

October 8, 2018

Randy Peachey, Manager
Royal St. Andrew Association, Inc.
555 South Gulfstream Avenue
Sarasota, FL 34236

Via Email: royalstandrew@verizon.net

**RE: *Royal St. Andrew
KEG Project P18RS-0416 REV02
Professional Engineering Services – Plumbing Summary***

Dear Mr. Peachey and Members of the Board of Directors:

In accordance with our agreement, dated July 2, 2018 and authorized July 17, 2018, Karins Engineering Group, Inc. (KEG) representatives reviewed the plumbing video work completed at Royal St. Andrew (RSA) by Specialized Plumbing Technologies (SPT).

KEG observed the underground mains are in good condition, with root intrusions observed at some joints of the clay piping portion. KEG recommends the main be cleaned and RSA plan for the installation of a cast in place plumbing (CIPP) system be installed within the next 18 months.

KEG observed, of the 11 plumbing stacks where camera work was completed, that 6 of the stacks had moderate to heavy buildup of scale and debris in the piping. KEG recommends the observed stacks showing buildup on the enclosed SPT report be scheduled for cleaning to prevent backup of the system.

WASTE STACK DISCUSSION

In general, waste stacks that tend to be in the worst condition are kitchen stacks. This is caused mainly by the amount of grease and corrosive cleaning products that are deposited in the pipes over time. Laundry machine stacks are the second most susceptible to failure because of the corrosive chemicals used in washing products. Backup, in the form of gurgling in sinks or toilets, may be the result of the formation of bubbles in the waste stack caused by excessive soap blocking the atmospheric pressure's effect on the plumbing stack. The soap bubbles effect is comparable to covering the top of a straw with one's finger while submerged in liquid, while one's finger is covering the straw's upper opening, the liquid will stay in the straw until atmospheric pressure is restored in the system by removing the finger. Bathroom stacks are usually in the best condition of the three, however, deterioration is usually not far behind the aforementioned kitchen and laundry machine stacks. Another cause of deterioration in cast iron piping is that the pipes are not used for long periods of time, such as the off season for seasonal residents.

RECOMMENDATIONS

KEG recommends RSA plan on cleaning the kitchen stacks at five year intervals beginning in 2019 and repeated every five years. The laundry and bathroom stacks should be planned to be cleaned at ten year intervals beginning in 2019 and repeated every 10 years, in conjunction with the kitchen stack cleaning. KEG does not recommend the use of biological cleaners to extend useful life, as they are not proven and

must be properly monitored for effectiveness. The cleaning intervals should reset following remediation of the plumbing system.

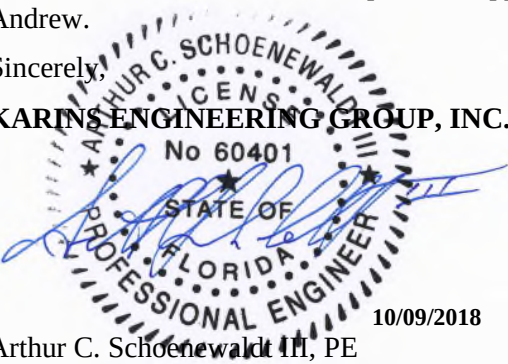
In order to maximize the useful life of the plumbing, KEG recommends providing the following guidelines to the owners to reduce waste buildup within the system:

- Avoid using chemical drain cleaning products, such as Drano, as they accelerate deterioration of piping. In addition, as they do not usually completely remove the clog, they tend to be used on multiple occasions leading to further accelerated deterioration of the piping system. In lieu of harsh chemicals, every month sprinkle ¼ cup of baking soda into sink and tub drains with just enough warm water to get the powder well into the drain. Then pour 1 cup of white vinegar into the drain and let the mixture stand for a few hours followed by flushing with hot water.
- Watch how quickly water goes down the drains; slow drainage is usually a sign of buildup in the plumbing line, and should be reported to property management.
- Keep food scraps out of kitchen drains, hair out of bathroom drains and only flush sewage and toilet paper down toilets. Never dump grease down the kitchen drain, even with a disposal, when hot grease cools it becomes a solid and clogs the drains. In order to reduce hair build up in bathroom drains, install screens over drains and remove hair buildup as necessary.
- Do not use excessive amounts of detergents in laundry machines. Excessive detergents slow the drainage process, but impeding venting of the stack, and lead to greasy build up in the stack.

We trust this information is helpful and appreciate this opportunity to provide our services to Royal St. Andrew.

Sincerely,

KARINS ENGINEERING GROUP, INC.



10/09/2018

Arthur C. Schoenewald III, PE
Karins Engineering Group, Inc.
Director of Restoration
Florida Registration #60401

Enclosed: SPT Video Report

