

Electric Manhole Corrosion

The Problem
How to Control It

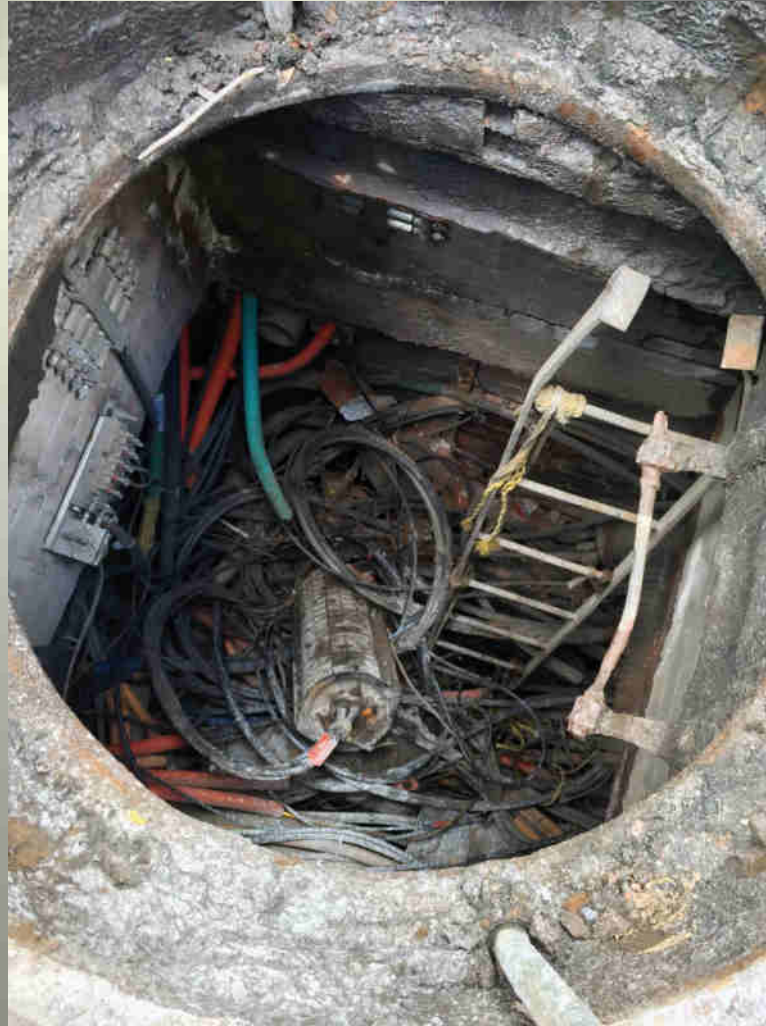
The Problem



COLUMBIA CORROSION CONTROL



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MATERIALS

