

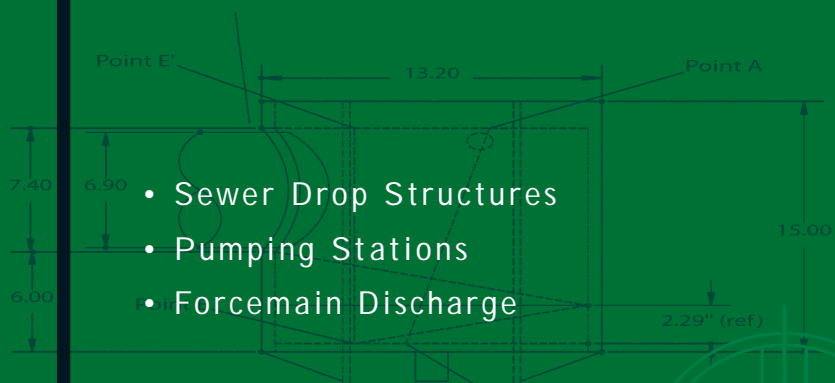
Inserts for Sewer Odor and Corrosion Control



Vortex Flow[™]
ODOR & CORROSION CONTROL

M U N I C I P A L S Y S T E M S

Vortex Ramp - Reference



IPEX

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We build tough products for tough environments®

VORTEX FLOW™

A SIMPLE SOLUTION FOR ODOR AND CORROSION CONTROL

Hydrogen sulfide (H₂S) gas and other odorous gases are a fact of life with sanitary sewer drop structures. When these gases become airborne, they not only generate complaints from the neighborhood, but also impact air quality and cause corrosion within the sewer system. Municipalities spend millions on various forms of odor and corrosion control, yet many of these methods are only partially successful and require considerable maintenance and chemicals.

A new solution for municipalities is the IPEX Vortex Flow Insert (VFI), a revolutionary technology for eliminating odorous emissions and minimizing corrosion in vertical sewer drops. With no moving parts and requiring no maintenance, VFIs have delivered significant cost savings in installations across North America.

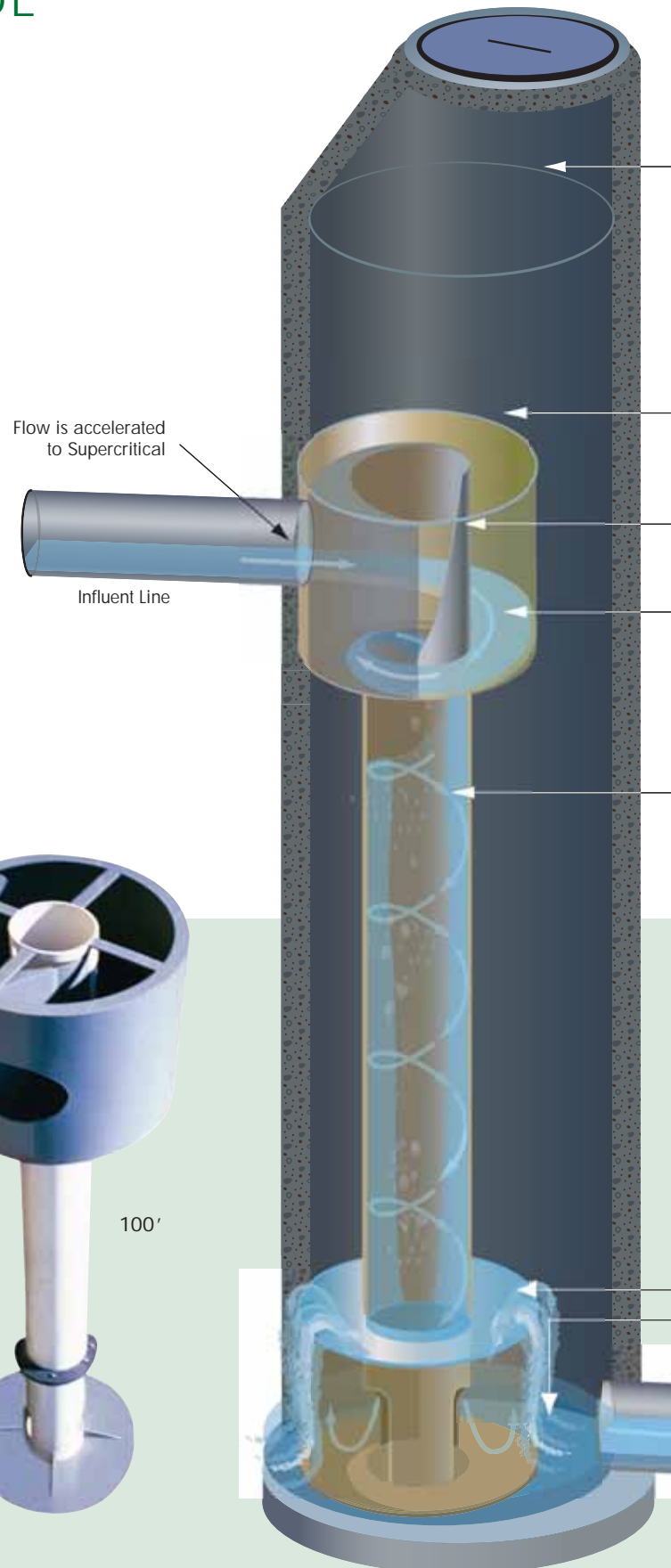
The VFI's patented spiral flow design eliminates odorous and corrosive gases in a unique way. It uses the wastewater's own flow energy to suppress the turbulence which releases noxious gases. The spiral flow creates a downdraft which traps airborne gases and forces air into the sewage flow to oxidize odorous gases. By installing a Vortex drop structure, municipalities can save thousands of dollars in monthly chemical feed, air-phase treatment and maintenance costs.

