

# Memo

**To:** City of Toronto, Development Engineering  
**From:** Dorothy Poon, P.Eng. Counterpoint Engineering  
**cc:** Wessal Omarkhail, Choice Grosvenor/Grenville Inc.  
**Date:** June 6, 2025  
**Subject:** 26 Grenville Street & 27 Grosvenor Street, Servicing Memo Addendum  
**Our File:** 24-18045

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This Memo has been prepared to discuss the servicing impact of the updated unit count/mix as shown on the architectural plans dated June 6, 2025.

Based on the June 6, 2025 architectural plans, the proposed development at 26 Grenville Street and 27 Grosvenor Street will have a total of 769 units compared to 770 units as indicated in all servicing demand calculations in the 'Functional Servicing and Stormwater Management Implementation Report' dated December 6, 2021 prepared by our office.

Based on the decrease in the total units, the water demand and sanitary demand calculations have been reviewed and updated to determine if the municipal infrastructure can accommodate the site and what external upgrades, if any, would be required. It should be noted that the increase in units does not have a fundamental impact on the proposed stormwater management design and therefore that component of the previously submitted Report was not reviewed.

Tower A water demand increases from 4,069 L/min to 4,106 L/min and Tower B Water demand increases from 4,114 L/min to 4,135 L/min, both of which is a marginal increase. Based on the previously completed flow test results, there is sufficient flow in the existing municipal watermain system to accommodate the updated total water demand.

The new equivalent population based on the unit count decrease is 1407 persons compared to 1511 persons as used in calculations in the December 6, 2021 Report. Based on this decrease in population, the new peak sanitary flow has been calculated to be 15.06 L/s compared to 16.25 L/s in the December 6, 2021 Report. Since the proposed unit count increase results in a decrease in peak sanitary flow, the proposed catchbasin disconnection at St. Nicholas Street can still provide the required 2:1 offset.

Given the above, it is our opinion that the increase in unit counts does not have any fundamental change on the conclusions discussed in our December 6, 2021 Report. No external upgrades, other than those already proposed in our December 6, 2021 Report, would be required to the municipal watermain, municipal storm sewer, and municipal sanitary sewer systems.

Sincerely,

A handwritten signature in black ink that reads "Dorothy Poon". The signature is fluid and cursive, with the first name and last name clearly distinguishable.

Dorothy Poon, P.Eng.

Associate | Team Lead, Engineering Toronto

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## **APPENDIX A**

### **SUPPORTING CALCULATIONS**

# Counterpoint Engineering Inc.

## Water Demand Design Calculations

**Project:** 27 Grosvenor & 26 Grenville - Tower A Demands  
**Project No:** 18045  
**Location:** Toronto, Ontario  
**Site Area:** 0.3846 ha

### Population

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

| Residential Units                    |           |             |           |             |
|--------------------------------------|-----------|-------------|-----------|-------------|
|                                      | 1B / 1B+D | 2B / 2B + D | 3B / 3B+D | Total Units |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 279       | 62          | 31        | 372         |

|                             | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                 | 391                        | 131                         | 97                          | 619                 |
|                             |                            |                             |                             |                     |
| Total Equivalent Population |                            |                             |                             | 619                 |

### City of Toronto Watermain Guidelines

#### Per Capita Demand

|               |     |                |
|---------------|-----|----------------|
| Single Family | 310 | (L/capita/day) |
| Multi-Unit    | 190 | (L/capita/day) |

#### Peaking Factors

| Land Use      | Minimum Hour | Maximum Hour | Maximum Day |
|---------------|--------------|--------------|-------------|
| Residential   | 0.80         | 2.25         | 1.50        |
| Commercial    | 0.84         | 1.20         | 1.10        |
| Industrial    | 0.84         | 1.90         | 1.10        |
| Institutional | 0.84         | 1.90         | 1.10        |
| Apartment     | 0.84         | 2.50         | 1.30        |

\*Values used for Residential (Multi-Unit) Land Use

#### Water Demand based on Equivalent Population

| Land Use                 | Population | Minimum Hour<br>(L/min) | Maximum Hour<br>(L/min) | Maximum Day<br>(L/min) | Fire Flow<br>Required<br>(L/min) | Fire Flow<br>Duration<br>(hr)* | Max Day +<br>Fire Flow<br>(L/min) |
|--------------------------|------------|-------------------------|-------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------|
| Residential (Multi-Unit) | 619        | 68.6                    | 204.2                   | 106.2                  | -                                | -                              | -                                 |
| <b>Totals</b>            | <b>619</b> | <b>68.6</b>             | <b>204.2</b>            | <b>106.2</b>           | <b>4000</b>                      | <b>2.00</b>                    | <b>4,106.2</b>                    |

# Counterpoint Engineering Inc.

## REQUIRED FIRE FLOW WORKSHEET - PROPOSED DEVELOPMENT

Fire Underwriters Survey

Project : 27 Grosvenor & 26 Grenville - Tower A Demands

Project No: 18045

Guide for Determination of Required Flow Copyright I.S.O

$$F = 220C\sqrt{A}$$

where

F = the required fire flow in litres per minute.  
C = coefficient related to the type of construction.  
= 1.5 for wood frame construction (structure essentially all combustible).  
= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior).  
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls).  
= 0.6 for fire-resistive construction (fully protected frame, floors, roof).  
A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building being considered.

| Type of Construction     | Class Factor |
|--------------------------|--------------|
| WF Wood Frame            | 1.5          |
| OC Ordinary Construction | 1.0          |
| NC Non-Combustible       | 0.8          |
| FC Fire-Resistive        | 0.6          |

Area Notes for Fire Resistive Buildings (from FUS manual, 1999):

If Vertical Openings are inadequately protected (less than 1-hour fire rating): Area is the total of the two largest adjoining floors (above ground level) plus 50% of the area of each of the next 8 adjoining floors above that.

| Contents               | % Reduction |
|------------------------|-------------|
| NC Non-Combustible     | 25          |
| LC Limited Combustible | 15          |
| C Combustible          | 0           |
| FB Free Burning        | 15          |
| RB Rapid Burning       | 25          |

If Vertical Openings are adequately protected (at least 1-hour fire rating): Area is the total of the largest floor (above ground level) plus 25% of the area of each of the next 2 immediately adjoining floors above that.

