The Regional Municipality of Durham

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Susan Siopis, P.Eng.
Commissioner of Works

Sent via standard mail and email (Raisa.Hoq@Ontario.ca)

September 3, 2020

Raisa Hoq, Project Engineer-in-Training (EDP)
Municipal Water and Wastewater Permissions Section
Ministry of the Environment, Conservation and Parks
40 St. Clair Ave. West, 2nd Floor
Toronto ON M4V 1M2
Raisa.Hoq@Ontario.ca

Dear Raisa:

RE: Consolidated Linear Infrastructure (Wastewater / Stormwater) ECA Process and Design Criteria Updates

Thank you for providing the Regional Municipality of Durham with the opportunity to review and comment on the Province's proposed updates to the Wastewater Environmental Compliance Approval process as well as the corresponding Design Criteria document for sanitary sewers, storm sewers and forcemains. The Region's Work Department has consolidated comments into this letter from the various divisions, which are provided in Tables 1 and 2, attached.

Please do not hesitate to contact the undersigned at 1-800-372-1102 ext. 3460 or by email at mike.hubble@durham.ca at your convenience should you require any further dialogue on these comments.

Sincerely,

Mike Hubble, P.Eng.
Manager, RMD Environmental Services Design Division
mike.hubble@durham.ca

c. By Email Only:

If you require this information in an accessible format, please contact 1-800-372-1102 ext. 3480.

MECP - Aziz Ahmed, Riaz Haq

RMD – Paul Gillespie, Paul Gee, Aaron Christie, Dan Waechter, Ian McIlwham

Attachments:

Table 1 – Design Criteria Comments

Table 2 – ECA Template Comments

Table 1 - Design Criteria Comments

DRAFT Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under Environmental Compliance Approval, Nov 2019		
No.	**Reference**	**Comment**
1.	Preface	Requiring "compliance" with the document is problematic as not all criteria can be met by all municipalities all the time. Rather these criteria should be considered "guidance" and subject to an engineer's discretion based on local conditions and systems.
2.	Section 1.1	MECP should confirm if a written calculation of the *uncommitted reserve hydraulic capacity* is required for every allowable alteration approval or not. The effort if required would be enormous and would require continuous calibration and updates of the network analysis.
3.	1.1.3.2	This is typically not completed nor required to be completed by the Proponent for every individual application.
4.	1.2.2	Maintenance holes (unless cast in place) adhere to OPSD's. Additional checks to ensure that they meet these additional Act's should be a requirement of the OPSD, not a requirement placed on every municipality.
5.	1.2.4	Additional clarity is required regarding the hardware that prohibits frost action in precast structures.
6.	1.2.5	This is generally good practical design, however not always feasible. Existing infrastructure and sometimes new infrastructure, in particular trunk sewers, are often located in low lying areas.
7.	1.2.7.2	Construction Management practices and guidelines such as erosion and sediment control should not be located within the sanitary sewer design criteria.
8.	2.1	Durham currently has design criteria which have been used to develop planning documents such as the Region's Official Plan and Development Charges By-Law. Arbitrary revisions to these design criteria could cause significant financial impacts to Developers and current rate payers. Clarification should be provided if each municipality is able to maintain/develop their own design criteria.
9.	2.1.1.2	Durham Standards currently use Harmon Peaking Factor

