

CASE STUDY

Mission Critical/Power Quality

Lightning Strike Study for Gladeville Baptist Church Gladeville, TN



Gladeville Baptist Church was experiencing costly damage to numerous equipment in their 90,000 SF church complex during thunderstorms, especially to the Direct Digital Control (DDC) system for the building's HVAC automation system that controls 49 HVAC units. Puckett Engineering was retained to perform a lightning study of the church complex that included three adjoining structures that were built in three phases between 1956 and 2008.

Puckett Engineering's study revealed the main source of the problem to be electrical isolation of the grounding systems between the three adjoining structures. This results in ground differentials, especially during lightning activity, which tries to equalize through any interconnecting cables between the buildings, hence the DDC data cables. Puckett Engineering's primary solutions included bonding the grounding systems together, improving the earth grounding, providing isolation in the data and communication circuits between the buildings, and adding surge protection. These solutions along with others were implemented in a subsequent design.



2008 addition



Bonding jumper installed
between buildings

PROBLEM OR NEED

Church experiencing costly damage due to multiple lightning strikes, especially to the DDC system for the HVAC.

PUCKETT SOLUTIONS

Main source of problem discovered to be electrical isolation of three adjoining structures.

Recommended bonding the grounding systems together, isolating data and communication circuits, and adding surge protection.

Puckett Engineering provided design to implement recommendations.

Year Completed: 2010
