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ABSTRACT

This report assesses: (1) whether the Jackson State University (JSU) Honors Dormitory required nearly $1 million in repairs two years after it was built because of inappropriate design, construction, and maintenance; and (2) if the state or university has legal recourse to recover damages resulting from inferior design and/or construction specifications. Findings reveal that JSU did not effectively investigate or identify existing subsurface water collection problems at the site. Also, the State Institutions of Higher Learning (IHL) did not assure that the dormitory was properly maintained when JSU failed to resolve the groundwater problem. Neither JSU nor the Department of Finance and Administration has legal recourse to recover damages to pay the repair expenses. Recommendations suggest: (1) a high-level JSU review of the university's preventive maintenance plan; (2) a JSU review of the distribution of maintenance responsibilities between facility maintenance staff and the student affairs staff to determine effective maintenance methods; and (3) the adoption of a uniform policy for preventive and emergency maintenance programs for all campus facilities. Concluding sections present responses to the report. (GR)

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#416

Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER)

Report to
the Mississippi Legislature

The Jackson State University Honors Dormitory: An Evaluation of Design, Construction, and Maintenance

The Jackson State University (JSU) Honors Dormitory was completed in 1992. By 1994, the dormitory had sustained damage caused by expanding and contracting soil conditions, necessitating a $920,000 repair/renovation project.

PEER contracted with a registered professional engineer to evaluate the dormitory's design and construction specifications to determine, to the extent feasible, the likelihood of design deficiencies that could have contributed to a decrease in the serviceable life of the dormitory. The engineer concluded that the JSU Honors Dorm's design and construction specifications met the professional standards and practices for soil conditions at the site and that the design and construction did not contribute to excessive moisture build-up in the soil after the dormitory was built.

The groundwater problems at the JSU Honors Dorm site were due to improper operation of the dormitory's sprinkler system and lack of maintenance of the system. When presented with physical evidence of a groundwater problem, JSU did not effectively investigate or identify existing subsurface water collection problems. Also, although IHL follows a custom and practice of delegating responsibility for maintenance to the university, IHL did not meet its responsibility to assure that the dormitory was properly maintained when JSU failed to resolve the groundwater problem.

Neither JSU nor the Department of Finance and Administration's Bureau of Building has legal recourse to recover damages for the expense of the Honors Dorm repair. JSU did not fulfill its operational and maintenance responsibilities for the dormitory's sprinkler system, and the serviceable life of the dormitory was based on proper operation and maintenance of the building's systems. If deficiencies in design or construction had existed, the six-year statute of limitations has expired for any legal action to recover damages for a deficiency in construction.

EF 006 034

December 27, 2000

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Honorable Ronnie Musgrove, Governor
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On December 27, 2000, the PEER Committee authorized release of the report entitled **The Jackson State University Honors Dormitory: An Evaluation of Design, Construction, and Maintenance.**

Senator William Canon, Chairman

This report does not recommend increased funding or additional staff.

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The Jackson State University Honors Dormitory: An Evaluation of Design, Construction, and Maintenance

Executive Summary

The Jackson State University Honors Dormitory was designed and constructed according to professional standards and practices for soil conditions at the site. However, JSU's subsequent improper operation and lack of maintenance of an interior courtyard sprinkler system caused groundwater problems and building damage, reducing the building's serviceable life and costing taxpayers approximately $920,000 in repairs and renovations.

In response to legislative concerns about the state's having to repair and renovate the eleven-year-old Honors Dormitory at Jackson State University (JSU), the PEER Committee sought to determine whether the Honors Dormitory was designed, constructed, and maintained in a manner that would provide the expected minimum serviceable life for this type of facility. PEER further sought to determine if the state or university has any legal recourse to recover damages in the event of inferior design and/or construction specifications.

The JSU Honors Dorm was completed in 1992. By 1994, the dormitory had sustained damages.

The JSU Honors Dormitory was planned, designed, and constructed in two phases by two general contractors and multiple sub-contractors over a six-year period. The dormitory was completed in 1992. By 1994, the dormitory had sustained damages, including cracked and buckled concrete in the courtyard and courtyard entrances, the door aprons to first floor rooms, and the interior walkways and stairwells. Currently, the Department of Finance and Administration is completing a $920,000 repair/renovation project at the Honors Dormitory that should repair the damage caused by expanding and contracting soil conditions.

PEER contracted with a registered professional engineer to evaluate the dormitory's design and construction specifications to determine, to the extent feasible, the likelihood of design deficiencies that could have contributed to a decrease in the serviceable life of the dormitory. PEER's contract engineer concluded that the JSU Honors Dorm's design and construction specifications met the professional standards and practices for soil

conditions at the site and that the design and construction did not contribute to the excessive moisture build-up in the soil after dormitory was built.

JSU did not effectively investigate or identify existing subsurface water collection problems. Also, IHL did not assure that the dormitory was properly maintained when JSU failed to resolve the groundwater problem.

The groundwater problems at the JSU Honors Dorm site were due to improper operation of the dormitory's sprinkler system and lack of maintenance of the system. When presented with physical evidence of a groundwater problem, JSU did not effectively investigate or identify existing subsurface water collection problems. Also, although IHL follows a custom and practice of delegating responsibility for maintenance to the university, IHL did not meet its responsibility to assure that the dormitory was properly maintained when JSU failed to resolve the groundwater problem.

Neither JSU nor DFA has legal recourse to recover damages to pay the repair expenses.

Neither JSU nor the Department of Finance and Administration's Bureau of Building has legal recourse to recover damages for the expense of the Honors Dorm repair project because:

- According to the consulting engineer's report, the architect and designing engineers met their professional responsibilities to design and build a dormitory that met the professional standards and practices for the Yazoo soil conditions.
- JSU did not fulfill its operational and maintenance responsibilities for the dormitory's sprinkler system, and the serviceable life of the dormitory was based on proper operation and maintenance of the building's systems.
- If deficiencies in design or construction had existed, the six-year statute of limitations has run out for any legal action to recover damages for a deficiency in construction.

Recommendations

1. Jackson State University's Vice President for Finance and Administration should review the preventive maintenance plan for JSU buildings. This administrator should determine whether the plan should be modified to ensure that all facility operating systems, such as sprinkler systems, are included in the plan.

2. The Jackson State University President or his designated representative(s) should review the distribution of maintenance responsibilities

between Facility Maintenance staff and the Student Affairs staff to determine whether this arrangement is the most effective method by which to implement preventive and emergency dormitory maintenance.

Should JSU choose to retain the current arrangement, the Vice Presidents for Student Affairs and Finance and Administration should prepare a written agreement that defines the:

- specific maintenance responsibilities of each division
- funding sources for each division
- management information system and its components that will be used to track and maintenance actions and account for the costs

3. IHL should adopt a uniform policy for preventive and emergency maintenance programs for all campus facilities in concert with the eight universities. This policy should address:

   - what, why, where, when, who, how, how often.
   - an IHL monitoring system that includes periodic university status reports and on-site verification visits.
   - a university certification program for accomplished preventive maintenance work, including completion certificate postings in each campus facility that answers what, where, when, who, how often.

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The Jackson State University Honors Dormitory: An Evaluation of Design, Construction, and Maintenance

Introduction

Authority

In response to legislative concerns about the state's having to repair and renovate the eleven-year-old Honors Dormitory at Jackson State University (JSU), the PEER Committee authorized a review of the design, construction, and maintenance of this facility. PEER conducted this review pursuant to the authority granted by MISS. CODE ANN. § 5-3-57 et seq. (1972).

Scope and Purpose

PEER sought to determine whether the Honors Dormitory was designed, constructed, and maintained in a manner that would provide the expected minimum serviceable life for this type of facility. PEER further sought to determine if the state or university has any legal recourse to recover damages in the event of inferior design and/or construction specifications.

This review focused on the period of the design, construction, and repair of the dormitory (from 1988 through 2000).

Method

PEER contracted with a registered professional engineer to evaluate the Honors Dorm's design and construction specifications and determine whether design deficiencies could have contributed to the dorm's need for repairs.

In conducting this study, PEER reviewed financial, construction, and/or maintenance program information of the Board of Trustees of State Institutions of Higher Learning (IHL), Department of Finance and Administration (DFA), JSU, and the professional contract firms for both the initial construction project and the repair/renovation project. PEER further reviewed state laws and IHL regulations, policies, procedures, and minutes. PEER interviewed IHL, DFA, JSU, contractual firm, and engineering design personnel, as well as personnel for the state licensing board for architects, engineers, and public contractors.

PEER also contracted with a registered professional engineer to evaluate the dormitory's design and construction specifications and determine, to the extent feasible, the likelihood of design deficiencies that would have contributed to a decrease in the serviceable life of the dormitory. (See page 10 for a summary of the contract engineer's conclusions.)

Background

Planning, Design, and Construction of the JSU Honors Dormitory

The JSU Honors Dormitory was planned, designed, and constructed in two phases by two general contractors and multiple sub-contractors over a six-year period. The dormitory was completed in 1992.

