APPENDIX F

Sewer Study

Technical Memorandum

Subject: **Sanitary Sewer Capacity Evaluation for the Maple & Main Apartments Development (APN: 428-0061-061-01)**

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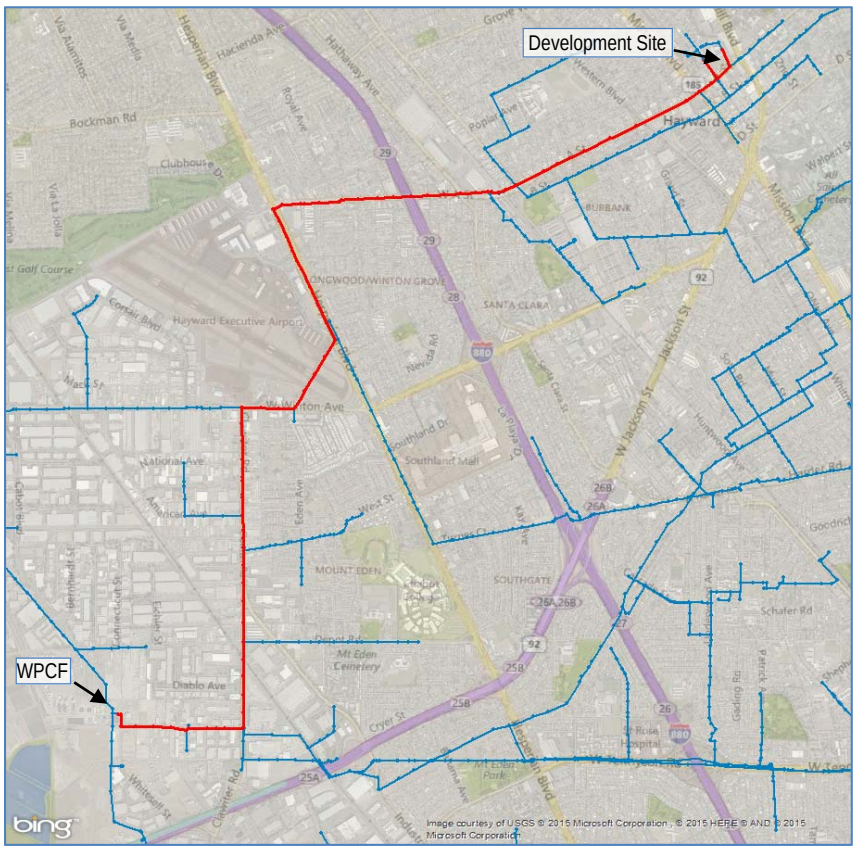
At the request of Wood Rodgers representing Bay Area Property Developers (BAPD), RMC evaluated the potential sanitary sewer capacity impact of the proposed Maple & Main Apartments development project (development) located between Maple Court, A Street, Main Street, and McKeever Avenue using the City of Hayward's (City's) sanitary sewer hydraulic model. This technical memorandum (TM) summarizes the approach, model input, and results of the analysis.

Figure 1 shows the location of the development site and the downstream sewer lines that would be affected by the additional flow from the development (affected lines in red). Flow from the development would enter the City's sewer collection system at two manholes: 0372-02 in Main St. and 0372-06 in Maple Ct.; then drain towards the Water Pollution Control Facility (WPCF) on the western end of the system via the A Street interceptor and the Clawiter interceptor.

Figure 1: Trunk Sewers Downstream of the Proposed Development Site



1 Approach

To evaluate the potential sewer capacity impact of the proposed development, the following model configurations were used:

- *Sewer network*: this analysis used the City's most current trunk network (network of larger diameter pipes that comprises the "backbone" of the collection system) that was developed for the 2015 Sewer Collection System Master Plan (2015 Master Plan), plus additional 6- and 8-inch local sewer lines in the immediate vicinity of the development site. These local lines were not in the original trunk network but were added specifically for this analysis in order to evaluate the development's impact to the local sewers.
- *Sanitary sewer loads*: two scenarios were evaluated for this analysis: an *existing* scenario to evaluate the immediate capacity impact that would be triggered by the proposed development, and a *future* scenario to evaluate the impact by buildout. Both sets of loads were developed as part of the 2015 Master Plan. The existing loads were developed based on average winter water use data from recent years, while the future loads were projected using various planning documents.
- *Design storm*: System capacity was evaluated based on the ability of the sanitary sewer system to convey future peak wet weather flow (PWWF) under design storm conditions. To maintain consistency, this analysis used the same 10-year design storm that was used for the 2015 Master Plan.

