



# Lightning Protection System Inspection & Maintenance

Presented by Jeff Regan

Sponsored by:



Session 2: *Power & Lightning (Surge)  
Protection*

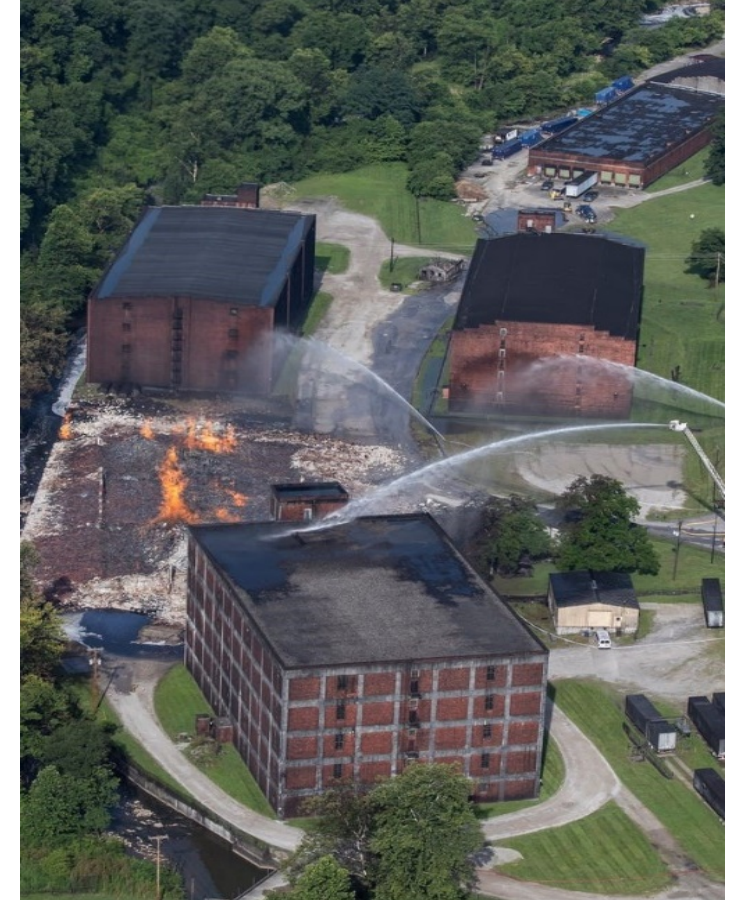
February 17, 2021

## Outline

- Maintaining the Investment
- Visual Inspection
- Theft
- Testing
- Maintenance Procedures
- Maintenance Records & Warranty

## Maintaining the Investment

- Historically, less than 2% of all systems are re-inspected or recertified
- These structures had systems installed but were not maintained
- Owner's initial investment was wasted



