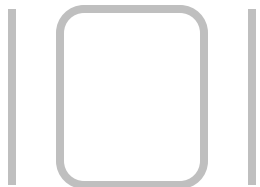
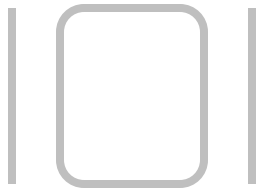


# ATR Installation & Inspection

How to get the most from your Automatic Traffic Recorder Installation



# ATRs



## Automatic Traffic Recorders:

A permanent installation of traffic counting equipment installed alongside a road. ATRs typically consist of one or more types of sensors installed in or near a roadway leading to a cabinet.

# Types of ATRs



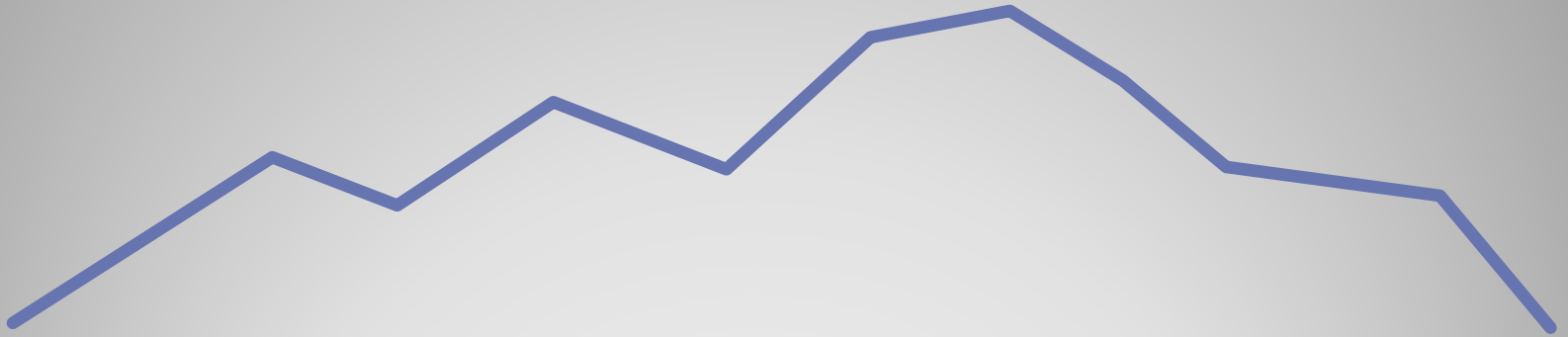
- Typical Passive ATRs
  - No Power / Communication
  - Inductive Loops
  - Volume Data
- Typical Continuous ATRs
  - Power / Communication
  - Inductive Loops
  - Piezos
  - Volume and Class Data

# Types of Data

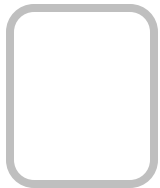
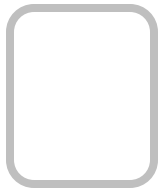


- Volume
  - Can be collected with one sensor per lane
  - Inductive loops or piezo
- Class
  - Length based Class
    - Two inductive loops per lane
  - Axle based Class
    - Typical setup piezo-loop-piezo.





# Inductive Loops



# Inductive Loops



- A sensor usually consisting of 3 or 4 turns of 12-14 gauge wire embedded in a rectangular ( often 6' x 6') pattern. The loop is connected to a detector that places an electric charge through the loop wire, thus generating an inductive (magnetic) field. When a vehicle travels through the inductive field, it causes the field to change its inductance, and is then counted by the traffic counter.