		and a minimum peaking factor of 1.5. What rationale was used to specify a peaking factor of 2.0?
10.	2.1.2.1	Clarification is required for how 28 m3/ha/day is calculated. Is it over the floor area or site area? Also, clarification is required if this is an average flow or peak flow rate. There is no peaking factor for non-residential uses. Current Durham Standards are as follows:
11.		*180 m^3/gross floor area/ha/day (2.08 l/s/day) including infiltration and peaking factor.*
12.		*Floor Space Index 0.5 of gross lot area unless designated otherwise on the approved plan.*
13.	2.1.3.1	Clarification is required if this is an average flow or peak flow rate. There is no peaking factor for non-residential uses. Current Durham Standards are as follows:
14.		*112 m^3/gross ha/day (1.30 l/s/ha) including infiltration and peaking factor. Area is full site area.*
15.		Historical flow data is only reviewed in rare situations that capacity is not available for the typical design criteria.
16.		Table 1 is included within the Durham standards but it is only used in rare occurrences that the other criteria does not apply.
17.	2.1.4.1	Clarification is required if this is an average flow or peak flow rate. There is no peaking factor for non-residential uses.
18.		Current Durham Standards are as follows:
19.		*180 m^3/gross ha/day including infiltration and peaking factor for local sewers.*
20.		*90 m^3/gross ha/day including infiltration and peaking factor for trunk sewers.*
21.	2.4.1	Clarification is required where a new sanitary sewer is installed by tunneling. While a positive slope is required to be maintained, a uniform slope is not always practical.
22.	2.4.2	Clarification is required for the following statement: *"slopes to provide at least 0.6 m/s of flow velocity at design flows"*. In the past Durham has always referenced the full pipe velocities.
23.		Calculating velocities based on design flows is challenging. Clarification is required if the velocity is based on average flow, peak flow, or peak flow + Infiltration.

24.		Durham standards currently try to achieve a minimum pipe grade of 0.5% when possible, and for the first upstream leg of sanitary sewer our standards try to achieve a minimum grade of 1.0%. Larger pipes, where approved by an Engineer, are permitted to use grades less than 0.5% on a case-by-case basis.
25.	2.4.4	Current Durham standards reference a maximum velocity of 3.65 m/s. Please provide a rationale for the proposed maximum velocity of 3.0 m/s.
26.	2.5.1	A sanitary sewer installed at this grade will likely not meet the maximum velocity of 3m/s. Inverted siphons installed via trenchless technology will not be anchored.
27.	2.5.3	Clarification should be provided for what constitutes ‘protection’ against typical scouring velocity.
		The reference to ‘erosion control measures’ should be removed.
28.	2.6.1	Durham has an Approved Manufactures Product List for products used for linear infrastructure which includes sanitary sewers and appurtenances. One of the criteria for obtaining approval is being acceptable with the Road Authority. The designer typically specifies the pipe material based on the soil conditions, loading, and other factors and the contractor can request an alternative which requires approval from the design Engineer before installation.
29.	2.6.2	The engineering drawings are signed and sealed by a P. Eng. who has selected the pipe material based on site conditions, loading and other factors. The reasoning is not identified on the engineering drawings nor the record drawings.
30.	2.7.1	The proposed criteria should note specific design practices/guidelines and reference OPSD, manufactures’ design charts, etc.
31.	2.8.1	Sanitary sewer pipe insulation design calculations and specifications are not readily available. Clarification is required to provide guidance for completing insulation calculations.
32.	2.8.2	Most sanitary sewers are subject to highway loading and this is considered in the typical depth of cover charts provided. Clarification is required regarding the reference to various other Design Codes and Acts. We note that sanitary sewers located under a railway typically require a

		protective casing so the loading on the actual sanitary sewer pipe is negligible when installed within a liner.
33.	2.9	Clarification is required for the definition of 'Seasonally High Groundwater Elevation'. The SHGWT typically fluctuates over time. Traditionally, this is not an easily defined level, and typically requires years of monitoring. These levels can also change drastically after basements and weeping systems are installed. If the SHGWT did not change after development, basements could flood.
34.	2.9.2	Constructing sanitary sewers to forcemain standards is not typically done and is not currently a Durham requirement. Clarification is required regarding specifications for service connections and tees, as in a gravity design they are typically subject to minor infiltration. Forcemains do not typically have service connections or tees and we believe that the intent here is to reduce infiltration.
35.	2.9.3	Details and specifications are required regarding the external wrapping of maintenance holes.
36.	2.9.4	Watertight maintenance hole covers are typically located in areas that are prone to surface water inflows, not in areas that are subject to seasonally high groundwater. Clarification is required regarding when air vents are required, and if venting is typically related to areas that are subject to seasonally high groundwater.
37.	2.10.1	Where trenchless technology is used, the maximum spacing of maintenance holes is typically evaluated on a site-specific basis. Durham has based maintenance hole spacing on the availability of maintenance products and materials, and our standards are longer than the maximum spacing identified in the draft document.
38.	2.10.2	Clarification is required to identify what type of situation would not permit the installation of a maintenance hole.
39.	2.10.3	Inflow and infiltration concerns are generally not located within new subdivisions. The sanitary sewer systems currently being designed work to mitigate, not eliminate, inflow and infiltration. This additional maintenance hole seems unnecessary and may not even be possible depending on the topography and layout of the subdivision.
40.	2.10.5	The invert of the downstream pipe must always be lower than the incoming pipes. The wording for this criterion

