

**220 Arkell Road, Guelph, Second Submission Engineering Comments for Third Draft Plan Submission  
D.P. 23T-19002, ZBA OZS19-017**

**Monday, February 12, 2024**

Responses to 2nd Submission Engineering Comments received from:

#	C/R	Comment / Response
<b>City of Guelph - Second Submission, Comments dated September 11, 2023 from Ethan Barrand, P.Eng., Development Engineer, 519-822-1260 x2250 , Ethan.barrand@guelph.ca Development Engineering and Transportation Services</b>		
<p>The following comments are provided based on the 2nd submission for the above-noted application as it relates to the following document(s) received April 2023:</p> <p>Plans</p> <ul style="list-style-type: none"> <li>Draft Plan of Subdivision, prepared by J.D. Barnes Limited, Project No. 16-14-118- 00-D, dated February 21, 2023</li> </ul>		
<p>Reports</p> <ul style="list-style-type: none"> <li>Preliminary Servicing, Grading and Stormwater Management Report, prepared by Stantec Consulting Ltd., Project No. 161423338, dated April 4, 2023</li> <li>Revised Water Balance Calculations in Response to First Submission Comments Draft Plan Application – 220 Arkell Road, City of Guelph, Ontario, prepared by Stantec Consulting Ltd., Project No. 161423338.801, dated March 29, 2023</li> <li>220 Arkell Road, Transportation Impact Study, Update, prepared by Paradigm Transportation Solutions Limited, Project No. 230080 /180099, dated April 2023</li> </ul>		
<b><u>GENERAL</u></b>		
<p>1. Some comments provided during pre-application discussions (approximately Dec. 2017 – Jan. 2019) remain outstanding, and do not appear to have been addressed in the application submission package. Please review these comments and include relevant detail as part of the design detail provided in the next submission.</p>		
i	C	<p>Please include the approved grading for the Open Space Block, and the adjacent lots of this subdivision and design the grading/servicing so that the objectives of the adjacent subdivision are not disrupted, and the area (including the Open Space Block and the lands to the north) is adequately and appropriately designed. Please take special note that the current design shows the relocated infiltration gallery. Latest design does not adequately show the revised gallery and catch basin, the overflow and connection from the existing galleries across the rear of existing lots are not shown. Additional details are required before staff can support the proposed temporary emergency access road. please reach out to staff for infiltration gallery/ design drawings for the Arkell Meadows subdivision</p>
	R	<p>Comment was discussed in further detail with City staff on October 12, 2023 including review of the existing City Plans. Additional details have been provided regarding the proposed CB and infiltration gallery layout as shown on revised Figure 2. It is understood that 100-year ponding is not to encroach onto existing Lot 12. Further details will be provided at the detailed design stage including a review of the proposed culvert sizing and overall ponding limits. Figure 2.0 has been revised noting this is to be reviewed at detailed design. This response was acknowledged by City staff per comments provided November 13, 2023, with additional note that details are to demonstrate that the infiltration gallery is not within 5 m of the foundation of Lot 12. This is noted.</p>
ii	C	<p>It should be noted that it is our expectation that the 10 m wide temporary road allowance would be restored to a 3m wide trail surface, at your client's sole expense, once the temporary access is no longer required. The 7 m restoration area should be planned on the west side and closer to the NHS and the restoration should include consideration for an alley of trees along the trail as well as other vegetation to stabilize, etc. Please include a restoration plan to show the ultimate state of these lands once the temporary emergency access has been removed. Keep City standards for pathways and tree planting in mind while completing this design, and ensure that the restoration plan provided for Block 20 should (at a minimum) reflect the street tree plan for Arkell Meadows Subdivision in terms of number and variety of deciduous/coniferous trees and shrubs. Note that preference is given to indigenous species. Please provide restoration plans at the Detailed Design stage.</p>
	R	<p>Requirement to be a Draft Plan Condition. This response was acknowledged by City staff per comments provided November 13, 2023, with additional note that the trail will be required to be restored to 4 m in certain sections to allow for pond maintenance access. This is noted.</p>

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iii	C	Please note: depending on the timing for construction of Dawes Ave extension, detailed design may include provision for the extension of Dawes Avenue; please show the design under existing conditions (Dawes Ave. cul- de-sac) and with the extension in place. Please note the location of the existing fire hydrant, and the potential relocation of the hydrant when extending Dawes Avenue, relocated hydrant locations must be demonstrated on all plans to ensure they comply with City standards.
