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MEDIUM VOLTAGE ELECTRICAL SYSTEM UPGRADE AT A VA MEDICAL CENTER

IDEA Campus Energy 2015

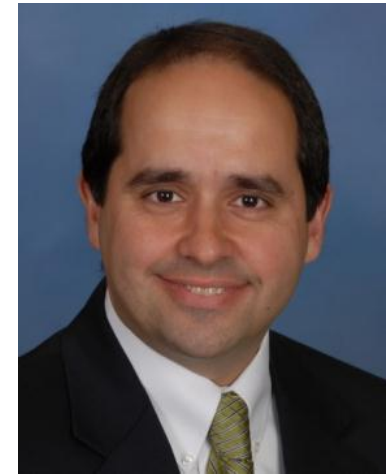
PRESENTATION AGENDA

Medical Center Medium Voltage Distribution System Upgrade

- Project Overview
- Field Surveys & Options Analysis
- Design Approach
- System Automation



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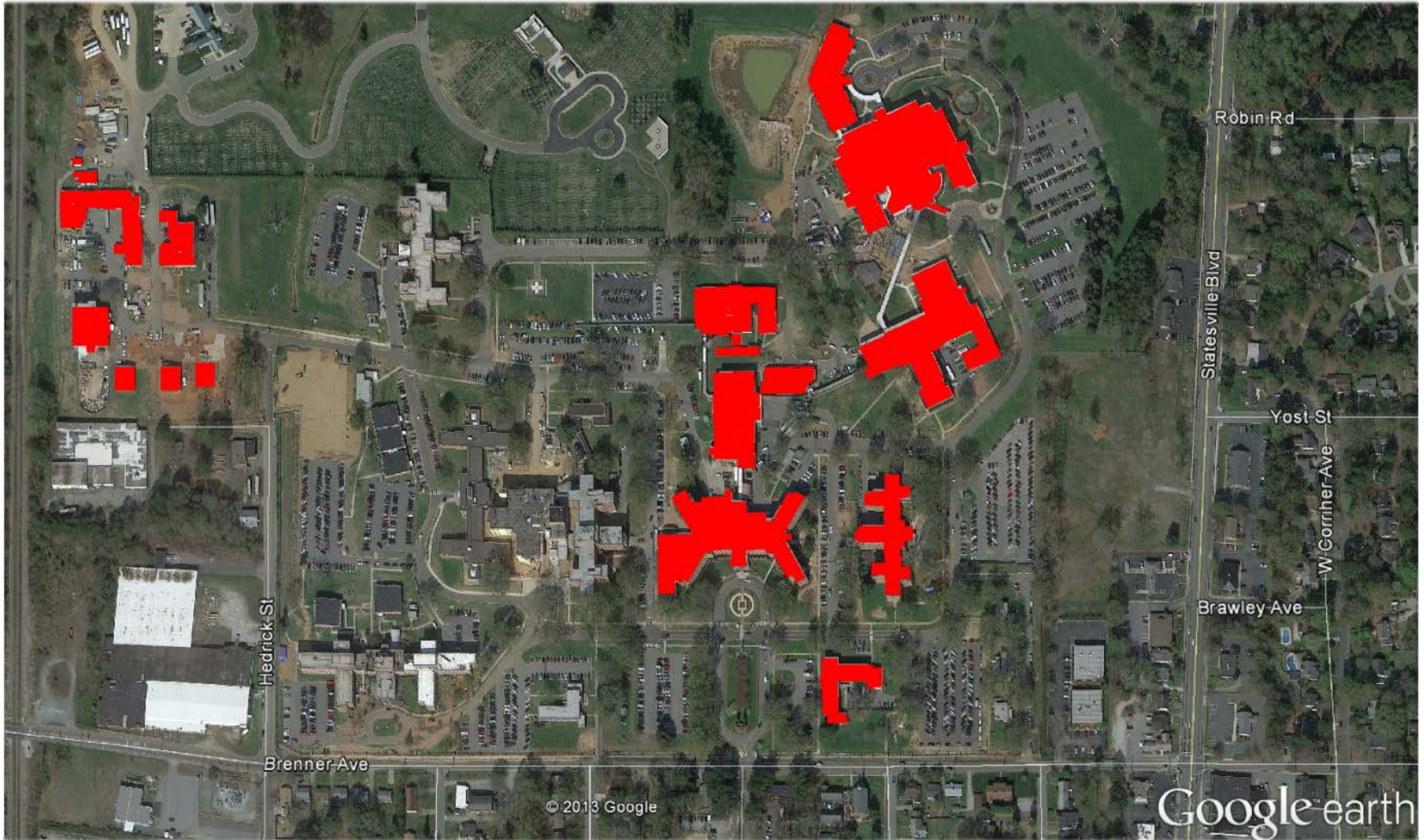
PROJECT OVERVIEW

