MEO & ASSOCIATES INC.

Architectural & Engineering Consultants, Project Managers

3600 Seven Lakes Dr., Suite 200 I Lasalle, Ontario, Canada N9H 0E5 I tel 519-250-8088 I fax 519-250-8070
web www.meogroup.com I e-mail rmeo@meoassociates.com

RE: Proposed Apartment Building at 2121 Riverside Drive at Rankin Avenue, Windsor, Ontario

SANITARY SEWER CAPACITY CHECK

Agbaba Holdings Corporation 2024-09-25

Via email only: agbabaholdings@gmail.com 4758 Agbaba 21

Attention: Marko Agbaba, president

Marko,

Further to your instructions, we have undertaken a review to confirm that sanitary sewer capacity exists for the new 46-unit apartment building being proposed on the south side of Riverside Drive, west side of Rankin Avenue, with present municipal address of 2121 Riverside Drive, Windsor, Ontario. This is our revised letter, to incorporate comments received from the City of Windsor

1.0 Sanitary Sewers Capacity Check

Mr. Juan Paramo, P.Eng., Development Engineer for the City of Windsor, has confirmed (email of July 29, 2024) that this new building will connect to the 300 mm sanitary sewer on Rankin Avenue, and that the infrastructure to be analysed is the 300 mm sewer on Rankin Avenue, from Riverside Drive to University Avenue.

The extend of the affected sanitary sewer drainage area is shown in attached Figure 1. It covers an overall area of 1.45 hectares.

The data available for the subject sewers is from the City's records, specifically Sheet F5 of the Sewer Atlas, partially reproduced in Figure 2. There are three relevant sewer runs in this block, from north to south:

Section 1 – 300 mm diameter sewer at 0.49% slope,
Section 2 - 300 mm diameter sewer at 0.27% slope,
Section 3 - 300 mm diameter sewer at 0.47% slope.

The type of land use is all residential, with single-family homes being predominant. A site review has resulted in the following dwelling count: 30 single homes; 3 semi-detached houses; one quadplex; for a total of 40 dwelling units (exclusive of the lot at 2121 Riverside Drive).

The Population Density is conservatively determined based on the following:

Single-family home	4 persons per house
Semi-detached home	4 persons per house
Quadplex apartment unit	2.5 persons per unit
2121 Riverside Drive	1.5 persons per unit

The proposed 46 new apartment units are studio units, geared to a single occupant. However, conservatively, we have allowed 1.5 persons per unit, to total 69.

This results in a total population of 223 persons in the study area.

The detailed calculations are summarized in the attached Table 1, using the standard City of Windsor criteria. The total sanitary flow from the proposed 46 apartments is 1.76 l/s.

With the proposed 46 apartment units contributing wastewater, the largest flow generated will be at the downstream end of the block, in Section 3, at about **6 litres/second**.

The three sections studied have capacity that varies from **50 to 68 litres/second**. This means that only about 9% of the pipe's capacity is utilized, therefore there is sufficient capacity available.

2.0 Wet Weather Flows Considerations

The existing 300 mm pipe is a combined sewer, draining both sanitary wastewater and rainfall runoff. The City of Windsor has provided the data in Table 2, which indicates that the maximum elevation of the Hydraulic Grade Line (HGL) is 184.15, for the 1:100-year storm, at 5RJ3682 (the junction where the subject 300 mm sewer on Rankin Avenue enters the 1200 mm storm sewer on University Avenue).

The attached Figure 3 shows how the new building's plumbing system will connect to the 300 mm sewer on Rankin, in front of the site. The plumbing from the first floor and above floors will flow by gravity directly to the sanitary sewer, with backflow valve installed. Obviously, no sewage can back up to the first floor (and above) elevations.

The basement floor elevation of 181.60 is 1.45 m above the 184.15 HGL elevation at 5RJ3682. The HGL is not likely to rise 1.45 m along Rankin, however, to be extra safe, the wastewater from the basement will not drain by direct gravity connection to the 300 mm sewer in the street, but it will be pumped up, to about 1.07 m above the street level, and then

continue by gravity to the 300 mm sewer. The sewage ejector pump will "lift" the wastewater only about 3 m, and it will have backup power.

The HGL would have to rise from 180.15 at 5RJ3682 to 183.70 (3.55 m) before the basement drainage would be negatively affected. However, since this is 1.07 m above the street level, it cannot happen: the water on the street would spill out overland to the Detroit River, even before it could reach the 183.00 grade around the proposed building.

