Appendix G – Domestic Water and Sanitary Sewer Demand Memorandum

TECHNICAL MEMORANDUM

Date: May 20, 2021 BKF Job Number: C20202159-10

Deliver To: Jenn Bodine, Smith Development

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Subject: 123 Sherman Avenue
Domestic Water and Sanitary Sewer Demand Memorandum

Purpose

The purpose of this memorandum is to provide information regarding impacts to the domestic water and sewer systems as a result of the proposed redevelopment project.

Domestic Water System Background

The proposed 123 Sherman redevelopment is approximately 0.79 acres occupied by three office buildings and parking lot. The site is bounded by Sherman Avenue, Park Avenue, Grant Avenue and residential units. The site is served by a 4-inch domestic water line in Sherman Avenue where a lateral extends from the line to the southeast into the west side of the project site and a second 4-inch domestic water line in Grant Avenue where a lateral extends northwest into the east side of the project site.

The proposed site consists of office and retail building and parking. The site will be serviced by a 6-inch domestic water lateral and a 1.5-inch irrigation lateral that stem off the 12-inch water main along Park Boulevard.

Domestic Water System Existing Demand

Domestic water system existing demands are included in Attachment A - Table 1. The total domestic water demand is based on the demand for existing buildings and landscape irrigation. The total existing domestic water demand is 1,720 gallons/day.

Domestic Water System Proposed Demand

Proposed domestic water demands are included in Attachment A - Table 2. The total domestic water demand is based on the demand for the proposed building and landscape irrigation. The total proposed domestic water demand is 6,050 gallons/day.

Sewer System Background

The site is served by a 6-inch sanitary sewer line in Grant Avenue where a 4-inch lateral extends from the line to the east side of the project site. There is a second 6-inch line along Sherman Avenue that has a lateral connecting the west side of the project site. The sewer lines in Grant Avenue and Sherman Avenue connects into the 12-inch main along Park Boulevard.

The proposed site will be serviced by a lateral connected to the 6-inch sanitary sewer line on Grant Avenue.

Sewer System Existing Demand

Existing sewer demands are included in Attachment A - Table 1. The total sewer demand is based on the demand for the existing buildings. The total existing average sewer demand is approximately 1,634 gallons of sewer per day.

Sewer System Proposed Demands

Proposed sewer demands are included in Attachment A - Table 2. The total sewer demand is based on the demand for the proposed building. The total proposed sewer demand is 5,747 gallons per day. The sewage is to be discharged to the proposed sewer lateral that connects to the existing 6-inch line in Grant Avenue.

Conclusion

The proposed redevelopment is estimated to use 6,050 gallons of water per day. The redevelopment will be served through laterals off the domestic water main along Park Boulevard. Compared to the existing demand of 1,720 gallons per day, the redevelopment represents an increase of 4,330 gallons per day for the municipal water system.

The proposed redevelopment is estimated to generate an average of 5,747 gallons of wastewater per day. The redevelopment will direct the sewage through the existing municipal 6-inch sewer line in Grant Avenue. Compared to the 1,634 gallon per day currently generated by the site, the redevelopment represents an increase of 4,113 gallons per day for the municipal sewer system.

ATTACHMENTS:

Attachment A: Water and Sewer Demand Summary

Attachment B: Excerpt from Redwood City Sanitary Sewer Master Plan (2008)

Attachment C: Excerpt from Sacramento Valley Land Use/Water Supply Analysis Guidebook (2007)

Attachment D: Unit Sewer Demands, Metcalf and Eddy (1972)

Attachment E: Excerpt from 2010 Housing Element, Burlingame General Plan

Attachment F: Excerpt from City of Burlingame Wastewater Collection System Master Plan (2010)

Attachment A: Water and Sewer Demand Summary

Table 1: Existing Project Water and Sewer Demand

DESCRIPTION OF USE				POTABLE WATER DEMAND		SEWER DEMAND	
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	Average Daily Demand (gpm)	Average Daily Demand (gpd)	Average Daily Demand (gpm)
Existing Parcel One Office[1]	**4,594**	**SF**	**0.105**	484	0.34	459	0.32
Existing Parcel Two Office[1]	**9,618**	**SF**	**0.105**	1,012	0.70	962	0.67
Existing Parcel Three Residential[2]	**2**	**Units**	**112**	224	0.08	213	0.15
Existing Irrigation[3]	**2,950**	**SF**	**0.082**	242	0.17	230	0.16
Total Demand				**1,720**	**1.12**	**1,634**	**1.13**

