AGENCY FLORIDA A&M UNIVERSITY
BUDGET ENTITY SUS
PROJECT TITLE Boiler #3 Replacement

3-YEAR CIP FORECAST - $21.1 MM

YEAR 1 FORECAST - $4.85MM

CHILLER 2 - $2.86 MM

This project will replace an existing 1100-Ton capacity chiller with a 2200-Ton capacity chiller in the Central Chiller Plant.

The Central Plant currently utilizes four (4) wells drawing water from the aquifer to cool four (4) electric water chillers in the Central Chiller Plant, having a total capacity of 6600-Tons. As the Florida A&M University grows and expands, so does the need for chilled water to efficiently cool all current buildings. The existing chilled water system can provide enough capacity to maintain comfortable learning and working environments in all current campus buildings served by the Central Cooling Plant. The addition of new, planned projects such as the new CASS building, plus any other future facilities on the north section of campus, would task the existing chillers to provide sufficient chilled water capacity, thereby requiring the additional 1100-Tons of central plant capacity for current and future growth as well as planned redundancy.

South Central Utility Plant - $1.38 MM

A new South Chiller is proposed, to be located south of Osceola Street and east of the current Multi-purpose Recreation Center. This plant would utilize a refurbished 1100-ton electric chiller from the existing Central Chiller Plant (currently designated as Chiller #2 and needing refurbishment costing $230,000 but not included as part of the $1.3MM). Condenser water would be utilized from the proposed new location of the Central Plant Return Well bore, as stated above, to be located to the east of the Multi-purpose Recreation Center. Power can be obtained from the medium-voltage lines at Manhole E-124, located along Osceola Street. New, underground Chilled water lines can be partially run toward the new 700 bed Residence Hall Phase 1 & Phase 2 area with plans for tieing into those new chilled water lines during Year 3 of this 3 Year CIP Forecast. Additionally, the Multi-purpose Recreation Center can be tied into this new system to then eliminate the currently problematic stand-alone water chillers at that facility.

CAMPUS CONTROLS REPLACEMENT - $0.90 MM

Research Buildings have obsolete, non-operational environmental control systems. This project will replace the control systems in Pharmacy Phase 1, Ware-Rhaney/Allied Health, Science Research, Jones Hall and Dyson Pharmacy.

Several campus buildings are severely hampered in controlling and maintaining accurate and comfortable learning environments due to obsolete and failing temperature and humidity

control systems. In many instances of Customer Service requests for temperature adjustments in those buildings, changes can only be made by manually, not automatically through a centrally-based control system. The research buildings all need the existing non-functioning environmental control systems removed and replaced with new, open-protocol digital control systems which can be controlled and changed remotely.

Year 1 TOTAL $5.14 MM

Year 2 FORECAST - $4.4 MM

BOILER #3 Replacement - $1.484 MM

This boiler will replace a second boiler with an excess of plugged boiler tubes causing the boiler to be extremely inefficient.

The Central Heating Plant currently has three older steam boilers. Boiler #1 is in process of being replaced. Boiler #3 has a large number of internal tubes sealed off, causing this boiler to be very inefficient, and also needs new control systems and frequently shuts off and goes into alarm. Only #2 Boiler) is currently fully operational, however, it also has many internal tubes sealed off causing progressively worse efficiencies. Frequent repairs to the natural gas and water delivery systems have also been made in order to maintain steam delivery to the campus heating systems.

The solution to these issues is to purchase and install a second new Hi-Efficiency Boiler in the place of the unreliable #3 Boiler with a flue-gas economizer and a 30 PPM, Lo-NOx, dual-fuel, Hi turn- down ratio burner, the same as is being done for #1 Boiler. This installation would provide the campus with a second reliable source of steam, as well as achieve an additional 15% energy savings through the economizer system and the Best Available Technology system of controls.

EAST LOOP TIE-IN - $1.27 MM

This project will create a tie-in of the 18” chilled water pipes east of Lee Hall and west of Ware-Rhaney, creating a closed loop to increase chilled water flows and decrease flow resistance in this area of campus.

