

One of two screening buildings on a large government complex. Inside, an Auger Monster® removes rags and trash from wastewater.

Monster Solutions

State Solves Wastewater Troubles with Innovative Screening Solution

Cranston, RI - For years State Officials had a mystery on their hands – how were tons of rags and trash getting into the sewer system and pump station that served the sprawling, 300 acre Pastore Government Center in Cranston?

In 2000 the City of Cranston, which manages the local wastewater treatment plant, asked their long-time pretreatment consultant, Tutela Engineering Associates, to conduct a comprehensive investigation of the pump station problems in order to put an end to the maintenance and emergency situations.

Based on Alfred Tutela's report, the State of Rhode Island also started investigating the sewer system serving the dozens of buildings on the Pastore complex and in 2003 hired the Louis Berger Group engineering firm to investigate the problems and propose solutions that would make their system more reliable.

The consultants traced the debris back to several correctional facilities mixed in with the other state agencies and buildings. This included an in-

PROBLEM: Rags and trash from correctional facilities were clogging sewer lines and causing problems at a nearby pump station.

SOLUTION: Auger Monster wastewater screens.

take center, maximum security prison and a women's facility. According to the consultants, inmates of most correctional institutions tend to stuff and flush material consisting of sheets, blankets, clothes, shoes, trash, plastics and food into the sanitary sewer system. The toilets within the cells are also used as their personal waste receptacles. As a result, the operation and maintenance staff frequently face backups, clogs and overflows within the sewer pipes which disrupt the institution's functioning. Large prison kitchens also tend to generate and discharge grease laden solids into the wastewater.



Many people played a role in the project's success, including (l-r): David Sheldon, State Official; Thomas E. Wright, State Official; Louis Ragozzino, PE, Louis Berger Group; Al Tutela; Tutela Engineering Assoc.; Susan Ferreira, State Official; Bob Mack, NE3; Tom Rengart, Vertex Environmental Services.

"We pinpointed the prisons as a high contributor of solids fairly early on in our study," said the State's consultant Louis Ragozzino, PE and Vice President of the Louis Berger Group engineering firm. "We were brought on board to do a feasibility study about grease and solids, conduct field investigations and develop a solution to limit the impact of solids."

The Solution

To solve the problem, the Louis Berger Group developed plans for two screening buildings on





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The Auger Monster is paired with a Macho Monster grinder which macerates solids and trash to prevent material from wrapping around the auger and to allow soft organics to be washed off the screenings.

State land to treat and remove solids from the wastewater, and installation of several powerful grinders to shred solids into small particles and prevent blockages. Both the Louis Berger Group and Tutela Engineering Associates favored a wastewater screen called the Auger Monster® from JWC Environmental.

Two Auger Monster screening systems macerate, remove, wash and compact solids and rags before the wastewater flows into a nearby pumping station, owned by the City of Cranston, which treats wastewater from the State Government complex. In addition, three large Macho Monster grinders were installed inside concrete vaults positioned near the prison facilities. These grinders have two rows of razor sharp steel cutter teeth which pull in and shred solids, turning them into small particles that flow harmlessly through the sewer pipes and into the screening buildings.

High solids loading was a problem the consulting engineers were aware of at other prisons. Prisons generate a lot of debris which can impact the downstream processes and treatment plant.

“I guess the folks in prison can’t find much else to do,” said Mr. Alfred Tutela of Tutela Engineering Associates. “Initially the City was having trouble with rags wrapping around the pump impellers and crews would have to clean them frequently. Then, rags began building up inside the sewer pipes in the Pastore Complex and in the City’s system, resulting in the wastewater overflowing through manholes.”

For several years the State and the City searched for solutions to the pump station and plumbing problems, but no one was sure where the debris was coming from and who was responsible for its introduction into the sewer system.

“I took over the project when it was going too slow. Our plumbers dealt with sewer blockages for 8 years,” said Thomas E. Wright, Assistant Director of the Department of Administration and the

project manager. “It was difficult to determine what the right solution was.”

“I’ve never seen such a big mess in my 19 years in the wastewater business,” said Bob Mack of New England Environmental Equipment, which sells and supports the Auger Monster screens and Macho Monster grinders. “Workers were there all the time cleaning the system out.”

