APPENDIX G – CONCEPTUAL SEWER AREA STUDY

CONCEPTUAL
SEWER AREA STUDY

FOR

TENTATIVE TRACT NO. 83674
RANCHO VISTA BLVD. & TILBURY STREET
PALMDALE, CA 93551

APRIL 2022

PREPARED BY:

ANTELOPE VALLEY ENGINEERING, INC.
129 WEST PONDERA STREET
LANCASTER, CA. 93534
(661) 948-0805

J.N. 20165

SEWER AREA STUDY

J.N. 20165

TENTATIVE TRACT NO. 83674

THE PURPOSE OF THIS STUDY IS TO VERIFY THE CAPACITY OF TWO PROPOSED 8" V.C.P. PUBLIC SEWER MAINS FOR TENTATIVE TRACT NO. 83674 ONE CONNECTION IN TILBURY DRIVE & THE OTHER CONNECTION IN REGISTRY WAY. IN ADDITION, THE CAPACITY OF THE PROPOSED 8" V.C.P. PUBLIC SEWER SYSTEM ALONG WITH THE EXISTING V.C.P. PUBLIC SEWER IN 30TH STREET WEST FROM RANCHO VISTA BLVD. TO AVENUE N-8 AND TO THE EXISTING TRUNK SEWER IN 40TH STREET WEST AND AVENUE N-8 WILL BE CHECKED FOR ADEQUATE CAPACITY. THE EXISTING V.C.P. FROM 30TH STREET WEST TO AVENUE N-8 IS ROUTED THRU VARIOUS EXISTING TRACTS, THEREFORE, THIS STUDY WILL CHECK CRITICAL CONNECTION POINTS FOR ADEQUATE CAPACITY ALONG THESE TRACTS.

LINE A — SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEETS 7-9)
76.0 ACRES PARK= 0.006752 CFS/AC
473.0 ACRES R-1 = 0.004 CFS/AC
4,000 STUDENTS (SCHOOL) = 0.000023 CFS/STUDENT
23.0 ACRES COMMERCIAL= 0.015 CFS/AC
39 ACRES FUTURE CHURCH PROJECT = 0.015 CFS/AC

FLOWS:
(76.0 AC *0.006752 CFS/AC) + (473.0 AC * 0.004 CFS/AC) + (4,000 STUDENTS * 0.000023 CFS/STUDENT) + (23.0 AC * 0.015 CFS/AC) + (39.0 AC * 0.015 CFS/AC = **3.42 CFS**

LINE/AREA A

OK

FLOWS
3.42 CFS > 2.32 CFS
(EXISTING 15" VCP MAIN @ 0.52% MIN. FLOWING 1/2 FULL- SEE SHEET 11)

LINE B — SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEET 7)
80.0 ACRES R-1 = 0.004 CFS/AC

FLOWS
80.0 AC * 0.004 CFS/AC = 0.32 CFS

SEWER AREA STUDY

J.N. 20165

TENTATIVE TRACT NO. 83674

LINE/AREA

A + B

OK

FLOWS

3.42 CFS + 0.32 CFS = 3.74 CFS > 2.32 CFS

(EXISTING 15" VCP MAIN @ 0.52% MIN. FLOWING 1/2 FULL- SEE SHEET 11)

LINE

C

SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEET 7)

195.0 ACRES R-1 = 0.004 CFS/AC (25 AC PROPOSED TENTATIVE TRACT 83674)

12.0 ACRES R-3= 0.012 CFS/AC

FLOWS

(195.0 AC * 0.004 CFS/AC) + (12.0 AC * 0.012 CFS/AC) = 0.92 CFS

OK

FLOWS

25 AC * 0.004 CFS/AC (A PORTION OF PROPOSED TENTATIVE TRACT NO. 83674= 0.10 CFS < 0.38 CFS

(PROPOSED 8" VCP SEWER @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 10)

OK

FLOWS

0.92 > 2.04 CFS

(EXISTING 15" VCP SEWER @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 12)

LINE/AREA

A + B + C

NO

FLOWS

3.42CFS + 0.32 CFS + 0.92 CFS = 4.66 CFS > 2.04 CFS

(EXISTING 15" VCP MAIN @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 12)

NOTE: SEE COMMENTS IN CONCLUSION

LINE

D

SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEET 7)

48.0 ACRES R-1 = 0.004 CFS/AC

FLOWS

48.0 AC * 0.004 CFS/AC = 0.19 CFS

SEWER AREA STUDY

J.N. 20165

TENTATIVE TRACT NO. 83674

LINE/AREA

A + B + C + D

NO

FLOWS

3.42 CFS + 0.32 CFS + 0.92 CFS + 0.19 CFS = 4.85 CFS > 2.04 CFS
(EXISTING 15" VCP MAIN @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 12)

NOTE: SEE COMMENTS IN CONCLUSION

LINE

E

SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEET 7)

242.0 ACRES R-1 = 0.004 CFS/AC (20 AC PROPOSED TENTATIVE TRACT 83674)
41.0 ACRES COMMERCIAL= 0.015 CFS/AC

OK

FLOWS

20 AC * 0.004 CFS/AC (A PORTION OF PROPOSED TENTATIVE TRACT NO. 83674=
0.08 CFS < 0.38 CFS
(PROPOSED 8" VCP SEWER @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 10)

FLOWS:
(242.0 AC * 0.004 CFS/AC) + (41.0 AC * 0.015 CFS/AC)= 1.58 CFS

LINE/AREA

A + B + C + D + E

NO

FLOWS

3.42 CFS + 0.32 CFS + 0.92 CFS + 0.19 CFS + 1.58 CFS= 6.43 CFS >
3.32 CFS
(EXISTING 18" VCP MAIN @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 14)

NOTE: SEE COMMENTS IN CONCLUSION

LINE

F

SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEET 7)

42.0 ACRES R-1 = 0.004 CFS/AC

FLOWS:
42.0 AC * 0.004 CFS/AC= 0.17 CFS

SEWER AREA STUDY

J.N. 20165

TENTATIVE TRACT NO. 83674

LINE/AREA

[A] + [B] + [C] + [D] + [E] + [F]

FLOWS

OK 3.42 CFS + 0.32 CFS + 0.92 CFS + 0.19 CFS + 1.58 CFS + 0.17 CFS =
6.60 CFS > 5.01 CFS
(EXISTING 21" VCP MAIN @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 15)

LINE

[G]

SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEET 7)

259.0 ACRES R-1 = 0.004 CFS/AC
13.0 ACRES COMMERCIAL= 0.015 CFS/AC

FLOWS:

OK (259.0 AC * 0.004 CFS/AC) + (13.0 AC * 0.015 CFS/AC)= 1.23 CFS < 3.79 CFS
(EXISTING 15" VCP MAIN @ 1.38% MIN. FLOWING 1/2 FULL- SEE SHEET 16)