- 1) **Fire Flow**  
Type of Construction: FC  
C= 0.6  
A\*= 1628 m<sup>2</sup>  
F= 5,326 L/min 5,000 L/min (round to the nearest 1,000L/min)

\*Note: Building will be fire restive as per OBC requirements with protected vertical openings.  
Area is the total of the largest floor (Level 1) plus 25% of the next 2 adjoining floors above.

- 2) **Occupancy Reduction/Surcharge**  
Contents Factor: NC  
Reduction/Surcharge of -25%  
F= 5000L/min + -1331 L/min = 3,669 L/min

- 3) **System Type Reduction**  
NFPA 13 Sprinkler: YES 30%  
Standard Water Supply: YES 10%  
Fully Supervised: YES 10%  
Total 50%  
Reduction of 50% L/min = 1,834 L/min  
F= 3669L/min - 1,834 L/min = 1,834 L/min

- 4) **Separation Charge**  
Building Face Dist(m) Charge  
North 26.1 10%  
East 0.0 25%  
South 8.4 20%  
West 12.0 15%  
Total 70% of 3668.6 L/min = 2,568 L/min  
(max exposure charge can be 75%)

| Separation  | Charge | Separation   | Charge |
|-------------|--------|--------------|--------|
| 0 to 3m     | 25%    | 20.1 to 30 m | 10%    |
| 3.1 to 10m  | 20%    | 30.1 to 45m  | 5%     |
| 10.1 to 20m | 15%    |              |        |

F= 1834L/min + 2568L/min = 4,402 L/min (2,000L/min<F<45,000L/min)

|    |             |                                   |
|----|-------------|-----------------------------------|
| F= | 4,000 L/min | (round to the nearest 1,000L/min) |
| F= | 67 L/s      |                                   |
| F= | 1,057 gpm   |                                   |

## counterpoint engineering

### NFPA Theoretical Flow Calculations

Project Name: 27 Grosvenor & 26 Grenville - Tower A Demands

Project Number: 18045

Based on National Fire Protection Association Guidelines, the available flow at the minimum residual pressure of 20psi can be calculated based on the observed flow at the observed pressure readings, as follows:

$$Q_F = 29.83 \times c \times d^2 \times p^{0.5}, \text{ where}$$

$Q_F$  = observed flow (US GPM)

$c$  = hydrant nozzle coefficient (0.90 - 0.95)

$d$  = nozzle diameter (in)

$p$  = observed pitot pressure

$$Q_R = Q_F \times h_F^{0.54} / h_R^{0.54}, \text{ where}$$

$Q_R$  = available flow

$Q_F$  = observed flow (US GPM)

$h_F$  = drop from measured static to desired baseline pressure

$h_R$  = drop from measured static to measured residual pressure

*Based on flow test results obtained by Lozzi Aqua Check dated September 4, 2019 on the Grosvenor watermain*

|                   |        |
|-------------------|--------|
| $c =$             | 0.95   |
| $d =$             | 2.5 in |
| number of ports = | 2      |
| $p =$             | 5      |

$$Q_F = 792 \text{ US GPM}$$

|                              |        |                                               |
|------------------------------|--------|-----------------------------------------------|
| Measured Static Pressure =   | 55 psi |                                               |
| Measured Residual Pressure = | 37 psi |                                               |
| Desired Residual Pressure =  | 20 psi | , minimum per City of Toronto design criteria |

$$Q_R = 1134 \text{ US GPM} \quad \text{per fire connection}$$

4,294 L/min

# Counterpoint Engineering Inc.

## Water Demand Design Calculations

**Project:** 27 Grosvenor & 26 Grenville - Tower B  
**Project No:** 18045  
**Location:** Toronto, Ontario  
**Site Area:** 0.3846 ha

### Population

|                     |        |                           |
|---------------------|--------|---------------------------|
| 1BR/1BR+Den         | 1.4    | ppu                       |
| 2BR/2BR+Den/        | 2.1    | ppu                       |
| 3BR/3BR+Den         | 3.1    | ppu                       |
| Commercial / Retail | 1.1    | persons/100m <sup>2</sup> |
| Offices             | 3.3    | persons/100m <sup>2</sup> |
| Schools             | 0.0258 | persons/m <sup>2</sup>    |

|                                      | Residential Units |             |           |             | Childcare              |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 216               | 92          | 89        | 397         | 669                    |

|                             | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                 | 303                        | 194                         | 276                         | 773                 |
| Institutional               | -                          | -                           | -                           | 18                  |
| Total Equivalent Population |                            |                             |                             | 791                 |

### City of Toronto Watermain Guidelines

#### Per Capita Demand

|               |     |                |
|---------------|-----|----------------|
| Single Family | 310 | (L/capita/day) |
| Multi-Unit    | 190 | (L/capita/day) |

#### Peaking Factors

| Land Use      | Minimum Hour | Maximum Hour | Maximum Day |
|---------------|--------------|--------------|-------------|
| Residential   | 0.80         | 2.25         | 1.50        |
| Commercial    | 0.84         | 1.20         | 1.10        |
| Industrial    | 0.84         | 1.90         | 1.10        |
| Institutional | 0.84         | 1.90         | 1.10        |
| Apartment     | 0.84         | 2.50         | 1.30        |

\*Values used for Institutional Land Use

\*Values used for Residential (Multi-Unit) Land Use

### Water Demand based on Equivalent Population

| Land Use                 | Population | Minimum Hour<br>(L/min) | Maximum Hour<br>(L/min) | Maximum Day<br>(L/min) | Fire Flow<br>Required<br>(L/min) | Fire Flow<br>Duration<br>(hr)* | Max Day +<br>Fire Flow<br>(L/min) |
|--------------------------|------------|-------------------------|-------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------|
| Institutional            | 18         | 2.0                     | 4.5                     | 2.6                    | -                                | -                              | -                                 |
| Residential (Multi-Unit) | 773        | 85.7                    | 255.0                   | 132.6                  | -                                | -                              | -                                 |
| Totals                   | 791        | 87.7                    | 259.5                   | 135.2                  | 4000                             | 2.00                           | 4,135.2                           |

# Counterpoint Engineering Inc.

## REQUIRED FIRE FLOW WORKSHEET - PROPOSED DEVELOPMENT

Fire Underwriters Survey

Project : 27 Grosvenor & 26 Grenville - Tower B

Project No: 18045

Guide for Determination of Required Flow Copyright I.S.O

$$F = 220C\sqrt{A}$$

where

F = the required fire flow in litres per minute.  
C = coefficient related to the type of construction.  
= 1.5 for wood frame construction (structure essentially all combustible).  
= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior).  
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls).  
= 0.6 for fire-resistive construction (fully protected frame, floors, roof).  
A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building being considered.

