

Appendix

Appendix K Sewer Study

Appendix

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TECHNICAL MEMORANDUM

To: Keith Linker

From: Kim Alexander

Date: September 9, 2019

Subject: Sewer Study – Renaissance Apartments, 1122 N. Anaheim Blvd.
City Project Tracking No.: OTH2019-01191



The purpose of this memorandum is to document a sewer study prepared for the proposed Renaissance Apartment Project (Project) consisting of 269 units. The 4.49 acre site, on Assessor Parcel No. (APN) 035-010-51, currently consists of an automobile tow yard with 3 single-story industrial buildings, that total approximately 15,000 square feet, along with a large surface parking area. The site address is 1122 Anaheim Boulevard, Anaheim, CA 92801, which is located on the east side of the street, north of La Palma Avenue and south of Carl Karcher Way, as shown on Figure 1. Surrounding uses include a new condominium project to the south, industrial use to the north and east, and a combination of vacant and commercial use to the west, across Anaheim Boulevard.

There was no sewer loading in the model associated with the existing project site. There was, however, existing commercial and industrial loading that had been associated with the property to the south that has since been redeveloped with a condominium project called the La Palma Condominiums. The previous sewer flows that were loaded to the 8-inch pipeline along La Palma Ave at manhole SW070412, equal to 3.057 gpm, were removed from the model. The flows associated with the 161 unit La Palma Condominium project, equal to 27.95 gpm, were added along the 8-inch pipeline in Anaheim Boulevard at SW070410 based on the January 2015 sewer study for the project completed by Kimley-Horn.

Sewage from the proposed Project is to be discharged to the existing 8-inch VCP sewer running along the east side of Anaheim Boulevard, on same side of the street as the Project. This same sewer line collects flow from the La Palma Condominium project upstream. There is also an existing 6-inch sewer pipeline running parallel along the west side of Anaheim Boulevard. The 8-inch sewer in Anaheim Boulevard continues north to an 8-inch sewer that crosses Anaheim Boulevard to the west at Carl Karcher Way. This short reach connects to another short 8-inch pipeline on the west side of Anaheim Boulevard that flows north and connects to the 24-inch pipeline that continues west along Carl Karcher Way. The 24-inch pipeline continues west along Carl Karcher Way, which transitions into Romneya Drive, and then connects to the 30-inch pipeline along Euclid Street where the sewer discharges south to the outfall at La Palma Ave.

The proposed Project flow was loaded to one manhole, SW070407, on Anaheim Boulevard based on the site plan provided by the developer (attached). The proposed flow generation rate and corresponding manhole loading is summarized in Table 1. The existing downstream sewer collection system and the location of the proposed Project site are shown on Figure 2. The proposed flow factor for apartment units is 210 gpd/du based on the Central Anaheim Master

Plan of Sanitary Sewers (CAMPSS). As shown in Table 1, the proposed flow increase for the Project is 56,490 gpd, or 39.23 gpm.

Table 1 – Proposed Project Manhole Flow Loading & Average Flow Increase

Manhole Number	Units		Flow Factor (gpd/unit)	Flow Rate (gpd)
	DU	ksf		
AVERAGE FLOW INCREASE				
Proposed Project				
Renaissance Apartments – SW070407	269		210	56,490
Existing to be Removed				
Tow Yard – No modeled load		15		0
Proposed Flow Increase				56,490