In November, the contractor working on the new screening buildings was surprised by the amount of debris in the sewage flow.

“We observed a lot of debris as we were installing the augers and grinders,” said Ross Hartman of Vertex Environmental Services, the main contractor on the project. Hartman praised the responsiveness of the Louis Berger Group and JWC Environmental, and said both firms responded quickly to last minute plan and equipment modifications.

Vertex completed construction in November and one month later the screening system was started up. What a difference five Monsters can make. After the first few months of operation, all of the parties involved like what they see. State plumbers have seen no blockages, the City of Cranston has seen a drop off in the amount of rags and solids entering their pumping station, and state managers are pleased to see their sewage problems disappear.

“It’s a well designed system – we’re very pleased,” said State Official Wright. “In terms of taking care of it, the Auger Monsters are fine – no problems. Cranston wastewater officials also seem quite pleased.”

The two Auger Monsters are designed to handle a combined peak flow of over 1 million gallons per day. Plumbers check on the system weekly and individuals are assigned to change out the Auger’s discharge bag every few days.

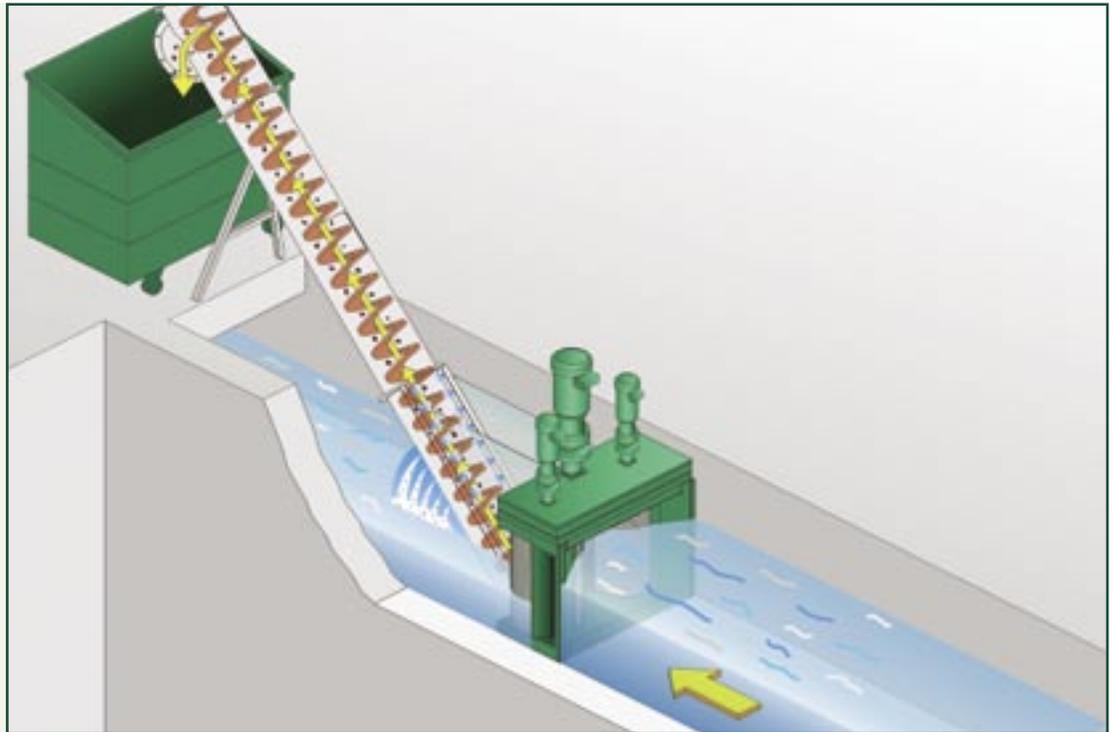
The Macho Monster grinders specified for the project are one of JWC’s larger models and designed to handle the tough solids and a higher

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The Auger Monster’s simple, rugged design and compact footprint makes it ideally suited for prison applications. The grinder helps protect the system from long stringy solids such as towels and coveralls.



concentration of debris without reversing. With a 10-Hp (7.5-kW) motor instead of the standard 5-Hp (3.7-kW) and steel cutters that are almost twice as large as the standard Muffin Monster® cutters, the Macho Monster is designed to grind-up whatever people decide to flush.