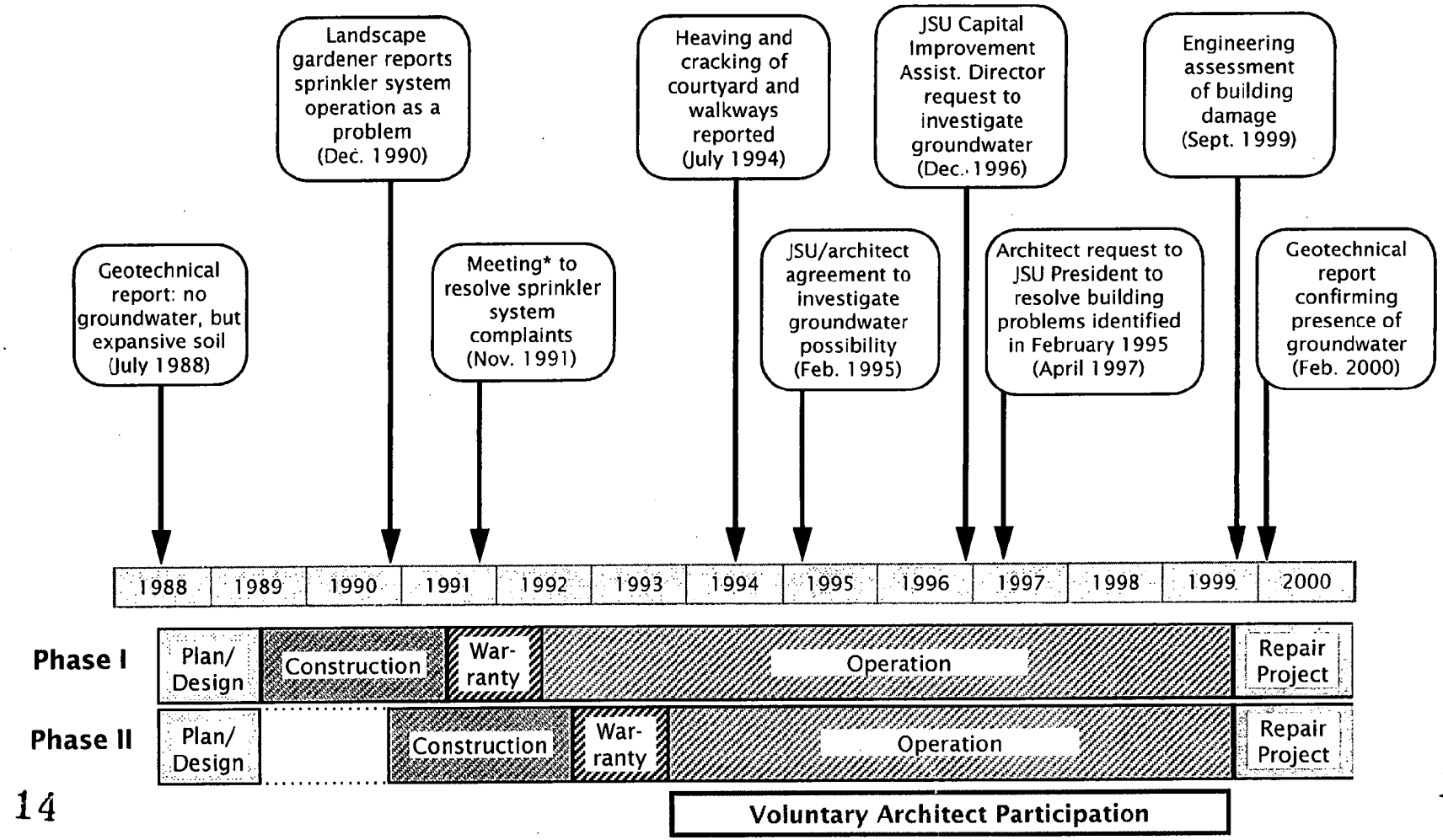
Jackson State University planned, designed, and constructed the Honors Dormitory from November 1986 to August 1992. Exhibit 1, page 4, presents a timeline of events related to the JSU Honors Dormitory.

JSU, as the dormitory's owner, retained and exercised final approval authority for all construction project management actions.

Due to property acquisition problems, the university built the dormitory in two phases. JSU hired Canizaro-Trigiani Architects and its consulting engineering team to plan and design both phases between June 1988-July 1989. However, two different general contractors built the two phases. Mac Construction Company, Inc., built Phase I (two buildings on south end) beginning August 1989 and completed in June 1991, while Dickerson Construction Company built Phase II (two buildings on north end) beginning November 1990 and completed in August 1992. These two contractors used subcontractors (e.g., mechanical and electrical) in the construction of the dormitory. In each phase, the architectural firm acted as the agent of JSU; however, JSU, as the owner, retained and exercised final approval authority for all project management actions.

The Honors Dormitory includes a common lobby area for four separate three-story dormitory buildings that house 400 students. These buildings are tied together with a central entrance/exit and a common interior courtyard with landscaped plant beds watered with an in-ground automatic watering system. The courtyard is covered with concrete except for the plant beds with brick borders. It also includes sitting areas, multiple security lights, three sets of east/west stairwells, and interior breezeway walkways to room entrances on each building floor. Exhibit 2, page 5, is a schematic drawing of the Honors Dormitory.

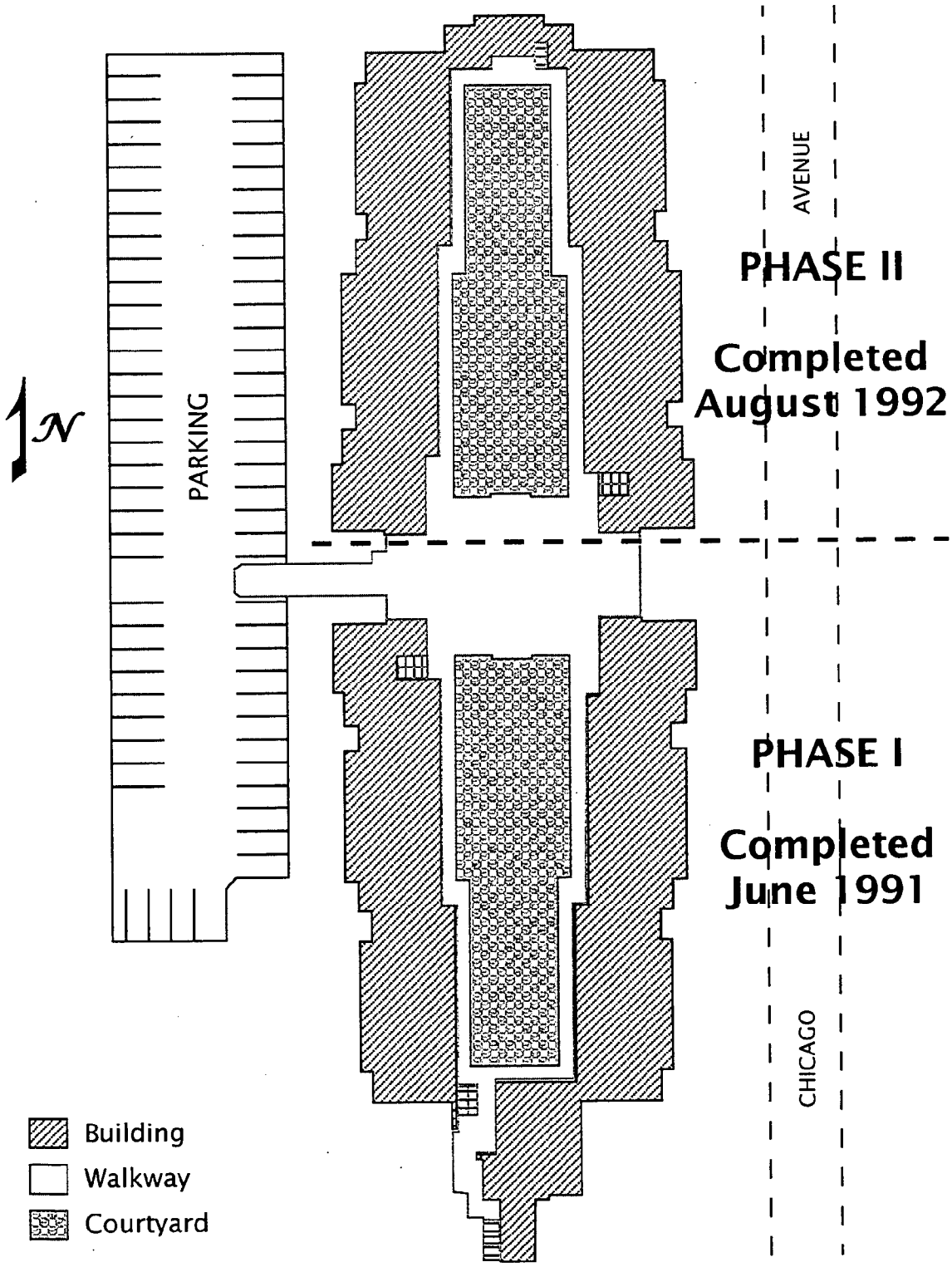
Exhibit 1: Timeline of JSU Honors Dorm Events



*Meeting attended by representatives from JSU, Architect, General Contractor and Sprinkler System Contractor.