# Inductive Loop Installation



- Saw Cut Method
  - Typically in Concrete
  - Easy to Locate
  - Affected by Rutting
  - Not preferred Method



**Saw Cut Loops**



**Saw Cut Loops**





**Saw Cut Loops**



**Saw Cut Loops**

# Inductive Loop Installation



- Sub-Pavement Method
  - Typically in Asphalt
  - Longer Lasting
  - Immune to Rutting
  - Harder to Locate
  - Harder to Replace Wire
  - Smooth Surface





**Sub-Pavement**





**Sub-Pavement**





**Sub-Pavement**





**Sub-Pavement**



**Sub-Pavement**





**Sub-Pavement**





**Sub-Pavement**





# Sub-Pavement





# Sub-Pavement



# Sub-Pavement





# Sub-Pavement



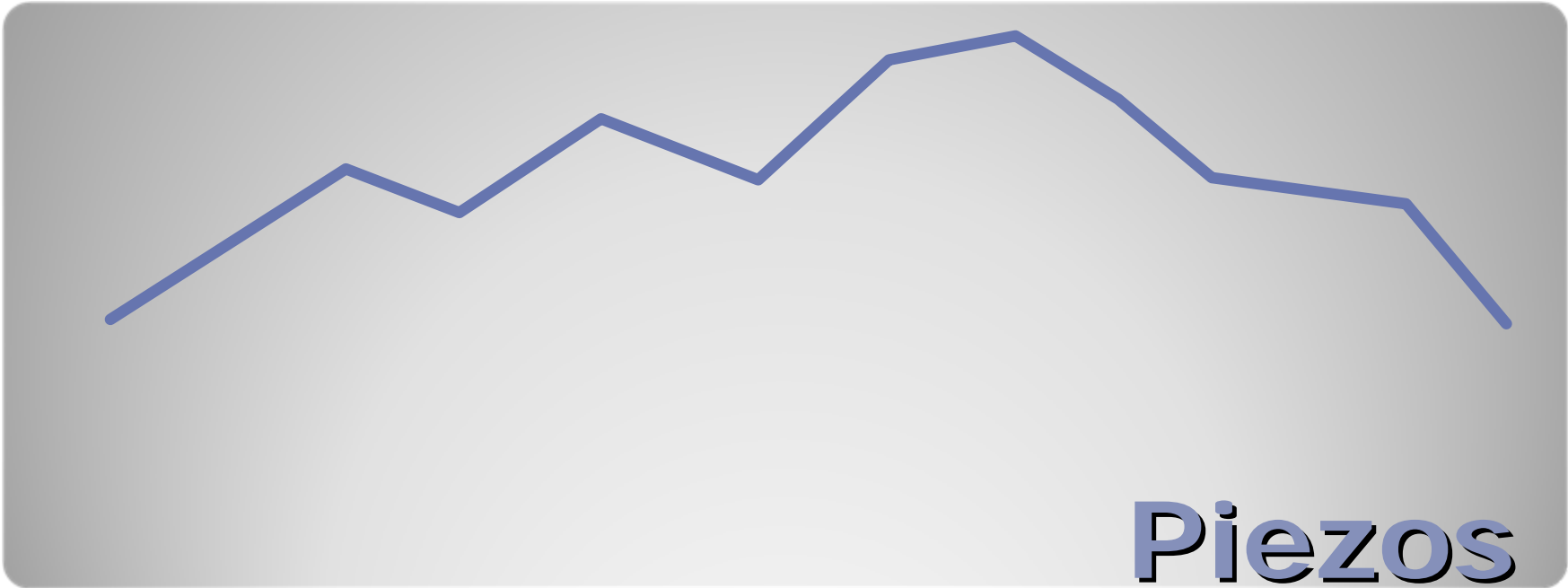


# Sub-Pavement





# Sub-Pavement



Piezos



# Piezos



- A sensor consisting of a length of piezoelectric material encased within some type of housing. The sensor is installed across a roadway and is used to detect axles. Whenever a vehicle's axles run over the sensor, the pressure on the piezoelectric material is converted into an electronic signal that can be detected by a traffic counter.



