APPENDIX O

Off-site Sewer Analysis

Infrastructure ENGINEERING CORPORATION

TECHNICAL MEMORANDUM

Sewer Hydraulic Impact Study for Cypress Point Subdivision

Technical Memorandum

Subject	Sewer Hydraulic Impact Study for Cypress Point Subdivision
Client	City of Oceanside
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Date - *Draft*	April 23, 2021
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PURPOSE

The City of Oceanside (City) retained the service of Infrastructure Engineering Corporation (IEC) to prepare a sewer hydraulic impact study for the Cypress Point Subdivision (Project), a proposed single-family residential development. The purpose of this sewer hydraulic impact study is to determine whether the proposed Project would require any off-site improvements to accommodate the Project flows.

DISCUSSION

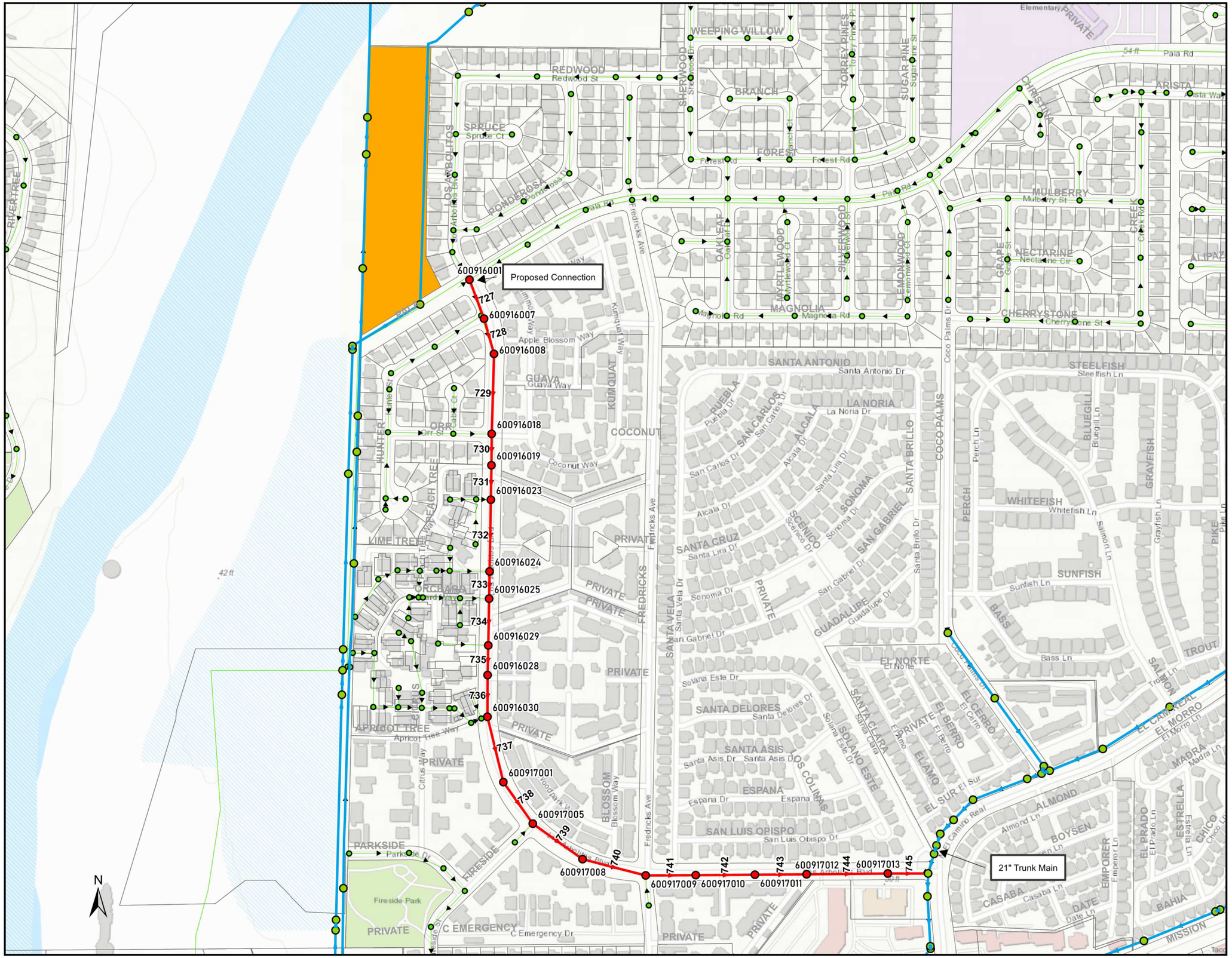
The Project site is located at a vacant lot northwest of intersection of Pala Rd and Los Arbolitos Blvd with Assessor's Parcel Number (APN) of 158-301-4600. The Project site encompasses approximately 7.5 acres and proposes to develop 54 single-family residential units. The developer proposes a new 8-inch sewer line on site and a new 8-inch sewer line in Pala Rd that will connect to the existing manhole (GIS ID: 600916001) at Los Arbolitos Rd. The existing sewer line in Los Arbolitos Blvd is 12 inches in size and flows south to a 21-inch trunk main in El Camino Real. The off-site sewer main downstream of the Project up to the trunk main were selected for analysis, as shown in Figure 1.

