Ontario

Ministry of the Environment, Conservation and Parks

Pipe Data Form - Watermain, Storm Sewer, Sanitary Sewer, and Forcemain Design Supplement to Application for Approval for Water and Sewage Works

General

Information requested in this form is collected under the authority of the *Ontario Water Resources Act*, R.S.O. 1990 (OWRA), the *Safe Drinking Water Act* (SDWA), the Drinking-Water Systems Regulation (O. Reg. 170.03) and the Environmental Bill of Rights, c. 28, Statutes of Ontario 1993 (EBR). This information will be used to evaluate applications for approval of municipal and private sewage works as required by Section 53 (OWRA) and to evaluate applications for approval of municipal and non- municipal drinking-water systems as required by Sections 31, 36, 38, 52 and 60 of the SDWA.

Instructions

1. This form should accompany all Applications for a Water and Sewage Works. It does not replace the Application form for a Certificate of Approval and is required in addition to the supporting technical information described in the Guide for Applying for Municipal and Private Water and Sewage Works. All designs are expected to be in accordance with MECP design guidelines and the 10 State Standards.

2. The information contained in this form and the required supporting stamped engineering drawings are the minimum information requirements used to process the application for a Certificate of Approval. All sections MUST be filled out and incomplete forms will be RETURNED to the applicant. If the design does not meet the MECP design guidelines and the 10 State Standards, please explain why and how the issue will be addressed. Additional information may be requested during the review process.

3. Application forms and supporting documentation are available from the Client Services and Permissions Branch (CSPB) toll free at 1-800-461-6290 (locally at 416-314-8001), from your local District Office of the Ministry of the Environment, Conservation and Parks, and in the “Publications” section of the Ministry of the Environment, Conservation and Parks website at https://www.ontario.ca/page/water-and-sewage-works-approvals-sample-applications-guides-and-resources

4. Questions regarding completion and submission of this data form should be directed to the Client Services and Permissions Branch (CSPB), 135 St. Clair Avenue West, 1st Floor, Toronto ON M4V 1P5, 1-800-461-6290 or 416-314-8001, or to your local District Office of the Ministry of the Environment, Conservation and Parks.

Information for Proponents Applying for a ECA for Water and Sewage Works

Section 53 of the *Ontario Water Resources Act* R.S.O. 1990 and Part V of the *Safe Drinking Water Act* require that anyone who establishes, alters, extends or replaces new or existing water or sewage works do so only in accordance with approval granted by the Director. As a result, any plans to change watermains, storm sewers, sanitary sewers, or combined sewers must first be granted a Certificate of Approval (works which are exempt from Certificate of Approval requirements are detailed in Ontario Regulation 525/98). Detailed information on approval requirements and procedures are contained in separate documents entitled “Guide for Applying for Approval of Municipal and Private Water and Sewage Works (Section 53 *Ontario Water Resources Act* R.S.O. 1990)” and “Guide For Applying For Approvals Related To Municipal And Nun-Municipal Drinking-Water-Systems – Parts V and VI of the *Safe Drinking Water Act* and Drinking-Water Systems Regulation” These documents are available on the Ministry of the Environment, Conservation and Parks website (https://www.ontario.ca/page/water-and-sewage-works-approvals-sample-applications-guides-and-resources) or can be obtained by contacting a client services representative at 413-314-8001.

Criteria for Approval – Water and Sewage Works

The anticipated environmental impacts of water and sewage works are land and water contamination, or overflow causing physical damage, or resulting in adverse effects. Generally, these impacts can be minimized by the appropriate design installation, operating and maintenance of the water and sewage pipes. There are a number of guideline assessment criteria, which will be explained in this data form, and which can be read in greater detail in the following guidelines:

