³ as provided in the FSR.	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) presents the updated water balance calculations based on the most recent grading and servicing plans provided by IBI. Under the revised post-development scenario, the infiltration trench will capture runoff from the rear lot lawns.
H-11		Table E-1 and Table F-1		Demonstrate how the remaining infiltration deficit will be mitigated.	The updated Hydrogeological Study and Water Balance Assessment report (dated March 17, 2021) presents the updated water balance calculations based on the most recent grading and servicing plans provided by IBI. Under the revised post-development scenario, an infiltration trench is proposed in the rear yard of the central development block. Additional enhanced infiltration is also considered through roof-top disconnect. The estimated infiltration rate in the post development



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					scenario is 5,610 m ³ /yr, a decrease of 1,385 m ³ /yr from the pre-development scenario. In consultation with IBI, additional opportunities to further enhance infiltration at the Site were not identified. This infiltration deficit will be mitigated via cash in lieu.
H-12				Provide detailed drawings of all proposed infiltration facilities	The infiltration trenches are included on the detail drawings.
H-13				Provide detailed cross sections of all proposed LID facilities, include the seasonal high groundwater level	Detailed cross sections of the infiltration trench are included on the detail drawings. The seasonal high groundwater level is conservatively at existing grade.
H-14				Provide detailed calculations demonstrating the volume of the LID facilities is sufficient to mitigate the deficit	Detailed calculations have been included that demonstrate the infiltration trench has sufficient volume to retain the values from the March 2021 WSP Hydrogeological Report and the 5 mm volume control requirement. The deficit for the overall water balance will be met via cash in lieu.
H-15				Provide detailed calculations demonstrating the area is sufficient to allow drawdown to occur within a 24-48 hour time period.	This has been included in the SWM Report water balance section. The estimated drawdown time is approximately 8.7 hours.