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December 16, 2020

Mr. Ahmed Elsayed
Project Manager, Planning Services
City of Ottawa
110 Laurier Ave. West
Ottawa, ON K1P 1J1

Dear Mr. Elsayed:

RESPONSE TO COMMENTS AFTER 1ST SUBMISSION - 1400 UPPER CANADA STREET

Engineering

General comments

1. Please include the file no. D07-12-20-0125 and Plan no. 18260 at the bottom left corner of the drawings as per city standards.
IBI Response: Completed

2. Please remove light blocks from civil drawings.
IBI Response: Light blocks remain on civil drawings to ensure there are no conflicts between light standard bases and civil infrastructure (i.e. catchbasins/manholes)

3. Please include an Existing Conditions drawing
IBI Response: Completed

Site Servicing Plan, Drawing # C-001, Date Aug. 2020, Rev.#1, Dated 2020-09-17

1. Please add more details to the drawing set to specify the proposed LID (i.e. identify that this is the Infiltration Gallery). Please add details for the proposed infiltration gallery: height, type of stone (is the stone a washed stone?), additional materials (i.e. geosynthetic fabric etc.), invert of the bottom of the practice, a cross sections of the proposed infiltration gallery, connection details for the pipe system.
IBI Response: Note identifying infiltration gallery added to drawing C-001, details of infiltration gallery added to drawing C-010

2. Please show information for Rooftop storage as per item 8.3.11.3 in City's guidelines.
IBI Response: Rooftop storage information added to ponding plan C-600

3. Some catch basins are shown behind the curb, please explain.
IBI Response: These are curb inlet catchbasins (lids per City STD S22 & S23) and are placed behind the curb to keep the structure out of the heavy truck traffic routes.

4. Please provide more information about the tile drain used for the concrete apron area.
IBI Response: Tile drains are not part of the civil package on this proposal, no allocation for their design has been completed.

5. According to item 5.7.2 roof drains should discharge to the surface as far away as is practical from the foundation wall.
IBI Response: Roof drains will be directed via internal plumbing to the storm sewer connection. All roof water will discharge via in building and underground pipes to the infiltration gallery.

6. Please show on the plan structure with ICDs.
IBI Response: Completed

7. It is not clear how runoff from the roof will flow by gravity into the proposed infiltration practice/gallery…it appears that the storm pipe directing flow from MH3 to the infiltration practice (invert 103.345m), which is at an elevation higher than the pipe directing flow to the downstream storm sewer (US pipe invert of 102.875 m). Furthermore, the STM pipe invert at the building itself is 103.185 (is the STM pipe proposed with a negative slope?). Please clarify how stormwater from the roof will first enter the infiltration practice (especially when flow is controlled to 20 l/s) to support the retention calculations submitted in Appendix C (per the calculation sheet, a 5.9 mm storm event would result in all roof runoff infiltrated).
IBI Response: Stormwater will flow from the roof via the 375mm lead to MH3. The 250mm invert to the infiltration gallery is lower than the 375mm bypass pipe so water will flow into the infiltration gallery. If the gallery fills up or there is a plug for some reason, the 375mm bypass pipe will still drain the water away from the building. The invert of the 375mm bypass pipe is now set lower than the STM invert at the building to ensure what does not back-up

8. Per Appendix C , it does not appear that the table entitled “SUMMARY OF INFILTRATION GALLERY CALCULATIONS” consistently summarizes the calculations sheets provided.

Dry Year Calculation sheet declares total infiltration volume of 1891 m3 (the table above states 4296 m3)
Wet Year Calculation sheet declares total infiltration volume of **2606 m3** (the table above states 2997 m3)

Note that the **project requires a total infiltration of 106 mm/year (equivalent to approximately 3380 m3 annually**). It does not appear that the wet year excel calculation annual infiltration volume results (2606 m3) demonstrates compliance with the target 3380 m3 annual infiltration volume, (and as such, the average year would also not achieve the retention SWM design criteria based on the proposed design).
Please revise the design accordingly to demonstrate compliance with the project's retention requirements. Please update all information in the report and drawings accordingly.
IBI Response: The infiltration calculations are divided into two steps. The first step is to establish a "runoff overflow volume" for both a wet year and a dry year. This overflow volume is expressed as a percentage of flows overflowed and not infiltrated. This occurrence would be due to flows in excess of what the gallery could infiltrate at a given time period. This overflow percentage is calculated using actual monitored data from a single year (either a wet or dry year).