SOURCE: Compiled by PEER.

Exhibit 2: Schematic of JSU Honors Dorm Layout



SCALE: 1/8" = 8.3 ft.

IHL Board's Role in the JSU Honors Dormitory Construction Project

The IHL Board and staff provided oversight of the construction of the JSU Honors Dormitory.

The IHL Board of Trustees and its staff fulfilled their reponsibilities to JSU for the construction process. These responsibilities included approval of the:

- university-initiated project
- university-selected architect and general contractors
- schematic, design development, and final contract documents for the building
- funding method and cost of contractors
- all change orders, including cost, to the approved final contract documents and contractor costs

IHL also conducted periodic reviews of the project during construction.

See pages 16 through 18 for a discussion of IHL's maintenance responsibilities for the Honors Dorm project.

Maintenance Responsibilities for the Honors Dorm

The maintenance responsibilities for dormitories are divided between the JSU Student Affairs and Facility Management offices.

JSU's Facility Management Division is responsible for maintaining the Honors Dorm and other campus buildings. However, the Student Affairs staff has its own routine maintenance crew to provide timely maintenance response to student requests for light carpentry and electrical and plumbing work.

The verbal agreement to divide maintenance responsibilities between Facility Management and Student Affairs was in effect from 1992 through 1994 and has been in effect continuously since 1997. These two staffs agreed that this arrangement included the following responsibilities.

- JSU's Facility Management Division maintenance staff would perform preventive and emergency maintenance on the dormitories and their major systems (e.g., electrical, mechanical, plumbing). Emergency repair work would be handled through the Facility Management work order system that required Student Affairs to submit written work orders to request maintenance.

- Student Affairs maintenance staff would perform routine maintenance (e.g., changing light bulbs, fixing outlets, replacing window panes, repairing locks). The maintenance crew included a maintenance supervisor and individuals with carpentry, electrical, and plumbing skills.

Damages at the Jackson State University Honors Dormitory

What were the damages associated with the JSU Honors Dorm?

The JSU Honors Dormitory had cracked and buckled concrete in the courtyard and courtyard entrances, first floor rooms, and the interior walkways and stairwells.

In July 1994, JSU began reporting Honors Dormitory damage to Canizaro-Trigiani Architects. The damage consisted of cracking and heaving concrete in the east and west entrances to the courtyard and the courtyard itself, the door aprons to first floor rooms, and the interior walkways and stairwells. These problems continued to worsen, and in 1997, JSU initiated a repair/renovation project for the Honors Dormitory (see page 9).

Prior to commencement of the project, in September 1999, a professional engineer from LAD Engineering Technologies, Inc., conducted an inspection of the Honors Dormitory to document the facility problems that should be addressed in the repair and renovation project. This engineer reported the following problems to JSU in his inspection report.

- The courtyard paving was cracking and buckling up due to differential settlement and thus the heaving problems. This problem appeared to be caused by the inability to maintain a constant moisture content in the expansive soil. One cause of this moisture content problem was that water from broken underground lawn sprinkler system pipes was constantly running beneath the concrete paving.

- Some rooms on the east side of the dormitory were flooding when it rained. This problem existed due to the ground on the east side of the building having no positive slope away from the structure, causing the rainwater to run into the rooms and under the floor slabs instead of away from the building.

- Second and third floor room ceilings were damaged from rain. This problem existed due to missing roof shingles in many places and the metal flashings for the roof needing sealing and realignment. (This damage would not have occurred if JSU had properly maintained the roof through its preventive maintenance program.)

- Room doors could not be opened because many of the doors and frames rubbed against each other and the floor. The cause of this problem was the movement of the slabs on the east side of the dormitory due to the groundwater collecting under the slab.

- Stairs and walkways were cracking due to the movement of the ground.

- Kitchen sinks were leaking due to movement in the kitchen pipes which are now separating. This problem was due to the movement of the ground.

What is being done to repair these damages and what are the costs?

The Department of Finance and Administration is completing a $920,000 repair/renovation project at the Honors Dormitory that should repair the damage caused by expanding and contracting soil conditions.

In the summer of 1997, JSU initiated the request for a repair/renovation project to the Department of Finance and Administration (DFA) during the annual legislative tour of universities. After JSU had a professional engineer assess the building damage (see page 8), JSU formally requested, through IHL, that DFA accomplish the project in the fall of 1999.

DFA is currently overseeing the completion of the repair/renovation project. The department is funding this project with approximately $920,000 of the $6,500,000 that the Legislature appropriated in SB 3254, 1998 Regular Session, for DFA'S discretionary use at JSU. DFA could use these funds to pay the costs of specific items, including repair and/or renovation of existing facilities, if the project was initiated or submitted to DFA before January 1, 1998.

The reconstruction work is designed to repair totally the damage caused by the expanding and contracting soil conditions at the dorm.

The reconstruction work is designed to repair totally the damage caused by the expanding and contracting soil conditions. According to DFA, JSU has occupied the second and third floor rooms of the dormitory during the 2000 Fall Semester and will occupy the first floor during the 2001 Spring Semester.

Conclusions

The Jackson State University Honors Dormitory was designed and constructed according to professional standards and practices for soil conditions at the site. However, JSU's subsequent improper operation and lack of maintenance of an interior courtyard sprinkler system caused groundwater problems and building damage, reducing the building's serviceable life and costing taxpayers approximately $920,000 in repairs and renovations.

Did the design or construction of the JSU Honors Dorm cause the damages?

PEER's contract engineer concluded that the JSU Honors Dorm's design and construction specifications met the professional standards and practices for soil conditions at the site and that the design and construction did not contribute to the excessive moisture build-up in the soil after dormitory was built.

PEER's contract engineer sought to determine, to the extent feasible, the likelihood of design deficiencies that could have contributed to a decrease in the serviceable life of the dormitory.[1] The engineer's evaluation addressed the following:

- Did the project design and specifications, as modified through approved change orders, yield a dormitory construction plan that should have met the serviceable life standards for the soil conditions existing at the time of facility construction?

- Assuming proper operation and maintenance of all building systems, did any structure design or construction specification(s) cause or contribute to the excessive moisture build-up in the soil after facility construction?

The dormitory met the serviceable life standards for the Yazoo Clay soil conditions that existed at the time of construction.

PEER's contract engineer concluded that the dormitory met the serviceable life standards for the Yazoo Clay soil conditions that existed at the time of construction. According to these standards, the JSU Honors Dormitory should have been serviceable for a minimum of fifty years and the courtyard/concrete pavement areas for a minimum of twenty years. This conclusion assumed an effective

1 *Serviceable life* is the number of years that a building should be safe and structurally sound, requiring only preventive/emergency maintenance.

preventive maintenance and emergency repair program for the dormitory and its systems.

The excessive moisture build-up under the courtyard area and its pavement reduced this area's serviceable life from approximately twenty years to approximately three years.

The "as built" design and construction specifications, accepted by JSU in the two completed Certificates of Substantial Completion for the dormitory, did not contribute to the conditions which warranted the DFA repair project in 2000.[2] According to the consulting engineer's report, the excessive moisture build-up under the courtyard area and its concrete pavement reduced this area's serviceable life from approximately twenty years to approximately three years.

The Appendix, page 23, contains the complete text of the contract engineer's evaluation report.

Did the soil content of the JSU Honors Dorm site contribute to the damages?

A 1988 geotechnical report on the dormitory site prior to construction reported no groundwater in the subsurface soil, but noted the expansive nature of the soils and recommended adequate drainage to control moisture.

Prior to beginning design and construction of the Honors Dormitory, Canizaro-Trigiani Architects completed a forensic evaluation of the soil conditions at the construction site through a consulting engineering firm. This geotechnical report, dated July 1988, reported no groundwater in the subsurface soil strata.[3] However, it repeatedly noted the expansive nature of the subsurface soils and recommended adequate drainage to control moisture changes in the soils. It also recommended that:

- the four dormitory structures be supported by piers drilled at least twenty feet below the floor elevation; and,
- the parking lot be constructed of a flexible asphalt pavement, after replacing some expansive clay at the ground surface with suitable compacted fill material.

The architect and his consulting engineers used the 1988 geotechnical recommendations to design the dormitory's foundation, drainage and grading system, landscaping system, and irrigation system.

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2 *As built* is defined as the original design and construction specifications, as modified through approved design change orders and material specifications, used to construct the building.
3 *Groundwater* is water that pools or flows in subsurface soil and that comes from some source other than the natural water content of the soil.

A February 2000 geotechnical report completed in conjunction with DFA's repair/renovation project found groundwater at the site.

As noted above, when the Honors Dormitory was constructed, the July 1988 geotechnical report for the forensic investigation found no groundwater in the subsurface soil. However, a February 2000 geotechnical report completed in conjunction with DFA dormitory's repair/renovation project found groundwater in five of ten soil borings in the inner courtyard, ranging from depths of six to ten feet below the concrete in the inner courtyard.