- Guidelines for the design of water distribution systems, Ministry of the Environment, 1985
- Guidelines for the design of sanitary sewage systems, Ministry of the Environment, 1985
- Interim guidelines for the design of storm sewer systems, Ministry of the Environment, 1985
- Procedure for the Determination of Treatment Requirements for Municipal and Private Combined and Partially Separated Sewer Systems (Procedure F-5-5)
- Procedures to govern separation of sewers and watermains (Procedure F-6-1)

Cette publication hautement spécialisée {Pipe Data Form - Watermain, Storm Sewer, Sanitary Sewer, and Forcemain Design Supplement to Application for Approval for Water and Sewage Works} n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la *Loi sur les services en français*. Pour obtenir des renseignements en français, veuillez communiquer avec le Ministère de l'Environnement, de la Protection de la nature et des Parcs au 416-314-8001 ou par courriel à enviropermissions@ontario.ca.

1.0 General Project Information

1.1 Site Name

40-60 Emma Street

1.2 Municipality

Town of Grand Valley

Client (if different from Municipality)

Sheldon Creek Developments

1.3 Type of Works Project (Please check all that apply)

- ☐ Watermain Please complete Sections 1.0 to 5.0 of this form
- ☑ Storm Sewer Please complete Sections 1.0 to 4.0, 6.0 and Appendix A of this form
- ☐ Sanitary Sewer Please complete Sections 1.0 to 4.0, 7.0 and Appendix B of this form
- ☐ Forcemain Please complete Sections 1.0 to 4.0, 8.0 and Appendix C of this form

1.4 (a) Project Purpose (Please check all that apply)

- ☐ Replacement
- ☐ Increased demand
- ☐ Connecting existing lines
- ☑ New development
- ☑ Other (specify) extension of existing storm system

2.0 Environmental Assessment Act Requirements

2.1 Is this a private sector project?

☐ Yes ☑ No If 'No', please complete 2.2 and 2.3

2.2 (a) Choose applicable Municipal sector Class EA Schedule

- ☑ Schedule A
- ☐ Schedule B
- ☐ Schedule C

(b) From the appropriate Schedule identified in 2.2(a), please identify Project Type and associated Schedule/Paragraph No. which applies to the proposed project

- ☐ Water Project
- ☐ Wastewater Project Schedule Number _____

For 'Schedule B' please complete 2.3(a),(b) For 'Schedule C', please complete 2.3(a),(b),(c)

2.3 (a) Has a Notice of Completion been submitted along with this application?

☐ Yes ☑ No

(b) Were any Part II Orders (ie "Bump-up" requests) received for this project?

☐ Yes ☑ No If 'Yes', please provide details:

(c) Has an Environmental Study Report (ESR) been completed?

☐ Yes If 'Yes', please include ESR Cover page with this submission ☑ No

3.0 Drawings

Note: All drawings must include an accurate scale and be stamped by a Professional engineer. If the drawing is of a large scale where small separation distances cannot be easily measured, these distances must be marked on the drawing or noted as a typical separation.

Have the following details been included with this submission?

- [x] Site Plan, including
  - [x] Proposed works
  - [x] Existing works (as appropriate)
  - [x] Property lines/Municipal boundaries
  - [x] Any water bodies in proximity to the works
- [x] Plan and Profile of all Pipes
  - [x] Horizontal distance between watermains and sewers
  - [x] Vertical distance between watermains and sewers
  - [x] Length, diameter and slope of each pipe segment
  - [x] Locations of valves, valve chambers if > 300mm diametre, pressure reducers, tees, etc
  - [x] Location of manholes (and their respective IDs)
- [x] Storm Drainage Area
  - [x] Indicate all areas which drain into the proposed works
  - [x] Physical area in hectares
  - [x] Runoff Coefficient for each drainage area
  - [x] Storm water drainage path
- [ ] Sanitary Drainage Area
  - [ ] Indicate all areas which drain into the proposed works
  - [ ] Physical area in hectares
  - [ ] Population for each drainage area
  - [ ] Sanitary Sewer drainage path
- [ ] Other Details
  - [ ] Typical separations, where not easily measured from pipe drawings
  - [ ] Appertunances
  - [ ] Municipal drains

4.0 Additional Information

4.1 Are the proposed works laid below the frost penetration depth for the area at all points?

- [x] Yes [ ] No

4.2 (a) Are all existing and proposed watermains separated by at least 2.5 m of clear horizontal distance from all existing and proposed sewers and storm water conveyance systems (ie. ditches)?

