



Memorandum

To: John Livsey
Lexington Engineering
Samuel Hadley Public Services Bldg
201 Bedford Street, Room 202
Lexington, MA 02420

Date: July 15, 2020

Project #: 14699.00

From: Nicholas Skoly, PE
Chris Nowak, PE

Re: 1050 Waltham Street Redevelopment
Sewer Capacity Analysis Memorandum

On behalf of our client, Greatland Realty Partners (the "Applicant"), VHB has prepared the following memorandum to document our analysis of the Town of Lexington's municipal sanitary sewer system in the vicinity of 1040/1050 Waltham Street and its capacity to service flows generated by the proposed Revolution Labs (the "Project"). The Project is located at 1040 and 1050 Waltham Street in Lexington, MA, and is a redevelopment of an existing 5.2-acre site that contains two 1980's era office buildings (the "Site"). The proposed development plan consists of a new three-story office/life science building with some ground floor amenity space, and an associated parking garage. Refer to the Site Plans for the proposed development and utility plan.

The sewer system in Waltham Street is owned and operated by the Town of Lexington. Consistent with The Town of Lexington requirements, VHB has analyzed the following:

- Current flow from the Concord Avenue Pump Station;
- Current flow from the existing buildings at 1040 and 1050 Waltham Avenue;
- Future flow projections from the Project; and
- Review of Town of Lexington Sewer Record Plans

The results of our analysis show there is adequate capacity in the municipal system to accommodate the proposed development.

Sewage Discharge Routing

There is a private pump station on-site that services the sanitary discharge from the two existing office buildings. As both buildings have basements, a pump station is needed for connection to the 10" Town of Lexington sewer line in Waltham Street. The 10" line in Waltham Street is tributary to Lexington's Concord Avenue Pump Station which ultimately discharges to the regional Massachusetts Water Resource Authority (MWRA) sewer collection system and the Deer Island Wastewater Treatment Plant in Boston, MA.

Concord Avenue Pump Station

VHB has been in contact with the Town of Lexington Engineering Department regarding the Concord Avenue Pump Station. Based on the information provided the existing pump station has a discharge rate of 450 GPM. There is an 8-foot diameter concrete wetwell with approximately 1,550 gallons of total volume. The discharge force main is 8 inches in diameter. The existing pump station discharges an average of approximately 256,500 GPD (based on run-times provided from Feb through June). The maximum capacity of the pump station is approximately 648,000 GPD (assuming one pump on at all times). Based on the information provided the pump station is running at approximately 40% capacity.

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Current and Future Flows

Current Flows from 1050 Waltham Street

Under existing conditions, it is estimated that the Site produces 4,331 GPD of wastewater. Estimated flows are based on 310 CMR 15: Title V, square footage and use. Refer to Attachment A – Estimated Sewer Generation. The existing site discharges sanitary sewer via an on-site pump station.

Proposed Flows from 1050 Waltham Street

As currently proposed, the Project is estimated to produce approximately 12,975 GPD of sewage flow. Estimated flows are based on 310 CMR 15: Title V, square footage and use. This estimate may vary somewhat depending on the ultimate tenant of the building. It should be noted that these estimates are based on the DEP Sewage generation rate for typical office of 75 GPD/100 SF of floor space. It is anticipated that this calculation is conservative as the new water efficient fixtures in the proposed building will provide additional benefit beyond the current fixtures. It is understood however that this calculation may need to be revisited once the tenant is determined. Refer to Attachment A – Estimated Sewer Generation.

Assuming a peaking factor of 4, the peak discharge for the proposed project is anticipated to be 36 gpm. This peak is 8% of the existing average flow of the Concord Avenue pump station. Considering the use is office/lab and a significant portion of the contributing area to the Concord Avenue pump station is residential, we note the peak flow from the site will discharge to the pump station off-peak from the contributing residential flow.

It is anticipated that on-average the pumps in the Concord Ave pump station will run an additional 19 minutes per day (1.3% of the capacity of the station).

Gravity Sewer Capacity Analysis

The capacity of the existing 10-inch sewer line in Waltham Street has been analyzed as part of this assessment. The capacity of the line is 969,475 GPD. Assuming a peaking factor of 4, the anticipated peak flow from the project is approximately 36 gpm, which is approximately 5% of the full flow capacity of the 10-inch pipe.

The net increase in sewage flow (8,644 GPD) is less than 1% of the full flow capacity of the existing 10" sewer line in Waltham Street which is an insignificant increase.

Based on the current finished floor elevation of the proposed building, site grades, and sewer inverts, it is anticipated that the sewer connection from the Project will be gravity and no on-site sewer pump is needed. See Attachment B – Pipe Capacity Analysis.

Summary

Based on the information provided and the analysis of the existing and proposed flows from the site, the Concord Avenue Pump Station has capacity to handle the projects sanitary sewer demand. The project will decommission the

existing private pump station servicing the site. As such, the peak sanitary flow from the Project is expected to be similar to or less than the current condition.

There is currently no proposed tenant but all sanitary sewer discharge from the buildings will meet federal and state requirements and pretreatment will be provided, as needed, before discharge to the local sewer system and ultimately the MWRA system.

Attachments



101 Walnut Street
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Estimated Sewer Generation

Project: 1050 Waltham St
Location: Lexington, MA

Proj. No.: 14699.00
Date: 7/14/2020
Computed by: NJS
Checked by: CDN

Block	Use	Area(SF)	Unit	Quantity	Unit Flow ¹ (Gal/Unit)	Average Flow (GPD)	Total Block Flow (GPD)	Total Development Flow (GPD)	Comments
1050 Waltham	Office/Lab/R&D	173,000	1,000 SF	173	75	12,975	12,975	12,975	
Existing	Office	57,752	1,000 SF	58	75	4,331	4,331	4,331	
							Net New	8,644	

1) Average flows for Massachusetts are based on 310 CMR 15: Title V



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Pipe Capacity Analysis

Project: 1050 Waltham St
Location: Lexington, MA

Proj. No.: 14699.00
Date: 12/17/2019
Computed by: NJS
Checked by:

PIPE			CAPACITY		HYDRAULIC				
Manning's n	Pipe Size in	SLOPE	Q full ft ³ /s	V full ft/s	LENGTH ft	FALL ft	RIM	INV UPPER	INV LOWER
0.012	10	0.0041	1.5	2.8	195	0.8	218.6	204.7	203.9