**Piezo Installation - Saw Cut**





## Piezo Installation - Placement



## Piezo Installation - Placement

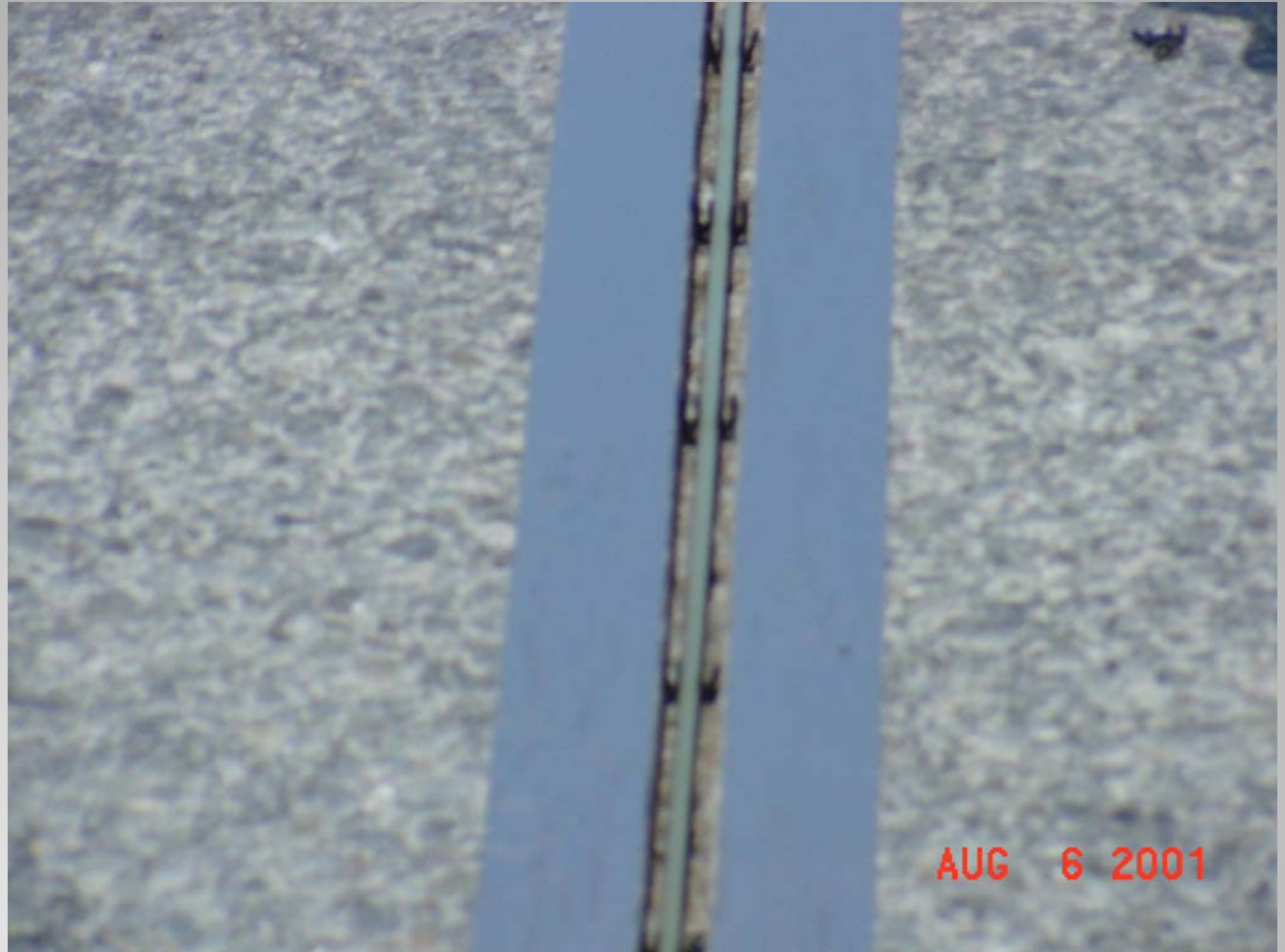




**Piezo Installation - Placement**



**Piezo Installation - Placement**



## Piezo Installation - Placement





**Piezo Installation - Placement**





**Piezo Installation - Placement**



## Piezo Installation - Placement





## Piezo Installation - Placement



**Piezo Installation - Placement**





# Piezo Installation - Epoxy



# Piezo