ARDURRA
COLLABORATE. INNOVATE. CREATE.

TECHNICAL MEMORANDUM

Water System Hydraulic Analysis

Technical Memorandum

Subject	501 Ocean Bluff Way Project Hydraulic Analysis
Client	San Dieguito Water District
Prepared By	Lamyaa Negm, PhD, CFM
Reviewed By	JiaJia Huang, PE; Shyamala Raveendran, PE
Date - *Draft*	June 10, 2024
Date - *FINAL*	June 12, 2024

PURPOSE

The San Dieguito Water District (SDWD) retained the services of Ardurra Group Inc. (Ardurra) to perform a water system hydraulic analysis for the subject proposed residential development on 501 Ocean Bluff Way (Development). This technical memorandum evaluates if the SDWD's water system can provide domestic and fire services to the proposed Development with adequate pressures and velocities. The hydraulic analysis evaluates the system under Maximum Day Demand plus Fire Flow (MDD + FF) condition.

DISCUSSION

Background

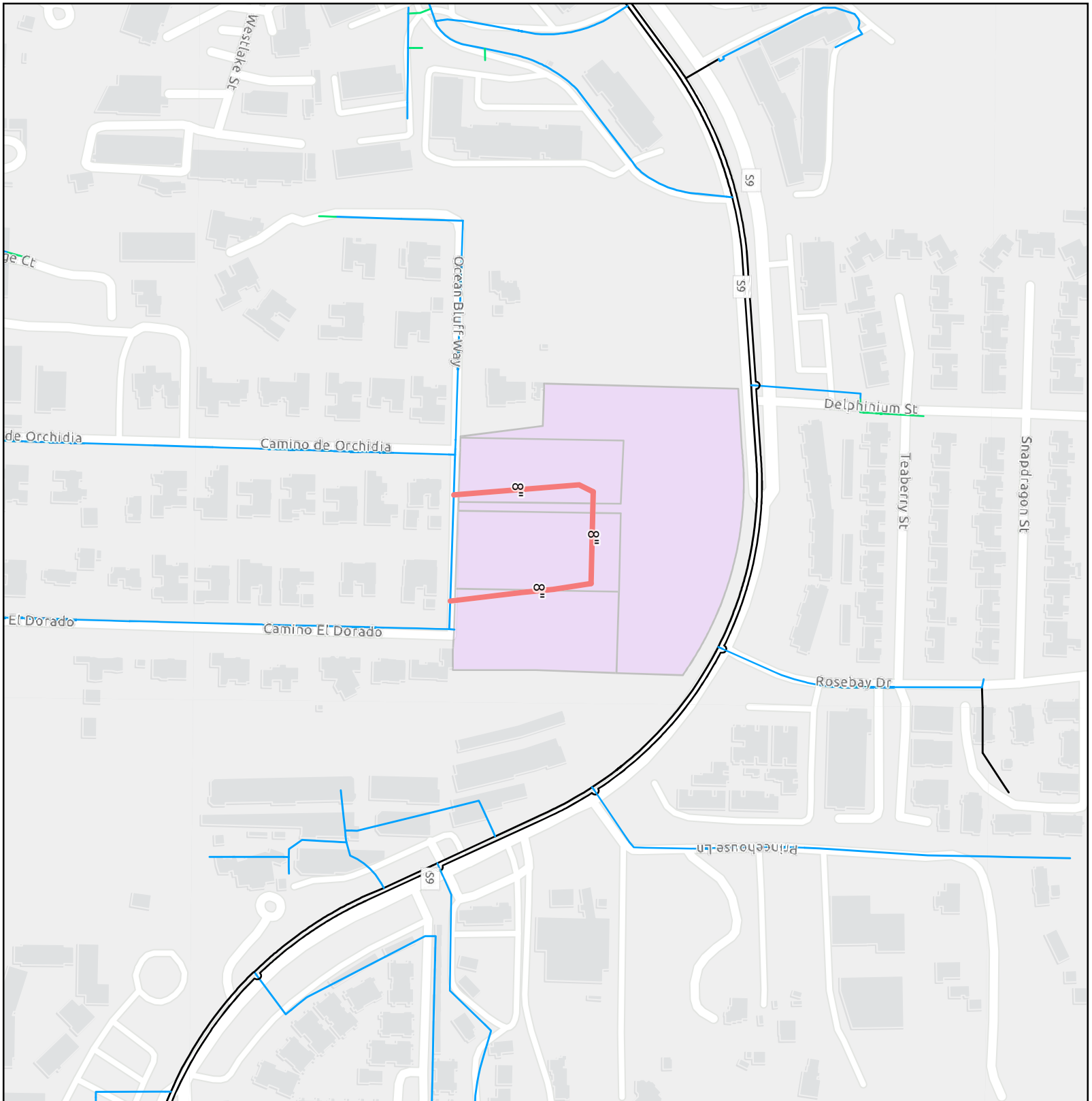
The Development is located on the north side of Ocean Bluff Way south of Encinitas Blvd (Hwy S9) in the City of Encinitas, California (Figure 1). The Development comprises of 27 single family residential units on approximately 7.2 acres of land with parcel numbers (APN) of 258-141-26, 258-141-25, 258-141-24, and 258-141-23.