In addition, land developers can save hundreds of thousands of dollars in excavation costs in areas where conventional drop structures are not allowed.

BUILT-TO-SPEC FOR ANY SIZE

Manholes, chambers and pumping stations are built in a variety of sizes. For that reason, IPEX custom-designs and custom-builds every Vortex Flow Insert, whether it's 3 feet long or 100'. For larger units, Dr. Eugene Natarius, the Vortex Drop Structure's inventor, personally creates a special design. Shop drawings are prepared and submitted to the customer, and each phase of the project is tightly-controlled to ensure the project's success.

IPEX VFIs are sized based on the peak flow that the unit is required to handle. In many cases, the insert can be installed in a standard manhole without restricting access for maintenance.



Drop Structure

Vortex Form

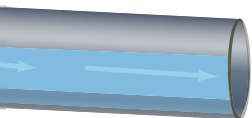
Top Cut

Vortex Channel

Vortex Shaft

Flow Exit

Vortex Shaft Base



Effluent Line

HOW IT WORKS

1

INTO THE VORTEX

The wastewater runs into the VFI which directs it around a curve of decreasing radius. At the same time, the increasing slope of the vortex form accelerates the water's flow to supercritical velocity.



2

DOWN THE DROP PIPE

Once the flow shoots into the smaller drop pipe, the velocity and centrifugal forces generated within the VF1 cause the flow to hug the inside walls of the drop pipe. This spiral flow creates a stable air core with a slight negative pressure, which sucks airborne gases down to the bottom of the structure. Frictional forces created by the flow around the drop pipe walls dissipate the flow energy.



3

THE POOL AT THE BOTTOM

The flow exit is submerged in the energy-dissipating pool at the bottom of the unit. Air and gases drawn down the air core are forced back through the wastewater and are re-entrained back into the flow. This significantly increases the dissolved oxygen concentration in the wastewater, and the re-entrained odorous compounds are then quickly oxidized.



WINNER OF THE APWA TECHNICAL ACHIEVEMENT AWARD

The American Public Works Association presents Technical Innovation Awards to designers of devices, processes or systems that benefit public works by serving the public and protecting the environment. Dr. Eugene Natarius, creator of the Vortex Drop Structure, received an award for his revolutionary design. Since then, units have been installed in cities across North America including municipalities in Ontario, California and Ohio.