LINE

[H]

SEE CONTRIBUTORY AREA ON MAP S1

COEFFICIENTS (PER SHEET 7)

21.0 ACRES R-1 = 0.004 CFS/AC

FLOWS

21.0 AC * 0.004 CFS/AC = 0.084 CFS

LINE/AREA

[G] + [H]

FLOWS

OK 1.23 CFS + 0.084 CFS = 1.31CFS < 3.23 CFS
(EXISTING 15" VCP MAIN @ 1.0% MIN. FLOWING 1/2 FULL- SEE SHEET 13)

LINE/AREA

[A] + [B] + [C] + [D] + [E] + [F] + [G] + [H]

FLOWS

OK 3.42 CFS + 0.32 CFS + 0.92 CFS + 0.19 CFS + 1.58 CFS + 0.17 CFS + 1.23 CFS
+ 0.084 CFS = 7.91 CFS > 5.01 CFS
(EXISTING 21" VCP MAIN @ 0.4% MIN. FLOWING 1/2 FULL- SEE SHEET 15)

SEWER AREA STUDY

J.N. 20165

TENTATIVE TRACT NO. 83674

CONCLUSION

ADDING THE PROPOSED TENTATIVE TRACT NO. 83674 TO THE EXISTING SEWER SYSTEM IN REGISTRY WAY & THE EXISTING SEWER SYSTEM IN TILBURY DRIVE DOES EXCEED THE CAPACITY OF A PORTION OF THE SEWER SYSTEM DOWN STREAM WHEN USING THE STANDARD METHODS OF DESIGN FOR THE CITY OF PALMDALE. HOWEVER, BASED ON INFORMATION FROM THE CITY OF PALMDALE SEWER MASTER PLAN FINAL REPORT PREPARED BY RMC IN SEPTEMBER 2009, THE SEWER RUNOFF VALUES USED FOR THE PROPOSED PROJECT ARE CONSERVATIVE AND AS A SEWER STUDY AREA INCREASES IN SIZE THE FLOW VALUES TEND TO BECOME UNREALISTIC (WHICH MAY BE HAPPENING IN THIS STUDY). ACCORDING TO THE RMC REPORT A DRY WEATHER FLOW TEST (FLOW METER 549) WAS PERFORMED DOWNSTREAM OF THIS SEWER STUDY AREA AND THE AVERAGE AND PEAK FLOW WERE 2.12 CFS AND 3.70 CFS RESPECTIVELY (SEE REFERENCE SHEETS 17-19). THIS SHOWS THAT THE CURRENT SEWER AREA STUDY SEEMS TO BE OVERESTIMATING THE ACTUAL FLOWS BY A LARGE DEGREE. LOOKING AT THE MINIMUM PIPE CAPACITY OF A 15" VCP SEWER AT 0.4% BEING 2.04 CFS (FLOWING 1/2 FULL) AND THE PEAK MEASURED DOWNSTREAM FLOW OF 3.70 CFS (WHICH ALSO INCLUDES LARGE AREAS SOUTHWEST OF THE CURRENT STUDY AREA), IT SEEMS THAT ADDING THE PROPOSED PROJECT AREA TO THE EXISTING SEWER SYSTEM IN REGISTRY WAY & THE EXISTING SEWER SYSTEM IN TILBURY DRIVE WILL NOT EXCEED THE SEWER CAPACITY.

Estimated Average Daily Sewage Flows for Various Occupancies

Occupancy	Abbreviation	*Average daily flow	
Apartment Buildings:			
Bachelor or Single dwelling units	Apt	150	gal/D.U.
1 bedroom dwelling units	Apt	200	gal/D.U.
2 bedroom dwelling units	Apt	250	gal/D.U.
3 bedroom or more dwelling units	Apt	300	gal/D.U.
Auditoriums, churches, etc.	Aud	5	gal/seat
Automobile parking	P	25	gal/1000 sq ft gross floor area
Bars, cocktails lounges, etc.	Bar	20	gal/seat
Commercial Shops & Stores	CS	100	gal/1000 sq ft gross floor area
Hospitals (surgical)	HS	500	gal/bed
Hospitals (convalescent)	HC	85	gal/bed
Hotels	H	150	gal/room
Medical Buildings	MB	300	gal/1000 sq ft gross floor area
Motels	MB	150	gal/unit
Office Buildings	Off	200	gal/1000 sq ft gross floor area
Restaurants, cafeterias, etc.	R	50	gal/seat
Schools:			
Elementary or Jr. High	S	10	gal/student
High Schools	HS	15	gal/student
Universities or Colleges	U	20	gal/student
College Dormitories	CD	85	gal/student

*Multiply the average daily flow by 2.5 to obtain the peak flow

Zoning Coefficients

Zone	Coefficient (cfs/Acre)
Agriculture ----------	0.001
Residential*:	
R-1 ----------	0.004
R-2 ----------	0.008
R-3 ----------	0.012
R-4 ----------	0.016*
Commercial:	
C-1 through C-4 ----------	0.015*
Heavy Industrial:	
M-1 through M-4 ----------	0.021*

* Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown

* Use 0.001 (cfs/unit) for condominiums only

COMMERCIAL/INDUSTRIAL /SPECIAL ZONING				
USE	ZONING DESIGNATION	BASIS OF DAILY FLOW COMPUTATION	AVERAGE FLOW COEFFICIENT FOR Qaverage	PEAK FLOW COEFFICIENT FOR Qpeak
Indoor Theatre	C	0.000193 cfs/1,000 SF	0.008424 cfs/acre	0.021060 cfs/acre
Laundry	C	0.005918 cfs/1,000 SF	0.257778 cfs/acre	0.644445 cfs/acre
Lumber Yard	C, L I, M I	0.000039 cfs/1,000 SF	0.001685 cfs /acre	0.004212 cfs/acre
Dry Manufacturing (Light)	L I	0.000039 cfs/1,000 SF	0.001685 cfs /acre	0.004212 cfs/acre
Manufacturing (Medium, Heavy)	M I, H I	0.000310 cfs/1,000 SF	0.013504 cfs/acre	0.033759 cfs/acre
Medical Office Building	C, CBD, CPD	0.000465 cfs/1,000 SF	0.020255 cfs/acre	0.050639 cfs/acre
Mortuary/Cemetery	O	0.000155 cfs/1,000 SF	0.006752 cfs /acre	0.016880 cfs/acre
Nursery/Greenhouse	C, L I	0.000039 cfs/1,000 SF	001688 cfs /acre	0.004220 cfs/acre
Office Building	O P	0.000310 cfs/1,000 SF	0.013504 cfs /acre	0.033759 cfs/acre
Open Storage	H I	0.000039 cfs/1,000 SF	0.001688 cfs /acre	0.004220 cfs/acre
Professional Building	O P	0.000465 cfs/1,000 SF	0.020255 cfs/acre	0.050639 cfs/acre
Restaurant	C, CBD, CPD	0.001547 cfs/1,000 SF	0.067393 cfs/acre	0.168482 cfs/acre
School (Boarding)	O	0.000155 cfs/Student	0.000155 cfs /Student	0.000388 cfs /Student
School (Private)	O	0.000310 cfs/1,000 SF	0.013504 cfs /acre	0.033759 cfs /acre
School (Elementary or Jr. High)	O	0.000016 cfs/Student	0.000016 cfs /Student	0.000039 cfs /Student
School (High School)	O	0.000023 cfs/Student	0.000023 cfs /Student	0.000058 cfs /Student
College/University	O	0.000031 cfs/Student	0.000031 cfs /Student	0.000077 cfs /Student
College Dormitories	O	0.00132 cfs/Student	0.000132 cfs /Student	0.000329 cfs /Student
Service Shop	C, L I	0.000155 cfs/1,000 SF	0.006752 cfs /acre	0.016880 cfs/acre
Service Station	C, L I	0.000155 cfs/1,000 SF	0.006752 cfs/acre	0.016880 cfs/acre
Shopping Center	C	0.000503 cfs/1,000 SF	0.021903 cfs/acre	0.054757 cfs/acre
Supermarket	C	0.000232 cfs/1,000 SF	0.010109 cfs/acre	0.025272 cfs/acre
Regional Mall	RC	0.000232 cfs/1,000 SF	0.010109 cfs/acre	0.025272 cfs/acre
Warehousing	H I	0.000039 cfs/1,000 SF	0.001685 cfs/acre	0.004212 cfs/acre
Wholesale Outlet	C, L I	0.000155 cfs/1,000 SF	.006752 cfs/acre	0.016880 cfs/acre

COMMERCIAL ZONING KEY
C - General Commercial
CBD - Central Business District
CPD - Commercial Planned Development
H - Hospital
OP - Office Professional
RC - Regional Commercial

INDUSTRIAL ZONING KEY
L I - Light Industrial
M I - Medium Industrial
H I - Heavy Industrial
BP - Business Park

SPECIAL PURPOSE ZONING KEY
O - Open Space

Table 2.4.9.3.1 SEWER LOAD COEFFICIENTS BY ZONING (Continued)

COMMERCIAL/INDUSTRIAL /SPECIAL ZONING				
USE	ZONING DESIGNATION	BASIS OF DAILY FLOW COMPUTATION	AVERAGE FLOW COEFFICIENT FOR Qaverage	PEAK FLOW COEFFICIENT FOR Qpeak
Airport	L I, M I, H I	0.000008 cfs/Passenger	0.000008 cfs /Passenger	0.000019 cfs /Passenger
Animal Kennels	RR-1, RR-2.5	0.000155 cfs/1,000 SF	0.006752 cfs /acre	0.016880 cfs/acre
Auditorium, Entertainment	C, CBD, CPD	0.000541 cfs/1,000 SF	0.023588 cfs /acre	0.058969 cfs/acre
Auto Parking w/ Facilities	C	0.00005 cfs/1,000 SF Gross Floor Area	0.002178 cfs /acre	0.005445 cfs/acre
Auto Sales/Repair	C	0.000155 cfs/1,000 SF	0.006752 cfs /acre	0.016880 cfs/acre
Bathhouses, Swimming Pools	C,O	0.000016 cfs/Person	0.000016 cfs /Person	0.000039 cfs /Person
Bar, Cocktail Lounge, Night Club, etc.	C, CBD, CPD	0.000541 cfs/1,000 SF	0.023588 cfs/acre	0.058969 cfs/acre
Bowling/Skating	C	0.000232 cfs/1,000 SF	0.010109 cfs/acre	0.025272 cfs/acre
Car Wash	C	Tunnel (No Recycling): 0.005724 cfs/1,000 SF Tunnel (With Recycling): 0.004177 cfs/1,000 SF Self-Serve Wand: 0.001083 cfs/1,000 SF	0.249337 cfs/acre 0.181950 cfs/acre 0.047175 cfs/acre	0.623344 cfs/acre 0.454875 cfs/acre 0.117939 cfs/acre
Church	C	0.000078 cfs/1,000 SF	0.003376 cfs /acre	0.008440 cfs /acre
Club (Service)	C	0.000193 cfs/1,000 SF	0.008424 cfs/acre	0.021060 cfs/acre
Commercial Shops & Stores	C, CBD, CPD	0.000155 cfs/1,000 SF	.006752 cfs /acre	0.016880 cfs/acre
Convalescent Home	C, CPD	0.000193 cfs/Bed	0.000193 cfs/Bed X 1/Acreage	0.000483 cfs/Bed X 1/Acreage
Convention Center, Fairground, Racetrack, Sports Stadium/Arena	C, CPD	0.000016 cfs X Average Daily Attendance	0.000016 cfs X Avg. Attendance X 1/Acreage	0.000039 cfs X Avg. Attendance X 1/Acreage
Drive-in Theatre	C	0.000031 cfs/1,000 SF	0.001348 cfs/acre	0.003370 cfs/acre
Factories	L I, M I, H I	0.000054 cfs/Person/Shift	0.000054 cfs /Person/Shift	0.000135 cfs /Person/Shift
Financial Institution (Bank, Credit Union, etc.)	C, O P	0.000155 cfs/1,000 SF	0.006752 cfs /acre	0.016880 cfs/acre
Golf Course, Camp, and Park (Structures and Improvements)	O	0.000155 cfs/1,000 SF	0.006752 cfs /acre	0.016880 cfs/acre
Health Spa, Gymnasium	C	(With Showers): 0.000930 cfs/1,000 SF (Without Showers): 0.000465 cfs/1,000 SF	(With Showers): 0.040511 cfs/acre (Without Showers): 0.020255 cfs/acre	(With Showers): 0.101277 cfs/acre (Without Showers): 0.050639 cfs/acre
Hotel, Motel, Rooming House	C	0.000232 cfs/Room(Unit)	0.000232 cfs /Room(Unit)	0.000580 cfs /Room(Unit)
Hospital (Surgical)	H	0.000775 cfs/Bed	0.000775 cfs/Bed	0.001938 cfs/Bed
Hospital (Convalescent)	H	0.019375 cfs/Bed	0.019375 cfs/Bed	0.048438 cfs/Bed