| Type of Construction     | Class Factor |
|--------------------------|--------------|
| WF Wood Frame            | 1.5          |
| OC Ordinary Construction | 1.0          |
| NC Non-Combustible       | 0.8          |
| FC Fire-Resistive        | 0.6          |

Area Notes for Fire Resistive Buildings (from FUS manual, 1999):

If Vertical Openings are inadequately protected (less than 1-hour fire rating): Area is the total of the two largest adjoining floors (above ground level) plus 50% of the area of each of the next 8 adjoining floors above that.

| Contents               | % Reduction |
|------------------------|-------------|
| NC Non-Combustible     | 25          |
| LC Limited Combustible | 15          |
| C Combustible          | 0           |
| FB Free Burning        | 15          |
| RB Rapid Burning       | 25          |

If Vertical Openings are adequately protected (at least 1-hour fire rating): Area is the total of the largest floor (above ground level) plus 25% of the area of each of the next 2 immediately adjoining floors above that.

1) **Fire Flow**  
Type of Construction: 

|     |
|-----|
| FC  |
| 0.6 |

  
C= 

|     |
|-----|
| 0.6 |
|-----|

  
A\*= 

|      |
|------|
| 1589 |
|------|

 m<sup>2</sup>  
F= 

|       |
|-------|
| 5,261 |
|-------|

 L/min      **5,000 L/min** (round to the nearest 1,000L/min)

\*Note: Building will be fire restive as per OBC requirements with protected vertical openings.  
Area is the total of the largest floor (Level 1) plus 25% of the next 2 adjoining floors above.

2) **Occupancy Reduction/Surcharge**  
Contents Factor: 

|      |
|------|
| NC   |
| -25% |

  
Reduction/Surcharge of 

|      |
|------|
| -25% |
|------|

 = 

|        |
|--------|
| -1,315 |
|--------|

 L/min  
F= 5000L/min + 

|       |
|-------|
| -1315 |
|-------|

 L/min = 

|       |
|-------|
| 3,685 |
|-------|

 L/min

3) **System Type Reduction**  
NFPA 13 Sprinkler: 

|     |     |
|-----|-----|
| YES | 30% |
|-----|-----|

  
Standard Water Supply: 

|     |     |
|-----|-----|
| YES | 10% |
|-----|-----|

  
Fully Supervised: 

|     |     |
|-----|-----|
| YES | 10% |
|-----|-----|

  
**Total**

|     |
|-----|
| 50% |
|-----|

  
Reduction of 

|     |
|-----|
| 50% |
|-----|

 L/min = 

|       |
|-------|
| 1,842 |
|-------|

 L/min  
F= 3685L/min - 

|       |
|-------|
| 1,842 |
|-------|

 L/min = 

|       |
|-------|
| 1,842 |
|-------|

 L/min

4) **Separation Charge**  
Building Face 

| Dist(m)      | Charge     |
|--------------|------------|
| North 8.4    | 20%        |
| East 11.5    | 15%        |
| South 24.1   | 10%        |
| West 5.5     | 20%        |
| <b>Total</b> | <b>65%</b> |

 of 3684.8 L/min = 

|       |
|-------|
| 2,395 |
|-------|

 L/min  
(max exposure charge can be 75%)

| Separation  | Charge | Separation   | Charge |
|-------------|--------|--------------|--------|
| 0 to 3m     | 25%    | 20.1 to 30 m | 10%    |
| 3.1 to 10m  | 20%    | 30.1 to 45m  | 5%     |
| 10.1 to 20m | 15%    |              |        |

F= 1842L/min + 2395L/min = 

|       |
|-------|
| 4,237 |
|-------|

 L/min (2,000L/min<F<45,000L/min)

|    |       |       |                                   |
|----|-------|-------|-----------------------------------|
| F= | 4,000 | L/min | (round to the nearest 1,000L/min) |
| F= | 67    | L/s   |                                   |
| F= | 1,057 | gpm   |                                   |



## counterpoint engineering

### NFPA Theoretical Flow Calculations

**Project Name:** 27 Grosvenor & 26 Grenville - Tower B

**Project Number:** 18045

Based on National Fire Protection Association Guidelines, the available flow at the minimum residual pressure of 20psi can be calculated based on the observed flow at the observed pressure readings, as follows:

$$Q_F = 29.83 \times c \times d^2 \times p^{0.5}, \text{ where}$$

$Q_F$  = observed flow (US GPM)

$c$  = hydrant nozzle coefficient (0.90 - 0.95)

$d$  = nozzle diameter (in)

$p$  = observed pitot pressure

$$Q_R = Q_F \times h_F^{0.54} / h_R^{0.54}, \text{ where}$$

$Q_R$  = available flow

$Q_F$  = observed flow (US GPM)

$h_F$  = drop from measured static to desired baseline pressure

$h_R$  = drop from measured static to measured residual pressure

***Based on flow test results obtained by Lozzi Aqua Check dated September 4, 2019 for the Grenville watermain***

|                   |        |
|-------------------|--------|
| $c =$             | 0.95   |
| $d =$             | 2.5 in |
| number of ports = | 2      |
| $p =$             | 25     |

**$Q_F = 1771$  US GPM**

|                              |        |                                               |
|------------------------------|--------|-----------------------------------------------|
| Measured Static Pressure =   | 56 psi |                                               |
| Measured Residual Pressure = | 40 psi |                                               |
| Desired Residual Pressure =  | 20 psi | , minimum per City of Toronto design criteria |

**$Q_R = 2744$  US GPM** per fire connection  
**10,388 L/min**

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto Ontario  
**Site Area:** 0.3846

## Existing Equivalent Population Calculations

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto

*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                        |     |                           |
|------------------------|-----|---------------------------|
| Single Family Dwelling | 3.5 | ppu                       |
| Duplex                 | 2.3 | ppu                       |
| 1BR/1BR+Den            | 1.4 | ppu                       |
| 2BR/2BR+Den/           | 2.1 | ppu                       |
| 3BR/3BR+Den            | 3.1 | ppu                       |
| Commercial / Retail    | 1.1 | persons/100m <sup>2</sup> |
| Offices                | 3.3 | persons/100m <sup>2</sup> |

|                                         | Residential Units      |              | Office                 |
|-----------------------------------------|------------------------|--------------|------------------------|
|                                         | Single Family Dwelling | Duplex Units | Area (m <sup>2</sup> ) |
| Existing 2 Storey Office (26 Grenville) | 0                      | -            | 2362                   |
| TOTAL UNITS / AREA (m <sup>2</sup> )    | 3                      | 0            | 2362                   |

|                                    | Single Family Dwelling | TOTAL POPULATION |
|------------------------------------|------------------------|------------------|
| Residential                        | 0                      | 0                |
| Office                             | -                      | 77.946           |
| <b>Total Equivalent Population</b> |                        | <b>78</b>        |

