



INDIAN RIVER COUNTY, FLORIDA DEPARTMENT OF UTILITY SERVICES

Date: April 3, 2017
To: Jason E. Brown, County Administrator
From: Vincent Burke, P.E., Director of Utility Services
Prepared By: Arjuna Weragoda, P.E., Capital Projects Manager
Subject: Work Order No. 13 with KHA – Roseland Elevated Tank Conversion-UCP 4136

DESCRIPTIONS AND CONDITIONS:

Indian River County Department of Utility Services (IRCDUS) maintains and operates three (3) elevated tanks, specifically known as Kings Highway, Gifford and Roseland tanks. The existing elevated remote storage tanks provide system storage and are intended to provide water supply during high demands. Normal operation is to fill during low demands and drain during high demands, allowing turnover of the water within the tank to prevent stale water. Altitude valves are typically used at elevated tanks to prevent overflow of the tank during low demands/higher system pressures, but then open during high demands/low system pressures to allow supply of water to the system.

The Roseland elevated tank is a steel hydro-pillar type that has a common inlet/outlet pipe that operates similarly to the Gifford tank. The existing Roseland tank configuration does not function as a normal elevated storage tank that provides capacity during peak system demands. Due to elevation limitations, the tank cannot operate properly and can only provide fire flow and peak hour pumping capacity when system pressures are less than 45 psi. Typically the County watermain system is maintained at a pressure of approximately 65 psi. System pressures of less than 45 psi are experienced when a main break occurs or county-wide flushing has been undertaken.

Kimley-Horn and Associates (KHA), IRCDUS's consulting engineer, considered a few options for the Roseland tank. The following were considered and evaluated:

- Option 1: Remove the tank from service and demolish,
- Option 2: Raise the tank to the proper elevation, or
- Option 3: Convert the tank to a remote "elevated" ground storage tank and booster pump station

Option 1: Based on existing operating conditions and hydraulic profiles, the tank is not useful and should be removed from service. This option considers the tank useless and should be demolished and removed from service. The Roseland tank is approximately 21 years old.

From an operational standpoint, the existing tank in its current configuration is dysfunctional. Additionally, although fire flow capacity can be met without the Roseland tank, it is believed that an elevated tank or

re-pump may be needed to provide fire flow in the Roseland area in the future. A new tank of this size may be upwards of \$2,000,000.

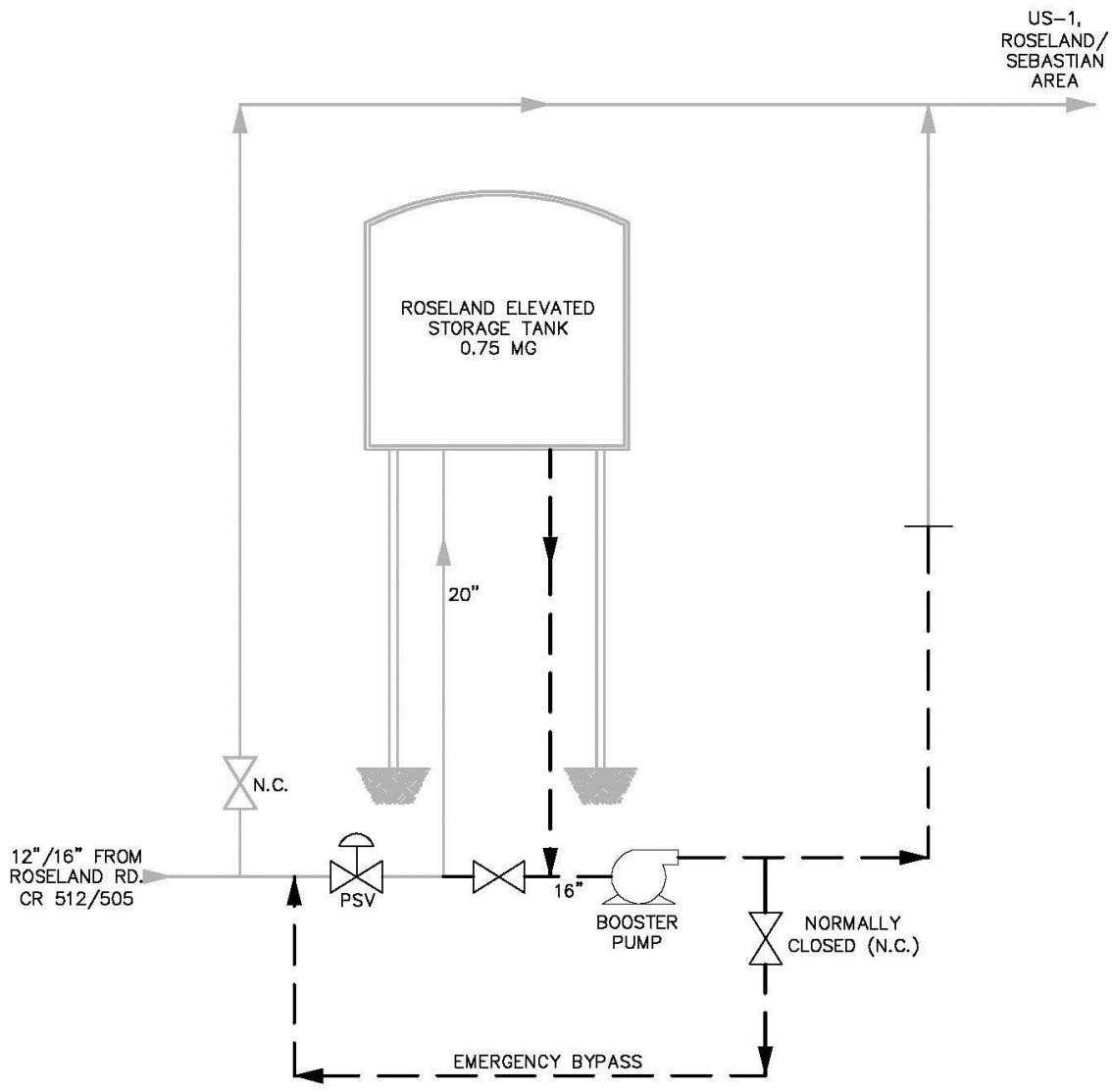
Option 2: Raising the tank is an option that could be performed, but would incur additional costs to elevate the tank, and includes the unknown impact to the foundation of the tank. Elevating the tank would also require it to meet the newer building codes which have more stringent wind loads, requiring foundation bolstering and additional cost. It would also require a review by the Federal Aviation Administration (FAA), who would likely require lights to be added to the elevated structure. It is also the understanding that FAA in the past has not allowed the height to be raised in the subject vicinity. The cost of raising the existing tank is comparable to a new tank.