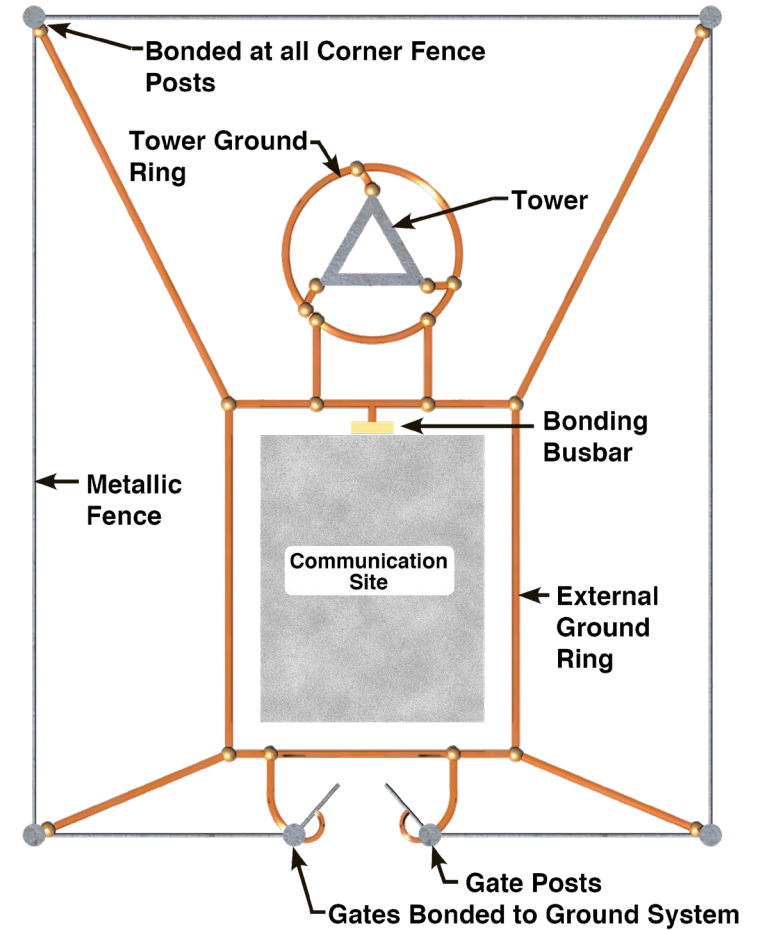
## Maintaining the Investment



- Protect Structural Investment
- Personnel Safety
- Data/Information Security
- Downtime Prevention

## Maintaining the Investment

- To operate as intended for protection against lightning strikes
- Therefore, the system must be properly maintained

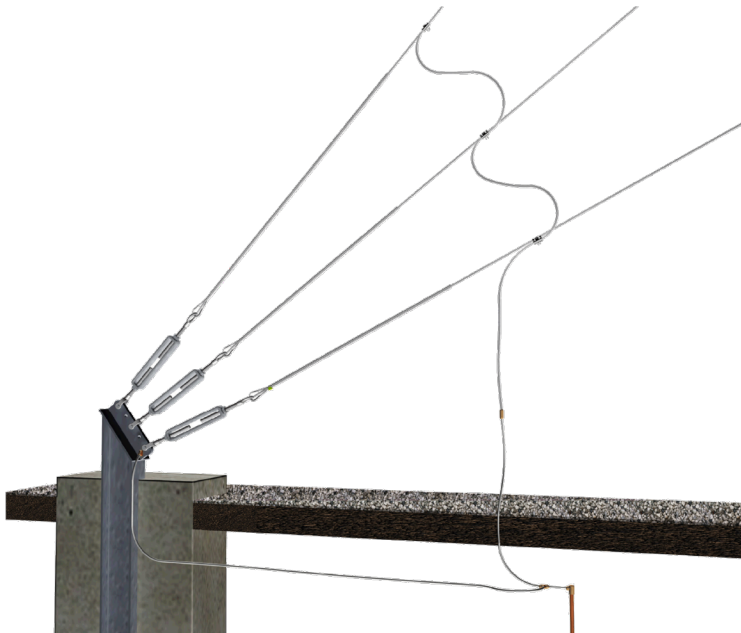


## Maintaining the Investment

- Ensure additions to structure are protected
- Protection should be verified prior to changes being made and adjustments done at time of commissioning.



## Visual Inspection



- Annual
- Semiannual with extreme climatic changes
- Known lightning event

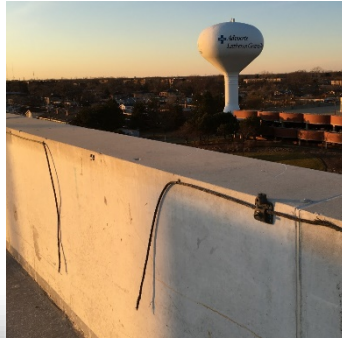
## Visual Inspection

- Anytime the system or building has been altered
- Other specified frequency (AHJ)
- The system complies with current editions of the standards