Design Scope

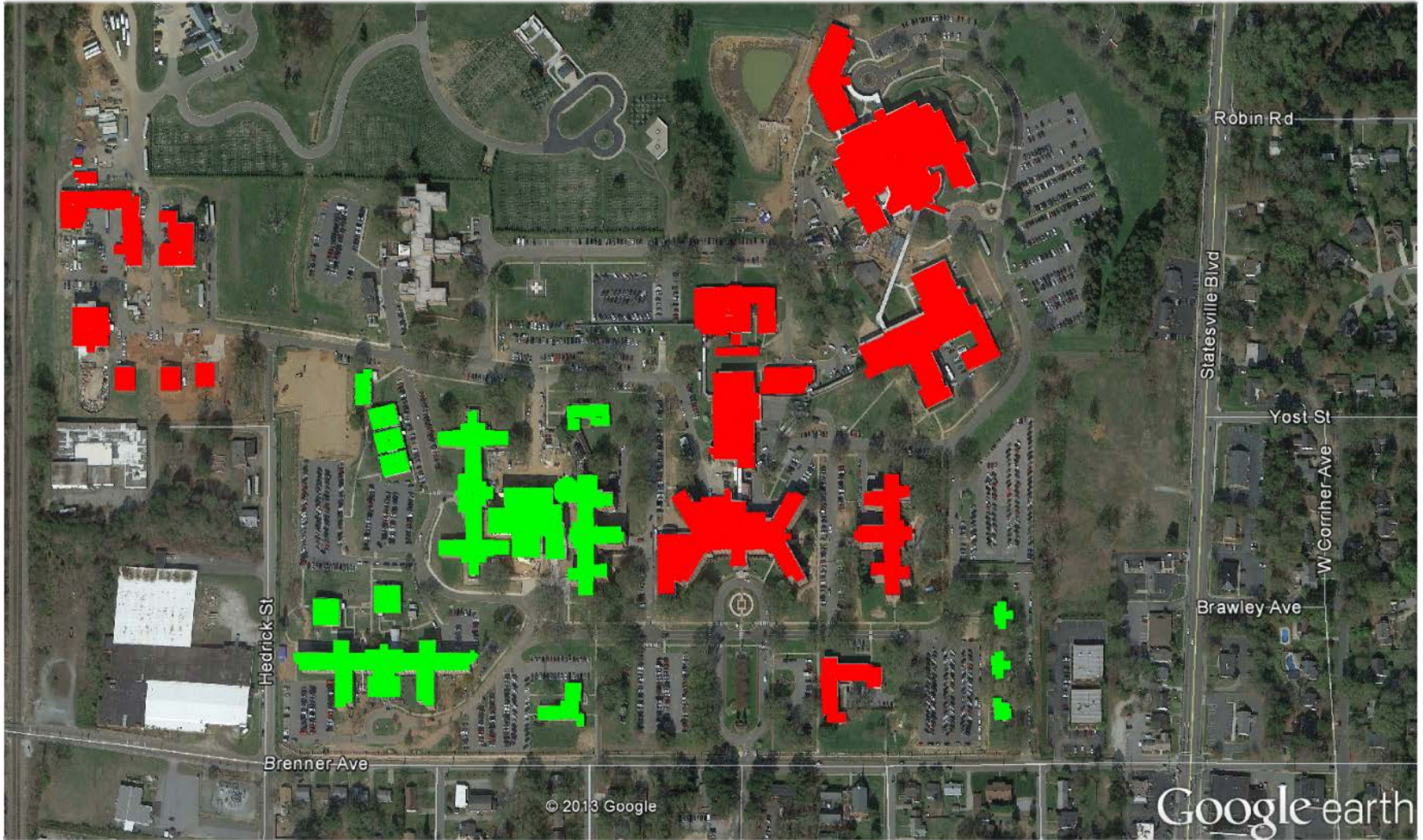
- Replace Aging Distribution System Equipment
- Replace Standby Generator (If Practical)
- Develop Design Options
- Base Detail Design on Client's Selection