Currently, the campus chilled water distribution system ends at two separate points on the East portion of campus: 1) at a point to the east of Lee Hall, and 2) at a point located west of the Ware-Rhaney Building. Both of the points have 18” diameter pipes, and connecting these two points with an 18-inch diameter chilled water supply and return would provide a

continuous loop on the East portion of campus and would equalize flow rates and pressure differentials in the chilled water loop.

PARTIAL NORTH LOOP FOR SBI - $1.38 MM

This project will create an underground 18" chilled water supply and return system to tie in SBI South and SBI East buildings, and end in a vault and valving for future expansion along Gamble Street.

STEAM PLANT MAKE-UP TANK - $0.53 MM

The Central Steam Plant is currently utilizing an original underground condensate storage tank from the 1950's. The tank has been exposed to degradation of the tank walls and should be replaced to ensure to eliminate dirt entering the tank and clean water is sent to the boilers.

Year 2 TOTAL $4.66 MM

YEAR 3 FORECAST - $7.85MM

PARTIAL NORTH LOOP FOR LUCY MOTEN - $1.584 MM

This project would install 18" Chilled Water lines along Gamble Street from the Lucy Moten Building to the current 12" lines at Science Research.

Currently the Lucy Moten Building receives chilled water from a localized water chiller. This chiller is used year-round and has repeatedly failed in service multiple times each cooling year. The campus chilled water distribution system ends at two points on the North portion of campus, at SBI West and at Pharmacy Phase 1. This project would install 18" diameter piping from the existing 12" piping at Pharmacy Phase 1, west along Gamble Street, and end at the Lucy Moten Building.

RESEARCH LOOP UPSIZE - $1.584 MM

This project would replace the current 12" chilled water pipes to 18" diameter and connect to the existing 18" piping at Ware-Rhaney and to the new 18" pipes at Pharmacy Phase 1.

This would provide additional flow capabilities from the main campus chilled water distribution system to the Pharmacy buildings and to the Lucy Moten building.

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FINISH NORTH LOOP - $1.440 MM

This project would connect the 18" chilled Water Pipes between SBI East and the Lucy Moten building.

This installation would be the final connections and provide a continuous chilled water distribution loop for the North Campus and eliminate the dead-end points currently in the distribution system.

BOILER 3 - $2.304 MM

This new boiler would replace the third and last older boiler in the Central Plant. This third boiler (#2 Boiler) is operational, however, it also has a large number of internal tubes capped off, causing progressively worse efficiencies. Frequent repairs to the gas and water delivery systems are also made to maintain steam delivery to the campus heating systems.

This final phase of the boiler replacement project is the purchase and installation of a third new Hi-Efficiency Boiler with flue-gas economizers and 30 PPM, Lo-NOx, dual-fuel, high turn-down ratio burners of the same manufacture as the replaced Boilers 1 & 2. This installation would finish the replacement of all old and inefficient boilers and provide the campus with the most efficient and reliable source of steam for the campus heating systems. This installation would also provide redundancy in order to accomplish Annual Preventive Maintenance on one boiler system while operating the other two systems.

RESEARCH BYPASS LOOP - $1.224 MM

This 18" chilled water pipe connection would join the single-ended piping to the west of Jones Hall and connect to the new 18" pipes at Ware-Rhaney building.

CHILLED WATER RETURN WELL $1.224 MM

Currently, the Central Plant Chilled Water Condenser cooling system is accomplished through the ability to utilize up to four (4) aquifer-fed condenser supply wells. This amount of water is then directed to only one aquifer return well. If a collapse of this one well occurs, all cooling to campus buildings would be stopped until a new well could be drilled. The Central Plant needs this redundancy for business continuation in the event of the primary return well failure.

A cost estimate of this second return well is approximately $1,224,000.

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SOUTH CHILLED WATER DISTRIBUTION SYSTEM $1.961 MM

This third-year Infrastructure improvement would extend the underground chilled water lines from the new South Chiller Plant to the "under-construction" Phase 2 700 Bed Residences and tie into those "under-construction" chilled water lines, providing chilled water to the Phase 2 residence buildings. Utilizing the South Chiller Plant would eliminate the need to purchase two additional 300-ton electric chillers for Phase 2.

Year 3 TOTAL $11.32 MM