Once the overflow percentage is calculated the second part of the calculation is to generate an average infiltration rate for the site which can accurately describe the infiltration over the long term. For this calculation the total infiltration is calculated using the maximum theoretical infiltration the gallery could produce and subtracts the average overflow. For this calculation different precipitation data is used. Climatic normals from the Government of Canada for 1981-2010 (the latest data available) are used to provide an average long term estimate of precipitation for the infiltration gallery and intern provide a long term average for infiltration to satisfy that the gallery is sized appropriately.

It should be noted that the "infiltration rate" numbers given on the dry and wet year calculations are misleading (these numbers are also not used in the final second step in the calculation) and have been removed from the sheets provided in the appendix. The remaining calculations are correct and demonstrate that the infiltration targets for the site are being met.

Site Grading Plan, Drawing # C-002, Date Aug. 2020, Rev.#1, Dated 2020-09-17

1. Existing contours shown makes it hard to read the drawing, please include existing grades instead.
IBI Response: contours removed

2. Grading slopes are not clear on the drawings, please make sure the labels are clearer.
IBI Response: slopes more clear with contours removed

3. Please show high points/ lines.
IBI Response: HP to denote high points have been added to point labels

4. Please show grades at depressed curb beside the handicap parking.
IBI Response: grades added

5. Please provide more information about existing ditch between site and Palladium drive.
IBI Response: the existing ditch is an interim swale that was cut within the past year as part of the Phase 5 subdivision construction, a note shows that this small ditch is to be filled into the grades as shown.

6. Please add more slopes showing that there will be enough drainage, specially towards the proposed catch basins.
IBI Response: Additional slope arrows added

7. Please provide more information on catch basins behind the curb (CICB14 to 24 & CICB6).
IBI Response: These are standard curb inlet 600mm x 600mm OPSD 705.010 basins with City STD lids S22 & S23

8. Please show more clearly location and information for proposed walls.
IBI Response: The only retaining walls proposed are at the loading dock and they have been labeled and top of wall and bottom of wall elevations provided.

9. Please highlight fire route and show heavy asphalt areas.
IBI Response: Fire route added to grading plan. Heavy duty asphalt is shown on the servicing plan C-001, the grading plan is too difficult to read with the heavy duty background shown.

Storm Drainage Plan, Drawing # C-500, Date Aug. 2020, Rev.#1, Dated 2020-09-17

1. Please show overall flow directions on the drawing.
IBI Response: Major flow arrows added to STM drainage plan.

Erosion and Sedimentation control Plan, Drawing # C-900, Date Aug. 2020, Rev.#1, Dated 2020-09-17

1. Please show location and details for proposed mud matts.
IBI Response: mud mat details are provided in the legend on drawing C-900. The mud mat locations (3) are shown on C-900

2. Please show location of proposed straw bale flow dam & Rock flow check dam.
IBI Response: Straw bale flow dams are shown, rock flow check dams are not needed on this site.

3. Please highlight catch basins that will be protected against sediments specially CBs along Upper Canada and Palladium street.
IBI Response: CB silt sack locations have been added to C-900

4. With respect to all proposed infiltration/retention practices proposed, please update the ESC plan to address the following from the MECP SWM Planning & Design Manual (March 2003), Section 4.6.6 “Infiltration basins will only operate as designed if they are constructed properly. There are three main rules that must be followed during construction:

- Basins should be constructed at the end of the development construction;
- Smearing of the native material at the interface with the basin floor must be avoided and/or corrected by raking or roto-tilling; and
- Compaction of the basin during construction must be minimized

IBI Response: The above notes are included in the infiltration gallery detail located on plan C-010

Design Brief Purolator Inc. 1400 Upper Canada St., Date September. 2020,

1. Please include pre consultation notes as part of the report.
IBI Response: not completed, minutes not available TRM Comment: Included in resubmission package; document is called Design Brief_Addendum.

2. Please provide more information on existing ditch, area drains to it and the proposed solution to existing ditch showing some calculations.
IBI Response: As noted above the existing ditch is an interim swale that was cut within the past year as part of the Phase 5 subdivision construction to provide interim drainage for the subject lands, a note shows that this small ditch is to be filled into the grades as shown

3. Please make sure storm sewers are designed with 90% maximum filled capacity.
IBI Response: All STM sewers now have at least 10% residual capacity

4. According to City guidelines, No ponding for 2-yrs is permitted.
IBI Response: noted, As per all previous submissions in the Kanata West Business Park, it has been agreed that no 2 year ponding in public access areas is reasonable to achieve which we have done on this site (no 2 year ponding in the public access spots to the front of the building). 2 year ponding in the truck areas along a minimal amount of 2 year ponding in the employee lot (at CB11) has been utilized. The no 2 year ponding requirement was not intended for light industrial applications.

