

Memorandum – Civil Engineering Scope (Recalculations)

To: Richard Chmiel – Principal / Chmiel Architects

Copies To: Radia Kaddour – Architect / Chmiel Architects

From: Guy Ste-Croix, Vice President & Branch Manager

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Introduction:

Based on the recent information (i.e. revised plans) received, it appears that the proposed number of stories as well as the number of units for the aforementioned building has increased. **However, it appears that the site plan hasn't changed.** This memo will recalculate the anticipated water and sanitary demands as well as fire flow requirements for the proposed development.

Domestic Water Demand:

Using the City of Ottawa guidelines, the original anticipated average daily demand (i.e. based on 33 residential units) was calculated to be 0.24L/s.

The new anticipated average daily demand (i.e. base on 50 residential units and 1 commercial area) is as follows:

- 3 units (studio) X 1.4 persons/unit X 350 L/person/day = 1,470 L/day = 0.017 L/s
- 34 units (1 bedroom) X 1.4 persons/unit X 350 L/person/day = 16,660 L/day = 0.193 L/s
- 13 units (2 bedroom) X 2.1 persons/unit X 350 L/person/day = 9,555 L/day = 0.111 L/s
- 96sq.m (commercial) X 2,500 L/1,000sq.m = 240 L/day = 0.003 L/s

Therefore, the new anticipated average daily demand has been calculated to be **0.32 L/s** instead of 0.24 L/s.

We note that since the average daily demand is still less than 50cu.m/day (0.57 L/s), only one 150mm diameter water service as originally designed is required to service the proposed development; therefore, no further changes are required.

We also note that the maximum daily demand and maximum hourly daily demand (peak hour) based on peaking factors of 7.2 and 10.85 derived from MOE table 3.3 (Peaking Factors for Drinking - Water Systems Serving Dewer than 500 people) for residential use and peaking factors of 1.5 and 1.8 from the City of Ottawa guidelines for commercial use will be **2.32 L/s** and

3.49 L/s respectfully, a slight but insignificant increase from the original design of 1.73 L/s and 2.60 L/s. No further changes are required.

Sanitary Demand:

Based on the average daily demand of 0.32 L/s calculated above, the anticipated peak sanitary flow has been calculated as follows:

- 0.32 L/s X 4.0 (peaking factor for residential flow) = 1.28 L/s
- 1.28 L/s + (0.07 ha 'area' X 0.33 L/s/gross ha 'infiltration allowance') = 1.30 L/s

Therefore, the new anticipated peak sanitary flow for the development has been calculated to be **1.30 L/s**, a slight but insignificant increase from the original design of 0.99 L/s. No further changes are required.

Fire Flow Requirements:

We note that the original design used a floor area of 450 sq.m to calculate the affected area of 1,800 sq.m. This was calculated using the two largest adjoining floors plus 50 percent of any floors immediate above them up to eight as follows:

$$A = (2 \text{ floors} \times 450 \text{ sq.m}) + (0.5 \times 4 \text{ floors} \times 450 \text{ sq.m})$$

$$A = 1,800 \text{ sq.m}$$

Using the following table provided by the Architect, the affected area is recalculated as follows:

CONSTRUCTION GFA (BALCONIES EXCLUDED)	
Level	Area
Level P1	639 m ²
Level 1	477 m ²
Level 2	493 m ²
Level 3	493 m ²
Level 4	493 m ²
Level 5	466 m ²
Level 6	466 m ²
Level 7	426 m ²
Level 8	425 m ²
Level 9	425 m ²
Roof	187 m ²
Upper Roof	18 m ²
Grand Total:	5008 m ²

$$A = (2 \text{ floors } [levels 2 \ \& \ 3] \times 493 \text{ sq.m}) + (0.5 \times 6 \text{ floors } [levels 4 \ \text{to} \ 9] \times 450 \text{ sq.m } [average \ floor \ area])$$

$$A = 2,336 \text{ sq.m}$$

We note that the revised affected area is greater than the one stipulated in the original design; however, the initial FUS fire flow requirement (i.e. prior to occupancy, sprinkler and exposure adjustments) remains the same:

$$F = 220 \times 0.6 \times \sqrt{2,336}$$

$$F = 6,380 \text{ L/min}$$

$$F = 6,000 \text{ L/min (rounded to the nearest 1,000 L/min)}$$

Therefore, the FUS fire flow requirement for this building has not changed from the original design and remains at 133 L/S.

Conclusion:

Based on 50 residential units and 1 commercial area instead of 33 residential units, we note:

1. The average water daily demand has increased from 0.24 L/s to **0.32 L/s**, no further changes required.
2. The peak sanitary flow including infiltration allowance has increased from 0.99 L/s to **1.30 L/s**, no further changes required.
3. No changes anticipated to the fire flow requirements.
4. No changes anticipated to the stormwater requirements. As noted above, the building footprint and overall site plan haven't changed.

Regards,

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