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0410 State Capitol Building Health and Life Safety Project

Colorado Legislative Council

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Report to the

COLORADO

GENERAL ASSEMBLY

Colorado Legislative Council
Research Publication No. 410
December 1995

RECOMMENDATIONS FOR 1996

STATE CAPITOL BUILDING HEALTH AND LIFE SAFETY PROJECT

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December 29, 1995

To Members of the Sixtieth General Assembly:

Submitted herewith is the final report of the Study of State Capitol Building Health and Life Safety Project. The working group was established by a study resolution adopted by the Executive Committee of Legislative Council at its June 8, 1995 meeting.

At its meeting on December 19, 1995 the Legislative Council reviewed the final report of this committee.

Respectfully submitted,

/s/ Senator Tom Norton
Chairman
Legislative Council

TN/fb

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Executive Summary

Project History

In the late 1980s the Department of Administration, Division of Capitol Complex Facilities, received an appropriation to install a new domestic water pump in the Capitol. As planning for the installation progressed, the division recognized that in order to properly install the pump, it would be necessary to evaluate the status of the Capitol's fire protection system. Subsequent to that determination, a decision was made to perform a comprehensive evaluation of the Capitol's systems that affect life safety. The evaluation concluded that the Capitol building fire and life safety systems were not in compliance with current code requirements. That report, the *Colorado State Capitol Life Safety Plan*, was completed in September 1990.

The intent of that plan was to initiate the development of a multi-year construction project to correct fire and life safety deficiencies by installing the following in the Capitol building:

- a complete fire suppression system (sprinklers);
- a complete fire alarm system;
- extended stairwells for emergency egress;
- emergency power;
- stair smoke control and atrium smoke evacuation systems; and
- emergency lighting and signage.

The division anticipated that the provisions of the project above were to have been accomplished in the building with all legislative and executive functions continuing to operate to the fullest extent possible. Additionally, it was desired that the historical integrity of the building be maintained during the course of construction, but no significant historical restorations were planned.

The scope of the 1990 Life Safety Project proposed a total of five construction phases to complete the project. The first phase provided for the design and installation of a fire sprinkler system (including a new fire water line and fire pump) in the sub-basement and dome, and partial asbestos abatement in the sub-basement. The remaining four phases were proposed to complete the balance of the project requirements on a quadrant-by-quadrant basis. Under this scenario, the Office of State

Planning and Budgeting, the Treasurer, and the Lieutenant Governor were proposed to relocate off-site to leased space for three years to provide temporary space for other building occupants during construction. The occupants of each quadrant (four floors, sub-basement to attic) were to have been relocated to temporary space to allow construction to take place in that quadrant. The 1990 plan also required some occupants to share work areas ("double bunk") for short periods of time. Construction was to have been accomplished in each quadrant during the interim of each year for a total of four years. This process was to have been repeated over the course of the four years until the project was completed. The occupants who had originally been relocated to temporary leased space were then to have been moved back into the Capitol building.

House Bill 92-1345 was signed in June 1992 with an appropriation of $799,760 (Capital Construction Fund) for the provisions of Phase 1. During the final planning and design stages for Phase 1, it became apparent that designs for all five phases would be required to efficiently plan and execute the remaining construction requirements. Senate Bill 93-237 was enacted to provide a supplemental appropriation of $700,000 (Capital Construction Fund) to the original Phase 1 for the architectural and engineering design for all five phases.

During the 1994 legislative session, the Capital Development Committee (CDC) approved Phase 2 as part of its capital construction recommendations. The project was to have included removal of the remaining sub-basement asbestos, sub-basement stairwell installation, and all life safety improvements to the first quadrant of the building from the basement to the attic. House Bill 94-1356 was enacted to provide an appropriation of $3,961,550 (Capital Construction Fund Exempt) to complete Phase 2.

At the end of the 1994 legislative session, an alternative proposal to the quadrant-by-quadrant approach was presented to House and Senate caucuses. This alternative proposed to move all occupants out of the Capitol for a two-year period while life safety construction was completed. Both House and Senate caucuses determined that the issue warranted further review, and the life safety portions of the project were halted.

The CDC recommended that asbestos abatement be allowed to continue in the Capitol while the Life Safety Project was being reviewed. The CDC requested that $560,468 be allocated for asbestos abatement and that the remaining $3,401,182 be withheld until the General Assembly could address the Life Safety Project during the 1995 legislative session.

The State Capitol Building Advisory Committee (SCBAC) and the CDC reviewed the project and recommended that the project proceed. Legislative leadership requested the CDC to host public and legislative informational forums and to sponsor legislation to determine how, or if, the project should be completed. These forums surfaced related issues regarding the poor condition of the Capitol building's mechanical and electrical systems. Discussions considered the opportunity to incorporate

renovations of these systems into the Life Safety Project. Additional consideration was also given to address any Capitol building historical restoration requirements.

The CDC directed the Office of Legislative Legal Services to draft a bill during the 1995 session to encompass potential approaches to correct all life safety deficiencies, to renovate building systems, and to restore the Capitol. A bill draft was prepared, but consensus on the provisions of the bill could not be attained and the bill was not introduced. At the end of the 1995 session, the Executive Committee of the Legislative Council resolved that a working group should be established during the 1995 interim to develop not more than four feasible alternatives to be recommended to the Legislative Council.

Health and life safety deficiencies. The initial *Colorado State Capitol Life Safety Plan* identified the following health and life safety deficiencies to be corrected in the Capitol building:

- *Unenclosed exit stairs.* Occupants are not protected from smoke and fire while using the existing stair exits. Smoke inhalation is recognized to be the most serious danger to building occupants.

- *Inadequate exit capacity for all upper floors.* Existing stairs dead end at the second floor and require all upper floor occupants to traverse to the single rotunda stair.

- *Unenclosed, non-rated vertical openings and atrium spaces.* These shafts serve as chimneys for smoke and fire. The smoke damage from a minor fire would be extensive, not to mention the life safety danger that results from a smoke-filled building.

- *Non-rated structure.* Exposed cast iron columns and wrought iron trusses lose their strength at temperatures as low as 650 to 850 degrees Fahrenheit. A small wastebasket fire can produce temperatures in excess of 1500 degrees Fahrenheit in three to five minutes. Structural collapse would occur within another five minutes.

- *Non-rated exit corridors.* The spread of smoke and fire from work areas to exit corridors on all floors would be quite rapid through existing doors, transom windows, and other corridor openings.

- *Incomplete automatic fire suppression systems.* The Capitol lacks a complete (except for the sub-basement and dome) automatic fire sprinkler system, which is the most beneficial life safety feature for any building. The advantage from such a system is that sprinklers put out a fire quickly before smoke spreads, exits are blocked, or floors

collapse. In addition, the existing temporary wet standpipe system, to which fire hoses are attached in the event of fire, is inadequate.

- *Inadequate fire detection and alarm systems.* The existing system provides very limited smoke detection and no alarm to building occupants or the fire department. Fires in many locations would burn undetected and occupants in almost the entire building would be unaware of a fire until it was out of control.

- *Inadequate emergency power and lighting.* Equipment and lights lack reliable emergency power. Exit lighting is dangerously sparse.

Health and life safety requirements. The following Health and Life Safety requirements to correct the remaining health and life safety deficiencies in the Capitol building were developed as a part of the initial plan. The requirements were further refined during the design activities in 1993-94 and confirmed by the Denver Fire Department and building code consultants to the State Building Engineers in 1995. The Working Group included these requirements as the basis for all four alternatives.

- *Sub-basement.* Install a complete fire alarm system and complete the balance of asbestos abatement. Extend two exit stairwells from the sub-basement to the basement level in the southeast or northeast quadrants.

- *Basement.* Install a fire alarm system, a fire sprinkler system, air pressurization fans, and an air pressurization system. Extend the exit stairs from the basement to the first floor in the northeast and southeast quadrants.

- *First Floor.* Install a fire alarm, fire sprinkler system, an air pressurization system and four new exit stairs from the second floor to the first floor.

- *Second Floor.* Install a fire alarm, fire sprinkler system, and an air pressurization system.

- *Third Floor.* Install a fire alarm, fire sprinkler system, and an air pressurization system. Extend the exit stairs from the third floor to the attic.

- *Attic.* Install a fire alarm, a fire sprinkler system, and a smoke evacuation system throughout the area. Extend the exit corridor system from the new third floor stairs into the attic to improve dome exiting.

- *Emergency Power.* Install an auxiliary engine, approximately 500 kilowatts in size, to provide emergency power for the fire pumps, fire alarm, emergency lighting, air pressurization system, elevators, and any other systems necessary for emergency operation.

Additional renovation considerations. The proposed construction to correct health and life safety deficiencies in the Capitol building would provide an opportunity to prepare the building for its next century of service. Building systems such as plumbing, lighting, electrical, heating, ventilation, and air conditioning are approaching the end of their useful lives and could be renovated while the health and life safety improvements are underway. Additionally, upgrades to the telecommunications and data transmission systems in the building could be more easily accomplished in conjunction with these construction activities.

Project Funding Summary as of September 26, 1995

House Bill 92-1345 was signed in June 1992 with an appropriation of $799,760 (Capital Construction Fund) to fund the provisions of Phase 1. The construction for Phase 1 was initiated in 1993 and completed in 1994 as planned.

Senate Bill 93-237 was enacted to provide a supplemental appropriation of $700,000 (Capital Construction Fund) to Phase 1 to fund the architectural and engineering design for all five phases. A contract for the full design was awarded, but design efforts were halted at 30 percent completion to allow further consideration of implementation options.

House Bill 94-1356 was enacted to provide an appropriation of $3,961,650 (Capital Construction Fund Exempt) to fund Phase 2; $560,468 was allocated for asbestos abatement. An allocation of $70,000 provided a functional space planning firm to assist the Working Group. The remaining $3,331,182 is currently being withheld until the General Assembly resolves an appropriate course of action for the balance of the Health and Life Safety Project.

Funding Summary

Bill	Appropriated	Allocated	Encumbered	Expenditures	Unencumbered
HB 92-1345	$799,760	$799,760	$752,297	$752,297	$47,463
SB 93-237	$700,000	$700,000	$625,677	$246,549	$74,323
HB 94-1356	$3,961,650	$630,468	$336,098	$101,426	$3,625,552
Total	$5,461,410	$2,130,228	$1,714,072	$1,100,272	$3,747,338

Working Group Report

Statutory Authority and Responsibility

The Working Group was established by the Executive Committee of the Legislative Council (Section 2-3-303.3, C.R.S.) in 1995 to develop recommendations for the legislative and executive branches of state government concerning the State Capitol Building Health and Life Safety Project. The task of the Working Group was to develop not more than four detailed, feasible alternatives for the project for consideration during the 1996 legislative session.

One alternative was to consist of the minimal modifications to the State Capitol Building required to bring the building into compliance with state and local health, fire, and safety codes. All alternatives were to identify the locations of all functions of the two houses of the General Assembly, legislative staff agencies, the Governor's office, and the offices of the Lieutenant Governor and the State Treasurer during the construction phases of the project. Each alternative was to include detailed budgetary information and project timelines. Additionally, each alternative to be recommended was to be prepared in bill form for consideration by the General Assembly.

The 1995 Interim Study Resolution required the Working Group to report its findings and recommendations to the Executive Committee, to inform the Capitol Development Committee as appropriate, and to report to the special committee upon the direction of the Executive Committee.

Membership and Representation

Membership of the Working Group comprised representatives of all the legislative and executive offices that currently occupy the Capitol building, the Capitol Complex Facilities staff project manager, the project architect, and the functional space planner. The project architectural firm, C.W. Fentress J.H. Bradburn and Associates, was selected to also serve as the functional space planner because of the firm's extensive experience with governmental space planning, its knowledge of the Capitol building, and its involvement in the development of previous Health and Life Safety studies.

The Working Group was also assisted by The Christman Co., as a subconsultant to Fentress Bradburn and Associates, for the development of project cost estimates and schedules. The Christman Co., of Lansing, Michigan, was selected because of the firm's recent experience in renovating the Michigan State Capitol Building and other similar projects. A second subconsultant that provided assistance was ABS Consultants,

a local mechanical and electrical engineering firm that provided the detailed life cycle cost analyses for mechanical and electrical systems.

Working Group Activities

The task of the Working Group was to develop not more than four detailed, feasible alternatives for the project for consideration by the legislative and executive branches of state government. To accomplish this task, the members of the working group met on a weekly basis from July through mid-December of the 1995 interim and performed the following tasks:

- reviewed the project history and evaluated various reasons why consensus on the provisions of the project has not been attained;
- reviewed the proposed construction requirements with representatives of the Denver Fire Department and building code consultants to the State Building Engineers;
- developed eight candidate alternatives to be evaluated;
- established criteria and evaluated the feasibility of each candidate alternative;
- reviewed similar renovation projects at other state capitols, including Georgia, Alabama, Michigan, Ohio, and Texas;
- reviewed current and forecasted functional space requirements with the space planner;
- toured the Capitol building and reviewed similar construction projects, such as the renovation of the City and County of Denver Building, to gain a better awareness of the project and the associated construction requirements;
- selected four final alternatives to be planned, scheduled, and estimated by the architect and functional space planner;
- reviewed space planning, block diagrams, and scheduling graphics prepared by the architect and functional space planner; and
- evaluated final project schedules and cost estimates for each final alternative to be recommended.

Key Issues

The Working Group recognized several key issues requiring consideration during the course of the study to develop feasible alternatives. Those issues, and a discussion of each, are as follows.

Health and life safety objectives. The provisions of the construction requirements to correct health and life safety deficiencies in the Capitol building were developed in 1990 as an element of the initial *Colorado State Capitol Life Safety Plan.* Representatives of the Denver Fire Department and building code consultants to the State Building Engineers determined that those provisions are "a reasonable minimal standard that is consistent with other redevelopment and historical preservation projects in Colorado and across the country." Therefore, the Working Group adopted the scope of work, as established in the initial plan and refined by the 1993-1994 initial design of the Life Safety Project, as the common foundation for all alternatives to be developed. Additional information regarding code requirements is provided in the Appendix section of this report.

Minimize disruptions to the legislative and executive processes. Construction activities in the Capitol building would introduce significant disruptions to the legislative and executive processes of state government. The proposed construction activities would require that all occupants be relocated, some possibly more than once. Additional disruptions would occur frequently due to the introduction of excessive noise, dust, and water exposure, and unforecasted power outages, in all areas of the building. A level of control could be exercised, but the risk of these disruptions could not be totally eliminated. Therefore, the Working Group resolved that all alternatives to be developed must focus on minimizing disruptions to the legislative and executive processes.

Occupant and visitor safety during construction. Approximately 300-350 people occupy legislative and executive space in the Capitol building. On any given day, during the session or interim, several hundred additional people may visit the building. The magnitude of the proposed construction activities would create an environment that could be unsafe to occupants or visitors of the building. Additionally, the presence of occupants and visitors in the building during construction would affect the scope, the schedule, and the cost of construction activities that could be accomplished safely. The Working Group resolved that all alternatives must provide an appropriate and safe environment during and after construction to maximize the safety of building occupants and visitors. They also determined that, regardless of whether the building is occupied or vacated, construction should take place only in unoccupied construction zones. Occupants in each construction zone would be relocated to temporary "swing space" or "double bunk" areas. In an occupied mode, access to some portions of the building would be restricted during construction. In a vacated mode, access to the entire building would possibly be restricted during construction.

Management of project schedules. The schedule and cost of the proposed construction activities in the building would be affected in the event that unforeseen complications occurred. Special legislative sessions during the interim, hidden existing conditions, material delivery delays, and change orders are examples of typical complications that could routinely arise during the course of the project. Therefore, the Working Group resolved that all alternatives to be developed should minimize the risk of construction complications and schedule extensions that could jeopardize the completion of the project and the availability of the necessary functional space for each session on a timely basis. Additionally, the Working Group resolved that alternatives should maximize control of key implementation issues such as "swing space" availability. Minimal swing space complexity would be achieved by utilizing existing state facilities to the greatest extent possible.

Systems renovations. The construction activities to correct health and life safety deficiencies would take place in virtually all areas of the Capitol interior. Opportunities could arise during construction where renovation of existing building systems could be incorporated into the project in an efficient and cost-effective manner. The Working Group resolved that the alternatives to be recommended should focus on health and life safety provisions. However, if the features of an alternative provided renovation opportunities, the Working Group would identify the extent of renovations that could be accomplished within the scope of the alternative. An assessment and recommendation of the existing Capitol building systems is provided in the Appendix section of this report.

Systems life cycle operating costs. The Working Group concluded many of the existing Capitol building systems have outlived their useful lives, that they have become extremely inefficient, and that recurring maintenance costs are escalating. In the event that building systems renovations are accomplished, the cost of operating and maintaining those systems would be affected. New mechanical and electrical systems would be more energy efficient and would substantially reduce the per unit consumption of electricity, water, and gas utilities. Likewise, the recurring maintenance costs per new unit would be substantially reduced during the initial years of operation. However, proposed renovations would introduce more air handling units, air conditioners, pumps, switches, and electric motors into the systems, which would increase the total utility consumption and long-term maintenance requirements. Therefore, the Working Group resolved that each alternative to be developed should identify the resulting impact to building systems life cycle operating costs.

Efficient use of space. The Capitol building currently accommodates more legislative and executive occupants and activities, and public visitors, than it was originally designed for. As a result, space utilization in the building is not efficient. Additionally, current provisions for legislative committee rooms, public hearing rooms, private conference rooms, and legislative and executive space are not sufficient. Opportunities could arise during construction where reconfiguration of existing space could be incorporated into the project in an efficient and cost-effective manner. The Working Group resolved that the alternatives to be recommended should focus on health and life safety provisions. However, if the features of an alternative provided space

reconfiguration opportunities, the Working Group would identify the extent of space reconfiguration that could be accomplished within the scope of that alternative.

Long-term capitol complex space needs. The facilities within the capitol complex provide space for executive, legislative, and agency functions of state government. Some of the facilities have been refurbished in recent years, while others are considered to be in need of extensive renovation, or even demolition. In some cases, the current floor plan is not compatible with the function of the building occupants. In other cases, the number of building occupants has increased, which contributes to crowded, and potentially unsafe, working environments. All of the buildings within the capitol complex are state-owned facilities. Other commercial leased space is provided outside the capitol complex, but within the metro-Denver area, to accommodate the space requirements of various state agencies.

The Working Group discussed whether long-term issues regarding space utilization of the entire capitol complex should be considered as part of the recommendations and resolved that the alternatives to be recommended should focus on health and life safety provisions within the Capitol building. However, if the features of an alternative provided opportunities to improve space utilization within the capitol complex, the Working Group would identify the extent of space improvement that could be accomplished within the scope of the alternative.

Maintaining historical integrity. Opportunities could arise during construction where historical restoration could be incorporated into the project in an efficient and cost-effective manner. On the other hand, construction activities, if not controlled, could potentially jeopardize the historical integrity of the Capitol as the symbol of state government. The Working Group resolved that all the alternatives to be recommended should focus on health and life safety provisions with explicit consideration given to maintaining the existing historical integrity of the building.

Cost efficiency and overall value. The Working Group recognized that during the development of feasible alternatives, where significant Capitol building improvements, or related future capital construction projects, could be incorporated into the Health and Life Safety Project and therefore, could be accomplished in an efficient and cost-effective manner. A variety of factors could influence the project cost and affect the long-term value of the final product. Some of those factors include the following:

- initial health and life safety improvement costs;
- temporary swing space construction or renovation costs;
- Capitol building occupant relocation costs;
- system life cycle operating costs;
- space reconfiguration costs;

- building systems improvement costs; and
- permanent building renovation costs for the Annex or other facilities.

The Working Group resolved to maximize long-term value to Colorado taxpayers, while maintaining a focus on health and life safety provisions.

SUMMARY OF RECOMMENDATIONS

Recommended Alternatives

The Working Group developed four alternatives to be recommended to the Executive Committee for consideration. All of the Working Group members, as representatives of the legislative and executive occupants of the Capitol building, contributed to extensive debate and discussion regarding the scope and feasibility of each alternative. These discussions provided each member with a better understanding of how each alternative would affect the executive and legislative processes during construction. Following is a summary of the general scope, the results, and the inherent benefits and disadvantages for each alternative developed. Detailed information regarding the estimated cost, schedule, and scope of work for each alternative is provided in the Analysis of Alternatives section of this report.

Alternative #1 — Occupied Capitol Building with Partially Renovated Sub-basement

General Scope

1. Approximately 10,000 square feet of the Capitol sub-basement would be permanently renovated to provide temporary "swing space" for approximately 60 personnel. The existing elevators and stairwells would be extended to provide access to the sub-basement.

2. Each group of personnel would be temporarily relocated to the "swing space" during each phase (approximately six months) to provide unoccupied construction zones on each floor during each phase. The remaining Capitol occupants would be required, in some cases, to share office space to provide sufficient unoccupied construction zones. Most occupants would be required to relocate once; however, multiple moves may be required for some. The offices of the Governor, the Speaker of the House, and the President of the Senate would be relocated during the last phases. The House and Senate chambers could always be available for special sessions.

3. Most of the Health and Life Safety Project construction would occur after completion of the sub-basement renovation. The project would require six construction phases, with each phase occurring during the interim of each year. The Capitol would remain open for the duration of construction, but access to some areas of the building would be restricted for occupant and public visitor safety.

Results

1. All health and life safety deficiencies in the Capitol building would be corrected to comply with the spirit and intent of most code requirements, or their equivalents.

2. No electrical, mechanical, or telecommunications systems improvements or restoration would be accomplished in the Capitol.

3. The sub-basement would be partially renovated to finished functional space.

Benefits

1. This alternative would provide for continuous occupancy of the Capitol. No one would move out of the building and the seat of state government would remain in the building.

2. This alternative would provide for the lowest total initial project cost of all the alternatives.

3. The partially renovated sub-basement would be available after project completion as finished functional space for other potential uses.

Disadvantages

1. This alternative would require the longest construction schedule, resulting in more potential disruption to building occupants and the executive and legislative processes.

2. This alternative would require the most repeated occupant relocation of all the alternatives.

3. This alternative would require the most expensive methods to safely install the required health and life safety improvements because the building would be totally occupied during the construction phases.