What caused the groundwater problem to occur subsequent to construction of the dormitory?

The groundwater problems at the JSU Honors Dorm site were due to improper operation of the dormitory's sprinkler system and lack of maintenance of the system.

The Honors Dormitory was designed to create a "garden apartment" environment with an interior courtyard peppered with plant beds and sitting areas. JSU approved a building design with an automated in-ground sprinkler system in order to water these plants properly. This type of system required the university to ensure that its housing and facility maintenance staffs properly operated and maintained the system through effective and timely preventive/emergency maintenance.

JSU's use of improper watering cycles and the lack of system maintenance contributed to the build-up of groundwater in the subsurface soil in the inner courtyard. The excessive water in the soil caused it to shift, resulting in damage to the dorm.

However, JSU's use of improper watering cycles in the dry season and the lack of system maintenance contributed to the build-up of groundwater in the subsurface soil in the inner courtyard. According to construction professionals, the excessive water content in the soil caused the Yazoo clay to expand and contract in the subsurface soil during weather changes. This shifting of the subsurface soil caused the concrete areas on top of the soil in the courtyard area to crack and heave within three years of dormitory completion.

This shifting soil caused major damage to the courtyard paving and walkways by 1994. It also eliminated the drainage slope away from the east side of the building resulting in surface water percolating into the subsurface soil and causing additional groundwater to pool or flow under the dormitory foundation. Sources of this surface water were rain, roof down spouts, or overflowing catchbasins along Chicago Avenue.

Problems with Operation of the Sprinkler System

JSU did not act to correct problems with sprinkler system operation.

The operation and maintenance of the Honors Dorm's sprinkler system was recognized as a problem as early as December 1990. In correspondence and meetings from this date until April 1997, various parties involved in the construction project (architect, landscape architect, general contractor, nursery sub-contractor, sprinkler system sub-contractor, and JSU) discussed the operation and maintenance of the sprinkler system. The stated problems with the system's operation included:

- appropriate system use in dry and wet seasons;
- excessive watering of plants;
- incorrect watering cycle;
- missing parts of the system;
- correct programming of the system;
- default programming for the automated watering system cycle;
- personnel training for programming the system; and,
- having a separate breaker switch for sprinkler system and boiler room lights.

In November 1991, the sub-contractor who installed the sprinkler system met with the architect, general contractor, other appropriate sub-contractors, and JSU personnel (dormitory manager and facility maintenance staff) to resolve these operational problems. At this meeting, the sub-contractor instructed the JSU dormitory manager and Facility Management personnel in how to program the automated sprinkler system and demonstrated that the system operated properly after reconnecting a disconnected system component.

The meeting participants also discovered that the electrical power to the system was turned on at its power box. This discovery was contrary to JSU staff's report that they had turned off the breaker for the system in order to stop it from coming on at erratic hours or running continuously. This same breaker controlled the power for the lights in the boiler room where, the sprinkler control unit was located.

At this November 1991 meeting, the group decided that the JSU dormitory manager would manually operate the system in the wet season (winter/spring) based on the need to water, and the JSU Facility Management personnel would program its automated operation in the dry season (summer/fall). Further, the group recommended that the circuit breaker for the sprinkler system be put on a separate circuit breaker from the boiler room lights.

According to the former dormitory manager, the agreed-to solution for operating the system worked fine in the wet season. However, it did not resolve the problem in the dry season when it was to be automatically operated by the programmed operating cycle of the JSU Facility Management personnel.

The excessive watering from the sprinkler system contributed to creating the groundwater that caused the dormitory damage.

The former dormitory manager reported that the system was programmed to run too many times per day during the dry season. To solve this excessive watering problem, the dormitory manager asked the Facility Management staff to provide her one of the two operational manuals that the architect had provided to their operation. She planned to re-program the sprinkler system; however, they never provided this document to her.

While all these actions were intended to correct the system's operational problems of the sprinkler system, JSU did not effectively operate the sprinkler system with the proper automated watering cycles. As a result, the excessive watering contributed to creating the groundwater that caused the dormitory damage.

Confusion Over Maintenance Responsibilities

Because JSU staff did not have a clear understanding of the distribution of maintenance responsibilities for the Honors Dorm sprinkler system, JSU did not perform routine preventive or emergency maintenance on the sprinkler system during the 1990s. This led to subsurface water collection problems that were responsible for the dorm's damage.

JSU staff did not perform routine preventive or emergency maintenance on the sprinkler system during the 1990s.

The two separate maintenance staffs claimed that the other maintenance staff was responsible for maintaining the sprinkler system in accordance with their agreement. Student Affairs acknowledged that they had not accomplished any type of maintenance on the sprinkler system during the period of divided maintenance responsibilities. Facility Management did not include the sprinkler system in its preventive maintenance plan for the university facilities. It also produced only one work order that showed any maintenance action on the

sprinkler system during the 1990s--i.e., providing a key for this system in October 1999.

Due to computer system crashes, inability to access computerized work order data for 1994-97, and flooding of the storage area, no maintenance records exist for the Honors Dormitory prior to 1998. As a result, PEER could not absolutely determine that the sprinkler system had not received some emergency maintenance repairs through the work order system of Facility Management.

What did JSU do to identify and correct the cause of the damage?

When presented with physical evidence of a groundwater problem, JSU did not effectively investigate or identify existing subsurface water collection problems.

Although JSU had assumed sole responsibility for the dormitory by 1993 and Canizaro-Trigiani had no legal responsibility to assist JSU, the architect's construction inspector met with the JSU Director of Facility Management in July 1994. The purpose of this meeting at the dormitory was to discuss the heaving and cracking of the concrete courtyard and walkways.

JSU's failure to investigate the possibility of groundwater under the dormitory slabs contributed to the need for the DFA repair/renovation project.

During this meeting, Canizaro-Trigiani identified and documented specific concrete heaving and cracking problems in eleven different locations in an architect's observation report. The size of cracks ranged from one-fourth inch to two inches in width, depending on the specific problem and its location.

From July 1994 to April 1997, Canizaro-Trigiani Architects documented meetings, telephone calls, and correspondence with JSU or IHL personnel concerning the concrete heaving and cracking problems. Through these various communication forms, the architectural firm attempted to assist the university in resolving dormitory facility problems.

Canizaro-Trigiani Architects was specifically concerned about the possibility of groundwater in the crawl space under the two dormitory slabs on the east side of the dormitory. In response to this concern, the JSU Director of Facility Management agreed to dig a hole on the east side of the dormitory in order that Canizaro-Trigiani Architects personnel could inspect this opened space for groundwater in February 1995.

Although the architectural firm continued to request that JSU take this action, the JSU Director of Facility Management did not accomplish this action at any time

from February 1995 to the 2000 DFA repair/renovation project. JSU personnel insisted that the general contractors who built the building should have opened the crawl space for the university. The contractors' warranty liability had legally expired for Phase I and Phase II in accordance with the completed warranty dates in June 1992 and August 1993.

The JSU Assistant Director of Capital Improvement in the Facility Management Division made a request to the JSU Maintenance Supervisor in December 1996 for the opening of a space and inspection under the east side of the dormitory. The Facility Management personnel took no action on her request and made no explanation for their inaction.

JSU's failure to investigate the possibility of groundwater under the dormitory slabs contributed to the need for the DFA repair/renovation project.

Although IHL follows a custom and practice of delegating responsibility for maintenance to the university, IHL did not meet its responsibility to assure that the dormitory was properly maintained when JSU failed to resolve the groundwater problem.

IHL Maintenance Responsibilities

Although IHL has management and control authority over all universities, its staff does not monitor universities' daily preventive or emergency maintenance actions as a matter of practice and policy. However, when IHL approved the JSU Honors Dormitory project, it entered into a project lease with the JSU Educational Building Corporation, dated April 1, 1988, which included a maintenance responsibility for the dormitory during the lease period. Article IV, Section 4.1.B. of the project lease states:

> *. . .the Board may arrange for the operation of all or any part of the Premises by others and may require the operator to perform all or some maintenance and repair,* ***but no such arrangement shall relieve the Board from such responsibility under the terms of this Project Lease except to the extent that such maintenance and repair is in fact performed.*** [PEER emphasis added]

In Article IV, Section 4.1.A. of the project lease, IHL agreed to maintain the premises in the manner described in Article VI, Section 6.01 of the JRA-JSU Loan Agreement, dated April 1, 1988. This loan agreement section states:

> *...will keep and maintain the premises in good condition, repair and working order, ordinary wear and tear excepted, at its own cost, and will make or cause to be made from time to time all necessary repairs thereto (including external and structural repairs) and renewals and replacements thereof.*

Through custom and practice, IHL delegates responsibility for building maintenance to the university where the facility is located. The board followed this practice regarding maintenance responsibility for the Honors Dormitory.

The lease period was July 1, 1989, or the date of the successful final inspection, whichever was earlier, to March 31, 2018.

IHL's Involvement in Investigating and Resolving Dormitory Problems

IHL never fulfilled its maintenance responsibility for investigating and resolving the cracking and heaving concrete problems.

