

**REINHOLD ENVIRONMENTAL Ltd.**



**2013 APC Round Table  
& Expo Presentation**

**July 8-9, 2013, in St. Louis, MO / Hosted by Ameren**

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## **2013 APC Round Table**

# Preventing Buildup on ESP Distribution Plates with Sonic Horns

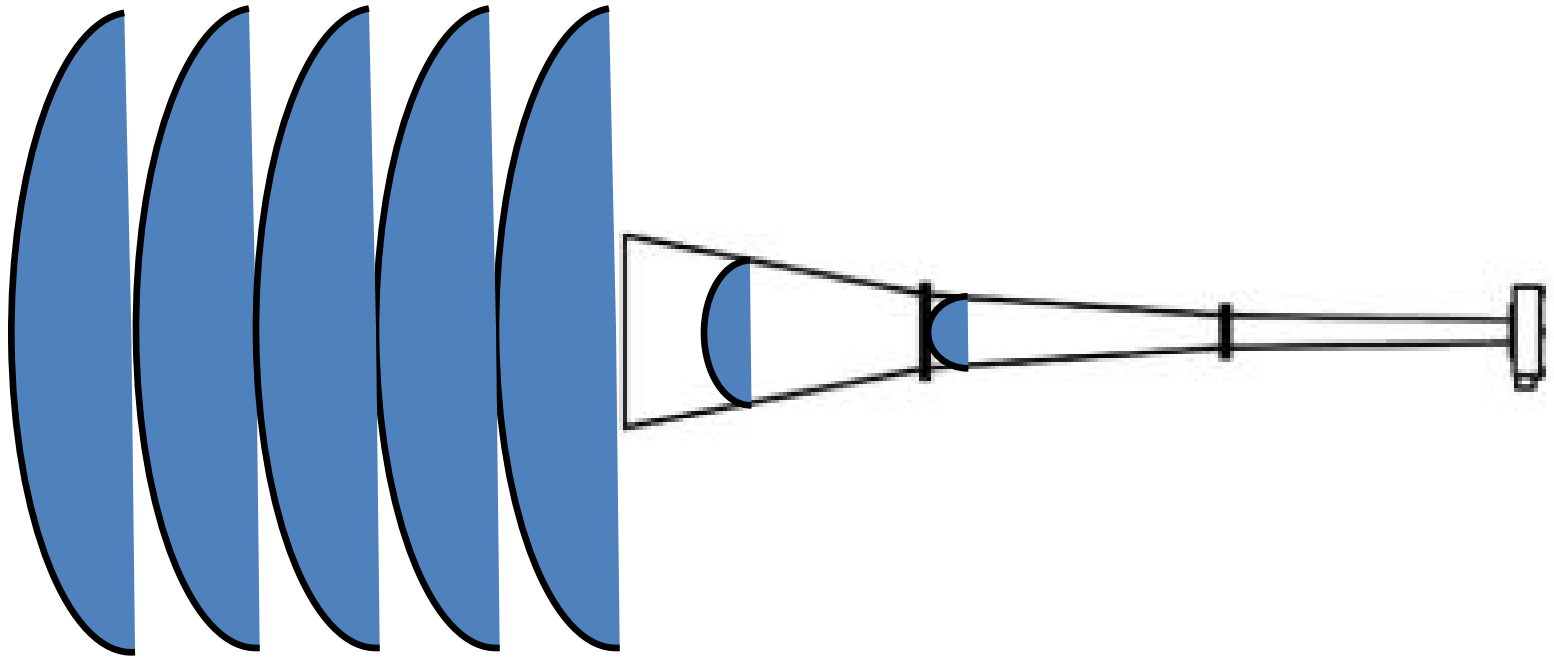


**Jeff Shelton**  
Martin Engineering  
jeffs@martin-eng.com



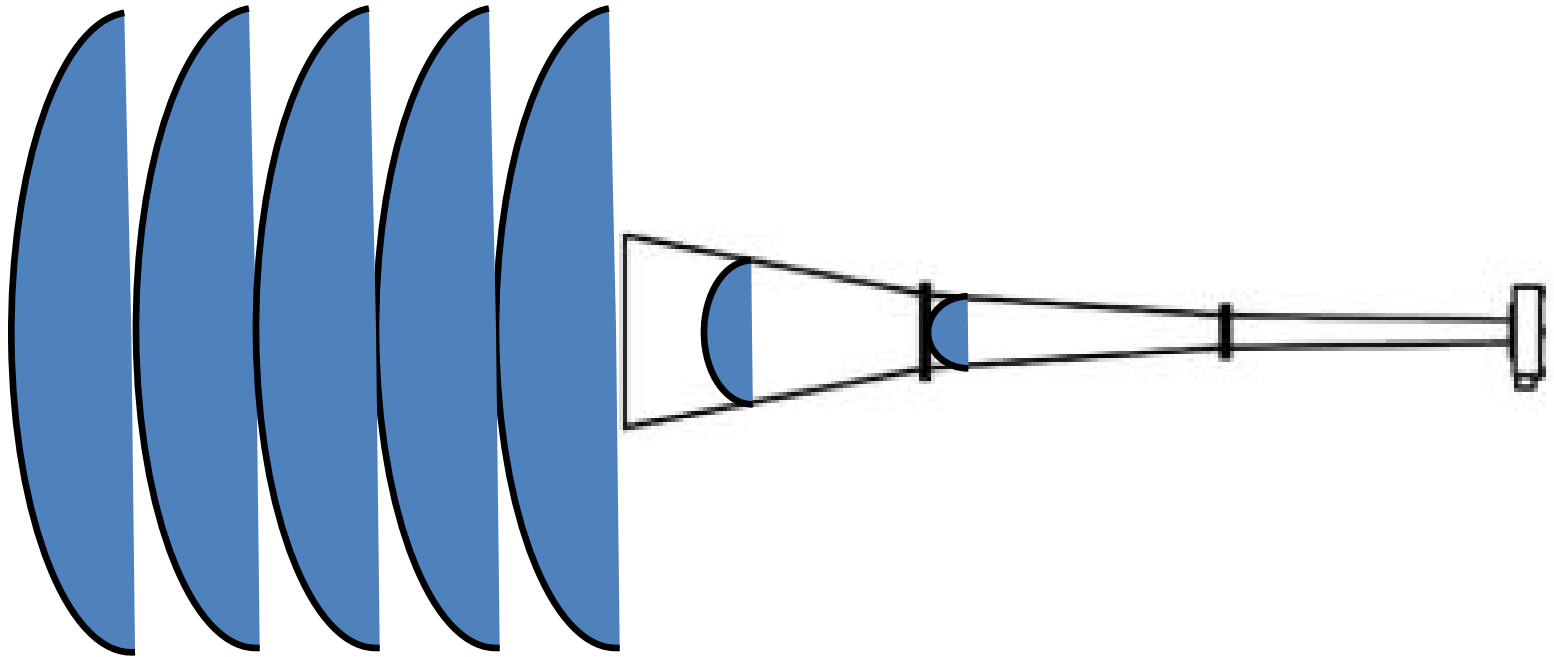
**Jake Shelton**  
SCR-Tech  
jks@coalogix.com

# Principle of Operation



Acoustic cleaners are air operated horns that produce low frequency/high energy sound waves

