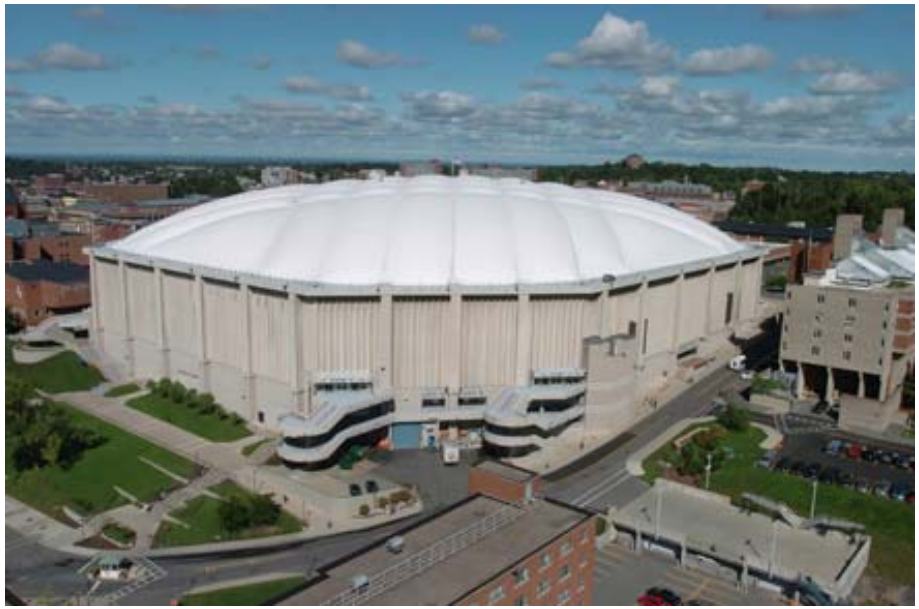
Rainwater Harvesting and Reuse system

CARRIER DOME

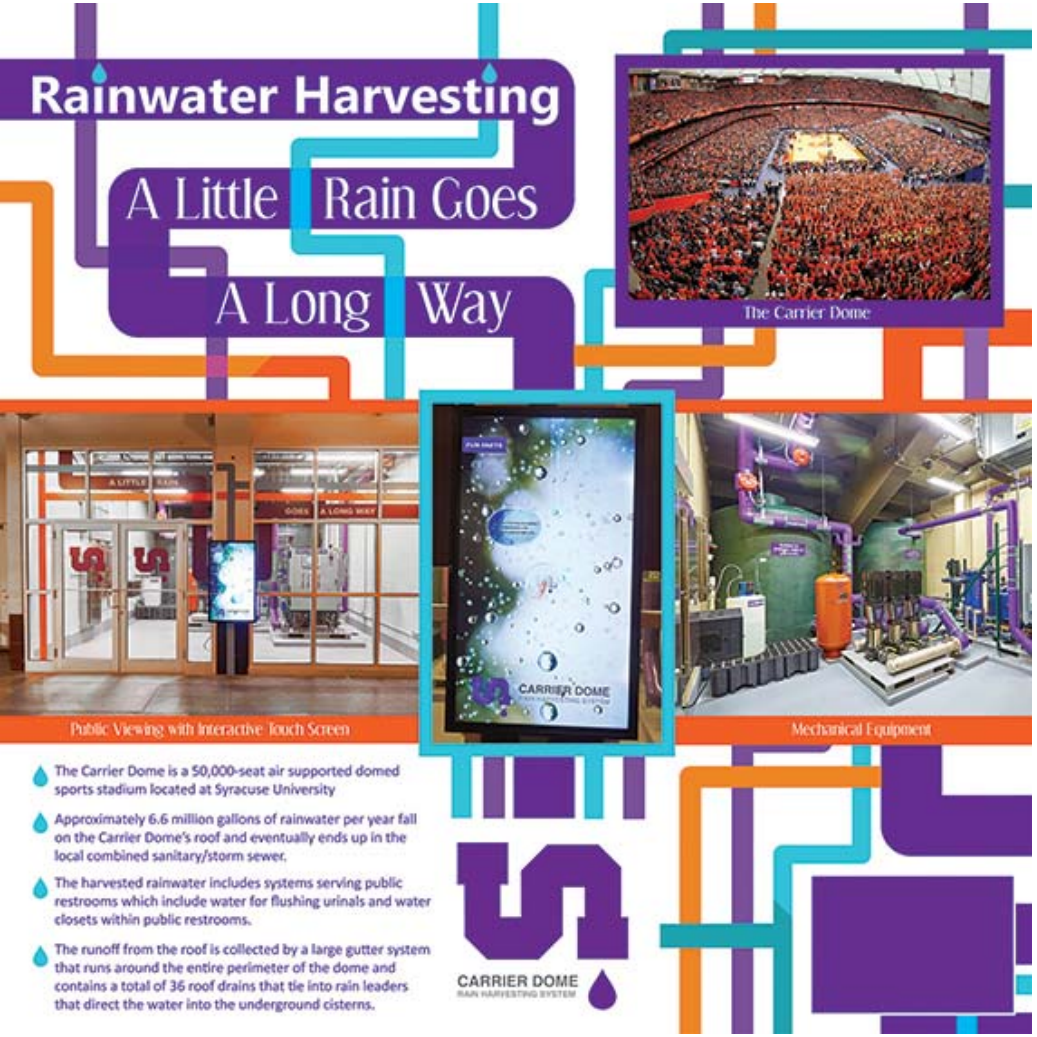
MELISSA CADWELL

Carrier Dome



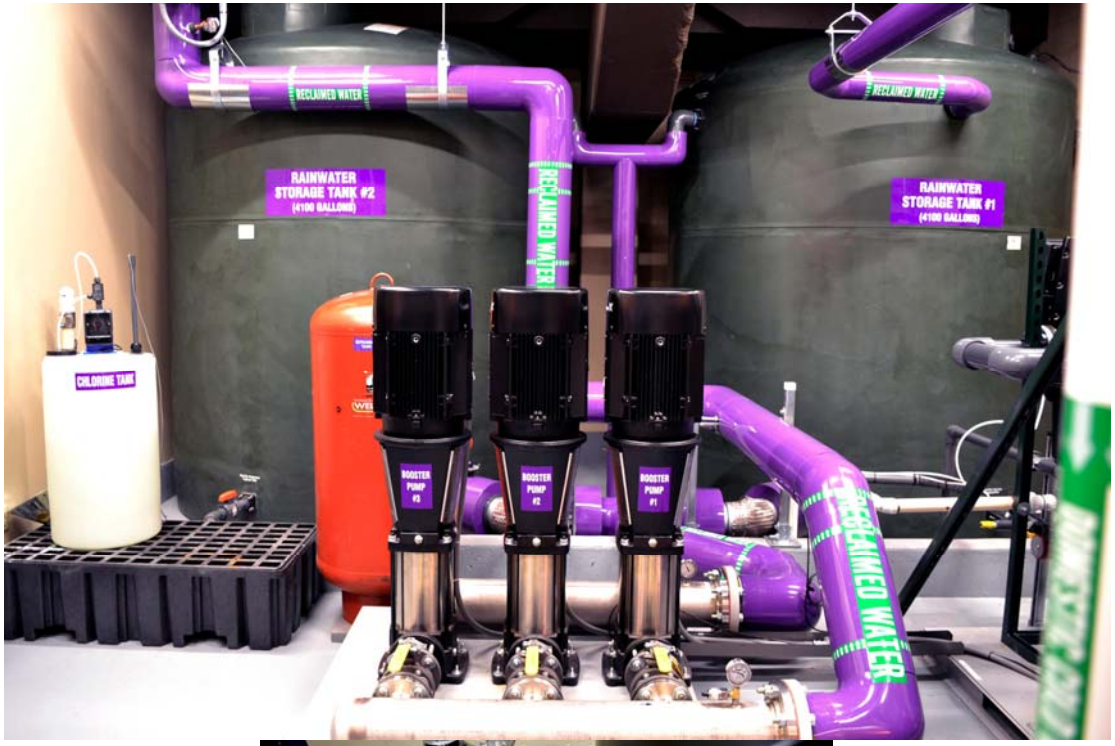
Carrier Dome

- Located in the City of Syracuse
- Seats approximately 49,262
- Host a variety of events
- Air supported roof
  - 6.5 acre
- 6.5 million gallons of rainwater is estimated to fall on the roof annually



Rainwater Harvesting System

- Received a $1.35 million state grant
- $1.5 million total
- System
  - Two exterior 25,000 gallon storage tanks
  - Two interior 4,500 gallon tanks
  - 12 roof drains to each tank
    - 1000 feet of piping
  - Gutter system Collects approximately 13% of water annually that runs on the roof



Rainwater System Controls

- Standard Industrial grade PLC controller
- Electronic sensors and valve operators
- Vortex solids separator
- Standard (100 gpm) submersible pump transfers the water from cisterns to mechanical room
- Treatment equipment
  - Cleanable 100-micron sediment filter
  - 25-micron bag filter
  - 120-gpm UV light system
  - Chlorine injection/recirculation
  - Dry injection system
- Triplex booster pump draws water from
  - Two interior tanks to supply the public bathrooms

Benefits

- Mechanical system was designed to be visible
- Engaged students
  - Communication design students -
  - School of Architecture
  - Civil and Environment Engineering students
- Large touchscreen informational kiosk that interacts with LED spotlights
- System keeps rainwater out of aging sewer system
- Uses rain water instead of highly treated and processed municipal water
- 2016 Diamond Award
  - American Council of Engineering Companies- NY Chapter
  - C&S was the engineer behind the project

Challenges

- Outdoor space for the two 25,000 gallon below-grade cisterns
- A viewing room
- Tying into the existing rain leader system with minimal disruption of the facility
- Municipal water backup system was necessary
- Bringing the students in too late to utilize their design elements
- System does not last a full football game
- Drought