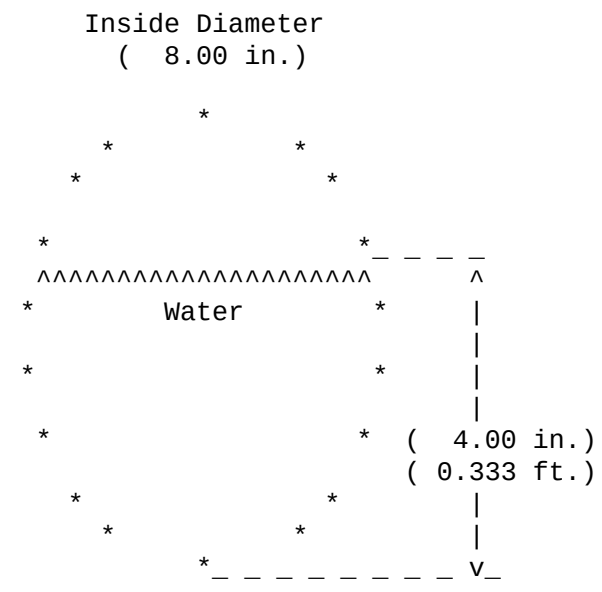
COMMERCIAL ZONING KEY
C - General Commercial
CBD - Central Business District
CPD - Commercial Planned Development
H - Hospital
OP - Office Professional
RC - Regional Commercial

INDUSTRIAL ZONING KEY
L I - Light Industrial
M I - Medium Industrial
H I - Heavy Industrial
BP - Business Park

SPECIAL PURPOSE ZONING KEY
O - Open Space

Table 2.4.9.3.1 SEWER LOAD COEFFICIENTS BY ZONING (Continued)

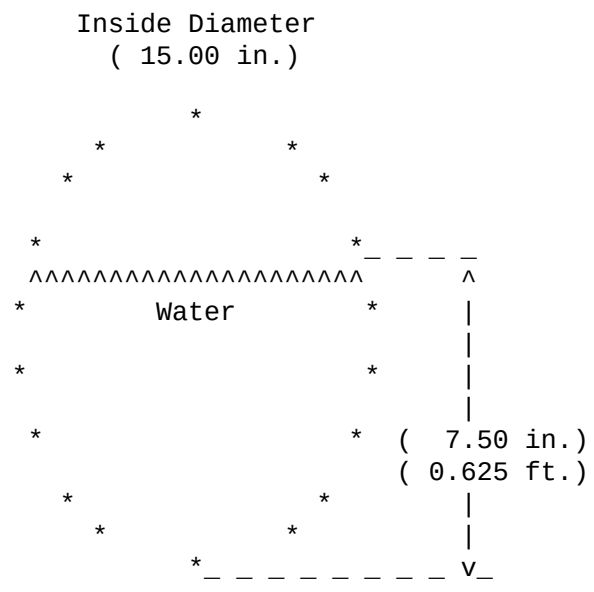
CIVILDESIGN CORP.
Consulting Engineers
250 S. Lena Rd.
San Bernardino, CA 92408
(909)885-3806



Circular Channel Section

Flowrate	0.382	CFS
Velocity	2.189	fps
Pipe Diameter	8.000	inches
Depth of Flow	4.000	inches
Depth of Flow	0.333	feet
Critical Depth	0.288	feet
Depth/Diameter (D/d)	0.500	
Slope of Pipe	0.400	%
X-Sectional Area	0.175	sq. ft.
Wetted Perimeter	1.047	feet
AR^(2/3)	0.053	
Mannings 'n'	0.013	
Min. Fric. Slope, 8 inch Pipe Flowing Full	0.100	%

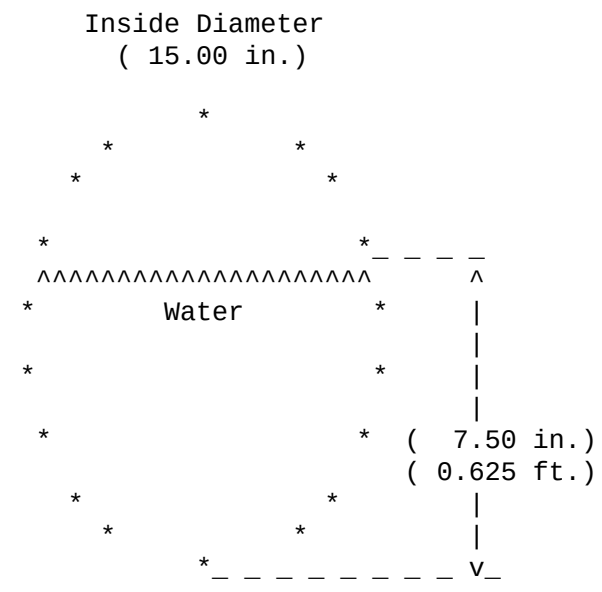
CIVILDESIGN CORP.
Consulting Engineers
250 S. Lena Rd.
San Bernardino, CA 92408
(909)885-3806



Circular Channel Section

Flowrate	2.329	CFS
Velocity	3.796	fps
Pipe Diameter	15.000	inches
Depth of Flow	7.500	inches
Depth of Flow	0.625	feet
Critical Depth	0.607	feet
Depth/Diameter (D/d)	0.500	
Slope of Pipe	0.520	%
X-Sectional Area	0.614	sq. ft.
Wetted Perimeter	1.963	feet
AR^(2/3)	0.283	
Mannings 'n'	0.013	
Min. Fric. Slope, 15 inch Pipe Flowing Full	0.130	%

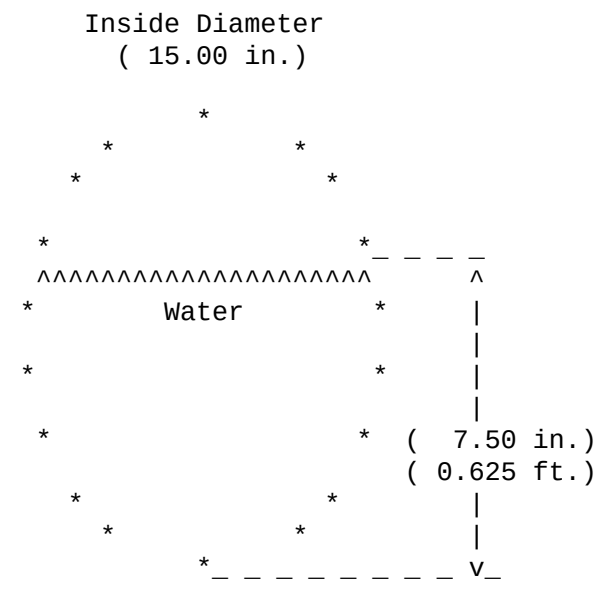
CIVILDESIGN CORP.
Consulting Engineers
250 S. Lena Rd.
San Bernardino, CA 92408
(909)885-3806