	R	<a href="#">Noted - The interim and ultimate profile of the emergency access is shown on Figure 2.0. That said, detailed grading to be provided during detail design. This response was acknowledged by City staff per comments provided November 13, 2023, with additional note that grading plans to existing Dawes Ave cul-de-sac and future extension Dawes Ave are required. This is noted.</a>
iv	C	Currently the plan shows a storm sewer pipe located within the proposed park block and within the wetland buffer . All major servicing and utilities must be located outside of the park block and wetland buffer. (Although this comment is on an element outside of our current review scope, we felt it important to note, for your future subdivision design work.) Parks staff have reconfirmed that, in accordance with Section C (ii) of the Local Servicing Policy, the park block must be free and clear of all encumbrances, and Parks would not support including an easement within the park block. The latest plan still note this is an easement.
	R	<a href="#">See attached revised Draft Plan and Eng Dwg. C-100 with the SWM Block expanded to include the sewer infrastructure and Park Block adjusted accordingly. This response was acknowledged by City staff per comments provided November 13, 2023 noting that engineering staff are satisfied with the storm infrastructure adjustment to the SWM Block and not the Park Block.</a>
v	C	City standard fencing will be required adjacent to the proposed/existing private properties. Additional fencing will be required adjacent to the temporary emergency access road where the grade slopes away from the road greater than 7% (i.e.. where 3:1 terracing is currently proposed sloping away from the road surface). Details on the required fencing will be discussed at a later stage of your subdivision submission, however please note required fencing on the resubmitted concept plans. Further details of the required fencing will be discussed during engineering review of the application package. In addition, during detailed design, discussion will be held regarding fencing requirements along the sides and rear of lots 29 and 30.
	R	<a href="#">Requirement to be summarized as a Draft Plan Condition. This response was acknowledged by City staff per comments provided November 13, 2023.</a>
vi.	C	Note that the temporary access and trail alignment that extends beyond Block 20 must be reviewed comprehensively and supported by an Environmental Impact Study in the future (for 220 Arkell Rd subdivision). Note that the EIS must include a policy analysis to demonstrate conformity with Official Plan policies
	R	<a href="#">EIS completed and under review by City. Per meeting with City staff on October 12, 2023, no action is required. This response was acknowledged by City staff per comments provided November 13, 2023 noting that Environmental Planning will review EIS and Policy Analysis.</a>
vii	C	The design and construction of the trail shall meet the accessibility criteria outlined in the City's Facility Accessibility Design Manual (FADM). The criteria includes maximum running slope on trails to be 5% and the maximum cross slope on trails to be 2%. The trails need to be designed to include minimum 0.6 m. wide mowed grass strips, having a cross slope of 2% away from the trail, longitudinally along both sides of the trail surface. Section 4.5.2 OUTDOOR RECREATIONAL FACILITIES of the FADM outlines the accessibility guidelines for trails. This document can be viewed at the following link: <a href="http://guelph.ca/wpcontent/uploads/Guelph_FADM_2015-06-30-FINAL.pdf">http://guelph.ca/wpcontent/uploads/Guelph_FADM_2015-06-30-FINAL.pdf</a> At the time of detailed design, the trail grades may be refined.