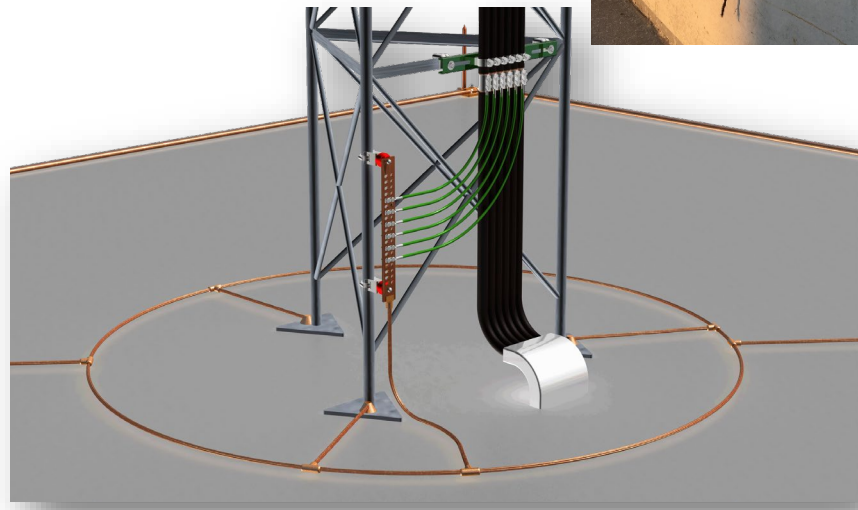




## Visual Inspection

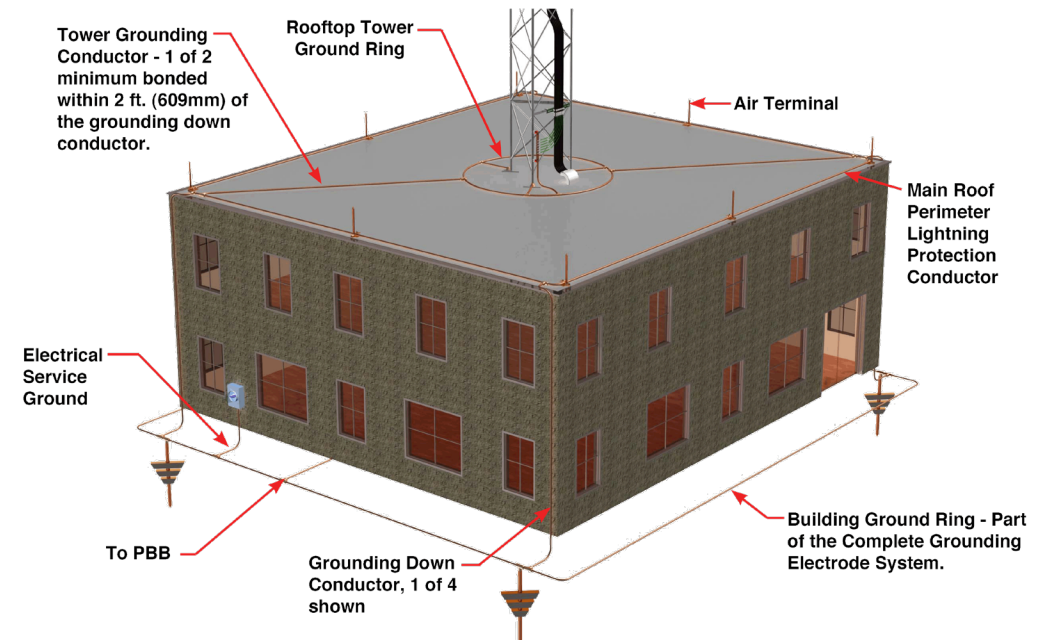


- The system is in good condition overall
- All connections are tight, and cables are not loose
- The system components are not corroded or damaged by vibration or moving ice and snow



