

Appendix N Sewer Technical Memo

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TECHNICAL MEMORANDUM

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DATE: May 12, 2021
RE: Sewer capacity assessment for The Hub Development Project

1. INTRODUCTION

The City of Fullerton (City) requires a sewer capacity analysis to evaluate the hydraulic effects of the sewer mains downstream of the proposed The Hub development at 2601-2751 E Chapman Avenue. The Hub would consist of mixed-use multi-family residential and neighborhood commercial development, which includes the addition of 420 multi-family residential units and 12,500 square feet of retail space. The Hub would be replacing existing mixed commercial-use spaces including small retail/office space and vacant units.

This brief Technical Memorandum (TM) describes the modeling work requested by the City of Fullerton to assess the hydraulic capacity of the City's sewer mains downstream of The Hub. The InfoSWMM model used for this evaluation was originally developed for the City's 2009 Sewer Master Plan (2009 Master Plan) and has been updated on an on-going basis to reflect new development projects and some changes to the sewer network, though the updates have not necessarily been comprehensive. The 2009 Master Plan estimated average dry weather wastewater flows of approximately 5,550 gallons per day (gpd) for the proposed development location, based on 2007/2008 water consumption data. Future loads in the 2009 Master Plan for this area were based on population and employment projections prepared by the Center for Demographic Research, which distributed projected growth across the city in Traffic Analysis Zones (TAZ). In the 2009 Master Plan, TAZ projections (with adjustments for some specific developments) were added on top of the existing loads to estimate future loads. The 2009 Master Plan did not identify any specific developments at The Hub location. For modeling purposes, it has been assumed that flows from the proposed development would replace the existing consumption-based flow and would be in addition to any projected growth in the TAZ.

The Hub is assumed to connect to the existing 8-inch sewer main running along East Chapman Avenue at manhole 36-58, consistent with the 2009 Master Plan. This sewer connects to Orange County Sanitation District (OC SAN) sewers at North State College Boulevard just north of Revere Avenue. Figure 1 shows the location of the development and the model sewer network. The 2009 Sewer Master Plan did not identify any capacity concerns in the City sewers downstream of the project under existing or future conditions.

2. MODEL RESULTS AND CONCLUSIONS

Wastewater flow projections for the residential units were estimated based on an Average Dry Weather Flow (ADWF) unit flow factor of 75 gallons per capita per day, and an assumed average of 2.93 persons per dwelling unit based on the city-wide average occupancy rate. The equivalent unit flow factor of 220 gallons per day per dwelling unit was used in a review of the Fullerton Transportation Center sewer flows, attached to the 2009 Master Plan. These flow factors were chosen for consistency with the 2009 Master Plan. Wastewater flow projections for the non-residential development were based on an ADWF unit flow factor of 0.1 gallons per day per square foot of building floor area. Projected average dry weather flows for The Hub development are summarized in **Table 1**; peaking factors were applied in the model by using the diurnal curves for residential and commercial spaces as developed in the 2009 Master Plan.

Wet weather flows were also developed as part of model calibration for the 2009 Master Plan and have not been changed. Note that flow monitoring was not performed for this sewer as part of that effort, so wet weather response is based on assumed I/I rates.

Table 1: The Hub Modeled Sewer Loads

	Units	Unit Flow Factor	Average Dry Weather Flow (gpd)
Residential	420 DU	220 gpd/DU	92,400
Commercial	12,500 Square Feet	0.1 gpd/square foot	1,250
Total			93,650