REDUCED EXCAVATION COSTS AND LONG TERM SAVINGS

While Vortex Flow Inserts leave manholes and pumping stations smelling better, they can also make a land developer's job easier or less costly. Due to the odor and corrosion problems of conventional drop structures, many municipalities have banned them altogether. Until now, the only alternative available to land developers was to install sewers with a gradual grade to trunk sewers deep underground, a practice which can cause the cost of excavation to skyrocket.

But by installing Vortex Drop Structures (drop structures with Vortex Flow Inserts), land developers can now comply with municipality concerns and save thousands, if not millions, in excavation costs. No wonder developers across North America are taking advantage of this revolutionary technology.

HOW VORTEX FLOW CAN SAVE MUNICIPALITIES MONEY



REDUCED CORROSION EXTENDS SEWER LIFE

Hydrogen sulfide (H_2S) emissions from forcemain discharges can literally eat through a concrete drop manhole. By oxidizing dissolved H_2S , a Vortex Flow Insert in a municipal sewer drop can significantly reduce concrete and metal corrosion, extending sewer life and saving the municipality money.



ELIMINATES ODOR TREATMENT COSTS

By increasing dissolved oxygen levels in wastewater and oxidizing sulfides and other odorous compounds, the use of a Vortex Flow Insert in a drop structure eliminates the need for costly chemical injection, high-maintenance biofilters and air scrubbers.



IMPROVES WASTE WATER QUALITY

Because a Vortex drop structure reduces the odorous and corrosive elements in the flow, a Vortex Flow Insert, installed upstream of a treatment plant, can actually improve wastewater quality prior to treatment, reducing treatment costs at sewage plants.



REDUCED MAINTENANCE COSTS

The use of a Vortex drop structure eliminates the corrosion of concrete and metal sewer components, dramatically reducing municipal maintenance costs of manholes and sewers.





Vortex Flow saved us hundreds of thousands in excavation costs. And it will save our county a lot of money in chemical odor treatment cost as well. Vortex Flow is a win-win investment for both of us.

*Skeet Sellers
Wastewater Superintendent
Lyon County Utility*

APPLICATIONS



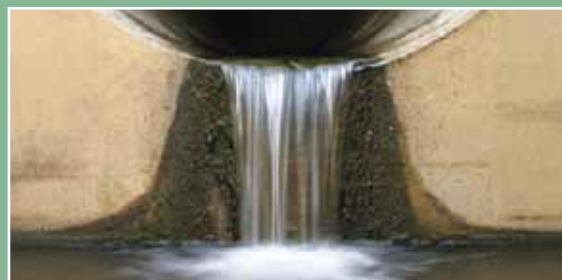
Manholes, Chambers and Forcemains – Wherever you have a drop from one pipe to another, Vortex drop structures can transform drop manholes from potential maintenance problems into effective aeration devices that control odor and corrosion.



Pumping Station Wet Wells – A Vortex drop structure can minimize gas emissions from pumping station wet wells.



Steep Grade Sewers – Vortex Flow can dissipate the flow energy of water running down a steep grade, reducing the flow's discharge speed.



Turbine Discharges – By dramatically reducing the flow energy of water through turbine discharges, Vortex Flow helps to reduce the environmental disturbance when the flow is released into rivers and lakes.

TYPICAL PROJECT FLOW FOR A VORTEX FLOW INSERT

STEP 1: INFORMATION GATHERING

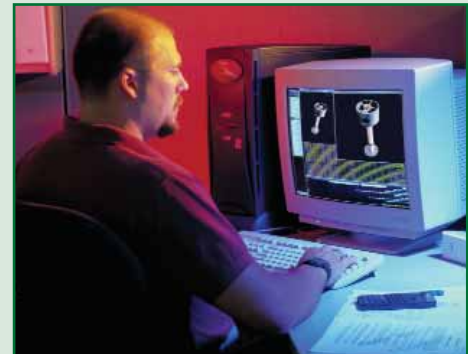
Customer provides flow data, basic site geometry such as manhole size, depth drawings, pipe size.