### Peak flow Design Parameters

|                              |      |                   |
|------------------------------|------|-------------------|
| Industrial/Commercial/Office | 240  | litres/person/day |
| Infiltration                 | 0.26 | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Total Population | Harmon Peak Factor |
|------------------|--------------------|
| 78               | 4.27               |

|                          |      |     |
|--------------------------|------|-----|
| Average Dry Weather Flow | 0.22 | L/s |
|--------------------------|------|-----|

|                            |      |     |
|----------------------------|------|-----|
| Total Peak Wastewater Flow | 0.92 | L/s |
| Infiltration               | 0.10 | L/s |

|             |             |            |
|-------------|-------------|------------|
| <b>Flow</b> | <b>1.02</b> | <b>L/s</b> |
|-------------|-------------|------------|

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto  
**Site Area:** 0.3846 ha

## Proposed Sanitary Flow Calculations (Entire Development)

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto

*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                     |        |                           |
|---------------------|--------|---------------------------|
| 1BR/1BR+Den         | 1.4    | ppu                       |
| 2BR/2BR+Den/        | 2.1    | ppu                       |
| 3BR/3BR+Den         | 3.1    | ppu                       |
| Commercial / Retail | 1.1    | persons/100m <sup>2</sup> |
| Offices             | 3.3    | persons/100m <sup>2</sup> |
| Schools             | 0.0258 | persons/m <sup>2</sup>    |

|                                      | Residential Units |             |           |             | Childcare              |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 495               | 154         | 120       | 769         | 669                    |

|                                    | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|------------------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                        | 693                        | 324                         | 372                         | 1389                |
| Institutional                      | -                          | -                           | -                           | 18                  |
| <b>Total Equivalent Population</b> |                            |                             |                             | <b>1407</b>         |

### Peak flow Design Parameters

|                          |         |                   |
|--------------------------|---------|-------------------|
| Residential Average flow | 240     | litres/person/day |
| Commercial Average flow  | 180,000 | litres/ha/day     |
| Infiltration             | 0.26    | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Residential Population | Harmon Peak Factor |
|------------------------|--------------------|
| 1389                   | 3.70               |

|                    |       |     |                      |
|--------------------|-------|-----|----------------------|
| Residential Flow   | 14.29 | L/s | *based on population |
| Institutional Flow | 0.14  | L/s | *based on floor area |
| Groundwater Flows  | 0.63  | L/s | * 10 USGPM pump      |

|      |       |     |
|------|-------|-----|
| Flow | 15.06 | L/s |
|------|-------|-----|

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto  
**Site Area:** 0.3846 ha

## Proposed Sanitary Flow Calculations (Tower A)

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto  
*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

| Residential Units                    |           |             |           |             |
|--------------------------------------|-----------|-------------|-----------|-------------|
|                                      | 1B / 1B+D | 2B / 2B + D | 3B / 3B+D | Total Units |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 279       | 62          | 31        | 372         |

|                                    | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|------------------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                        | 391                        | 131                         | 97                          | 619                 |
| <b>Total Equivalent Population</b> |                            |                             |                             | <b>619</b>          |

### Peak flow Design Parameters

|                          |         |                   |
|--------------------------|---------|-------------------|
| Residential Average flow | 240     | litres/person/day |
| Commercial Average flow  | 180,000 | litres/ha/day     |
| Infiltration             | 0.26    | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Residential Population | Harmon Peak Factor |
|------------------------|--------------------|
| 619                    | 3.92               |

|                   |      |     |                      |
|-------------------|------|-----|----------------------|
| Residential Flow  | 6.75 | L/s | *based on population |
| Retail Flow       | 0.00 | L/s | *based on floor area |
| Groundwater Flows | 0.63 | L/s | * 10 USGPM pump      |

|      |      |     |
|------|------|-----|
| Flow | 7.38 | L/s |
|------|------|-----|

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto  
**Site Area:** 0.3846 ha

## Proposed Sanitary Flow Calculations (Tower B)

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto  
*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                     |        |                           |
|---------------------|--------|---------------------------|
| 1BR/1BR+Den         | 1.4    | ppu                       |
| 2BR/2BR+Den/        | 2.1    | ppu                       |
| 3BR/3BR+Den         | 3.1    | ppu                       |
| Commercial / Retail | 1.1    | persons/100m <sup>2</sup> |
| Offices             | 3.3    | persons/100m <sup>2</sup> |
| Schools             | 0.0258 | persons/m <sup>2</sup>    |

|                                      | Residential Units |             |           |             | Childcare              |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 216               | 92          | 89        | 397         | 669                    |

|                                    | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|------------------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                        | 303                        | 194                         | 276                         | 773                 |
| Childcare                          | -                          | -                           | -                           | 18                  |
| <b>Total Equivalent Population</b> |                            |                             |                             | <b>791</b>          |

### Peak flow Design Parameters

|                            |         |                   |
|----------------------------|---------|-------------------|
| Residential Average flow   | 240     | litres/person/day |
| Institutional Average flow | 180,000 | litres/ha/day     |
| Infiltration               | 0.26    | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Residential Population | Harmon Peak Factor |
|------------------------|--------------------|
| 773                    | 3.87               |

|                    |      |     |                      |
|--------------------|------|-----|----------------------|
| Residential Flow   | 8.31 | L/s | *based on population |
| Institutional Flow | 0.14 | L/s | *based on floor area |
| Groundwater Flows  | 0.00 | L/s |                      |

|      |      |     |
|------|------|-----|
| Flow | 8.45 | L/s |
|------|------|-----|

## **APPENDIX B**

**SUPPORTING CALCULATIONS FROM 'FUNCTIONAL SERVICIGN AND  
STORMWATER MANAGEMENT IMPLEMENTATION REPORT' DATED  
DECEMBER 6, 2021**

