# Addendum

**DATE:** **1/1/2024**

**SUBJECT:** **Addendum to City of Edmonton Design and Construction Standards Volume 3-03 Design Guidelines – January 2024**

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**Purpose:**

The January 2024 "*Addendum to City of Edmonton Design and Construction Standards Volume 3-03: Design Guidelines*" provides an update to **Section 1.0 Sanitary Sewer Design Criteria**. The update aligns the design standards with the zoning types introduced in the City of Edmonton Zoning Bylaw Renewal and updates flow generation metrics based on the most recent water use trends observed in Edmonton.

**Updates:**

Sections, 1.1.1, 1.1.2, 1.1.3, 1.2, 1.4 and 1.13: Tables 1.3, 1.4, 1.4.1 (new) and 1.5, of Volume 3-03 of the design and construction standards are removed and replaced with the attached update.

A summary of the changes made are noted in the table below.

| Current Section: | Changes: | Date: |
|---|---|---|
| 1.1.1 | Directs designers to contact EPCOR Water Services at boundaryconditions@epcor.com for customized metrics for the design of trunk sewers and pump stations for larger areas. | January 2024 |
| 1.1.2 | References updated tables and adds reference to the Neighbourhood Structure Plan (NSP) Terms of Reference to determine people per unit by land use.<br>Removes reference to maximum saturation density. | January 2024 |
| 1.1.3 | References updated tables including new Table 1.4.1.<br>Directs designers to refer to Section 1.4 to determine metrics for high water consumption land uses. | January 2024 |
| 1.2 | Includes updated flow metrics for preliminary planning purposes for industrial land uses (8 $m^3$/day/ha). | January 2024 |
| 1.4 | Directs designers to contact EPCOR Water Services at boundaryconditions@epcor.com for guidance on high water consumption land uses. | January 2024 |

| Current Section: | Changes: | Date: |
|---|---|---|
| 1.13: Table 1.3, Table 1.4, Table 1.4.1 (new), Table 1.5 | Revised Table 1.3 – Updated zones, inclusion of zoning modifier and updated units/ha. Directs designers to refer to the NSP Terms of Reference to determine people per unit by land use.<br><br>Revised Table 1.4 – Table revised to reflect flow generation by business type from flow generation per floor area.<br><br>New Table 1.4.1 – New table of flow generation by business type for neighbourhood shopping centers.<br><br>Table 1.5 – Updated zones and sanitary flow generation factors by land use.<br><br>Tables 1.4, 1.4.1 and 1.5 directs designers to contact EPCOR Water Services at boundaryconditions@epcor.com for further guidance in the event of unique use cases. | January 2024 |

The January 2024 addendum to City of Edmonton Design and Construction Standards Volume 3-03 Drainage is considered part of Volume 3-03 of the design and construction standards wherever the design and construction standards are referenced by other documents.

Should any users have any questions regarding this addendum, the user is advised to seek clarification by sending an email to DRENG@epcor.com.

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| Professional Engineer Seal | Permit to Practice |
|---|---|
| PROFESSIONAL ENGINEER ALBERTA ADAM SHYPANSKI ID 85613 2023-DEC-19<br><br>Adam Shypanski, P.Eng.<br>Engineer, IRP<br>EPCOR Water Services Inc. | PERMIT TO PRACTICE<br>EPCOR WATER SERVICES INC.<br>RM SIGNATURE:<br>RM APEGA ID #: 46796<br>DATE: Dec 19/2023.<br>PERMIT NUMBER: P006368<br>The Association of Professional Engineers and Geoscientists of Alberta (APEGA)<br><br>Susan Ancel, P.Eng.<br>Director, One Water Planning<br>EPCOR Water Services Inc. |

Enclosures

# VOLUME 3

# DRAINAGE

## VOL. 3-03
## DESIGN GUIDELINES

**January 2024**

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# 1.0 SANITARY SEWER DESIGN CRITERIA