Therefore, adequate provisions will be in place for the sanitary wastewater drainage from the building, even during heavy rainfall events.

The sanitary flow of 1.76 l/s is to be deducted from the allowable release rate when calculating the storage volume required by the Storm Water Management plan, which will be undertaken as part of the Site Plan Control for the proposed development.

3.0 Conclusions and Recommendations

The existing 300 mm sanitary sewers have sufficient capacity to serve the proposed 46-unit apartment building at 2121 Riverside Drive, as well as the rest of the residences that drain into it.

The plumbing system for the proposed building should be installed and maintained as detailed herein, including backup power.

The allowable release rate for the Storm Water Management plan should be reduced by the sanitary flow emanating from the proposed apartment building (1.76 l/s reduction).

If you have any questions, or require any further information, please let us know.

Yours Truly,

MEO & ASSOCIATES INC.

_____

PER: Raffaele Meo, P.Eng., P.E.

Enclosures: Figure 1 – Study Area
Figure 2 – Sanitary Sewer Capacity
Figure 3 – Sewage Ejector Pump Discharge Above HGL
Table 1 – Sanitary Sewer Design Sheet
Table 2 – Hydraulic Grade Line at 5RJ3682

FIGURE 1
STUDY AREA (1.452 HA)

PROJECT No:	AUTOCAD REF.:	SCALE:	
4758	4758 - SSC - Figure 1.dwg	N.T.S.	MEO & ASSOCIATES INC. Architectural & Engineering Consultants
	DATE: AUGUST 15, 2024		

4758 –SSC– Figure 1.dwg, (Figure 1) Aug 15, 2024 – 4:47pm

FIGURE 2

SANITARY SEWER CAPACITY

PROJECT No:	AUTOCAD REF.:	SCALE:	
4758	4758 - SSC - Figure 2.dwg	N.T.S.	MEO & ASSOCIATES INC. Architectural & Engineering Consultants
	DATE: AUGUST 15, 2024		