Option 3 (Recommended): Converting the tank to a storage and re-pump station that provides remote storage and re-pumping to the North Roseland service area is an option that would allow IRCDUS to reuse the asset and address future fire flow requirements. The benefits include improving water quality by frequently turning the water over, providing true fire flow protection, and maintaining use of a known asset. Additionally, the existing tank elevation would not be an issue with this option as long as there is a functioning pressure sustaining valve upstream of the tank to prevent over-filling of the tank.

Currently, the existing operation of the tank is to utilize one pipe for filling and draining. Depending on system demands, the tank will fill during low system demands and drain during high demands. The proposed operation is to convert it to a re-pump facility, where it is filled through one pipe, and pumped out via separate outlet pipe as shown in Figure 2 below. The tank essentially separates the distribution system into two regions, upstream (supply) and downstream (demand). The supply region is one which supplies water to the tank and fills the tank at varying rates with a set tank inlet pressure. Filling of the tank would occur during low system demands. This region would consist of the Roseland Road (CR 505) corridor. Discharge from the tank to the downstream region would be through booster pumps which essentially increase and enhance system pressure in the general area, including the Sebastian River Medical Center and the commercial areas along US1. An emergency bypass with valve could boost pressure to both the upstream and downstream sides of the tank during fire flow conditions.

The recommended option is to convert the tank to a remote “elevated” ground storage tank and booster re-pump station. The engineer’s opinion of probable cost as of March, 2017 for the conversion is estimated at \$950,000.00. This includes two (2) 3,000 gpm pumps with 50 hp motors, piping, inlet control (altitude valve) on the inlet side, electrical gear and variable frequency (VFD) drives and improvements that would be housed inside the existing tank hydropillar shell, a portable or fixed generator, and a pump station controller. A bypass would be provided to boost both sides (upstream and downstream) of the tank.

This document, together with the concepts and design presented herein, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



OPTION 3
 MODIFY ROSELAND TANK OPERATION
 N.T.S.

LEGEND:	
—	EXISTING
- - -	PROPOSED

SCALE: N.T.S.		MAR. 2015	INDIAN RIVER COUNTY	DESIGN ENGINEER: MARK D. MILLER	SHEET NUMBER
DESIGNED BY: MDM		PROJECT NO. 0445720.30		FLORIDA P.E. LICENSE NUMBER: 45320	FIG 2
DRAWN BY: NPB		<small>© 2015 KIMLEY-HORN AND ASSOCIATES, INC. 1920 WEKIVA WAY SUITE 200, WEST PALM BEACH, FL 33411 PHONE (561) 843-0863 FAX (561) 853-8175 WWW.KIMLEY-HORN.COM CA 00000695</small>			
CHECKED BY: MDM		DATE:			

ANALYSIS:

Staff requested that KHA submit a proposal to provide design, permitting and construction phase assistance. The scope of the Roseland Elevated Tank Conversion is more specifically described in the attached Work Order No. 13. On November 4, 2014, the Indian River County Board of County Commissioners (BCC) approved the Extension and Amendment of the Continuing Contract Agreement for Professional Services with KHA. The total negotiated cost for the design, permitting and construction phase assistance of the Roseland Elevated Tank Conversion is a lump sum amount of \$112,222.00. KHA will prepare four signed and sealed copies of the permit package to be submitted to the Florida Department of Environmental Protection (FDEP) Southeast District. It is anticipated that the project will be permitted and ready to bid 225 calendar days from notice to proceed.

FUNDING:

Funding for Work Order No. 13 is derived from the operating fund. Operating revenues are generated from water and sewer sales.

Description	Account No.	Amount
Roseland Elevated Tank Conversion	471-169000-17517	\$112,222.00

RECOMMENDATION:

Staff recommends that the BCC approve the attached Work Order No. 13 with KHA, for the lump sum amount of \$112,222.00, and authorize the Chairman to execute the same, as presented.

ATTACHMENT:

1. Work Order No. 13 – Scope of Services from KHA, Roseland Elevated Tank Conversion