Installation - Epoxy





# Piezo Installation - Epoxy





# Piezo Installation - Epoxy





## Piezo Installation - Epoxy



**Piezo Installation - Epoxy**





**Piezo Installation - Clean up**



**Piezo Installation - Clean up**



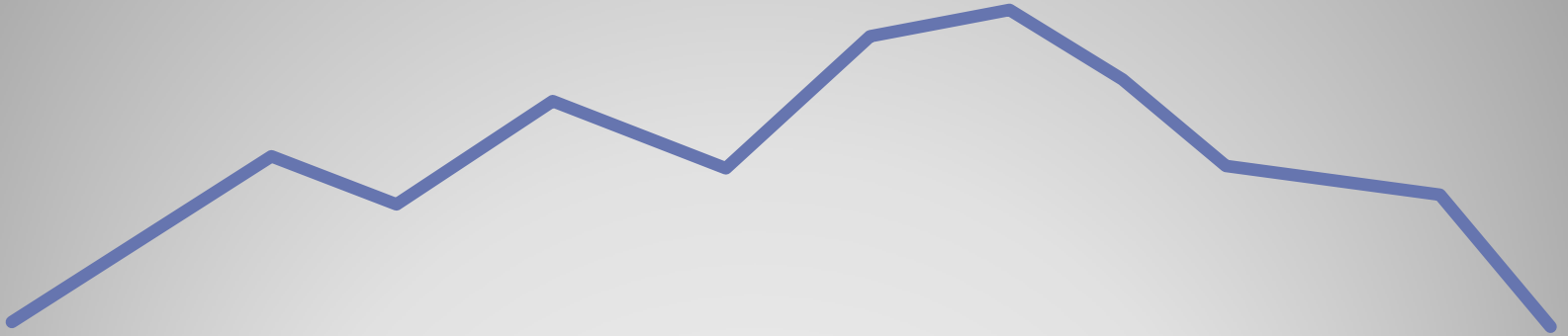


## Piezo Installation - Clean Up



**Piezo Installation - Grind**





**Cabinets**



- Typical CBA1 Cabinets
  - No Power
  - No Communications
  - Inductive Loops
  - Contains Traffic Counter
  - Volume Only
  - Short term Counts