	R	<a href="#">Current preliminary design respected the max 5% slope and note accessibility criteria will be respected during detail design. This response was acknowledged by City staff per comments provided November 13, 2023.</a>
2.0	C	Please be sure to indicate and include a 0.3m reserve on the draft plan fronting street access to Block 31.
	R	<a href="#">Per meeting with City staff on October 12, 2023, no reserve is required along the frontage of Block 31. A reserve is to be provided at the end of Street A and shown on the attached Updated Draft Plan. This response was acknowledged by City staff per comments provided November 13, 2023.</a>

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<b>TRANSPORTATION PLANNING</b>		
3	C	<p>The TIS study shows overestimated future traffic projections leading to the prediction of extremely severe congestions in the area road network. As such, staff require the consultant to submit a technical memorandum with revised traffic projections by following the below assumptions.</p> <ul style="list-style-type: none"> <li>•City's comments on the previous TIS study (April 2019) include a suggestion of using more recent traffic counts at the intersection of Victoria/Arkell. The current submitted TIS is still based on the 2016 TMCs. Please use more recent TMCs from October 8, 2019 that can be found in 388 Arkell Road TIS study.</li> <li>•Use a 2% annual growth rate up to year 2031 and 1.5% up to year 2036.</li> <li>•Generate diagrams showing traffic volumes for the base year, 2036 generalized background traffic growth, other area development trips, development trips, and 2036 total traffic.</li> <li>•Provide traffic operation analysis for the horizon year 2036 only.</li> <li>•Provide traffic signal warrant analysis at the intersections of Colonial/Arkell and Summerfield/Arkell under the horizon year 2036.</li> <li>•The technical memorandum should recognize the change in the posted speed limits from 50 km/h to 40 km/h for these streets: Decorso Drive, Summerfield Drive, Colonial Drive, Zecca Drive and Amos Drive.</li> </ul>
	R	The above comments have been addressed in the Technical Memo-Letter dated 15 January 2024.
<b>SUSTAINABLE TRANSPORTATION</b>		
4	C	In line with the Transportation Master Plan, the City will continue to require street designs that permit for sidewalks on both sides of the street. This is also consistent with the existing sidewalk provision on Dawes Avenue to the south and with the proposed extension of Dawes Avenue to the west as well as Poole Street which will be connected to Street 'A' in the future. Additionally, these roads will also provide access to the future secondary school, as such the City will be looking for all proposed and future developments to have sidewalks on both sides of the streets. Please revise the plans to incorporate a 20.0m wide cross section with sidewalks on both sides.
	R	<a href="#">The attached updated Draft Plan has been revised to incorporate a 20.0 m wide ROW on Street 'A', accommodating sidewalks on both sides of the street. This response was acknowledged by City staff per comments provided November 13, 2023.</a>
5	C	Please indicate on the concept plan how the trail will connect to the sidewalk network. Without any sidewalk on the south side of Street A, a crossing will be required. The crossing location needs to be shown on the concept plan, to ensure no conflict with the position of driveways and utilities. The trail can have a dropped curb at the road pavement edge, and must comply with AODA requirements of including Tactile Warning Strips and any staff-requested signage or pavement markings. At detailed design stage, Staff will request signage to indicate there is a crossing and will request no on-street parking in the vicinity of the crossing.
	R	<a href="#">See response to Comment #4 providing sidewalk on both sides of the street.</a>
<b>SOURCE WATER PROTECTION</b>		
6	C	The property is located in a WHPA B with a vulnerability score of 8. The property is not located in an Issue Contributing Area. Please complete and return a Section 59 Policy Applicability Review form. If you require assistance in completing the form, contact the City of Guelph's Risk Management Official at: 519-822-1260 ext. 2368 or peter.rider@guelph.ca
	R	<a href="#">Document was submitted April 4, 2023. Per meeting with City staff on October 12, 2023, no action is required.</a>
7	C	Note: Ensure that any private water supply or monitoring wells that are no longer in use are abandoned in accordance with O. Reg. 903. In accordance with Grand River Source Protection Policy CG-CW-37, the applicant will need to indicate what DNAPL (if any) or other potentially significant drinking water threats will be stored and/or handled on the property. A Risk Management Plan may need to be developed.
	R	<a href="#">Per meeting with City staff on October 12, 2023, no action is required.</a>

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<b>WASTE WATER OPERATIONS</b>		
8	C	Due to high ground water elevation, at the detailed design stage, sanitary sewers are to be designed in accordance with section 2.9 of the MECP Design Criteria.
	R	Noted.