- [x] Yes [ ] No

(b) Are all existing and proposed watermains separated by at least 0.5 m of clear vertical distance higher than all existing and proposed sewers and storm water conveyance systems (ie. ditches)?

- [x] Yes [ ] No

(c) Are all existing and proposed sewers, including all drains and similar sources of contamination, separated by at least 15 metres from potable water reservoirs below normal ground surface and well supplies?

- [x] Yes [ ] No

If 'No' to any part of Question 4.0, please refer to Procedure F-6-1 for solutions to prevent contamination when separation distances cannot be met

5.0 Watermains

For Questions 5.1 to 5.3, please attach an additional sheet if necessary

5.1 Description of Proposed Watermain(s) (including service area/development)

5.2 Description of Existing Works (in proximity to proposed works)

5.3 For each watermain, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness

5.4 Are all of the watermains a minimum of 150 mm in diameter?

☐ Yes ☐ No

5.5 What is the expected operating pressure range for this watermain under maximum day demand?

_____ to _____ (please indicate units)

5.6 (a) Will the watermain pressure drop below 275 kPa (40 psi)?

☐ Yes ☐ No

If 'Yes', please provide an explanation for this situation and future plans to address the problem

(b) Is there sufficient pressure (138 kPA or 20 psi) reserved for fire flow/protection?

☐ Yes ☐ No

5.7 If this is a feedermain or a pipe dedicated to transporting potable water only (ie. having no service connections), have hydraulic transients been considered?

☐ Yes ☐ No

If 'Yes', please describe the results

5.8 (a) Are there any dead end points in the system?

☐ Yes ☐ No If 'Yes', then please complete 5.8(b)

(b) How will water stagnation be addressed?

☐ Fire Hydrants ☐ Blow-off point ☐ Other (Specify) _____

5.9 (a) Are there any tee- or cross-connections?

☐ Yes ☐ No If 'Yes', then please complete 5.9(b)

(b) Are there at least two (2) shut-off valves at each tee-connection, and at least three (3) shut-off valves at each cross-connection?

☐ Yes ☐ No

If 'No', how will disruptions to the system be minimized during repairs or emergencies?

6.0 Storm Sewers

For Questions 6.1 to 6.3, please attach an additional sheet if necessary

6.1 Description of Proposed Storm Sewer(s) (including service area/development)

Storm sewers on Emma Street from William street to 111m north of William including structures and a connection to an ~0.40 Ha private residential development at 40-60 Emma Street.

6.2 Is this application for approval a part of a larger and/or phased development?

☐ Yes ☑ No

If 'Yes', please provide full details on any existing developments including all Certificates of Approval that have been approved or application that are currently under review. Clearly indicate in all stamped engineering drawings and reports which developments belong to which phase and whether they are existing, for current development, or for future development

6.3 Description of Existing Works (in proximity to proposed works)

Storm sewers currently do not exist on Emma Street between Mill Street West and William Street. It is serviced by a combination of ditches, ditch inlets with culvert outlets which discharge to the William Street storm sewer.

The William Street storm sewer was upgraded in 2013-2014 to accommodate new development lands on the west end of Town. The design report by Gamsby and Mannerow (Design Brief, William Street Storm Outlet, Grand Valley, Revised, August 2011) includes Rational method calculations for both the 5 year and 100-year storm. The storm sewer was designed with this development in mind; a runoff coefficient of 0.5 was used for the existing residential area. The William Street trunk sewer is 1500mm upstream from the William and Emma Street intersection and a 1220mm x 1920 mm horizontal elliptical concrete pipe (1500mm equivalent) downstream of the intersection to the outlet at the Grand River.