4. This alternative cannot provide any significant improvements to building systems because the building would be occupied during construction. The telecommunications, mechanical, and electrical systems would require major upgrades during the next 5-10 years, creating additional costs and disruption. Additional information on the condition of existing building systems is included in the Appendix section of this report.

5. This alternative would provide the highest building systems life cycle operating costs of all the alternatives.

6. This alternative would pose the highest risk of fire or injury during construction due to the need for more phases and the existence of more occupants in the building.

Alternative #2 — Partially Vacant Capitol Building with Renovated Annex Building

General Scope

1. The Department of Revenue would be relocated from the Annex to a different facility.

2. The Annex would be renovated to provide sufficient temporary office space for selected Capitol occupants. All remaining space in the renovated Annex would be available for use by other state agencies.

3. The offices of the Legislative Council staff, Legislative Legal Services staff, and the Office of State Planning and Budgeting would be temporarily relocated to the Annex, providing approximately one and one-quarter floors of unoccupied swing space in the Capitol. These offices would remain in the Annex for approximately two years but would potentially retain a "satellite" office for each group in the Capitol. The remaining Capitol occupants would be relocated within the Capitol building to provide sufficient unoccupied construction zones. Occupants would not be required to share office space to provide sufficient unoccupied construction zones. Most occupants would be required to relocate once; however, multiple moves may be required for some. The offices of the Governor, the Speaker of the House, and the President of the Senate would be relocated during the last phases. The House and Senate chambers could always be available for special sessions.

4. Health and Life Safety Project construction would occur in three phases, primarily during the interim of each year after completion of the Annex renovation and relocation of some Capitol occupants. Basement construction would occur during the session. The Capitol would remain open for the duration of construction, but access to some areas would be restricted.

Results

1. All health and life safety deficiencies in the Capitol building would be corrected to comply with the spirit and intent of most code requirements or their equivalents.

2. Complete telecommunications and fiber optic systems upgrades would be installed in the Capitol.

3. Additional power outlets and lighting improvements would be accomplished in all office areas of the Capitol.

4. A new heating system would be installed for the entire Capitol building. New ventilation and air conditioning systems would be installed in areas that do not currently have these systems.

5. Four floors of the Annex would be renovated.

6. The Department of Revenue would occupy a different facility.

Benefits

1. This alternative would provide for lower building systems life cycle operating costs than Alternative #1.

2. This alternative would offer the opportunity for the reduction of on-going lease costs for some state agencies currently occupying commercial leased space in the metro-Denver area.

3. This alternative would provide additional finished functional space in the Annex for other executive, legislative, and agency functions after the completion of the Capitol project. The Annex is currently programmed for full renovation to correct health and life safety deficiencies and to upgrade building systems as soon as possible. The building was built in 1939 and is the last major building, besides the Capitol, in the Capitol Complex to be fully renovated. An assessment of the condition of the existing Annex building systems is provided in the Appendix section of this report. Four floors of the Annex would be initially renovated for staff occupancy. The remaining floors could be finished in the future for potential occupancy by other state agencies.

4. This alternative would provide for continuous occupancy of the Capitol during sessions and the seat of state government would remain in the building.

5. This alternative would provide a different facility with more efficient and functional space for the Department of Revenue.

6. This alternative would provide for a shorter project construction schedule, less occupant disruption, and less repeated occupant relocation than Alternative #1.

7. This alternative would provide the opportunity to reconfigure existing space in the Capitol in the event that some building occupants remained permanently in the Annex. Additional space for more or enlarged committee rooms, executive and legislative office areas, conference rooms, and public areas could be constructed in the space vacated by those occupants.

Disadvantages

1. This alternative would require a higher initial total project cost than Alternative #1.

2. This alternative would require a higher per unit improvement cost for health and life safety improvements, and other systems improvements, than Alternatives #3 and #4.

3. This alternative would require temporary relocation of some legislative and executive staff out of the Capitol.

4. This alternative would not provide a cost effective opportunity for total building systems improvements in the Capitol. Future construction would be required to complete the refurbishment of existing building systems.

5. This alternative would require more expensive methods to safely install the required health and life safety improvements due to the building's being partially occupied during the construction phases.

Alternative #3 — Vacant Capitol Building with Renovated Annex Building and Limited Temporary Retrofit of the Legislative Services Building

General Scope

1. The Department of Revenue would be relocated from the Annex to a different facility.

2. The Annex and portions of the Legislative Services Building (LSB) would be renovated to provide sufficient finished functional space for all Capitol occupants and functions.

3. All Capitol occupants and functions would be temporarily relocated to the Annex and LSB.

4. Health and Life Safety Project construction would occur in one continuous two and one-half year phase, after completion of the Annex and LSB renovation and relocation of all Capitol occupants. The Capitol would be closed for the duration of construction.

Results

1. All health and life safety deficiencies in the Capitol building would be corrected to comply with the spirit and intent of most code requirements or their equivalents.

2. Complete new telecommunications, heating, air conditioning, ventilation, plumbing and piping, electrical and lighting, and audiovisual systems would be provided in the Capitol. A description of recommended systems upgrades is provided in the Summary Assessment and Recommendations for Existing Capitol Building Systems section of this report.

3. The Annex would be completely renovated. A description of recommended systems upgrades is provided in the Summary Assessment of Existing Capitol Annex Building Systems section of this report.

4. The Department of Revenue would occupy a different facility.

Benefits

1. This alternative would provide for a completely renovated Annex building with finished functional space for potential use by executive, legislative, and state agency functions after completion of the Capitol project.

2. This alternative would offer the opportunity for the reduction of on-going lease costs for some state agencies currently occupying commercial leased space in the metro-Denver area.

3. This alternative would provide a different facility with more efficient and functional space for the Department of Revenue.

4. This alternative would require a shorter construction project schedule, less occupant disruption, and less repeated occupant relocation than Alternatives #1 and #2.

5. This alternative would provide for a lower per unit improvement cost for health and life safety improvements, and building systems improvements, than Alternatives #1 and #2.

6. This alternative would provide for lower building systems life cycle operating costs than Alternatives #1 and #2.

7. This alternative would provide the opportunity to reconfigure existing space in the Capitol in the event that some building occupants remained permanently in the Annex. Additional space for more or enlarged committee rooms, executive

and legislative office areas, conference rooms, and public areas could be constructed in the space vacated by those occupants.

8. This alternative could provide an opportunity for restoration of all public areas and office areas of the Capitol. Additional information regarding restoration is located in the Appendix section of this report.

Disadvantages

1. This alternative would require higher initial total project costs than Alternatives #1 and #2.

2. This alternative would require temporary relocation of all Capitol occupants to the Capitol Annex and Legislative Services Building.

3. All Capitol occupants would experience some temporary space reductions by relocating to the Annex and the Legislative Services Building.

4. The public would be unfamiliar with the temporary locations of the legislative and executive functions in the Annex and the Legislative Services Building.

Alternative #4 — Vacant Capitol Building with New Capitol Complex Building

General Scope

1. A new Capitol Complex office and parking facility would be designed and constructed.

2. All Capitol occupants and functions would be temporarily relocated to the new facility.

3. Health and Life Safety Project construction in the Capitol building would occur in one continuous two and one-half year phase, after completion of the new building and relocation of Capitol occupants. The Capitol would be closed for the duration of construction.

Results

1. All health and life safety deficiencies in the Capitol building would be corrected to comply with the spirit and intent of most code requirements or their equivalents.

2. Complete new telecommunications, mechanical, electrical and audiovisual systems would be provided in the Capitol. A description of recommended systems upgrades is provided in the Summary Assessment and Recommendations for Existing Capitol Building Systems section of this report.

3. A new capitol complex office and parking facility would be constructed.

Benefits

1. This alternative would provide for a new capitol complex office and parking facility with finished functional space for potential use by executive, legislative, and state agency functions after completion of the Capitol project.

2. This alternative would offer the opportunity for the reduction of on-going lease costs for some state agencies currently occupying commercial leased space in the metro-Denver area.

3. This alternative would require a shorter construction project schedule, less occupant disruption, and less repeated occupant relocation than Alternative #1 and Alternative #2.

4. This alternative would provide for a lower per unit of improvement cost for health and life safety improvements, and building systems improvements, than Alternatives #1 and #2.

5. This alternative would provide for lower building systems life cycle operating costs than Alternatives #1 and #2.

6. This alternative would provide the opportunity to reconfigure existing space in the Capitol in the event that some building occupants remained permanently in the new facility. Additional space for more or enlarged committee rooms, executive and legislative office areas, conference rooms, and public areas could be constructed in the space vacated by those occupants.

7. This alternative could provide an opportunity for restoration of all public areas and office areas of the Capitol. Additional information regarding restoration is located in the Appendix section of this report.

Disadvantages

1. This alternative would require the highest initial total project costs.

2. This alternative would require temporary relocation of all Capitol occupants to the new facility.

3. This alternative would not provide a different facility with more efficient and functional space for the Department of Revenue.

4. This alternative would not provide for the renovation of the Annex.

5. This alternative would require higher capitol complex building systems life cycle operating costs due to the introduction of new additional systems in the new facility.

Additional Recommendations

Project oversight committee. The Working Group reviewed similar construction projects at other state capitol buildings to become aware of the "lessons learned" during the course of those projects. Each of those projects employed an "oversight committee" to govern and manage the vision and the direction of the project. These committees were also established to provide continuity to the project from design to project completion. All of the sources that were contacted indicated that the success of the project was greatly due to the existence of an oversight committee.

Therefore, the Working Group also recommends that a project oversight committee be established for the duration of the Health and Life Safety Project. The committee would be responsible for coordinating with all existing committees, occupant representatives, and interested parties to resolve key issues and to preside over final decisions such as the following:

- the review and approval of the project's final definition and requirements;
- the review and approval of the project's final design;
- the review and approval of any temporary health and life safety improvement policies or practices that may be required prior to the completion of the project;
- the review and approval of contractor final payment invoices and major design changes;
- the establishment of public relations policies;
- the establishment of applicable restoration standards and policies;
- the establishment of final capitol complex space utilization requirements in the event that Alternative #2, #3, or #4 is selected; and
- the final selection of the project contractors.

Immediate health and life safety actions. The Working Group also recommends that some immediate, short-term actions be taken to improve the existing health and life safety conditions in the building. These actions regard the review of existing policies and procedures to determine what changes could be made to enhance the prevention of fires in the building and to aid a safe evacuation in the event of a fire. New policies and procedures should address the following concerns:

- the proper use and placement of temporary smoke alarms, fire extinguishers, exit and evacuation signs, and emergency lights;

- the administration of routine fire evacuation drills;
- the storage of flammable materials;
- the use of fire-rated storage cabinets;
- the installation and use of temporary escape mechanisms from the upper floors to exterior exits; and
- the application of fire resistant coatings on all carpets and upholstery.

State Capitol Building Health and Life Safety Project
Summary of Scope of Work of the Alternatives

	Alternative #1	Alternative #2	Alternative #3	Alternative #4
Schedule	Start: July 1996; Occupant Relocation: June 1998; 6 year Capitol construction; Complete: Dec. 2003	Start: July 1996; Occupant Relocation: Oct. 1999; 3 year Capitol construction; Complete: Dec. 2002	Start: July 1996; Occupant Relocation: Oct. 1999; 2 ½ year Capitol construction; Complete: June 2002	Start: July 1999; Occupant Relocation: Oct. 1999; 2 ½ year Capitol construction; Complete: Oct. 2002
Capitol Building Life Safety	Complete fire alarm system, Complete sprinkler system, Extended stairwells, Emergency power and lighting, Complete smoke evacuation system. •	Complete fire alarm system, Complete sprinkler system, Extended stairwells, Emergency power and lighting, Complete smoke evacuation system.	Complete fire alarm system, Complete sprinkler system, Extended stairwells, Emergency power and lighting, Complete smoke evacuation system.	Complete fire alarm system, Complete sprinkler system, Extended stairwells, Emergency power and lighting, Complete smoke evacuation system.
Capitol Building Systems Upgrades	None, however, • 10,000 square feet of finished "swing space" with extended elevators and stairs in the sub-basement would be provided as a result of this method of implementation.	Complete heating system replacement, Ventilation and air conditioning in areas not currently provided, Power outlets and lighting upgrades in all office areas, and Complete telecommunications and fiber optic transmission system and cable.	Complete heating system replacement, Complete air conditioning system replacement, Complete plumbing and domestic water system replacement, All systems incorporated into the Energy Management System, Modification of entire electrical power distribution system, Power outlets and lighting upgrades in all office areas, and Complete telecommunications and fiber optic transmission system and cable.	Complete heating system replacement, Complete air conditioning system replacement, Complete plumbing and domestic water system replacement, All systems incorporated into the Energy Management System, Modification of entire electrical power distribution system, Power outlets and lighting upgrades in all office areas, and Complete telecommunications and fiber optic transmission system and cable.
Revenue Facility	None	Different facility with appropriate space, public access, and size.	Different facility with appropriate space, public access, and size.	None
Annex Building Life Safety	None	Complete fire alarm system, Complete sprinkler system, Fire pumps, Air pressurization system, Emergency power and lighting, and Emergency exits.	Complete fire alarm system, Complete sprinkler system, Fire pumps, Air pressurization system, Emergency power and lighting, and Emergency exits.	None
Annex Building Systems Upgrades	None	Renovation and finish of four floors and office space, ADA toilet room upgrades, Window replacement, Exterior wall and roof insulation, Wall restoration, Sitework, Elevator upgrades, Partial asbestos abatement, Complete HVAC renovation, and Complete power and lighting upgrades.	Complete renovation and finish of all nine floors and office space, ADA toilet room upgrades, Window replacement, Exterior wall and roof insulation, Wall restoration, Sitework, Elevator upgrades, Asbestos abatement, Complete HVAC renovation, and Complete power and lighting upgrades.	None
New Capitol Complex Facility	None	None	None	New 120,000-150,000 square foot office building, New underground parking facility for 500 cars, New tunnel to Capitol building.

State Capitol Building Health and Life Safety Project
Summary of Cost Estimates and Required Appropriations for the Alternatives
(1995 Dollars)

	Alternative #1	Alternative #2	Alternative #3	Alternative #4
Implementation Method	Occupied Capitol, Sub-basement swing space to accommodate temporary relocation of all occupants, Construction during interim only.	Partially vacant Capitol, Revenue to different facility, Partial Annex renovation to accommodate temporary relocation of occupants from 1 1/4 floors, Construction primarily during interim.	Vacant Capitol, Revenue to different facility, Complete Annex renovation and partial LSB retrofit to accommodate temporary relocation of all occupants, Continuous construction during session and interim	Vacant Capitol, New Capitol Complex facility to accommodate temporary relocation of all occupants, Continuous construction during session and interim.
Scope of Work	Capitol Building Life Safety	Capitol Building Life Safety Revenue Facility Annex Building Life Safety Annex Building System Upgrades	Capitol Building Life Safety Revenue Facility Annex Building Life Safety Annex Building System Upgrades	Capitol Building Life Safety New Capitol Complex Facility
Cost	$15,752,000	$33,134,000	$36,096,000	$49,390,000
Capitol Building Systems Upgrades Cost	$0	$7,212,000	$15,057,000	$15,058,000
Total Construction Cost	$15,752,000	$40,346,000	$51,153,000	$64,448,000
Available Appropriation	$3,331,000	$3,331,000	$3,331,000	$3,331,000
FY 1996-97 Appropriation	$0	$4,654,000	$5,771,000	$2,286,000
FY 1997-98 Appropriation	$0	$13,449,000	$17,025,000	$34,419,000
FY 1998-99 Appropriation	$2,033,000	$13,721,000	$25,026,000	$24,412,000
FY 1999-2000 Appropriation	$2,212,000	$0	$0	$0
FY 2000-01 Appropriation	$3,551,000	$5,191,000	$0	$0
FY 2001-02 Appropriation	$2,944,000	$0	$0	$0
FY 2002-03 Appropriation	$1,681,000	$0	$0	$0
Total Appropriations	$12,421,000	$37,015,000	$47,822,000	$61,117,000

State Capitol Building Health and Life Safety Project
Summary of Inflation and Break-even Point Analysis

One of the issues of concern to the Working Group was the question of whether improvements to the Capitol building and other facilities in each of the alternatives would provide long-term cost savings which would offset the initial investments. In order to determine whether this would occur, a break-even point analysis was conducted. The long-term cost savings could be generated by installation of modern, energy-efficient building systems, reduction of recurring maintenance costs, and opportunities to achieve lease benefits in the capitol complex.

Break-even point analysis. The following analysis was conducted to determine an inflation-adjusted investment break-even point. The inflation factors used and their 20-year compound annual average growth rates were: lease rates at 4.0 percent (determined in consultation with Frederick Ross), maintenance costs at 4.49 percent, building costs at 2.99 percent, and moving costs at 2.91 percent (energy, government pay, building construction, and other services price deflators as provided by The WEFA Group). The analysis method of "net present value" was then employed to account for the changing value of money over time and differing construction start dates. The time value of money was estimated at 5.5 percent.

Maintenance and construction costs. Maintenance and operating costs were estimated for the Capitol building, the Annex, the new capitol complex facility, and the different Revenue facility identified in the alternatives. Maintenance and operating costs were assumed to be comprised of 70 percent energy and 30 percent government labor as estimated by Capitol Complex Facilities. Maintenance and operating costs for the different Revenue facility were estimated to be approximately $250,000 per year. Additional construction costs to finish all remaining floors in the Annex for Alternative #2 were estimated to be approximately $2,250,000.

Benefits (maintenance and asset values). In determining a break-even point, the costs of each alternative are compared to its benefits. These benefits include maintenance savings gained from more efficient operating systems within the Capitol and Annex buildings, as well as increases in the value of the assets that have been acquired or improved. Maintenance savings are estimated as the difference between the maintenance costs for the new projects and maintenance costs if nothing is done (cost estimates provided by Capitol Complex Facilities and ABS Consultants). New mechanical and electrical systems would be more energy efficient and would substantially reduce the per unit consumption of electrical, water, and gas utilities. Increases in asset values are measured by using the difference in the expected values of leasing the improved space before the project is begun and after the project is completed. For example, if a space in the Annex building has a market lease value of $10 per square foot before the project and the improvements raise that lease value to $12.50 per square foot, then the increase in asset value for the building is $2.50 per square foot. In the case of newly acquired buildings, the increase in asset value to the state is measured as the entire lease value of the building.

Lease costs. The following lease rates were used for asset valuation. The new capitol complex facility was considered to be Class A space with a 1995 lease market value of $14.50 per square foot, the refurbished Annex was considered to be Class B space with a 1995 lease market value of $12.50 per square foot, and the Capitol sub-basement space was considered to be Class C space with a 1995 lease market value of $10.00 per square foot. The new parking facility with 500 parking spaces was estimated to generate $40 per month per space. The Capitol and Annex buildings are considered Class C space in their current condition. Partial improvements to the Capitol were valued at a relative percentage of the lease rate increase gained from full improvement.

Net Unrecovered Investment, Break-even Point, and Net Positive Return
(Cumulative Net Present Value in $000)

	FY 2005	FY 2010	FY 2020	**FY 2028**	**FY 2036**	FY 2045	FY 2055	FY 2075
Alternative #1	($14,401)	($14,199)	($13,861)	($13,637)	($13,451)	($13,282)	($13,140)	($12,978)
Alternative #2	($39,261)	($32,778)	($18,175)	($6,837)	**$4,020**	$15,632	$27,770	$49,674
Alternative #3	($42,200)	($34,363)	($14,875)	**$44**	$14,083	$28,893	$44,217	$71,649
Alternative #4	($58,866)	($48,942)	($28,675)	($13,590)	**$480**	$15,187	$30,244	$56,748

Analysis of Alternatives

Alternative One Phases

Phase One

Install sprinklers in the sub-basement and dome. Complete.

Phase Two

Install sub-basement fire alarm, emergency power, emergency lighting, and smoke control systems. Install off-site emergency generator.

Construct sub-basement swing space and extend elevators to sub-basement.

Relocate occupants out of stair construction areas to "double bunk" offices and temporary offices in committee rooms.

Extend northeast stairs from sub-basement to attic.

Extend southeast stairs from sub-basement to basement.

Phase Three

Relocate Legislative Legal Services, Governor's press and policy divisions, and some legislative offices in the southeast corner to and from sub-basement swing space.

Extend southeast stairs from basement to second floor.

Install fire sprinkler, fire alarm, emergency power, emergency lighting, and smoke control systems in the southeast area, basement to attic.

Phase Four

Relocate Legislative Council to and from sub-basement swing space.

Install fire sprinkler, fire alarm, emergency power, emergency lighting, and smoke control systems in basement committee rooms, cafeteria, and Legislative Council areas.

Phase Five

Relocate Treasurer, Lieutenant Governor, OSPB, and some legislative offices in the north end to and from sub-basement swing space. "Double bunk" some legislative offices on second and third floors.

Extend northwest stairs from first floor to attic.

Install all fire sprinkler, fire alarm, emergency power, emergency lighting, and smoke control systems in the north end of the Capitol, first floor to attic.

Phase Six

Relocate Lieutenant Governor, Treasurer and some legislative offices in the southwest corner to and from the sub-basement swing space.

Relocate Governor's suite and immediate staff to Lieutenant Governor and Treasurer area.

"Double bunk" some Legislative offices on second and third floors.

Extend southwest stairs from first to second floor.

Install all fire sprinkler, fire alarm, emergency power, emergency lighting, and smoke control systems in the Senate Chamber, as well as the southwest area from first floor to attic.