STEP 2: CONCEPTUAL DESIGN

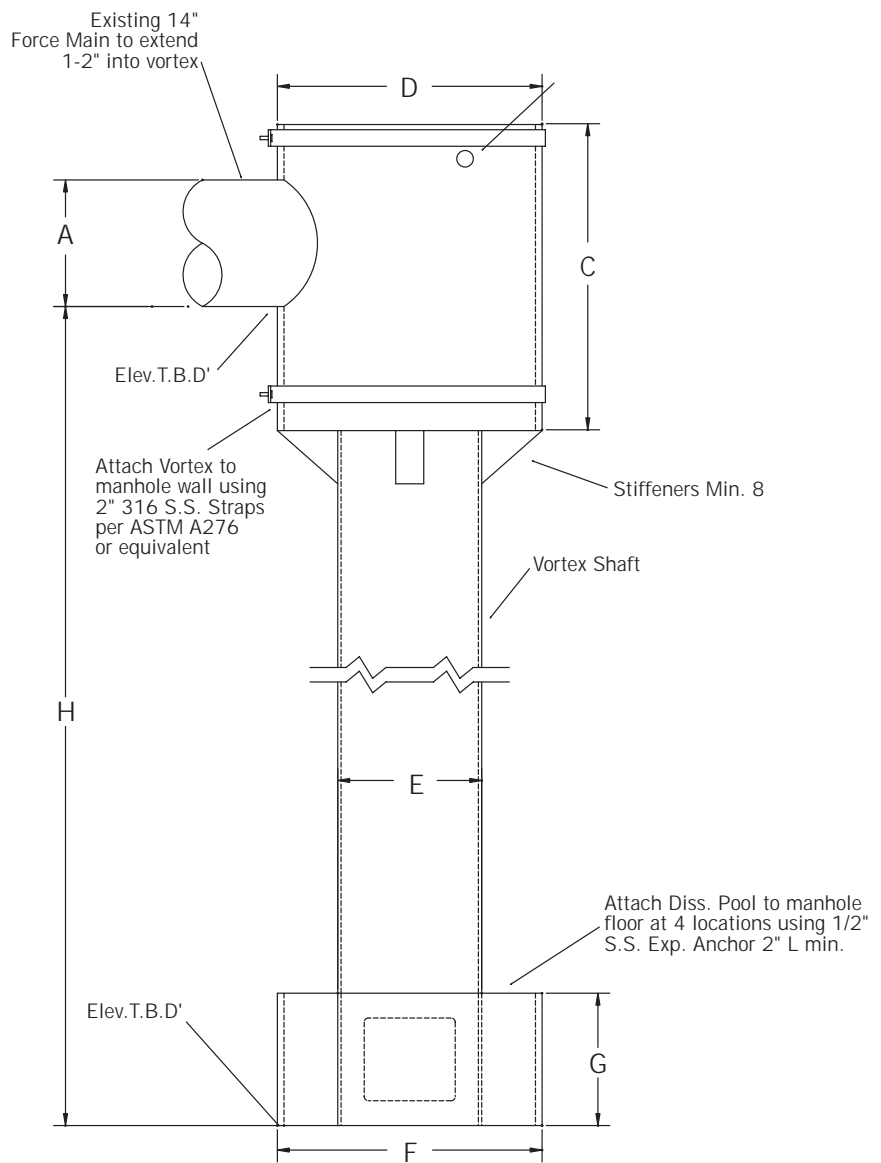
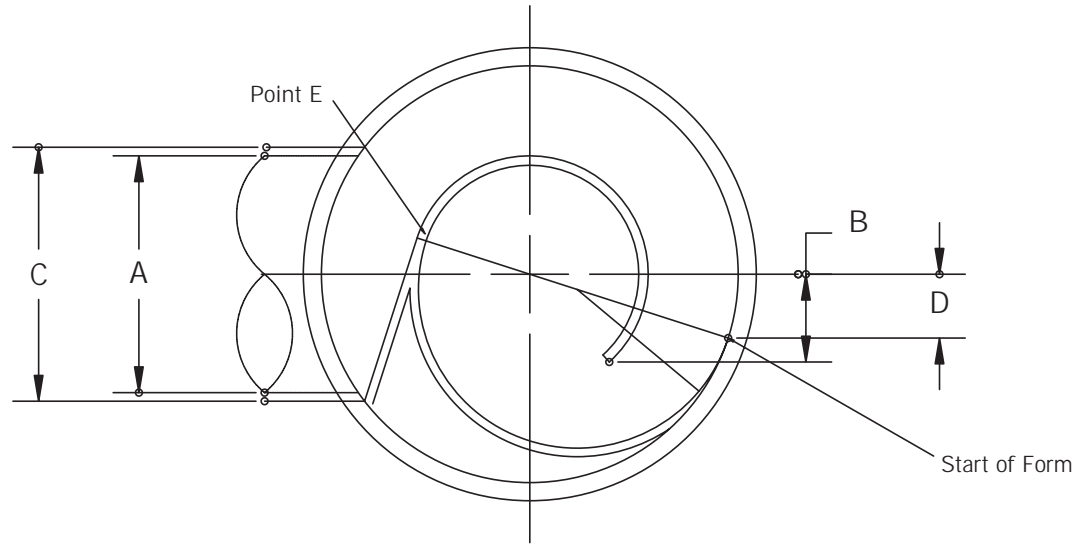
IPEX dimensions the unit based on customer input
IPEX provides conceptual drawings for the project
IPEX provides engineering estimate

