Power Quality on Campus:

Electrical Infrastructure is a Top Priority at Renowned Computing Center

Computers and networks are woven into the fabric of university life. Today, they are essential to the educational experience, whether training students for satisfying work in an increasingly digital world or connecting them to vast storehouses of knowledge pertaining to their specialized fields of study.

Networks are everywhere on campus, including dormitories, computer labs, media centers, libraries and research labs. Many business schools today have installed realistic securities "trading floors" complete with ticker boards, where students can learn how to execute real-time transactions in global markets based on up-to-the-minute financial data.

A computer-intensive educational facility requires the utmost in reliable, stable and clean electrical power, or what's known as high power quality. An excellent example of power quality on campus is the electrical infrastructure at the Ray and Maria Stata Center on the campus of the Massachusetts Institute of Technology.

The 720,000-sq ft "Stata" is arguably one of the most eye-catching structures to be found on any American college campus. Regardless of its unusual appearance, the Stata has an enviable electrical infrastructure that ensures the highest level of power quality, with copper being the focal point in the workings.

The installation includes a 500-kcmil bare copper ring ground and multiple "triangulated" copper-clad electrodes to ensure less than 5 ohms resistance to ground. A well-designed copper-based grounding system is essential for any electrical wiring project, especially one this complex. It helps stabilize an electrical wiring system, and provide a path to the Earth for transient conditions such as over voltages and lightning.

Several copper-wound, K-rated transformers help to accommodate harmonic currents and improve energy efficiency. Moreover, full-sized grounding conductors in all circuits ensure low ground resistance to the points-of-use.

The dedication and separation of "sensitive" branch circuits from branch circuits serving non-sensitive equipment helps to shield sensitive equipment from electrical noise. The number of outlets on sensitive branch circuits is limited to six or less, to reduce the magnitude of harmonic currents; isolated grounds (IGs) in all sensitive circuits provide additional protection against RF noise and other voltage irregularities. Finally, the electrical infrastructure includes the installation of transit voltage surge suppression (TVSS) equipment at substations and at points of use. Layered protection of this type assures maximum protection from voltage surges, while requiring a low-resistance ground path to work properly.

The Stata's electrical infrastructure not only benefits from a robust wiring and grounding system now, but also provides sufficient size and flexibility to accommodate the future needs of the Institute.

For more information about the electrical infrastructure of the Stata Center and the optimization of power quality at educational institutions, visit the power quality applications section of www.copper.org. ***HPN***