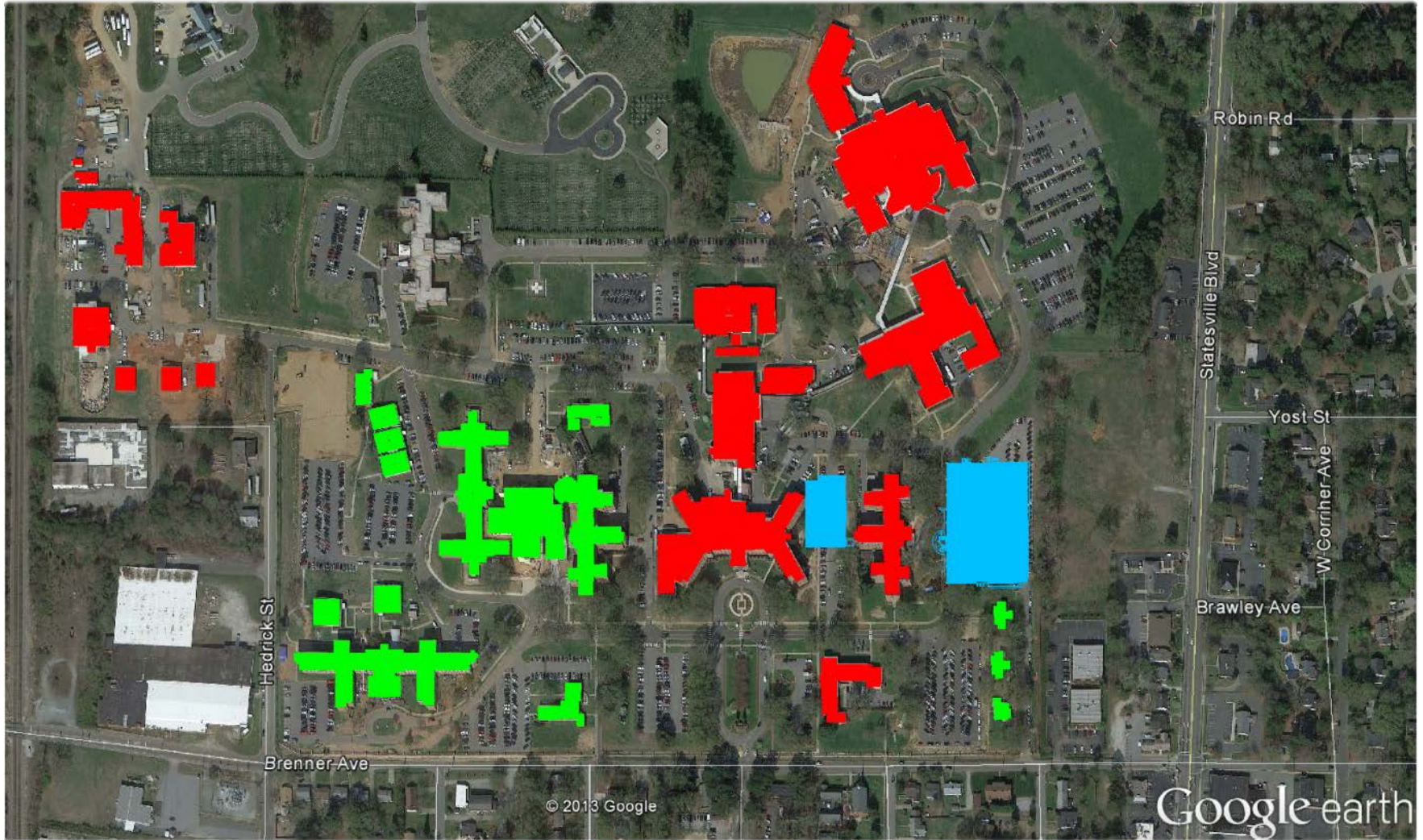
PROJECT OVERVIEW



PROJECT OVERVIEW



PROJECT OVERVIEW



FIELD SURVEY

- Full assessment of existing system
- Extensive underground utility survey



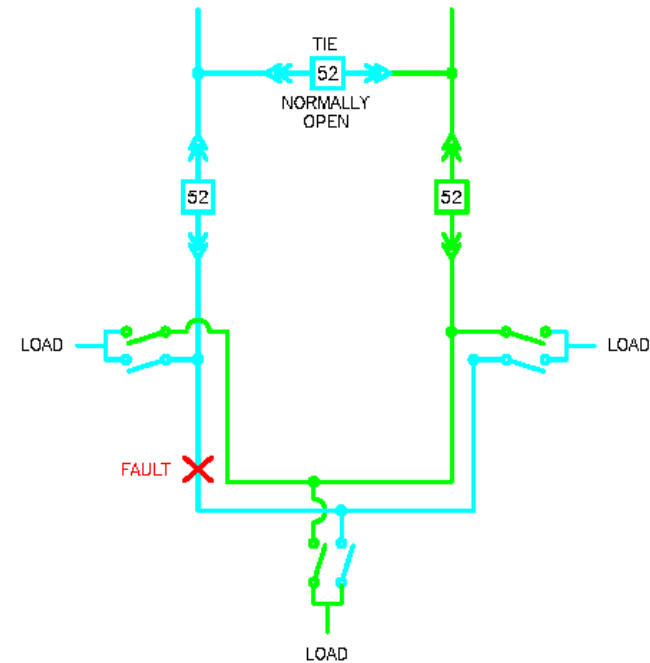
OPTIONS ANALYSIS

■ Presented Four Main Options

1. Primary Selective System
