Solar/Alternative Energy (SAE) Design Guidelines

The SAE Design Guidelines are applicable for all new SAE projects at ASU. These guidelines have been established to address the most common SAE design elements at ASU. They are to be used in conjunction with the requirements set forth by applicable codes, laws and ordinances of this jurisdiction, recognized industry standards, good industry practice and specific program needs. Energy Innovations will assist the project team in the development and implementation of SAE strategies at ASU.

SAE Projects – SAE projects fall into two primary categories:

1. **New construction**

    a. The design of the new construction project shall consider the spatial, mechanical, structural, electrical, etc. requirements of the new SAE project early in the planning phase. These requirements largely include:
        i. Adequate pathways for piping/conduit.
        ii. Adequate connections/terminations to building electrical and mechanical gear.
        iii. Proper location and adequate spacing of equipment such that the equipment can be readily maintained and removed/replaced.
            1. To minimize cooling loads in buildings, it is preferred that the solar inverters be placed outside.
            2. If inverters cannot be placed outside, they shall be located in an equipment space within the building that minimizes the cooling needs of the building.
        iv. Rooftop considerations:
            1. Structural loads of new equipment.
            2. Single ply roofing material for ballasted systems.
            3. Minimum setback of equipment shall be 8’-0” from parapet walls that are less than 42” above the finished roof.

    b. New construction projects that will implement SAE projects at a later date should be designed “SAE ready” and planned in the same manner as if the SAE project would be part of the new construction project.

2. **Existing facilities/areas**

    a. Note: Some installations of SAE projects on/in existing facilities/areas may already be “SAE ready” and have the necessary infrastructure and design considerations incorporated at the project site, while other installations may need these considerations to be part of the SAE design.

    b. For rooftop installations, the project design must include a full inspection of the facility’s roof to 1) ensure the structure can handle the additional load and 2) evaluate the condition of the roof and remaining warranty. The project must determine if a new roof or re-coating of existing roof is required prior to installation of the system. The CPMG PM shall coordinate with ASU FM to assure existing roof warranties are maintained by project design and execution. All installations must follow ASU Project Guidelines for roofing systems. See Division 7: Thermal and Moisture Protection.

General Considerations –The following is a list of considerations that are general in nature for all SAE projects. In all cases, ASU's Project Guidelines shall be followed for all relevant A/MEP and EIS work.

Conduits and Piping

Where possible, conduit runs should be internal to the building and hidden from view. In every measure, external conduit runs should be avoided and will be reviewed on a case by case basis. If the conduit has to be run on the exterior of the building, extensive efforts must be taken to screen it from the public view.

Inverters and/or Equipment

Inverters should be placed in a location that is not visually accessible from the ground plane. Inverters, transformers, panels and other SAE associated gear/equipment located on the ground plane shall be installed in a screened enclosure. .

Equipment Screening

Equipment visible to the general public shall be securely screened from view. Care should be taken to minimize the visual and physical impact of these structures on the surrounding environment. The OUA DM will coordinate the screening requirements of the project.

Energy Information System (EIS) Metering

All SAE systems shall interface with ASU's EIS. The FDM Technology Support will coordinate the interconnection to the EIS.

Shading

Specific to the SAE project, design professional shall provide shading studies to the ASU Solar Team. Shading studies shall be conducted for the Vernal Equinox, Summer Solstice, Autumnal Equinox, and Winter Solstice, and shall include shading at 9 a.m., noon, 3 p.m., and 5 p.m., for each day.

Landscape

The requirement for restoration of existing landscape or establishment of new landscape will be determined on a case by case basis by OUA. Based on the proposed placement, plant material that is deemed necessary for removal will be reviewed with ASU Grounds and assessed a value. This value will be used to plant/transplant trees in a location on campus where there is a need. This will aid in the carbon sequester program on campus. Restored or new landscapes requiring irrigation work will be reviewed by OUA to determine exact system requirements.

Signage

Permanent signage will be included in the costs for each SAE project. Use the University/OUA SAE signage template for all project signage. Signage text will be coordinated with OUA and Energy Innovations. OUA will identify the location for the signage and coordinate installation.

Parking

CPMG PM and OUA DM will coordinate all parking related issues regarding SAE projects with ASU Parking and Transit Services.