Phase Seven

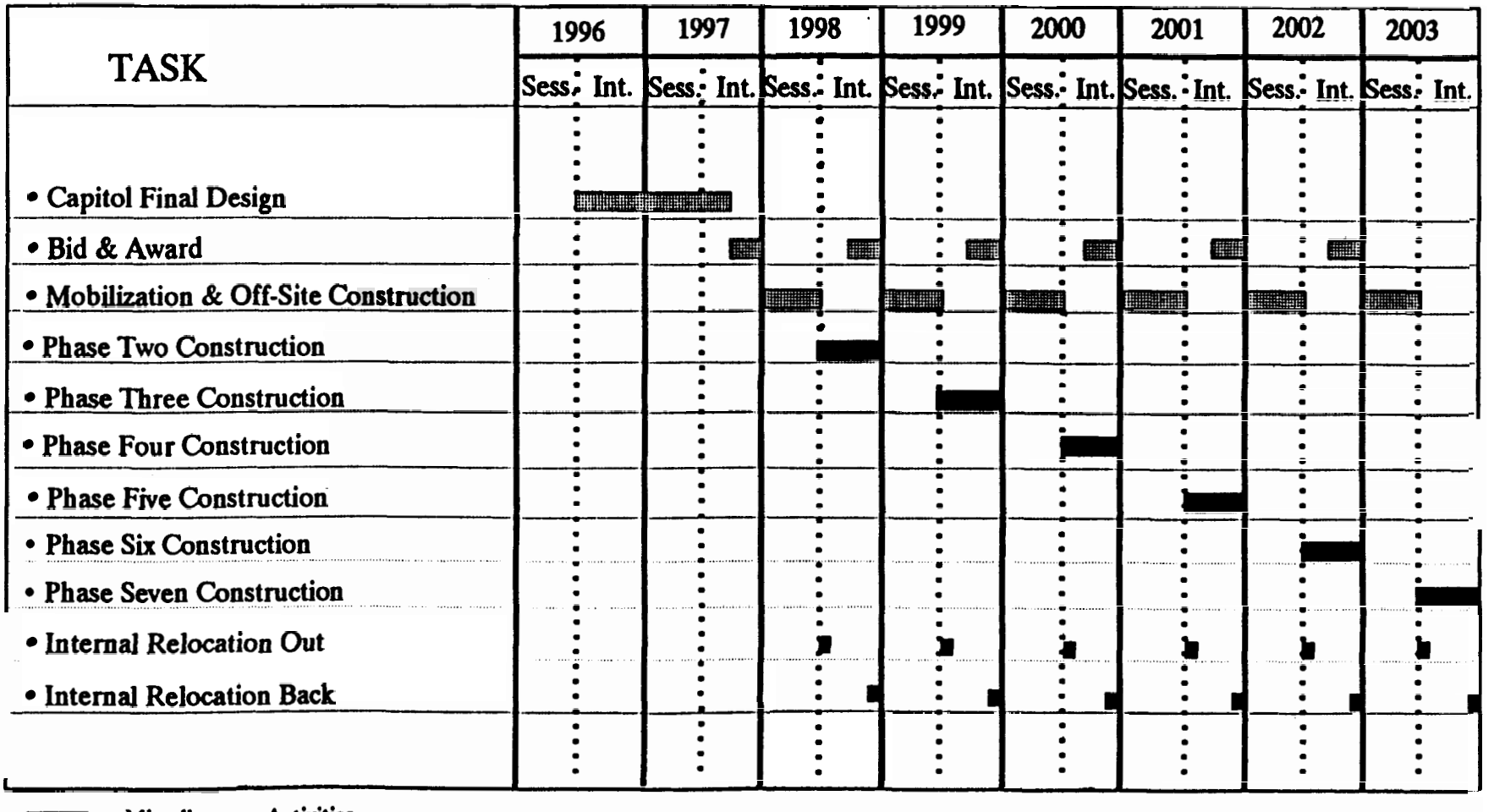
Relocate some second floor, east side legislative offices to and from sub-basement swing space.

Install all fire sprinkler, fire alarm, emergency power, emergency lighting, and smoke control systems in the House chamber, rotunda, third floor committee rooms and second floor offices on the east side.

COLORADO STATE CAPITOL - LIFE SAFETY PROJECT

ALTERNATIVE NO. 1 SCHEDULE

October 10, 1995



State Capitol Building Health and Life Safety Project
Alternative #1 Cost Estimate Matrix
(1995 Dollars)
Revised November 29, 1995

Item	FY 1996-97	FY 1997-98	FY 1998-99	FY 1999-00	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	Total
Sub-basement Space	75,000	578,000							653,000
Revenue Relocate/Facility									0
Renovate Annex									0
LSB Retrofit									0
New Capitol Complex Facility									0
Lead/Asbestos Abatement	20,000	84,000	17,000	14,000	33,000	27,000	15,000		210,000
Occupant Relocation		13,000	84,000	69,000	132,000	109,000	62,000		469,000
Capitol Life Safety *	200,000	1,694,000	2,599,000	2,129,000	3,386,000	2,808,000	1,604,000		14,420,000
Sub-total to Complete Life Safety	295,000	2,369,000	2,700,000	2,212,000	3,551,000	2,944,000	1,681,000	0	15,752,000
Telecommunications									0
Electrical									0
Mechanical									0
Restoration									0
Exterior Wall, Roof, and Site									0
Furniture									0
Sub-total to Complete Capitol Upgrades	0	0	0	0	0	0	0	0	0
TOTAL Capital Requirement	295,000	2,369,000	2,700,000	2,212,000	3,551,000	2,944,000	1,681,000		15,752,000
Appropriation Requirement	0	0	2,033,000	2,212,000	3,551,000	2,944,000	1,681,000	0	12,421,000

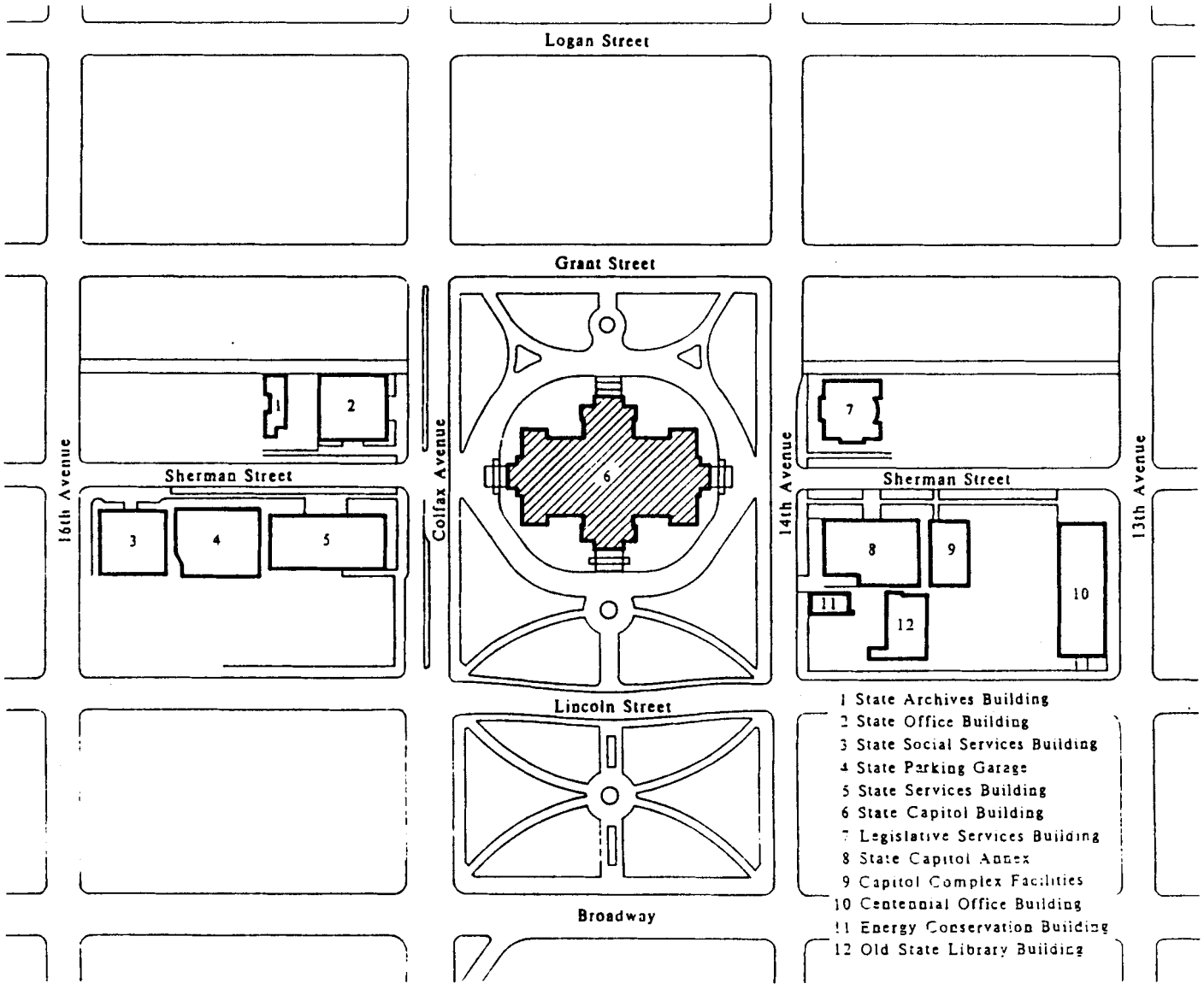
* Refer to the following pages for an itemization of Capitol Life Safety cost estimates.

COLORADO STATE CAPITOL – HEALTH AND LIFE SAFETY PROJECT
ALTERNATIVE NO. 1 COST BREAKDOWN
NOVEMBER 10, 1995

1	**CAPITOL LIFE SAFETY**	
1.1	Demolition	554,000
1.2	Concrete	5,000
1.3	Masonry	14,000
1.4	Steel and Stairs	2,132,000
1.5	Carpentry, Doors and Hardware	467,000
1.6	Plaster, Drywall & Ceilings	385,000
1.7	Flooring and Stone	610,000
1.8	Painting	217,000
1.9	Fire Protection	1,124,000
1.10	Mechanical	2,299,000
1.11	Fire Alarm	1,213,000
1.12	Electrical	880,000
1.13	Subtotal Direct Costs	9,900,000
1.14	General Conditions, Bonds & Insurance	1,882,000
1.15	Construction Reserve	589,000
1.16	Contractor Fee	494,000
1.17	Design Fee	200,000
1.18	Project Contingency	1,355,000
1.19	TOTAL ALTERNATE NO.1 LINE 8, CAPITOL LIFE SAFETY	14,420,000

CLARIFICATIONS:

1.) All costs are in 1995 dollars
2.) Costs are based on the scope of life safety improvements defined in the 1990 Life Safety Plan and refined by the 1993/1994 Life Safety Project initial design
3.) The Capitol renovation is in six phases
4.) General conditions, bonds, and insurance include items such as the General Contractor's project manager, superintendent and project engineer; construction cleaning, power and temporary office, temporary barricades; premiums for systems connections between phases and similar items
5.) The construction reserve covers items not yet shown by the design documents and any potential variations between current estimates and bid amounts for each direct cost line item
6.) The project contingency covers potential additional scope items that the Owner may need or desire

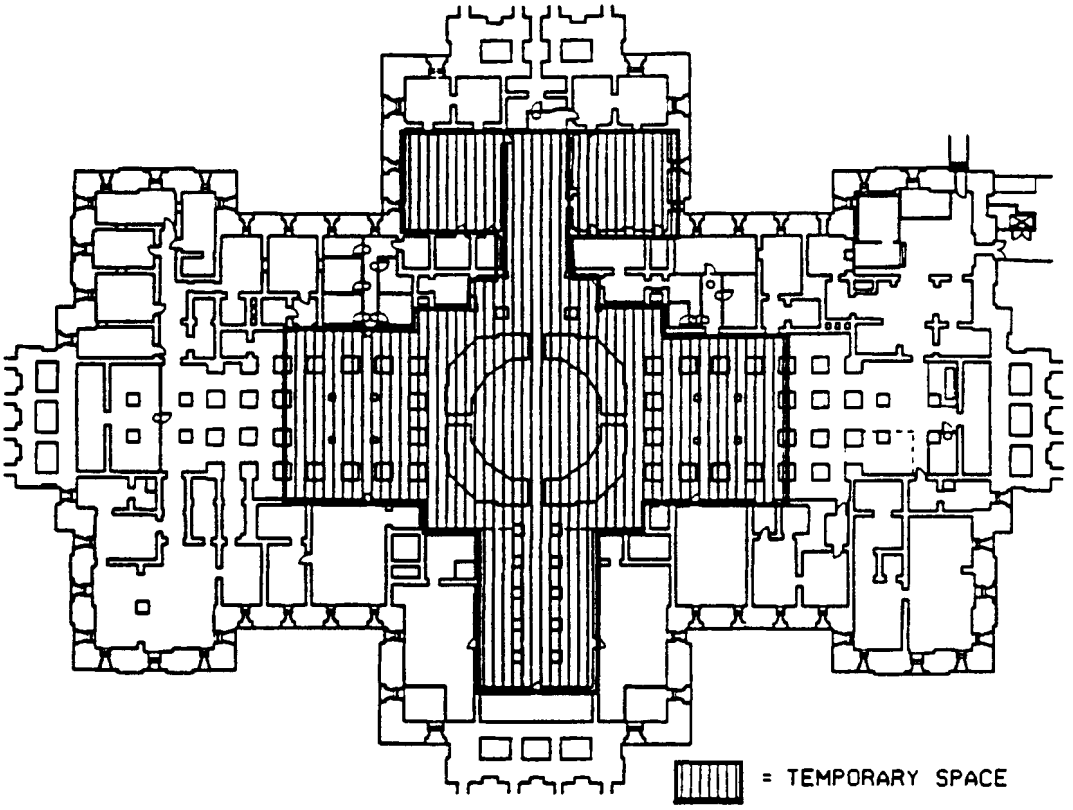


COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT

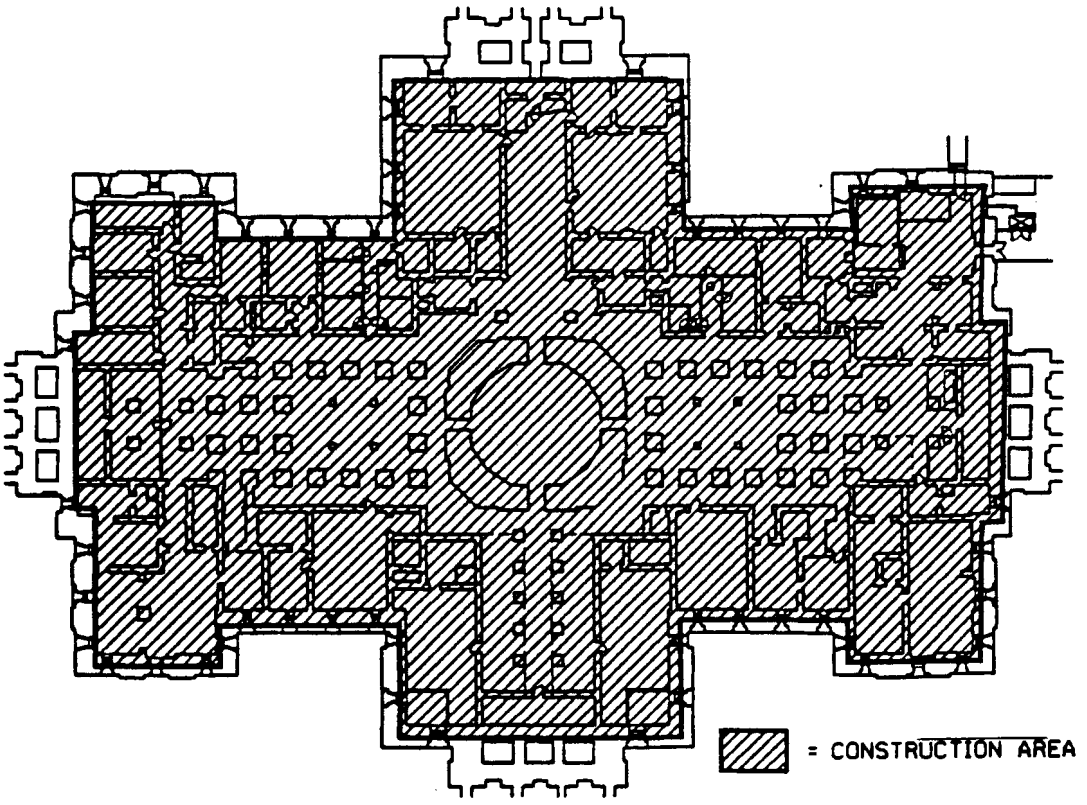
Capitol Complex Site Plan

Alternative One

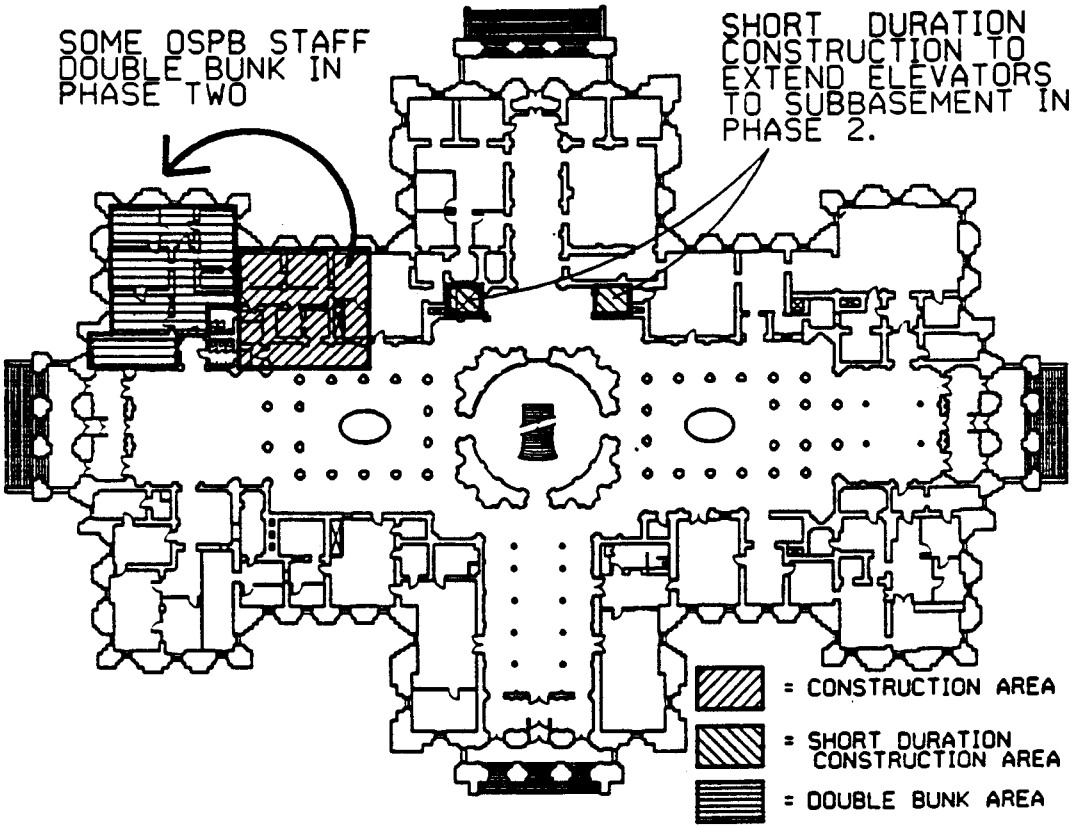
C.W. Fentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASES 3-7 - SUBBASEMENT



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 2 - SUBBASEMENT



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
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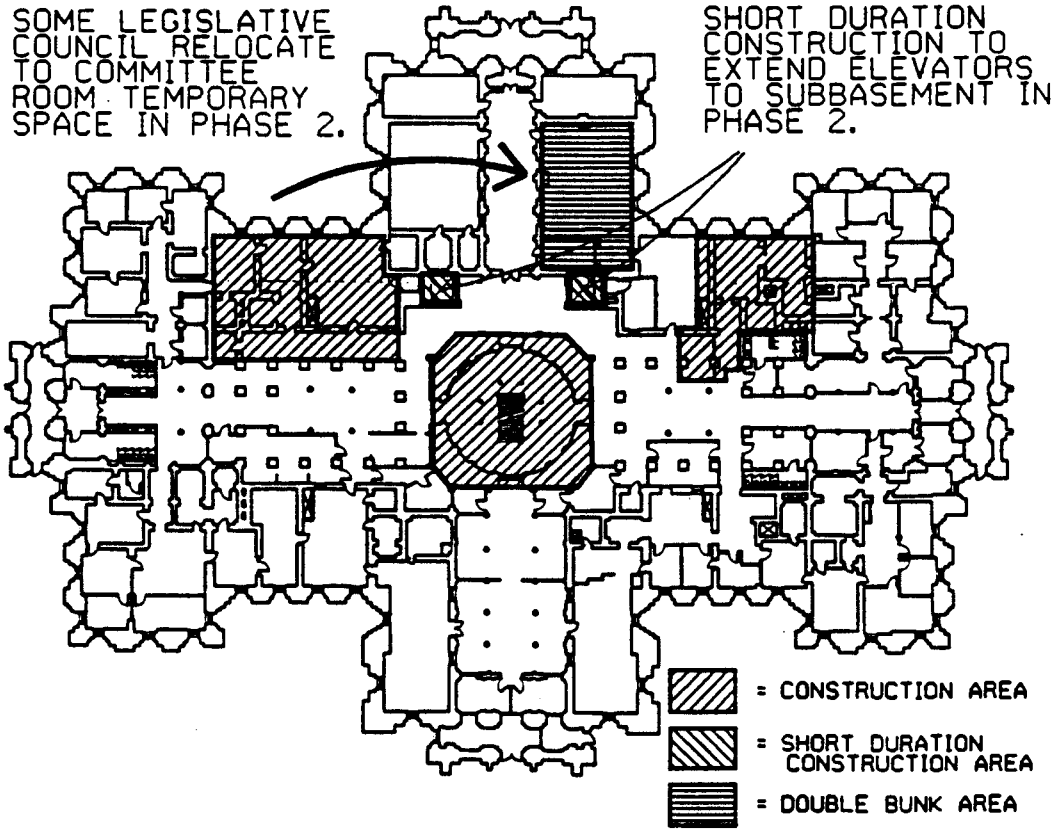
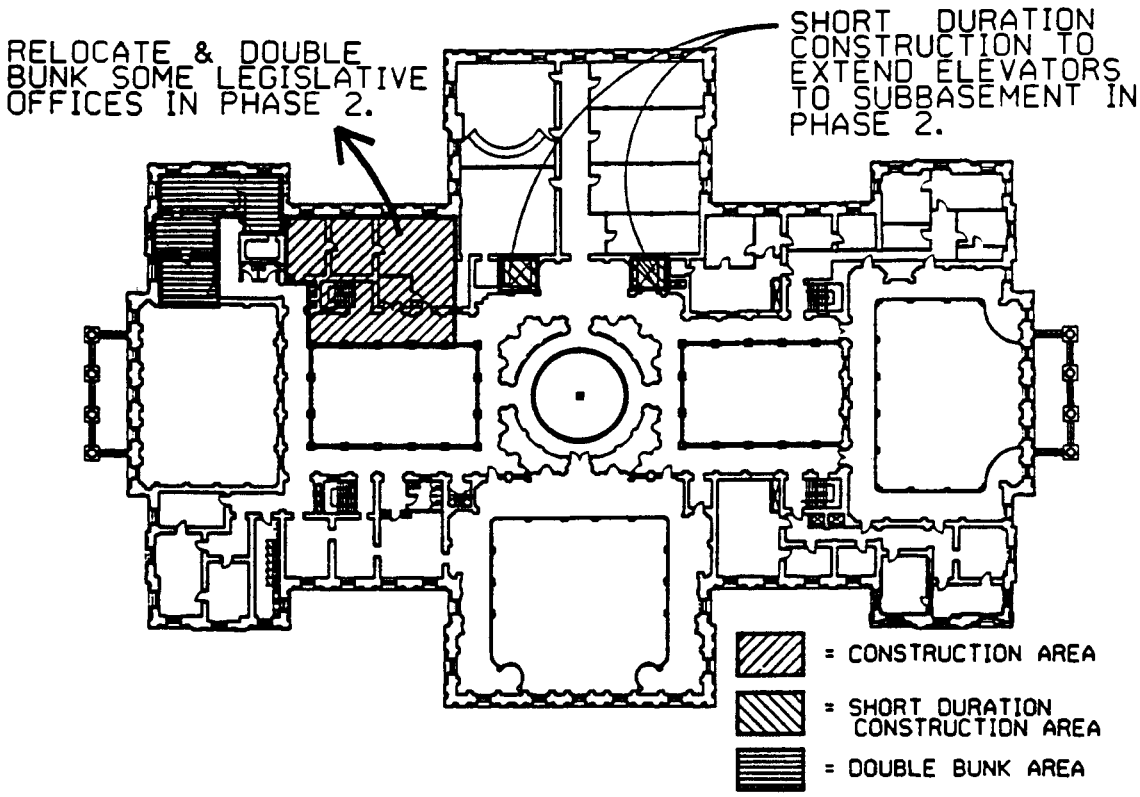


COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 2 - BASEMENT



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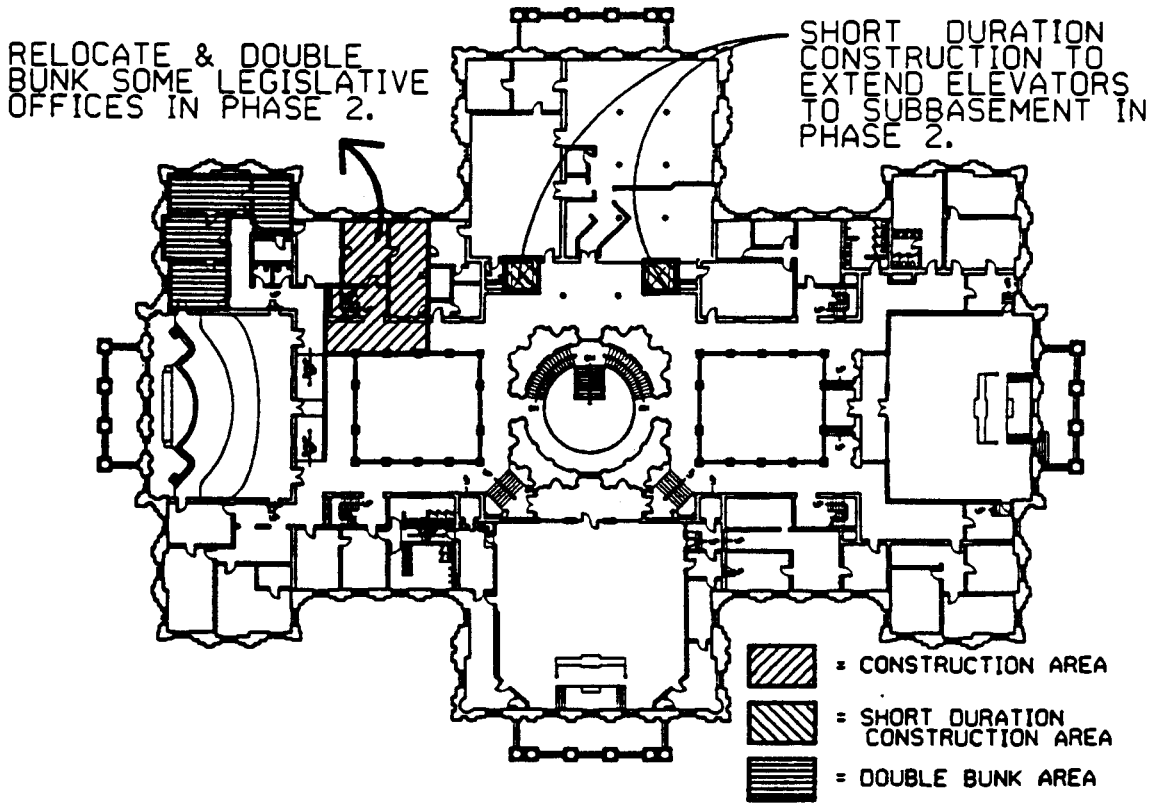

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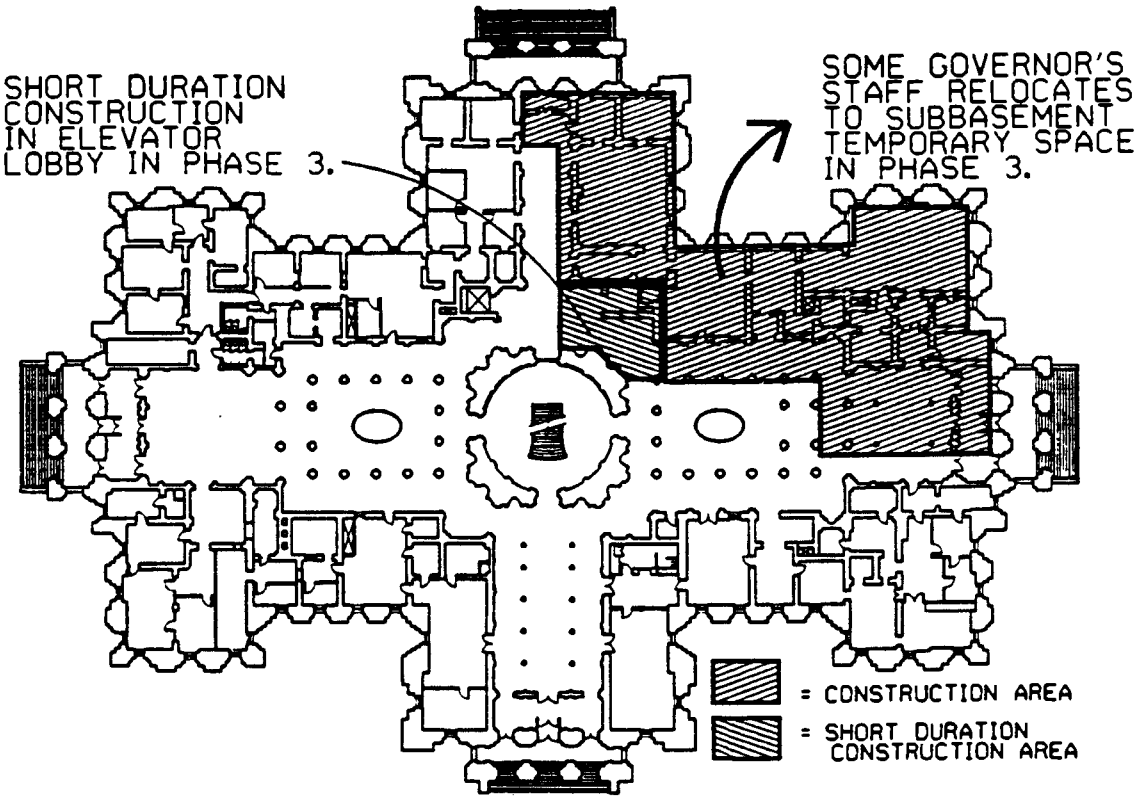
PHASE 2 - 2ND FLOOR



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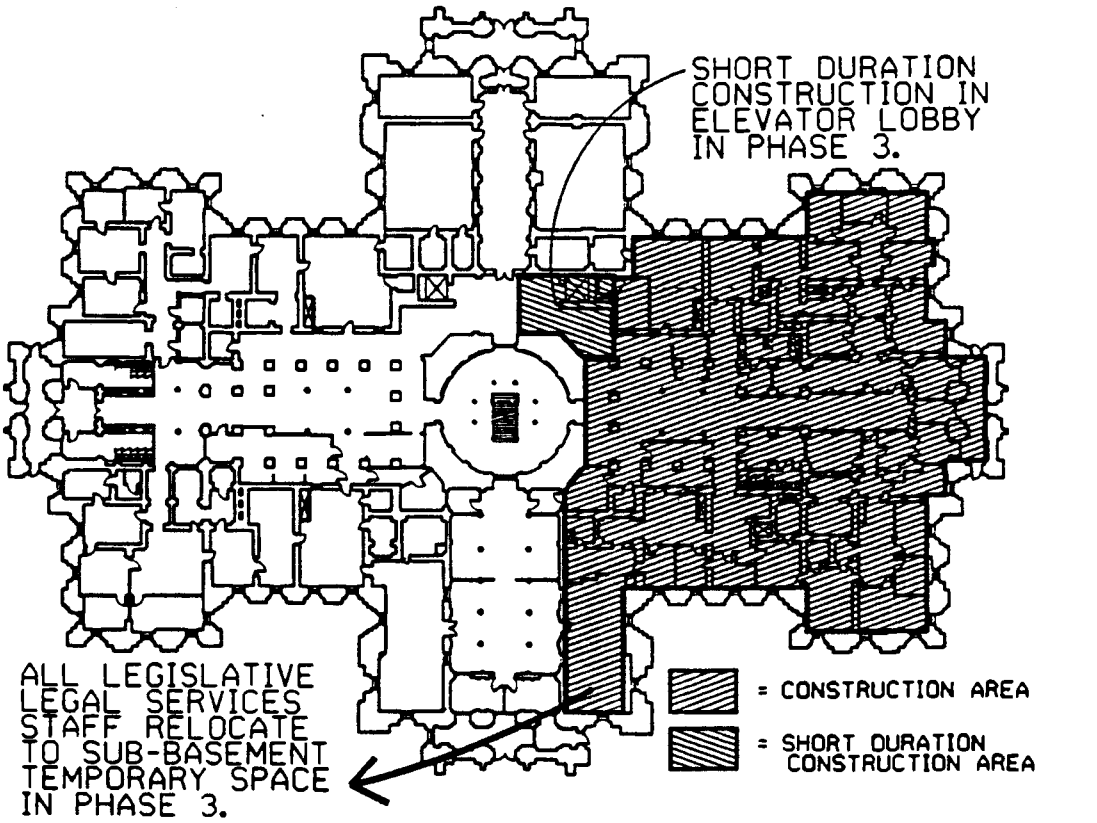
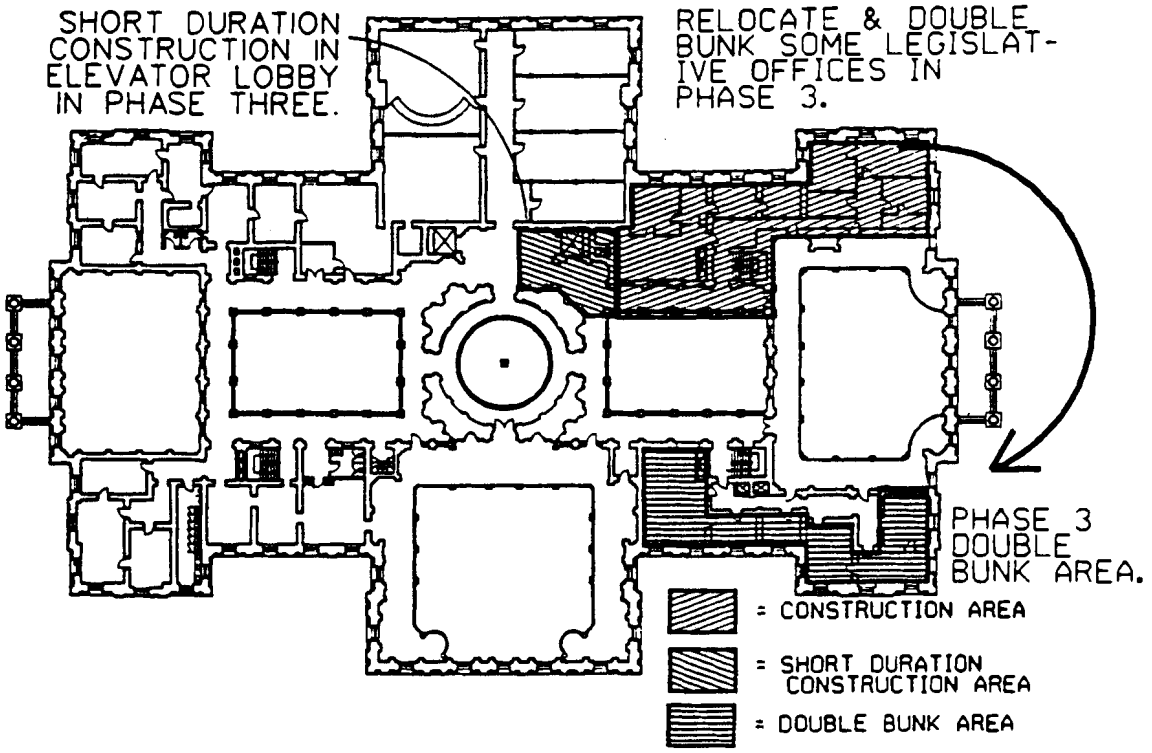


COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 3 - BASEMENT



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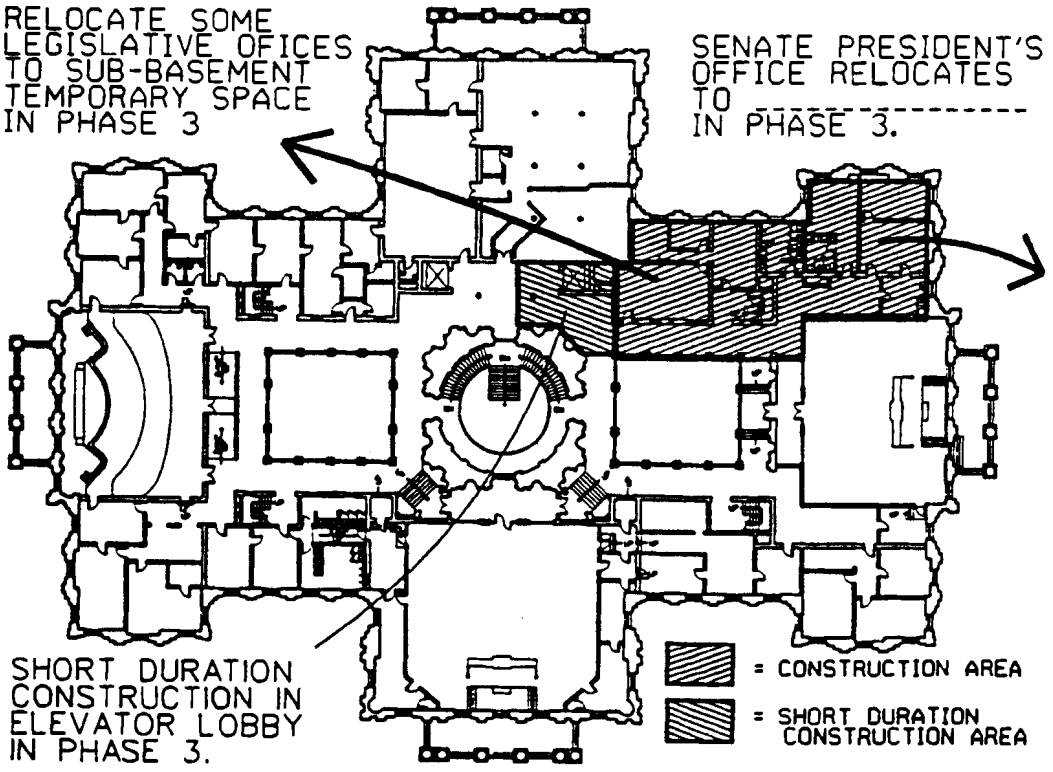
PHASE 3 - 3RD FLOOR



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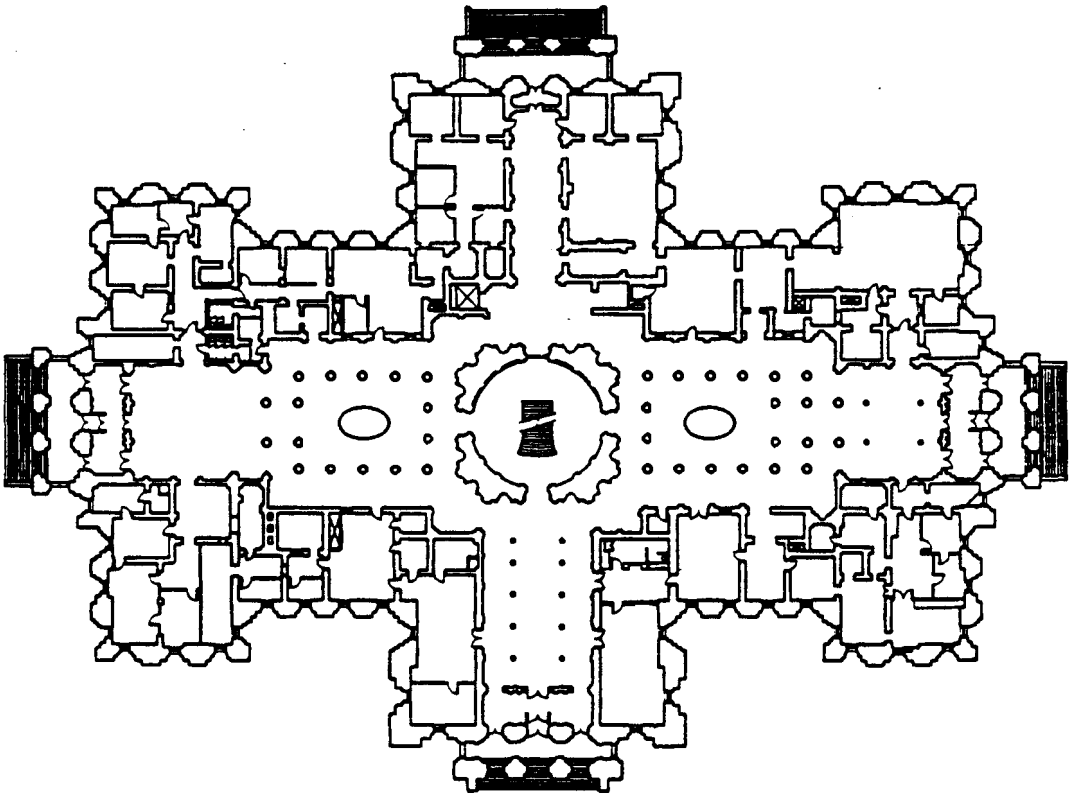

COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
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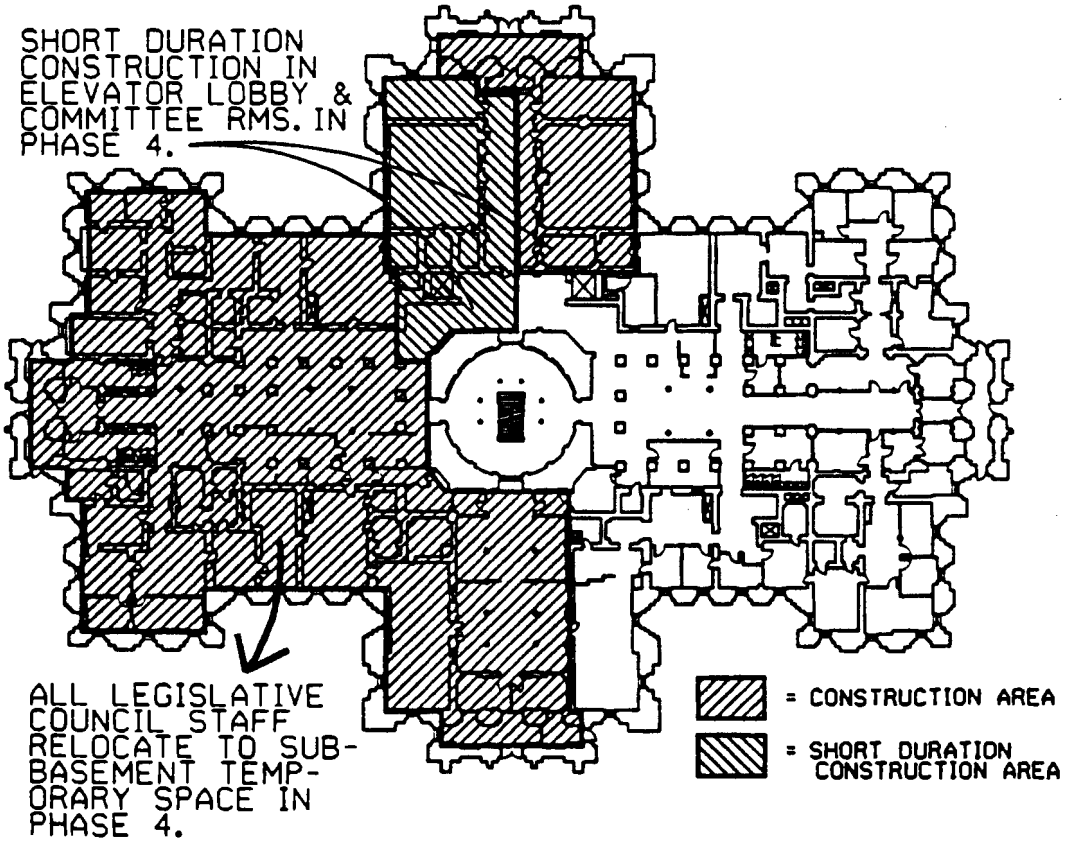
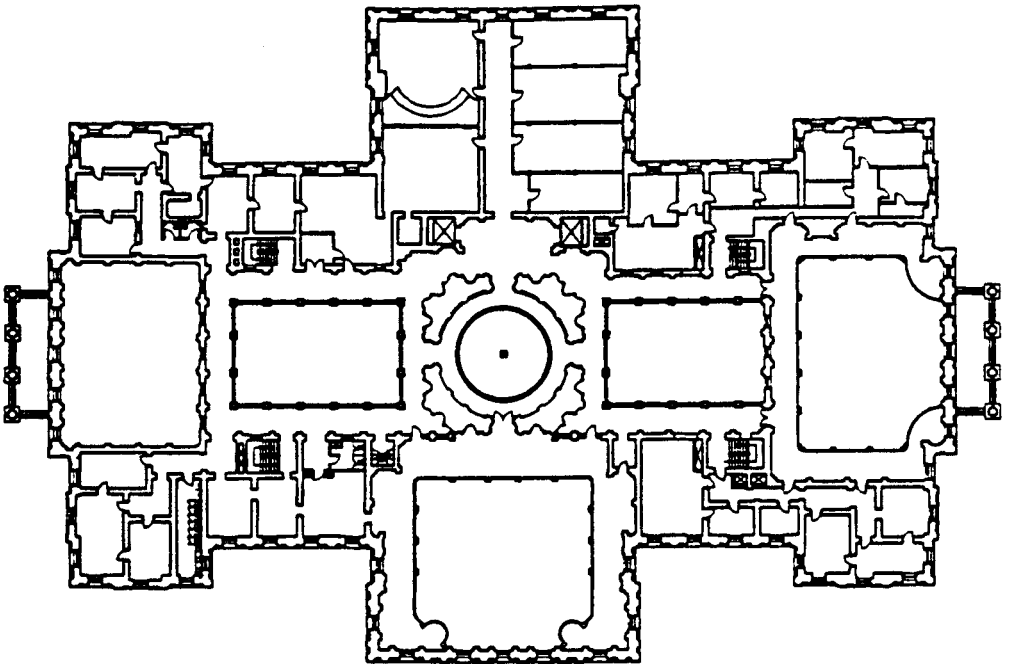


COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 4 - BASEMENT



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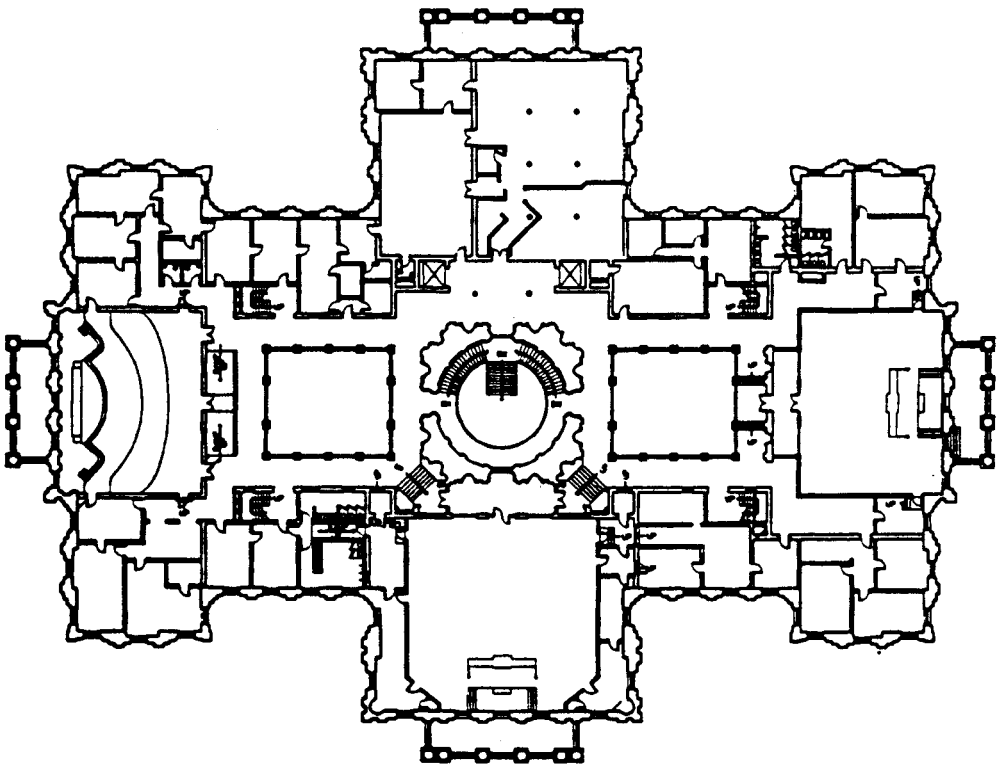
PHASE 4 - 3RD FLOOR



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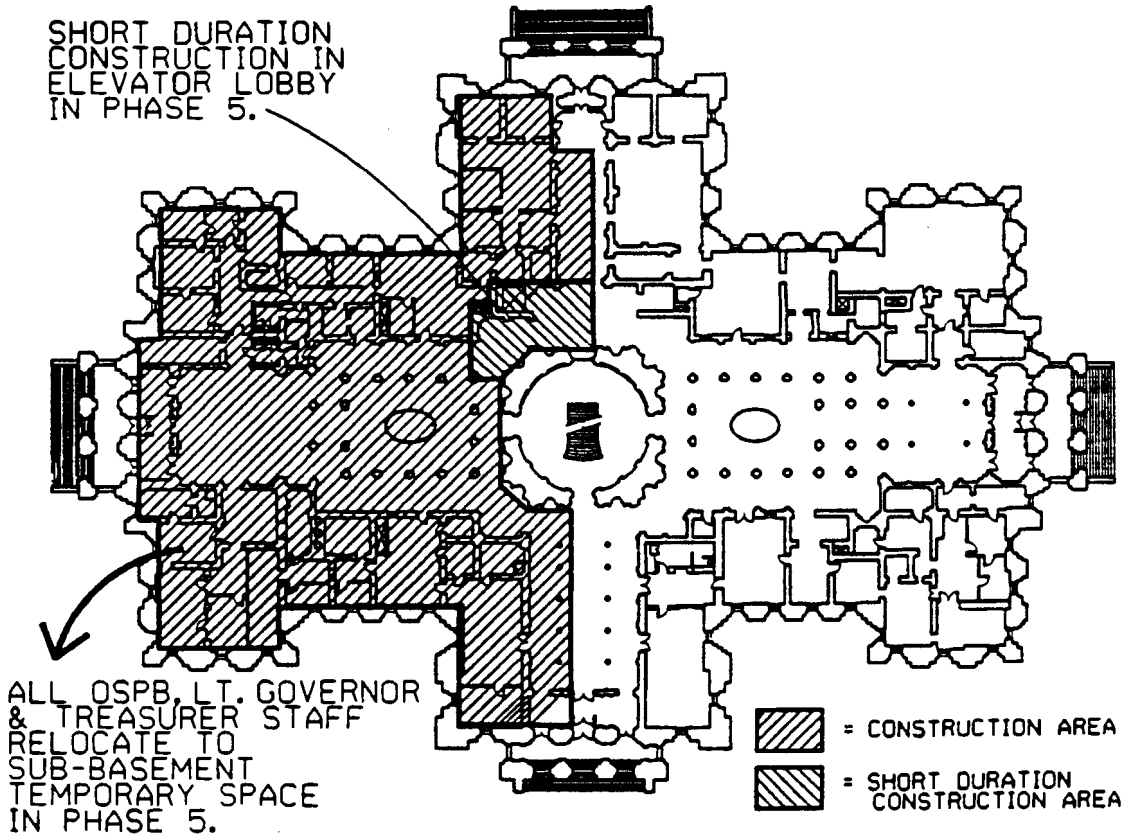
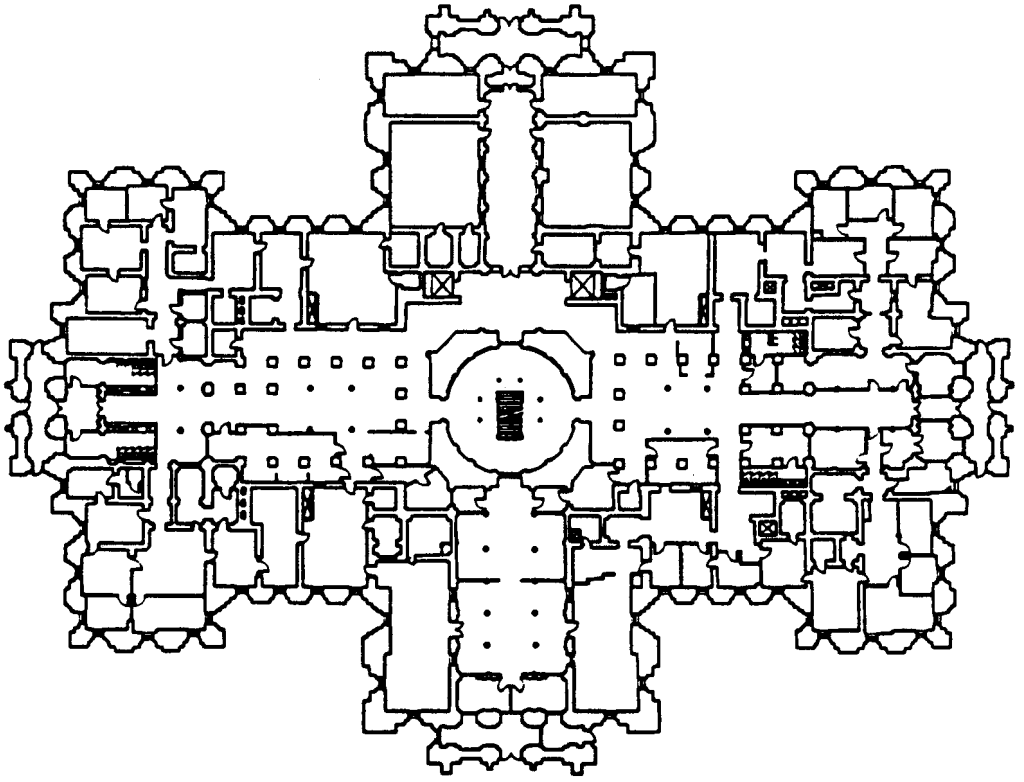
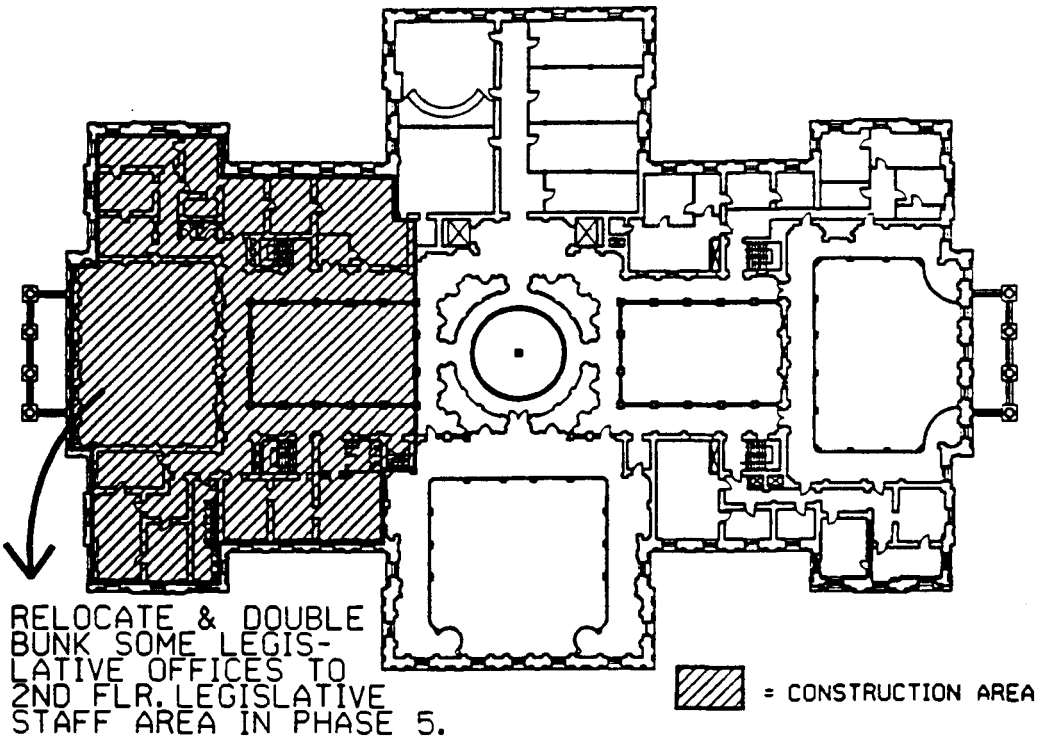
PHASE 4 - 2ND FLOOR



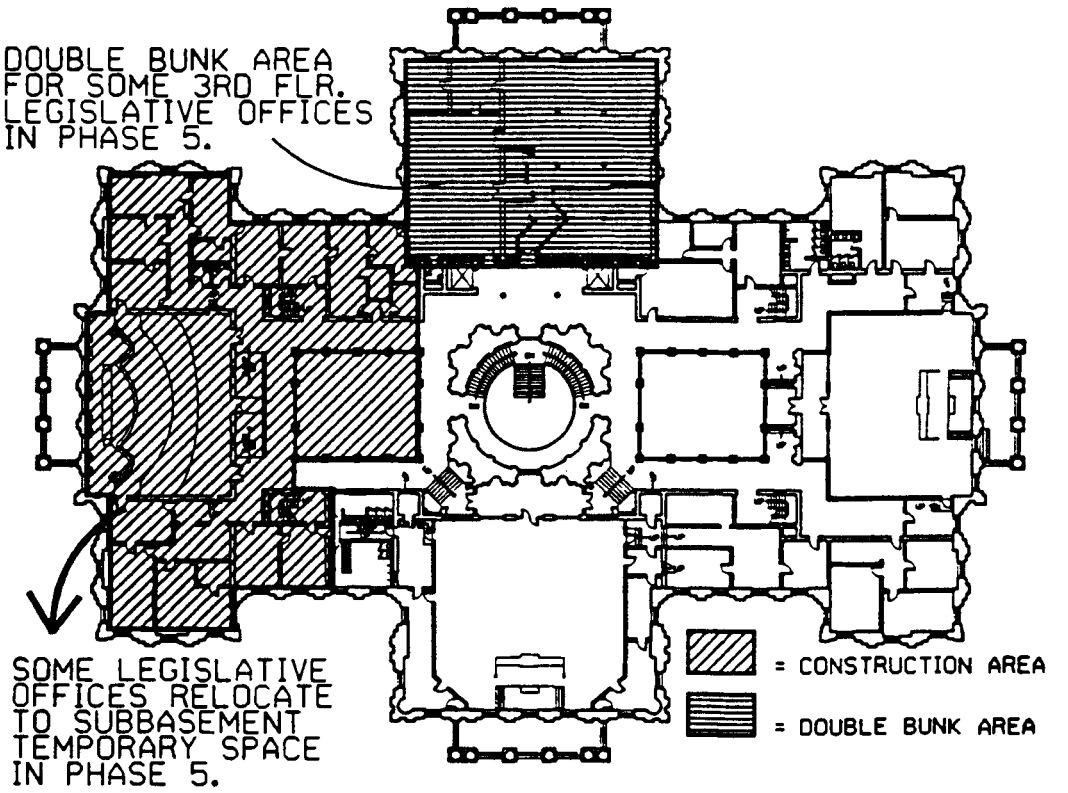
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 5 - 1ST FLOOR



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 5 - BASEMENT



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 5 - 3RD FLOOR



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
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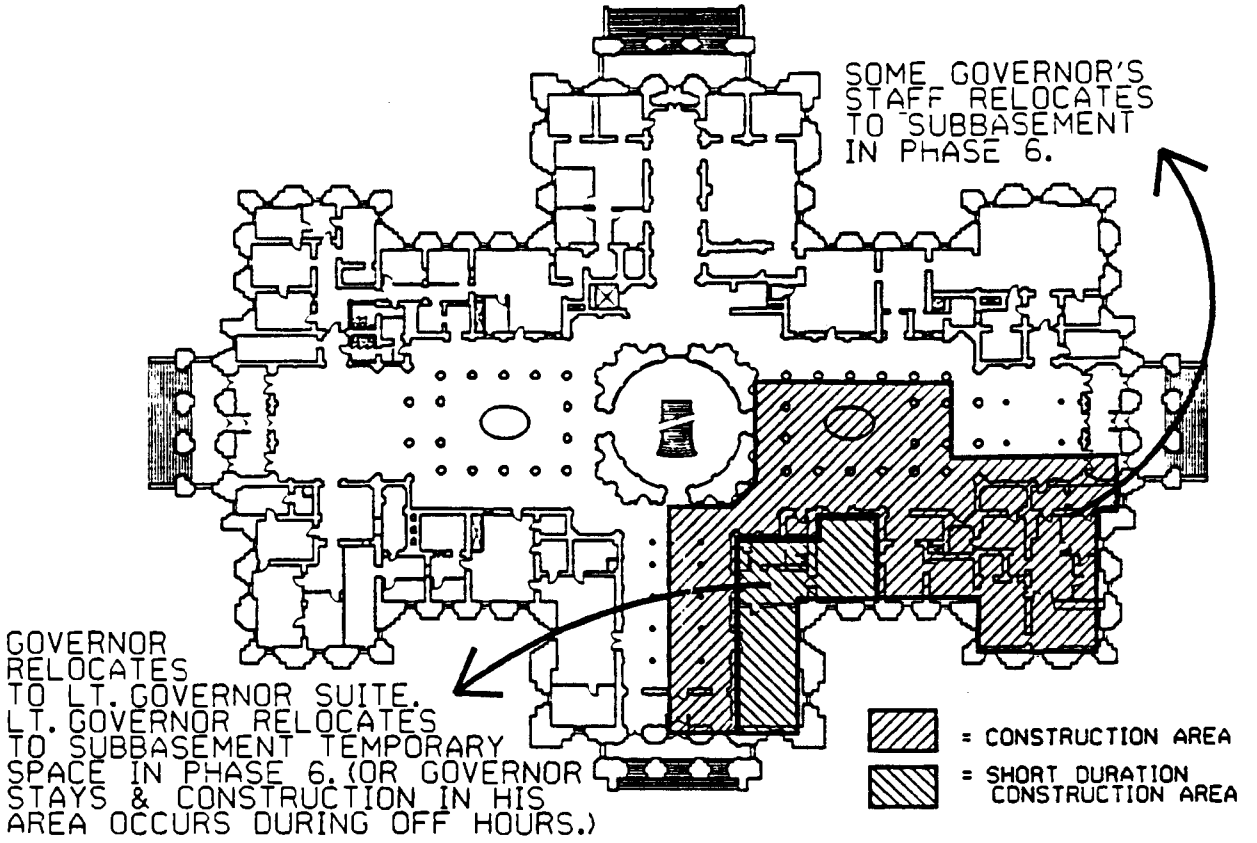
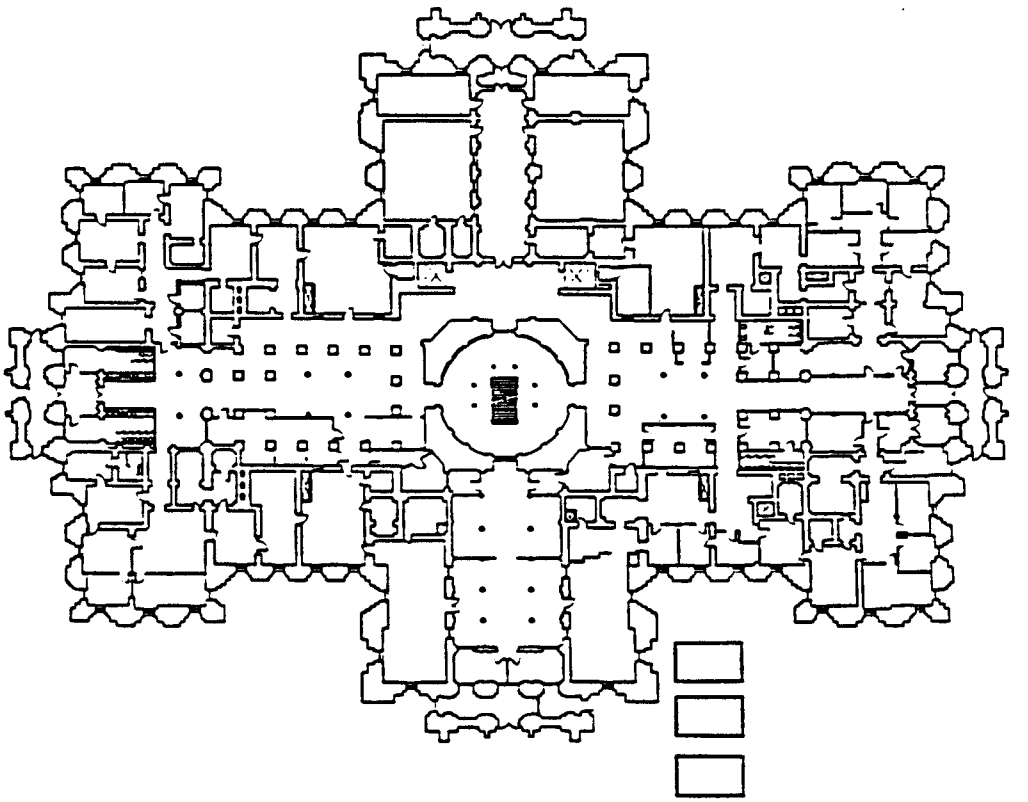
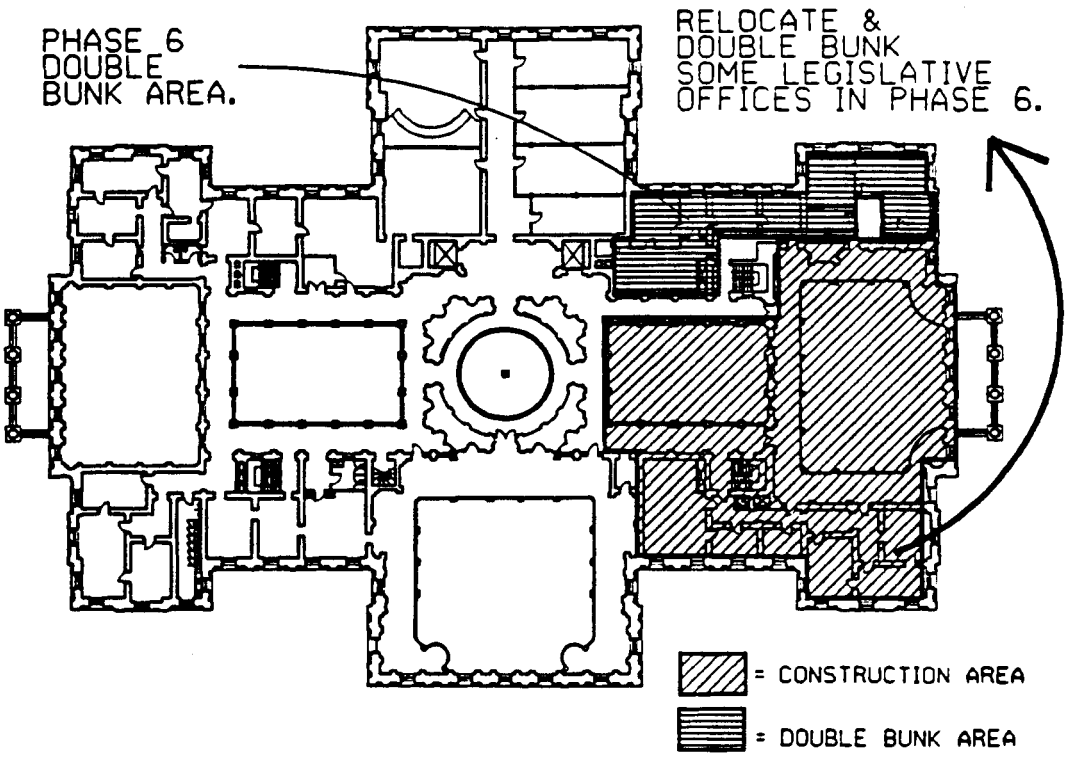