# Principle of Operation

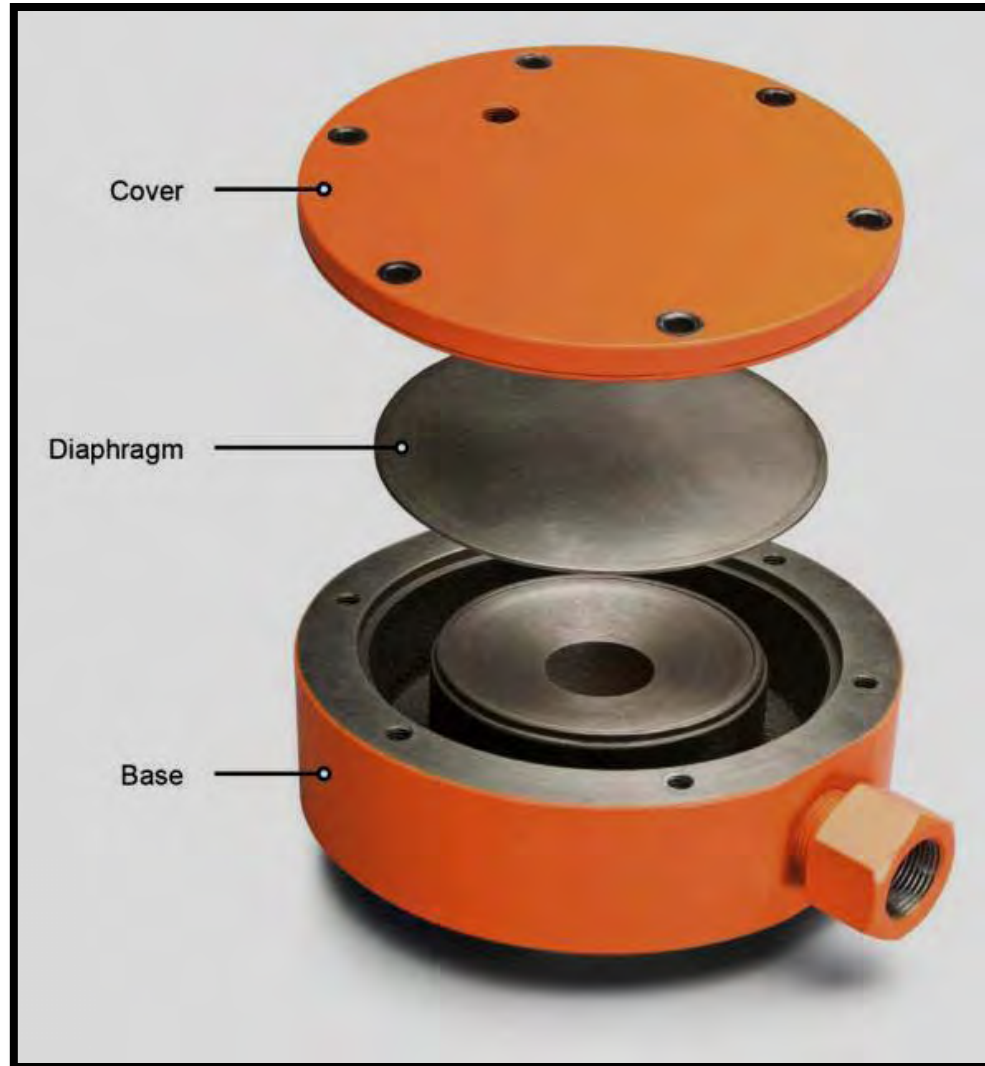


The sound waves cause particulate deposits to resonate and dislodge from structural and catalyst surfaces.

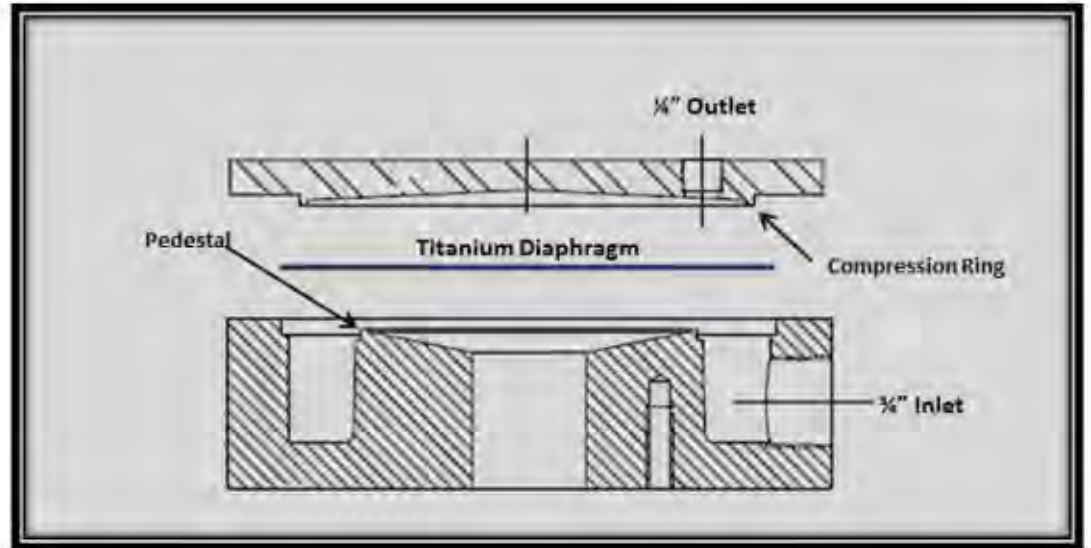
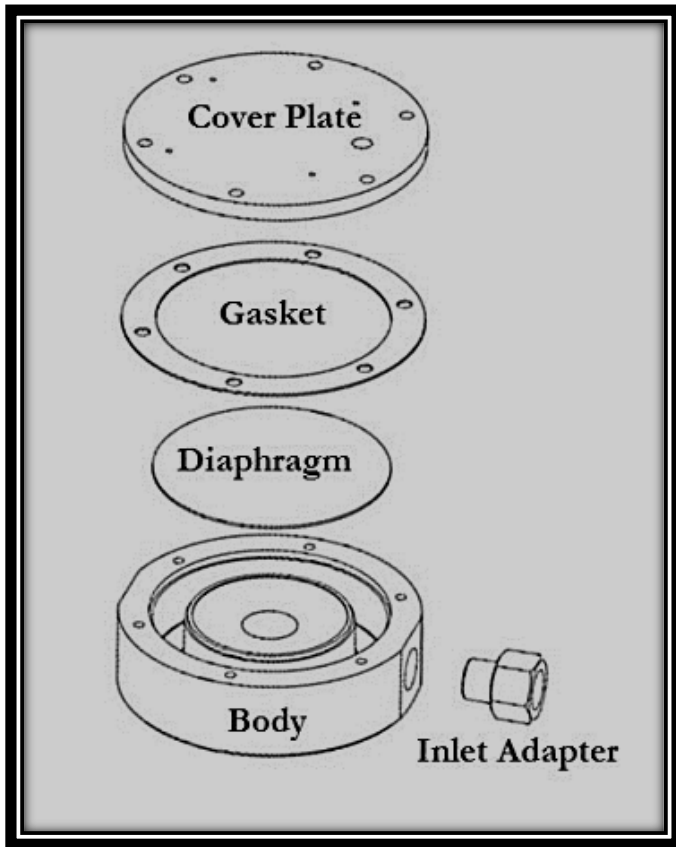
# Resonation Video