## 1.1 Estimating Sanitary Flows

1.1.1 Residential sanitary flow (population-generated)

The peak population-generated sanitary sewage flow a residential population shall be determined by the following formula:

$$Q_{PDW} = \frac{G \times P \times PF}{86400}$$

where: $Q_{PDW}$ = the peak dry weather flow rate (L/s)

and: G = the per capita daily sewage flow generation

= 220 L/day/person

and: P = the design contribution population

and: PF = a "peaking factor" determined as follows:

The peaking factor (PF) shall be the larger of 1.5 or:

$$PF = 2.6P_{pf}^{-0.1}$$

where: $P_{pf}$ = the design contribution population in 1,000's

For larger areas comprising several typical subdivisions please contact EPCOR Water Services at boundaryconditions@epcor.com for further guidance on applying customized metrics for the design of trunk sewers and pump stations.

1.1.2 For the design of sanitary sewers to serve small numbers of properties, such as a single typical subdivision, ***Table 1.3*** at the end of this section can be used as a guide to establish population (P) by zoning. Refer to the City of Edmonton Neighbourhood Structure Plan (NSP) Terms of Reference for determining people per unit by land use. For larger areas comprising several typical subdivisions or more, trunk sewers and pump stations are to be sized to accommodate average population densities as proposed in preceding statutory plans (General Municipal Plan, Area and Neighbourhood Structure Plans).

1.1.3 Commercial, institutional and industrial sanitary flow generation

For detailed system design, the average sanitary sewage flow from commercial, institutional and industrial land use areas is to be estimated on the basis of:

- Average daily flow generation computed using rates per business type, as set out in ***Table 1.4*** and ***Table 1.4.1*** at the end of this section;
- Average daily per area flow generation in accordance with proposed ultimate zoning, as set out in ***Table 1.5*** at the end of this section;
- Projected flows justified by the designer with specific and reliable information relating the projected land uses to flow generation characteristics;
- For high water consumption land uses, refer to Section **1.4**.

## 1.2 Average Flow Generation Estimates for Planning

For system planning purposes, when specific land uses and zoning are unknown and the requirements of Section **1.1** cannot be defined, the recommended lower limits for the estimation of average flow generation, to be used for preliminary planning unless the use of other values is justified with more specific or reliable information, are as follows:

- Commercial and institutional land uses: The lower limit for average flow generation shall be 20 $m^3$/day/ha;
- Industrial land uses: The lower limit for average flow generation shall be 8 $m^3$/day/ha.

## 1.4 High Water Consumption Land Uses

The foregoing guidelines do not apply to high water consumption land uses, for instance heavy industry, meat packing plants and breweries. Detailed analysis of the design requirements specific to each development proposal is required in such cases. Please contact EPCOR Water Services at boundaryconditions@epcor.com for further guidance.

## 1.13 Tables of Sanitary Design Factors

**Table 1.3: Residential Unit Density by Zoning**

| Zone[1] | Description | Zoning Bylaw Modifier[2] | (Net) Units/ha |
|---|---|---|---|
| RS | Small Scale Residential Zone | | 35 |
| RSF | Small Scale Flex Residential Zone | | 42 |
| RSM | Small-Medium Scale Transition Residential Zone | | 42 |
| RM | Medium Scale Residential Zone | h16 | 80 |
| | | h23 | 125 |
| | | h28 | 225 |
| RL | Large Scale Residential Zone | h50 | 300 |
| | | h65 | 325 |

*[1] Refer to the NSP Terms of Reference for people per unit by land use.*
*[2] Modifiers are categories that restrict the maximum allowable height in each zone. For example, the h16 modifier means that developments under that designation have a maximum allowable height of 16 meters.*

