Attachment 24. Sanitary Sewer Capacity Evaluation

TECHNICAL MEMORANDUM

City of Daly City
Wastewater Collection System Hydraulic Modeling Support

SUBJECT: Sanitary Sewer Capacity Evaluation for 493 Eastmoor Avenue, 305 Eastmoor Avenue, and 1784 Sullivan Avenue Developments.

PREPARED BY: Laney Nelson, Woodard & Curran

REVIEWED BY: Gisa Ju, Woodard & Curran, CA PE No. 31823

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REFERENCE: 0011352.00, Subtask 1.9

This Technical Memorandum (TM) summarizes the evaluation of the potential sanitary sewer capacity impact of the proposed developments at 493 Eastmoor Avenue, 305 Eastmoor Avenue, and 1784 Sullivan Avenue. The evaluation used the City's sanitary sewer hydraulic model developed as part of the 2009 North San Mateo County Sanitation District's (NSMCSD, District) Collection System Evaluation/Assurance, Management and Improvement Plan (2009 Collection System Evaluation) and updated in 2015 for the Collection System Model Update and Flow Impact Study for Proposed Serramonte Center Expansion (2015 Model Update).

The proposed developments are located on parcels 008-082-200, 008-082-160, and 008-082-180. The location of the proposed developments and the downstream sewers are shown in **Figure 1**. Flow from the proposed development sites enter the City's system in a 15-inch sewer on Eastmoor Avenue and Sullivan Avenue, then continues north and northwest to the NSMCSD Wastewater Treatment Plant (WWTP). The proposed development would not contribute to the loads of any required capacity improvements identified in the 2015 Model Update, as none of these improvements are located downstream of the development.

1. MODEL INPUT

1.1 Sewer Network

This analysis used the City's existing model of the trunk sewer network that was last updated in 2015. In a previous development review for the Edgeworth development in 2015[1], a scenario was created which subdivided subcatchments in the area and added loads from the development on Edgeworth Avenue. This scenario was used as a basis for this study and the Edgeworth Avenue development loads were included. The subcatchments were further divided to incorporate the loading of the proposed developments, as shown in **Figure 2**.

1.2 Sewer Loads

The 2015 Model Update evaluated the sewer system under two planning scenarios: Existing and Future. The Existing Scenario was considered to represent 2015 flows, and the Future Scenario was developed to represent 2030 conditions by incorporating future residential and commercial projects that would potentially be implemented between 2015 and

[1] Technical Memorandum, Collection System Flow Study for the Edgeworth Development (515 Washington Street), December 17, 2015.

2030. This analysis only evaluated the proposed development under the Future Scenario with the Edgeworth Avenue development included. The Eastmoor Residential Development at 493 Eastmoor is located on parcel 008-082-200, which is currently vacant with no existing loads in the model. There are existing loads in the model attributed to the parcel 008-082-160 for the Jefferson Elementary School District (JESD) Margaret P. Brown elementary school at 305 Eastmoor Avenue. The proposed development at 305 Eastmoor is faculty and staff housing that will be built on an existing school play field adjacent to the school, therefore these existing loads were left in the model. There are also existing loads in the model attributed to a commercial development in parcel 008-082-180, which will be replaced with the proposed 1784 Sullivan residential development and will therefore be removed from the model for this study.

The proposed Eastmoor Residential Development includes 72 affordable housing units, and approximately 1,200 square feet (sq. ft.) of commercial office space. The proposed JESD Faculty and Staff Housing Project includes 56 apartments and an approximate 1,000-sq. ft. community center. The proposed residential development at 1784 Sullivan Avenue includes 22 apartments renovated in a previously commercial office building. The proposed developments include both residential and non-residential loads. The residential loads were estimated based on an apartment unit flow factor of 170 gallons per day (gpd) per dwelling unit (DU), as used in the 2015 Model Update. The non-residential loads were estimated based on a non-residential unit flow factor of 0.1 gpd/sq. ft. for general commercial, retail, and offices uses. The development quantities and estimated base wastewater flow (BWF) sewer loads from the developments are shown in **Table 1** below.