In July 1994, JSU began reporting Honors Dormitory damage to Canizaro-Trigiani Architects that included the cracking and heaving concrete problems throughout the dormitory. This architectural firm documented multiple attempts to assist the university in resolving these problems from July 1994 through April 1997 and communicated this information to the IHL staff through copies of university correspondence, letters to IHL, and joint meetings with IHL and JSU staff.

In October 1996, the IHL building construction staff requested that the JSU Facility Management staff open the crawl space under the east side of the dormitory as they had agreed to do in February 1995. Then the architect's building construction supervisor and JSU staff would determine if groundwater existed and was collecting under the dormitory foundation slabs. In December 1996, these same IHL staff members attended two different meetings on successive days that again addressed this unaccomplished investigative work under the dormitory foundation slab.

Although IHL understood the potential dangers of dormitory damage, the board never ensured or required that JSU accomplish this investigative work before the board approved the university-requested DFA repair and renovation project in September 1999. As a result, it did not fulfill its maintenance responsibility to the JSU

Educational Building Corporation and contributed to the significance of the damage to the dormitory that had to be repaired in the CY 2000 DFA project.

Recourse for Recovering Damages

Neither JSU nor the Department of Finance and Administration's Bureau of Building has legal recourse to recover damages for the expense of the Honors Dorm repair project.

Neither JSU nor the Department of Finance and Administration's Bureau of Building has any legal recourse to recover damages for the expense of repairing the Honor Dormitory because:

- According to the consulting engineer's report, the architect and designing engineers met their professional responsibilities to design and build a dormitory that met the professional standards and practices for the Yazoo Soil conditions. (See discussion on page 10.)

- JSU did not fulfill its operational and maintenance responsibilities for the dormitory's sprinkler system. The serviceable life of the dormitory was based on proper operation and maintenance of the building's systems. (See discussion on page 12.)

- If deficiencies in design or construction had existed, the six-year statute of limitations, which is established in MISS. CODE ANN. Section §15-1-41 (1972), has run out for any legal action to recover damages for a deficiency in construction. This state law states:

> *No action may be brought to recover damages for injury to property, real or personal, or for an injury to the person, arising out of any deficiency in the design, planning, supervision or observation of construction, or construction of an improvement to real property. . . .against any person, firm or corporation performing or furnishing the design, planning, supervision of construction or construction of such improvement to real property* ***more than six (6) years*** *after the written acceptance or actual occupancy or use, whichever occurs first, of such improvement by the owner thereof. This limitation shall apply to actions against persons, firms and corporations performing or furnishing the design, planning, supervision of construction or construction of such improvement to real property for the State of Mississippi or any*

agency, department, institution or political subdivision thereof as well as for any private or nongovernmental entity.

Recommendations

1. Jackson State University's Vice President for Finance and Administration should review the preventive maintenance plan for JSU buildings. This administrator should determine whether the plan should be modified to ensure that all facility operating systems, such as sprinkler systems, are included in the plan.

2. The Jackson State University President or his designated representative(s) should review the distribution of maintenance responsibilities between Facility Maintenance staff and the Student Affairs staff to determine whether this arrangement is the most effective method by which to implement preventive and emergency dormitory maintenance.

   Should JSU choose to retain the current arrangement, the Vice Presidents for Student Affairs and Finance and Administration should prepare a written agreement that defines the:

   - specific maintenance responsibilities of each division
   - funding sources for each division
   - management information system and its components that will be used to track and maintenance actions and account for the costs

3. IHL should adopt a uniform policy for preventive and emergency maintenance programs for all campus facilities in concert with the eight universities. This policy should address:

   - What, why, where, when, who, how, how often.
   - An IHL monitoring system that includes periodic university status reports and on-site verification visits.
   - A university certification program for accomplished preventive maintenance work, including completion certificate postings in each

campus facility that answers what, where, when, who, how often.

Appendix

EVALUATION OF FINAL DESIGN AND CONSTRUCTION SPECIFICATIONS

HONORS DORMITORY AT JACKSON STATE UNIVERSITY

for

THE JOINT LEGISLATIVE COMMITTEE ON
PERFORMANCE EVALUATION AND EXPENDITURE REVIEW

EXECUTIVE SUMMARY

An evaluation of the subject project was undertaken to determine to the extent feasible, the likelihood of design deficiencies which would contribute to a decrease in the serviceable life of the dormitory. The evaluation commenced in November and December of the Year 2000 and answered the following:

1. Did the project design and specifications, as modified through approved change orders, yield a dormitory construction plan that should have met the serviceable life standards for the soil conditions existing at the time of facility construction?

Opinion:

Section 2.1.1 Geotechnical Considerations: In general the recommendations and results of this report prepared by Ware Lind Furlow Engineers, Inc., in our opinion, are in accordance with general accepted practices to this area.

Section 2.1.2 Foundation System: We believe this foundation system was designed appropriately and in accordance with planning considerations. Although no entrance was given to the crawl space we do not believe this would have affected the serviceable life of the buildings but merely required other means of inspection.

Section 2.1.3 Grading and Drainage System: In our opinion, we believe if installed properly the storm drainage system could handle the amount of water under normal storm events. Excessive watering over a period of time could silt up the gravel in the french drain system and cause the system to drain slower.

Section 2.1.4 Landscaping and Irrigation: In our opinion the landscaping and irrigation systems were designed adequately. Subsurface drainage was provided and is normal practice under the soil conditions for this site. Under normal operating conditions this system should have provided an

adequate avenue to remove water through percolation therefore, we do not believed the system as designed would have decreased the serviceable life of the building. Although with any mechanical system, the installation of the irrigation system required an increased level of maintenance especially with the underlying soil conditions.

Conclusion:

Per our evaluation of the information provided by the Joint Legislative Committee relating to the planning, design, and construction plans for the referenced project. We believe that the project design and specifications, as modified through approved change orders met the serviceable life standards for the soils conditions existing at the time of facility construction. Further, we believe the design met professional design and construction practices at the time.

The serviceable life may vary depending on operation and maintenance of the facility. With proper maintenance, the serviceable life for the building and superstructure could be 50 years or longer and for the courtyard and concrete pavement, 20 years or longer.

2. Assuming proper operation and maintenance of all building systems, did any structure design or construction specification(s) cause or contribute to the excessive moisture build-up in the soil after facility construction?

Conclusion :

After review of the structure design and construction specifications, it is our opinion that these items did not contribute to the excessive moisture build-up in soil after facility construction.

If you have any questions about the results of our investigation contained in this report, please feel free to call. Our services were performed using the degree of skill normally exercised by practicing Consulting Engineers in this and similar locales. No other warranty is either expressed or implied. All conclusions were based on visual examination only.

Sincerely,

HARRIS & STEED, INC.

Richard W Steed

Richard W. Steed, P. E.
Principal

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EVALUATION OF FINAL DESIGN AND CONSTRUCTION HONORS DORMITORY AT JACKSON STATE UNIVERSITY

for

THE JOINT LEGISLATIVE COMMITTEE ON PERFORMANCE EVALUATION AND EXPENDITURE REVIEW

1.0 INTRODUCTION

The following report summarizes the results of an evaluation of final design and construction specifications for the Honors Dormitory at Jackson State University. The evaluation was conducted by Harris & Steed, Inc., Consulting Engineers, during November and December of the year 2000.

1.1 PROJECT DESCRIPTION

Jackson State University constructed a dormitory facility that consisted of four three-story dormitory units and housed 400 students. These units have a common interior courtyard and associated parking on the West and North ends of the property. Due to property acquisition problems, this project was built in two phases. Canizaro Trigiani, Inc., the Architect, and its consulting engineer team designed both phases, but different general contractors built each of the two phases. Phase I was completed in June 1991 and the warranty ended in June 1992. Phase II was completed in August 1992 and the warranty ended in August 1993.

1.2 PURPOSE AND SCOPE

The Joint Legislative Committee on Performance Evaluation and Expenditure review has requested whether planning, design, construction, and maintenance of the Jackson State University's Honor Dormitory was properly performed to assure that the delivered facility provided the minimum satisfactory serviceable life for this type of facility.

An evaluation of the subject project was undertaken to determine to the extent feasible, the likelihood of design deficiencies which would contribute to a decrease in the serviceable life of the dormitory. The evaluation commenced in November and December of the Year 2000 and answered the following:

1. Did the project design and specifications, as modified through approved change orders, yield a dormitory construction plan that should have met the serviceable life standards for the soil conditions existing at the time of facility construction?

2. Assuming proper operation and maintenance of all building systems, did any structure design or construction specification(s) cause or contribute to the excessive moisture build-up in the soil after facility construction?

2.0 PROJECT DESIGN AND IMPLEMENTATION

On November 21, 1986 Canizaro Trigiani Architects, P. A., 733 North State Street, Jackson, Mississippi were contracted to design and manage the subject project. A design team was developed and project planning and design began in 1988. This section will describe design methodology, considerations, and constraints pertinent to the design development of this project. The project was designed at one time but would be constructed in two phases. Specifically, this report will address certain questions asked by the Joint legislative Peer Committee pertaining to certain problems due to soil conditions.

