



CITY OF SACRAMENTO

DEPARTMENT OF GENERAL SERVICES

OFFICE OF THE DIRECTOR

FACILITY MAINTENANCE DIVISION
FLEET MANAGEMENT DIVISION
RISK MANAGEMENT & INS. DIVISION
SUPPORT SERVICES DIVISION

February 18, 1986
PM:86190:DW:JB

APPROVED
BY THE CITY COUNCIL

City Council
Sacramento, California

FEB 18 1986

as amended

Honorable Members in Session:

OFFICE OF THE
CITY CLERK

**SUBJECT: Report Back on Structural, Life Safety, and Fire Protection
Deficiencies in Memorial Auditorium**

SUMMARY

This report looks at interim measures that could be used to mitigate safety hazards and keep Memorial Auditorium open on a temporary basis. While there are possible ways to mitigate emergency exiting, fire protection, and electrical hazards, the building cannot be made safe because of the structural hazard in the ceiling.

BACKGROUND

At their February 11, 1986 meeting, the Transportation and Community Development Committee requested a report back identifying any temporary measures that could be used to keep Memorial Auditorium open while studies were made on future uses and plans were made to correct deficiencies.

The attached listing identifies the code and safety deficiencies in Memorial Auditorium. An interim solution would require, as a minimum, some means of mitigating the primary safety hazards on the list while deferring action on code violations. The four primary safety hazards are discussed below:

1. Hazard: Emergency Exiting.

Permanent Solution: Widen aisles, add exits, widen stairs and add exit lights.

Interim Measure: Reduce building occupancy to meet current exiting capacity of stairs and hallways. This would require closure of stairs and access to second floor, Little Theater, Memorial Hall, and basement (access to restrooms would be permitted).

2. Hazard: Combustible construction materials.

Permanent Solution: Remove or protect combustible material and add an automatic sprinkler system.

Interim Solution: Provide personnel to perform fire watch during high occupancy periods.

3. Hazard: Ungrounded electrical system with open contactors and frayed, crystalized insulation on wiring.

Permanent Solution: Correct electrical grounding deficiencies, replace obsolete electrical distribution and lighting panel boards, and replace all branch circuit and feeder wiring.

Interim Solution: Provide temporary panels and switching for major electrical loads including lighting and sound systems.

4. Hazard: Dense plaster ceiling supported by plaster soaked jute rags fastened to a light steel framing grid with no lateral bracing. (A photo copy attached.) After 60 years, the organic material in the jute rags has deteriorated. An earthquake, explosion, or sudden shock would accelerate the failure causing the ceiling to sway back and forth with only the deteriorated rags to support it vertically and horizontally.

Permanent Solution: Replace the ceiling and fireproof the area above the ceiling.

Interim Solution: No interim solution could be found. The ceiling weighs approximately 624,000 pounds or 312 tons. We have considered trying to install a temporary support system under the existing ceiling, but the additional weight of the steel frame and wire mesh sized to hold the existing ceiling, plus its own weight will overload the structural system. Removal of the ceiling would require new lighting, mechanical equipment, replacement of the wood catwalk system, and would also expose the roof decking and trusses to quick destruction and collapse in case of a fire. Also, temporary support or removal of the ceiling would require 3-6 months to design and construct.

ANALYSIS

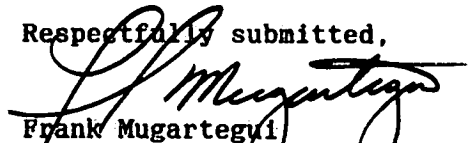
Although some safety hazards could be mitigated through interim measures and the correction of code deficiencies could be deferred, no temporary solution could be found for supporting the ceiling. The potential for a ceiling collapse while the auditorium is occupied places the City and anyone booking the auditorium at a very high risk.

Also, normal City policy is to require correction of all related safety and code violations whenever a building is remodeled. Therefore, correcting only a part of the deficiencies on a temporary or even a permanent basis would cause the City to waiver the policy used for other facilities where building and fire inspections are made and permits issued.

RECOMMENDATION

It is recommended that the arena area of Memorial Auditorium not be kept open on a temporary basis.

Respectfully submitted,



Frank Mugartegui
Director of General Services

RECOMMENDATION APPROVED



WALTER J. SLIPE
City Manager

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MEMORIAL AUDITORIUM CODE
AND SAFETY DEFICIENCIES

The deficiencies can be divided into three general categories: 1) fire and exiting code violations, 2) handicap and mechanical code violations, and 3) patron and employee safety. A cost estimate for each of these three categories follows:

1. Fire and Exiting Code Violations

- a. Perform recommended work required to make the auditorium's exiting reasonably conform with the Uniform Building Code. This would include widening the balcony aisles and eliminating excess aisles and eliminating excess aisle length over 20 feet, widening each of the corner stairs, providing new east and west exits, providing approved exit hardware on all exit doors, providing dress circle and balcony aisle step lights and handrails and providing illuminated exit signage with an auxiliary emergency lighting system.....\$ 372,600