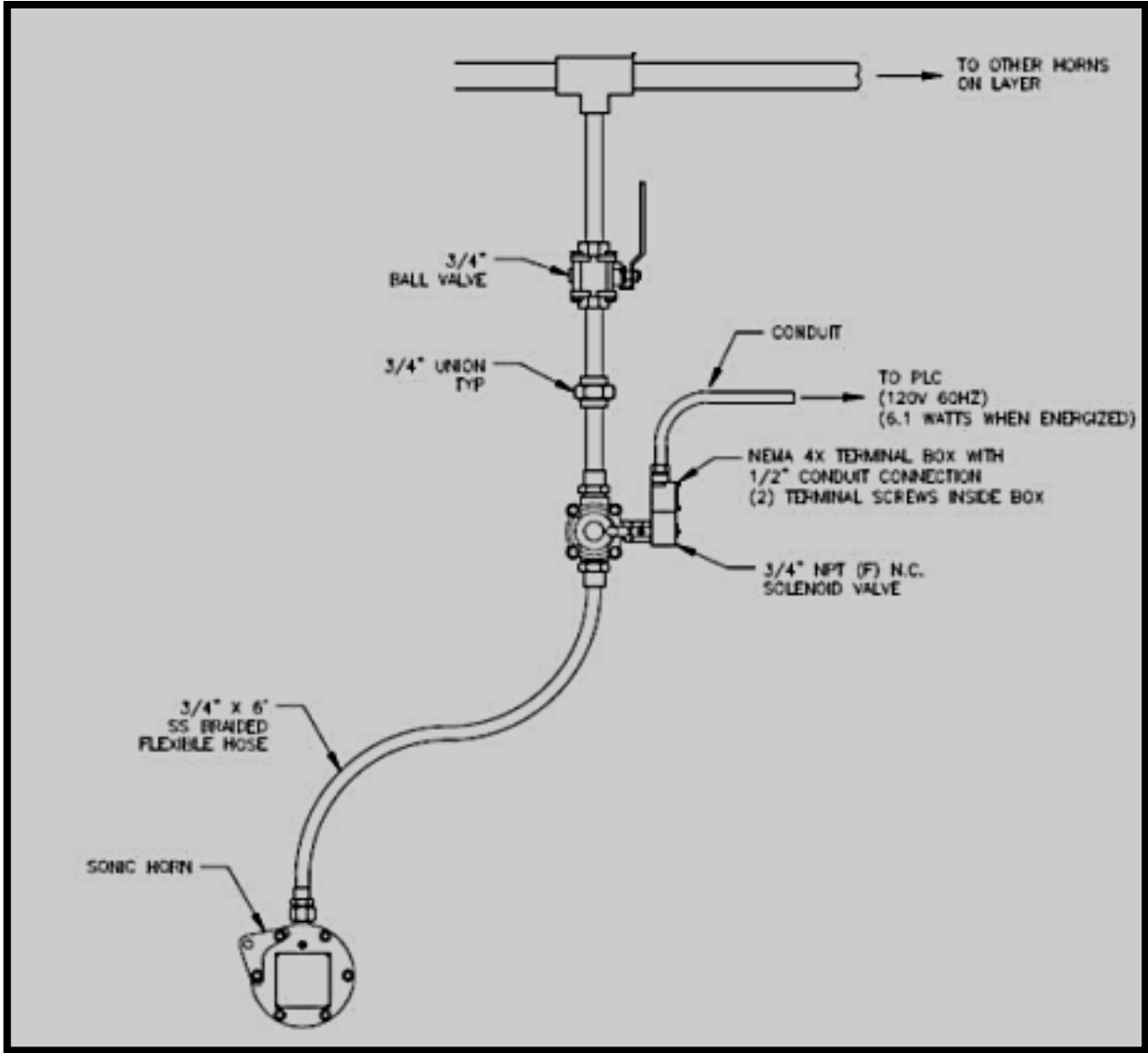
# Sound Generator



# Sound Generator



# Air Piping Arrangement



# Air Requirements

## **Air Pressure:**

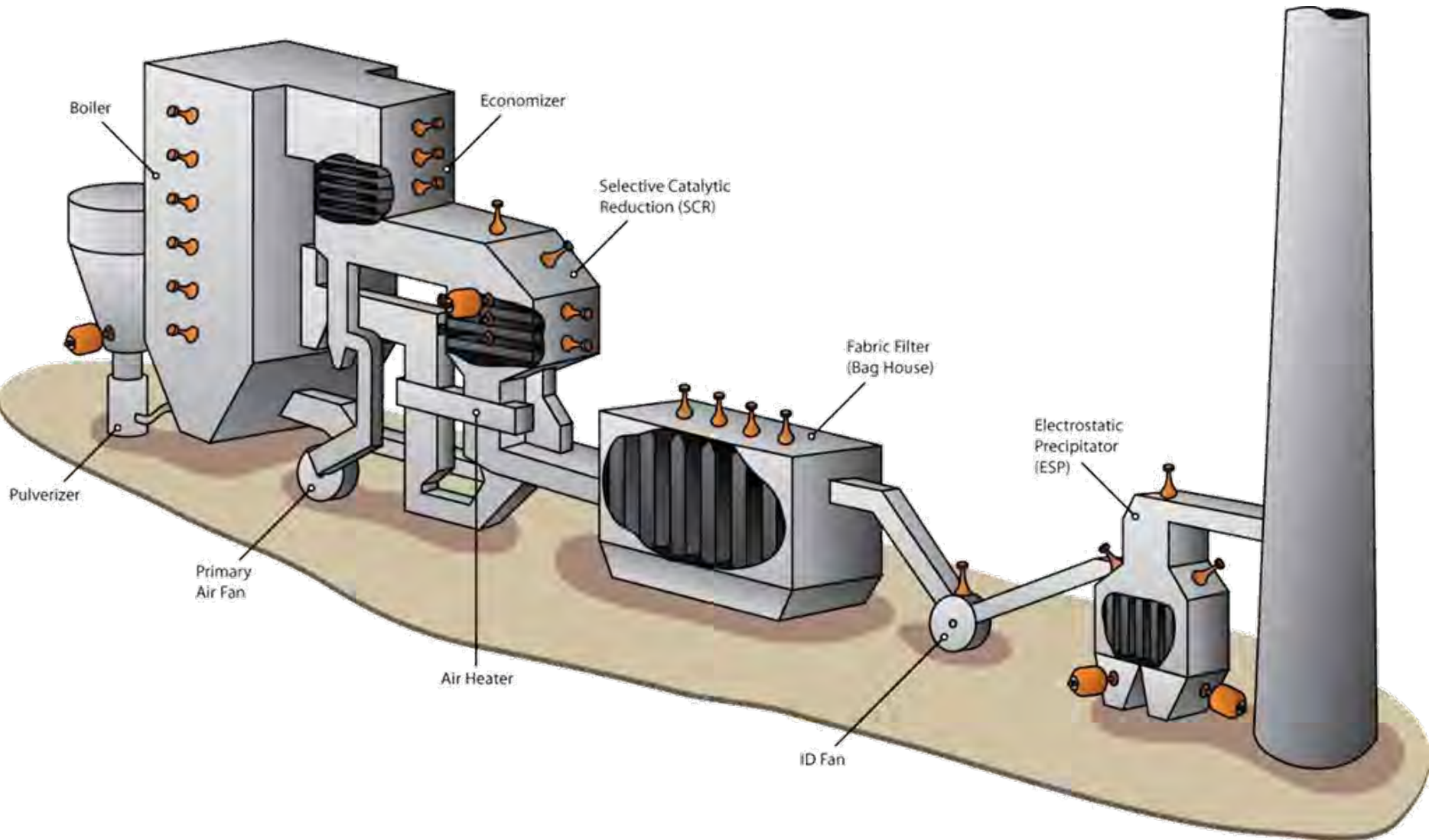
**70 – 90 PSI**

## **Air Consumption:**

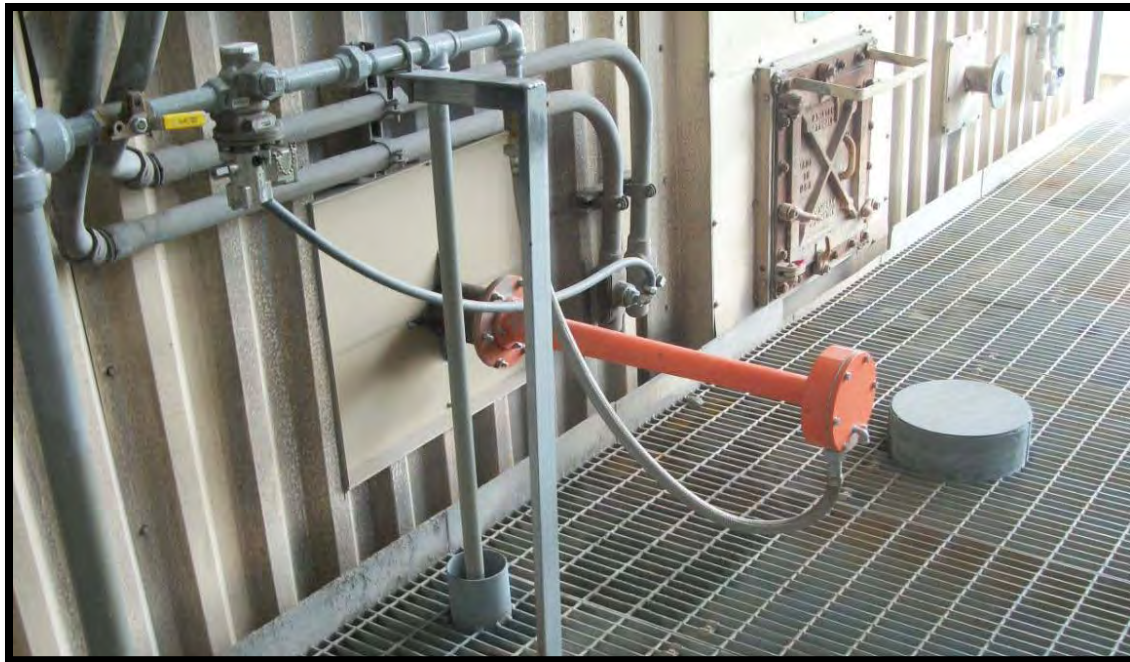
**60 – 80 SCFM**

The typical operating cycle for acoustic cleaners is to sound each acoustic cleaner for 10 seconds every 10 minutes. The air consumption during the sounding cycle is 13 SCF of air.

# Utility Industry Applications



# Cleaning Heat Transfer Surfaces



# SCR Reactors



# **Installation Justifications For Precipitators**

- ❖ Improve Efficiency of Rapping Systems
- ❖ Elimination of Hopper Pluggage
- ❖ Increased Collection Efficiency
- ❖ Increased ESP Up-Time
- ❖ Reduced Maintenance Costs