# Counterpoint Engineering Inc.

## Water Demand Design Calculations

**Project:** 27 Grosvenor & 26 Grenville - North Tower Demands  
**Project No:** 18045  
**Location:** Toronto, Ontario  
**Site Area:** 0.3846 ha

### Population

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

|                                      | Residential Units |             |           |             | Commercial             |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 80                | 101         | 25        | 206         | 0.0                    |

|                             |  | Population 1BR<br>/ 1B + D | Population<br>2BR / 2BR +<br>D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|--|----------------------------|--------------------------------|-----------------------------|---------------------|
| Residential                 |  | 112                        | 213                            | 78                          | 403                 |
| Commercial                  |  | -                          | -                              | -                           | 0                   |
| Total Equivalent Population |  |                            |                                |                             | 403                 |

### City of Toronto Watermain Guidelines

#### Per Capita Demand

|               |     |                |
|---------------|-----|----------------|
| Single Family | 310 | (L/capita/day) |
| Multi-Unit    | 190 | (L/capita/day) |

#### Peaking Factors

| Land Use      | Minimum Hour | Maximum Hour | Maximum Day |
|---------------|--------------|--------------|-------------|
| Residential   | 0.80         | 2.25         | 1.50        |
| Commercial    | 0.84         | 1.20         | 1.10        |
| Industrial    | 0.84         | 1.90         | 1.10        |
| Institutional | 0.84         | 1.90         | 1.10        |
| Apartment     | 0.84         | 2.50         | 1.30        |

\*Values used for Commercial Land Use

\*Values used for Residential (Multi-Unit) Land Use

#### Water Demand based on Equivalent Population

| Land Use                 | Population | Minimum Hour<br>(L/min) | Maximum<br>Hour<br>(L/min) | Maximum Day<br>(L/min) | Fire Flow<br>Required<br>(L/min) | Fire Flow<br>Duration<br>(hr)* | Max Day +<br>Fire Flow<br>(L/min) |
|--------------------------|------------|-------------------------|----------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------|
| Commercial               | 0          | 0.0                     | 0.0                        | 0.0                    | -                                | -                              | -                                 |
| Residential (Multi-Unit) | 403        | 44.7                    | 132.9                      | 69.1                   | -                                | -                              | -                                 |
| <b>Totals</b>            | <b>403</b> | <b>44.7</b>             | <b>132.9</b>               | <b>69.1</b>            | <b>4000</b>                      | <b>2.00</b>                    | <b>4,069.1</b>                    |

# Counterpoint Engineering Inc.

## REQUIRED FIRE FLOW WORKSHEET - PROPOSED DEVELOPMENT

Fire Underwriters Survey

Project : 27 Grosvenor & 26 Grenville - North Tower Demands

Project No: 18045

Guide for Determination of Required Flow Copyright I.S.O

$$F = 220C\sqrt{A}$$

where  
 F = the required fire flow in litres per minute.  
 C = coefficient related to the type of construction.  
 = 1.5 for wood frame construction (structure essentially all combustible).  
 = 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior).  
 = 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls).  
 = 0.6 for fire-resistive construction (fully protected frame, floors, roof).  
 A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building being considered.

| Type of Construction     | Class Factor |
|--------------------------|--------------|
| WF Wood Frame            | 1.5          |
| OC Ordinary Construction | 1.0          |
| NC Non-Combustible       | 0.8          |
| FC Fire-Resistive        | 0.6          |

Area Notes for Fire Resistive Buildings (from FUS manual, 1999):

If Vertical Openings are inadequately protected (less than 1-hour fire rating): Area is the total of the two largest adjoining floors (above ground level) plus 50% of the area of each of the next 8 adjoining floors above that.

| Contents               | % Reduction |
|------------------------|-------------|
| NC Non-Combustible     | 25          |
| LC Limited Combustible | 15          |
| C Combustible          | 0           |
| FB Free Burning        | 15          |
| RB Rapid Burning       | 25          |

If Vertical Openings are adequately protected (at least 1-hour fire rating): Area is the total of the largest floor (above ground level) plus 25% of the area of each of the next 2 immediately adjoining floors above that.

### 1) Fire Flow

Type of Construction:

C=

A\*=

F=

|                     |
|---------------------|
| FC                  |
| 0.6                 |
| 1175 m <sup>2</sup> |
| 4,524 L/min         |

5,000 L/min (round to the nearest 1,000L/min)

\*Note: Building will be fire restive as per OBC requirements with protected vertical openings.  
 Area is the total of the largest floor (Level 12) plus 25% of the next 2 adjoining floors above.

### 2) Occupancy Reduction/Surcharge

Contents Factor:

Reduction/Surcharge of

F=

|      |
|------|
| NC   |
| -25% |

= -1,131 L/min

5000L/min + -1131 L/min = 3,869 L/min

### 3) System Type Reduction

NFPA 13 Sprinkler:

Standard Water Supply:

Fully Supervised:

Total

Reduction of

F=

|       |     |
|-------|-----|
| YES   | 30% |
| YES   | 10% |
| YES   | 10% |
| Total | 50% |

50% L/min = 1,935 L/min

3869L/min - 1,935 L/min = 1,935 L/min

### 4) Separation Charge

Building Face

North

East

South

West

Total

| Dist(m) | Charge |
|---------|--------|
| 26.1    | 10%    |
| 5.3     | 20%    |
| 21.0    | 10%    |
| 19.1    | 15%    |

55% of 3869.1 L/min = 2,128 L/min

(max exposure charge can be 75%)

| Separation  | Charge | Separation   | Charge |
|-------------|--------|--------------|--------|
| 0 to 3m     | 25%    | 20.1 to 30 m | 10%    |
| 3.1 to 10m  | 20%    | 30.1 to 45m  | 5%     |
| 10.1 to 20m | 15%    |              |        |

F= 1935L/min + 2128L/min = 4,063 L/min (2,000L/min<F<45,000L/min)

|    |             |                                   |
|----|-------------|-----------------------------------|
| F= | 4,000 L/min | (round to the nearest 1,000L/min) |
| F= | 67 L/s      |                                   |
| F= | 1,057 gpm   |                                   |



## counterpoint engineering

### NFPA Theoretical Flow Calculations

Project Name: 27 Grosvenor & 26 Grenville - North Tower Demands

Project Number: 18045

Based on National Fire Protection Association Guidelines, the available flow at the minimum residual pressure of 20psi can be calculated based on the observed flow at the observed pressure readings, as follows:

$$Q_F = 29.83 \times c \times d^2 \times p^{0.5}, \text{ where}$$

$Q_F$  = observed flow (US GPM)

