## Case Study

# *CORNELL TECH*

## Roosevelt Island
## New York, NY

## Facility Description

*Characteristics*:

- New, high performance academic learning facility designed to be among the largest Net-Zero energy buildings in the U.S.
- Pioneers higher levels of building performance and sustainability
- Targeting LEED Platinum certification
- 160,000 sqft. / 4 Floors

## Challenge

The Cornell Tech First Academic Building is designed to be a functional example of ultimate building performance, energy efficiency and overall sustainability. The facility was designed with a number of energy efficiency technologies to generate its own energy, such as a photovoltaic array on the roof and geothermal heating and cooling systems. Driven by the efficiency goals set forth, the electrical design engineer capitalized on an often missed opportunity. The Engineer wanted to ensure the electricity generated on site was being distributed efficiently throughout the building. In order to do so, the engineer had to make sure that the distribution system was 100% compatible with the electronic (nonlinear) loads it would be supplying. Aware of PQI's industry leading expertise in overall system efficiency and harmonic mitigation, the engineer tasked PQI with designing a comprehensive harmonic mitigation plan that would guarantee a high level of system efficiency, load efficiency, power quality.

## Solution

PQI's engineering team analyzed the engineer's original design and the facility's load characteristics. Next, PQI engineered a few different harmonic mitigation strategies for the design engineer to choose from. The PQI recommend solution was chosen and specified on the projects. This solution consisted of the strategically engineered application of PQI harmonic mitigating transformers, which were design with extremely unique and effective phase shifts. The engineered phase shifts of the transformers accomplished the maximum level of harmonic mitigation possible, based on the engineer's design. PQI's custom phase shifts accomplished a level of harmonic cancellation unachievable by any other transformer manufacturer.

## Impact

- ✓ 18 Pulse system that cancels all harmonics from the 17$^{th}$ and under. Distribution system that is 100% compatible with the loads it supplies
- ✓ Savings generated by the elimination of electrical losses typically experienced in transformers due to harmonic currents
- ✓ Savings generated by the elimination of electrical losses typically experienced in the system (cables), due to reduction of current distortion
- ✓ Savings generated by the supply of undistorted voltage waveforms to the loads, which enables each load to operate at its intended and published efficiency