Circular Channel Section

Flowrate	2.043	CFS
Velocity	3.329	fps
Pipe Diameter	15.000	inches
Depth of Flow	7.500	inches
Depth of Flow	0.625	feet
Critical Depth	0.567	feet
Depth/Diameter (D/d)	0.500	
Slope of Pipe	0.400	%
X-Sectional Area	0.614	sq. ft.
Wetted Perimeter	1.963	feet
AR^(2/3)	0.283	
Mannings 'n'	0.013	
Min. Fric. Slope, 15 inch Pipe Flowing Full	0.100	%

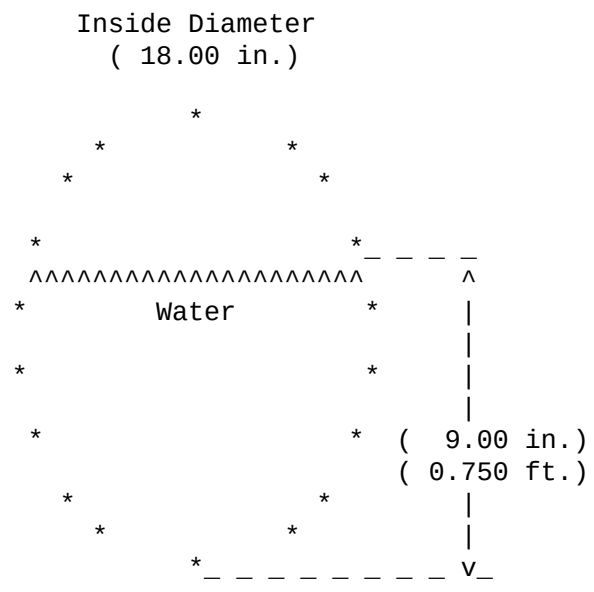
CIVILDESIGN CORP.
Consulting Engineers
250 S. Lena Rd.
San Bernardino, CA 92408
(909)885-3806



Circular Channel Section

Flowrate	3.230	CFS
Velocity	5.264	fps
Pipe Diameter	15.000	inches
Depth of Flow	7.500	inches
Depth of Flow	0.625	feet
Critical Depth	0.725	feet
Depth/Diameter (D/d)	0.500	
Slope of Pipe	1.000	%
X-Sectional Area	0.614	sq. ft.
Wetted Perimeter	1.963	feet
AR^(2/3)	0.283	
Mannings 'n'	0.013	
Min. Fric. Slope, 15 inch Pipe Flowing Full	0.250	%

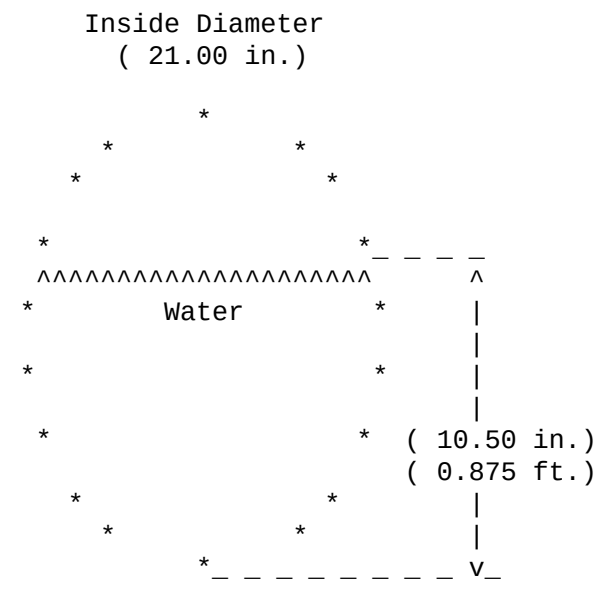
CIVILDESIGN CORP.
Consulting Engineers
250 S. Lena Rd.
San Bernardino, CA 92408
(909)885-3806



Circular Channel Section

Flowrate	3.322	CFS
Velocity	3.759	fps
Pipe Diameter	18.000	inches
Depth of Flow	9.000	inches
Depth of Flow	0.750	feet
Critical Depth	0.690	feet
Depth/Diameter (D/d)	0.500	
Slope of Pipe	0.400	%
X-Sectional Area	0.884	sq. ft.
Wetted Perimeter	2.356	feet
AR^(2/3)	0.459	
Mannings 'n'	0.013	
Min. Fric. Slope, 18 inch Pipe Flowing Full	0.100	%

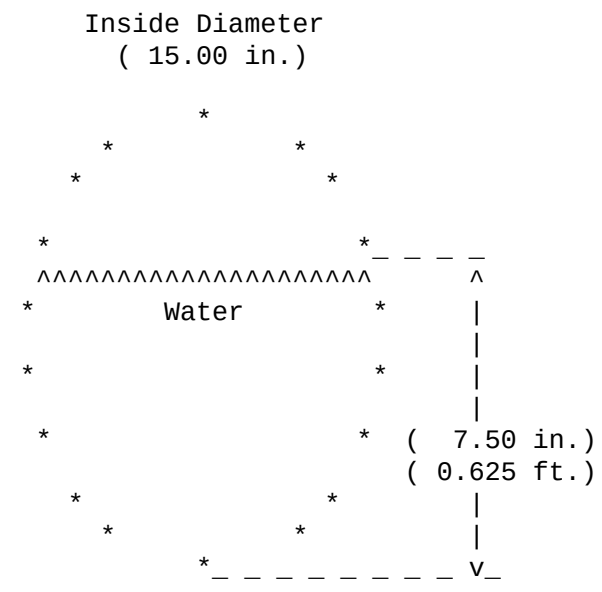
CIVILDESIGN CORP.
Consulting Engineers
250 S. Lena Rd.
San Bernardino, CA 92408
(909)885-3806



Circular Channel Section

Flowrate	5.011	CFS
Velocity	4.166	fps
Pipe Diameter	21.000	inches
Depth of Flow	10.500	inches
Depth of Flow	0.875	feet
Critical Depth	0.822	feet
Depth/Diameter (D/d)	0.500	
Slope of Pipe	0.400	%
X-Sectional Area	1.203	sq. ft.
Wetted Perimeter	2.749	feet
AR^(2/3)	0.693	
Mannings 'n'	0.013	
Min. Fric. Slope, 21 inch Pipe Flowing Full	0.100	%

CIVILDESIGN CORP.
Consulting Engineers
250 S. Lena Rd.
San Bernardino, CA 92408
(909)885-3806



Circular Channel Section

Flowrate	3.794	CFS
Velocity	6.184	fps
Pipe Diameter	15.000	inches
Depth of Flow	7.500	inches
Depth of Flow	0.625	feet
Critical Depth	0.787	feet
Depth/Diameter (D/d)	0.500	
Slope of Pipe	1.380	%
X-Sectional Area	0.614	sq. ft.
Wetted Perimeter	1.963	feet
AR^(2/3)	0.283	
Mannings 'n'	0.013	
Min. Fric. Slope, 15 inch Pipe Flowing Full	0.345	%