- b. Install a full, automatic sprinkler system throughout all areas of the auditorium including the stage, grid-iron and fly, main arena and attic, area below the arena operable floor, basement, dressing rooms storage areas, Little Theater and Memorial Hall.....\$ 391,230

- c. Eliminate /or protect all combustibile construction materials. This includes the stage wood grid-iron, catwalks and exposed structural steel framing.....\$ 98,325

- d. Perform all work required by the National Electrical Code at main switch-board, correct all electrical grounding deficiencies, replace obsolete electrical distribution and lighting panel boards, and replace all branch circuit and feeder wiring.....\$ 336,375

- e. Construct new toilet room facilities at Main Level. Provide handicap facilities and code required numbers of toilets, urinals, lavatories and drinking fountains. (Relocation to ground level is recommended to eliminate basement exiting upgrade problems and alleviate costly basement toilet room remodeling while still having to meet



NATIONAL COUNCIL ON EDUCATION FOR THE HANDICAPPED

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

requirements for providing handicap facilities at Main Level.....	170,775
f. Extend dry stand pipe to roof over stage....	5,175
g. Correct all fire extinguisher and fire hose/cabinet violations.....	8,280
h. Replace theatrical draperies per Fire Code requirements.....	47,610
i. Provide refuse compaction and approved storage units per Fire Code requirements....	<u>28,980</u>
Sub Total Category No. 1	\$1,459,350

2. Handicap and Mechanical Code Violations

a. To meet present-day code corrections to building's HVAC system, refurbish existing mechanical equipment including up-grade of one-hour ratings of all ducts, provide required duct fire dampers, smoke purge and detection systems and incorporate new controls related to energy conservation.....	414,000
b. Supplement (2a.) all building areas with up-graded heating, cooling and exhaust/ventilation systems per code requirements for air changes per hour.....	414,000
c. Correct deficiencies, re: existing plumbing systems consisting of various gas lines, dressing room and toilet room code up-grades, backflow prevention device at boiler, sewer, water and storm drain piping, sump pumps, sewage ejectors and steam traps.....	136,620
d. Modify existing concession stands with reference to Mechanical, Plumbing and Health Code violations.....	87,975
e. Provide ingress/egress to the facility for the physically handicapped.....	<u>434,700</u>
Sub Total Category No. 2	\$1,487,295

3. Patron and Employee Safety

a. Construct new off-street loading dock/service drive to the stage area.....	173,880
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b.	Replace main arena decorative plaster ceiling.....	310,500
c.	Provide, above arena ceiling, full system of catwalks and rigging positions....	223,560
d.	Strengthen portions of the stage.....	5,796
e.	Provide removeable forestage and stage riser platform.....	80,730
f.	Provide freight elevator with stops at all levels.....	93,150
g.	Provide wet closets for janitorial services at all levels of the arena.....	24,840
h.	Repair exterior scupper/drain system.....	6,624
i.	Repair and replace fixed seating as required.....	207,000
j.	Provide production connections (company switch).....	10,350
k.	Provide dimmer banks.....	49,680
l.	Remove ventilation mushrooms at fixed seating areas, patch and repair.....	34,983
m.	Provide new accesses to roof equipment and safety line cable.....	<u>8,797.50</u>
	Sub Total Category No. 3	\$1,229,890.50
	TOTAL OF ALL CATEGORIES	<u><u>\$4,176,535.50</u></u>



CITY OF SACRAMENTO
CALIFORNIA

OFFICE OF THE
CITY MANAGER

CITY HALL
915 I STREET - 95814
(916) 449-5704

February 10, 1986

City Council
Sacramento, California

Honorable Members In Session:

Subject: STRUCTURAL, LIFE SAFETY, AND FIRE PROTECTION DEFICIENCIES IN
MEMORIAL AUDITORIUM

SUMMARY

On September 10, 1985 the City Council approved a report concerning the Handicapped Access Compliance Program. During the review of that report, staff was asked to review handicap accessibility problems at the Memorial Auditorium and other structural, life safety, and fire protection deficiencies in the facility. Significant problems were found during the review and this report recommends that the Memorial Auditorium be closed to the public on February 18, 1986; and, further, that a task force be appointed by the City Manager to recommend potential reuses.

BACKGROUND

A staff task force recently completed a full review of the Memorial Auditorium to determine the required structural, safety, and fire protection deficiencies. The following is a summary of the findings of the task force.

1. Structural

The major structural deficiency in Memorial Auditorium, which was completed in 1926, is the heavy (35-40 pounds per square foot) ceiling loading. Vertical support for the ceiling is provided by plaster soaked organic material that is embedded in the ceiling plaster and hung from a light steel framing grid. Although the material shows no deterioration at this time, there is no way to predict how long this organic material will last. There is no lateral bracing, therefore, an earthquake could cause the ceiling to begin swaying back and forth with only the unreinforced material to support the weight of the moving ceiling. A report from Marr-Shaffer and Associates, Consulting Structural Engineers in Sacramento, states in part, "We cannot overemphasize the extreme hazard of the heavy ceiling to the public in the event of a major seismic disturbance".

