A&J Consulting
Engineering Services, P.C.

164 Brighton Road, Clifton, NJ 07012 **T** 973-777-9696 **F** 973-777-5528

CLIENT

NEW JERSEY INSTITUTE OF TECHNOLOGY (NJIT)

LOCATION:

Hazell Student Center
Newark, NJ

CONSTRUCTION VALUE:
$500,000

DESIGN START:
2003

DESIGN COMPLETE:
2004

CONSTRUCTION COMPLETE:
2004

PV Array and Tracking Modules

Photovoltaic System on Roof of NJIT

SCOPE OF WORK

Design 50 KW Photovoltaic System for Hazell Student Center

PROJECT DESCRIPTION

As prime engineering consultant, A&J managed and supported the design and installation of an innovative 50-KW solar photovoltaic system on the NJIT Hazell Student Union Building in Newark. The system will deliver "clean" renewable electrical energy for the needs of the building while protecting the roof from the damaging effects of weather and UV radiation. The lightweight solar plant is utility-grid connected, is installed without roof penetrations, and provides beneficial sun shading. The system comprises an array of photovoltaic modules each mounted on a mechanical space frame, four 104 sq ft four-panel tracker modules, terminal and combiner boxes and a data acquisition and monitoring system (DAS). The inverters are wired into the building's electrical system. The rooftop PV array (144 modules) covers approximately 5100 sf with a rough layout of 60 by 85 feet. At standard conditions, the array produces 50.4 KW.

The system selected is a rooftop solar electric system designed for flat-roof buildings. The tilted solar arrays provide better power generation with maximum cooling and draining features. The panels are aluminum with a stainless steel base allowing them to withstand intense UV radiation and temperatures. Design life is 25 years. Wind loading up to 125 mph is no problem as the modules are securely linked for strength and stability. System performance is continuously measured including output power, sunlight intensity, wind speed and air temperature. This data is used to estimate potential power output, which can then be compared with actual system output.