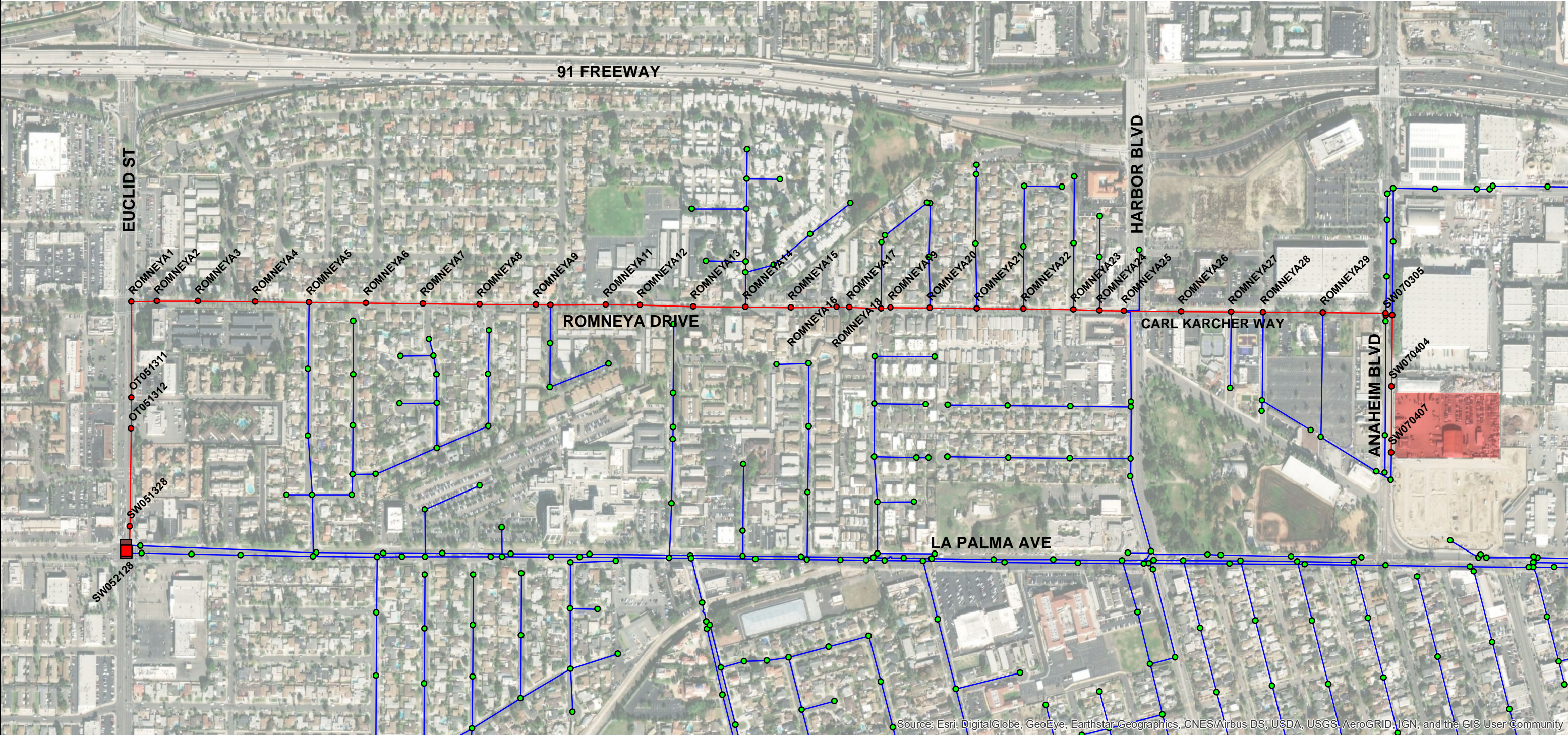
The Existing Condition Scenario plus the Project flows and depth-to-Diameter (d/D) ratios for the sewer collection system from the hydraulic model for the CAMPSS are shown in Table 2. The City's replacement criteria allows for a maximum d/D of 0.67 for pipes with diameters less than 12 inches and 0.75 for pipes with diameters equal or greater than 12. As shown on Table 2, Existing Scenario, the existing condition results show no deficiencies along the tributary sewer pipelines. Similarly, the Buildout Condition Scenario plus the Project flows and the resulting d/D ratios for the sewer collection system are shown in Table 3. As seen in Table 3, Buildout Scenario, there continues to be no deficiencies along the tributary pipeline under projected buildout conditions.

Conclusion

No sewer system improvements are required for the proposed Renaissance Apartments Project consisting of 269 apartment units. Model results show sufficient capacity within the existing sewer collection pipelines for increased sewer flow generated by the proposed Project.