Table 1: Average BWF Sewer Load for the Proposed Developments

Type	Amount	Unit	Rate (gpd/unit)	Flow (gpd)	Flow (MGD)
Eastmoor Residential Development, 493 Eastmoor Avenue					
Apartments	72	DU	170	12,240	0.0122
Commercial Office Space	1,196	sq. ft.	0.1	120	0.0001
			Subtotal	**12,360**	**0.0124**
JESD Faculty and Staff Housing Project, 305 Eastmoor Avenue					
Apartments	56	DU	170	9,520	0.0095
Community Center	1,000	sq. ft.	0.1	100	0.0001
			Subtotal	**9,620**	**0.0096**
Residential Development, 1784 Sullivan Avenue					
Apartments	22	DU	170	3,740	0.0037
			Subtotal	**3,740**	**0.0037**
			Total for Proposed Developments	**25,720**	**0.0257**

The proposed developments are located in model subcatchments S-032A and S-102A as delineated in the Edgeworth development review. These subcatchments and the adjacent subcatchments were split to more accurately represent the loading to the sewers that were added to the model for this study (**Figure 2**). The proposed 493 Eastmoor Residential Development is located in new model subcatchment S-032C, the proposed JESD Faculty and Staff Housing at 305 Eastmoor Ave. is located in new model subcatchment S-102F, and the proposed residential development at 1784 Sullivan Ave. is located in new model subcatchment S-032D, as shown in **Figure 2.** The loading manholes and the average BWF loading for the revised subcatchments are shown in **Table 2** .

Table 2: Average BWF Sewer Loads for Modeled Subcatchments

Subcatchment	Load Manhole	Residential Flow (mgd)	Non-residential Flow (mgd)	Total Flow (mgd)
S-032A	MH-D06-058	0.0138	--	0.0138
S-032B	MH-D06-058	0.0068	0.0003	0.0071
S-032C	MH-D07-012	0.0131	0.0001	0.0132
S-032D	MH-D07-011	0.0433	--	0.0433
S-032E	MH-D06-166	--	0.0015	0.0015
S-032F	MH-D06-061	--	--	--
S-102A	MH-D06-020	0.0148	--	0.0148
S-102B	MH-D07-003	--	--	--
S-102C	MH-D06-052	--	0.0003	0.0003
S-102D	MH-D06-051	0.3421	--	0.3421
S-102E	MH-D06-050	0.0025	--	0.0025
S-102F	MH-D07-015	0.0198	0.0001	0.0199

1.3 Design Flow Parameters

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. The analysis for this study used the same diurnal curves for residential and non-residential flows, as well as the same rainfall-dependent inflow and infiltration (RDI/I) for this area applied to the 5-year return period design event, as used in the 2009 Collection System Evaluation and 2015 Model Update.

2. MODEL RESULTS

The model was run for PWWF conditions for future sewer loads with all of the proposed developments. The results indicated that the developments would not cause any capacity deficiencies in the sewers on Eastmoor Avenue or Sullivan Avenue or further downstream of the development. **Figure 3** shows the profile of the 15-inch sewer in Eastmoor and Sullivan Avenues to 92nd Street, indicating that the flow in the pipe would generally not exceed ¼ full under the PWWF scenario.