According to Alfred Tutela of Tutela Engineering Associates, Cranston’s pump station managers say the new screening system is having a positive impact. “Are they happy with it? Absolutely!” he said.

A Common, Yet Complex Problem

Many of America’s older correctional facilities do not have wastewater equipment in place to deal with the heavy load of trash, rags and debris prisoners typically flush, according to Ragozzino, an engineering expert in the prison industry since the 1980’s.

The crushing load of trash and debris found in prison wastewater has a tremendous impact on downstream pumps, piping systems, treatment plants and the people who operate and maintain them.

“I hear about this problem from all across the country. The local communities often do not realize the maintenance impacts that a prison will have on their wastewater treatment plant,” said Ragozzino. “Often, they have to go back and retrofit a wastewater screen.”

Since the 1990’s Ragozzino has come to rely on and specify the Auger Monster screen to solve problems for his correctional clients. He’s conducted several studies over the years for federal and state officials interested in finding the best screen for prison applications, and his research indicates the Auger Monster is more efficient and cleaner than ordinary catenary bar screens. Moreover, the perforated fine screen used in the JWC system captures small plastics and trash, such as ketchup packets, which tend to bypass bar screens.

The Auger Monster can be customized to match the unique features of the site, and fits in a com-

compact footprint. It’s three main components, a grinder, perforated plate screen and auger discharge tube, are used to screen out solids, such as rags, towels, clothing, plastics and trash, and grind, remove, wash, convey and compact them, finally dropping the cleaned screenings into a bin or the optional bagging system.

“In terms of the site, the Auger Monster is much cleaner and neater,” said Ragozzino. “JWC’s equipment is very conducive to on-line installation and is easy to retrofit into existing systems. The discharged solids are dry and easy to handle.”

Tutela also felt the Auger Monster was a more complete package for correctional installations, particularly since the auger component helps keep the screening mechanism from becoming inundated with debris.

“I like the idea of how simple it works,” said Tutela. “Seems fairly maintenance free, and it’s a proven product. I like it because the grinder/auger combo is a total solution for prisons.”

Bob Mack, JWC’s local sales representative, has seen the Auger Monster prove itself successful in dozens of New England prison applications (there are over 650 Auger Monsters installed worldwide).

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About the Companies

For over 30 years **JWC Environmental** and its worldwide family of employees have been delivering cutting edge wastewater solutions, from the Muffin Monster® family of grinders to the Auger Monster modular screen system to the Monster Separation System™ family of fine screens and washer compactors. The Monster family of products is legendary for quality and reliability. On the web at www.jwce.com





JWC's model AGD Auger Monster screen with 40002 Macho Monster grinder.

New England Environmental Equipment, Inc is a Bedford, Massachusetts based representative for many of the leading names in wastewater, including the Muffin Monster family of products. The dedicated staff provides on site sales visits as well as offering training and support for wastewater equipment. On the web at www.ne3inc.com.

Few firms get to work on as many correctional projects as the **Louis Berger Group**, a worldwide consulting engineer firm. Berger offers professional services in the areas of correctional facility construction and environmental engineering. Founded by Dr. Louis Berger in 1953, the Group has grown into a recognized worldwide leader in the consulting field. On the web at www.LouisBerger.com

Tutela Engineering Associates is a consulting engineering firm with offices in Providence, RI and Wilmington, MA. Their environmental services include the management of industrial pretreatment programs and the design of water and wastewater treatment facilities for towns and cities across the Northeast. Call them at 401-861-5990 or 978-658-7493.

Contractor **Vertex Environmental Services Inc.** is a leading provider of environmental and construction services. Since its incorporation in 1995, Vertex's culture has been defined by speed, attitude and first class work product. On the web at www.VertexEng.com.

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The Macho Monster grinders specified for the project are one of JWC's larger models and designed to handle tougher solids and a higher concentration of debris without reversing.



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