6.4 For each storm sewer, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness
Emma Street	William Street Sewer	TICBMH14	525	0.013
Emma Street	TICBMH14	TICBMH1	525	0.013
Emma Street	TICBMH1	TICBMH3	450	0.013
Emma Street	TICB2	TICBMH1	300	0.013
Emma Street	TICB4	TICBMH3	300	0.013
Emma Street	CBMH15	TICBMH1	375	0.013

6.5 Has the Storm Sewer Hydraulic Design Sheet (or equivalent) been included with this submission? (refer to the Guidance Document in Appendix A)

☑ Yes ☐ No

6.6 Please indicate which land use surface types are included in the drainage area and list the runoff coefficient(s) used for each type

	Surface Type	Recommended	Used
☑	Asphalt, concrete, roof areas	0.90 - 1.00	0.95
☐	Gravel	0.80 - 0.85	
☑	Grassed areas, parkland	0.15 - 0.35	0.5
☐	Commercial	0.75 - 0.85	

	Surface Type	Recommended	Used
☐	Industrial	0.65 - 0.75	
☑	Single family dwelling	0.40 - 0.45	0.5
☐	Semi-detached	0.45 - 0.60	
☐	Row housing, Townhousing	0.50 - 0.70	
☐	Apartments	0.60 - 0.75	
☐	Institutional	0.40 - 0.75	
☐	Other		

If USED runoff coefficient does not fall within the RECOMMENDED range, please provide rationale below:
Steep slope of grassed area therefore used higher coefficient

6.7 (a) What is the full flow velocity range for all storm sewers in the proposed works?

2.02 to 3.32 m/s

(b) If the full flow velocity is outside of the range of 0.8 m/s to 6.0 m/s, what measures will be employed to reduce sediment build up and/or erosion in the pipe?

6.8 (a) What is the municipality's requirement for the minor design storm event?

☐ 2 year ☑ 5 year ☐ 10 year ☐ Other

(b) What storm event has been used for the design of the proposed works?

☐ 2 year ☑ 5 year ☐ 10 year ☐ Other

(c) Are there any inlet control devices (ICDs) proposed in the catch basins?

☑ Yes ☐ No

6.9 Please indicate the first destination/location that will be receiving the storm water:

☑ Natural Water Body

Name Grand River

Has the Conservation Authority granted approval to discharge to this water body?

☑ Yes ☐ No

☐ Storm Water Management (SWM) Facility

Name

Certificate of Approval Number (if applicable) OR

Application Reference Number (if submitted)

Has the Operating Authority (of the SWM facility) granted approval to discharge to this facility?

☐ Yes ☐ No

☐ Municipal Drain

☐ Existing Sewers

7.0 Sanitary Sewers

For Questions 7.1 to 7.3, please attach an additional sheet if necessary

7.1 Description of Proposed Sanitary Sewer(s) (including service area/development)

7.2 Description of Existing Works (in proximity to proposed works)

7.3 For each sewer, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness	

7.4 Has the Sanitary Sewer Design Sheet (or equivalent) been included with this submission? (refer to Guidance Document in Appendix B)

☐ Yes ☐ No

7.5 Please indicate which sewage types are applicable in the drainage area and list the daily design flows used in the pipe design for each type.

	Sewage Type	Recommended	Used
☐	Domestic	225 - 450 L/cap/day	
☐	Hospitals	900 - 1800 L/bed/day	
☐	Schools	70 - 140 L/student/day	
☐	Trailer Parks	340 - 800 L/space/day	
☐	Infiltration	0.1 - 0.28 L/ha/s	
☐	Industrial	35 - 55 m3/ha/day	
☐	Shopping Centres	2500 - 5000 L/1000 m2/day	
☐	Hotels/Motels	150 - 225 L/bed space/day	
☐	Other		

If USED sewage daily design flow does not fall within the RECOMMENDED range, please provide rationale below

7.6 (a) What is the full flow velocity range for all sanitary sewers in the proposed works?