Attachments: Figures 1 & 2, Tables 2 & 3, Site Plan





Source: Esri, DigitalGlobe, GeoEye, Earthstar, Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

— Project Tributary Pipelines

FIGURE 2
TRIBUTARY BASIN MAP

Table 2 - Existing Land Use Scenario Plus Project

Street	Cross Street	Upstrm MH-Dwnstrm MH	Size (in)	Length (ft)	Slope (ft/ft)	Peak Flow (gpm)	d/D
Anaheim Blvd	Carl Karcher	SW070410-SW070407	8	145	0.006	37	0.22
		SW070407-SW070404	8	348	0.002	135	0.56
		SW070404-SW070401	8	375	0.005	137	0.46
		SW070401-SW070305	8	33	0.060	181	0.27
		SW070104-SW070305-A	8	8	0.004	186	0.58
Carl Karcher	Swan Homer Harbor	ROMNEYA29-ROMNEYA30	24	331	0.002	985	0.33
		ROMNEYA28-ROMNEYA29	24	314	0.002	1,031	0.33
		ROMNEYA27-ROMNEYA28	24	170	0.002	1,040	0.34
		ROMNEYA26-ROMNEYA27	24	263	0.002	1,045	0.34
		ROMNEYA25-ROMNEYA26	24	300	0.002	1,045	0.34
Romneya	Raleigh Ravenna Riviera Ralston	ROMNEYA24-ROMNEYA25	24	130	0.002	1,049	0.34
		ROMNEYA23-ROMNEYA24	24	137	0.002	1,091	0.35
		ROMNEYA22-ROMNEYA23	24	262	0.002	1,102	0.35
		ROMNEYA21-ROMNEYA22	24	246	0.002	1,113	0.35
		ROMNEYA20-ROMNEYA21	24	248	0.002	1,138	0.35
		ROMNEYA19-ROMNEYA20	24	206	0.002	1,149	0.36
	Citron	ROMNEYA18-ROMNEYA19	24	50	0.002	1,149	0.36
		ROMNEYA17-ROMNEYA18	24	168	0.002	1,160	0.36
		ROMNEYA16-ROMNEYA17	24	66	0.002	1,160	0.37
		ROMNEYA15-ROMNEYA16	24	242	0.002	1,177	0.36
	Robin	ROMNEYA14-ROMNEYA15	24	239	0.002	1,182	0.36
		ROMNEYA13-ROMNEYA14	24	274	0.002	1,354	0.39
		ROMNEYA12-ROMNEYA13	24	281	0.002	1,358	0.39
		ROMNEYA11-ROMNEYA12	24	179	0.002	1,360	0.39
	Lombard	ROMNEYA10-ROMNEYA11	24	292	0.002	1,408	0.39
		ROMNEYA9-ROMNEYA10	24	78	0.003	1,442	0.38
		ROMNEYA8-ROMNEYA9	24	295	0.003	1,442	0.37
		ROMNEYA7-ROMNEYA8	24	300	0.003	1,443	0.37
	Arbor	ROMNEYA6-ROMNEYA7	24	300	0.003	1,444	0.37
		ROMNEYA5-ROMNEYA6	24	300	0.003	1,445	0.37
		ROMNEYA4-ROMNEYA5	24	285	0.003	1,446	0.37
		ROMNEYA3-ROMNEYA4	24	300	0.003	1,446	0.37
	Euclid	ROMNEYA2-ROMNEYA3	24	216	0.003	1,446	0.37
		ROMNEYA1-ROMNEYA2	24	134	0.003	1,446	0.37
Euclid	La Palma	ROMNEYA1-OT051311	30	506	0.001	1,446	0.37
		OT051311-OT051312	30	163	0.001	1,446	0.37
		OT051312-SW051328	30	516	0.001	1,446	0.37
		SW051328-SW052128	30	144	0.001	1,446	0.37