## Cabinets





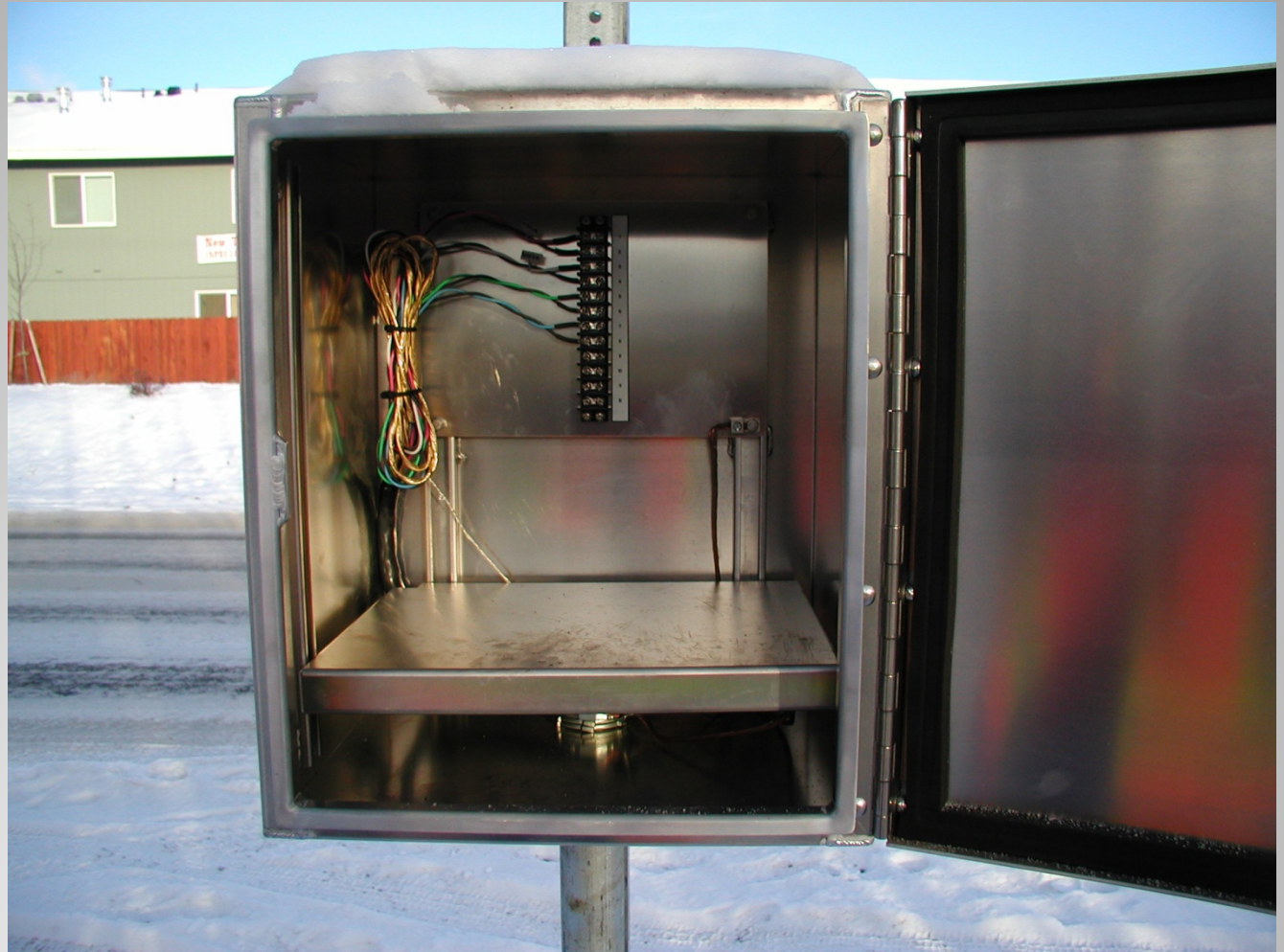


**Cabinets – CBA1**



**Cabinets – CBA1**





**Cabinets – CBA1**



**Cabinets – CBA1**





**Cabinets – CBA1**

- Typical CBA2 Cabinets
  - Power
  - Communications
  - Inductive Loops
  - Piezos
  - Contains Traffic Counter
  - Other Equipment
  - Volume and Class
  - Continuous Counts