9	C	Please note, flow monitoring will be required following construction. At the detailed design stage, MH64A must be designed to either include or allow for the insertion of flow monitoring equipment. As per section 2.10.3 of the MECP Design Criteria
	R	Per meeting with City staff on October 12, 2023, this monitoring will be the Developer's responsibility and cost during the Underground Warranty Period, no action is required. This should be identified as a Draft Plan Condition. This response was acknowledged by City staff per comments provided November 13, 2023 with additional reminder that monitoring is at the developer's responsibility and cost and monitoring is to track I&I ensuring any deficiencies linked to I&I will be addressed before final assumption. This is noted.
<b>WASTE SERVICES</b>		
10	C	Please note, waste services has reviewed the conceptual site plan block 31 and has the following comment. A continuous path of travel for sideload cart collection is required, and do not approve properties that would require backing up laneways to service residents. As such, the developer will need to show where the carts can be collected on the corners that allow operations to maintain continuous forward travel. These details are provided for the applicants knowledge and consideration for site plan design of this block
	R	Noted. To be addressed during Site Plan Approval.
<b>FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT</b>		
<b>Water Servicing</b>		
11	C	Please note that, based on our review of the city's existing watermain modeling, there is potential for marginal water supply pressures in proposed development under certain conditions such as peak hour demand scenario at locations with elevation greater than 346 m height above mean sea level (AMSL) and average day demand (ADD) scenario at locations with elevation greater than 339 m height AMSL in the existing water system
	R	Noted. No action required.
<b>Storm Servicing</b>		
12	C	Servicing Lots 19-28 via a proposed sump pump to the rear is not a preferred solution by the City, with back to front drainage it has been seen that the water being discharged from the sump will work its way back down the foundation and keep re-cycling. The 100-year hydraulic grade-line is currently not shown on the plan and profile drawing. Can this be shown to demonstrate if foundation drains can be connected to the storm sewer? Alternatively, can a clean water collector be utilized on-site to collect runoff from all foundation drains?
	R	Comment was further discussed with City staff on October 12, 2023. As no storm service laterals are provided, It is proposed to revise the grading to be split drainage and to place rear yard catchbasins to collect sump discharge water and rear yard drainage such to pipe to the storm sewers on Street A. It was noted that the City does not require an easement for rear yard structures. The rear yard swales on these lots are proposed to be located fully on the subdivision lots, off of the Site Plan Block. Drawing C-100 has been updated to show the proposed location of rear yard laterals & structures and intent of revised grading and drainage strategy. This response was acknowledged by City staff per comments provided November 13, 2023 with additional comment that lots are not to drain onto private blocks; however, overland flow from rear yards may be directed to the site plan laneway to the ROW, and that the City preference is to avoid conflicts recently seen where sump pumps discharging at the rear lot recycles the water, causing pumps to continuously run. This comment is noted.
13	C	Storm sewers do not have the required depth of cover. At minimum storm sewers should be designed to have appropriate frost cover, this does not appear to be the case. Please review tables on drawing C-100 and update the design
	R	As discussed with City Staff on Oct. 12, 2023, frost depth for the Region is 1.2 m. Storm sewers are designed to have appropriate frost cover.
14	C	There shall not be a horizontal bend in sewers. Please remove the 22.5 degree bend between FD-8HC and the headwall
	R	Plans have been updated to remove the horizontal bend as requested. This response was acknowledged by City staff per comments provided November 13, 2023.

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<b>High Ground Water</b>		
15	C	Please review the DEM to ensure appropriate separation is provided between bottom floor elevations and the seasonal high groundwater elevation. During detailed design the plans shall demonstrate approximate basement floor or underside of footing elevations on the plan and profile
	R	Noted.
16	C	Please confirm "ground water profile" labeled on the plan and profile drawings is the same as "seasonal high groundwater level". If it is, please update the drawing. Please also ensure this elevation is shown across the entire road length, currently, it appears missing from station 0+000 to 0+040
	R	Stations 0+000 to 0+040 does not have lot frontage. Plan and Profile will be updated during detailed design to show ground water profile in this area as discussed during the City meeting on November 13, 2023.
