



May 5, 2022

SUBJECT: PRIVATE SEWER SIZING MEMORANDUM FOR DANA POINT HARBOR MARINA GANGWAYS

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As a part of The Dana Point Harbor Revitalization Marina Improvements project a private sewer line system will be constructed to service the sewage discharge generate by the boaters by connecting the discharge line from docks sewer pump outs to the existing South Coast Water District sewer main. The proposed sewer system is depicted in the Dana Point Harbor Marina Wet Utility Construction Documents submitted under permit PKG22-0060. This memorandum is in response to comment 2.07 and it provides a summary of the calculations and results of the sewer line sizing. The following calculations were performed in accordance with the South Coast Water District Design (SCWD) Requirements (2014).

SEWER SIZING METHODOLOGY AND FINDINGS

Several private sewer lines are proposed to connect to the marina gangways and are to be used for discharging effluent from the boats docked at the harbor. The pump design and analysis were conducted by KECO Inc and is provided under a separate cover for the sewage pump design. The analysis showed that only one pump will be active at any one time with a discharge rate of 30 gallons per minute (gpm). The smallest line proposed was analyzed utilizing the flow design criteria provided by KECO and following the SCWD standards to ensure the smallest line has capacity for the proposed effluent. The proposed 4-inch gravity sewer line connection was evaluated with a peak flow rate of 30 gallons per minute (0.07 CFS) and slope of 2 percent using the Launch Express software tool which runs a manning’s equation calculation to calculate the depth of flow. A maximum flow depth of 0.12-feet was found. This indicates that the calculated D/d for the project is below the 0.5 required by SCWD standards for pipes less than 12-inches. See calculation below for design check to ensure the depth of flow is less than half the pipe diameter.

$$\frac{\text{Depth of Flow (FT)}}{\text{diameter of pipe (FT)}} < 0.5 \text{ (Standard from South Coast Water District)}$$

$$\text{Design Check} = \frac{0.12'}{0.5'} < 0.5$$

The flow velocity is 2.5 FPS which complies with the minimum of 2 FPS. See attached calculations. As a result, it can be concluded that if the smaller size pipe of 4-inches at the minimum slope of 2% complies with the requirement, therefore all other proposed sewer lines that are same or larger size at slopes higher than 2% also provide sufficient capacity for the sewage effluent. It can be concluded then that the proposed private sewer systems are designed adequately.

Channel Report

4IN SEWER LINE

Circular

Diameter (ft) = 0.33

Invert Elev (ft) = 1.00

Slope (%) = 2.00

N-Value = 0.013

Calculations

Compute by: Known Q

Known Q (cfs) = 0.07

Highlighted

Depth (ft) = 0.12

Q (cfs) = 0.070

Area (sqft) = 0.03

Velocity (ft/s) = 2.49

Wetted Perim (ft) = 0.43

Crit Depth, Yc (ft) = 0.15

Top Width (ft) = 0.32

EGL (ft) = 0.22