2.1 PLANNING AND DESIGN CONSIDERATIONS

During the planning phase of the project, design methodology was taking place. This evaluation will address planning and design considerations for the project pertaining to the geotechnical considerations, drainage system, foundation system, and landscaping and irrigation systems. These items are described specifically as follows:

1. **Geotechnical Considerations:** A soils investigation dated July 31, 1998 was conducted by Ware Lind Furlow Engineers, Inc. to evaluate soil conditions in the proposed construction area and pertinent physical properties of the soils encountered to determine certain design parameters for the foundation systems for the building, parking areas, and construction recommendations. A total of 10 borings were drilled in the construction area. Borings 1 thru 8 were drilled to a depth of 20ft and

borings 9 and 10 were drilled to a depth of 10 ft. Considering the similarity in the subsurface conditions, shallow Yazoo clays and the small area of construction, the total number of borings should have been sufficient to prepare design parameters for this project.

According to the soils report, surface soils at the site consisted predominately of stiff to hard silty clays. These silty clays range in thickness from 2 feet in Boring No. 6 to 6.5 feet in Boring No. 2. The natural water content of the soils generally appeared to be below the plastic limit indicating the potential for large volume increase or swelling with the increase of water.

According to the soils report, surface soils near Boring No. 7 at a depth of 4.5 feet were sandy clays and also sandy clays were encountered from 3 feet to 5 feet in Boring No. 6. The natural water content of these soils was 15 percent and indicated a low potential for swell.

Underlying the above mentioned soils were Yazoo clay, the report indicated the protective cover over the Yazoo clays was not adequate to minimize the development of water content changes and the swelling or shrinking which results from these changes. Therefore certain recommendations were made for the foundation and parking systems. Specifically, the foundation system recommended above grade floor system with appropriate crawl space and supported on drilled and under-reamed piers extended in at least 20 feet below the finish floor. In the parking area a flexible pavement system was recommended to be installed on select fill after over-excavation of the Yazoo clay.

The report indicated no free groundwater was observed in any of the borings made. The report implied the sensitivity of the soil in the construction area and repeatedly noted the expansive nature of the soils and recommended adequate drainage to control moisture changes in the soils.

In general the recommendations and results of this report prepared by Ware Lind Furlow Engineers, Inc., in our opinion, are in accordance with general accepted practices to this area.

2. **Foundation System:** As indicated on the construction plans (Ref: Plan Sheets S1-S9) the foundation system designed was in accordance with the recommendations detailed in the geotechnical investigation. The crawl space between the floor system and finish grade was 2 feet. No consideration was taken for free water which might get under the building in the crawl space. Also, no entrance was designed to enter the crawl space for periodic inspection and no French drain system was indicated to be installed around the perimeter wall to collect water. This was probably because the geotechnical report indicated no free groundwater was observed and the site grading and drainage plan had shown a French drain on the south end of Phase I and other areas were shown to be graded away from the building.

   We believe this foundation system was designed appropriately and in accordance with planning considerations. Although no entrance was given to the crawl space we do not believe this would have affected the serviceable life of the buildings but merely required other means of inspection.

3. **Grading and Drainage System:** The proposed grading and drainage (Ref: Plan Sheets A.1.2,A1.2.A) for this project included collecting storm water draining along Chicago Avenue, storm water from the rain leader down spouts, and surface drainage around the building. Collection as indicated on the construction plans was by individual catch basins which collected the storm water in a storm pipes and ultimately drained it towards the northwest under the parking area on the west side of the building.

   Grading on the east side in the green area between the buildings and Chicago Avenue is shown to have been graded away from the building to a swale about 1.5 to 2 feet below the building and then to a catch basin

near the center between Phases I and II. On the northeast corner and southeast corner catch basins were also placed and graded similar. Roof down spouts in this area should drain towards these swales and to the catch basins. Grading on the west side of the building was shown to drain away from the building towards the parking lot and ultimately out of the construction area.

The inter courtyard grading (Ref: Plan Sheets L1) collected surface water by placement of individual catch basins in and around the courtyard. Spot elevations indicated specific grades to make the pavement drain towards the inlets. Roof downspouts were tied to the storm pipe system underground and not allowed to surface drain. Also, a French drain with a 6" perforated pipe was installed during each phase down the center of the courtyard to collect subsurface drainage created from the irrigation system.

Storm water runoff from the north parking lot constructed later in 1996 drained away from the building and did not effect the construction area.

In our opinion, we believe if installed properly the storm drainage system could handle the amount of water under normal storm events. Excessive watering over a period of time could silt up the gravel in the french drain system and cause the system to drain slower.

4. **Landscaping and Irrigation:** Primarily the landscaping in this project pertained to the inter courtyard area between the four units built. Irrigation was to be installed in the courtyard area as well as around the building and parking islands as indicated in the construction plans (Ref: Plan Sheets L1-L5).

   A. **Landscaping:** Richard Griffin, Landscape Architect, designed the inter courtyard with a series of landscaped islands heavily planted and scored concrete pavement throughout the courtyard. Individual plant beds and an irrigation system would be installed for watering. The scored concrete pavement

was installed independently from the building foundation system. This is normal so maintenance and repair to the concrete segments in the future would be easier and cheaper.

B. **Irrigation:** An irrigation system was selected to assist in watering of the planting material. It is my understanding that this was mutually agreed upon by Jackson State University and the Architect. A French drain system would handle the subsurface drainage as indicated on the construction plans and a mechanical control system was installed that could be programmed to set when the system would turn on and off. The system was designed so that excessive watering would not occur during the rainy season and other watering times could be programmed for the dry season.

No subsurface drainage was indicated on the perimeter of the of the four units. General grading should have handled the normal irrigation water and drained to the individual catch basins.

It should be noted that generally, an irrigation system is not recommended with the types of underlying soils encountered in the construction area. In this area we have become accustomed to yazoo clays, if possible we avoid them but sometime we have to design around them. In this case a French drain system was installed in the confined area of the courtyard to remove excess moisture from the soil. This is a general practice in the area when these soils area encountered. The French drain system is not designed to handle surface drainage nor roof drainage but simply to allow excess subsurface water to drain and prevent pore water buildup in the clays.

In our opinion the landscaping and irrigation systems were designed adequately. Subsurface drainage was provided and is normal practice under the soil conditions for this site. Under normal operating conditions this system should

have provided an adequate avenue to remove water through percolation therefore, we do not believed the system as designed would have decreased the serviceable life of the building. Although with any mechanical system, the installation of the irrigation system required an increased level of maintenance especially with the underlying soil conditions.

2.2 DESIGN MODIFICATIONS

During the planning process, a September 22, 1988 meeting notes discussed a more expensive foundation system would be required because of poor soil conditions. The foundation system proposed would increase the design cost of the building. Design recommendations were followed as outlined in the geotechnical investigations prepared by Ware Lind Furlow Engineers, Inc.

Further in April of 1990, considerations were made to relocate Phase II west of Phase I because of property acquisition. No design change was made. Property was acquired by Eminent Domain in August 1990.

3.0 PROJECT CONSTRUCTION

The Honor's Dormitory was constructed in two phases. The Architect provided construction administration and management during the entire construction process. Phase I was awarded to Mac's Construction Company on August 14,1989 and Phase II was awarded to Dickerson Construction on November 5, 1990.

3.1 PHASE I CONSTRUCTION

Phase I of the Honors Dormitory was to construct two of the four units on the south end of the construction area, installation of approximately half the storm drain system and courtyard, lobby area, and installation of the parking area west of the buildings. Correspondence between the Architect and the contractor during the construction of Phase I was reviewed during this evaluation. From the beginning of construction in 1989 to completion in 1991, no change orders, field observations, and field repairs led us to believe that any design changes were made during the construction of Phase I. Changes made were generally, not related to items which would contribute to soil moisture increases but were related to equipment and similar items. Therefore, we believe that the project design was

not altered and/or modified by the Architect during the construction process. Certain drainage problems, water seepage, and irrigation were discussed during the construction process. These items are discussed further in this section. No correspondence was available to review pertaining to site grading and drainage installation.

3.2 PHASE II CONSTRUCTION

Phase II of the Honors Dormitory was to construct two of the four units on the north end of the construction area, installation of approximately half the storm drain system and courtyard, and ensure proper transition from Phase I. From the beginning of construction in 1990 to completion in 1992, no change orders, field observations, and field repairs led us to believe that any design changes were made during the construction of Phase II. Changes made were generally, not related to items which would contribute to soil moisture increases but were related to equipment and similar items. Therefore we believe that the project design was not altered and/or modified by the architect during the construction process and was constructed generally as designed. No correspondence was available to review pertaining to site grade and drainage installation.

3.3 CONSTRUCTION ADMINISTRATION AND MANAGEMENT

Listed below is general correspondence related to construction administration and management during the construction process pertaining to soil moisture changes.

Phase I

1. Observation Report Dated October 9, 1990, pointed out water seepage in the Mechanical Room. The mechanical room is on the south end of Phase I. Waterproofing of the building was called for in the design documents. The seepage in the room indicates seepage through the wall. This would also indicate that the proposed French drain may have not been working properly.
   The Architect recommended excavation around the end of the dormitory and draining all water underneath the building and resealing.