<b>Stormwater Management</b>		
17	C	It appears that the Torrance Creek Sub watershed Study criteria are not being met under the current design. The following are some items noted in the TCSWS: a) The site is located within sub watershed drainage areas 105, 106 and 110, in Zone 2. b) Peak flow control for all design events (post to pre, 2 to 100 year events), please include 10, 25 and 50 year storm events. Currently, the post 2 year storm flow runoff exceeds the pre rate.
	R	a) The Report has been revised identifying Zone 2 as noted. b) 10- and 50-yr design storms will be added (25-yr is already included). The exceedance of the 2-yr event is discussed in the Addendum Report. It is a negligible increase of 0.001 cms in the model, which doesn't account for infiltration - meaning the actual value will be less. Additionally, a 75 mm orifice size is used and a smaller orifice may increase the risk of clogging. This response was acknowledged by City staff per comments provided November 13, 2023.
18	C	The dry SWMF is not designed as per DEM or MECP design standards. Please review the design and update accordingly. Some of the design elements that need to be reviewed include (but are not limited to): a) Operations staff will not support a storm tank to be used on City owned lands. b) Infiltration galleries cannot be located beneath a SWM Pond. Please re-locate the infiltration gallery. Additionally, galleries must have sufficient separation from the seasonal high groundwater level as noted in the DEM. c) Please review pond forebay design and ensure the forebay is designed for 80% TSS removal, revising settling velocity and settling distance. Additional discussions may be necessary with City staff.
	R	a & b) the design of the EOP SWMF has been adjusted to remove the subsurface storm tank beneath the pond. Infiltration will now occur in the SWMF through a surface infiltration cell. Details are included in the latest FSR Addendum Report  c) Per Table 3.2 of the MECP SWMPDM the required water quality storage volume for an infiltration basin is 88 m <sup>3</sup> for 58% impervious coverage of a 2.83 ha area. The basin design includes 256 m <sup>3</sup> , so the facility will provide 80% TSS removal. Additionally, The OGS has been sized to provide >70% TSS removal, but per City of Guelph guidelines can be credited with 50% removal. The forebay is designed to contain and to isolate sediment for cleanout. The sizing of the forebay has been completed per MECP guidance. The SWMF as a whole though will provide the required TSS removal while the OGS and forebay are more provided to prevent clogging of the infiltration cell and to isolate sediment deposition. During the non-winter months, the infiltration cell of the SWMF will provide infiltration of the 25mm event, which accounts for over 80% of annual precipitation volume, and will provide over 80% removal of TSS to the downstream system. During the winter months, the SWMF will likely still provide this infiltration and meet the required TSS removal through infiltration/volume reduction, but in the instances where the ground is still frozen but runoff is occurring, surface discharge downstream may occur in events smaller than the 25mm event. The ponding depth prior to surface discharge will be around 0.3m in the infiltration cell and the SWMF will therefore function more as a constructed wetland as vegetation should be established throughout the infiltration cell. As per MECP guidance, the total unitary volume requirement for enhanced water quality treatment in a wetland is 108 m <sup>3</sup> /ha for 58% impervious coverage. Based on the drainage area of 2.83 ha and subtracting the 40 m <sup>3</sup> /ha extended detention volume leads to a total permanent pool requirement of 192 m <sup>3</sup> . The infiltration cell has 256 m <sup>3</sup> of storage capacity and therefore would exceed this requirement in the case that the infiltration cell were full. Therefore, the SWMF will provide 80% TSS removal to the downstream system in winter months as well as the remainder of the year with the OGS and forebay providing pre-treatment to reduce sedimentation build up in the infiltration cell.

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19	C	Please explain how the flows in Table 5, generally satisfy the pre to post criteria, however, in Table 7 it can be seen there is an excess of flow annually generated to the Torrance Creek Swamp.
	R	These two are unrelated. Table 5 is peak flows and Table 7 is annual volumes. Although peak flows are lower, the duration of discharge is typically longer as a result of reduced upstream evapotranspiration and infiltration, resulting in increased runoff volumes.