$c$  = hydrant nozzle coefficient (0.90 - 0.95)

$d$  = nozzle diameter (in)

$p$  = observed pitot pressure

$$Q_R = Q_F \times h_F^{0.54} / h_R^{0.54}, \text{ where}$$

$Q_R$  = available flow

$Q_F$  = observed flow (US GPM)

$h_F$  = drop from measured static to desired baseline pressure

$h_R$  = drop from measured static to measured residual pressure

*Based on flow test results obtained by Lozzi Aqua Check dated September 4, 2019 on the Grosvenor watermain*

|                   |        |
|-------------------|--------|
| $c$ =             | 0.9    |
| $d$ =             | 2.5 in |
| number of ports = | 2      |
| $p$ =             | 5      |

$$Q_F = 750 \text{ US GPM}$$

Measured Static Pressure = 55 psi

Measured Residual Pressure = 37 psi

Desired Residual Pressure = 20 psi, minimum per City of Toronto design criteria

$$Q_R = 1075 \text{ US GPM} \text{ per fire conneciton}$$

4,068 L/min

# Counterpoint Engineering Inc.

## Water Demand Design Calculations

Project: 27 Grosvenor & 26 Grenville - South Tower  
 Project No: 18045  
 Location: Toronto, Ontario  
 Site Area: 0.3846 ha

### Population

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

|                                      | Residential Units |             |           |             | Commercial             |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 198               | 165         | 12        | 375         | 0.0                    |

|                             |  | Population 1BR / 1B + D | Population 2BR / 2BR + D | Population 3BR / 3BR + D | TOTAL POPULATION |
|-----------------------------|--|-------------------------|--------------------------|--------------------------|------------------|
| Residential                 |  | 278                     | 347                      | 38                       | 663              |
| Commercial                  |  | -                       | -                        | -                        | 0                |
| Total Equivalent Population |  |                         |                          |                          | 663              |

### City of Toronto Watermain Guidelines

#### Per Capita Demand

|               |     |                |
|---------------|-----|----------------|
| Single Family | 310 | (L/capita/day) |
| Multi-Unit    | 190 | (L/capita/day) |

#### Peaking Factors

| Land Use      | Minimum Hour | Maximum Hour | Maximum Day |
|---------------|--------------|--------------|-------------|
| Residential   | 0.80         | 2.25         | 1.50        |
| Commercial    | 0.84         | 1.20         | 1.10        |
| Industrial    | 0.84         | 1.90         | 1.10        |
| Institutional | 0.84         | 1.90         | 1.10        |
| Apartment     | 0.84         | 2.50         | 1.30        |

\*Values used for Commercial Land Use

\*Values used for Residential (Multi-Unit) Land Use

#### Water Demand based on Equivalent Population

| Land Use                 | Population | Minimum Hour (L/min) | Maximum Hour (L/min) | Maximum Day (L/min) | Fire Flow Required (L/min) | Fire Flow Duration (hr)* | Max Day + Fire Flow (L/min) |
|--------------------------|------------|----------------------|----------------------|---------------------|----------------------------|--------------------------|-----------------------------|
| Commercial               | 0          | 0.0                  | 0.0                  | 0.0                 | -                          | -                        | -                           |
| Residential (Multi-Unit) | 663        | 73.5                 | 218.7                | 113.7               | -                          | -                        | -                           |
| Totals                   | 663        | 73.5                 | 218.7                | 113.7               | 4000                       | 2.00                     | 4,113.7                     |

# Counterpoint Engineering Inc.

## REQUIRED FIRE FLOW WORKSHEET - PROPOSED DEVELOPMENT

Fire Underwriters Survey

Project : 27 Grosvenor & 26 Grenville - South Tower  
Project No: 18045

Guide for Determination of Required Flow Copyright I.S.O

$$F = 220C\sqrt{A}$$

where

F = the required fire flow in litres per minute.  
C = coefficient related to the type of construction.  
= 1.5 for wood frame construction (structure essentially all combustible).  
= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior).  
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls).  
= 0.6 for fire-resistive construction (fully protected frame, floors, roof).  
A = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building being considered.

| Type of Construction     | Class Factor |
|--------------------------|--------------|
| WF Wood Frame            | 1.5          |
| OC Ordinary Construction | 1.0          |
| NC Non-Combustible       | 0.8          |
| FC Fire-Resistive        | 0.6          |

Area Notes for Fire Resistive Buildings (from FUS manual, 1999):

If Vertical Openings are inadequately protected (less than 1-hour fire rating): Area is the total of the two largest adjoining floors (above ground level) plus 50% of the area of each of the next 8 adjoining floors above that.

| Contents               | % Reduction |
|------------------------|-------------|
| NC Non-Combustible     | 25          |
| LC Limited Combustible | 15          |
| C Combustible          | 0           |
| FB Free Burning        | 15          |
| RB Rapid Burning       | 25          |

If Vertical Openings are adequately protected (at least 1-hour fire rating): Area is the total of the largest floor (above ground level) plus 25% of the area of each of the next 2 immediately adjoining floors above that.

- 1) **Fire Flow**  
Type of Construction: FC  
C= 0.6  
A\*= 1175 m<sup>2</sup>  
F= 4,524 L/min 5,000 L/min (round to the nearest 1,000L/min)

\*Note: Building will be fire restive as per OBC requirements with protected vertical openings.  
Area is the total of the largest floor (Level 12) plus 25% of the next 2 adjoining floors above.

- 2) **Occupancy Reduction/Surcharge**  
Contents Factor: NC  
Reduction/Surcharge of -25%  
F= 5000L/min + -1131 L/min = 3,869 L/min

- 3) **System Type Reduction**  
NFPA 13 Sprinkler: YES 30%  
Standard Water Supply: YES 10%  
Fully Supervised: YES 10%  
Total 50%  
Reduction of 50% L/min = 1,935 L/min  
F= 3869L/min - 1,935 L/min = 1,935 L/min

- 4) **Separation Charge**  
Building Face Dist(m) Charge  
North 14.2 15%  
East 12.6 15%  
South 24.1 10%  
West 5.6 20%  
Total 60% of 3869.1 L/min = 2,321 L/min  
(max exposure charge can be 75%)

| Separation  | Charge | Separation   | Charge |
|-------------|--------|--------------|--------|
| 0 to 3m     | 25%    | 20.1 to 30 m | 10%    |
| 3.1 to 10m  | 20%    | 30.1 to 45m  | 5%     |
| 10.1 to 20m | 15%    |              |        |