Table 3 - Buildout Land Use Scenario Plus Project

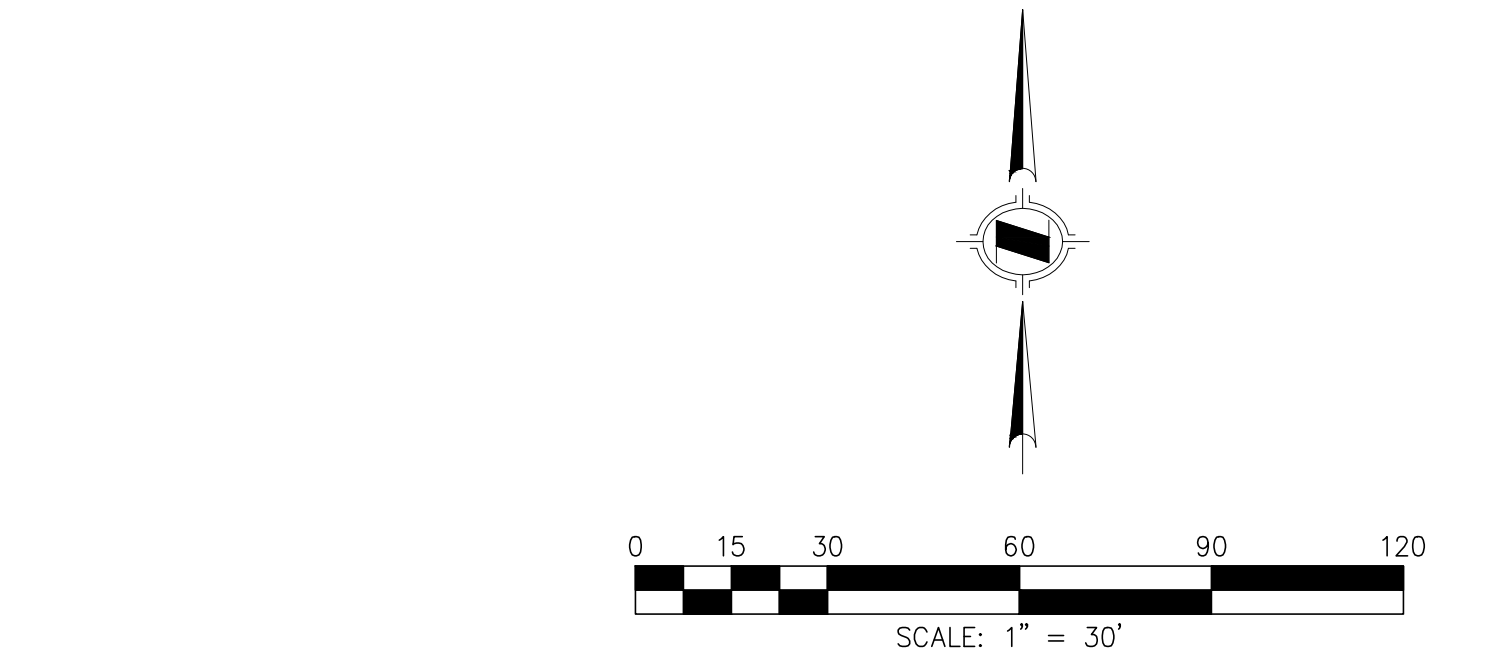
Street	Cross Street	Upstrm MH-Dwnstrm MH	Size (in)	Length (ft)	Slope (ft/ft)	Peak Flow (gpm)	d/D
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		SW070407-SW070404	8	348	0.002	135	0.56
		SW070404-SW070401	8	375	0.005	138	0.46
		SW070401-SW070305	8	33	0.060	193	0.28
		SW070104-SW070305-A	8	8	0.004	198	0.61
Carl Karcher	Swan Homer	ROMNEYA29-ROMNEYA30	24	331	0.002	1,018	0.33
		ROMNEYA28-ROMNEYA29	24	314	0.002	1,067	0.34
		ROMNEYA27-ROMNEYA28	24	170	0.002	1,076	0.34
		ROMNEYA26-ROMNEYA27	24	263	0.002	1,082	0.34
	Harbor	ROMNEYA25-ROMNEYA26	24	300	0.002	1,082	0.34
Romneya	Raleigh Ravenna Riviera Ralston	ROMNEYA24-ROMNEYA25	24	130	0.002	1,087	0.35
		ROMNEYA23-ROMNEYA24	24	137	0.002	1,130	0.35
		ROMNEYA22-ROMNEYA23	24	262	0.002	1,142	0.35
		ROMNEYA21-ROMNEYA22	24	246	0.002	1,153	0.35
		ROMNEYA20-ROMNEYA21	24	248	0.002	1,179	0.36
		ROMNEYA19-ROMNEYA20	24	206	0.002	1,190	0.36
	Citron	ROMNEYA18-ROMNEYA19	24	50	0.002	1,190	0.37
		ROMNEYA17-ROMNEYA18	24	168	0.002	1,202	0.36
		ROMNEYA16-ROMNEYA17	24	66	0.002	1,202	0.37
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		ROMNEYA12-ROMNEYA13	24	281	0.002	1,410	0.40
		ROMNEYA11-ROMNEYA12	24	179	0.002	1,413	0.40
	Lombard	ROMNEYA10-ROMNEYA11	24	292	0.002	1,463	0.40
		ROMNEYA9-ROMNEYA10	24	78	0.003	1,500	0.38
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		OT051311-OT051312	30	163	0.001	1,504	0.38
		OT051312-SW051328	30	516	0.001	1,504	0.37
		SW051328-SW052128	30	144	0.001	1,504	0.37