20	C	How is thermal mitigation accounted for during events greater than 25mm? What impacts will this have on the wetlands? Please consider using additional measures such as cooling trenches
	R	The impacts of thermal mitigation are focused around the small events (typically more so 10mm or less). Sizing thermal mitigation measures to treat larger storm events is unnecessary. As per MOE manual (2003) in discussion on cooling trench - "the trench should be designed to accommodate frequent events (i.e. <10mm) which will have a greater effect on the thermal regime of the receiving watercourse". As the lot-level and SWMF provide infiltration for events up to and including the 25mm event, there will be negligible thermal impact of surface flows from the site. This response was acknowledged by City staff per comments provided November 13, 2023.
21	C	In Section 5.6.3 and on Figure 10, it is suggested that there is an existing culvert along the rear property line of Block 20, Arkell Meadows Subdivision, with a reverse slope, and the subsequent drainage design for this area is based on this premise. Our records show a CB in this location with a CB lead along the rear property line to infiltration galleries. Please verify and clearly label the CB. Additional detail is needed for this area, including additional detail on the servicing and grading plans.
	R	Per meeting with City staff on Oct. 12, 2023, there is no existing culvert along the rear of Block 20. A culvert is proposed with a reversed slope to promote ponding and contribution to the relocated infiltration gallery discussed in response to Comment #1 i) above. No further action is required. This response was acknowledged by City staff per comments provided November 13, 2023.
22	C	Section 5.7.3: As previously noted, Torrance Creek Sub watershed Study criteria identify extended detention of the 25mm storm event, please provide additional detail within the report.
	R	As per Table 5, the drawdown of the 25 mm is approximately 24 hours, which meets the target in the TCSS. Additionally, the drawdown time of the MECP extended detention volume exceeds this further at 29 hours.
23	C	In-situ infiltration testing is required as per the DEM. Infiltration rates cannot be determined based on laboratory or particle size distribution results. Please perform in- situ testing as per the DEM and update the findings accordingly. This must be completed during the draft plan stage to ensure water balance targets can be met without the need to revise plans and re-size infiltration galleries, etc.
	R	In-situ infiltration testing has been completed through 14 test pits, with results summarized in a stand alone memo and incorporated into the updated design. Infiltration rates were noted to be higher than previously assumed, and therefore LID measures can be fully implemented, with no impact to the water balance assessment. This response was acknowledged by City staff per comments provided November 13, 2023.
24	C	If an infiltration gallery is to be used following the stormwater pond, please be sure infiltration calculations during diversion (winter) months are not accounted for within the monthly and annual infiltration calculations. Please indicate what party would be responsible for controlling the by-pass to the gallery. Is there a less intrusive design that can be incorporated to allow for the bypass to be fully independent? Additional discussions may be required with City staff.
	R	During winter operations, water quantity control in the SWMF will still be provided as modelling has ignored any infiltration across the site (including in the SWMF). Water quality will be maintained as outlined in Comment/Response #18.
<b>Drawing C-400 Conceptual Grading Plan</b>		
25	C	Please review the drainage culvert connecting Blocks 32 and 33. Please provide design calculations for the sizing of the culvert. At detailed design, please include EOP erosion controls along with reviewing if the culvert can be revised to provide sufficient frost coverage
	R	Culvert size and EOP treatment to be addressed at detail design. This response was acknowledged by City staff per comments provided November 13, 2023.
<b>Hydrogeological Assessment</b>		
26	C	Engineering echoes comments provided by Environmental Planning for this report.
	R	Noted
<b>Geotechnical Investigation</b>		

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27	C	Groundwater levels were monitored in 2017 and 2018; please include the monitoring levels collected from the wells installed in May 2022. Current data from 2017 and 2018 will not be accepted by City staff as it is becoming quite outdated. Please utilize the wells recently installed on-site.
	R	<a href="#">Water level measurements were summarized in the Water Balance Memo for wells installed in 2022 and included spring 2023 measurements. Please refer to this document rather than the Geotech Investigation for groundwater levels.</a>