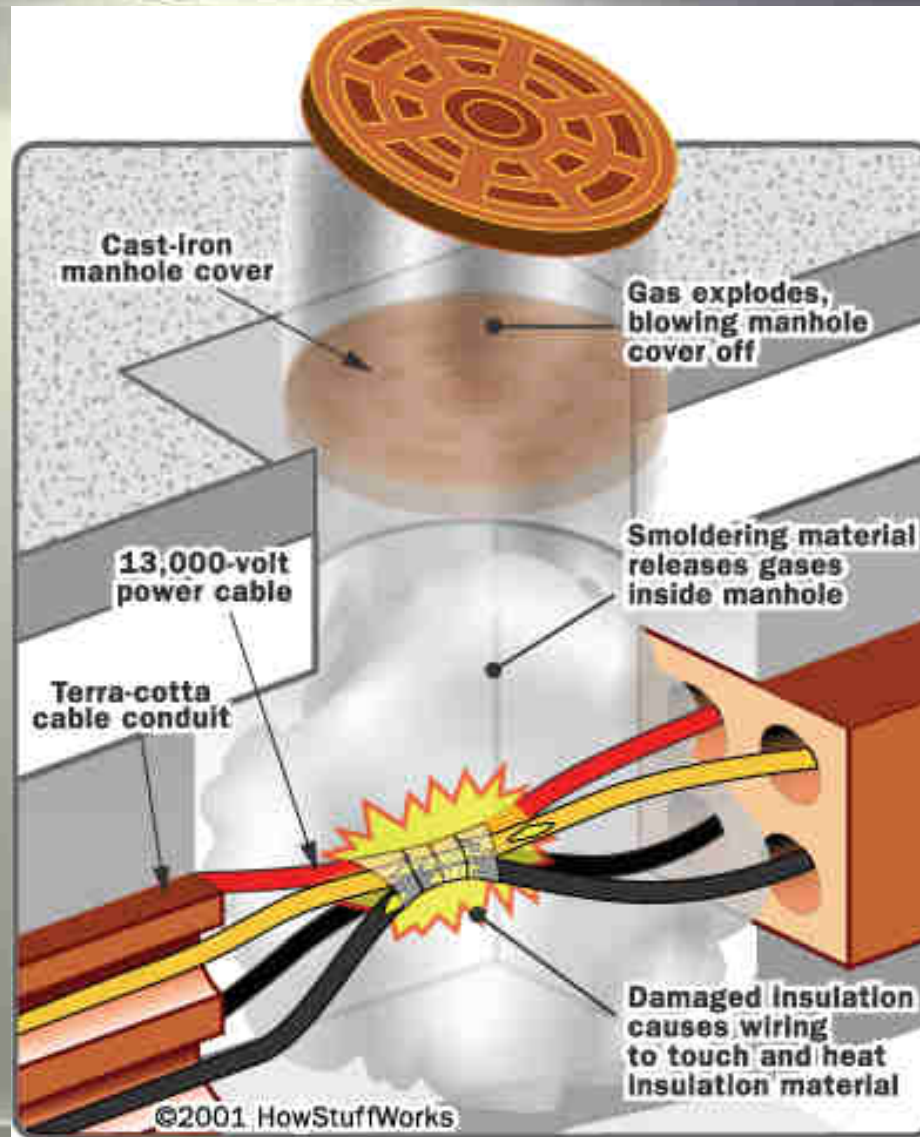


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MATERIALS



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The Main Causes of Manhole Corrosion