2. Looped Distribution System
3. Loop System with Full Standby Generation
4. Loop System with Second Utility Feed

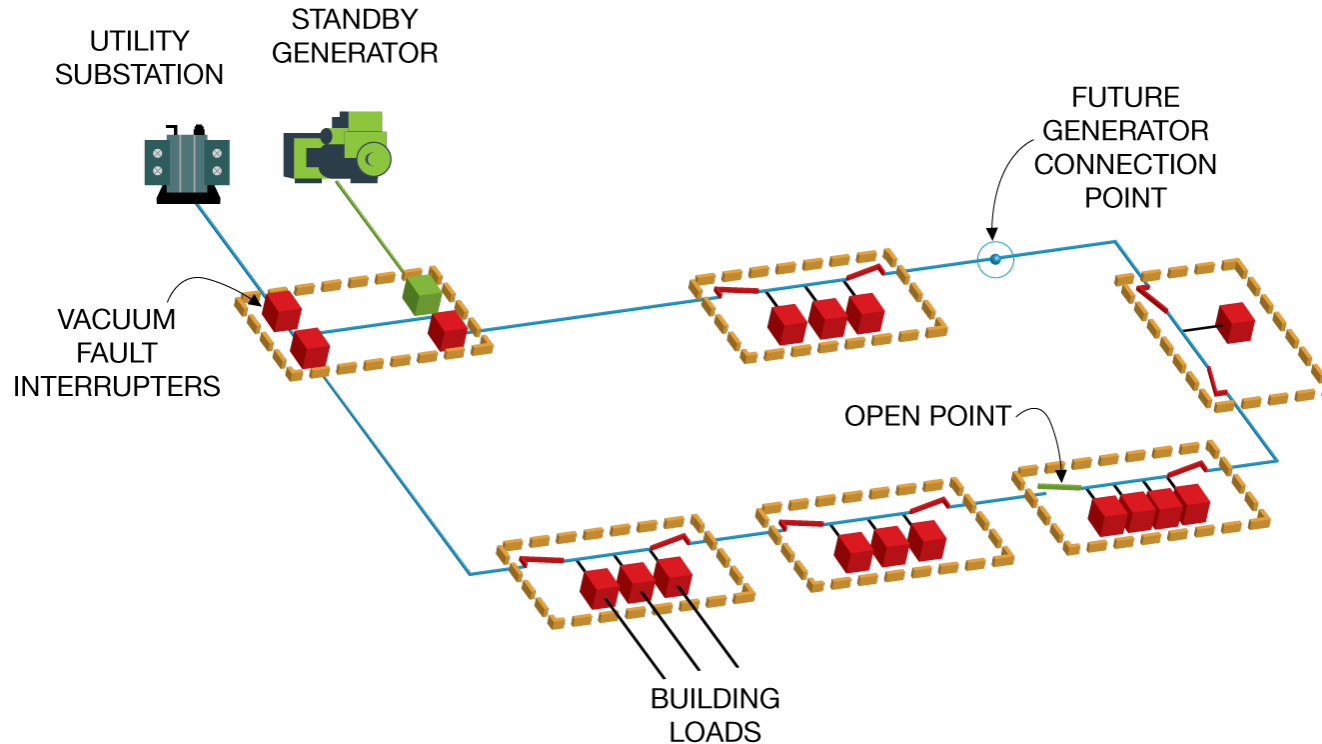
■ Estimated Infrastructure Comparison

	Primary Selective	Loop
Duct Bank	9000 ft	9500 ft
1/C Cable	76,000 ft	43,000 ft
Sectionalizing Switch	21	10



