



# TULSA COMMUNITY COLLEGE

Oklahoma

## Overview

To increase the energy and water efficiency of Tulsa Community College, Water Management, Inc. (WMI) was subcontracted to provide a comprehensive, innovative, and sustainable water and energy savings program for the College. The scope of this project was spread throughout the Tulsa metropolitan area and encompassed the four main campuses of Metro, Northeast, West, and Southeast.

## The Assessment

The evaluation process included an investment grade audit of all water using equipment and processes, measurements of water consumption used by the existing equipment, analysis of historical water use, and knowledge of facility demographics.

Following this assessment, WMI was confident significant water, energy, and sustainability measures were attainable while simultaneously improving facility functionality. The measures included were:

- Sustainability initiatives including rain gardens, rainwater harvesting, and solar thermal measures
- Non-domestic kitchen equipment optimization including the installation of high efficiency dishwashers, ice machines, and pre-rinse sprayers
- Cooling tower sub-metering
- Domestic fixture replacement/retrofits with low flow fixtures

## AT A GLANCE

### LOCATION

*Tulsa, Oklahoma*

### FACILITY SCOPE

*Main campuses of Metro, Northeast, West, and Southeast*

### SITE DEMOGRAPHICS

*Approximately 30,000 students and 2,700 employees*

### WATER CONSERVATION MEASURES

*Sustainability measures including rainwater harvesting, rain gardens, and solar thermal*

*Non-Domestic kitchen equipment optimization*

*Sub-metering of 20 cooling towers*

*Installation/retrofit of nearly 1400 fixtures with low-flow technology*

### ANNUAL SAVINGS

*\$130,000*

### PAYBACK

*5.5 years*

## The Measures

Water Management, Inc. designed and implemented 2050ft<sup>2</sup> of rain gardens using native species to better utilize natural rain events, enhance the aesthetic value of the College, and prevent building seepage during intense rainfalls. This involved digging shallow depressions to collect and filter stormwater runoff coming from roof downspouts, allowing it to slowly permeate through the soil. Excess water was diverted from the rain gardens into existing in-ground storm drains through a 4" drain pipe.

In addition to rain gardens, a 1700 gallon rainwater harvesting system was designed and installed to provide an alternative irrigation water source. This included a digital flow sensor to calculate the total water consumption from the harvesting system, a rainwater pump with hose bib attachment, a French drain (70' long and 4' wide) to redirect the rainwater from existing roof drains, a 1700 gallon underground cistern with pedestrian manway, and all necessary filters.

The installation of 6 solar panels and 160 and 60 gallon hot water tanks were installed as part of a solar thermal hot water system. This solar thermal energy is used for the campus' hot water application; including domestic water use for lavatories, kitchen faucets, and other kitchen equipment.

Non-domestic kitchen equipment optimization included the installation of in-line flow controls on the water supply for the dish machine as well as the replacement of high flow (>3.0gpm) pre-rinse sprayers with 1.42gpm spray heads. Additionally, heat exchangers were installed on the ice machines which use the rejected water from the machine's cold plate to pre-cool the potable supply water, thereby increasing the numbers of cycles run per day.

To eliminate unnecessary utility charges, the supply and blow-down lines on 20 cooling towers were sub-metered which allowed the College to receive sewer abatement credit for the amount of water being lost to drift or evaporation. This measure eliminated approximately 70% of the billable sewer charges for cooling tower consumption; lowering the price per thousand gallons by over 50%.

Domestically, WMI replaced or retrofitted 729 toilets and urinals with low flow fixtures along with 682 low flow, pressure compensating faucets and showerheads. Throughout the process, WMI worked around student and staff schedules to ensure installation did not interfere with College operations.

## The Results

Due to the efficient design and implementation of these measures, **Water Management, Inc. was able to save Tulsa Community College over \$130,000 annually.** Effective project management and competitive pricing allowed this project to offer a payback of less than 6 years.