2. Field Review. On November 26, 1990, Richard Griffin reviewed plant installation in the planting areas and noted installation was satisfactory. 2"x4" expansion joints were noted to not have been installed and was causing cracking in several locations in the concrete paving.

3. Letter dated December 17,1990 from Structural Engineer. Noted Seepage in the mechanical room and recommended excavation, waterproofing of exterior wall, and regrading for positive drainage away from the mechanical room.

4. Letter Dated February 28, 1991 from Barnes Bros. Noted that the irrigation system was in use in spite of their recommendation. Noted excessive watering would cause plant loss.

5. Letter Dated March 28, 1991 from Barnes Bros. Noted that the irrigation system was in use after above dated letter in spite of their recommendations. Noted excessive watering would cause plant loss.

6. Letter Dated May 20, 1991 from Barnes Bros. Noted that the excessive watering was causing plant loss.

7. Letter Dated September 3, 1991 from Mac's Construction. Noted the irrigation system was not functioning properly.

8. Letter Dated September 9, 1991 from Love's Irrigation. Noted the irrigation solenoid coil to be unscrewed. Re-installed and noted system was functioning properly.

9. Letter Dated November 7, 1991 from the Architect. Requested inspection of irrigation system and training on programming and operation of the system for Jackson State Personnel.

10. Letter Dated November 11, 1991 from the Architect. Noted JSU was still encountering problems with the irrigation system. The system was turned off in order to stop operation. Love's irrigation met with the building manger and a schedule for use was worked out.

11. Letter Dated February 13, 1992 from Richard Griffin. Noted the French drains were not working properly. He noted the planting beds were holding water and the drainage must be corrected and proper use of sprinkler system is a must.

12. Letter Dated March 5, 1992 from the Architect. Determined that the French drain system was not operating and noted this was the cause of plants dying. Also, the Architect noted that the system was mismanaged and plants were watered excessively.

13. Letter Dated June 26, 1992 from the Architect. Noted corrective action is supposed to be underway with regard to landscaping and subsurface drainage.

14. Letter Dated August 4, 1992 from Architect. Item No. 2. Mac's Construction has completed the french drain and it is working properly.

15. Letter Dated September 10, 1992 from Architect. The Architect informs JSU that all items pertaining to Phase I was completed by January 1992. This included warranty items and after this date items identified were several maintenance problems for JSU.

Phase II

1. Observation Report Dated July 25, 1994. Item No. 3 Courtyard Paving. Along the South end at crosswalk, the report notes the beginning of heave in the concrete pavement and indicates moisture changes.

In our opinion the Architect and design team perform well to meeting the rigorous task of constructions of the facility in Phase I and II. Time and time again we see through the dialogue in the correspondence that when a problem arose it was addressed to all parties involved and corrections noted where required. Management during and after construction met and/or exceeded general practice.

4.0 FACILITY OPERATIONS AND MAINTENANCE

Listed below is general correspondence related to operation and maintenance of the dormitory facility after completion of construction:

1. Field Report Dated December 2, 1996. Noted maintenance was not being done. Again it was noted that the sprinkler system was running too much and plumbing in the building was leaking.

2. Memorandum Dated December 2, 1996. Noted a list of various maintenance items that were leaking and contributing to the moisture changes.

3. Observation Report Dated December 4, 1996. Noted catch basins clogged with debris and not functioning properly.

4. Observation Report Dated December 6, 1996. Noted the need to verify the presence of free water under building.

5. Letter Dated October 14, 1996. Noted leaking in kitchen and other areas. The concern was that excess water was reaching the crawl space and therefore saturating the Yazoo clays which could lead to structural problems with foundation.

5.0 SUMMARY AND CONCLUSIONS

An evaluation of the subject project was undertaken to determine to the extent feasible, the likelihood of design deficiencies which would contribute to a

decrease in the serviceable life of the dormitory. The evaluation commenced in November and December of the Year 2000 and answered the following:

A. Did the project design and specifications, as modified through approved change orders, yield a dormitory construction plan that should have met the serviceable life standards for the soil conditions existing at the time of facility construction?

Opinion:

Section 2.1.1 Geotechnical Considerations: In general the recommendations and results of this report prepared by Ware Lind Furlow Engineers, Inc., in our opinion, are in accordance with general accepted practices to this area.

Section 2.1.2 Foundation System: We believe this foundation system was designed appropriately and in accordance with planning considerations. Although no entrance was given to the crawl space we do not believe this would have affected the serviceable life of the buildings but merely required other means of inspection.

Section 2.1.3 Grading and Drainage System: In our opinion, we believe if installed properly the storm drainage system could handle the amount of water under normal storm events. Excessive watering over a period of time could silt up the gravel in the french drain system and cause the system to drain slower.

Section 2.1.4 Landscaping and Irrigation: In our opinion the landscaping and irrigation systems were designed adequately. Subsurface drainage was provided and is normal practice under the soil conditions for this site. Under normal operating conditions this system should have provided an adequate avenue to remove water through percolation therefore, we do not believed the system as designed would have decreased the serviceable life of the building. Although with any mechanical system, the installation of

the irrigation system required an increased level of maintenance especially with the underlying soil conditions.

Conclusion:

Per our evaluation of the information provided by the Joint Legislative Committee relating to the planning, design, and construction plans for the referenced project. We believe that the project design and specifications, as modified through approved change orders met the serviceable life standards for the soils conditions existing at the time of facility construction. Further, we believe the design met professional design and construction practices at the time.

The serviceable life may vary depending on operation and maintenance of the facility. With proper maintenance, the serviceable life for the building and superstructure could be 50 years or longer and for the courtyard and concrete pavement, 20 years or longer.

B. Assuming proper operation and maintenance of all building systems, did any structure design or construction specification(s) cause or contribute to the excessive moisture build-up in the soil after facility construction?

Conclusion :

After review of the structure design and construction specifications, it is our opinion that these items did not contribute to the excessive moisture build-up in soil after facility construction.

If you have any questions about the results of our investigation contained in this report, please feel free to call. Our services were performed using the degree of skill normally exercised by practicing Consulting Engineers in this and similar locales. No other warranty is either expressed or implied. All conclusions were based on visual examination only.

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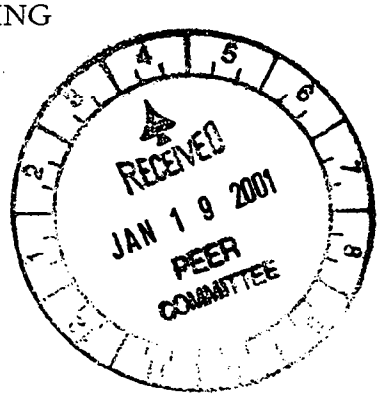

Office of Commissioner

January 19, 2001

Dr. Max Arinder
Executive Director
PEER Committee
222 N. President Street
Jackson, MS 39201

Re: Board's Response to Review of the JSU Honors Dormitory Issue

Dear Dr. Arinder:

Please find attached the response from the Board of Trustees of State Institutions of Higher Learning ("the Board") in relation to PEER's recommendations concerning the Jackson State University (JSU) Honors Dormitory issue.

The recommendations that are JSU specific have been discussed with the President of JSU. JSU's response is being submitted under separate cover.

Implementation of the Board's measures as set out in the response was approved by the Board and submitted to the District Court on June 30, 1998 for review and approval. On October 1, 1999 the court granted the Board request to proceed with the facilities maintenance plan review process, including formal Board approval of finalized facilities maintenance plans for each university.

If you have any additional questions, please contact me.

Sincerely,

Thomas D. Layzell
Commissioner

Attachment

3825 Ridgewood Road • Jackson, Mississippi 39211-6453 • (601) 432-6623 • FAX (601) 432-6972

BOARD'S RESPONSE TO PEER COMMITTEE REVIEW OF THE JACKSON STATE UNIVERSITY HONORS DORMITORY ISSUE

January 19, 2001

The Board of Trustees of State Institutions of Higher Learning ("the Board") has received the PEER Committee's Draft Executive Summary in regard to the Honors Dormitory at Jackson State University (JSU). Staff members of the Board have examined the findings and given special attention to PEER's recommendations. Those recommendations that are JSU specific have been discussed with the President of JSU.

PEER's recommendation regarding the Board adopting a uniform policy for preventive and emergency maintenance programs for all campus facilities parallels certain facilities maintenance policies previously approved by the Board and, subsequently, by the United States District Court pursuant to the *Ayers* Remedial Decree. The District Court's opinion of March 7, 1995 noted high levels of deferred maintenance at the IHL Institutions. The court's decision attributed this, in part, to a high level of institutional autonomy over maintenance funds and required the Board to make recommendations for improving this function. The new facilities maintenance policies approved by the Board on February 18, 1998 and submitted to the court on June 30, 1998 were as follows:

Recommendations for New Facilities Maintenance Policies

The Board recommends establishment of a policy requiring the universities to expend monies earmarked for facilities operation and maintenance for such purposes. Implementation of this policy falls into three broad categories: (1) development of a facilities maintenance plan; (2) evaluation of the success of the past year's maintenance program; and (3) Board audit of O&M funds to determine that they have been expended properly. Policy implementation will include the following:

1. The Board will require the universities to prepare a facilities maintenance plan to be submitted during the annual budget process. Plans may be modified during the year with Board approval. This plan will describe how ongoing maintenance needs will be addressed in the upcoming budget cycle and will include but not necessarily be limited to, schedules for general maintenance, painting, grounds maintenance and schedules for service contracts for the inspection of mechanical systems. An emergency fund should be included in each physical plant budget to be used for unexpected occurrences.

