

CAMPUS DEFERRED MAINTENANCE EXAMPLES

(Submitted by Institution)

November 2006

THE UNIVERSITY OF KANSAS

The University's top priority continues to be tunnel improvements but it does not address the day to day crisis management of deferred maintenance. In August 2006, a major electrical power line failed. To keep the facility in operation a large generator needed to be brought in to power the facility while the new replacement cable was located and shipped to the site. This failure resulted over \$180,000 in expenses that were not planned for. In September 2006 the transformer at Wescoe Hall failed and again a generator was needed to keep the facility fully functional. The over 30 year old transformer is not an off the shelf item and it took several weeks to find a replacement. Again this was another failure that place further burden on the financial aspects of the deferred maintenance. The cost of the generator rental and transformer replacement was over \$120,000. In October 2006 we once again are face with yet another failure. The chiller in Green Hall failed. The chiller had been rebuilt four previous times and needs to be replaced. This is another impact of \$150,000 that was not planned for.

Collapsing Utility Tunnels:

The underground tunnels that house steam pipes, electric cables, and data transmission lines are leaking and are near collapsing. Every time maintenance workers have to go into certain parts of the tunnels, they are risking their lives. Fortunately, the worst sections of the tunnels are being replaced under the Energy Performance Contract but much work remains. If a tunnel collapses, it could take with it the electricity for multiple buildings. If one of those buildings is Malott Hall, where a large share of research on campus is conducted, the value of the lost research would be millions.

Collapsing Utility Tunnels:

In November 2003 a deteriorating condition in the tunnel between Lippincott and Spooner Hall was identified by an FO employee. This tunnel section was hand dug through the shale layer and had a brick arched roof. This section of tunnel is approximately 25 feet deep. In the mid 1960s the tunnel was in bad condition and the tunnel was lined with a corrugated metal tube material. Three years ago this tunnel was inspected by a structural engineer and was considered in poor condition but seemed OK. Today you can easily push your hand through the metal liner of the tube that was installed in the 1960s. The structural engineer re inspected the tunnel and basically condemned the tunnel preventing access by maintenance staff. On a steam system it is critical to maintain the steam and condensate piping expansion joints and steam traps. Several of these steam system components exist in this section of tunnel. If we had a maintenance employee in an adjacent tunnel doing maintenance when a failure occurred,

the tunnel would fill with steam removing the oxygen from the tunnel resulting in a fatality. The tunnel serves the Kansas Memorial Union, Dyche, Lippincott, Spooner, Douthart (student residence) and Grace Pearson (student residence) Halls. Loss of steam could result in loss of use of over 511,000 square feet of facilities. During the winter months there would be a serious concern for property loss due to freezing conditions. Loss of steam heat would potentially result in displacement of 100 students from resident halls. Loss of steam could potentially result in displacement of over 181,000 s.f. of academic, research and museum space and associated faculty, students and staff until steam heat could be restored. Within Dyche Hall there is an estimated \$200,000,000 in specimens that are temperature and humidity sensitive that would be in jeopardy of being damaged or lost due to lack of steam. Also in Dyche Hall there is approximately \$5 million in research that would be seriously delayed until steam is restored. The Spencer Art Museum is one of the top major University collections in the country. At Spencer Art Museum there is approximately 25,000 works of art and a majority of the collection is irreplaceable. Cost impact to the Kansas Union closing due to a lack of steam heat would result in a loss of revenue ranging from \$5,000+/day during the time between semesters (no students on campus) to \$30,000+/day for a typical day during the semester to \$300,000/day in the first couple weeks of each semester. To provide temporary heat, one option would be temporary rental boilers. From past experience, boiler rental would cost approximately \$9,000/month plus initial costs to connect to the facilities plus monthly fuel costs. It would take a minimum of four portable boilers to provide the steam requirements, a minimum of one week to locate and transport the boilers to the site and a minimum of one week to install the temporary piping. This two-week plus period without heat would place the facilities in jeopardy of freeze damage to plumbing. Freeze damage to plumbing in turn could result in damage to furnishings and other valuable contents.

In the summer of 2004 the university started an emergency replacement of this section of tunnel at a cost of approximately \$1.4 million dollars. For FY 2005 we had anticipated continuing the repairs to the tunnel section started in the summer of 2003. Instead we reallocated the funds to this emergency, deferred a re-roofing project for another year, picked up funding balances from other completed projects and we utilizing the crumbling classrooms bond refinance funds allocated to KU to complete the funding package.

Failing Masonry Walls and Floors:

In the spring of 2004 a staff person in Oldfathers Studios contacted Facilities Operations and Design and Construction Management expressing concern about the condition of some interior walls. What we found was significant floor settlement causing wide horizontal cracks in the 20+ feet high masonry walls. This was a very unstable wall condition in several studio class labs. A structural engineer was called in to analyze the condition and provide short term and long term repair options. The only option provided was the complete removal of the walls, replace the floor slabs and reconstruct the walls to current design standards and codes. Oldfathers Studio is 19,745 s.f. of offices and studio class labs. Of the 4,402 s.f. of first floor space, 8838 s.f. of studio class lab space was in jeopardy of being closed off due to unsafe conditions. A second engineer was brought in to identify an option for temporary bracing and support for the walls. A couple smaller

rooms have been closed off; a small area in a large scene storage room (approx. 2,300 s.f.) has been marked off disallowing further storage or scene assembly activity. Several walls have installed temporary vertical steel supports to allow continued use of the spaces. The interior wall failure would not result in building collapse. A wall failure could have resulted in serious injury to students and faculty and potentially loss of life. Failure would displace a class activity that cannot easily be relocated to other facilities due to the size, and supporting equipment.

This same wall and floor condition exists in a couple more facilities on campus. In Wescoe Hall on first floor the soils have rebounded causing the first floor slab to undulate as much as 4 to 6 inches. This has caused the demountable partitions to rack and push up the suspended ceiling system. The uneven floor causes a tripping hazard and the partitions pushing up the ceiling system creates a condition where light fixtures become unstable and are at risk of falling out of the ceiling. Potential for injury to students, faculty and staff exist in the building and this requires close monitoring to reduce the risk of injury. This level of the building is predominately office space and repair will displace approximately 48 offices and associated support space totaling over 7,500 s.f. The repair would result in temporary relocation of the offices to other space, demolition of the partitions and floor slab, stabilization of the sub soil and reconstruction of the slab and partitions. Cost of repair is over \$750,000 plus relocation costs. In Robinson a similar wall and floor condition exists with similar risks of injury to students, faculty and staff.