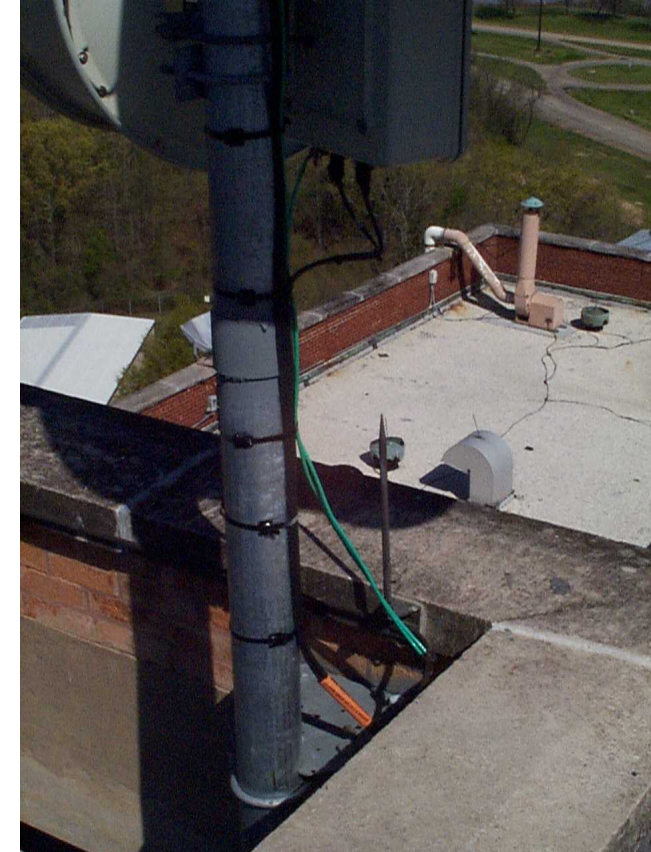
## Visual Inspection

- Down conductors and ground terminals are properly connected
- All conductors and system components remain securely fastened to their mounting surfaces and are protected from mechanical damage or displacement.



## Visual Inspection

- Communications equipment added after the lightning protection system were installed
- Listed parts (for lightning protection) must be used to bond to LP system



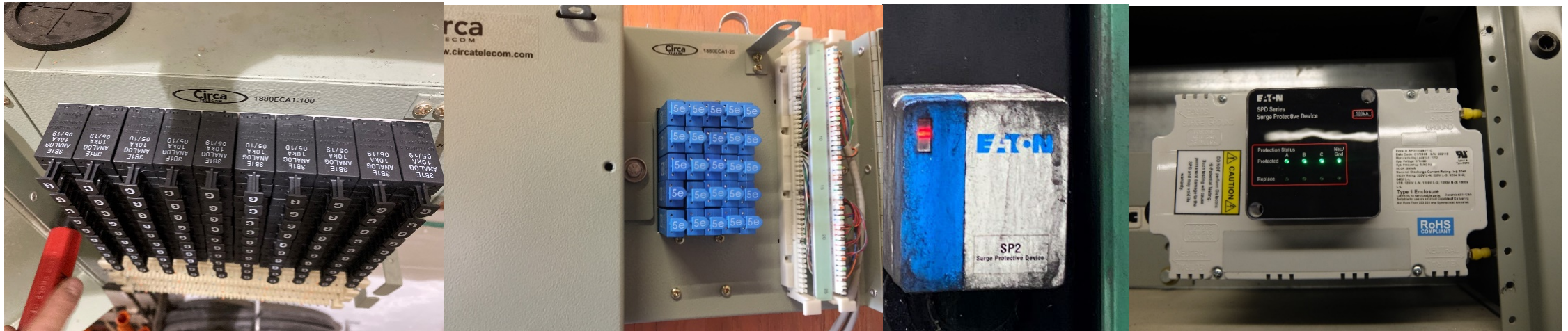
## Visual Inspection Annual Maintenance - Findings

- Camera installed after lightning protection installation
- This can happen before the third party inspection even takes place



## Visual Inspection

- Check that there is no indication of damage to surge protective devices, both electrical and communications