# Acoustic Cleaners – Precipitator Applications

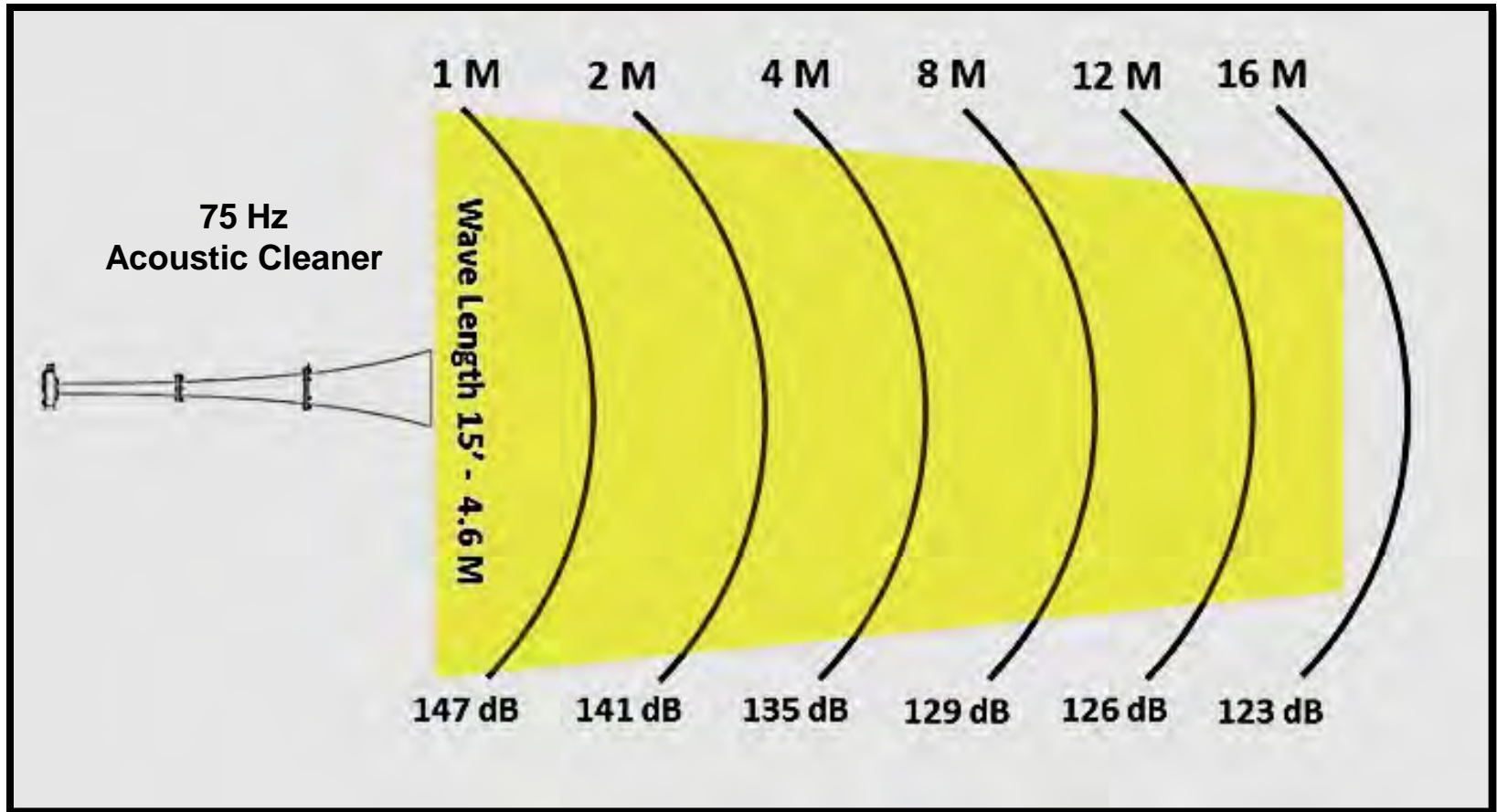


**Frequency:**  
**75 Hz**

**Sound Pressure Level:**  
**147 to 152 dB**



# Effective Cleaning Area

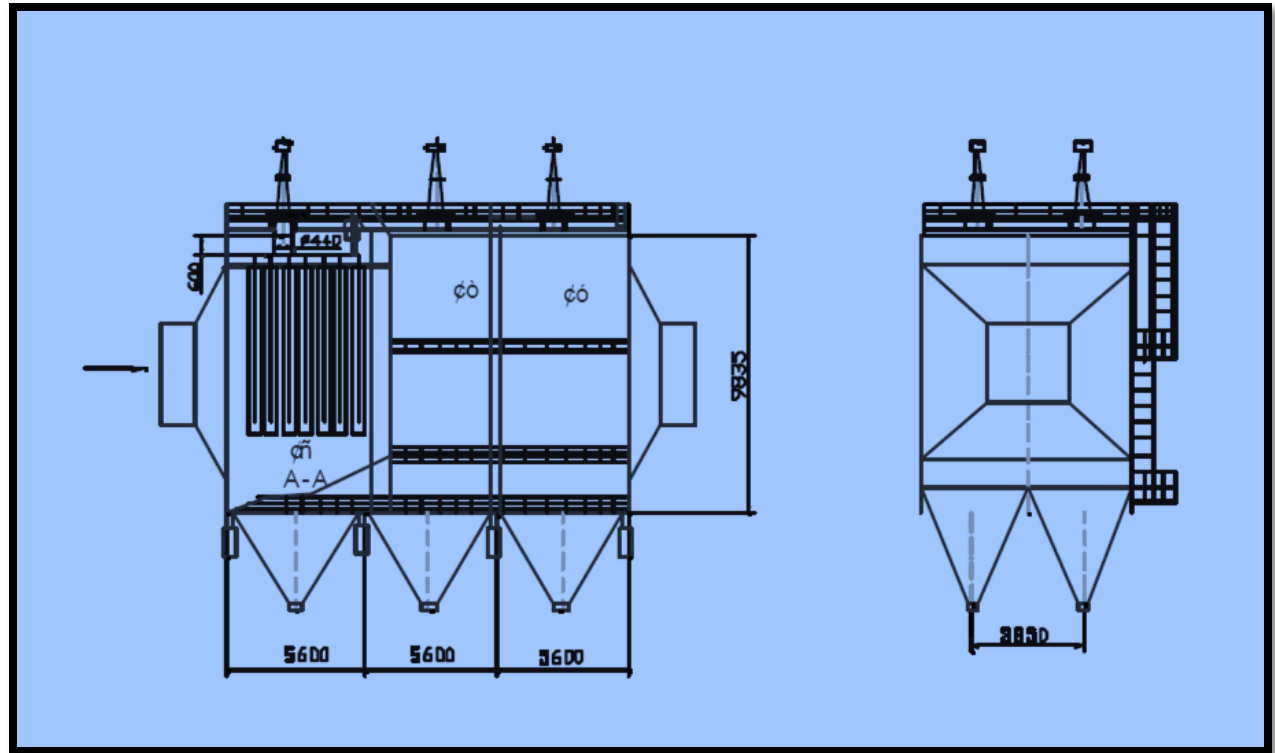


**Black Lines – Wave Length**  
**Yellow Shade – Cleaning