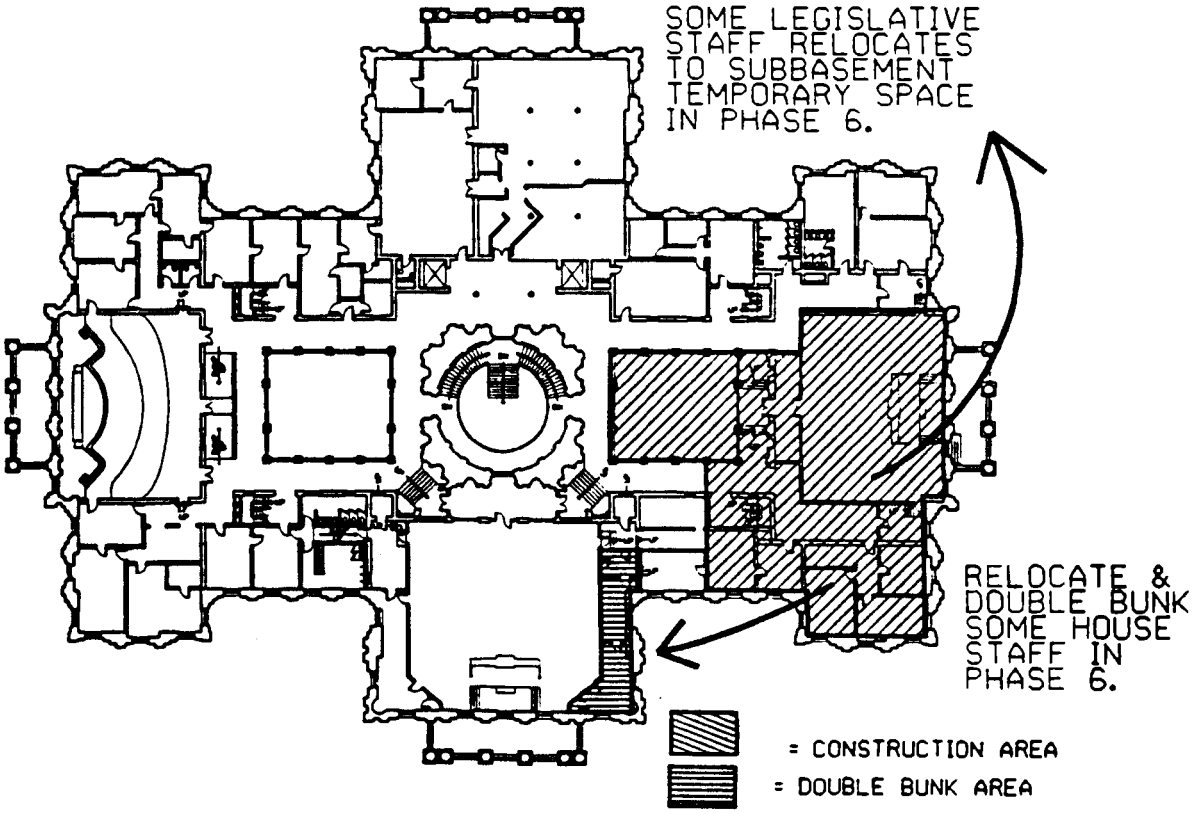
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 6 - 1ST FLOOR



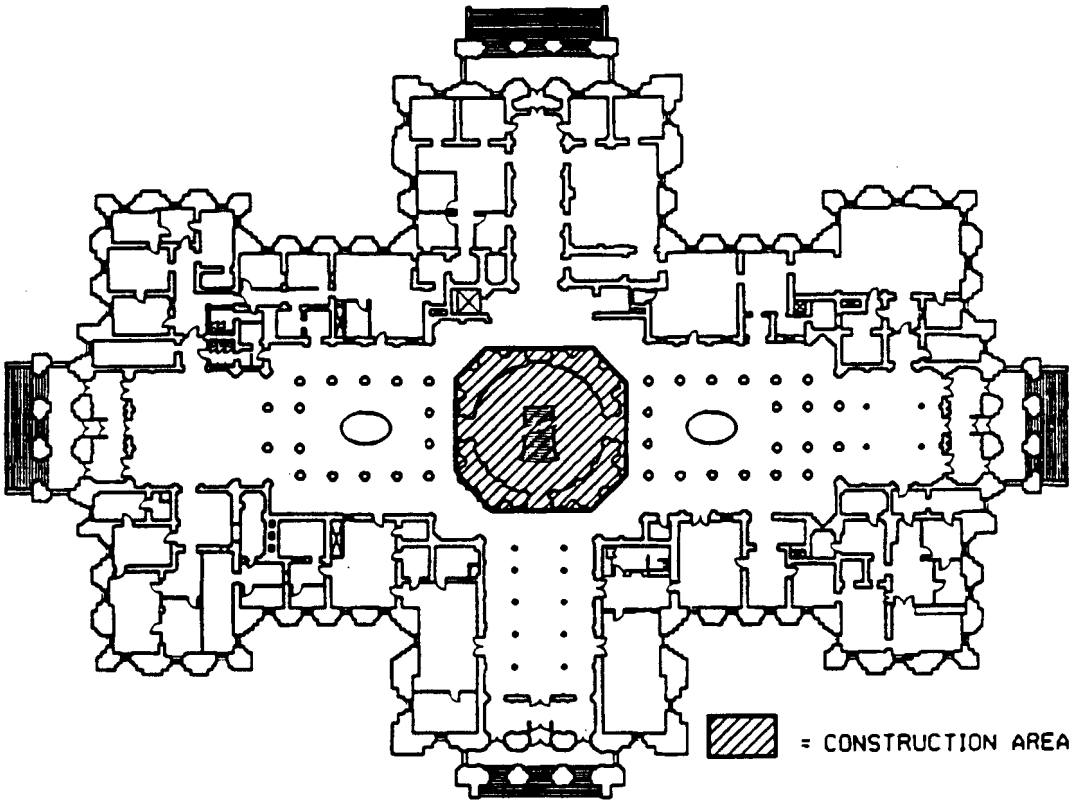
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 6 - BASEMENT



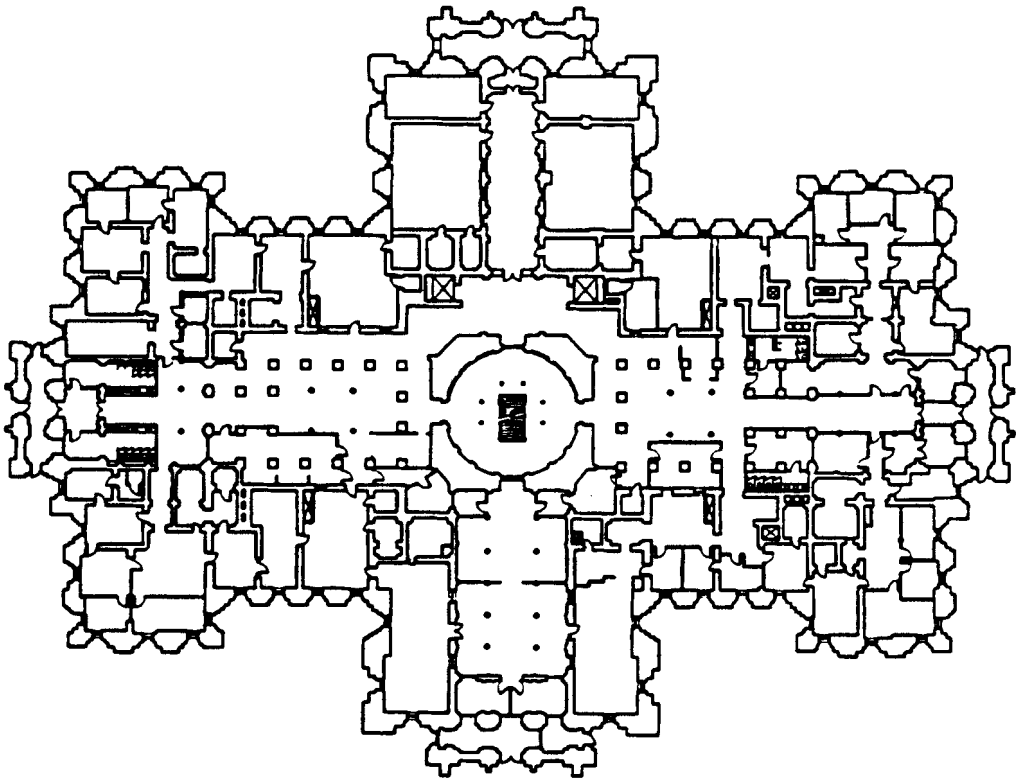
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 6 - 3RD FLOOR



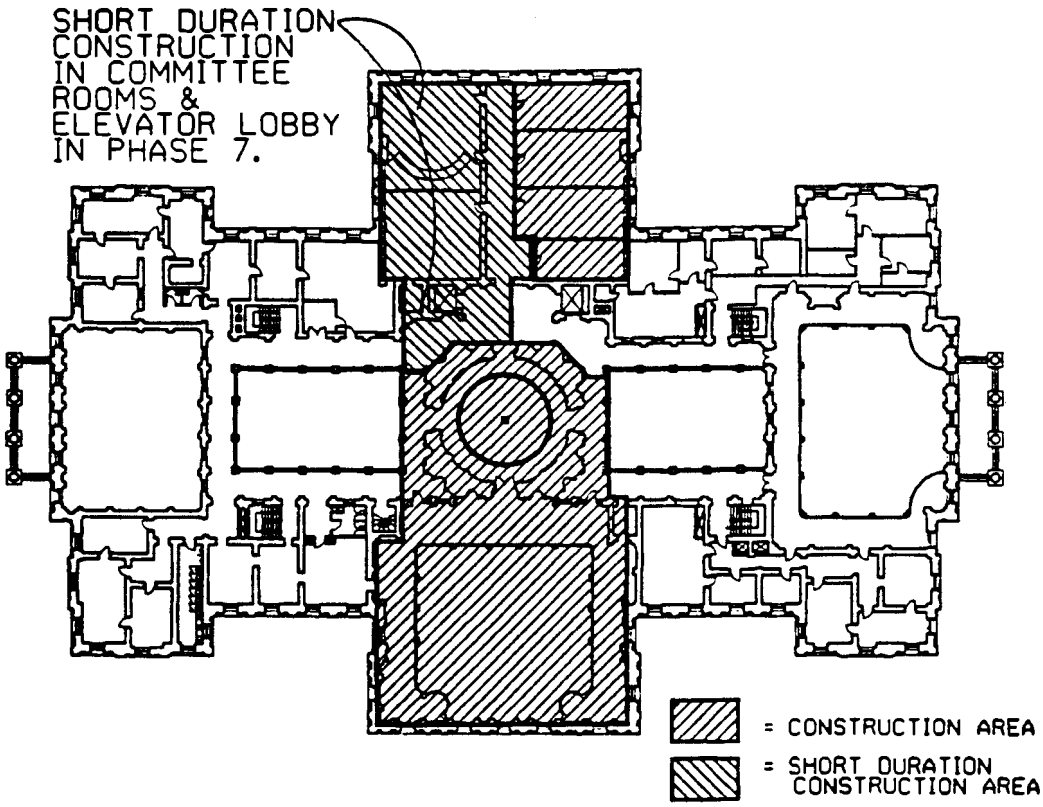
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 6 - 2ND FLOOR



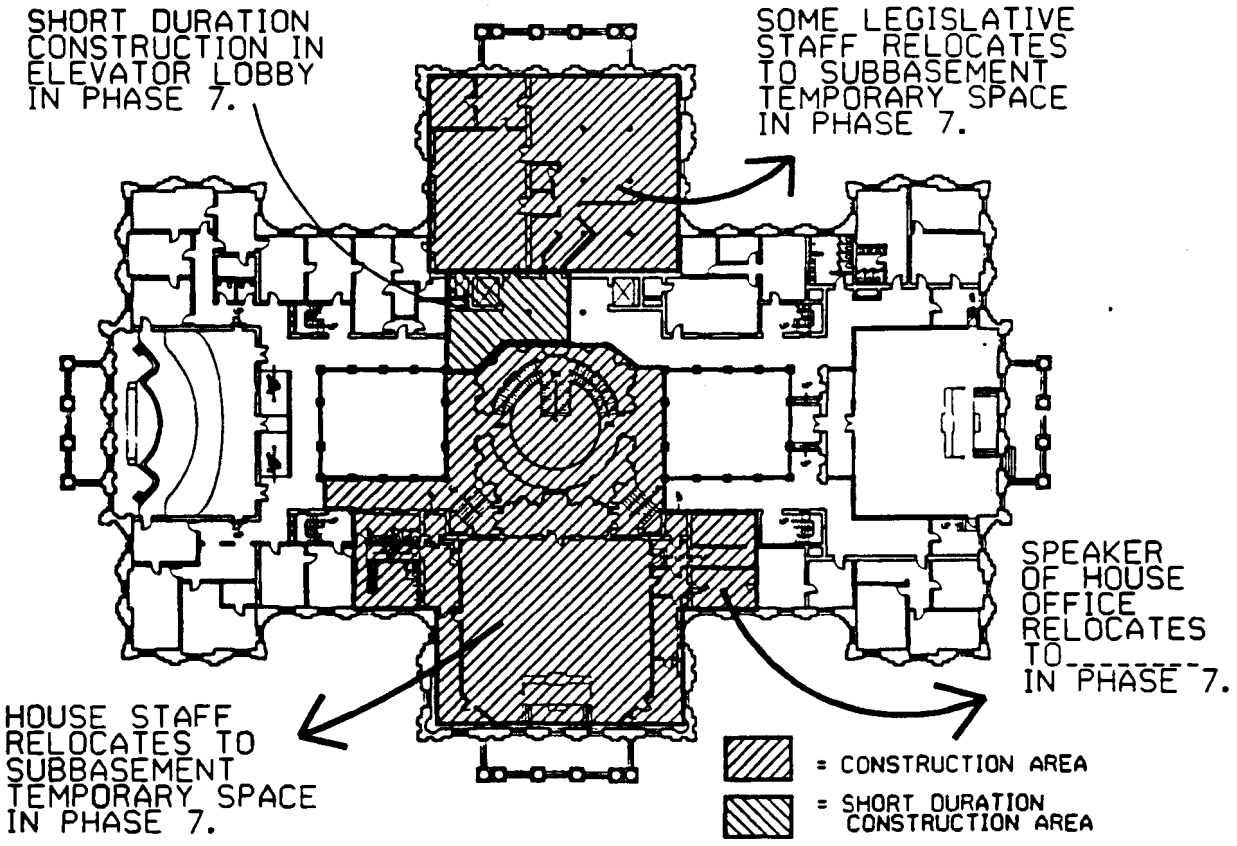
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 7 - 1ST FLOOR



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 7 - BASEMENT



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 7 - 3RD FLOOR



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE ONE
PHASE 7 - 2ND FLOOR

Alternative Two Phases

Phase One

Install fire sprinklers in the sub-basement and dome. Complete.

Preparation for Phases Two through Four

Relocate Revenue Department to another facility.

Renovate the Capitol Annex Building.

Relocate OSPB, Legislative Council, and Legislative Legal Services to Annex for two years.

Phase Two

Relocate Governor's press and policy divisions to and from vacant OSPB area.

Relocate some second and third floor Legislative offices to and from the vacant basement area.

Extend southeast stairs from sub-basement to second floor.

Install all fire sprinkler, fire alarm, emergency power, emergency lighting, smoke control, telecommunications, electrical, and mechanical improvements in basement committee rooms, Senate chambers, and south side of the Capitol; sub-basement to attic. Install off-site emergency generator.

Phase Three

Relocate some second and third floor Legislative offices to and from vacant basement area.

Extend northeast stairs from sub-basement to attic.

Install all fire sprinkler, fire alarm, emergency power, emergency lighting, smoke control, telecommunications, electrical, and mechanical improvements in the third floor committee rooms, as well as the north side of the Capitol, from sub-basement to attic.

Phase Four

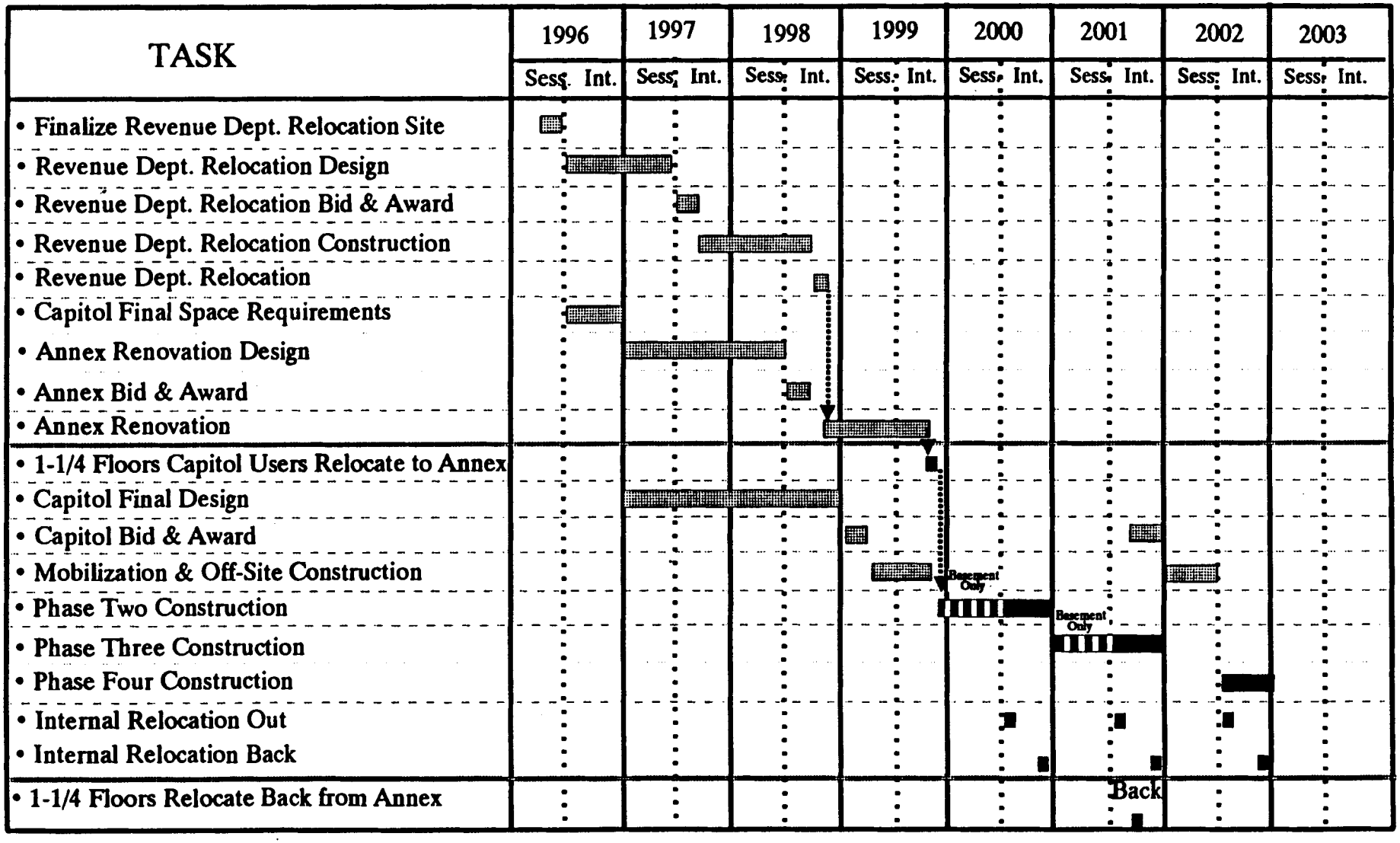
Relocate some second and third floor legislative offices, Lieutenant Governor, and Treasurer to and from the vacant basement area.

Relocate Governor's suite and immediate staff to and from vacant OSPB area.

Extend the northwest and southwest stairs.