_____ to _____ m/s

(b) If the full flow velocity is outside of the range of 0.6 m/s to 3.0 m/s, what measures will be employed to reduce sewage build up and/or erosion in the pipe?

7.7 It is recommended that sanitary sewers be laid at sufficient depth to receive gravity flow from basements. Are any sanitary sewers above the depth of any basements in the area?

☐ Yes ☐ No

If 'Yes', what methods will be employed to prevent sewage backup into basements?

8.0 Forcemains

For Questions 8.1 to 8.3, please attach an additional sheet if necessary

8.1 Description of Proposed Forcemain(s) (including service area/development)

8.2 Description of Existing Works (in proximity to proposed works)

8.3 For each forcemain, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness	

8.4 (a) Is there an existing ECA for the pumping station associated with this forcemain?

☐ Yes ☐ No

If 'Yes', please provide the Certificate of Approval Number: _____

If 'No', please complete 8.4(b)

(b) Please provide the pumping station design elements by completing Tables 1, 2, and 3 in Appendix C. Have Tables 1, 2, and 3 been included with this submission?

☐ Yes ☐ No

8.5 If this system is not a grinder pump system, is the minimum pipe size at least 100 mm to allow for the passage of small solids?

☐ Yes ☐ No

If 'No', please indicate below which methods will be employed to prevent a blockage in the pipe

---

8.6 (a) What is the velocity range for all forcemains in the proposed works?

_____ to _____ m/s

(b) If the velocity falls outside of the range of 0.8 m/s to 2.5 m/s, what measures will be employed to reduce sewage build up and/or erosion in the pipe?

8.7 Have the effects of hydraulic transient been considered?

☐ Yes ☐ No

If 'Yes', please indicate the results below

Appendix A - Sample Template

Storm Sewer Hydraulic Design Sheet

Site location (City)	n=	Checking Date (yyyy/mm/dd)
Ref #	Reviewer	

Design Storm: The _____ Year Storm Event

Rational Formula: Q = 2.78*CIA
Where: Q: peak flow (L/s)
C: runoff coefficient
I: rainfall intensity (mm/h)
A: area (ha)

Concentration time: tc = ti + tf (minute)
Where: ti: inlet time before pipe (minute)
tf: time of flow in pipe (minute)
tf = L/(60V) (minute)

Manning Equation:
Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coefficient

			Runoff							Pipe						
Street Name	**From (MH/CB)**	**To (MH/CB)**	Area (A) (ha)	Runoff Coefficient (C)	Section (AC) (ha)	Accum. (AC) (ha)	Concentration time (tc) (min.)	Rainfall Intensity (I) (mm/hr)	Peak Flow (Q) (L/s)	Length (L) (m)	Slope (S) (%)	N. D. (D) (mm)	Qcap. (full) (L/s)	V (full) (m/s)	Time of flow in pipe (min.) (tf)	(Q) / Qcap.

Note: This table has been provided as a reference template only. Applicants are encouraged to use this sample template as an example when creating their own Storm Sewer Hydraulic Design Sheet.

Appendix B - Sample Template

Sanitary Sewer Design Sheet

Site location (City)	n=	Checking Date (yyyy/mm/dd)
Ref #	Reviewer	

Residential Unit average daily flow (q): _____ L/cap.d (225~450 L/cap.d) Unit extraneous flow (E): _____ L/s/ha (0.1-0.28L.s.ha)

q = average daily per capita flow (L/cap.d)
I = Unit of peak extraneous flow (L/s/ha)
Q(p) = peak population flow (L/s)
Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)

Peaking Factor:
M =1+14/(4+(P/1000)^0.5)
Q(p) = (P/1000)qM/86.4 (L/s)
Q(I) = IA (L/s); where A = Area in hectares
Q(d) = Q(p) + Q(I) (L/s)