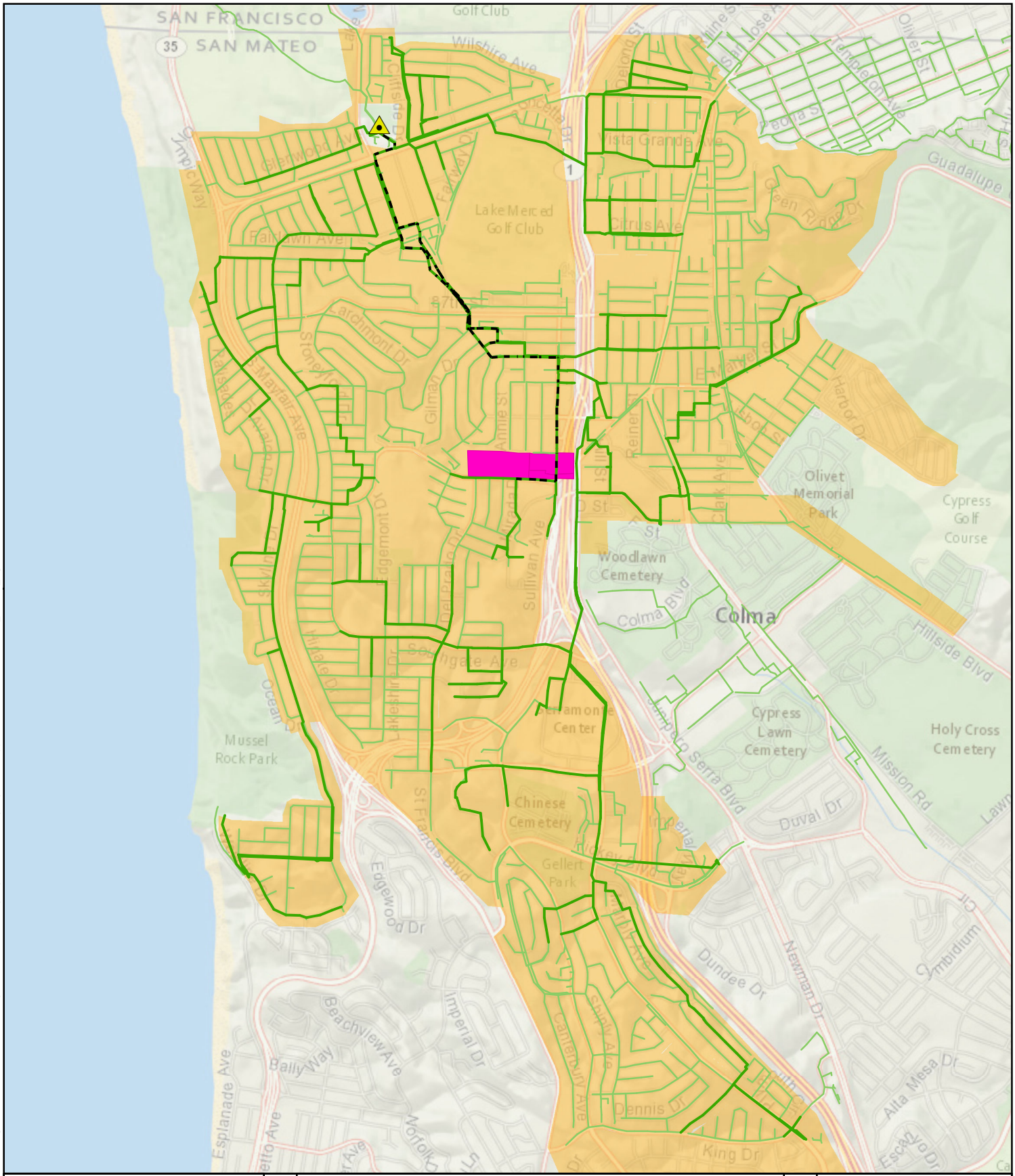

Figure 1: Proposed Development Location

493 Eastmoor Ave. 305 Eastmoor Ave & 1784 Sullivan Ave Developments
Daly City, CA

Legend

- Wastewater Treatment Plant
- Pipes downstream of developments
- Modeled Pipes
- Unmodeled Pipes
- Proposed Developments
- Service Area

N

0 0.125 0.25 0.5 Miles

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Project #: 0011352.00
Map Created: February 2019

Figure Exported: 2/12/2020 By: dnelson Using: \\woodardcurran.net\shared\Projects\RMCS\J0120 Daly City\0011352.00 Daly City Model Support 2018\GIS\MXDs\Eastmoor_Sullivan_Fig1.mxd