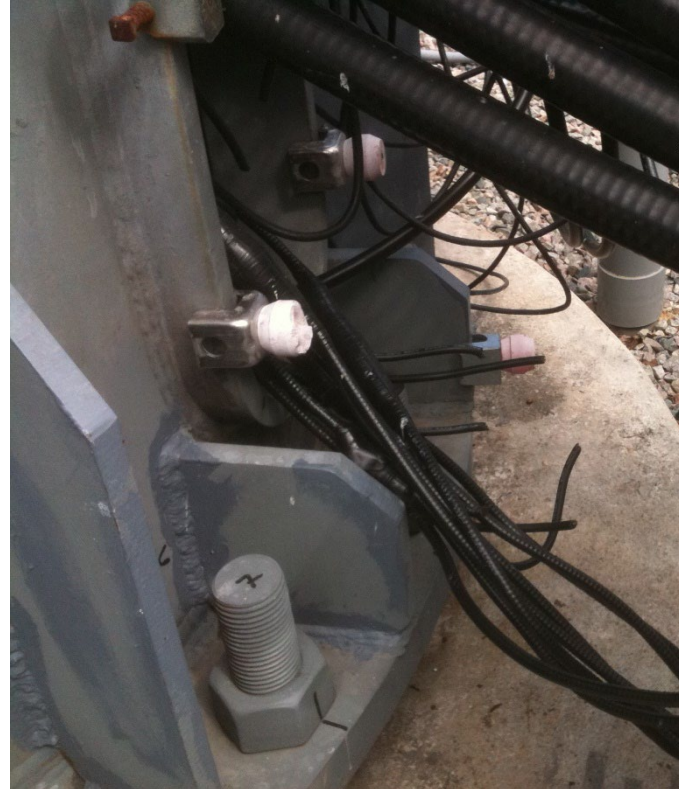
## Visual Inspection



- Galvanic corrosion due to dissimilar metals
- Main sized bonding connection to ladder required

**Theft**

- Ground bars stolen



## Theft

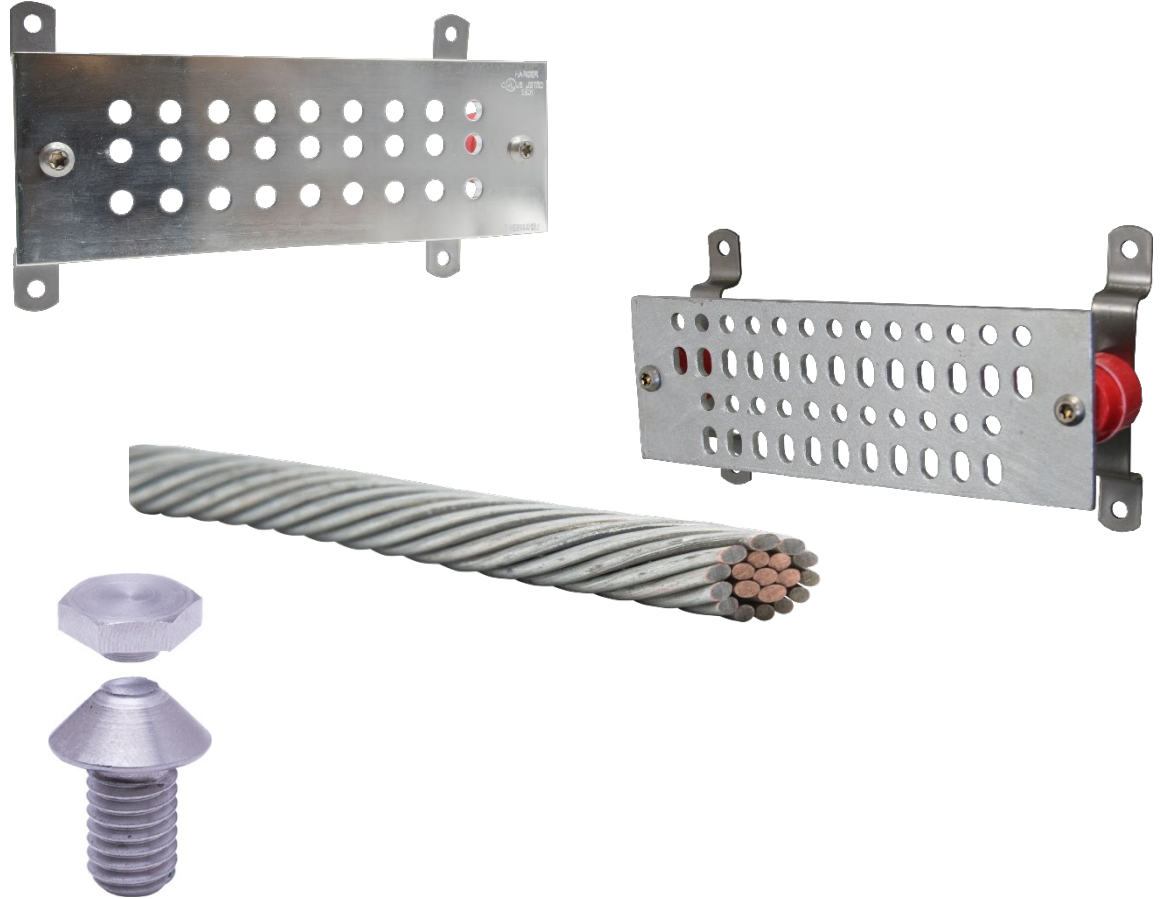
- Cables cut





## Theft

- Deterrents
  - Tinned Ground Bars
  - Galvanized steel bars
  - Theft deterrent conductors
  - Break off hardware