2. Life Safety

There are numerous building code and exiting deficiencies including inadequate aisle width, inadequate door width, insufficient exits, insufficient handrails, inadequate panic hardware on doors, noncomplying ramp slopes and stair tread and riser dimensions, insufficient light on steps and a need for illuminated exit signs.

3. Fire Protection

Existing wet and dry standpipe outlets must be relocated or extended and a fully automatic sprinkler system installed in the main arena, office, stage, balconies, basement, area below the arena operable floor, dressing rooms, storage areas, Little Theater, and Memorial Hall. There are large amounts of nonconforming combustible materials in the facility.

4. Handicap Compliance

There are 112 deficiencies requiring correction per Title 24 of the State Building Code and the Rehabilitation Act Section 504 of the Congress of the United States. Major problem areas are in the restrooms and entrances. No restrooms are accessible to the handicapped and a front entrance ramp needs to be provided.

5. Other Safety Deficiencies

There are also deficiencies in lighting systems, loading docks, ventilation, sound systems, stage, dressing rooms, and electrical distribution, which impact safety and add to operation and maintenance cost.

Based on cost estimates provided by consultants who studied upgrading Memorial Auditorium 4 - 5 years ago, it would cost approximately \$4,200,000 in 1985 dollars to correct the deficiencies listed above. Changes to improve the functional use of the building would be an additional cost.

CONCLUSIONS

1. The safety, fire and handicapped accessibility deficiencies in Memorial Auditorium are largely related to the kinds of uses allowed in the facility. However, the structural deficiencies need to be corrected for any use. The cost of correcting safety, fire, and accessibility problems could change significantly if the use is changed. The cost of correcting the listed deficiencies is \$4,200,000 and does not include functional and aesthetic improvement to the building, therefore, a full review of the future use or reuse of the building must be completed.
2. Memorial Auditorium fails to conform with City, State, and Federal standards and codes. This increases the probability of an incident and resulting catastrophic claims. This risk coupled with the City's loss of its liability insurance coverage leaves the City with the need to make an immediate decision on public use. It is in the best interest of the City to close Memorial Auditorium until the deficiencies can be corrected.

FINANCIAL DATA

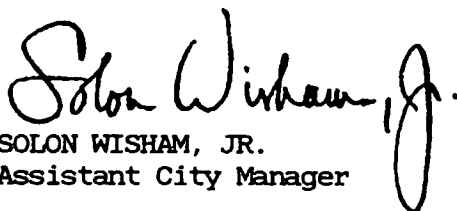
Closure of the Memorial Auditorium will result in an estimated net loss of revenues in the amount of \$127,000 for the remainder of FY 85-86 and \$305,000 during FY 86-87. Projections are as follows:

<u>Period</u>	<u>Revenue Loss</u>	<u>Reduced Expenses</u>	<u>Net Gain/(Loss)</u>
2/18/86-6/30/86	\$180,000	\$ 53,000	(\$127,000)
7/1/86-6/30/87	\$432,000	\$127,000	(\$305,000)

RECOMMENDATION

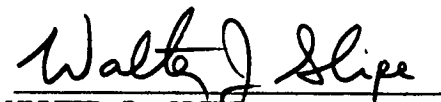
It is recommended that the City Council approve the attached Resolution to (1) Close Memorial Auditorium to the public on February 18, 1986 and (2) Direct the City Manager to appoint a task force of City staff and citizens to review options for future uses of the facility with a report back to the City Council by May 1, 1986.

Respectfully submitted,



SOLON WISHAM, JR.
Assistant City Manager

RECOMMENDATION APPROVED,


 WALTER J. SLIRE,
 City Manager

February 18, 1986
All Districts

MEMORIAL AUDITORIUM CODE
AND SAFETY DEFICIENCIES

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RESOLUTION NO. 86-141

ADOPTED BY THE SACRAMENTO CITY COUNCIL ON DATE OF

RESOLUTION DIRECTING THE CLOSURE OF MEMORIAL AUDITORIUM TO THE PUBLIC AND ESTABLISHING A TASK FORCE TO STUDY OPTIONS FOR FUTURE USE OF THE FACILITY

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF SACRAMENTO:

- 1. The Sacramento Memorial Auditorium be closed to public use not later than February 18, 1986.
- 2. The City Manager is to appoint a Task Force to study options for future uses of Memorial Auditorium and report back with a recommendation to the City Council by May 1, 1986.

MAYOR

ATTEST:

CITY CLERK

APPROVED
BY THE CITY COUNCIL

FEB 18 1986

OFFICE OF THE
CITY CLERK

MANAGER'S TASK FORCE ON MEMORIAL AUDITORIUM

1. Sacramento Community Center Authority
2. Sacramento Convention and Visitors' Bureau Board
3. Veterans of Foreign Wars
4. American Legion
5. History and Museum Commission
6. Sacramento Downtown Association
7. Sacramento Old City Association
8. Greater Sacramento Chamber of Commerce
9. Architectural Review Board
10. Community Center Department
11. Public Works Department
12. Planning and Development Department
13. Fire Department
14. Sacramento Housing and Redevelopment Agency
15. City Manager's Office
16. Citizen-At-Large
17. Citizen-At-Large
18. Citizen-At-Large