Table 2: Proposed Project Water and Sewer Demand

DESCRIPTION OF USE				POTABLE WATER DEMAND		SEWER DEMAND	
Land Use	No.	Unit	Unit Demand (g/unit)	Average Daily Demand (gpd)	Average Daily Demand (gpm)	Average Daily Demand (gpd)	Average Daily Demand (gpm)
Proposed Commercial[1]	**54,780**	**SF**	**0.105**	5,752	3.99	5,464	3.79
Proposed Irrigation[3]	**3,633**	**SF**	**0.082**	298	0.21	283	0.20
Total Demand				**6,050**	**4.20**	**5,747**	**3.99**

Table 3: Net Project Water and Sewer Demand

DESCRIPTION OF USE	POTABLE WATER DEMAND		SEWER DEMAND	
Land Use	Average Daily Demand (gpd)	Average Daily Demand (gpm)	Average Daily Demand (gpd)	Average Daily Demand (gpm)
Total Existing Demand	1,720	1.12	1,634	1.13
Total Proposed Demand	6,050	4.20	5,747	3.99
Total Demand Increase	**4,330**	**3.08**	**4,113**	**2.86**

Notes:

1 Sewer demand for non-residential uses based on Redwood City Chapter 4.2.1 - 0.1 gpd/sqft - Resulting in 0.105 gpd/sqft water demand - Assuming 95% return of potable water to sanitary sewer.

2 Potable water demand for rental residential units based on 60 gallons per capita per day (gpcd) at 1.87 residents per dwelling unit for a total of 112 gallons per Dwelling Unit.

3 Demand factor is based on average demand of 4 acre-feet per year. See Attachment B: Excerpt from Sacramento Valley Land Use/Water Supply Analysis Guidebook.

4.2.1 Base Wastewater Loads

Existing BWF entering the modeled system were estimated based on population and water use data. A per-capita unit flow rate was applied to the population within each sewershed (described in Chapter 2) to define the average BWF from residential sources, while average winter water consumption was used to define the load from non-residential sources.

Residential Loads

Both existing and future residential loads were determined by applying a per-capita flow rate to the existing and future sewershed populations (discussed in Chapter 2). The following per capita loads were applied to the model:

Weekday per-capita flow. 70 gallons per capita per day (gpcd)

Weekend per-capita flow. 75 gpcd

These per capita loads are similar to loads observed in other Bay Area cities, and were confirmed to be appropriate for the City through comparisons of model flows to flow meter data, as discussed in Section 4.4, Model Calibration.

Non-Residential Loads

Existing non-residential loads were based on winter water usage for non-residential customers. Winter water use is considered a reasonable approximation of wastewater flow because outdoor water use during the winter is generally minimal. Water consumption from the City's water billing database was averaged for each non-residential customer for winter (December through April) 2004/2005 and 2005/2006 to determine the existing wastewater load. To determine the location of water usage/sewer loads, non-residential water customers were linked to parcels based on the geobase code where possible, and the remaining water customer locations were geocoded based on the City's street GIS layer. Non-residential water usage was then aggregated to sewersheds.

Future non-residential loads were based on a combination of percentage growth in employment, as projected by ABAG at the census tract level, and a unit load per parcel acre or building square footage for currently vacant parcels and the Downtown Precise Plan area. The unit loads used for the Downtown Precise Plan developments and development of existing vacant parcels according to the City's General Plan are listed in **Table 4-1**. As shown in the table, the unit flow factors for future development outside of the Downtown Precise Plan area are based on assumed floor area ratios (FARs) for the various types of land uses in the City's General Plan, multiplied by a typical unit flow rate per square foot of building space, based on experience from other communities.

Table 4-1 Future Non-Residential Base Wastewater Flow Unit Flow Factors

Type of Development	Unit Flow Factor	Assumptions
Downtown Precise Plan		
Commercial/Retail	0.1 gpd/sq. ft.	
Lodging	100 gpd/room	
General Plan (Existing Vacant Land)		
Heavy Commercial	8,700 gpd/acre	2 FAR at 0.1 gpd/sq. ft.
Intermediate Commercial	4,400 gpd/acre	1 FAR at 0.1 gpd/sq. ft.
Mixed Commercial	2,200 gpd/acre	0.5 FAR at 0.1 gpd/sq. ft.
Neighborhood Commercial	2,200 gpd/acre	0.5 FAR at 0.1 gpd/sq. ft.
Heavy Industrial	2,900 gpd/acre	0.45 FAR at 0.15 gpd/sq. ft.
Light Industrial	2,900 gpd/acre	0.45 FAR at 0.15 gpd/sq. ft.