Per the preliminary plan provided by the District (Attachment A), the on-site water system will consist of approximately 805 linear feet of 8-inch PVC water main, which will loop through the Development and connect to the existing 8-inch water main on Ocean Bluff Way. The proposed development will be served off the 520 Pressure Zone.

Domestic Water Demands & Fire Flow Requirements

Anticipated on-site average water usage, or average day demand (ADD), provided by the developer's engineer is 14,175 gallon per day (gpd) or 10 gallons per minute (gpm). This corresponds to a MDD of 15 gpm with a MDD peaking factor of 1.5 based on 2022 Water System Master Plan.

Fire flow requirement for the Development will need to meet a minimum of 1,500 gpm at 20 psi with pipeline velocities not to exceed 15 feet per second (fps).


Westlake St
S9
Ocean Bluff Way
Delphinium St
Camino de Orchidia
8"
8"
8"
Teaberry St
Snapdragon St
El Dorado
Camino El Dorado
Rosebay Dr
Primerose Ln

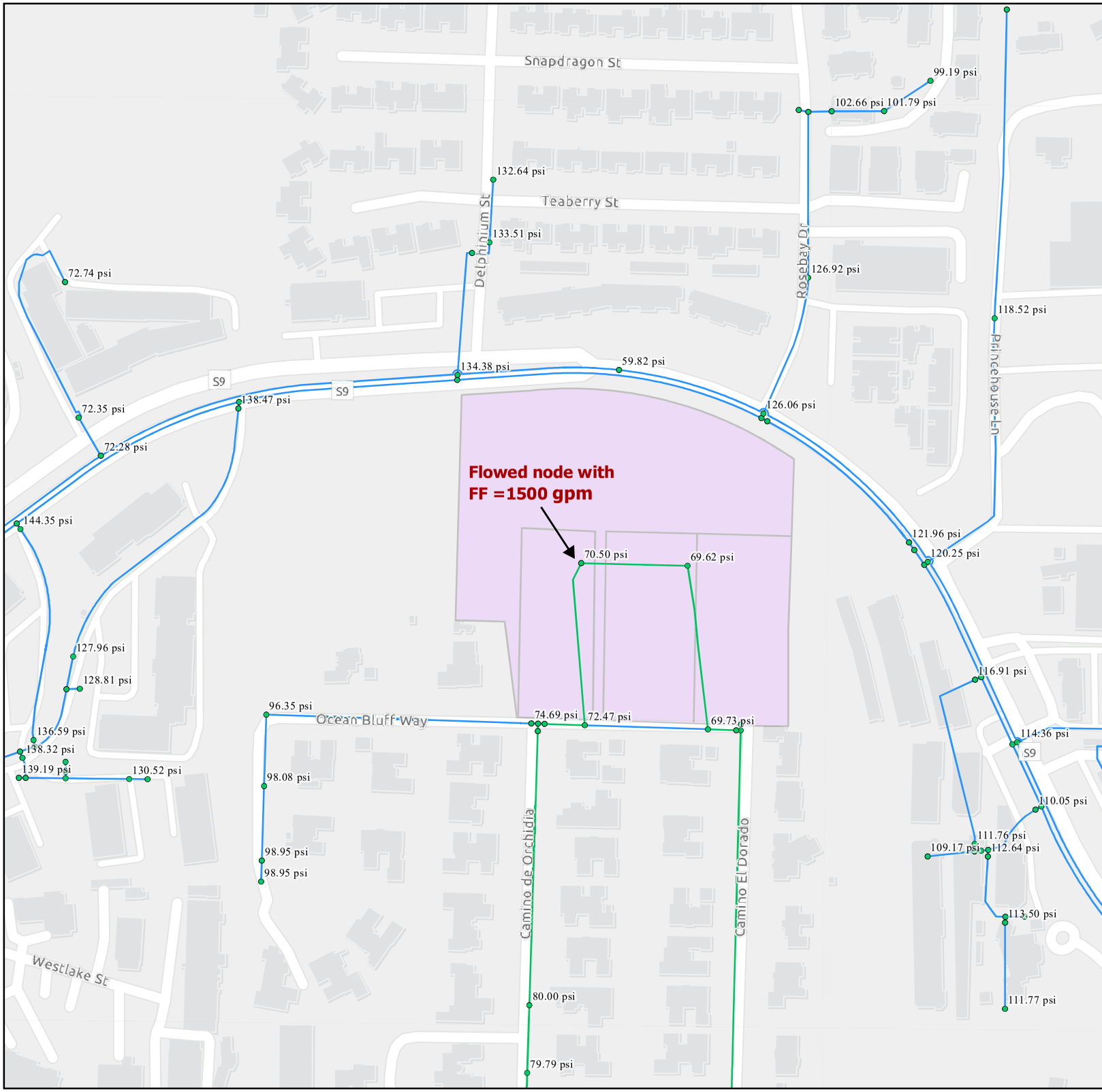
Fire Flow Analysis

The proposed waterline was added to the District's existing InfoWater Pro model. A Hazen-Williams coefficient ("C") of 130 was assumed for the new PVC waterlines. Junction elevations were estimated from profile lines depicted on the preliminary plan provided by the District. The anticipated residential demand described above was allocated evenly between two (2) junctions located along the on-site 8-inch water mains. Scenario "2021_MDD_FF" in the District's latest potable water model was used for this analysis.

Model results shown on Figure 2 were based on a fire flow of 1,500 gpm at a node of the on-site water system under MDD conditions. Model results indicated that the proposed on-site water system can sustain the required fire flow demands under MDD condition while preserving residual pressures above 20 psi and at pipe velocities below 15 fps.