Pattern**

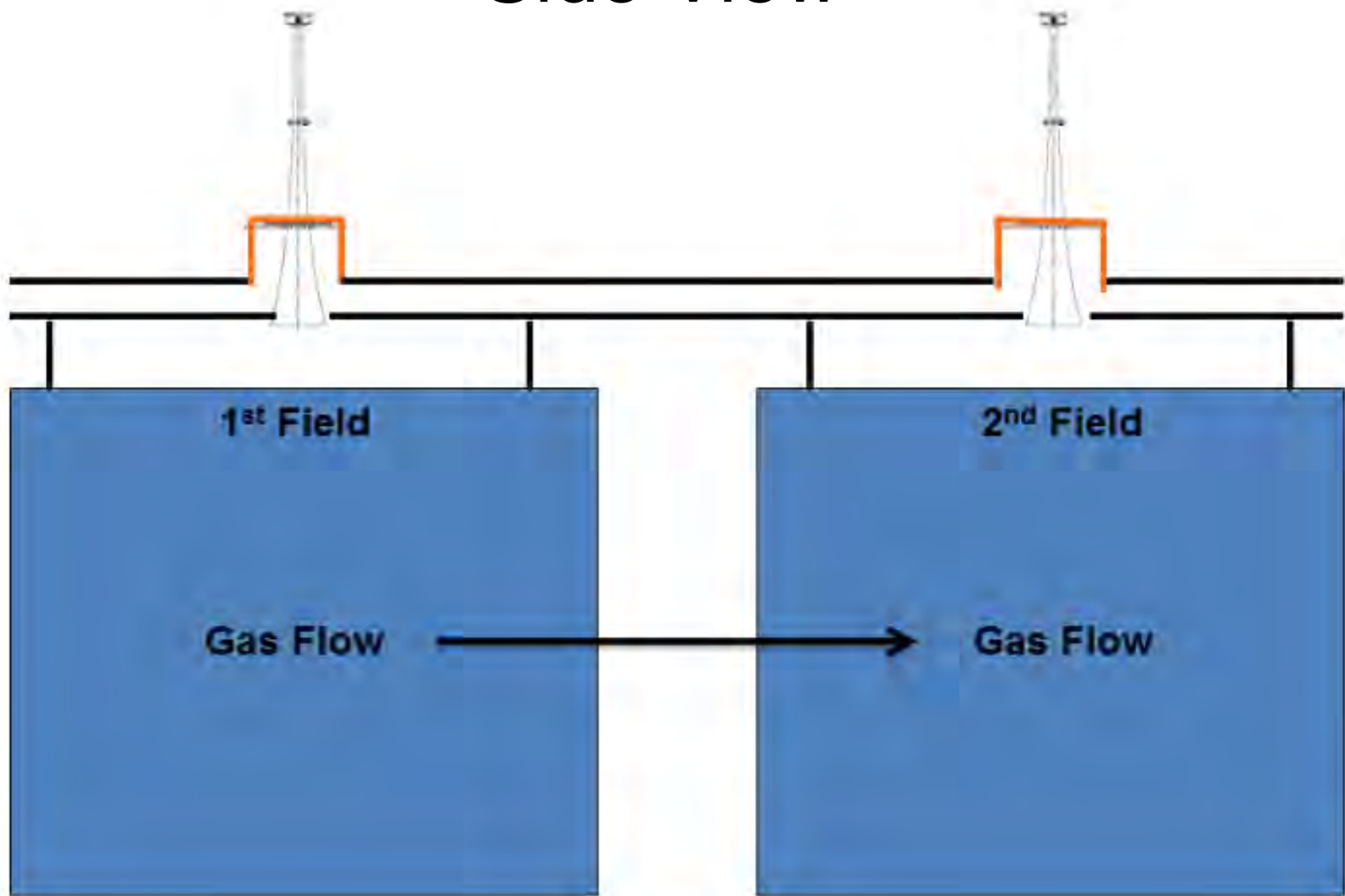
# Acoustic Cleaners – Precipitator Applications Guidelines:

Acoustic Cleaners can be installed in these areas:

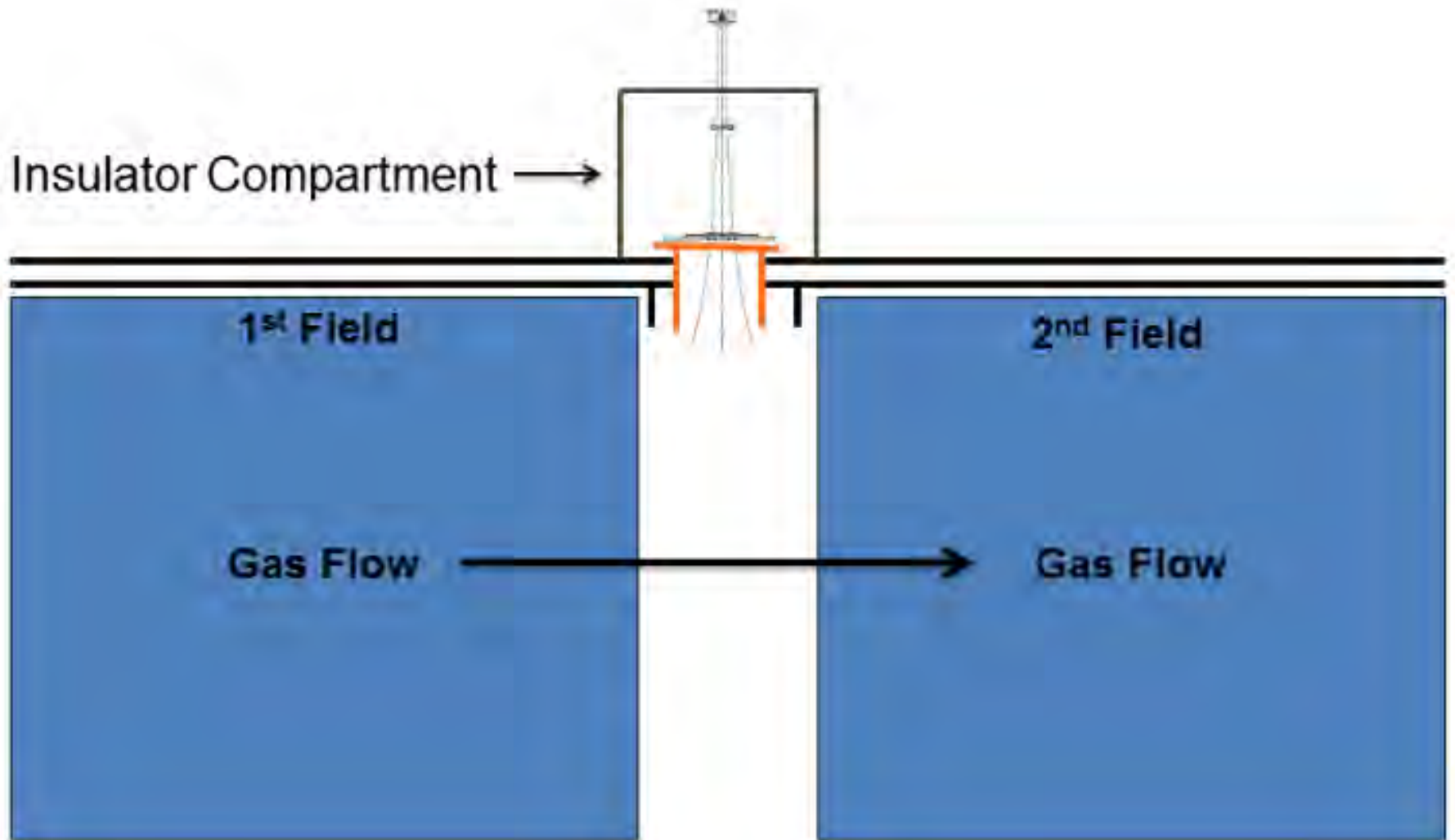
- On the hot roof, above each field
- On the inlet duct
- On the hopper sections