		should be revised for clarity.
41.	2.10.6	A 200mm dia. pipe connecting to a 900mm dia. pipe with matching obverts would have a drop of 700mm and a drop structure would not be practical to be installed. The wording for this criterion should be revised for clarity.
42.		Clarification and design rationale should be provided for the dimension of 610mm.
43.	2.10.9	The word 'benched' does not appear to be used in a traditional manner. Clarification is required.
44.	2.10.11	Provide details for when frost straps are required and specifications for their installation. Frost straps are typically not required and the separation of maintenance hole sections is not normally encountered in Durham.
45.	2.10.12	This is typically dependent on the size of the pipe. For larger pipe sizes this isn't practical or affordable.
46.	2.10.13	Provide details and specifications for 'water tight membrane'. High groundwater and flooding conditions need to be defined. These two terms typically are completely different scenarios.
47.	2.10.15	Currently OPSD identifies a maximum spacing of 5m. Additional checks to ensure that they meet OHSA should be a requirement of the OPSD, not a requirement placed on every municipality.
48.	2.11	The proposed standard for siphon design appears to be revised based on the current MECP criteria (a minimum velocity of 0.9m/s). Rationale should be provided for this change. The embankment typically dictates the slope of the pipe, and Conservation Authorities typically have a difference of opinion when it comes to drain chambers (some prefer it, some do not).
49.	2.11.2	Inverted Siphon pipe diameters smaller than 200 mm are often required in developing areas to achieve the required self cleansing velocity. The initial flow will be very small until the upstream area develops a sufficient population to require a 200 mm pipe. Smaller diameter pipes should be permitted with the approval of the Design Engineer.
50.	2.11.3	The minimum velocity achieved 'at least once a day' requires further clarification.
51.	2.12	Service connections to existing sewer systems do not normally require ECAs. Clarification is required if this has changed.

52.	2.12.5	Durham currently does not support the requirement for mandatory cleanouts for every installation. This would be very difficult to facilitate particularly in light of the Province's housing density requirements. Durham has our own standards for cleanouts, which are only mandatory if the length of the service is significant and/or is considered when access to a cleanout inside a home is not available.
53.	3	Durham does not currently have a forcemain design standard. The design is signed and sealed by an Engineer. All similar comments identified above for gravity sewers also apply to the proposed forcemain design criteria.
54.	3.8.1	Clarification should be provided to define the meaning of 'provide smooth flow transition'.
55.	3.8.3	Clarification should be provided to define the meaning of the 'flow line'. Is this the spring line? Also, please provide the design rationale for why no gravity sewers can be located within the transition maintenance hole, in particular if the forcemain is located well above all gravity sewers.
56.	3.8.4	Provide details and specifications for 'protective coatings and/or approved concrete additives'.
57.	3.8.5	It is very unusual and not cost effective to size a pipe for half of its capacity, in particular if the receiving sewer has upstream drainage other than the forcemain. The receiving sewer is often an existing trunk sewer with significant upstream drainage area and flow.
58.	3.13	Providing a drain valve on forcemains is not a typical practice in Durham. A location to drain is not normally readily available by gravity. A drain would also necessitate regular maintenance to ensure it operates properly. Regular maintenance requires a significant coordination effort by Plant Operations and Maintenance staff.
59.	3.13.3	There will not normally be a nearby "wastewater pipe" (assuming this means gravity sanitary sewer) adjacent to forcemain drain valves because forcemains are typically required in areas which cannot be serviced by gravity sanitary sewers.
60.	5.1.5	The City of Oshawa (within Durham) currently uses a 1-year return storm sewer design, while other area municipalities within Durham utilize different criteria. Design rationale should be provided for the use of a 2-year return storm sewer design as the choice of design