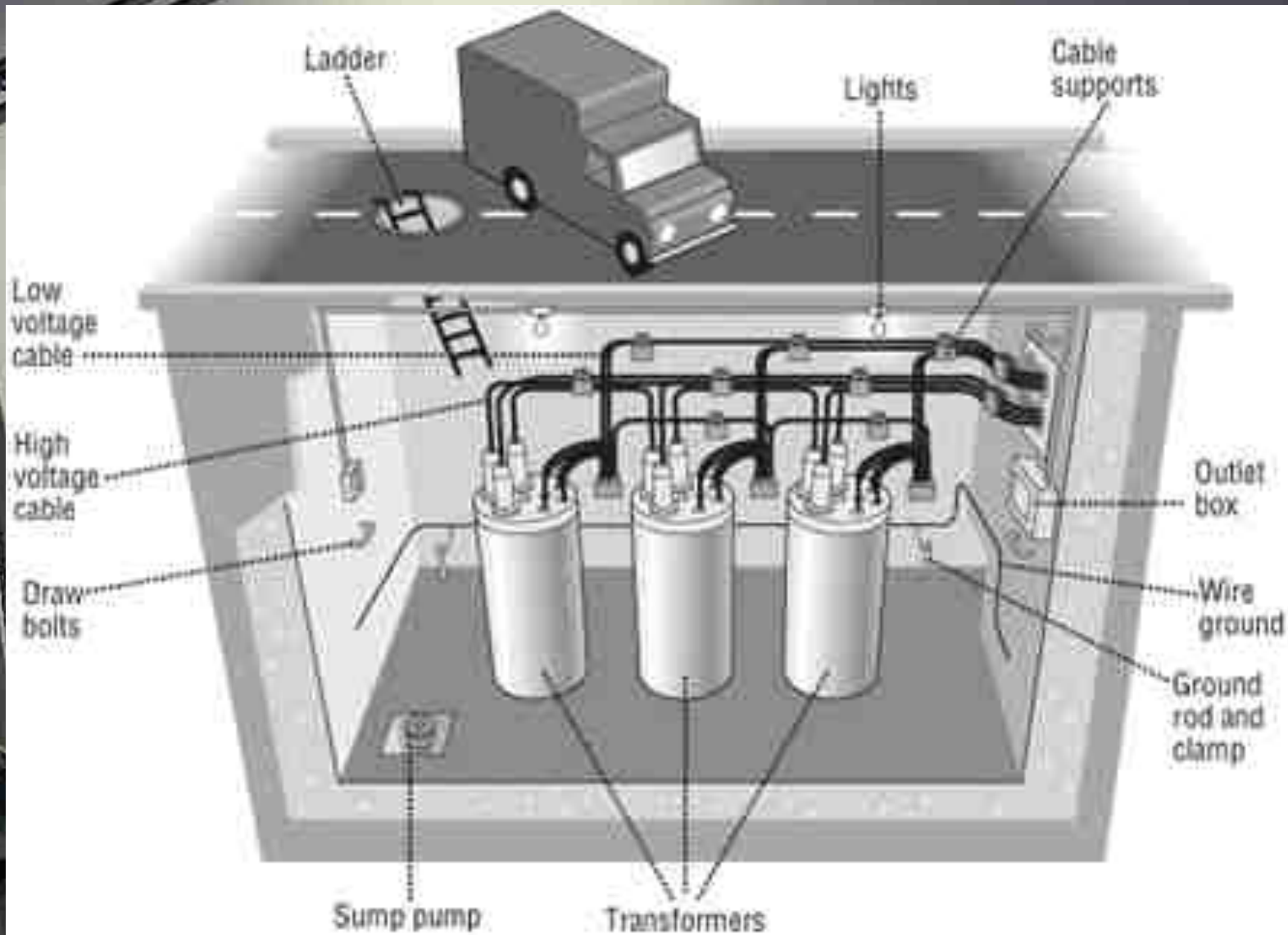
1. Dissimilar Metals
2. Improper Materials Choices
3. Non-Coated Cables & Connectors
4. Uncoated Copper Grounds
5. Inadequate Coatings
6. Stray Electrical Currents
7. No Cathodic Protection
8. Lack of Maintenance

#1 Manhole Corrosion Problem

Dissimilar Metals



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Improper Materials Choices

Galvanized Steel

Aluminum

Stainless Steel

Polymers

Brass

Non-Coated Cables & Connectors

Allowing Dissimilar Metals Contacts



Uncoated Copper Grounds

All copper ground wires should be insulated
All copper ground connections should be coated
Never have exposed Copper in a Manhole

Inadequate Coatings

Poor Thickness &
Not repairing damaged coatings

Polyurethane
Powder Coatings
Carbon Coatings
Nano Coatings

Stray Electrical Currents

Damaged Insulations

1/3 neutral return currents

Exposed damaged grounding connectors

Improper grounding of equipment

No Cathodic Protection

1. All manholes should have cathodic protection
2. Galvanic zinc or magnesium anodes
3. Impressed current where necessary
4. Test locations with submersible test cells (copper sulfate, or silver), wiring to all equipment, and easily accessible surface located test boxes

Lack of Maintenance

- Regular testing of corrosion test cells
- Visual above grade inspections
- Replacing anodes
- Repairing corrosion protection
- Repairing coating damage
- Testing for stray currents
- Scheduled pump outs and inspections
- Maintained records

Corrosion Control Methods

- System Corrosion Surveys
- Cathodic Protection
- Proper Coating Selections
- Proper Material Selections
- Proper Grounding
- Aggressive Maintenance



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