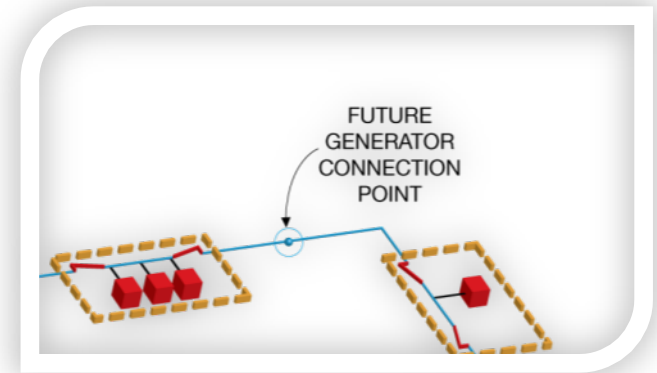
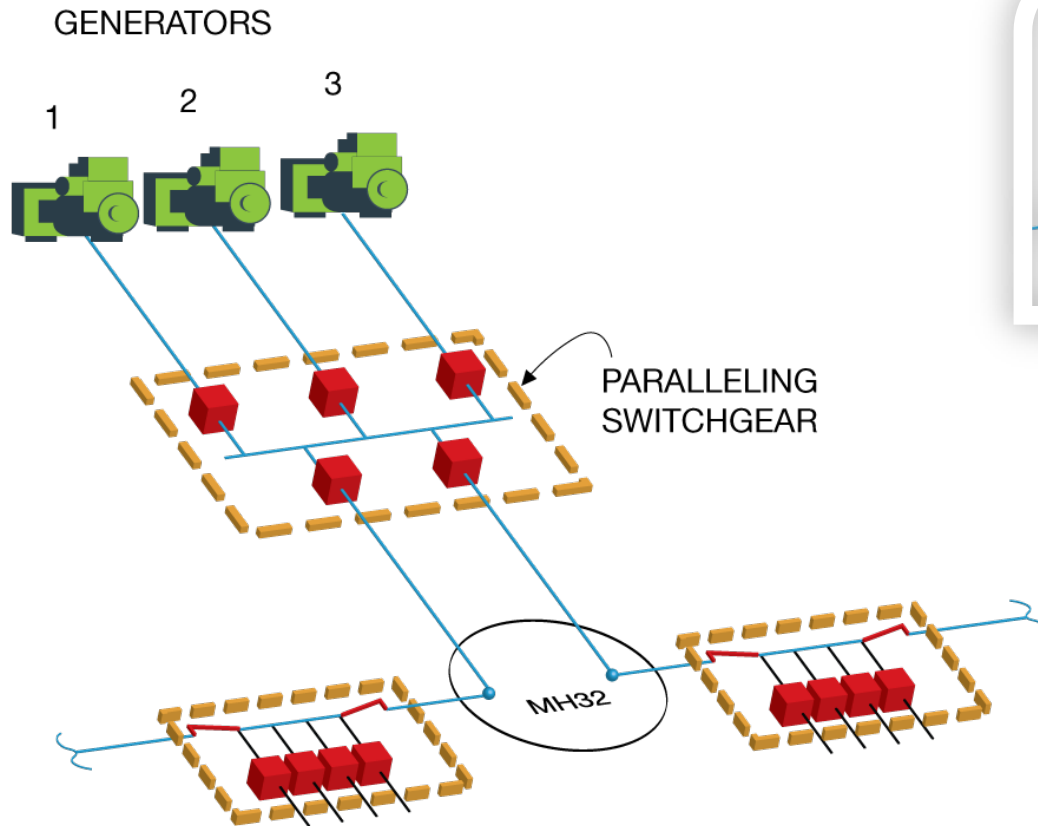
DESIGN APPROACH

- 12.47kV Loop Distribution System Designed for 6MW Site Load
- Plan for future Generator/Utility Connections



DESIGN APPROACH

Inherent Ability for Modularity



DESIGN APPROACH

Substation Modifications

- Additional Power Capacity
- Distribution Voltage Increase
- Temporary Transformer Required



DESIGN APPROACH

Phasing

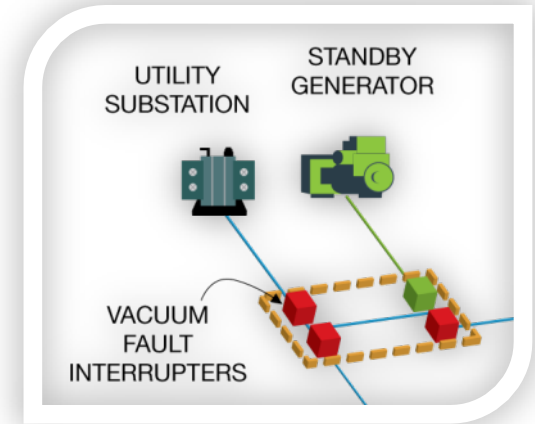
- Facility Functional Throughout Construction
- Plan for Minimal Interruptions