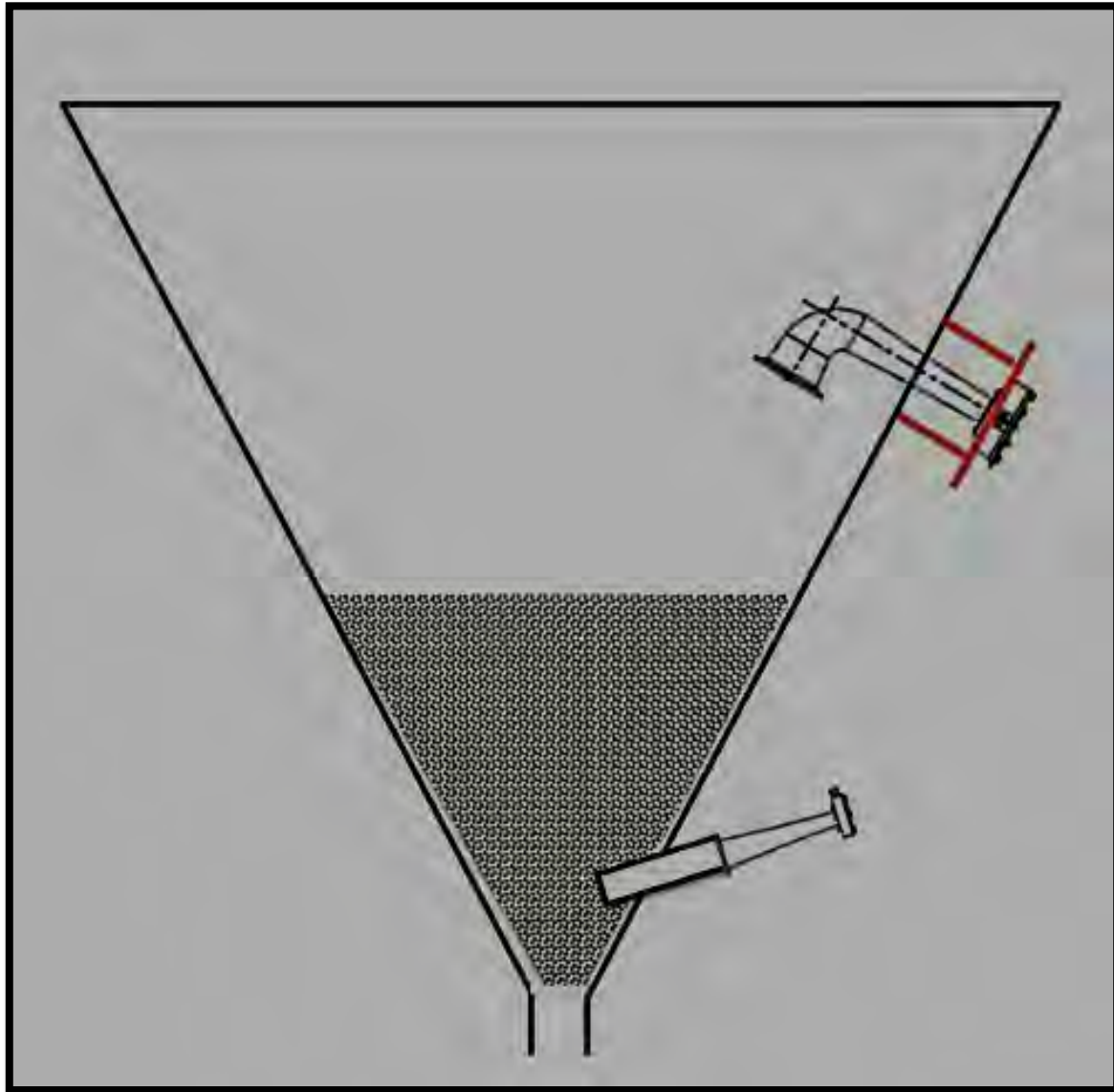
# Curtain Design Side View



# Rigid Frame Precipitator Side View



# Precipitator Hopper Application



# Precipitator Hopper Video



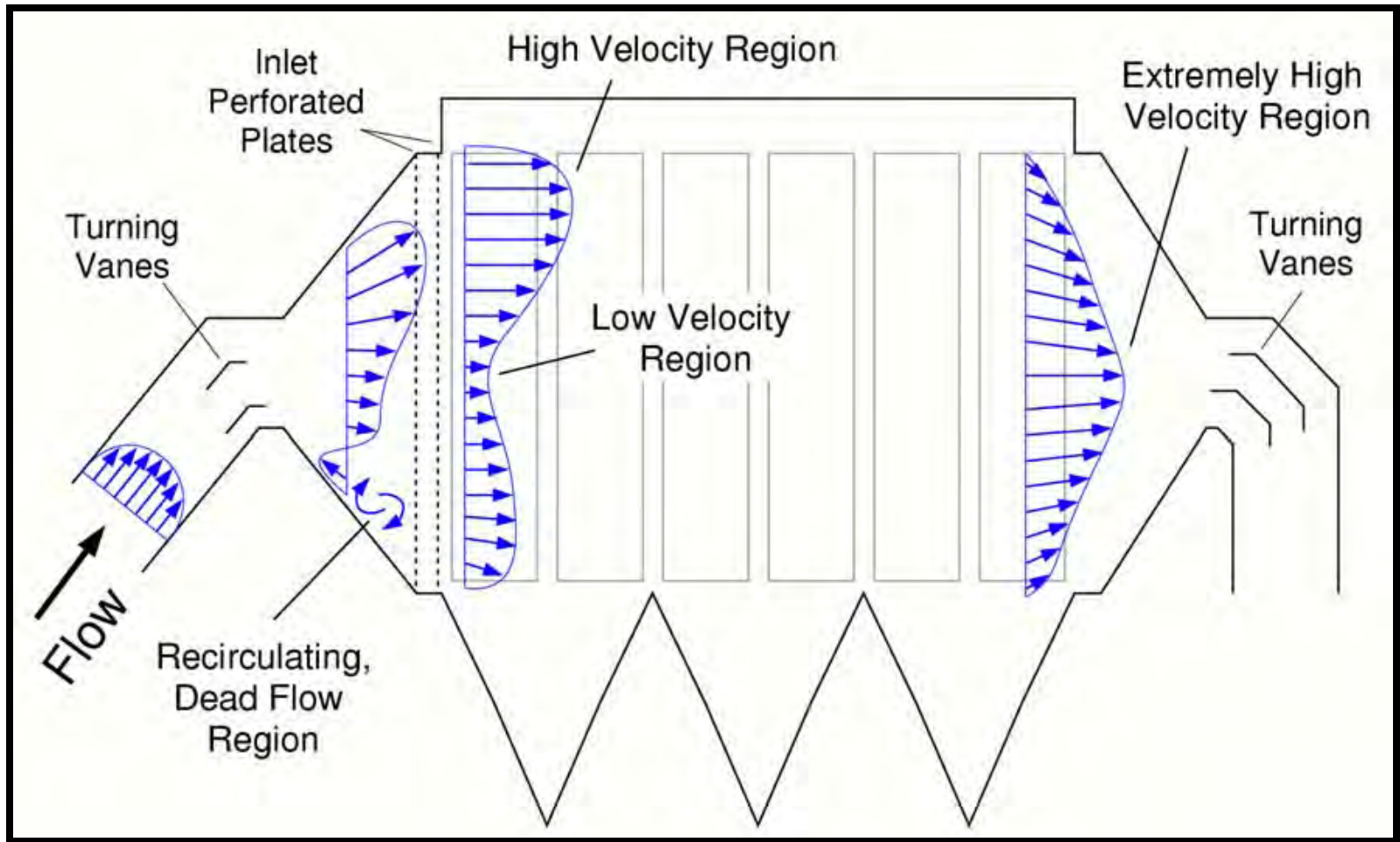
# Tampa Electric - Big Bend Power Station Apollo Beach, Florida