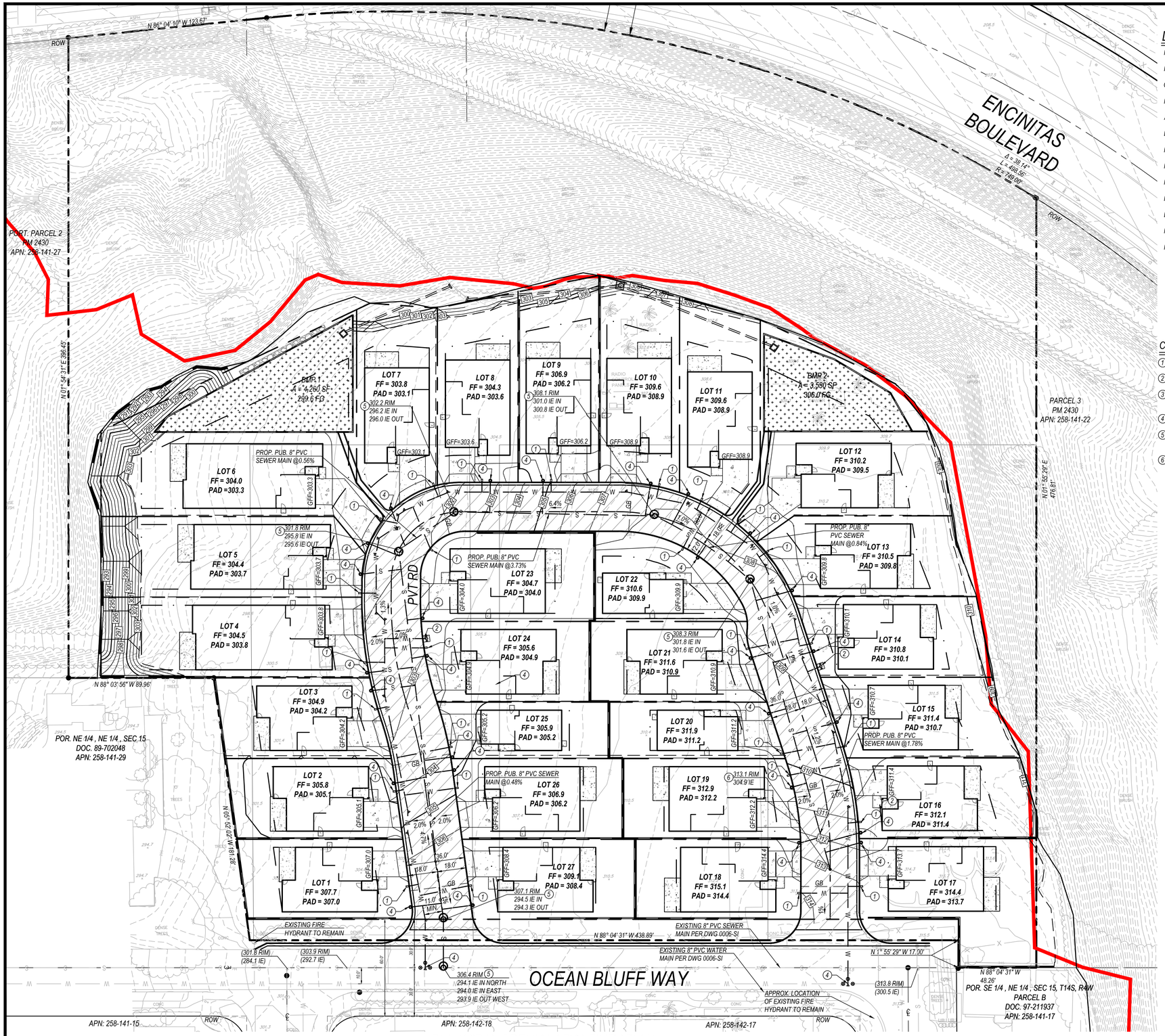
Conclusion

Based on model results, the system can provide domestic and fire services to the Development with the proposed on-site water system while maintaining the SDWD's design criteria.


Snapdragon St
Teaberry St
Delphinium St
Rosebay Dr
Ocean Bluff Way
Camino de Orchidia
Camino El Dorado
Westlake St
S9
S9
Flowed node with
FF =1500 gpm
99.19 psi
102.66 psi
101.79 psi
132.64 psi
133.51 psi
126.92 psi
118.52 psi
72.74 psi
134.38 psi
59.82 psi
72.35 psi
138.47 psi
126.06 psi
72.28 psi
144.35 psi
70.50 psi
69.62 psi
121.96 psi
120.25 psi
127.96 psi
128.81 psi
116.91 psi
96.35 psi
74.69 psi
72.47 psi
69.73 psi
136.59 psi
138.32 psi
139.19 psi
130.52 psi
114.36 psi
98.08 psi
110.05 psi
111.76 psi
109.17 psi
112.64 psi
98.95 psi
98.95 psi
113.50 psi
80.00 psi
111.77 psi
79.79 psi

Attachment A.

Preliminary Development Plan



PLAN VIEW - PRELIMINARY UTILITY PLAN

SCALE: 1" = 20'

LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY
- CENTERLINE OF ROAD
- PROPOSED LOT LINES
- ADJACENT LOT LINES
- EXISTING EASEMENTS
- PROPOSED EASEMENT
- PROPOSED SETBACKS
- PROPOSED LIMIT OF GRADING
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED 8" PVC WATER MAIN
- PROPOSED 8" PVC SEWER MAIN
- PROPOSED 6" CURB & GUTTER
- PROPOSED 6" CURB
- PROPOSED HARDSCAPE
- PROPOSED MASONRY RETAINING WALL