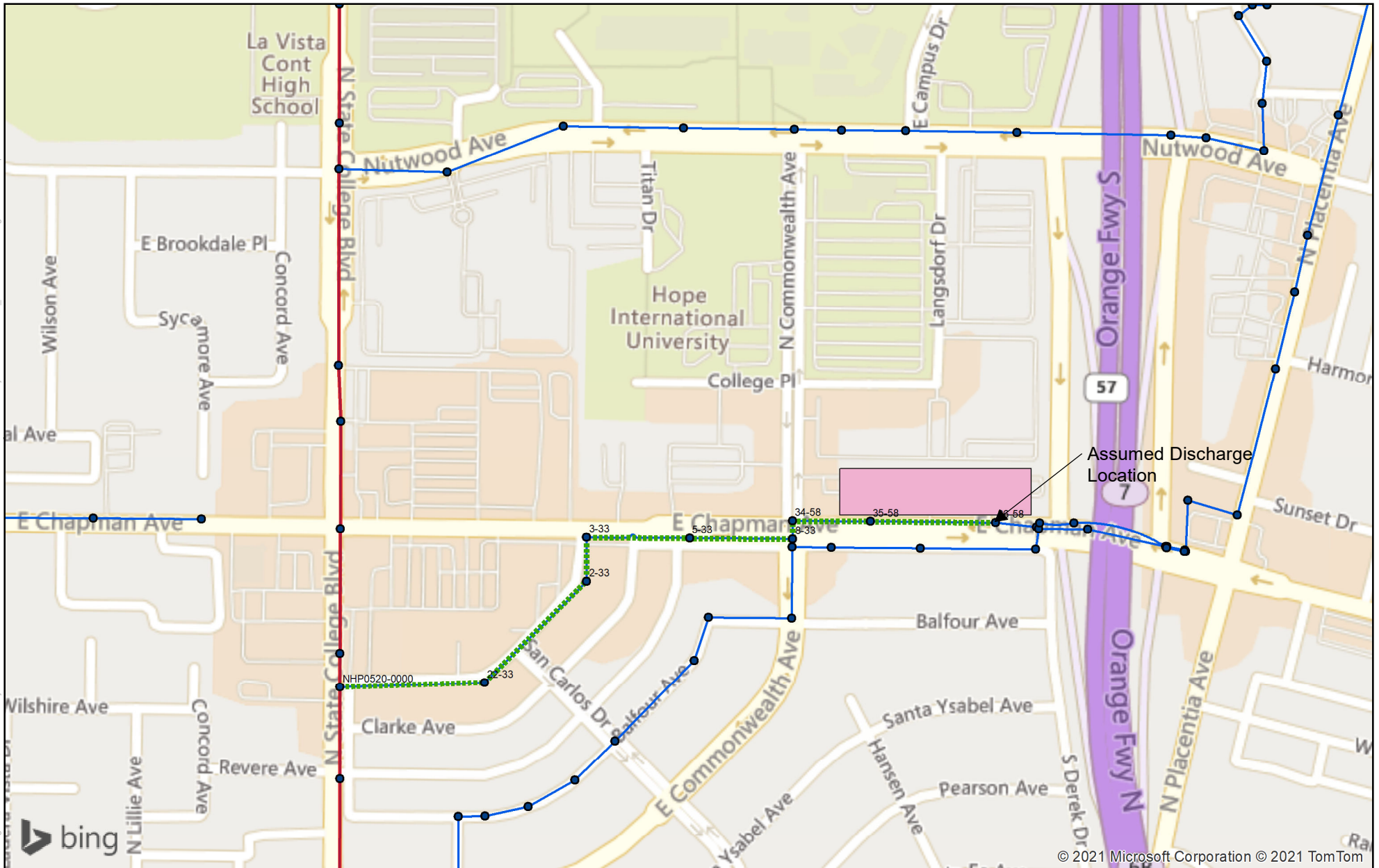
The model was run using the 2035 flow projections, with the addition of The Hub projected flows, under dry weather and wet-weather design storm scenarios to determine whether the proposed development would cause any new capacity deficiencies.

The “trigger” criterion for capacity deficiencies, which identifies when an existing sewer has insufficient capacity and requires capacity relief, was defined to occur when pipe surcharge exceeds two feet over the pipe crown or if the hydraulic grade line reaches within five feet of ground surface.

Figure 2 shows the hydraulic profile of the City sewers downstream of the development under peak dry weather conditions with The Hub. The modeled profile is not appreciably different without The Hub, so has not been presented. In addition, the assumed wet weather response for this sewer is relatively small and does not result in a noticeable increase in flows under the design storm scenario; therefore, a separate hydraulic profile has not been presented.

Based on these results, the model predicts that while there is some modeled surcharge at the upstream end of the project under peak dry and wet weather conditions, the surcharge would not exceed the City’s 2-foot surcharge criterion. Based on these results, the increase in flows from The Hub would not trigger any capacity deficiencies under dry weather or wet conditions, even under 2035 loads.