STEP 3: DETAILED DESIGN & FABRICATION

Once the project has been bid and IPEX received the order, the detailed design and fabrication will start. IPEX will verify all data received from customer, client or design engineer prior to fabrication.



SAMPLE CONCEPTUAL DRAWING



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U.S. Customers call
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www.ipexinc.com

About IPEX

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Our products and systems have been designed for a broad range of customers and markets. Contact us for information on:

- Municipal pressure and gravity piping systems
- PE Electrofusion systems for gas and water
- PVC, CPVC, PP, ABS, PEX and PE pipe and fittings (1/4" to 48")
- Electrical systems
- Telecommunications and utility systems
- Industrial process piping systems
- Plumbing and mechanical pipe systems
- Irrigation systems
- Radiant heating systems
- Cements, primers and accessories



WARRANTY: All IPEX products are guaranteed against defects resulting from faulty workmanship or materials. If any such product is found to be defective by reason of faulty workmanship or materials, upon written notice and return of the product, the defective product will be replaced by IPEX free of charge, including shipping charges for the replacement product. Claims for labor costs and other expenses required to replace such defective product or to repair any damage resulting from the use thereof will not be allowed by IPEX. Our liability is limited to the price paid for the defective product. IPEX will not be bound by any warranty, other than above set forth, unless such warranty is in writing.

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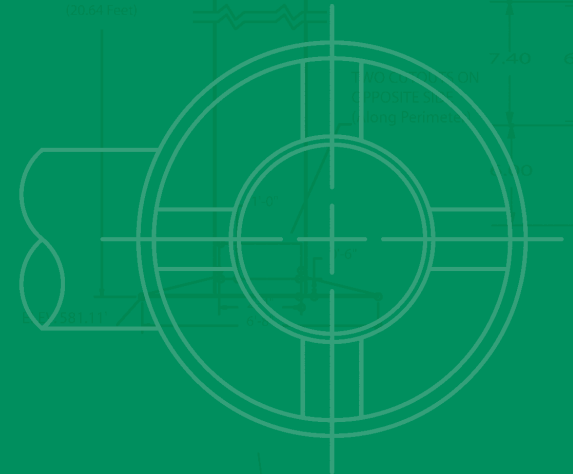
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TWO CUTOUTS ON
OPPOSITE SIDE
(Always Refer to
Drawing)



Vortex Ramp - Reference

