



VACUUM PLUMBING SYSTEMS



Case Study - Guy Fieri's Vegas Kitchen and Bar Moving Kitchen Waste Up and Out

View of the restaurant kitchen

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CONTRACTOR:

JBA Consulting Engineers, Las Vegas, NV

OVERVIEW

While the location selected for Guy Fieri's Vegas Kitchen and Bar was a restaurateur's dream, the construction challenges were an architect's nightmare. The salient issue was a NV Energy easement running straight through the middle of the basement, which was to become the prep kitchen for the restaurant. Crews could not work anywhere close to that easement, and no waste piping could run in proximity. Somehow, the kitchen waste would have to move up and out of the building.

AcornVac was the chosen solution because the vacuum plumbing:

- Routes overhead, never having to interfere with the easement.
- Is more reliable and requires less maintenance than a sewage ejection system.
- Eliminates waste leaks, which are common in traditional plumbing.
- Is easily reconfigured because of its modular characteristics.

BACKGROUND INFO

The location of Guy Fieri's Vegas Kitchen and Bar had previously been the site of a liquor store. It was a prime location with thousands of visitors passing by every day. The space designated as the kitchen prep area of the restaurant was a storage area located in the basement—a space that had no existing plumbing.

CHALLENGES

The NV Energy easement ran straight through the middle of what was to be the new prep kitchen area in the basement of the building. This meant that the plumbing crew could not run pipe required in a gravity system under or over that easement. The building owner was not willing to compromise—the basement prep kitchen would stay, so a solution had to be found. A solution that would be able to move all the kitchen waste up and out of the building.

ALTERNATIVE SOLUTIONS

JBA considered using two sewage ejector sumps, one on either side of the easement, to pump the grease and kitchen waste out of



View of the vacuum center installed above the kitchen



The ceiling space in the kitchen where the vacuum system is located

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the building and into remotely located grease interceptors. This option would require the addition of emulsion heaters and there was concern generated by the reputation those heaters have for being high maintenance. Aside from the issues associated with pumping the waste vertically, the distance that the waste would have to travel horizontally posed a problem as well, due to grease's tendency to solidify and settle out over time. Even if it could be done, it would be a maintenance nightmare.

ACORNVAC A MORE RELIABLE SOLUTION

Having seen successful AcornVac systems installed in other applications, and knowing its proven track record for providing reliable and efficient performance, the engineers and client decided the vacuum system was the right solution to this unique challenge. Everyone involved, including AcornVac, knew this application would test the capabilities of vacuum plumbing and stretch the limits of what was possible. Because of that, AcornVac's team of experts was on hand all throughout the project.

Large-volume accumulator tanks were buried below the basement floor to handle the high volume of waste from three compartment sinks for washing pots, pans, and food prep handling. Smaller accumulators took on the remaining gray water waste from hand washing sinks.

The fifty-gallon accumulator tanks would hold the waste until it was time to move it out, via vacuum, and up into the vacuum tanks located in the mezzanine above the main kitchen, two stories and approximately 50 feet above the basement prep kitchen. The system was designed around draining 18 to 20 gpm from the fixtures.

This was exactly the type of challenge JBA and AcornVac were expecting and were geared to provide. As any engineer will tell you, there is always a solution; you just have to find it.

The AcornVac vacuum system is capable of lifting waste vertically about 25 feet before special engineering attention is required. However, in this situation the waste was being lifted approximately 50 feet before its final discharge to the sanitary sewer line.



Vacuum center from above the kitchen



Ladder lift

Because the waste was being lifted vertically beyond 25', AcornVac worked with JBA to design a special "ladder" piping system needed to lift the high volume of grease and sanitary waste up to the mezzanine.

The ladder system was built with a four-foot vertical section of pipe between each segment of the ladder. (See Photo)

Just when JBA thought they were in the clear, a wrench was thrown into their plan. Hansen construction started digging in the basement for placement of the large accumulators, and discovered that the easement, which was believed to run only east and west, took a sudden turn north. JBA and AcornVac worked together to successfully modify the ladder design in real time, including changes in the flow rates, while under construction.

With the ladder system in place, the team was ready for a test run. The accumulator tank holds 50 gallons of water while the three-compartment sink holds 180 gallons. When the valve is open on the two-inch sink drain line, that waste can reach a flow rate of 25 gpm.

When the sink is drained, waste enters the accumulator tank. Once the accumulator fills to a pre-determined level, the vacuum valve on the accumulator opens, so that vacuum can pull the waste up through the ladder system. Despite the speed at which the water flows from the sink, the vacuum system draws the waste successfully through the ladder system, up into the mezzanine, where it finally connects with gravity waste piping leading to the grease interceptor or sanitary sewer line.

RESULTS

Guy Fieri's Kitchen and Bar is one of the most popular restaurants on the Vegas strip often turning out 2000 covers a day. The well-designed vacuum system straddling the NV Energy easement has met the challenge and plays a major role in a busy basement kitchen on the Las Vegas strip.



The vacuum system is hidden behind the brick wall



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