2. The Board has implemented a system of quarterly uniform institutional financial reporting. This quarterly reporting will include all expenditures for facilities maintenance and will permit the Board to monitor compliance with the facilities maintenance plan.

3. At periodic intervals throughout the year, the Board staff will visit the campuses and evaluate how the university is meeting goals established in their maintenance plan. These visits along with a report on past year's performance will be used to develop

a strategy for addressing maintenance needs in the coming year.

4. Operations and maintenance funds will periodically be audited to insure that O&M expenditures are consistent with Board policy and that they are being expended properly. Recommendations for changes in the maintenance program will be addressed at this time.

5. The Board will require the institutions to retain qualified personnel to fill the position of physical plant director. The staff will assist the university in obtaining technical expertise which may not be available on campus, and make suggestions in scheduling preventive maintenance.

6. The Office of Construction and Physical Affairs will act on behalf of the Board in implementing this policy. The staff is to be increased by two professionals, a facilities auditor and one support person. Periodic evaluations will determine necessary changes to procedures and personnel to insure desired results.

7. Institutional responsibility for the successful implementation of this policy shall rest with the institutional executive officer. The institutional executive officers are responsible for insuring that institutional facilities are properly maintained. The Board will evaluate requests for new facilities construction and facilities renovation in light of the operations and maintenance policies.

The court on October 1, 1999 granted the Board's request to proceed with facilities maintenance plan review process, including formal Board approval of finalized facilities maintenance plans for each university. All institutions are currently required to prepare Maintenance Plans on an annual basis as a part of their budget process. As of July 15, 1999, two people have been added to the Board staff as Facilities Maintenance Coordinators. Their responsibility is to work with the institutions in preparation of required plans and review compliance.

Implementation of these measures was intended by the Board and the court to address and alleviate the very concerns raised by this review.

JACKSON STATE UNIVERSITY
JACKSON, MISSISSIPPI 39217

OFFICE OF
THE PRESIDENT

(601) 979-2323
FAX NO. (601) 979-2948

January 19, 2001

Dr. Max Arinder
Executive Director
PEER Committee
222 N. President Street
Jackson, Mississippi 39201

Dear Dr. Arinder:

Jackson State University has received the draft of the PEER Committee's Executive Summary regarding the University's Honors Dormitory. I have enclosed for your review Jackson State's response to the recommendations and the historical summary of the Honors Dormitory.

If you have questions or need additional information, please feel free to contact my office at 979-2323. Thank you for your support and assistance in this matter.

Sincerely,

Ronald Mason, Jr.
President

RM:dg

Enclosure

RECEIVED
JAN 19 2001
PEER
COMMITTEE

Jackson State University Honors Dormitory

Historical Summary

The Honors Dormitory Phase I construction was completed in 1990 by Mac's Construction and was occupied in January 1991. Phase II was completed in 1992 by Dickerson Construction and was occupied in September 1992. The cost of construction was $6,250,000.00. The overall facility was designed to house 272 students.

On August 22, 1994, Jackson State requested the project professionals, Canizaro Trigiani Architects, to investigate the heaving and cracking of the courtyard and walkways at the front of the ground floor suites. In 1995, a response was forwarded by the Architect to Jackson State referencing the complaints. As a result, the Architect prepared a list of items and corrective work that Jackson State would need to perform as a part of the investigation. In December 1996, upon completion of the items outlined by the professional, the University continued to experience problems.

On September 19, 1999, Jackson State selected a private consulting engineer to perform an analysis of damage and to prepare a statement of probable cost of repairs. The field report from the general contractor for the recent renovation project is attached as part of this response.

Recommendations

I offer the following responses to the recommendations made in the Executive Summary:

1. Mr. Kevin Appleton is the University's Vice President for Finance and Administration, and campus operations responsibilities fall under his area of administration. Mr. Appleton has reviewed the preventive maintenance plan, and a copy of the plan was submitted to the PEER Committee staff during its review. The plan has been revised to include the sprinkler system. Please be advised that although the sprinkler system was not included in the plan, the system was/is checked on a regular basis.

2. Currently, the day to day maintenance of the dormitories is performed by the Housing Department of the Student Life Division. Extraordinary repairs that are required in the dormitories are performed by the Department of Facilities Management. Under a new University reorganization plan which will be effective July 1, 2001, the Department of Facilities Management will be responsible for all work required in the dormitories.

PROBABLE CAUSES OF WORK ITEMS
JSU HONORS DORM RENOVATIONS
1/05/01

A) COURT YARD CONCRETE MOVEMENT

EXPANSIVE SOILS UNDER PAVEMENT NOT REMOVED DURING CONSTRUCTION

TRAPPED WATER IN BUILDING CRAWL SPACE DURING CONSTRUCTION

WATER COMING FROM OUTSIDE COURTYARD DUE TO GRADING AND ADDITION OF PARKING LOT ON NORTH SIDE OF BUILDING.

BROKEN SPRINKLER LINE (LINE WAS ON THE NORTH END OF PROJECT BUT IT WAS STILL NECESSARY TO REPLACE PAVEMENT 300 FEET AWAY)

B) DRAINAGE IMPROVEMENTS OUTSIDE OF COURTYARD

PROPER SURFACE DRAINAGE AND CATCH BASINS NOT IN ORIGINAL PLANS

ADDITION OF PARKING LOT ON NORTH END OF SITE, WHICH STOPPED WATER FROM FLOWING AROUND BUILDING

PUMPS BURNED UP DUE TO EXESSIVE WATER GOING UNDER BUILDING

C) NORMAL BUILDING REPAIRS

AGE OF BUILDING AND FROM NORMAL USE

NEW REQUIREMENTS TO MEET ADA REQUIREMENTS AND TO ALLOW FOR FIRE ALARM TO TIE INTO FUTURE CAMPUS WIDE SECURITY SYSTEM.

D) WALL LEAKS

SCREWS WERE DRILLED THRU DRAIN LINES IN ORIGINAL CONSTRUCTION TO HANG WALL CABINETS.

CABINETS AND TOPS WERE DAMAGED FROM LEAKING WATER

MISC. FLOOR TILE DAMAGED BY WATER FROM WALL LEAKS

E) MAINTENTENCE PROBLEM

PUMP BURNED UP DUE TO DRAINAGE OF WATER FROM OUTSIDE OF BUILDING

WIND BLEW OFF MISC. SHINGLES AND FLASHING OVER THE YEARS AND THEY WERE NOT REPLACED.

MISC. HARDWARE ITEMS WERE DAMAGED OR REMOVED AND THEY WERE NOT REPLACED OVER THE YEARS

MISC. SMOKE ALARMS REMOVED OR DAMAGED AND NOT REPLACED

PC3/JSU/PEER2

LAD ENGINEERING TECHNOLOGIES, INC.

TOMMY E. WARREN
GENERAL CONTRACTOR'S, INC.
118 NORTH JACKSON STREET
CRYSTAL SPRINGS, MS 39059

TRANSMITTAL LETTER

DATE: January 12, 2001

GS #103-185
PROJECT:
Honors Dormitory Renovation
Jackson State University
Jackson, Mississippi
TO: Lad Engineering Technologies, Inc.
3103 West Northside Drive
Jackson, Mississippi 39213

To Whom It May Concern:

The following is a summary of the defects found on the above mention project. However I didn't have the access to the original contract documents, therefore I'm wasn't aware of all the requirements in the documents. We first noticed there was no select fill material under the courtyard slab after excavation of two feet. we also found trash (masonry, sand & construction debris) in fill. On the building northside a large concentration of water was found, we installed a drain line to the storm drain to revive the pressure under the building. There was considerable amount of ridge cap missing from the dormitory roof. In my opinion, due to expansion there is considerable movement in the building.

BY: Tommy E. Warren
TOMMY E. WARREN

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JAN 12 2001
DEPARTMENT OF FACILITIES MANAGEMENT
JACKSON STATE UNIVERSITY

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Ted Booth, General Counsel

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Linda Triplett, Division Manager
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Larry Landrum, Systems Analyst

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Corporate Source: Mississippi Legislature

Publication Date: December 27, 2000

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Sign here, → please

Signature:	Printed Name/Position/Title: Max Arinder, Executive Director
Organization/Address: PEER Committee P. O. Box 1204, Jackson, MS 39215-1204	Telephone: (601) 359-1226 / FAX: (601) 359-1420
	E-Mail Address: / Date: 10/29/01

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