SWITCHGEAR

Outdoor Metal-Clad Switchgear Replaced with Pad-mount Switchgear

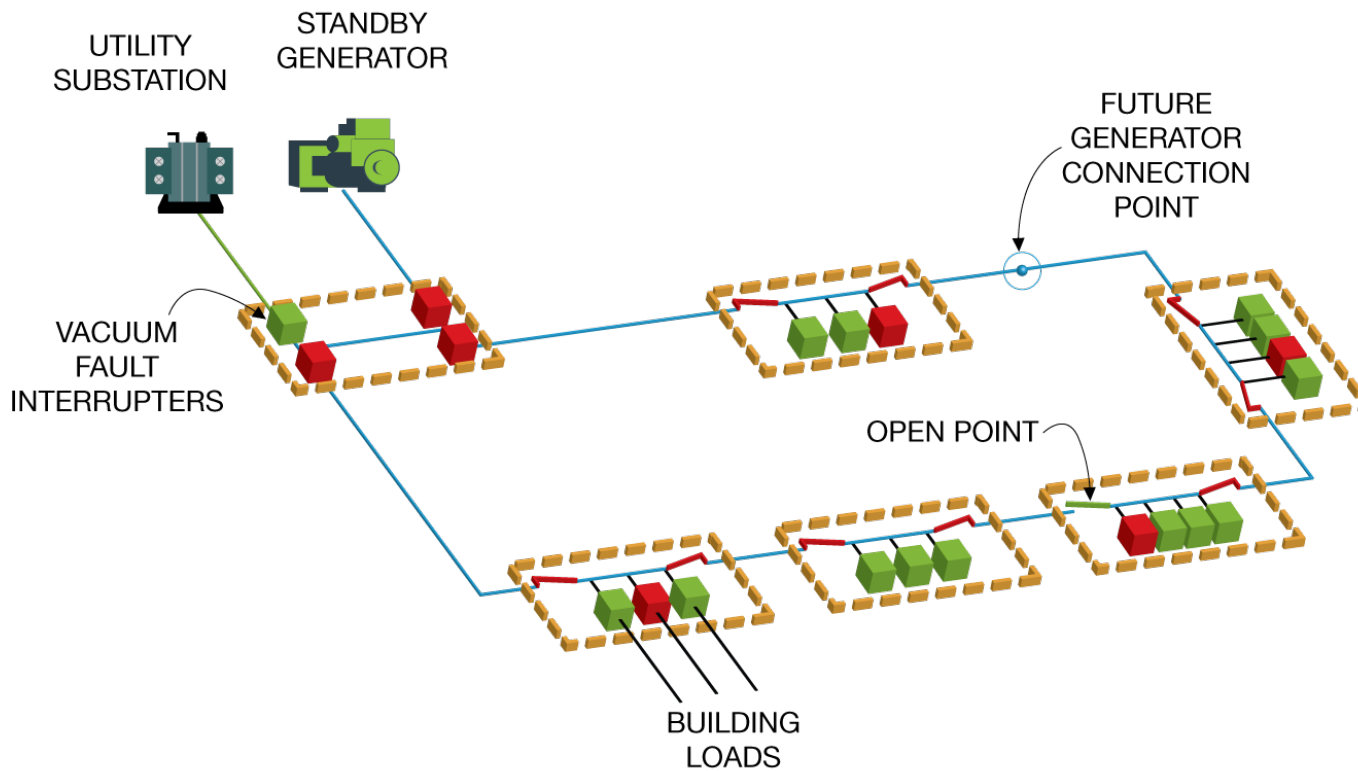
- Significant Cost Savings
- Relaying and Fast Interrupters Can Meet Utility Requirements
- Rated Up To 600A
- Operator Preferred Option



