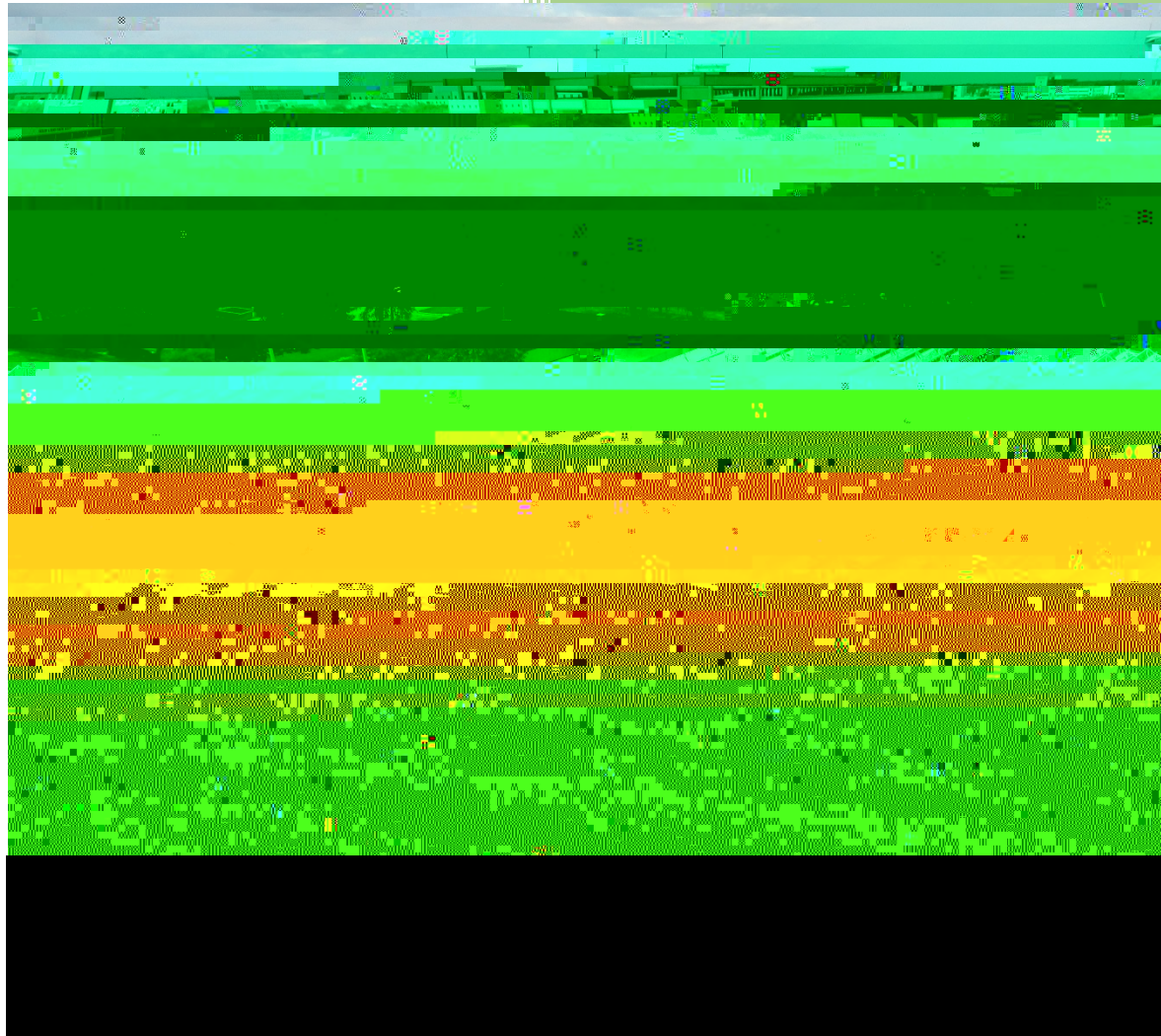


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*Submitted by*

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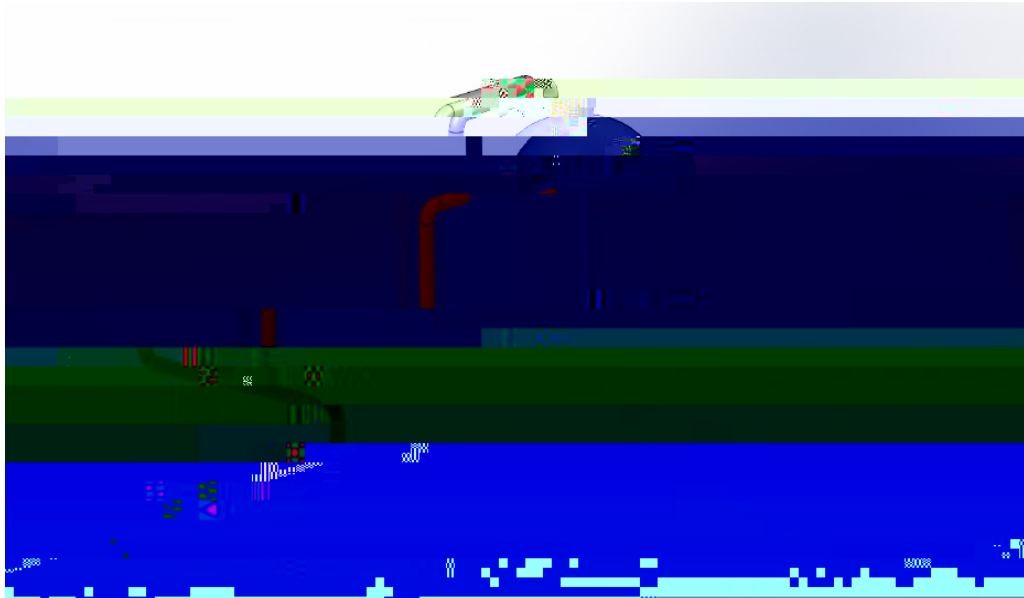


Figure2: Proposed TES tank design

## Project tasks & time schedule

Total project duration is close to 9 months.

## Sustainability of the Project:

After construction of this thermal energy storage project is completed, ownership will be transferred to the Clean Energy Research Center (CERC), a USF research group, and to the USF Research Foundation, which owns the land where the power plant is sited. Long-term operation, maintenance, and accountability will be handled by the students and faculty members of CERC.

## Project Cost

Student engagement

## Project Benefits

### Cost Benefit Analysis

The solar field (with thermal storage) is expected to produce about 90,000 kWh per year\*. Based on the TECO price structure, the total value of electricity generation will be about \$ 7,970.40 per year (see Table 1). Some maintenance will be required, which primarily consists of periodic lubrication and cleaning, and may cost about \$ 1,200 to \$ 1,500 per year. Simple payback of the project is 11.2 years.

Table1: Electricity cost savings

\*Based on 6 hours daily operation at 50 kW design power for 300 days per year

### Sustainability Benefits

The solar power plant with thermal energy storage at USF CERC will generate an average of about 300 kWh per day, with daily variations depending upon the time of the year and weather conditions. While there are no global warming emissions associated with the generation of solar energy, there are emissions associated with other sources of electricity generation.

Annual-power generation

CO<sub>2</sub>-e savings (from

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courses (Solar Energy & Application, Design of Solar Power Plants, Mechanical Engineering Lab, etc.) have been using this facility as a part of their curriculum, while the USF chapter of the International Solar Energy Society hosts biannual tours for the Tampa Bay community. Having a fully-equipped plant will serve better in the future for lot of USF students as well as other outside visiting parties.