5. Please provide more information about ponding area (3) in the appendix, it’s not clear where the ICD will be.

IBI Response: The ICD is now located at MH8, thus we will utilize underground storage in this area, the release rate has been reduced by 50% when calculating the required storage.

6. Please provide more information about ponding area (4) as it is not shown in the appendix, and not clear on the drawing.
IBI Response: Ponding area #4 is centered on CICB 23 and 24 with a maximum spill elevation of 104.75m.

7. Please make sure that all ponding IDs in the appendix are consistent in the tables with the drawing.
IBI Response: Completed

8. Ponding ID 5 mentioned in the appendix is not on the ponding drawing, also ponding area for CICB23 is not clear on ponding plan
IBI Response: ponding area 5 was deleted, the id should read pond id #4 for CICB23, the correction was made.

9. Because rooftop storage is proposed as part of the SWM strategy, the following information is required to be provided on the engineering plan(s) and discussion and documented in the report as per Ottawa Sewer Design Guidelines (SDG) SD002, October 2012, City of Ottawa, Clause 8.3.11.3. The below information is to be provided if rooftop storage is proposed as part of the SWM solution. Please provide a design table that includes the following information for the 2-year, 5-year and 100-year events on the engineering drawings once complete (it is suggested to present in a table format on the drawing) *i. Total number of control devices proposed for the building;*

ii. Type of control device proposed (product name and manufacturer);
iii. Rooftop storage volume for each roof drain catchment area;
iv. Depth of Flow depth
v. Location of roof drains (show/define roof drain catchment areas);
vi. Scupper locations;▪ Spill points (onto scuppers);
vii. Proposed flow per roof drain;
viii. Total flow from the roof.

IBI Response: Table has been added to the ponding plan C-600

10. For roof top storage, please provide a Flow Control Roof Drainage Declaration (attached). It needs to be completed by the mechanical and structural engineer responsible for the design.
IBI Response: To be provided under separate cover

11. Some drainage areas show ponding required exceeding ponding provided, please explain.

IBI Response: Drainage area CB17 exceeds its ponding volume, the excess water then flows to CICB16 and is accounted for there, this drainage area also overflows to area L1, again the surplus volume is added to the L1 required storage. L1 has adequate ponding volume to store the flows from that drainage area as well as the overflow volumes.

12. The Design Brief states: “Infiltration was assumed through the bottom and the bottom 1/3 of the side walls, with percolation rates established based on Geotechnical investigation of the site.” The calculations provided in the Appendix do not appear to include any exfiltration through the side walls. Please clarify the source data (and any relevant calculations) where contributing lateral exfiltration towards retention and update the design submission to support how this contributes to the proposed retention practice (if applicable). Please update the report accordingly.

IBI Response: The design and calculations used in sizing the infiltration gallery have been reviewed and approved by City staff over many projects in the Kanata West Business Park (Tanger Outlets, Kanata Retail Center, Cabela’s, UPS, Wingate Hotel, Kinaxis). In the subject infiltration gallery infiltration via the bottom of the gallery alone is adequate to meet the infiltration targets. Note the column on the DRY YEAR and WET YEAR calculations, “INFILTRATION FROM SIDES (BOTTOM 1/3) however, this is an “IF” statement and since these values are not needed then they are not counted towards the infiltration target.

13. Please note for future projects, infiltration rate shall be used when sizing an infiltration gallery (or similar LID). The Infiltration rate is “The rate at which stormwater moves from the surface into the soil, typically measured in inches per hour, millimeters, centimeters or meters per second. It is critical to note that infiltration rate and hydraulic conductivity are two different concepts and that conversion from one parameter to another cannot be done through unit conversion (see hydraulic conductivity and saturated hydraulic conductivity). Typically saturated hydraulic conductivity is used to calculate the infiltration rate to be used as a design input based on approximate relationships and often include an infiltration reduction factor (or safety factor).”

As such, for future projects, the preference is that the Hydrogeological investigations include in-situ infiltration testing to confirm hydraulic conductivity and design infiltration rates (in addition to groundwater conditions, including seasonally high groundwater elevation and seasonal fluctuations as requested in the comment above)

IBI Response: Noted, the percolation rates used in the infiltration gallery sizing are provided in the Geotechnical report and are based on testing and site conditions. The rates are provided in minutes per centimeter and converted to meters per day for the analysis.

Mr. Ahmed Elsayed –December 16, 2020

IBI Group

James Battison C.E.T.