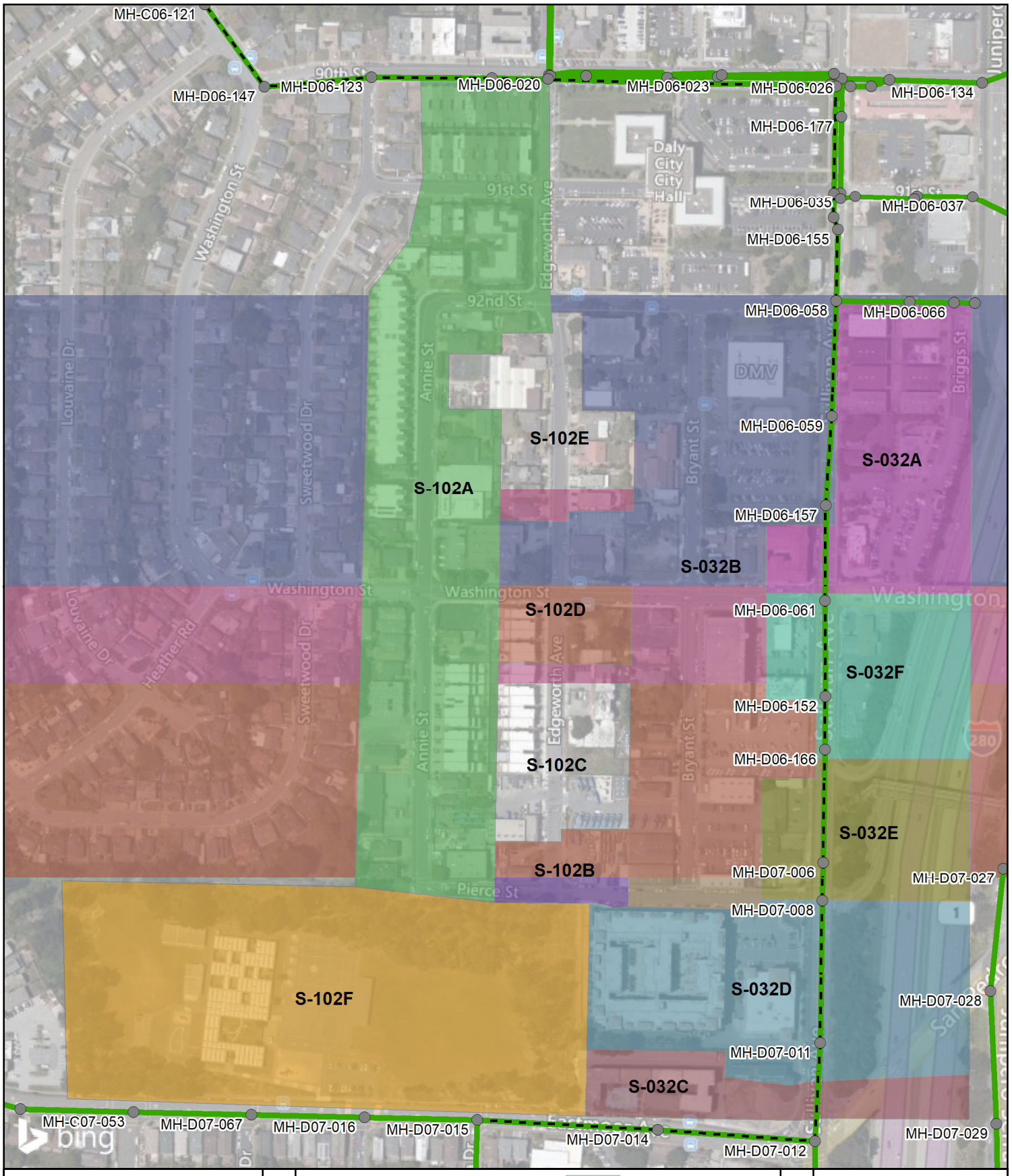

Figure 2: Development Site

493 Eastmoor Ave, 305 Eastmoor Ave, & 1784 Sullivan Ave Developments
Daly City, CA

Legend

- Modeled Nodes
- Pipes downstream of developments
- Modeled Sewers
- S-032F Subcatchments

N

0 75 150 300 Feet

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Project #: 0011352
Map Created: February 2020