AUTOMATION

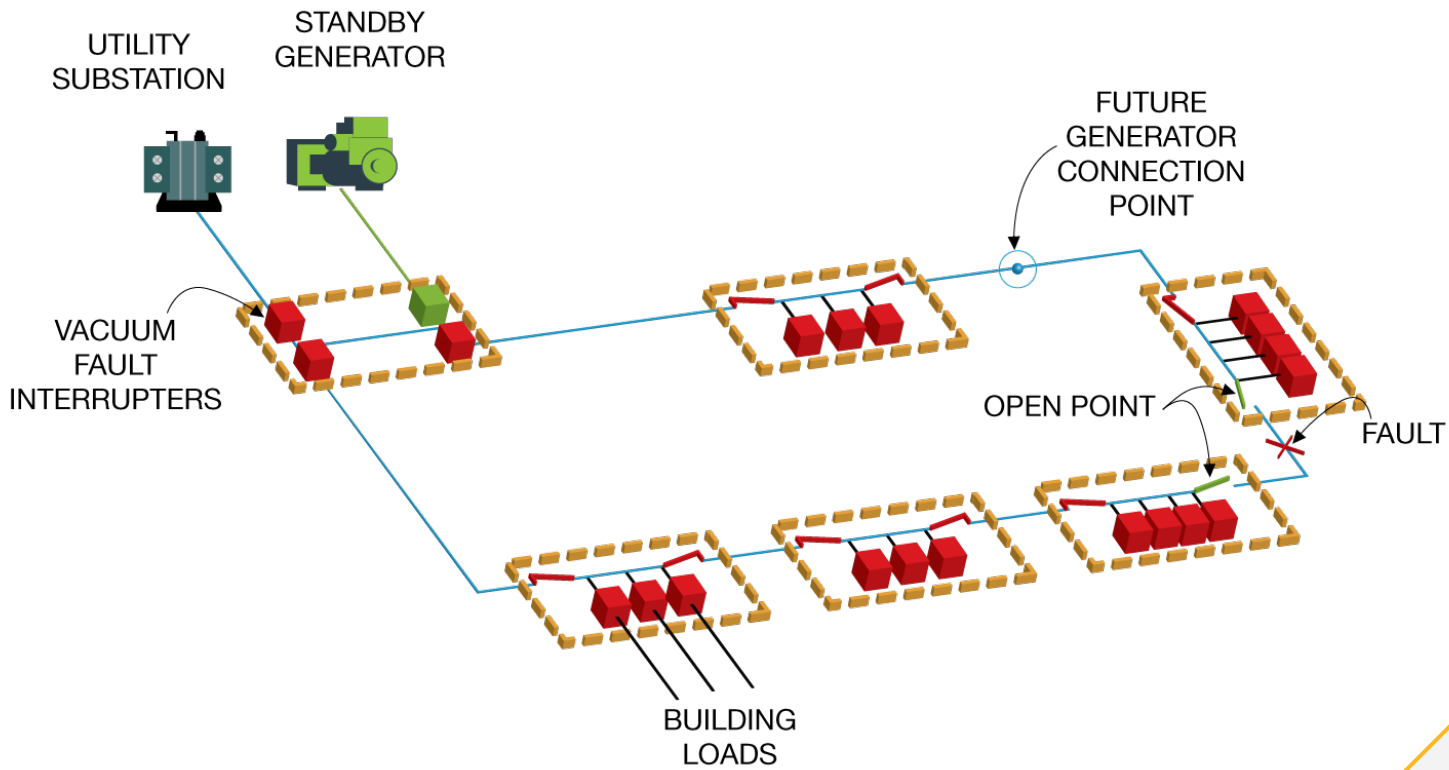
Load Shed/Restoration

- Load Shed Key For Loop Design
- Greater Generator Utilization



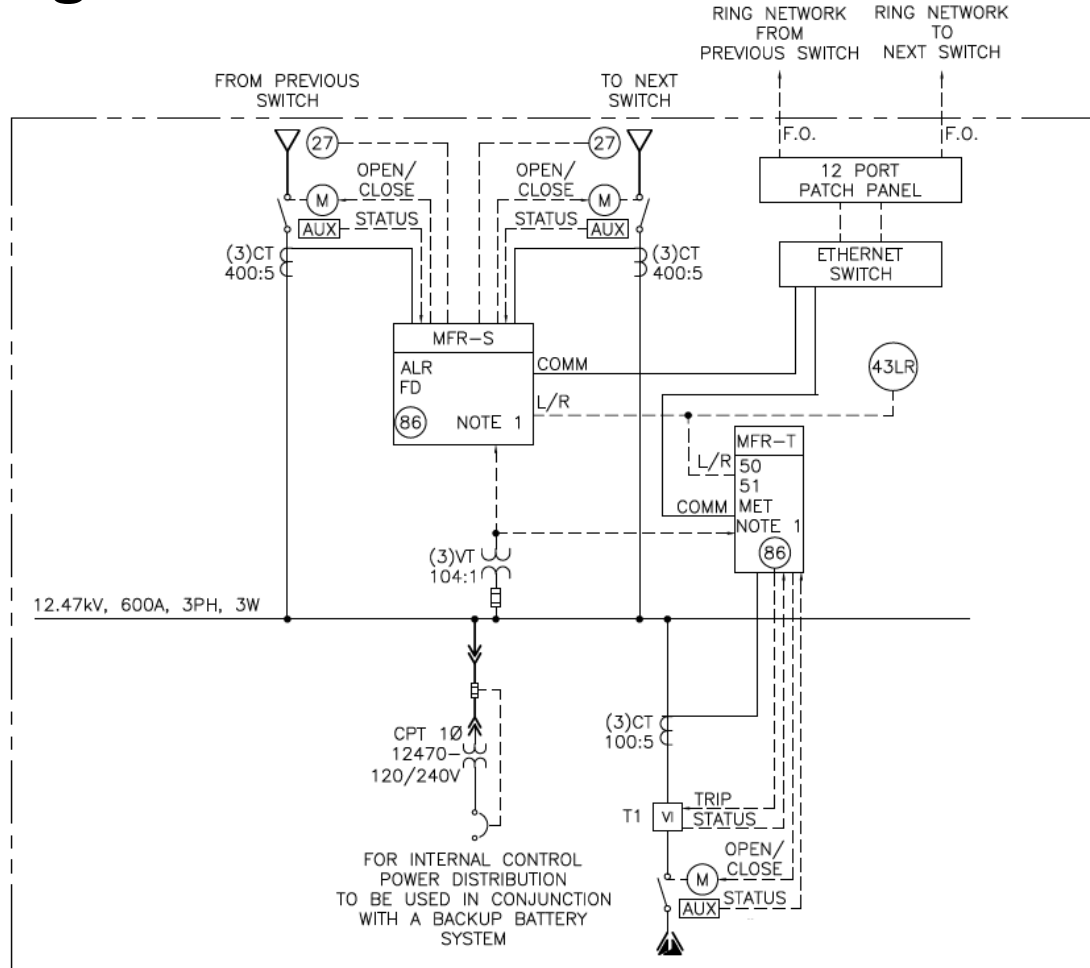
AUTOMATION

- Fault Detection
- Automatic Loop Restoration



AUTOMATION

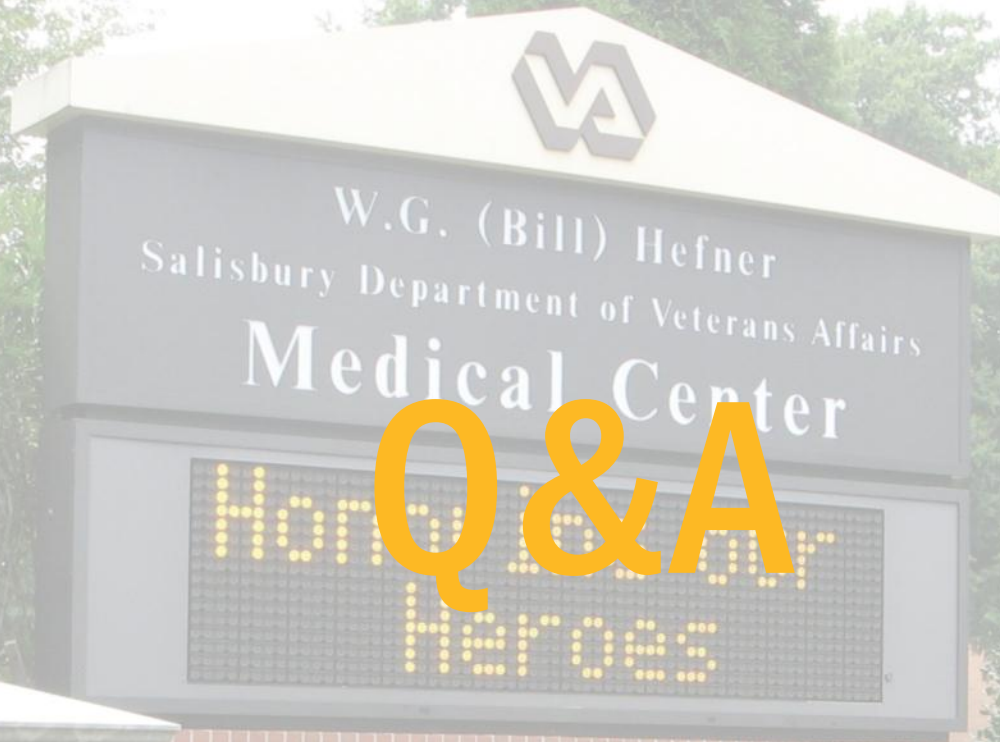
Sectionalizing Switch Detail



CONCLUSION

- New Infrastructure Creates Safer Operation
- Automation Improves Distribution System
- Lower Cost Achieved Through Automation
- Future Projects Considered





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