**Table 1.4: Sanitary Flow Generation Design Rates by Business Type**

| Business Type | Flow Generation Per Business ($m^3$/day)[1] |
|---|---|
| **Commercial Services** | |
| Automotive Servicing<br>Oil changes, lubrication, and general repair | 2 |
| Family Services and Places of Assembly<br>Child care services, funeral homes, places of assembly and temporary shelters | 3 |
| Medical Services<br>Clinics, dentists and rehabilitation services | 3 |
| Offices<br>Administrative activities such financial services, insurance, general consulting, contracting offices, government offices and research and development offices | 4 |
| **Other Services** | |
| Public Safety Services<br>Police, fire services and ambulance dispatches | 7 |
| **Accommodations** | |
| Hotels | 50 |
| Motels | 30 |
| Nursing Care Facilities | 50 |
| Continuing Care and Homes for the Elderly | 20 |
| **Education** | |
| Elementary and Junior Grade Schools | 5 |
| Senior Grade Schools | 20 |
| **Industrial Services** | |
| Small Manufacturing and Machining<br>Businesses related to the manufacturing of physical materials such as machine shops, structure fabrication and metal works | 3 |
| Warehousing, Storage, Commercial Sales and Logistics<br>Dedicated towards the storage of bulk goods such as refrigerated and general warehousing, freighting services, courier and shipping services, and industrial sales | 4 |
| **Retail Services (Shopping Centers/Districts)** | |
| Car Washes, Food Services, Gas Bars, Personal Care Services and Retail Shopping Outlets | See Table 1.4.1 |
| **High Water Use Facilities** | |
| Events and Attractions | Contact EPCOR |
| High-rise Towers | |
| Hospitals | |
| Secondary Education Institutions and Buildings | |
| Sports and Recreation Facilities | |
| Other High Water Users (heavy industry, meat packing plants and breweries) | |

[1] *Flow generation per business is based on 2019 water use records. If it is expected that the business will have unique uses or is uniquely sized, EPCOR can be contacted for further guidance at boundaryconditions@epcor.com.*

**Table 1.4.1: Sanitary Flow Generation Design Rates by Business Type for Retail Services Common to Neighborhood Shopping Centers**

| Neighborhood Shopping Centers (developments of 2 to 15 ha in approximate size) | | | | |
|---|---|---|---|---|
| Neighborhood Shopping Center | Business Type | | | Flow Generation Per Business ($m^3$/day)[1] |
| | Anchor Stores | Building Footprint | Large > 1.0 ha | 22 |
| | | | Small 0.5-1.0 ha | 15 |
| | Mid-size General Retail *(0.2 – 0.5 ha Building Footprint)* | | | 4 |
| | Small Retail & Personal Services | | | 2 |
| | Sit Down Restaurant & General Food Service | | | 10 |
| | Take Out Restaurant | | | 8 |
| | Gas Bar Only | | | 2 |
| | Carwash | | | 23 |

[1] *Flow generation per business is based on 2019 water use records. If it is expected that the business will have unique uses or is uniquely sized, EPCOR can be contacted for further guidance at boundaryconditions@epcor.com*

**Table 1.5: Commercial/Institutional and Industrial Sanitary Flow Generation Factors by Zoning**

| Land Use | Zone | Typical Lot Area (ha)[1] | Flow Generation ($m^3$/day/ha)[1,2,3] |
|---|---|---|---|
| Industrial | IM | 0.3-1.5 | 10 |
| | IH | 0.3-2.0 | 10 |
| | BE | 0.3-1.5 | 10 |
| Commercial | CG | 0.3-2.0 | 40 |
| | CB | | |
| | CN | 0.03-0.4 | 40 |
| Mixed Use | Mixed Use (MU, MUN) | 0.03-0.2 | 60 |

[1] *Contact EPCOR at boundaryconditions@epcor.com for assistance with atypical lot sizes and for assistance with high consumption land uses.*
[2] *Where water use for residential purposes is anticipated, flow generation is to be determined based on population and may be additive to other use generation.*
[3] *Flow generation is for Net Area that is assumed to be 80% of Gross Area.*