1. VARIOUS EXISTING ON-SITE UNDERGROUND UTILITIES AND ABOVE GROUND APPURTENANCES WILL BE DEMOLISHED PRIOR TO CONSTRUCTION PURSUANT TO AN APPROVED DEMOLITION PERMIT.
2. ALL IMPROVEMENTS WITHIN THE PUBLIC RIGHT-OF-WAY WILL REQUIRE A RIGHT-OF-WAY CONSTRUCTION PERMIT.
3. ALL IMPROVEMENTS TO BE CONSTRUCTED PER CITY OF ANAHEIM STANDARD DETAILS, UNLESS OTHERWISE NOTED ON THIS PLAN.
4. ALL REQUESTS FOR NEW WATER SERVICES, BACKFLOW EQUIPMENT, OR FIRE LINES, AS WELL AS ANY MODIFICATIONS, RELOCATIONS, OR ABANDONMENTS OF EXISTING WATER SERVICES, BACKFLOW EQUIPMENT, AND FIRE LINES, SHALL BE COORDINATED AND PERMITTED THROUGH WATER ENGINEERING DIVISION OF THE ANAHEIM PUBLIC UTILITIES DEPARTMENT.
5. THE OWNER SHALL IRREVOCABLY OFFER TO DEDICATE TO THE CITY OF ANAHEIM (I) AN EASEMENT FOR ALL LARGE DOMESTIC ABOVE-GROUND WATER METERS AND FIRE HYDRANTS, INCLUDING A FIVE (5)-FOOT WIDE EASEMENT AROUND THE FIRE HYDRANTS, WATER METER BOXES AND/OR WATER METER PAD. (II) A TWENTY (20) FOOT WIDE EASEMENT FOR ALL WATER SERVICE MAINS AND SERVICE LATERALS ALL TO THE SATISFACTION OF THE WATER ENGINEERING DIVISION. THE EASEMENTS SHALL BE GRANTED ON THE WATER ENGINEERING DIVISION OF THE PUBLIC UTILITIES DEPARTMENT'S STANDARD WATER EASEMENT DEED. THE EASEMENT DEEDS SHALL INCLUDE LANGUAGE THAT REQUIRES THE OWNER TO BE RESPONSIBLE FOR RESTORING ANY SPECIAL SURFACE IMPROVEMENTS, OTHER THAN ASPHALT PAVING, INCLUDING BUT NOT LIMITED TO COLORED CONCRETE, BRICKS, PAVERS, STAMPED CONCRETE, DECORATIVE HARDSCAPE, WALLS OR LANDSCAPING THAT BECOMES DAMAGED DURING ANY EXCAVATION, REPAIR OR REPLACEMENT OF CITY OWNED WATER FACILITIES. PROVISIONS FOR THE REPAIR, REPLACEMENT AND MAINTENANCE OF ALL SURFACE IMPROVEMENTS OTHER THAN ASPHALT PAVING SHALL BE THE RESPONSIBILITY OF THE OWNER AND INCLUDED AND RECORDED IN THE MASTER CC & RS FOR THE PROJECT.
6. THAT THE DEVELOPER/OWNER SHALL SUBMIT TO THE PUBLIC UTILITIES DEPARTMENT WATER ENGINEERING DIVISION AN ESTIMATE OF THE MAXIMUM FIRE FLOW RATE AND MAXIMUM DAY AND PEAK HOUR WATER DEMANDS FOR THE PROJECT.
7. APPLICANT SHALL CONTACT WATER ENGINEERING FOR RECYCLED WATER SYSTEM REQUIREMENTS AND SPECIFIC WATER CONSERVATION MEASURES TO BE INCORPORATED INTO THE BUILDING AND LANDSCAPE CONSTRUCTION PLANS.
8. FIRE HYDRANT LOCATIONS AND FIRE FLOW SHALL BE PROVIDED TO COMPLY WITH MINIMUM APPLICABLE CALIFORNIA FIRE CODE REGULATIONS AND CITY OF ANAHEIM FIRE DEPARTMENT SPECIFICATIONS AND REQUIREMENTS.
9. SEWER IMPROVEMENTS SHALL COMPLY WITH LATEST PLUMBING CODE.
10. THE DEVELOPER/OWNER SHALL SUBMIT A SET OF IMPROVEMENT PLANS FOR PUBLIC UTILITIES WATER ENGINEERING REVIEW AND APPROVAL IN DETERMINING THE CONDITIONS NECESSARY FOR PROVIDING WATER SERVICE TO THE PROJECT.