- PROPOSED RETAINING WALL (DESIGN BY OTHERS)
- PROPOSED AC PAVEMENT
- PROPOSED BIOFILTRATION BASIN
- EXISTING WATER MAIN (SIZE PER PLAN)
- EXISTING SEWER MAIN (SIZE PER PLAN)

CONSTRUCTION NOTES

1. PROPOSED 1" DUAL DOMESTIC FIRE/WATER SERVICE PER WAS WS-09
2. PROPOSED FIRE HYDRANT W/ 6" FIRE SERVICE PER WAS WF-01
3. PROPOSED NEW PUBLIC 8" PVC WATER MAIN; CONNECT TO EXSTING WATER MAIN WITH 8" X 8" X 8" TEE
4. PROPOSED 4" PVC SEWER LATERAL AND CLEANOUT PER SDRSD SS-01 AND SC-01
5. PROPOSED 60" DIAMETER SEWER MANHOLE WITH EPOXY LINER PER SDRSD SM-02 SEE NOTE 2 BELOW
6. PROPOSED 6" SEWER CLEANOUT PER SDRSD SC-01

SITE NOTES

1. ALL UTILITIES SHOWN HEREON PER BEST AVAILABLE RECORDS. CONTRACTOR SHALL VERIFY EXACT HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD OF DISCREPANCIES UPON DISCOVERY.
2. NEW AND MODIFIED SEWER MANHOLES SHALL BE LINED WITH AN APPROVED EPOXY LINING SYSTEM AND SHALL BE SPARK TESTED FOR PINHOLES AND HOLIDAYS.
3. PROPOSED PUBLIC ~805 LF 8" PVC WATER MAIN TO LOOP THROUGH SITE.
4. A GENERAL UTILITY EASEMENT SHALL BE PROVIDED FOR SEWER CLEANOUTS AND DRY UTILITY STRUCTURES.
5. EXACT LOCATION OF PROPOSED ONSITE MECHANICAL AND ELECTRICAL EQUIPMENT NOT KNOWN AT THIS TIME. ALL GROUND-MOUNTED ELECTRICAL AND MECHANICAL EQUIPMENT SHALL BE SCREENED TO THE SATISFACTION OF THE PLANNING AND BUILDING DEPARTMENT.

PLSA
PLSAENGINEERING.COM