4758 –SSC– Figure 2.dwg, (Figure 2) Aug 15, 2024 – 4:47pm

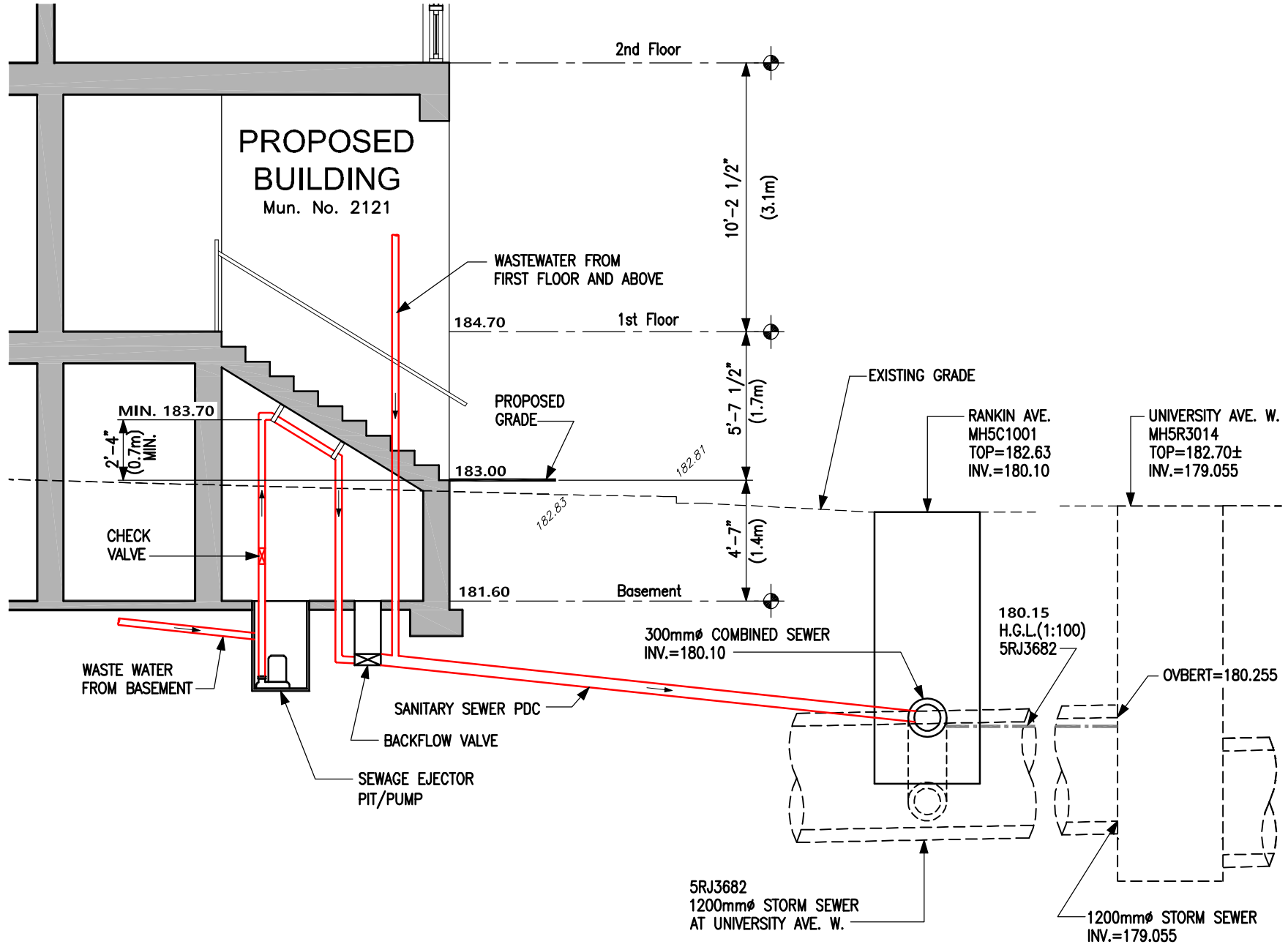

FIGURE 3

SEWAGE EJECTOR PUMP DISCHARGE ABOVE H.G.L.

(VIEW LOOKING NORTH – N.T.S.)

PROJECT No: **4758**

AUTOCAD REF.: 4758 - Cross section.dwg

DATE: SEPTEMBER 13, 2024

SCALE: N.T.S.

MEO & ASSOCIATES INC.
Architectural & Engineering Consultants

4758 – Cross section.dwg, (Figure 3) Sep 13, 2024 – 1:15pm

Designed by: **R. Meo**
Checked by:
Filename: **4758 Sanitary Sewer Outlet Capacity.xls**
Project Name: **Apartment Buildings at 2121 Riverside Drive, Windsor ON**
Project Number: **4758**

M E O & A S S O C I A T E S I N C .

TABLE 1 - SANITARY SEWER DESIGN SHEET

City of Windsor, County of Essex

Manning's n= **0.013**
Date is 2024-08-15

Location	From M.H.	To M.H.	Area Hectare	Density per/Ha.	Popul.	Cummu. Area(Ha.)	Cummu. Popul.	Peak Factor	Sewage Fl(L/s)	Infilt. Fl(L/s)	Total Fl(L/s)	Slope (%)	Pipe D(mm)	Capacity (L/s)	Vel. (m/s)	**Capacity Used, %**
Section 1	5C1001	5C176				0.00		6.00	0.00	0.00	0.00	0.49%	300	67.69	0.96	
Section 2	5C176	5C177				0.00		6.00	0.00	0.00	0.00	0.27%	300	50.25	0.71	
Section 3	5C177	5C3013			223	1.45	**223**	6.00	5.63	0.23	**5.86**	0.47%	300	66.29	0.94	**9%**

THE 69 PERSONS FROM THE PROPOSED 46 APARTMENT UNITS ARE INCLUDED IN THE 223 POPULATION ABOVE

NOTES:

1) Average Daily Flow/capita = **0.0042** Litres/second
2) Infiltration Flow/hectare = **0.1560** Litres/second
3) Ultimate Flow Factor = **6.0** varies, Sec. 9.1.2.d) City of Windsor Development Manual
4) Desirable Minimum Velocity = **0.75** m/s
5) Population Density has been calculated using Figure 1 and based on occupancy of:

Per single family or semi-detached house= **4** persons / house
Per standard apartment unit= **2.5** persons / apartment
Per studio apartment unit= **1.5** persons / unit

TABLE 2 HYDRAULIC GRADE LINE (WATER LEVELS) AT MH 5RJ3682