11. ALL BACKFLOW EQUIPMENT SHALL BE LOCATED ABOVE GROUND OUTSIDE OF THE STREET SETBACK AREA IN A MANNER FULLY SCREENED FROM ALL PUBLIC STREETS AND ALLEYS. ANY BACKFLOW ASSEMBLIES CURRENTLY INSTALLED IN A VAULT WILL HAVE TO BE BROUGHT UP TO CURRENT STANDARDS. ANY OTHER LARGE WATER SYSTEM EQUIPMENT SHALL BE INSTALLED TO THE SATISFACTION OF THE WATER ENGINEERING DIVISION OUTSIDE OF THE STREET SETBACK AREA IN A MANNER FULLY SCREENED FROM ALL PUBLIC STREETS AND ALLEYS. SAID INFORMATION SHALL BE SPECIFICALLY SHOWN ON PLANS AND APPROVED BY WATER ENGINEERING AND CROSS CONNECTION CONTROL INSPECTOR.
12. ALL EXISTING WATER SERVICES AND FIRE SERVICES SHALL CONFORM TO CURRENT WATER SERVICES STANDARDS SPECIFICATIONS. ANY WATER SERVICE AND/OR FIRE LINE THAT DOES NOT MEET CURRENT STANDARDS SHALL BE UPGRADED IF CONTINUED USE IS NECESSARY OR ABANDONED IF THE EXISTING SERVICE IS NO LONGER NEEDED. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR THE COSTS TO UPGRADE OR TO ABANDON ANY WATER SERVICE OR FIRE LINE.
13. THE OWNER/DEVELOPER SHALL SUBMIT A WATER SYSTEM MASTER PLAN, INCLUDING A HYDRAULIC DISTRIBUTION NETWORK ANALYSIS, CONSIDERING THE MAXIMUM FIRE FLOW RATE PLUS MAXIMUM DAY DEMANDS AND PEAK HOUR WATER DEMANDS FOR THE PROJECT FOR PUBLIC UTILITIES WATER ENGINEERING REVIEW AND APPROVAL. THE MASTER PLAN SHALL DEMONSTRATE THE ADEQUACY OF THE EXISTING WATER SYSTEM AND PROPOSED ON-SITE WATER SYSTEM TO MEET THE PROJECT'S WATER DEMANDS AND FIRE PROTECTION REQUIREMENTS. ANY OFF-SITE WATER SYSTEM IMPROVEMENTS REQUIRED TO SERVE THE PROJECT SHALL BE PAID FOR BY THE OWNER/DEVELOPER DONE IN ACCORDANCE WITH RULE NO. 15A.1 OF THE WATER UTILITY RATES, RULES, AND REGULATIONS.
14. WATER IMPROVEMENT PLANS SHALL BE SUBMITTED TO THE WATER ENGINEERING DIVISION FOR APPROVAL AND A PERFORMANCE BOND IN THE AMOUNT APPROVED BY THE CITY ENGINEER AND FORM APPROVED BY CITY ATTORNEY SHALL BE POSTED WITH THE CITY OF ANAHEIM.
15. INDIVIDUAL WATER SERVICE AND/OR FIRE LINE CONNECTIONS WILL BE REQUIRED FOR EACH PARCEL OR RESIDENTIAL, COMMERCIAL, INDUSTRIAL UNIT PER RULE 18 OF THE CITY OF ANAHEIM'S WATER RATES, RULES AND REGULATIONS.
16. THE FOLLOWING MINIMUM OUTSIDE-TO-OUTSIDE CLEARANCES SHALL BE PROVIDED AROUND ALL OTHER NEW AND EXISTING PUBLIC WATER FACILITIES (E.G. WATER MAIN, FIRE HYDRANTS, SERVICE LATERALS, METERS, METER BOXES, BACKFLOW DEVICES, ETC.):
 - 10-FOOT FROM STORMWATER, BMPs, POWER POLES, STREET LIGHTS, AND TREES.
 - 5-FOET FROM STRUCTURES, FOOTINGS, AND WALLS WHERE APPROVED IN ADVANCED BY WATER ENGINEERING. CLEARANCES LESS THAN 5 FEET SHALL NOT BE ALLOWED.
 - 5-FOET FROM DRIVEWAYS, BCR/ECR OF CURB RETURNS, AND ALL OTHER UTILITIES (E.G. STORM DRAIN, GAS, ELECTRIC, ETC.) OR ABOVE GROUND FACILITIES.