## Cabinets







**Cabinets – CBA2**



**Cabinets – CBA2**





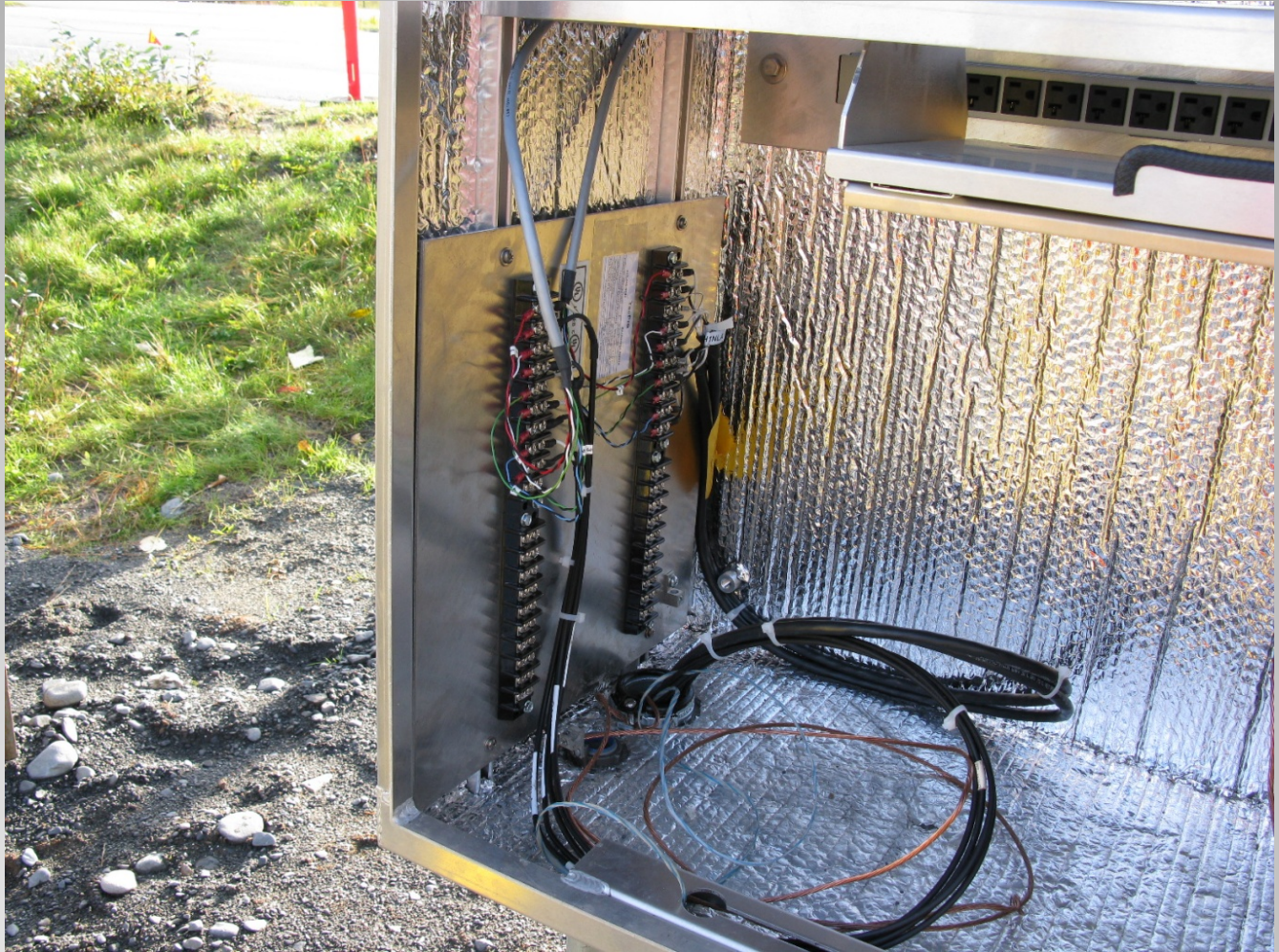
**Cabinets – CBA2**



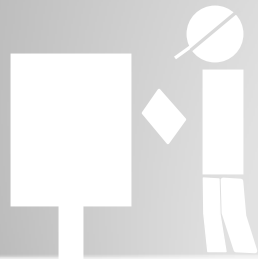
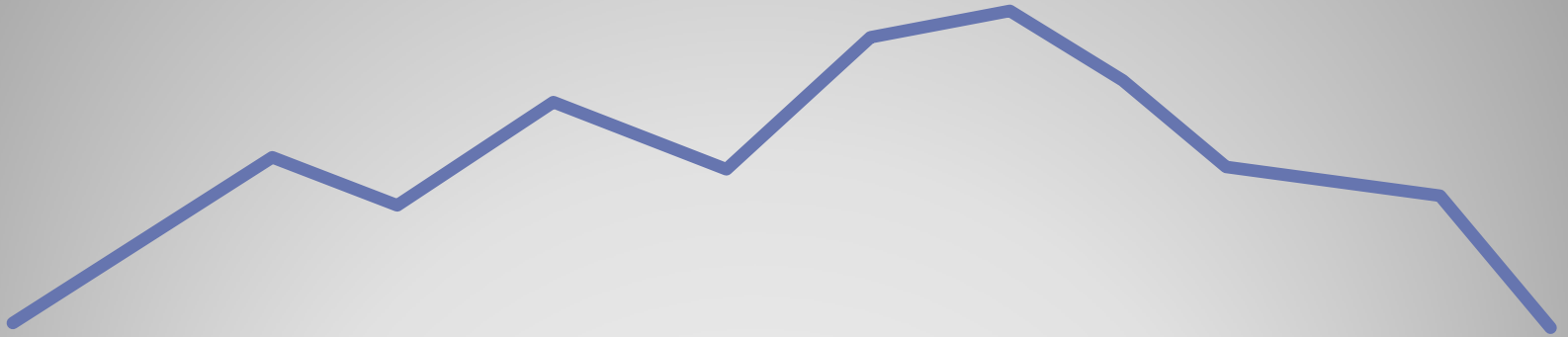


**Cabinets – CBA2**

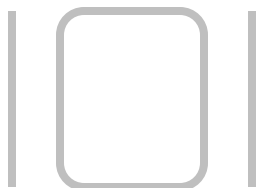
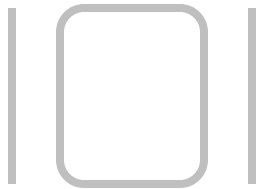




