Preliminary Sewer Capacity Report

307 Main MF 2019-Q, LLC
321 Main Street
City of Hackensack, Bergen County, NJ

Prepared for: 307 Main MF 2019-Q, LLC
22 Maple Street
Morristown, NJ 07960

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July 22, 2020
I. **Project Description**

This report shall be part of an application to the City of Hackensack Planning Board for the construction of the mixed-use building, by 307 Main MF 2019-Q, LLC. The proposed development includes the construction of 10,000 SF of commercial space and 270 residential units, located at 321 Main Street in the City of Hackensack in Bergen County, NJ.

II. **Existing Sewerage Demand**

(Calculated per NJAC 7:14 – 23.3)

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Number of Units</th>
<th>GPD per unit</th>
<th>GPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>38,226 SF</td>
<td>0.1</td>
<td>3,822.6</td>
</tr>
</tbody>
</table>

Total Flow: 382.26

III. **Proposed Sewerage Demand**

(Calculated per NJAC 7:14 – 23.3)

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Number of Units</th>
<th>GPD per unit</th>
<th>GPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>10,000 SF</td>
<td>0.1</td>
<td>1000</td>
</tr>
<tr>
<td>Mid-Rise Studio</td>
<td>24 Units</td>
<td>150</td>
<td>3,600</td>
</tr>
<tr>
<td>Mid-Rise 1 Bedroom</td>
<td>190 Units</td>
<td>150</td>
<td>28,500</td>
</tr>
<tr>
<td>Mid-Rise 2-Bedroom</td>
<td>56 Units</td>
<td>225</td>
<td>12,600</td>
</tr>
</tbody>
</table>

Total Flow: 45,700

IV. **Methodology and Pipe Flow Calculations**

From the above table, the projected flow from the developments will be 45,700 GPD (0.0457 MGD). According to the methodology described in NJAC 7:14A-23.6 Sanitary Sewer Design (b), the proposed 6” PVC gravity sewer shall have sufficient capacity to carry at least twice the estimated projected flow when flowing half full.

**New Projected Flow Calculations:**

**Proposed 6” PVC Sanitary Lateral**

New Projected Flow = 0.0457 MGD x 2 = 0.0914 MGD
6” PVC – Capacity Calculations

From the above table, the net projected flow from the development will be 45,700 GPD (0.0457 MGD). In accordance with Section 7:14A-23.6 (b), the 6” PVC gravity sewer lateral has sufficient capacity to carry at least twice the estimated average projected flow when flowing half full.

6” PVC per Manning’s Equation:

\[ Q_{1/2} = \frac{1.486}{n} A R^{2/3} S^{1/2} \]

where:  
\[ Q = \text{pipe capacity (cfs) (half full)} \]
\[ n = \text{Manning’s roughness coeff.} \]
\[ A = \text{Area (half full)} \]
\[ R = \text{Wetted Perimeter (half full)} \]
\[ S = \text{slope (ft/ft)} \]

\[ Q_{1/2} = \frac{1.486}{0.012} (0.098) (0.125)^{2/3} (0.01)^{1/2} \]
\[ Q_{1/2} = 0.30 \text{ cfs or 0.196 MGD} \]

Therefore: 0.196 MGD > 0.0914 MGD  OK

V. Conclusion

Based on the flow metering data and estimated projected flow, the proposed 6” PVC sanitary lateral connecting to the 12” sewer in Main Street has sufficient capacity for the proposed improvements.