- F= 1935L/min + 2321L/min = 4,256 L/min (2,000L/min<F<45,000L/min)

|    |             |                                   |
|----|-------------|-----------------------------------|
| F= | 4,000 L/min | (round to the nearest 1,000L/min) |
| F= | 67 L/s      |                                   |
| F= | 1,057 gpm   |                                   |

## counterpoint engineering

### NFPA Theoretical Flow Calculations

**Project Name:** 27 Grosvenor & 26 Grenville - South Tower

**Project Number:** 18045

Based on National Fire Protection Association Guidelines, the available flow at the minimum residual pressure of 20psi can be calculated based on the observed flow at the observed pressure readings, as follows:

$$Q_F = 29.83 \times c \times d^2 \times p^{0.5}, \text{ where}$$

$Q_F$  = observed flow (US GPM)

$c$  = hydrant nozzle coefficient (0.90 - 0.95)

$d$  = nozzle diameter (in)

$p$  = observed pitot pressure

$$Q_R = Q_F \times h_F^{0.54} / h_R^{0.54}, \text{ where}$$

$Q_R$  = available flow

$Q_F$  = observed flow (US GPM)

$h_F$  = drop from measured static to desired baseline pressure

$h_R$  = drop from measured static to measured residual pressure

***Based on flow test results obtained by Lozzi Aqua Check dated September 4, 2019 for the Grenville watermain***

|                   |        |
|-------------------|--------|
| $c$ =             | 0.9    |
| $d$ =             | 2.5 in |
| number of ports = | 2      |
| $p$ =             | 25     |

$$Q_F = 1678 \text{ US GPM}$$

|                              |        |                                               |
|------------------------------|--------|-----------------------------------------------|
| Measured Static Pressure =   | 56 psi |                                               |
| Measured Residual Pressure = | 40 psi |                                               |
| Desired Residual Pressure =  | 20 psi | , minimum per City of Toronto design criteria |

$$Q_R = 2600 \text{ US GPM} \quad \text{per fire connection}$$

9,842 L/min

# Counterpoint Engineering Inc.

## Water Demand Design Calculations

**Project:** 27 Grosvenor & 26 Grenville - Podium  
**Project No:** 18045  
**Location:** Toronto, Ontario  
**Site Area:** 0.3846 ha

### Population

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

|                                      | Residential Units |             |           |             | Commercial             |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 50                | 75          | 64        | 189         | 1781.0                 |

|                             |  | Population 1BR<br>/ 1B + D | Population<br>2BR / 2BR +<br>D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|--|----------------------------|--------------------------------|-----------------------------|---------------------|
| Residential                 |  | 70                         | 158                            | 199                         | 427                 |
| Commercial                  |  | -                          | -                              | -                           | 20                  |
| Total Equivalent Population |  |                            |                                |                             | 447                 |

### City of Toronto Watermain Guidelines

#### Per Capita Demand

|               |     |                |
|---------------|-----|----------------|
| Single Family | 310 | (L/capita/day) |
| Multi-Unit    | 190 | (L/capita/day) |

#### Peaking Factors

| Land Use      | Minimum Hour | Maximum Hour | Maximum Day |
|---------------|--------------|--------------|-------------|
| Residential   | 0.80         | 2.25         | 1.50        |
| Commercial    | 0.84         | 1.20         | 1.10        |
| Industrial    | 0.84         | 1.90         | 1.10        |
| Institutional | 0.84         | 1.90         | 1.10        |
| Apartment     | 0.84         | 2.50         | 1.30        |

\*Values used for Commercial Land Use

\*Values used for Residential (Multi-Unit) Land Use

#### Water Demand based on Equivalent Population

| Land Use                 | Population | Minimum Hour<br>(L/min) | Maximum<br>Hour<br>(L/min) | Maximum Day<br>(L/min) | Fire Flow<br>Required<br>(L/min) | Fire Flow<br>Duration<br>(hr)* | Max Day +<br>Fire Flow<br>(L/min) |
|--------------------------|------------|-------------------------|----------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------|
| Commercial               | 20         | 2.2                     | 3.2                        | 2.9                    | -                                | -                              | -                                 |
| Residential (Multi-Unit) | 427        | 47.3                    | 140.9                      | 73.2                   | -                                | -                              | -                                 |
| <b>Totals</b>            | <b>447</b> | <b>49.5</b>             | <b>144.0</b>               | <b>76.1</b>            | <b>8000</b>                      | <b>2.00</b>                    | <b>8,076.1</b>                    |

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto Ontario  
**Site Area:** 0.3846

## Existing Equivalent Population Calculations

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto

*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                        |     |                           |
|------------------------|-----|---------------------------|
| Single Family Dwelling | 3.5 | ppu                       |
| Duplex                 | 2.3 | ppu                       |
| 1BR/1BR+Den            | 1.4 | ppu                       |
| 2BR/2BR+Den/           | 2.1 | ppu                       |
| 3BR/3BR+Den            | 3.1 | ppu                       |
| Commercial / Retail    | 1.1 | persons/100m <sup>2</sup> |
| Offices                | 3.3 | persons/100m <sup>2</sup> |

|                                           | Residential Units      |              | Office                 |
|-------------------------------------------|------------------------|--------------|------------------------|
|                                           | Single Family Dwelling | Duplex Units | Area (m <sup>2</sup> ) |
| Existing 2 Storey Office (26 Grenville)   | 0                      | -            | 2362                   |
| <b>TOTAL UNITS / AREA (m<sup>2</sup>)</b> | <b>3</b>               | <b>0</b>     | <b>2362</b>            |

|                                    | Single Family Dwelling | TOTAL POPULATION |
|------------------------------------|------------------------|------------------|
| Residential                        | 0                      | 0                |
| Office                             | -                      | 77.946           |
| <b>Total Equivalent Population</b> |                        | <b>78</b>        |

### Peak flow Design Parameters

|                              |      |                   |
|------------------------------|------|-------------------|
| Industrial/Commercial/Office | 240  | litres/person/day |
| Infiltration                 | 0.26 | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Total Population | Harmon Peak Factor |
|------------------|--------------------|
| 78               | 4.27               |

|                          |      |     |
|--------------------------|------|-----|
| Average Dry Weather Flow | 0.22 | L/s |
|--------------------------|------|-----|

|                            |      |     |
|----------------------------|------|-----|
| Total Peak Wastewater Flow | 0.92 | L/s |
| Infiltration               | 0.10 | L/s |

|             |             |            |
|-------------|-------------|------------|
| <b>Flow</b> | <b>1.02</b> | <b>L/s</b> |
|-------------|-------------|------------|