THE FOLLOWING MINIMUM HORIZONTAL CLEARANCES SHALL BE MAINTAINED BETWEEN PROPOSED PUBLIC WATER MAIN AND OTHER FACILITIES:

- 10-FOET MINIMUM SEPARATION (OUTSIDE WALL-TO-OUTSIDE WALL) FROM SANITARY SEWER MAINS AND LATERALS
- 5-FOET MINIMUM SEPARATION FROM ALL OTHER UTILITIES, INCLUDING STORM DRAINS, GAS, AND ELECTRIC
- 6-FOET MINIMUM SEPARATION FROM CURB FACE

17. NO PUBLIC WATER MAIN OR PUBLIC WATER FACILITIES SHALL BE INSTALLED IN PRIVATE ALLEYS OR PASEO AREAS.
18. ALL FIRE SERVICES 2-INCH AND SMALLER SHALL BE METERED WITH A UL LISTED METER, HERSEY RESIDENTIAL FIRE METER WITH TRANSLATOR REGISTER, NO EQUALS.
19. THE OWNER SHALL BE RESPONSIBLE FOR RESTORING ANY SPECIAL SURFACE IMPROVEMENTS, OTHER THAN ASPHALT PAVING, WITHIN ANY RIGHT-OF-WAY, PUBLIC UTILITY EASEMENT OR CITY EASEMENT AREA, INCLUDING BUT NOT LIMITED TO COLORED CONCRETE, BRICKS, PAVERS, STAMPED CONCRETE, WALLS, DECORATIVE HARDSCAPE OR LANDSCAPING THAT BECOMES DAMAGED DURING ANY EXCAVATION, REPAIR OR REPLACEMENT OF CITY OWNED WATER FACILITIES. PROVISIONS FOR MAINTENANCE OF ALL SAID SPECIAL SURFACE IMPROVEMENTS SHALL BE INCLUDED IN THE RECORDED MASTER CC&RS FOR THE PROJECT AND THE CITY EASEMENT DEEDS.



PROPOSED TRANSFORMER LOCATIONS

S · C 19	1122 N. ANAHEIM BLVD "THE RENAISSANCE" CONCEPTUAL UTILITIES PLAN City of Anaheim	SHEET C-2
	