T e c h n i c a l M e m o r a n d u m

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Subject	3. Existing Campus Conditions 3.2 Existing Campus Infrastructure 3.2.5 Communications
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To	Tennessee State University

The objective of this work is to discuss the condition and capability of the existing communications cable plant distribution system. The current Telecommunications infrastructure is comprised of large pair count copper cabling and Multi-Mode fiber optic cable to each of the primary buildings on the campus. Single Mode fiber optic cable is minimally distributed to various buildings across the campus.

1. COMMUNICATIONS

The majority of the Communications Cable Plant currently resides in the tunnel system. This tunnel is cohabitated with other campus utilities. When the cable plant is being distributed it leaves the tunnel system and enters into the manhole system and then into the respective buildings. The Copper and Fiber Optic splice cases reside in both the manholes and the tunnel system. All cabling currently originates out of the Campus Center/Kean Bldg.

A large portion of the Copper and Fiber Optic Backbone Cabling was installed in 1992-1993. Although this may seem to be a recent project, documentation for this project and the existing infrastructure is incomplete.

The existing Communications cable plant system is in need of immediate major repair. Both copper and fiber optic splice closures are damaged beyond repair and conductors are being exposed to the environmental conditions. As identified in the other articles of this outline, active steam leaks are evident in the tunnel system. The leaks increase the temperatures in these pathways. The manhole locations are the areas in which the majority of the heat radiates and can't escape. These manholes are the location of the splice points for both copper and fiber optic cabling. The temperatures that are experienced in the manholes are well over the acceptable range for the product installed, thus degrading the cable jacket and the composition of the splice cases. In one communications manhole, a 182 degree temperature reading was taken at the cover. This exceeds the cable manufactures recommendation by over 25 degrees. The splice cases are not temperature rated however, this is where the major product breakdown is occurring. The splice cases are becoming brittle falling off the wall of the manhole.

It is unknown how long the closures have been in this state. The volatility of copper cable plant is evident nearly every week according to the TSU CIT staff. The CIT staff is constantly making repairs to fix the problems but all are minor repairs to a much larger problem. The staff has been utilizing the growth copper pairs and are now close to exhaustion. The fiber optic cabling has some volatility also. The fiber optic cabling has a more urgent nature, however the Telecommunications staff is currently taking measures to correct the problem as detailed in a later article. The current state of the Communications Plant Cabling (copper & fiber optic) need to be addressed immediately. An additional study is recommended to specifically identify where the problems occur and what an adequate, long term solution will be.

In the short term the copper & fiber optic splice cases should be replaced with metallic armored splice closures to reflect some of the heat generated by the steam tunnel. Additional protection should be placed on the fiber optic cables. It is recommended optical inner duct shall be placed on the fiber optic cables while in the manhole. Some cable may be required to be replaced. Based on the volatility of the cabling, the estimated cost for the repair is $160,000.

The current phone PBX (Private Branch Exchange) is a series of Fujitsu 9600's. This system has exceeded its natural life cycle. It is currently reaching capacity and is in need of re-evaluation. With the anticipated growth of the campus, the telecommunications staff continues to struggle with serving the yearly needs of the campus. Currently, the staff has to procure used or reconditioned parts to service the phone switch and the peripheral devices associated with the PBX.

Campus Dormitory renovation projects continue to improve on the cabling infrastructure. Upgrading these systems allows the networks to operate more efficiently and provides for a better campus experience for the students.

Code Blue Emergency Phones are typically identified as a security device; however, they also have a telecommunications function. These devices are rendered incapacitated when the phone lines are damaged. The Code Blue Devices are in need of evaluation as several of them currently do not function properly.

The Avon Williams Campus is in good health. The Facility recently went through a major renovation project in 2005-06 in which the entire cabling and technical infrastructure had been replaced.

Lastly, TSU should consider creating a design and installation standards document to govern practices and identify approved products to be used on the campuses as the upgrades continue through the next decade. The document will provide guidelines for the many contractors that are employed on the campuses each year.