Figure Exported: 5/12/2021 4:00 PM By: dmerio Using: \\woodardcurran\projects\shared\Projects\RMC\SD\0234_Fullerton\0234-002-00_Fullerton_On_Call_Services\B_Project\Work\The Hub_2021-05-10\GIS\Figure 1 - Development_Location.mxd

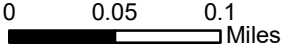


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Figure 1
Proposed Development Location
 The Hub Sewer Capacity Assessment

Legend

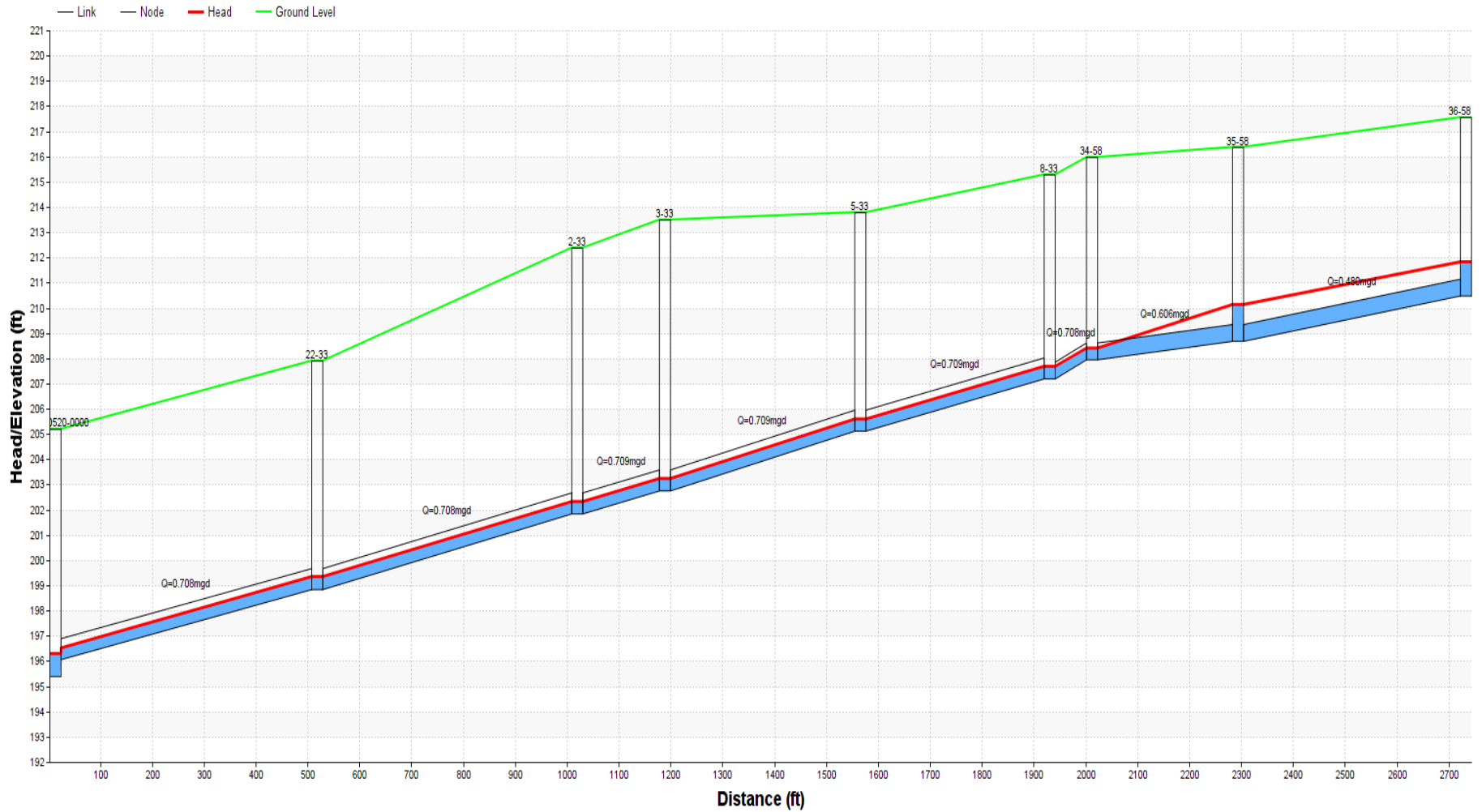
- Modeled manhole
- OC SAN sewer
- Modeled City sewer
- Proposed development location
- ⋯ Sewer downstream of proposed development



Project #: 0011744.01
 Map Created: April 2021

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

Figure 2: Hydraulic Profile under Peak Dry Weather and Wet Weather Conditions with The Hub



*Flows shown represent peak flow conditions.