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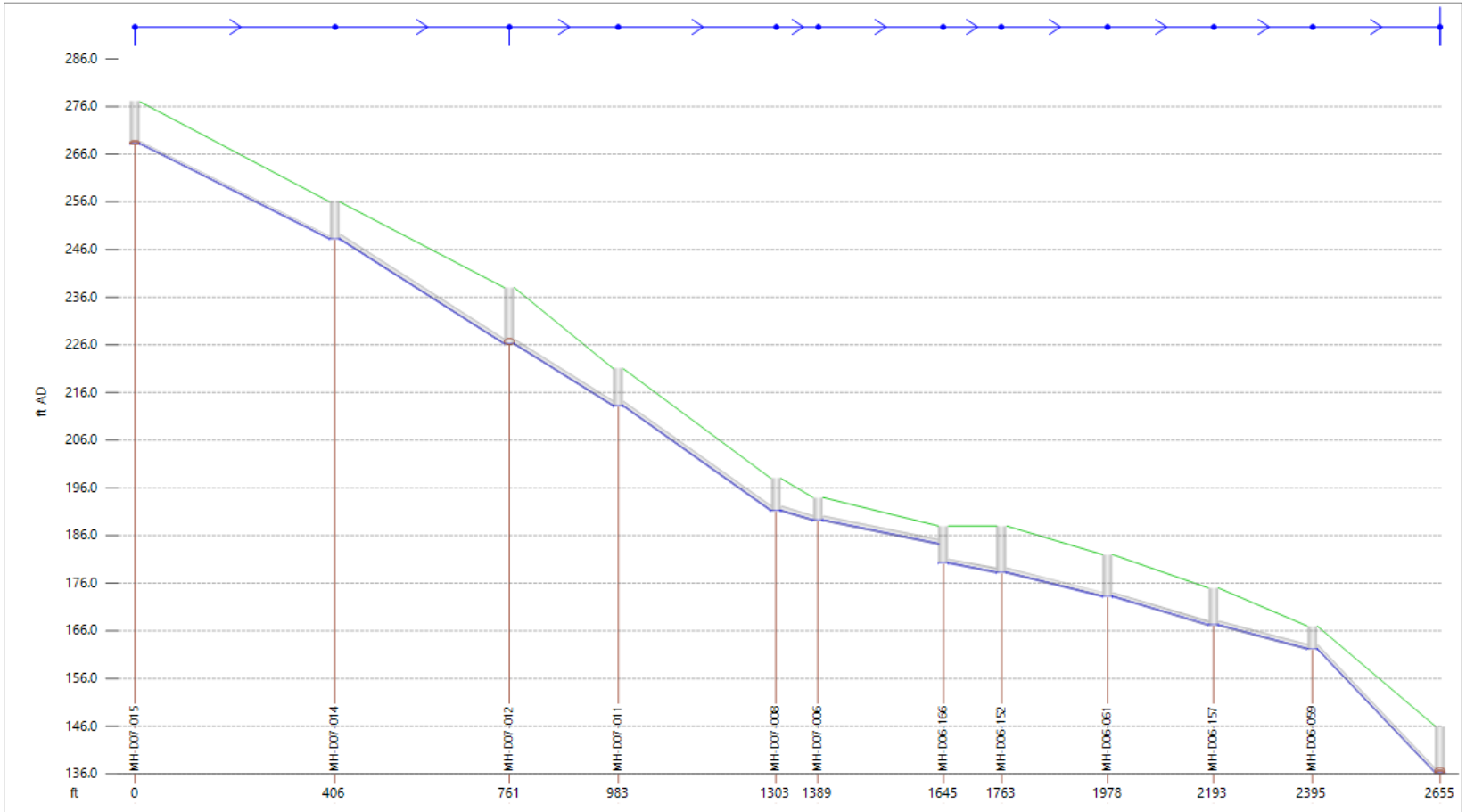
Figure 3: Model Profile with Proposed Developments (MH-D07-015 to MH-D06-058)



Link	MH-D07-015.1	MH-D07-014.1	MH-D07-012.1	MH-D07-011.1	-	MH-D07-006.1	-	MH-D06-152.1	MH-D06-061.1	MH-D06-157.1	MH-D06-059.1
length (ft)	406.2	355.2	221.8	320.2	85.7	255.6	118.6	215.1	215.2	201.3	260.3
width (in)	10.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
us inv (ft AD)	268.000	248.000	226.000	213.000	-	189.000	180.000	178.000	173.000	167.000	162.000
ds inv (ft AD)	248.000	226.000	213.000	191.000	-	184.000	178.000	173.000	167.000	162.000	136.000
grad (%)	4.924	6.194	5.862	6.871	2.333	1.956	1.686	2.324	2.789	2.484	9.988
pfc (MGD)	3.14	10.39	10.11	10.95	6.38	5.84	5.42	6.37	6.97	6.58	13.20
surc	0.30	0.19	0.20	0.24	0.25	0.25	0.26	0.24	0.24	0.24	0.23

Node	MH-D07-015	MH-D07-014	MH-D07-012	MH-D07-011	MH-D07-008	-	-	-	MH-D06-061	MH-D06-157	MH-D06-059	-
ground (ft AD)	277.000	256.000	238.000	221.000	198.000	194.000	188.000	188.000	182.000	175.000	167.000	146.000
flood dep (ft)	-8.746	-7.764	-11.756	-7.752	-6.697	-4.683	-7.671	-9.696	-8.708	-7.700	-4.768	-9.707