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto  
**Site Area:** 0.3846 ha

## Proposed Sanitary Flow Calculations (Entire Development)

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto

*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

|                                      | Residential Units |             |           |             | Commercial             |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 328               | 341         | 101       | 770         | 1781                   |

|                             | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                 | 460                        | 717                         | 314                         | 1491                |
| Commercial                  | -                          | -                           | -                           | 20                  |
| Total Equivalent Population |                            |                             |                             | 1511                |

### Peak flow Design Parameters

|                          |         |                   |
|--------------------------|---------|-------------------|
| Residential Average flow | 240     | litres/person/day |
| Commercial Average flow  | 180,000 | litres/ha/day     |
| Infiltration             | 0.26    | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Residential Population | Harmon Peak Factor |
|------------------------|--------------------|
| 1491                   | 3.68               |

|                   |       |     |                      |
|-------------------|-------|-----|----------------------|
| Residential Flow  | 15.25 | L/s | *based on population |
| Retail Flow       | 0.37  | L/s | *based on floor area |
| Groundwater Flows | 0.63  | L/s | * 10 USGPM pump      |

|      |       |     |
|------|-------|-----|
| Flow | 16.25 | L/s |
|------|-------|-----|

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto  
**Site Area:** 0.3846 ha

## Proposed Sanitary Flow Calculations (North Tower)

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto  
*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

|                                      | Residential Units |             |           |             | Commercial             |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 80                | 101         | 25        | 206         | 0                      |

|                             | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                 | 112                        | 213                         | 78                          | 403                 |
| Commercial                  | -                          | -                           | -                           | 0                   |
| Total Equivalent Population |                            |                             |                             | 403                 |

### Peak flow Design Parameters

|                          |         |                   |
|--------------------------|---------|-------------------|
| Residential Average flow | 240     | litres/person/day |
| Commercial Average flow  | 180,000 | litres/ha/day     |
| Infiltration             | 0.26    | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Residential Population | Harmon Peak Factor |
|------------------------|--------------------|
| 403                    | 4.02               |

|                   |      |     |                      |
|-------------------|------|-----|----------------------|
| Residential Flow  | 4.50 | L/s | *based on population |
| Retail Flow       | 0.00 | L/s | *based on floor area |
| Groundwater Flows | 0.63 | L/s | * 10 USGPM pump      |

|      |      |     |
|------|------|-----|
| Flow | 5.13 | L/s |
|------|------|-----|



# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto  
**Site Area:** 0.3846 ha

## Proposed Sanitary Flow Calculations (South Tower)

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto

*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

|                                      | Residential Units |             |           |             | Commercial             |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 198               | 165         | 12        | 375         | 0                      |

|                             | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                 | 278                        | 347                         | 38                          | 663                 |
| Commercial                  | -                          | -                           | -                           | 0                   |
| Total Equivalent Population |                            |                             |                             | 663                 |
|                             |                            |                             |                             |                     |

### Peak flow Design Parameters

|                          |         |                   |
|--------------------------|---------|-------------------|
| Residential Average flow | 240     | litres/person/day |
| Commercial Average flow  | 180,000 | litres/ha/day     |
| Infiltration             | 0.26    | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Residential Population | Harmon Peak Factor |
|------------------------|--------------------|
| 663                    | 3.91               |

|                   |      |     |                      |
|-------------------|------|-----|----------------------|
| Residential Flow  | 7.20 | L/s | *based on population |
| Retail Flow       | 0.00 | L/s |                      |
| Groundwater Flows | 0.00 | L/s | *based on floor area |

|      |      |     |
|------|------|-----|
| Flow | 7.20 | L/s |
|------|------|-----|

# Counterpoint Engineering Inc.

**Project:** 27 Grosvenor & 26 Grenville  
**Project No:** 18045  
**Location:** Toronto  
**Site Area:** 0.3846 ha

## Proposed Sanitary Flow Calculations (Podium)

As per Design Criteria for Sewers and Watermains - First Edition November 2009 City of Toronto  
*Design flow = average daily dry weather flow x peaking factor + infiltration*

### Persons Per Unit and per Land Use

|                     |     |                           |
|---------------------|-----|---------------------------|
| 1BR/1BR+Den         | 1.4 | ppu                       |
| 2BR/2BR+Den/        | 2.1 | ppu                       |
| 3BR/3BR+Den         | 3.1 | ppu                       |
| Commercial / Retail | 1.1 | persons/100m <sup>2</sup> |
| Offices             | 3.3 | persons/100m <sup>2</sup> |

|                                      | Residential Units |             |           |             | Commercial             |
|--------------------------------------|-------------------|-------------|-----------|-------------|------------------------|
|                                      | 1B / 1B+D         | 2B / 2B + D | 3B / 3B+D | Total Units | Area (m <sup>2</sup> ) |
| TOTAL UNITS / AREA (m <sup>2</sup> ) | 50                | 75          | 64        | 189         | 1781                   |

|                             | Population<br>1BR / 1B + D | Population<br>2BR / 2BR + D | Population<br>3BR / 3BR + D | TOTAL<br>POPULATION |
|-----------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|
| Residential                 | 70                         | 158                         | 199                         | 427                 |
| Commercial                  | -                          | -                           | -                           | 20                  |
| Total Equivalent Population |                            |                             |                             | 447                 |
|                             |                            |                             |                             |                     |

### Peak flow Design Parameters

|                          |         |                   |
|--------------------------|---------|-------------------|
| Residential Average flow | 240     | litres/person/day |
| Commercial Average flow  | 180,000 | litres/ha/day     |
| Infiltration             | 0.26    | litres/second/ha  |

### Harmon Peaking Factor

$$PF = 1 + (14/(4+(P/1000)^{1/2}))$$

| Residential Population | Harmon Peak Factor |
|------------------------|--------------------|
| 427                    | 4.01               |

|                   |      |     |                      |
|-------------------|------|-----|----------------------|
| Residential Flow  | 4.75 | L/s | *based on population |
| Retail Flow       | 0.37 | L/s |                      |
| Groundwater Flows | 0.00 | L/s | *based on floor area |

|      |      |     |
|------|------|-----|
| Flow | 5.13 | L/s |
|------|------|-----|