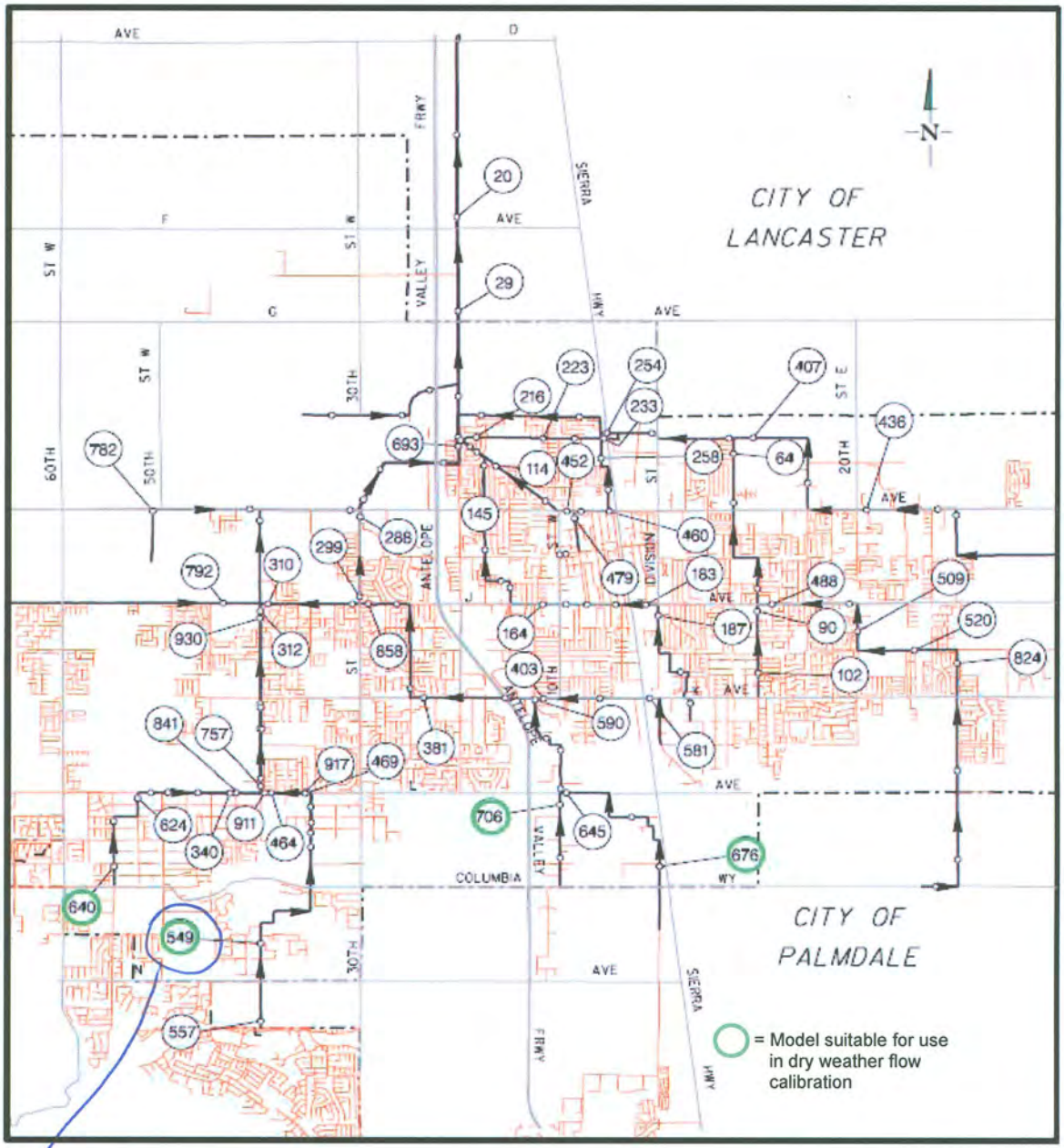


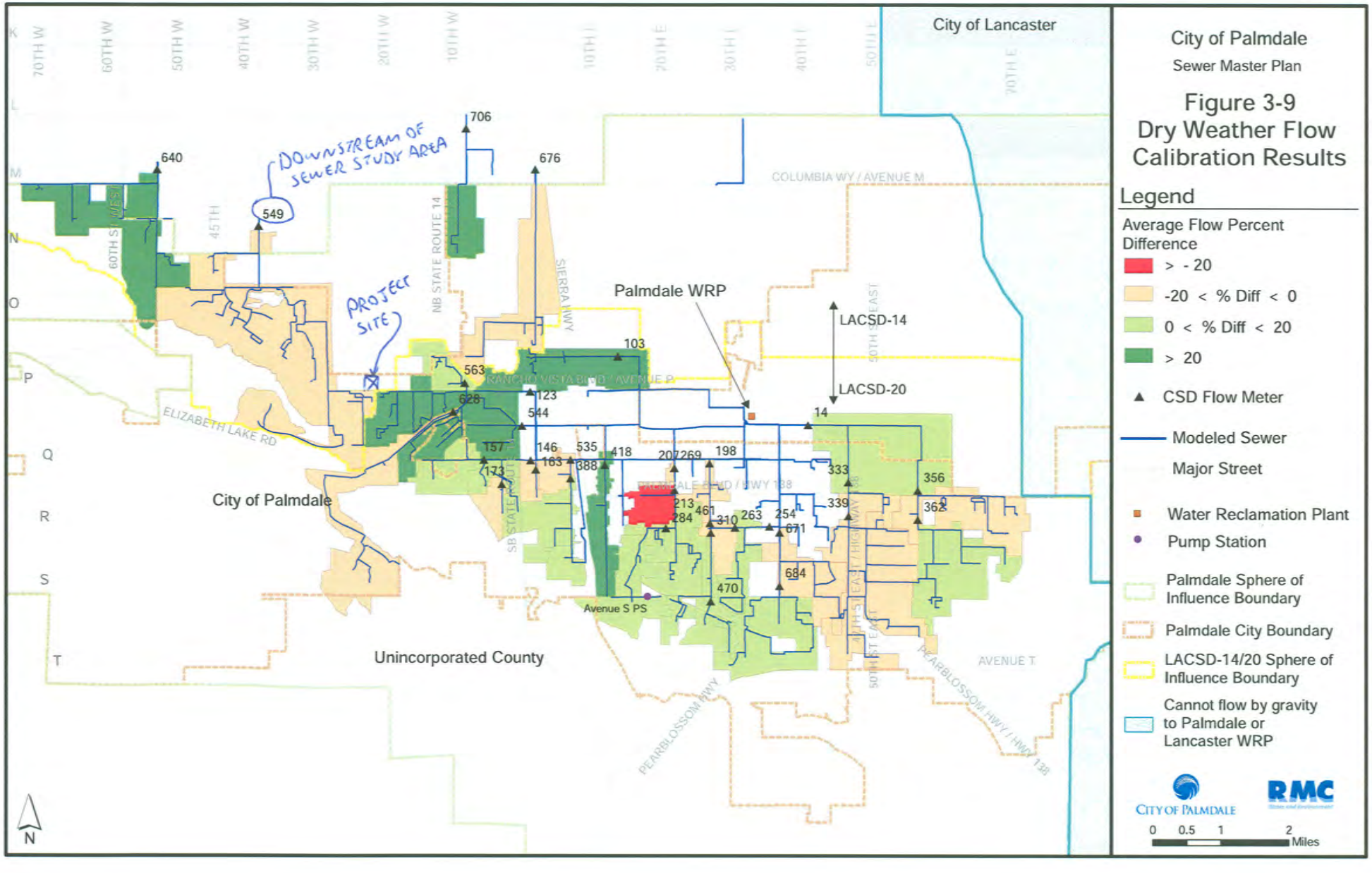
Figure 3-3: LACSD-14 Temporary Flow Meters Used in Dry Weather Flow Calibration