2 Model Input

The development was added to the model as an individual subcatchment with the following settings:

- *Sanitary Sewer load*: The proposed development consists of 235 apartment units, a fitness center, a leasing office, and retail spaces. **Table 1** below summarizes the estimated flow from the development. Existing buildings will be demolished except for the medical office building located in the corner of Maple Ct. and McKeever Ave. To avoid double-counting, flow from the existing buildings were identified and removed from the model, except for the medical office building. The site also has an anticipated development project in the Subdivision Tract list and is also located in a Priority Development Area with concentrated future growth. The future flow associated with this future growth was also removed from the model to avoid double-counting.

Table 1: Estimated Flow for the Proposed Development

No.	Land Use	Quantity (1)	Unit Flow Factor	Estimated Flow (4)	Loading Manhole	Total Flow
1	Apartment	121 Units	205 gpd/unit (2)	24,805 gpd	0372-06	26,317 gpd (0.026 mgd)
2	Fitness Center	3,600 SF	0.42 gpd/SF (3)	1,512 gpd	0372-06	
3	Apartment	114 Units	205 gpd/unit (2)	23,370 gpd	0372-02	23,776 gpd (0.024 mgd)
4	Leasing Office	1,650 SF	0.14 gpd/SF (3)	231 gpd	0372-02	
5	Retail Space	2,183 SF	0.08 gpd/SF (3)	175 gpd	0372-02	

(1) Provided by Wood Rodgers via email.

(2) Source: Table 2-1 (Projected New Development and Redevelopment and Unit Flow Factors) of the *2015 Sewer Collection System Master Plan.*

(3) Specific unit flow factors for fitness center, leasing office, and retail space are not available in the Master Plan. For the purpose of this analysis, unit flow factors published in Exhibit E: Sewage Treatment Plant Connection Fees, Coefficients, and Rates published by the San Jose/Santa Clara Water Pollution Control Plant were used.

(4) Estimated Flow = Quantity x Unit Flow Factor

- *Diurnal Profile:* A residential diurnal curve was applied to the subcatchment to simulate flows from the apartment units, and an all-week commercial diurnal curve was applied to simulate flows from the fitness center, leasing office, and retail space. The curves can be found in Figure 2-3 of the 2015 Master Plan.
- *Rainfall Profile:* The City's design storm profile was applied to the model to predict system performance under future PWWF condition. The storm was timed to cause peak rainfall-dependent infiltration/inflow (RDI/I) at approximately the same time as the peak base wastewater flow of the system.
- *Contributing Area and I/I Parameters*: The I/I contributing area was set to be equal to the parcel area. I/I parameters were set to be the same as the area in the immediate vicinity.

3 Model Results

Review of the model hydraulic profiles of the sewers downstream of the development under PWWF conditions indicated the following:

Existing Scenario without the Development: the model showed that the two 6-inch lines in Maple Ct. and Main St. immediately downstream of the development would be about 10 percent full; the 12-inch line in A Street (between Maple Ct. and Meekland Ave.) would be about 20 percent full; the A Street interceptor and the Clawiter interceptor would be about 50 to 65 percent full.

Existing Scenario with the Development: the model showed that the 6-inch lines immediately downstream of the development would be about 30 percent full; the 12-inch line in A Street would be about 20 to 30 percent full; the A Street interceptor and the Clawiter interceptor would be about 50 to 65 percent full. No surcharge was triggered.

Future Scenario without the Development: the model showed that the 6-inch lines immediately downstream of the development would be about 40 percent full; the 12-inch line in A Street would be about 20 percent full; the A Street interceptor and the Clawiter interceptor would be about 60 to 70 percent full.

Future Scenario with the Development: the model showed that the 6-inch lines immediately downstream of the development would be about 50 to 60 percent full; the 12-inch line in A Street would be about 20 to 30 percent full; the Clawiter interceptor would be about 60 to 70 percent full. No surcharge was triggered.

In summary, the model predicted that no capacity issues would be triggered by the additional flow from the proposed development, and therefore no capacity improvement is needed.