Table 1 presents the estimated average sewer flows contributed by the Project.

Table 1.Estimated Sewer Flow for Cypress Point Subdivision

APN	Location	Land Use Type	Lot Acre	Proposed Developments	Sewer Generation Factor (gpd/unit)	Estimated Sewer Flow (gpd)
				Single-Family Residential (unit)		
1583014600	Pala Rd & Los Arbolitos Blvd	Single Family Residential	7.48	54	170	9,180

The selected sewer mains were evaluated under Ultimate Peak Wet Weather Flow (PWWF) condition without and with the development flow using the InfoSWMM sewer hydraulic model that was developed as part of the City's 2015 Sewer Master Plan (SMP) and has been continuously updated by IEC for the City's on-call hydraulic analysis tasks. PWWF is typically used for sizing sewers and lift stations.



Legend

- Active Model MH
- Selected Model MH
- City Manhole
- City Sewer Main
- City Parcel
- Cypress Point Subdivision

Infrastructure ENGINEERING CORPORATION

City of Oceanside
Sewer Hydraulic Analysis

Cypress Point Subdivision Study Area

Figure 1

The PWWF includes the Peak Dry Weather Flow (PDWF) plus the peak flow response from Rainfall Dependent Infiltration and Inflow (RDII). PDWF was calculated by applying the residential or non-residential diurnal patterns developed from the 2015 SMP to the respective categorized average flows. The RDII component accounted for a 10-year 24-hour design storm. The model estimated the peak RDII using the RTK method. Detail of this method was discussed in Section 5.5.2 of the 2015 SMP.

Table 2 summarizes the model results of the selected sewer mains under Ultimate PWWF condition.

Table 2. Model Results

ID	From MH	To MH	Length (ft)	Slope (%)	Ex. Diameter (in.)	Ultimate PWWF without Development Flow		Ultimate PWWF with Development Flow	
						Max. Flow (mgd)	Max. d/D	Max. Flow (mgd)	Max. d/D
727	600916001	600916007	183.5	0.21	12	0.310	0.367	0.316	0.370
728	600916007	600916008	161.6	0.24	12	0.311	0.372	0.317	0.376
729	600916008	600916018	353.5	0.22	12	0.311	0.361	0.316	0.364
730	600916018	600916019	138.5	0.35	12	0.330	0.352	0.336	0.355
731	600916019	600916023	151.9	0.28	12	0.351	0.386	0.356	0.389
732	600916023	600916024	316.5	0.25	12	0.383	0.394	0.388	0.397
733	600916024	600916025	120.2	0.30	12	0.394	0.400	0.400	0.403
734	600916025	600916029	206.2	0.25	12	0.412	0.409	0.417	0.412
735	600916029	600916028	131.1	0.30	12	0.429	0.408	0.435	0.411
736	600916028	600916030	184.0	0.27	12	0.429	0.441	0.435	0.444
737	600916030	600917001	296.6	0.24	12	0.492	0.458	0.498	0.461
738	600917001	600917005	224.7	0.27	12	0.495	0.457	0.500	0.460
739	600917005	600917008	269.7	0.25	12	0.509	0.474	0.515	0.477
740	600917008	600917009	289.4	0.25	12	0.512	0.461	0.517	0.464
741	600917009	600917010	220.9	0.31	12	0.511	0.462	0.517	0.465
742	600917010	600917011	261.3	0.26	12	0.546	0.479	0.551	0.482
743	600917011	600917012	228.3	0.27	12	0.546	0.510	0.551	0.513
744	600917012	600917013	358.1	0.24	12	0.545	0.421	0.551	0.423
745	600917013	601017016	179.7	1.58	12	0.545	0.572	0.551	0.573

Based on City's design criteria for existing pipelines, maximum depth over diameter (d/D) for pipes with 12-inch or small should not exceed 0.7. Model results indicate that the existing 12-inch sewer main in Los Arbolitos Blvd up to the trunk main in El Camino Real has sufficient capacity to accommodate the proposed Project flow under Ultimate PWWF condition.

CONCLUSION

The proposed Project does not require any off-site pipeline improvements to accommodate the additional sewer flows.