		return period is somewhat arbitrary and chosen as a "level of convenience" because all storms above this return period are serviced by the major system. While Oshawa uses a 1:1 year return period, it also requires the design of a very robust major system.
61.	5.7.1	Clarification is required to identify what type of situation would not permit the installation of a maintenance hole.
62.	5.7.2	Durham's MH spacing is 120m for sewers between 300mm and 1200mm and 150m for sewers great than 1200m. Durham has been effectively able to maintain their sewers based on these dimensions. Durham has based maintenance hole spacing on the availability of maintenance products and materials.
63.	6.1.5	A minimum slope of 1% in sewer systems cannot be achieved in most southern Ontario settings without significant and expensive earthmoving.
64.	Appendix A Section 2.3 – Leakage Testing	The requirements for leakage testing appear to have been prepared in the context of new sewer installations (e.g. for new sewers within new subdivision developments) or for new sewer alignments in existing serviced areas, and not for systems that service existing residents, businesses, institutions and/or industries that are replaced in-situ. Due to the congestion of Municipal road allowances with buried utilities, it is not uncommon for an Owner to need to replace an existing local system that has reached the end of design life along its existing alignment. Commonly, sewage flow in a local sewer being replaced is managed by a Contractor during daily construction activities only in order to minimize extended disruptions (e.g. beyond 8am – 5pm daily) of service to the public. Isolating the newly constructed system, once completed, for the purpose of completing the leakage testing (either hydrostatic or air testing) would introduce a scenario whereby temporary bypass systems would need to be in place for extended periods, which aside from incurring increased construction cost for infrastructure renewal projects, does inherently carry its own environmental risks (e.g. spillage due to system failure) and/or health and safety risks (e.g. vehicle / pedestrian hazards associated with at-grade temporary pipe systems or with potential Contractor staff entry into private buildings for the purpose of installing temporary plugs within service laterals). Mitigating Contractor staff entry into private residences is a newly realized hazard to

		Contractor staff and residents that has become apparent during the current pandemic health crisis. Our suggestion is to modify the design criteria to permit the infrastructure Owner to make exception decisions for pipeline quality assurance inspections. Durham has historically completed the CCTV inspection of newly constructed sewers for the purpose of identifying deficiencies (i.e. such as joints offsets and pipe breaks that lead to eventual groundwater infiltration issues). Our experience is that this is an effective approach for quality assurance purposes as part of construction, and it does not typically require temporary bypass of the systems being inspected.

Table 2 - ECA Template Comments

DRAFT Template ENVIRONMENTAL COMPLIANCE APPROVAL (ECA) For a Municipal Sewage Collection System, undated		
No.	**Reference**	**Comment**
1.	General	Storm sewer systems in Durham Region have complex ownership. There is combined ownership between Durham and the area municipalities within the same watershed and same sewer system. There are also locations of very old storm sewers, constructed before Durham existed and likely before the need for an ECA (formerly a C of A), but, within Regional roads where the ownership is not clearly known.
2.	General	How will Consolidated Linear Infrastructure ECAs be structured if the ownership is shared between upper and lower tier municipalities?

		One stated purpose of a Consolidated Linear Infrastructure ECA is to phase out the Transfer of Review Program. If shared ownership makes such a Consolidated ECA impossible or impractical, and there is no Transfer of Review process, how will new storm sewers be approved?