



MEMORANDUM

To: Christopher Johnson
From: Ed Castle, PE
Date: 2 December 2014
Re: Evaluation of Collection Systems Served by KWRU

Introduction

KW Resort Utility engaged the Weiler Engineering Corporation (WEC) to provide a report documenting the quantity, type and condition of the various collection systems connected to the KW Resort Utility Corp. wastewater treatment plant. The reclaimed water transmission system is included in the report

KWRU Owned Systems

Lincoln Gardens Gravity Collection System

The Lincoln Gardens area of South Stock Island consists of a residential area served by a gravity collection system. The gravity mains and manholes are located in the public right of way or in permanent easement granted to the Utility.

The gravity piping is generally vitrified clay. Much of the pipe has been slip-lined with plastic liners, including the gravity laterals. The piping is in good condition. Salinity records show that there is very little saltwater infiltration. Flow records demonstrate that the wet weather inflow and infiltration is limited.

There are three Utility-owned lift stations (discharge into gravity piping) and Utility-owned force main pump stations in the system. The Sunset Trailer Park area discharges into the Lincoln Gardens gravity collection system, using a number of small grinder lift stations.

The gravity collection system consists of approximately:

- 20,525 LF of 8" gravity main
- 300 LF of 10" gravity main
- 53 manholes
- 3,015 LF of 4" gravity service laterals (to property line)

Key West Golf Club Development Gravity Collection System

The Key West Golf Club Development is a residential community located on North Stock Island. It is served by a gravity collection system that discharges to two force main pump stations. The gravity collection system is constructed of PVC and is in new condition. It is located within the common area (streets) of the development.

The gravity collection system consists of approximately:

- 6,282 LF of 8" gravity main
- 662 LF of 6" gravity main
- 36 manholes
- 3,150 LF of 6" gravity lateral (to property line)

South Stock Island Vacuum Collection System

The South Stock Island vacuum collection system serves the remainder of the properties south of US Highway 1 that are not served by the Lincoln Gardens gravity collection system or by the KWRU force main systems. The vacuum system is constructed of PVC piping, fiberglass vacuum pits and concrete buffer tanks. 6" PVC gravity laterals connect properties to the vacuum pits and buffer tanks.

Certain larger properties were provided with a vacuum stub from which privately-owned vacuum collections systems were extended onto the properties. The quantities of privately-owned vacuum collection system piping and pits are not included in the following summary.

The vacuum collection system consist of approximately:

- 13,665 LF of 10" vacuum main
- 4,709 LF of 8" vacuum main
- 5,435 FL of 6" vacuum main
- 844 LF of 4" vacuum main
- 1,660 LF of 3" vacuum service lateral (to vacuum pits)
- 70 vacuum pits
- 13 buffer tanks
- 2,358 LF of 6" gravity lateral (to property line)

The vacuum collection system is operated by vacuum provided from the vacuum pump station located at 6630 Front Street at the KWRU WWTP site. The vacuum collection tank is buried, with adjacent inlet and discharge valve vaults. The submersible sewage pumps are located in the vacuum collection tank, are rail mounted and are readily accessible through two quick-release manways. The vacuum pumps and motor control center are located in an adjacent building. All components are in good condition.

The vacuum pump station consists of:

- One 5,000 gallon vacuum collection tank
- Two 25 HP, 460 V, 3 ϕ , submersible sewage solids-handling pumps
- Four 25 HP, 460 V, 3 ϕ , vacuum pumps

- Motor control center
- Vacuum Station building

Sewage Force Main Systems

The KWRU sewage force main systems consist of force main piping of varying sizes and 10 Utility-owned pump stations. There are approximately 29 privately-owned pump stations connected to the KWRU force main systems. The piping is PVC or HDPE and is in new to good condition and is located in the public right of way and in easements. The quantities of privately-owned force mains are not included in the summary below.

The force main systems consist of approximately:

- 8,110 LF of 8" force main
- 3,636 LF of 6" force main
- 11,085 LF of 4" force main

The sewage pumping stations consist of:

- Pines & Palms Pump Station: Two 5 HP, 480 V, 3 ϕ , submersible solids-handling pumps
- Boyd's Campground Pump Station: Two 5 HP, 230 V, 3 ϕ , submersible grinder pumps
- Laundromat Lift Station: Two 0.5 HP, 240 V, 1 ϕ , submersible solids-handling pumps
- L2A Pump Station: Two 5 HP, 230 V, 3 ϕ , submersible grinder pumps
- Forcemain Pump Station: Two 5 HP, 230 V, 3 ϕ , submersible grinder pumps
- L4 Lift Station: Two 0.5 HP, 230 V, 1 ϕ , submersible solids-handling pumps
- L3 Lift Station: Two 0.5 HP, 230 V, 1 ϕ , submersible solids-handling pumps
- L1 Lift Station: Two 0.5 HP, 230 V, 3 ϕ , submersible solids-handling pumps
- MCDC Main Pump Station: Two 15 HP, 460 V, 3 ϕ , submersible solids-handling pumps
- Golf Course Main Pump Station: Two 5 HP, 408 V, 3 ϕ , submersible grinder pumps

Reclaimed Water Mains

The KWRU reclaimed water transmission system pumps reclaimed water to the Key West Golf Club, the Monroe County Detention Center and has recently been extended to the Lower Florida Keys Medical Center, Gerald Adams elementary school and the Florida Keys Community College. The transmission mains are constructed of PVC and HDPE pipe and are in new to good condition. The piping is located in the public right of way and in easements.

There are two Utility-owned reclaimed water pumping stations. The main pumping station is located at the KWRU WWTP at 6630 Front Street. This pump station is in good condition. The secondary pump station is located adjacent to the reclaimed water storage pond on the Key West Golf Club. The secondary pump station withdraws

reclaimed water from the 8" transmission main upstream of the discharge into the storage pond. It pumps reclaimed water to the Monroe County Detention center and other users on North College Road. The secondary pump station is in new condition.

The reclaimed water transmission system consists of approximately:

- 8,150 LF of 8" transmission main
- 4,525 LF of 4" transmission main
- 16 LF of 3" transmission main

The reclaimed water pumping stations consist of:

- Main Pump Station: Two 40 HP, 460 V, 3 ϕ , dry-well water pumps
- Golf Course Pond Pump Station: Two 2 HP, 230 V, 3 ϕ , submersible water pumps