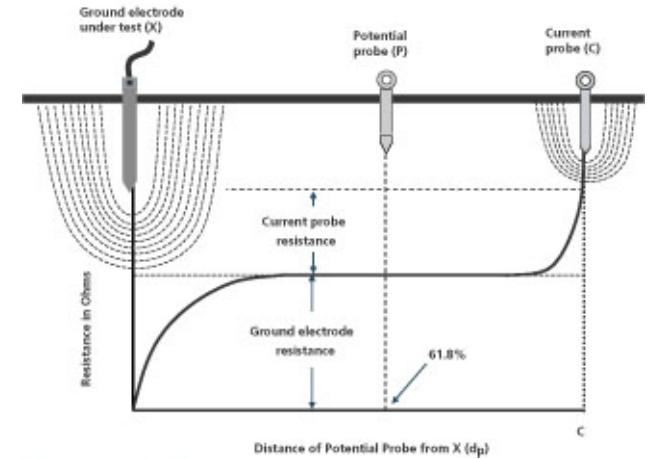
## Testing

- Continuity test of the lightning protection system
- Ground resistance measurements of the ground electrode system



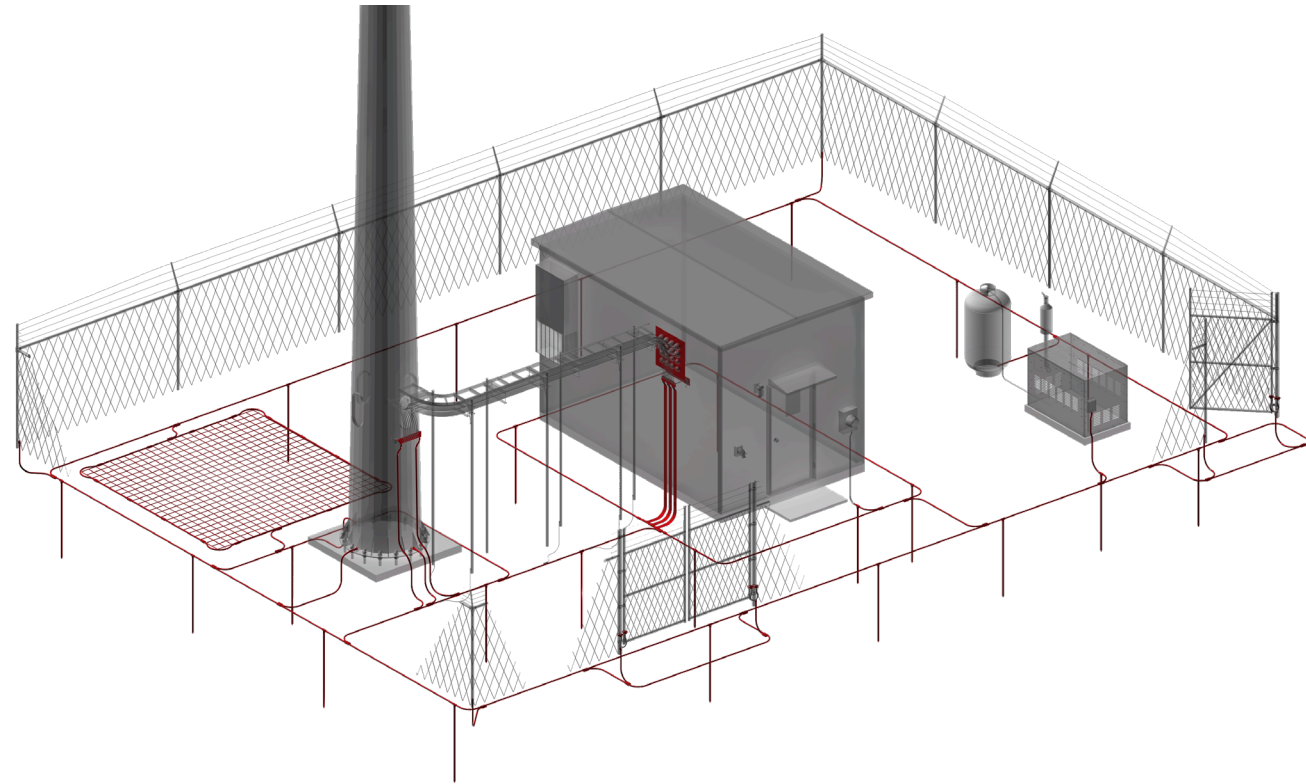
## Testing

- 3 point fall of potential test of grounding system
  - Can not be done if utility is hooked up
- Clamp on test of grounding system
  - Proper location of tester is mandatory

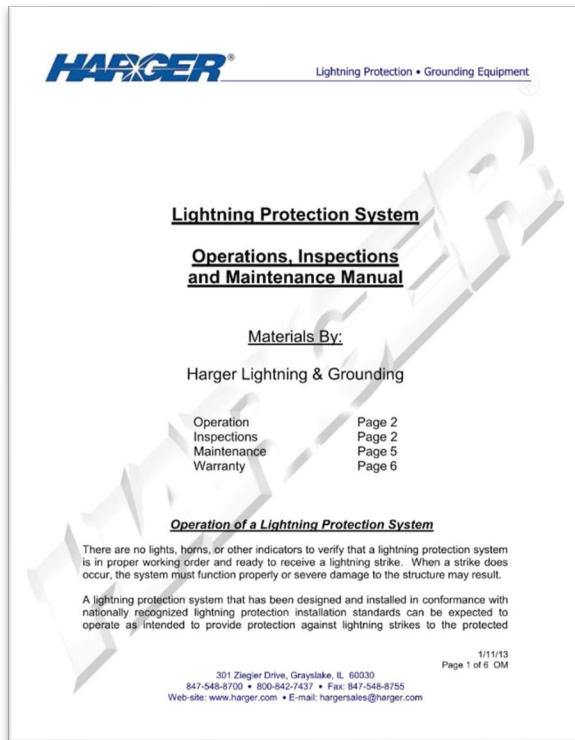


## Testing

- Key to protection is to maintain equal potential bonding
- Document all test results



# Maintenance Procedures



- Good maintenance programs should utilize an O&M manual

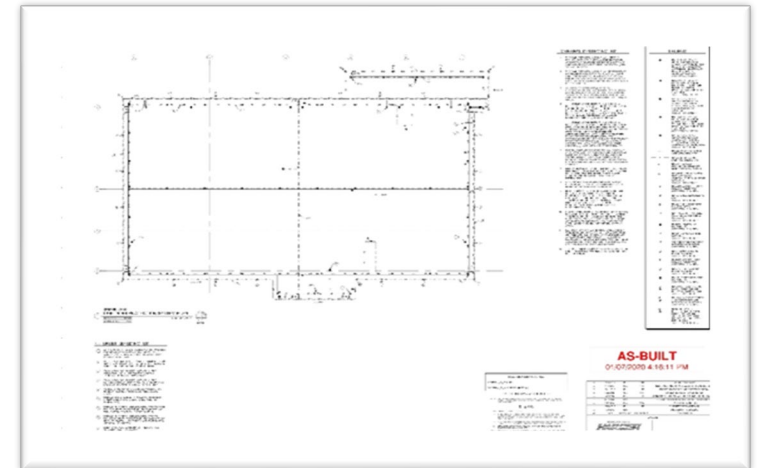
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## Maintenance Records & Warranty

- Complete records should be kept of all maintenance & routines
- Corrective actions made and recommendations
- Ground testing records (track annual variances)
- As-Built's
- Copy of third-party certification



## Maintenance Records & Warranty

- The manufacturer shall carry a warranty against defects in material for a period of 1 year
- The installer shall carry a warranty against workmanship or installation defects for a period of 1 year



## Summary

- Making the initial investment to install a lightning protection system and not maintaining it; is akin to buying a new car and never changing the oil





 Thank you