Unit 4 - 485 MW (1985)

*Fuel:* High Sulfur Eastern Bituminous Coal with up to 20% pet coke

# Precipitator Illustration



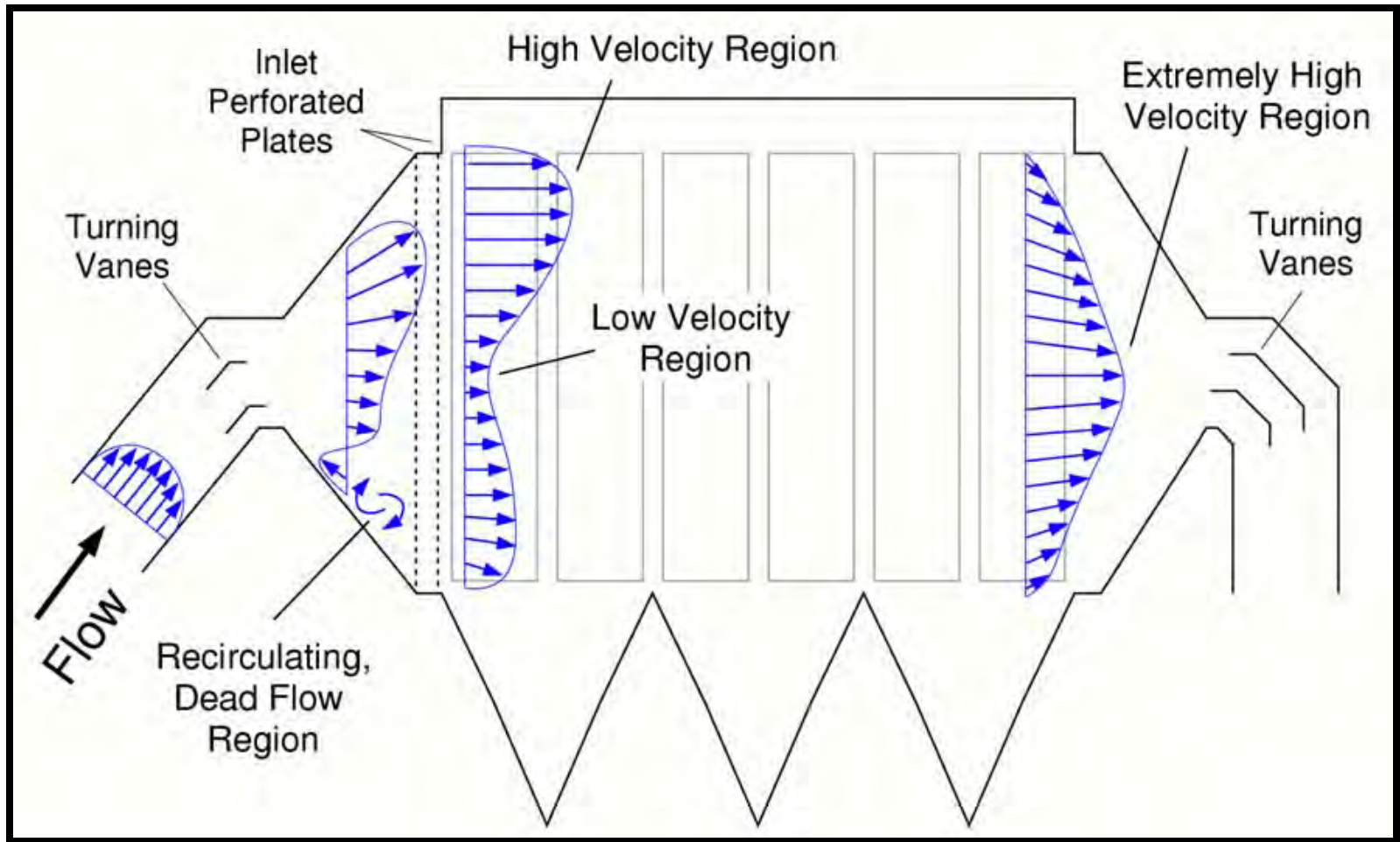


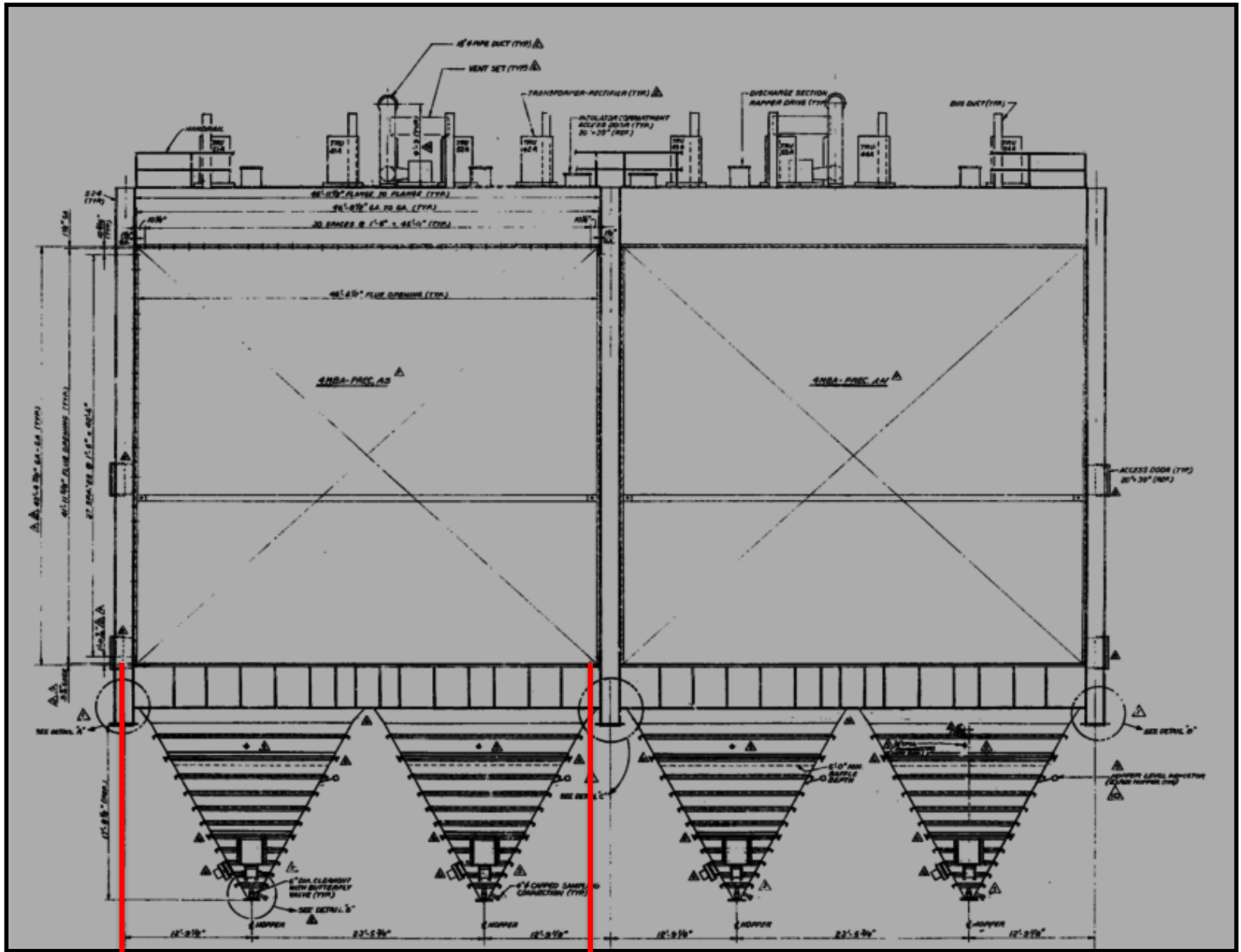






# Precipitator Illustration





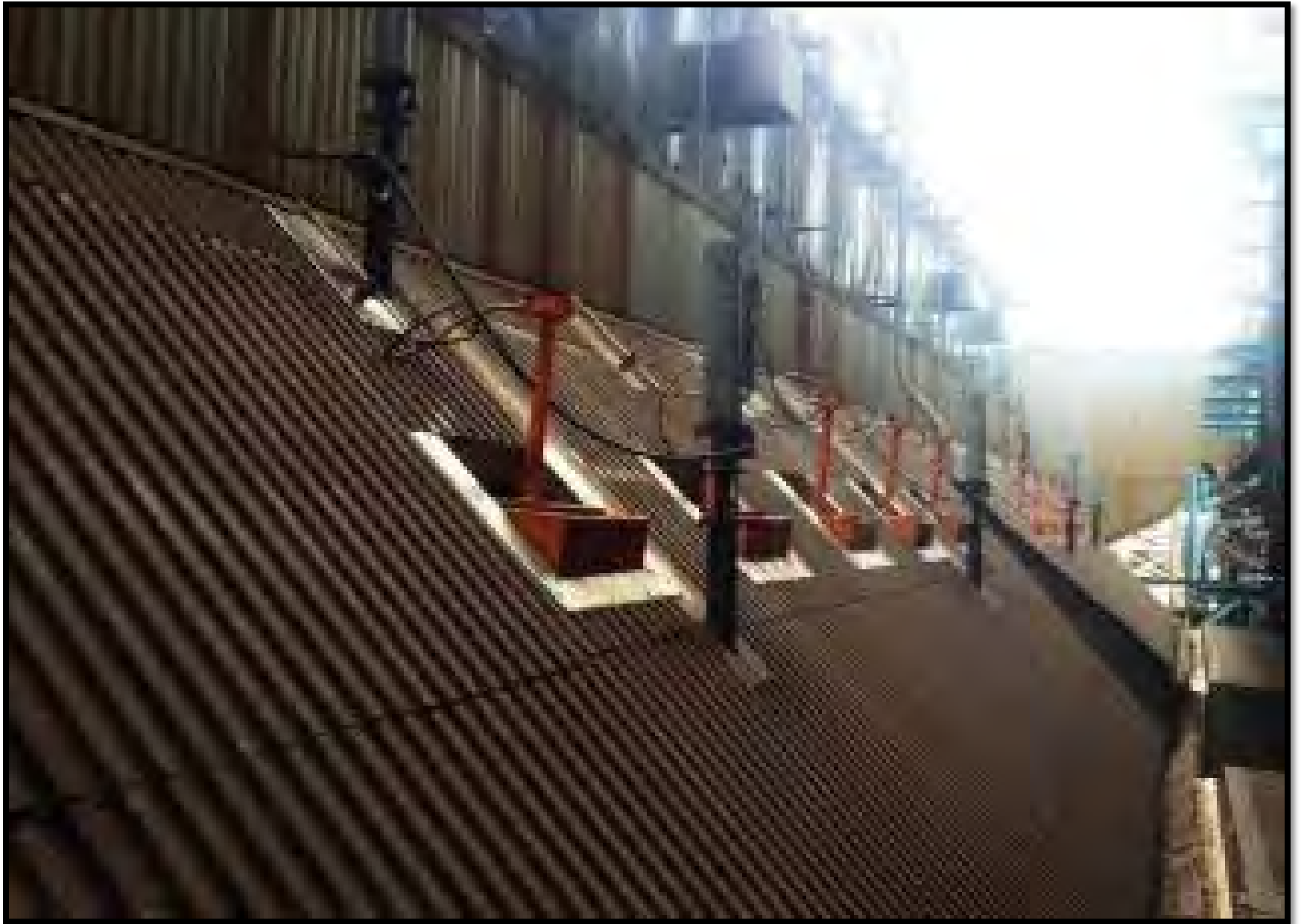
50'

8 existing Rappers that are attached to the 4 distribution plates.

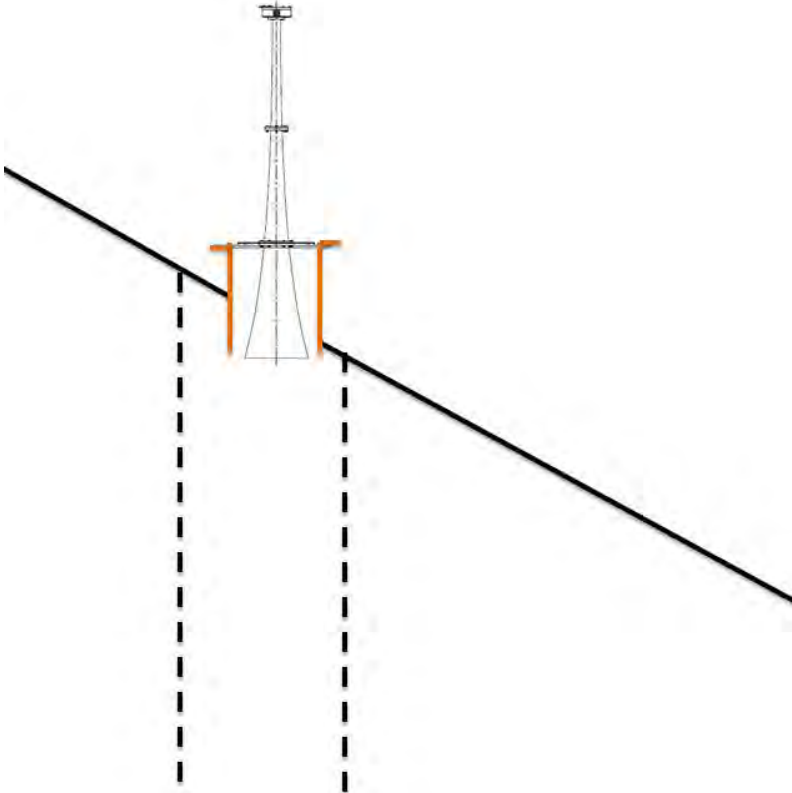
Customer recommended locations for the other 5 Sonic Horns on second inlet precipitator.

Install 10 Sonic Horns five (5) per duct adjacent to support beams that are 4 feet apart between the two distribution plates that are on each inlet to number 4 precipitator.

02.13.2012 11:37



# 75 Hz Acoustic Cleaner Installed On Sloped Inlet Ductwork





East Precipitator Inlet Nozzle









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# Questions?



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