**Cabinets – CBA2**



# ATR Inspection







## **ATR Inspection – Loops**



## ATR Inspection – Piezos





## ATR Inspection – Jboxes



## ATR Inspection – Splices





## ATR Inspection – Splices





## ATR Inspection – Splices





**Cabinets – CBA1**



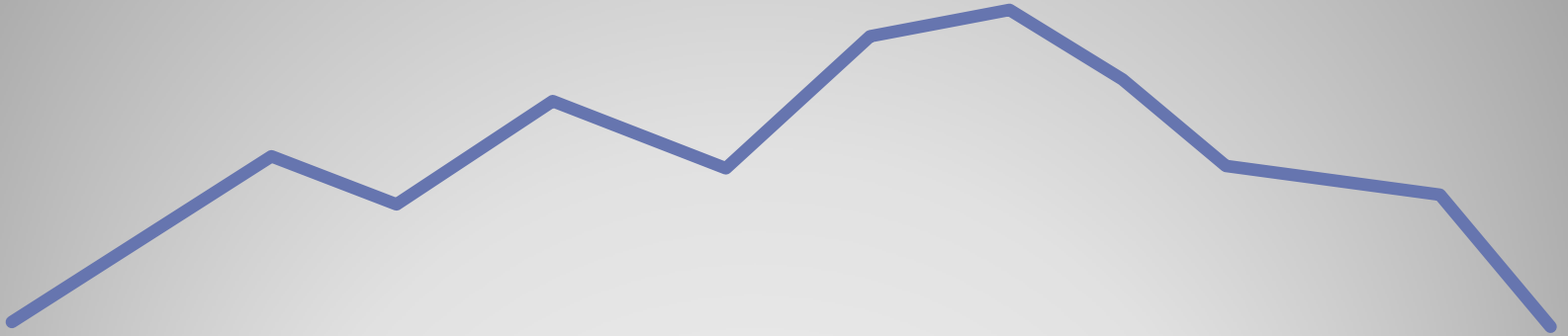
## **ATR Inspection – Cabinets**



# Conclusion



- Good Design
- On-Site Inspection
- Thorough Testing



Questions?