FLOW METER 549 IS DIRECTLY DOWNSTREAM OF CURRENT SEWER STUDY AREA

REFERENCE FROM RMC REPORT

SHEET 17

REFERENCE FROM RMC REPORT



SHEET 18

Table 3-2: Dry Weather Calibration Results for Average and Peak Flows

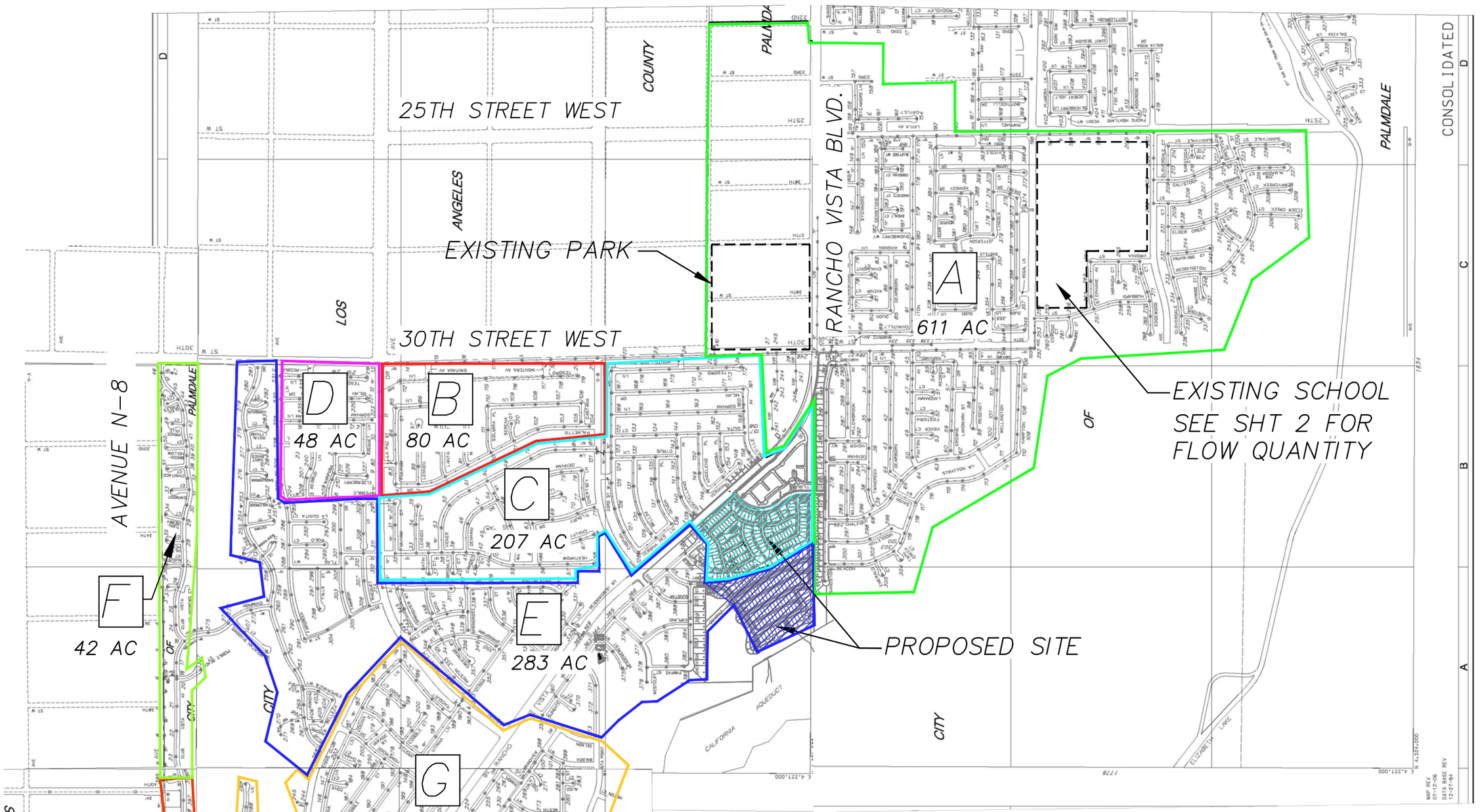
Flow Survey	Meter Avg. Flow (mgd)	Model Avg. Flow (mgd)	Avg. Flow % Diff	Weekday Meter Peak Flow	Weekday Model Peak Flow	Weekday Peak Flow % Diff
14	1.70	1.70	0.40	2.92	2.68	-8.13
103	0.06	0.08	32.40	0.15	0.14	-4.14
123	0.05	0.06	20.18	0.09	0.09	1.93
146	0.37	0.41	12.64	0.58	0.78	35.25
157	0.15	0.17	10.30	0.27	0.32	19.55
163	0.11	0.09	-10.59	0.25	0.16	-36.56
173	0.09	0.08	-9.55	0.25	0.16	-38.44
198	0.56	0.55	-2.79	1.16	0.86	-25.96
207	0.42	0.34	-18.84	0.60	0.50	-15.98
213	0.26	0.21	-20.61	0.41	0.32	-20.96
254	0.30	0.36	19.15	0.44	0.56	28.00
263	0.17	0.17	-0.25	0.29	0.26	-8.38
269	0.82	0.90	9.66	1.52	1.41	-7.82
284	0.55	0.56	2.89	1.04	0.88	-14.73
310	0.38	0.44	14.18	0.67	0.69	2.18
333	1.25	1.17	-6.15	2.03	2.06	1.33
339	0.67	0.67	-0.44	1.31	1.11	-15.66
356	0.57	0.54	-5.05	0.98	0.85	-13.26
362	0.41	0.42	1.87	0.70	0.66	-5.58
388	0.33	0.37	13.40	0.70	0.59	-16.39
418	0.11	0.14	21.86	0.21	0.21	-3.38
461	0.37	0.35	-4.67	0.67	0.56	-16.78
470	0.24	0.24	1.34	0.43	0.39	-9.36
479	0.07	0.07	6.97	0.14	0.13	-6.85
535	0.74	0.62	-16.72	1.00	0.94	-6.63
544	0.65	0.80	22.45	1.16	1.18	1.75
→ 549	1.37	1.27	-7.00	2.39	2.32	-2.86
563	0.11	0.11	0.10	0.18	0.19	9.92
628	0.13	0.12	-10.82	0.26	0.17	-35.01
640	0.18	0.33	80.78	0.52	0.60	15.90
671	1.30	1.05	-19.58	2.00	1.80	-10.15
676	0.06	0.05	-21.85	0.10	0.08	-24.34
684	0.57	0.59	2.15	0.89	1.04	17.04
706	0.07	0.07	1.50	0.19	0.13	-31.02