Manning Equation:
Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coefficient

			Inlet Flow								Pipe					
Location			**Individual**		**Accumulative**		**Peaking**	**Pop.**	**Extran.**	**Design**	**Length**	**Size**	**Slope**	**Capacity**	**Velocity**	
Street Name	**From (MH)**	**To (MH)**	P (person)	Area (ha)	P (person)	Area (ha)	Factor (M)	Q(p) (L/s)	Q(e) (L/s)	Q(d) (L/s)	L (m)	D (mm)	S (%)	Qcap. (L/s)	V (m/s)	Q(d)/ Qcap

Note: This table has been provided as a reference template only. Applicants are encouraged to use this sample template as an example when creating their own Sanitary Sewer Design Sheet.

Table 1 (H-1 of APPENDIX H)

Sewage Pumping Station Design – Table 1

Municipality

Pumping Station

Designed by | Date (yyyy/mm/dd)

Design Subject		Unit	Initial Period	10 Year Period	20 Year Period	Ultimate Period
Tributary	A) Residential	ha				
	B) Commercial	ha				
	C) Industrial	ha				
Population Density		Pers/ha				
Population or Equivalent	A) Residential	No.				
	B) Commercial	No.				
	C) Industrial	No.				
Per Capita Flow		L/cap.d				
Average Flow		L/s				
Peak Flow Factor*						
Peak Domestic Flow		L/s				
Infiltration Rate		L/ha.s				
Infiltration Flow		L/s				
Design Peak Flow		L/s				
Pumps		No.				
Pump Discharge		L/s				
Force Main Diameter		mm				
Velocity		m/s				

Note: * The peak flow factor is: 1+14/(4+P^0.5), where P is designed population, in thousand.

Table 2 (H-2 of APPENDIX H)

Sewage Pumping Station Design – Table 2

Municipality

Pumping Station

Designed by | Date (yyyy/mm/dd)

Design Subject	Unit	C=120	C=130	C=140
Pump Design Flow	L/s			
Forcemain Diam.	mm			
Velocity	m/s			
Forcemain Length	m			
Forcemain Head Loss	m			
Suction Line Head Loss	m			
Discharge Line Head Loss	m			
Total Head Loss	m			
Low Water Level Wet Well	m			
High Water Level Wet Well	m			
Forcemain End Elevation	m			
Static Head Max.	m			
Static Head Min.	m			
Total Danamic Head Max.	m			
Total Danamic Head Min.	m			

Table 3 (Abstracted from Appendix I)

Information Required for Sewage Pumping Stations Applications

Standby Power Supply

Is standby power required?

☐ Yes ☐ No

If yes, what kind of standby power is available for this pumping station?

☐ a) Standby Generator ☐ b) Portable Generator ☐ c) Additional hydro feed line

Receiving Watercourse

Will sewage be overflow/bypass any receiving watercourse?

☐ Yes ☐ No

If yes, then:

a) It will be necessary to know in detail the route by which overflow/bypass flow would gain access to the watercourse?

b) The flow in the receiving watercourse at the point of overflow/bypass from the pumping station is as follows:

_____ flow in dry weather (m^3/s)

_____ flow in wet weather (m^3/s)

c) The nearest water intake is located on the receiving watercourse within

_____ metres of the point of entry of the overflow.

Sewage Pumping Station

a) The operating authority responsible for maintenance and operation of this pumping station is

b) The high level alarm is set up to relay a signal to _____

c) Between the time of activation of the high level alarm and the overflow/basement flooding, there are:

_____ m^3 of storage capacity available in the sewers;

_____ m^3 of storage capacity available in the pumping station.

d) This storage will provide:

_____ minutes retention before overflow/basement flooding occurs at the average daily design flow of _____ L/s;

and _____ minutes retention before overflow/basement flooding occurs at the peak design flow of _____ L/s;

e) It is possible to bypass or pump around the pumping station with portable equipment by utilizing the following procedure