1.37 mgd = 2.12 cfs

2.39 mgd = 3.70 cfs

REFERENCE FROM RMC REPORT

SHEET 19



REGISTERED PROFESSIONAL ENGINEER
JUSTIN A. MUNZ
C75596
EXP. 6/30/22
CIVIL
STATE OF CALIFORNIA

SHEET TITLE

SEWER AREA MAP

PLANS PREPARED BY:
ANTELOPE VALLEY ENGINEERING, INC.

129 WEST PONDERA STREET
LANCASTER, CA. 93534
(661) 948-0805

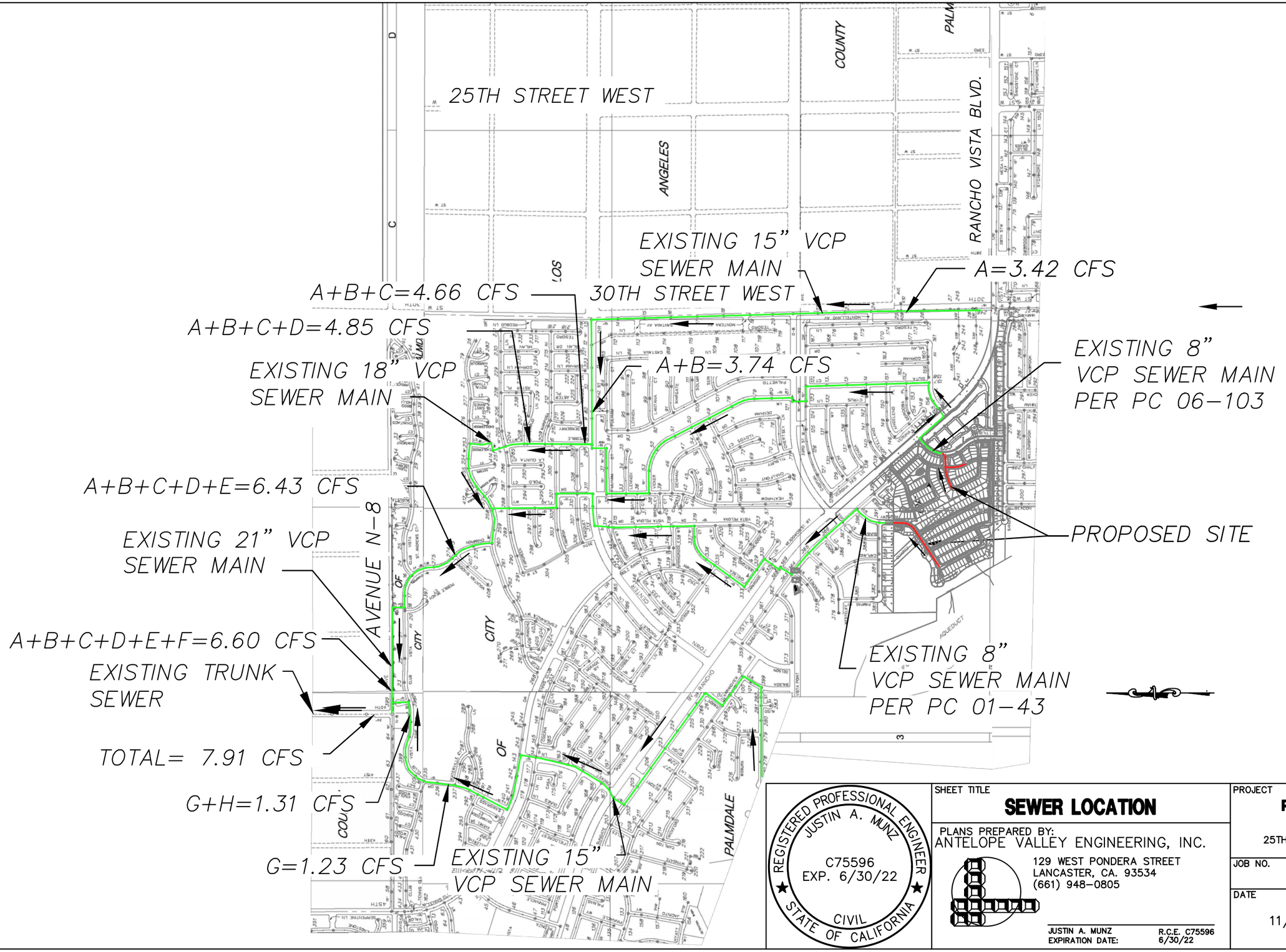
JUSTIN A. MUNZ
EXPIRATION DATE: R.C.E. C75596 6/30/22

PROJECT

PROPOSED TENTATIVE TRACT MAP NO. 83674

RANCHO VISTA BLVD. & TILBURY
PALMDALE, CA 93551

JOB NO.	DRAWN
20165	JAM, MD
DATE	SHEET
5/2/22	S1 OF 2 SHEETS



REGISTERED PROFESSIONAL ENGINEER
JUSTIN A. MUNZ
C75596
EXP. 6/30/22
CIVIL
STATE OF CALIFORNIA

SHEET TITLE

SEWER LOCATION

PLANS PREPARED BY:
ANTELOPE VALLEY ENGINEERING, INC.

129 WEST PONDERA STREET
LANCASTER, CA. 93534
(661) 948-0805

JUSTIN A. MUNZ R.C.E. C75596
EXPIRATION DATE: 6/30/22

PROJECT

PROPOSED TENTATIVE TRACT NO. 83674

25TH ST. WEST & RANCHO VISTA BLVD.
PALMDALE, CA 93551

JOB NO.	DRAWN
20165	JAM, MD
DATE	SHEET
11/29/11	S2 OF 2 SHEETS