Install all fire sprinkler, fire alarm, emergency power, emergency lighting, smoke control, telecommunications, electrical, and mechanical improvements in the House chamber and the west side of the Capitol; first through third floors.

COLORADO STATE CAPITOL - LIFE SAFETY PROJECT
ALTERNATIVE NO. 2 SCHEDULE
October 10, 1995



= Miscellaneous Activities

= Capitol Construction

= Capitol Occupant Relocation

State Capitol Building Health and Life Safety Project
Alternative #2 Cost Estimate Matrix
(1995 Dollars)
Revised November 29, 1995

Item	FY 1996-97	FY 1997-98	FY 1998-99	FY 1999-00	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	Total
Sub-basement Space									0
Revenue Relocate/Facility	6,200,000	4,415,000							10,615,000
Renovate Annex	750,000	7,469,000							8,219,000
LSB Retrofit									0
New Capitol Complex Facility									0
Lead/Asbestos Abatement			100,000	36,000	64,000				200,000
Occupant Relocation			213,000	154,000	149,000				516,000
Capitol Life Safety *		1,300,000	8,904,000		3,380,000				13,584,000
Sub-total to Complete Life Safety	6,950,000	13,184,000	9,217,000	190,000	3,593,000	0	0	0	33,134,000
Telecommunications	105,000	58,000	567,000		176,000				906,000
Electrical	180,000	40,000	724,000		275,000				1,219,000
Mechanical	750,000	167,000	3,023,000		1,147,000				5,087,000
Restoration									0
Exterior Wall, Roof, and Site									0
Furniture									0
Sub-total to Complete Capitol Upgrades	1,035,000	265,000	4,314,000	0	1,598,000	0	0	0	7,212,000
TOTAL Capital Requirement	7,985,000	13,449,000	13,531,000	190,000	5,191,000	0	0	0	40,346,000
Appropriation Requirement	4,654,000	13,449,000	13,721,000	0	5,191,000	0	0	0	37,015,000

* Refer to the following pages for an itemization of Capitol Life Safety cost estimates.

COLORADO STATE CAPITOL – HEALTH AND LIFE SAFETY PROJECT
ALTERNATIVE NO. 2 COST BREAKDOWN
NOVEMBER 10, 1995

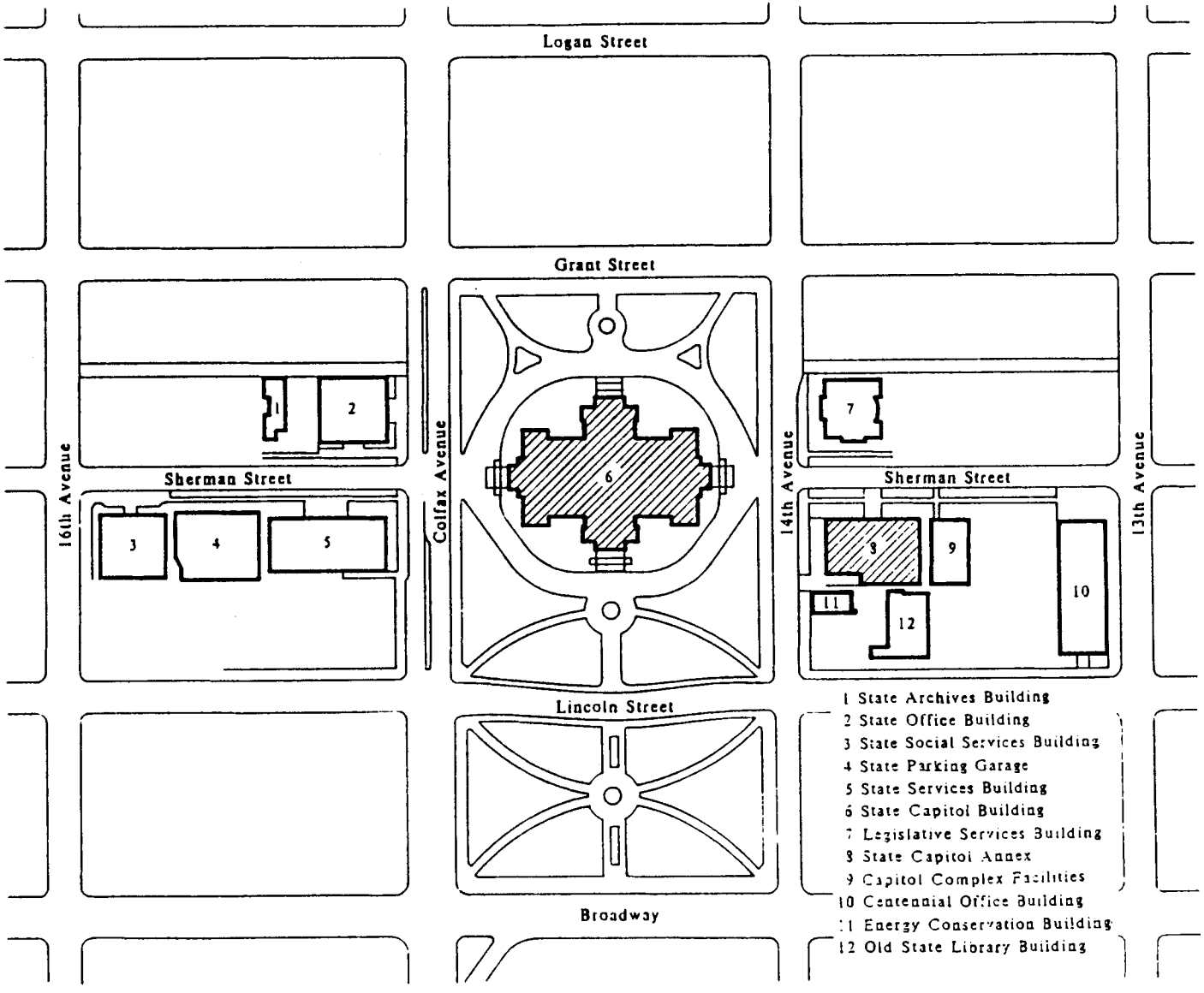
1	CAPITOL LIFE SAFETY	
1.1	Demolition	554,000
1.2	Concrete	5,000
1.3	Masonry	14,000
1.4	Steel and Stairs	2,132,000
1.5	Carpentry, Doors and Hardware	467,000
1.6	Plaster, Drywill & Ceilings	385,000
1.7	Flooring and Stone	610,000
1.8	Painting	217,000
1.9	Fire Protection	1,124,000
1.10	Mechanical	2,299,000
1.11	Fire Alarm	1,213,000
1.12	Electrical	880,000
1.13	Subtotal Direct Costs	9,900,000
1.14	General Conditions, Bonds & Insurance	1,349,000
1.15	Construction Reserve	562,000
1.16	Contractor Fee	472,000
1.17	Design Fee	0
1.18	Project Contingency	1,301,000
1.19	TOTAL ALTERNATE NO.2 LINE 8, CAPITOL LIFE SAFETY	13,584,000
2	RELOCATE REVENUE DEPARTMENT	
2.1	Facility Purchase	6,000,000
2.2	Move Out	250,000
2.3	Abatement	50,000
2.4	Tenant Improvements	2,000,000
2.5	Furniture	625,000
2.6	Telecommunications	600,000
2.7	Design Fee	125,000
2.8	Project Contingency	965,000
2.9	TOTAL ALTERNATIVE NO. 2 LINE 2, RELOCATE REVENUE DEPARTMENT	10,615,000

3 RENOVATE ANNEX

3.1	Abatement		100,000
3.2	Renovation (four floors finished, balance to core & shell level)		6,699,000
	A. Demolition	257,000	
	B. Concrete	0	
	C. Stair Revisions	202,000	
	D. Masonry	60,000	
	E. Interior Glazing	13,000	
	F. Carpentry	269,000	
	G. Plaster, Drywall and Ceilings	471,000	
	H. Tile	268,000	
	I. Flooring	61,000	
	J. Painting	34,000	
	K. Specialties	101,000	
	L. Fire Protection	189,000	
	M. Mechanical	2,087,000	
	N. Electrical	783,000	
	O. Audiovisual	32,000	
	P. Food Service Equipment	0	
	Q. Elevators	269,000	
	R. Re-roof	49,000	
	S. Window Restoration/Replacement	243,000	
	T. Exterior Stone Cleaning & Restoration	114,000	
	U. Landscaping	200,000	
	V. General Conditions, Bonds & Insurance	571,000	
	W. Construction Reserve	163,000	
	X. Contractor Fee	263,000	
3.3	Furniture (re-use existing)		0
3.4	Telecommunications		50,000
3.5	Design Fee		685,000
3.6	Project Contingency		685,000
3.7	TOTAL ALTERNATIVE NO.2 LINE 3, RENOVATE ANNEX		8,219,000

CLARIFICATIONS:

1.) All costs are in 1995 dollars
2.) Costs are based on the scope of life safety improvements defined in the 1990 Life Safety Plan and refined by the 1993/1994 Life Safety Project initial design
3.) The Capitol renovation is in three phases
4.) General conditions, bonds, and insurance include items such as the General Contractor's project manager, superintendent and project engineer; construction cleaning, power and temporary office, temporary barricades; premiums for systems connections between phases and similar items
5.) The construction reserve covers items not yet shown by the design documents and any potential variations between current estimates and bid amounts for each direct cost line item
6.) The project contingency covers potential additional scope items that the Owner may need or desire
7.) The Revenue Department relocation assumes:
   - Purchase of an existing 100,000 r.s.f. Class B office building with minor tenant finish layout revisions and minimal system modifications
8.) Refer to the recommended alternatives section for additional information on Annex Renovation scope

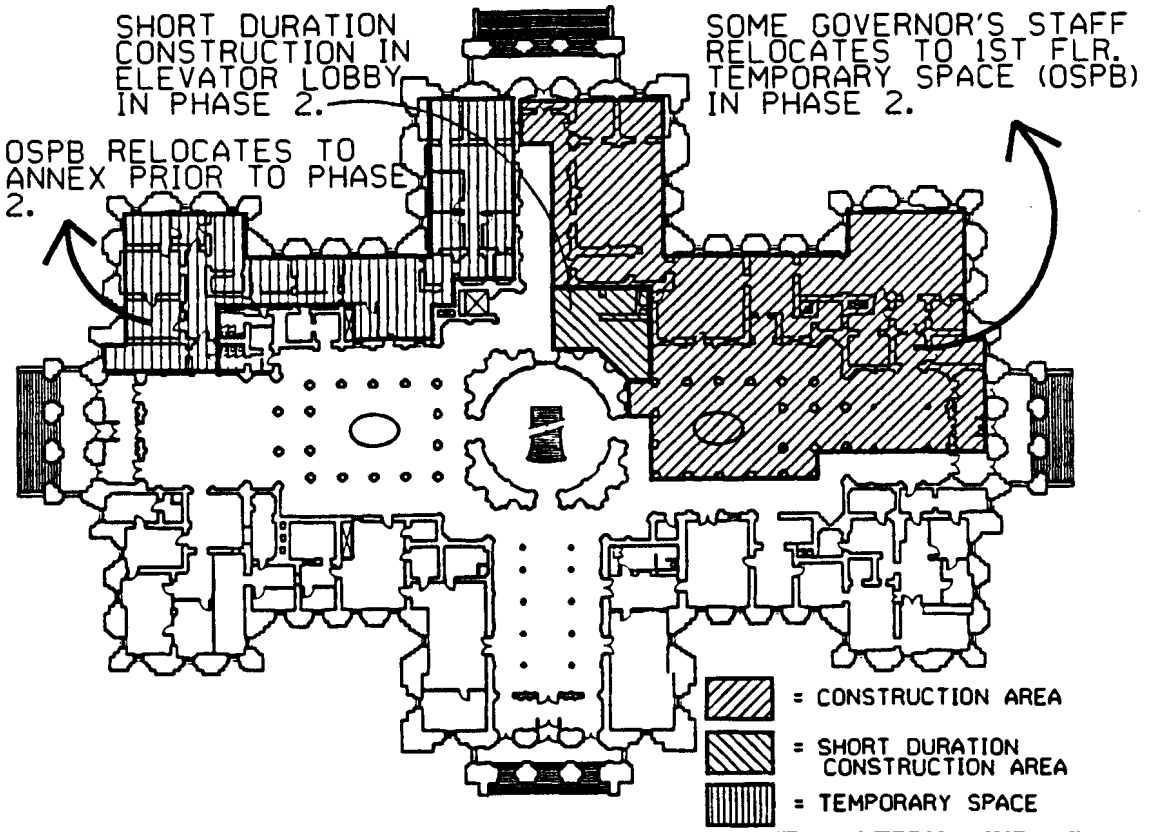


COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT

Capitol Complex Site Plan

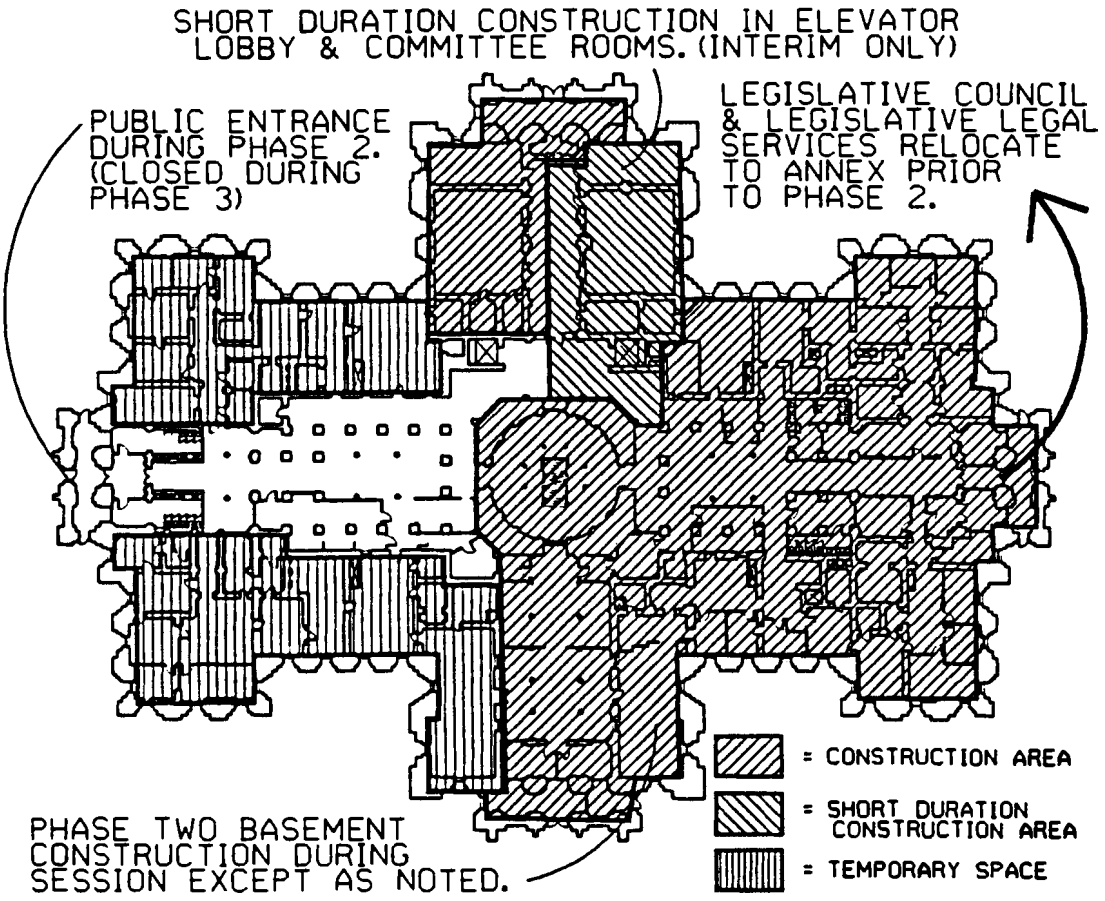
Alternative Two

C.W. Fentress J.H. Bradburn and Associates, P.C.



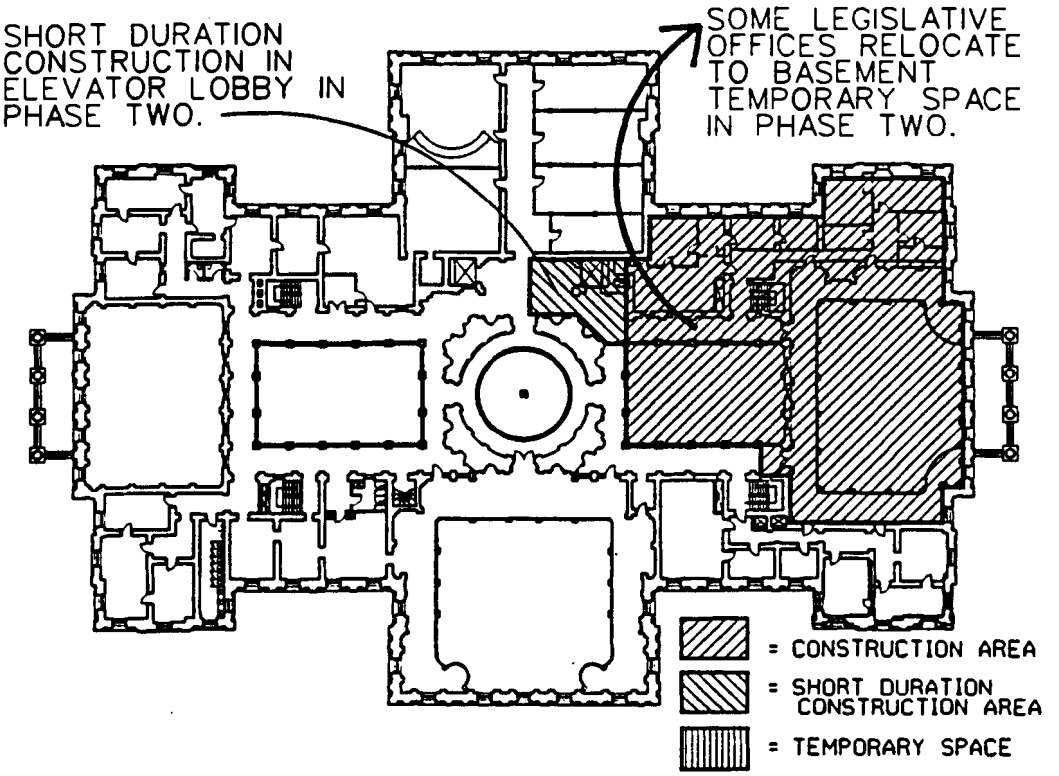
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO

PHASE 2 - 1ST FLOOR

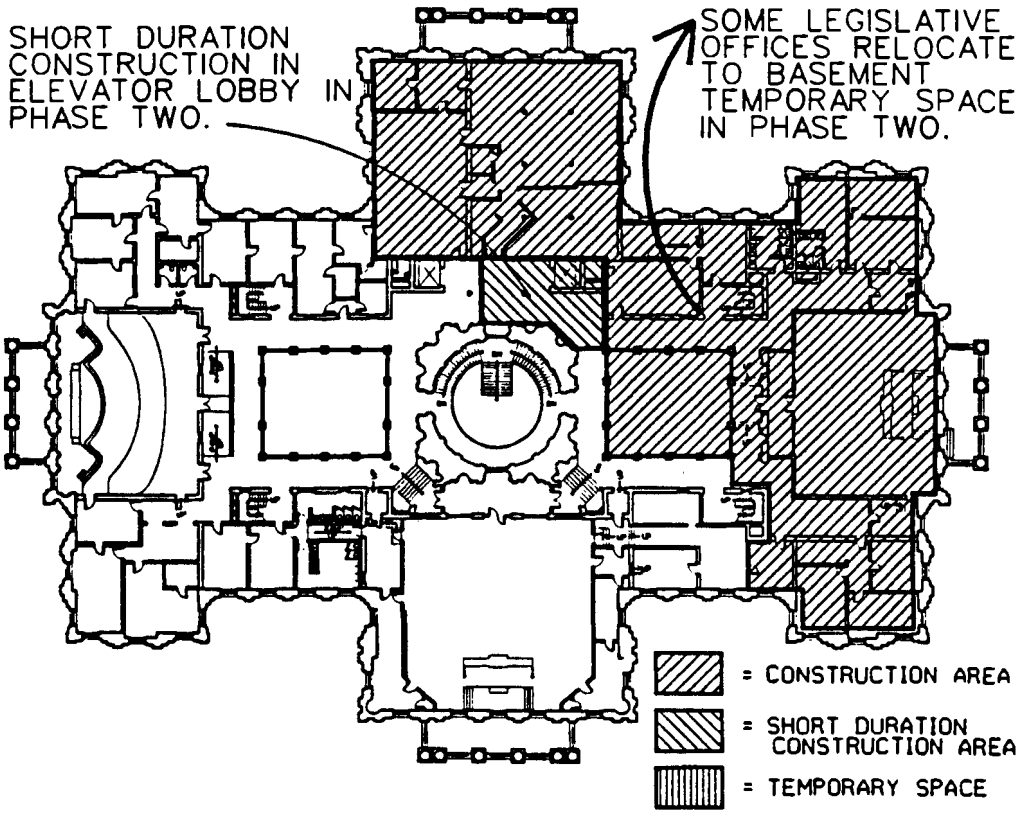


COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO

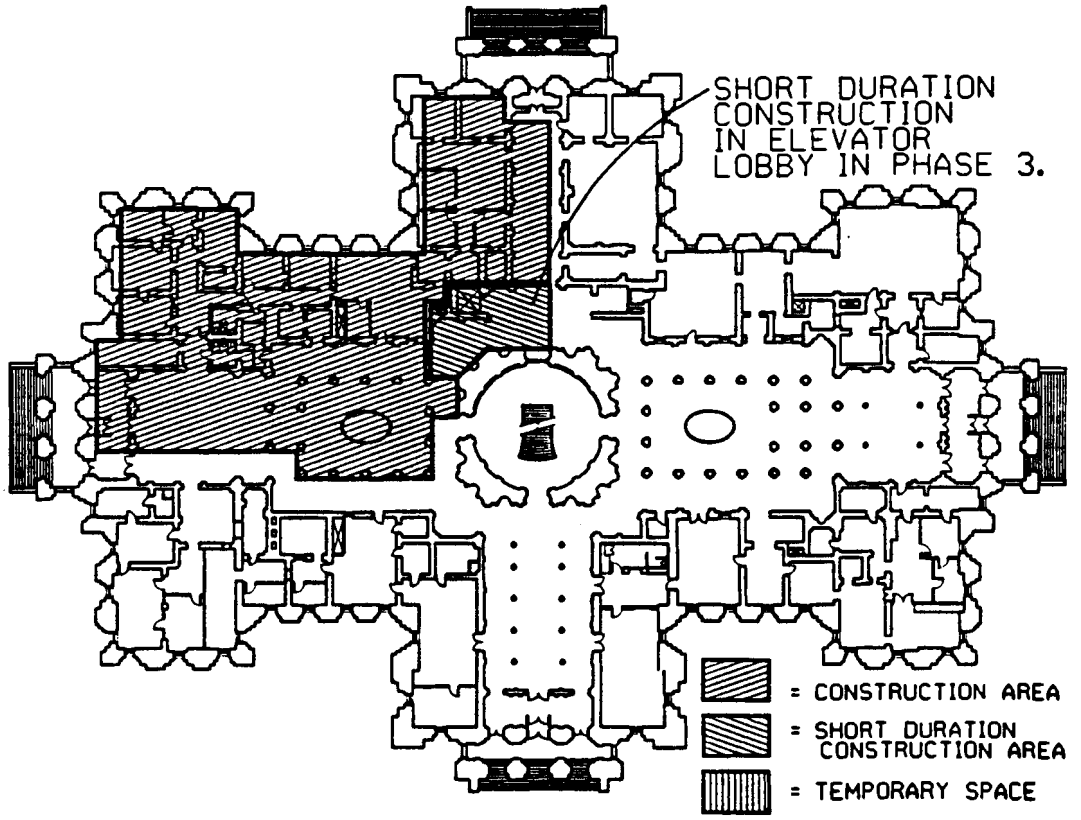
PHASE 2 - BASEMENT



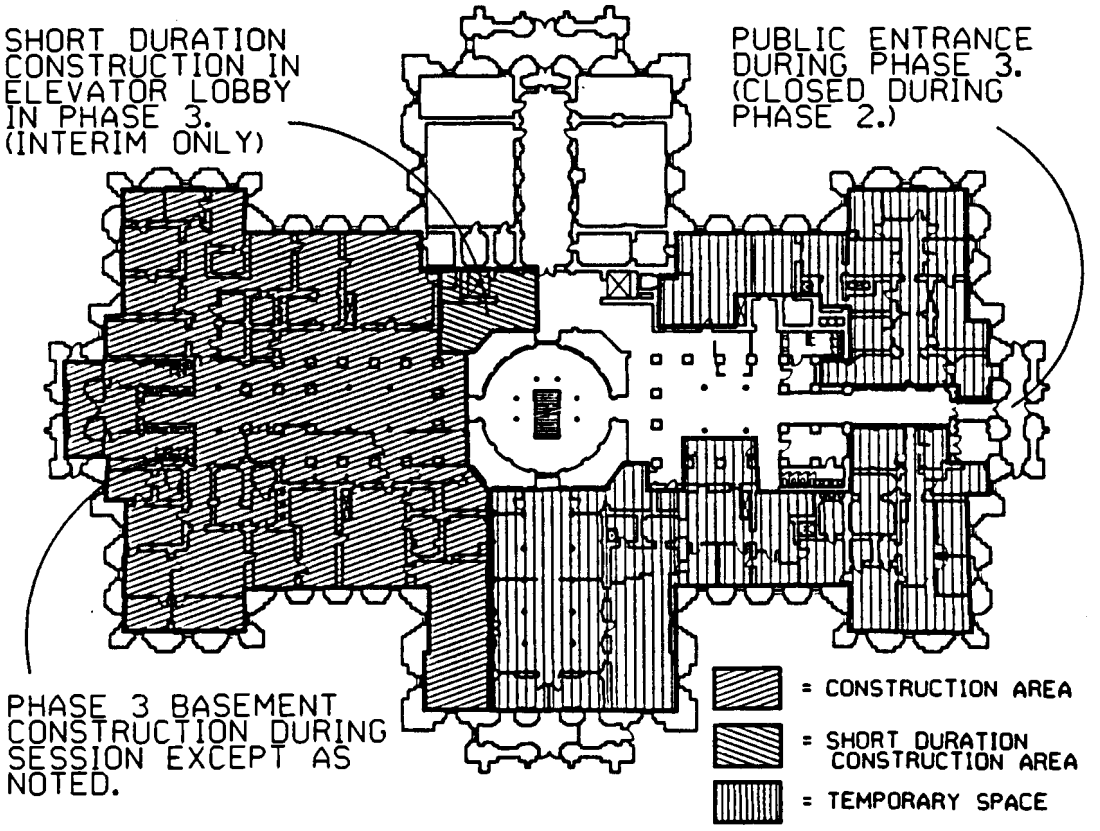
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 2 - 3RD FLOOR



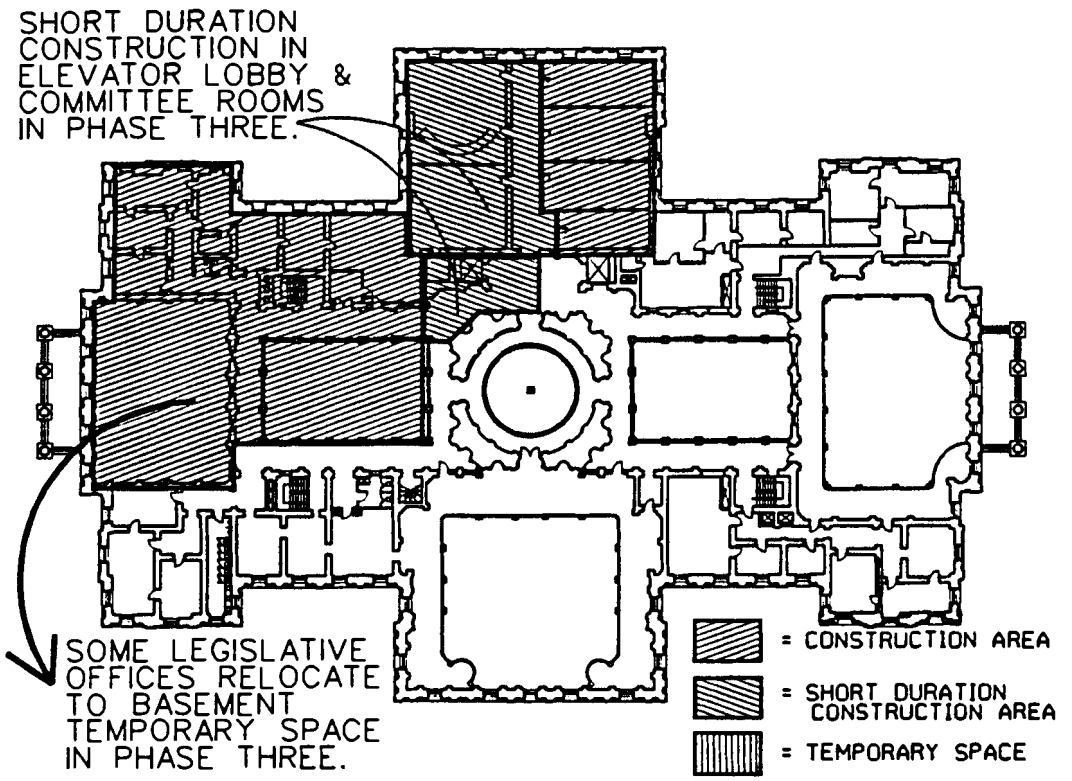
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 2 - 2ND FLOOR



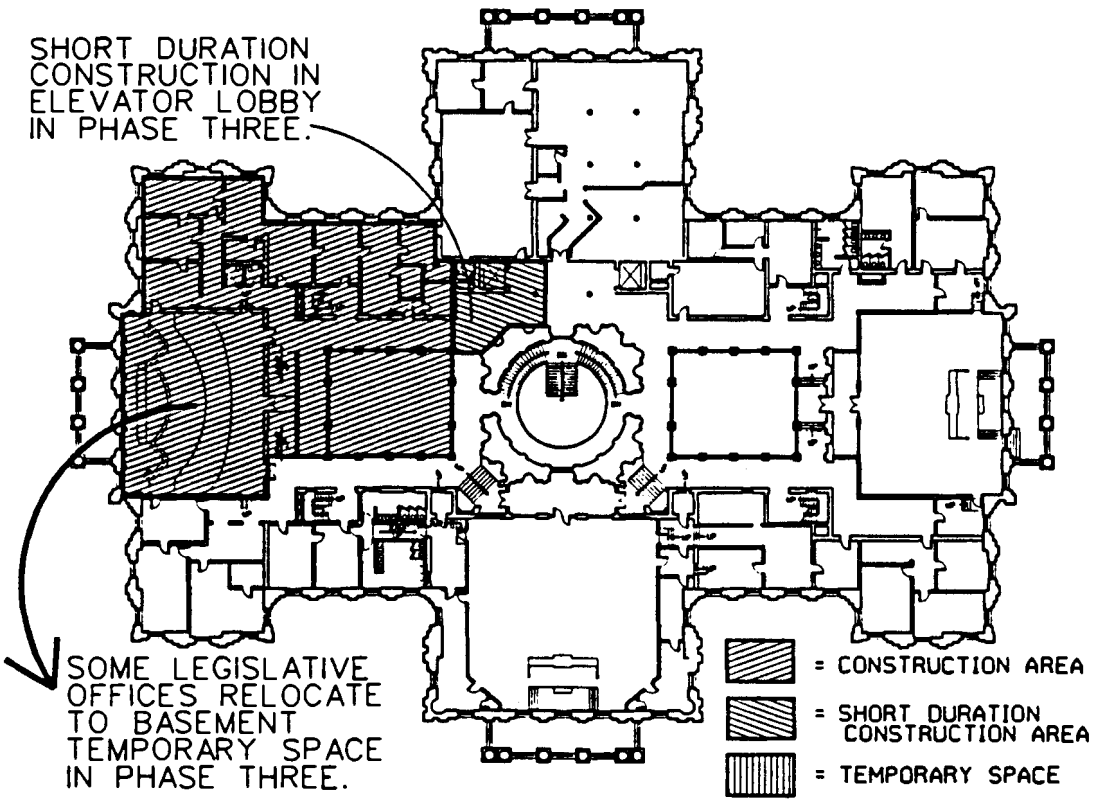
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 3 - 1ST FLOOR



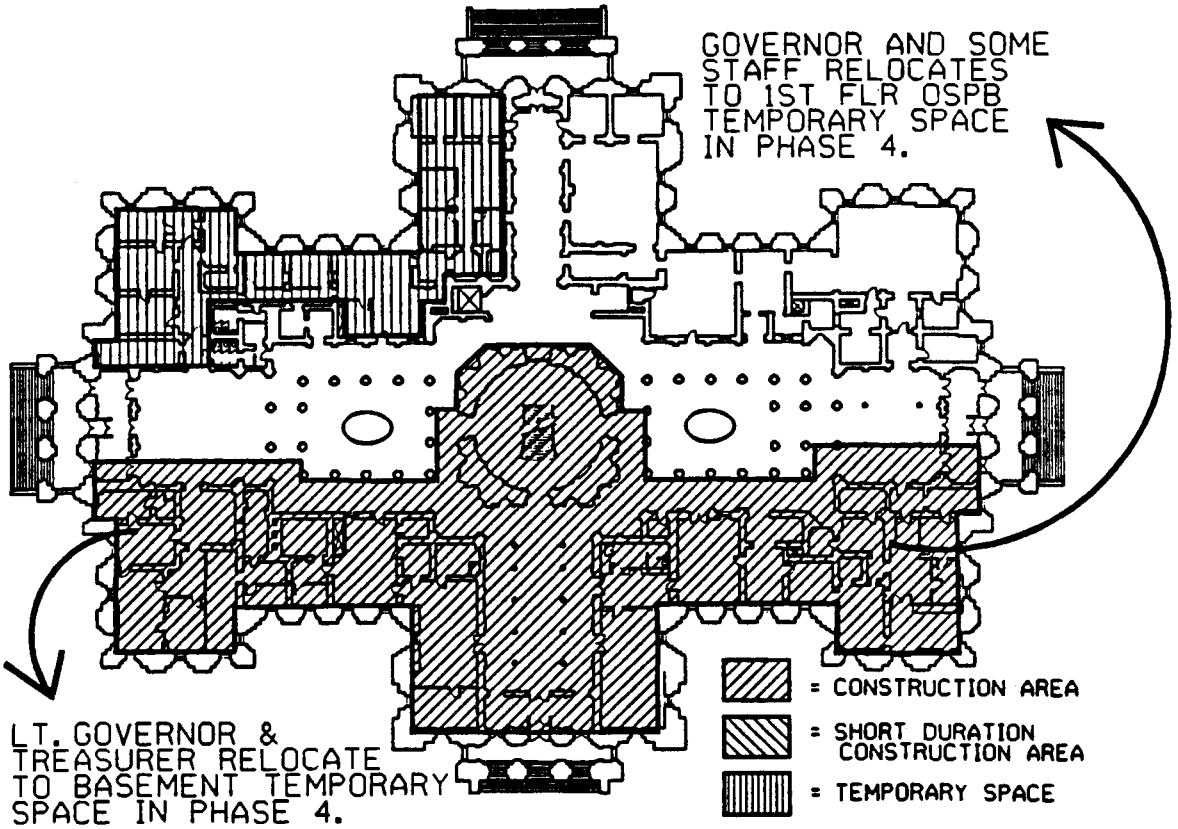
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 3 - BASEMENT



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 3 - 3RD FLOOR

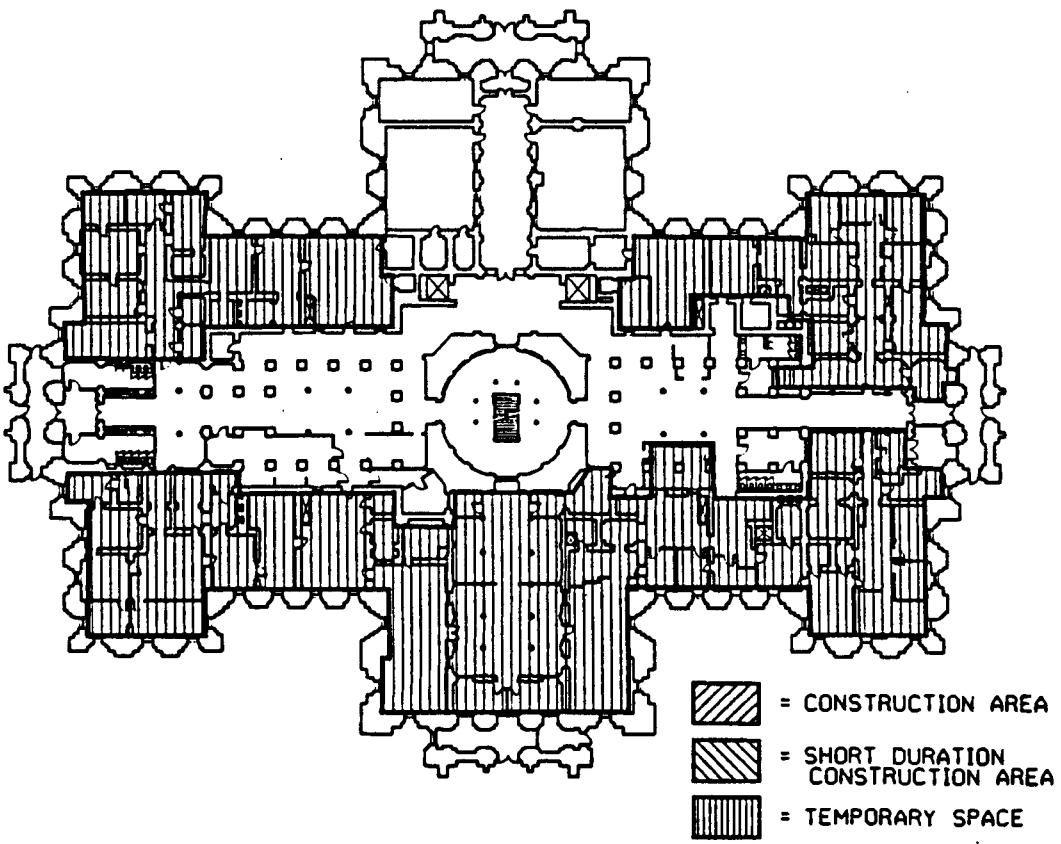


COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 3 - 2ND FLOOR



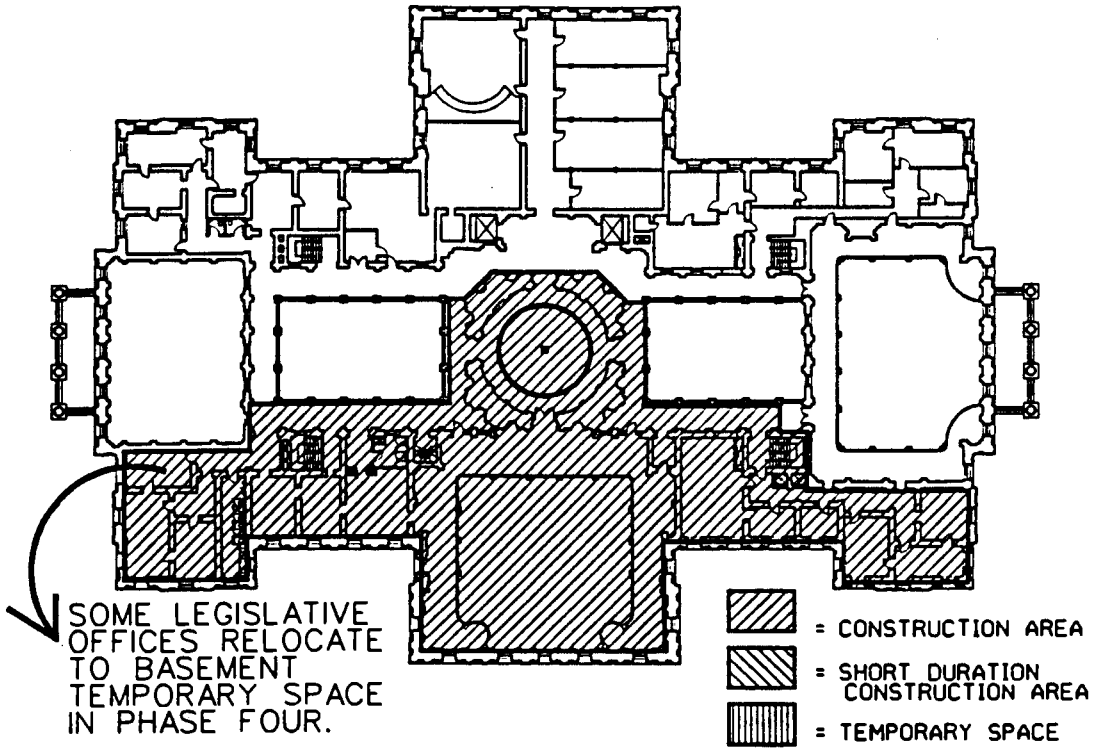
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO

PHASE 4 - 1ST FLOOR

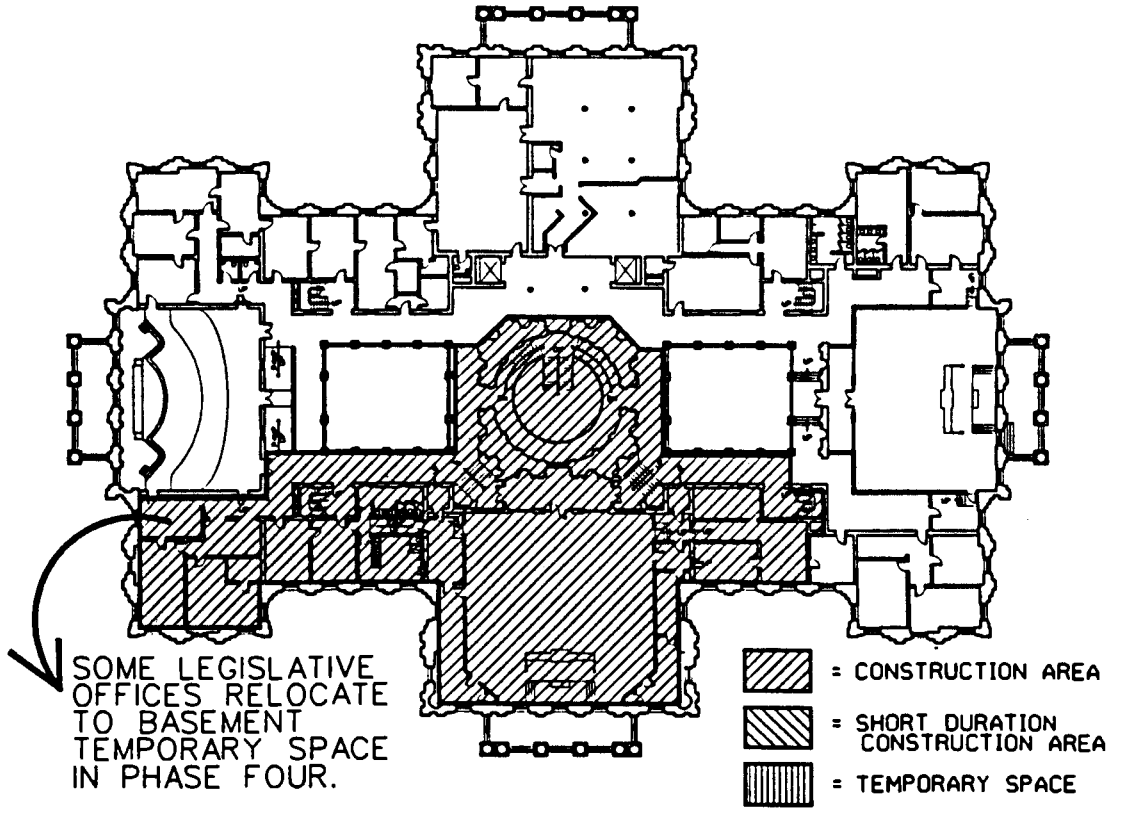


COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO

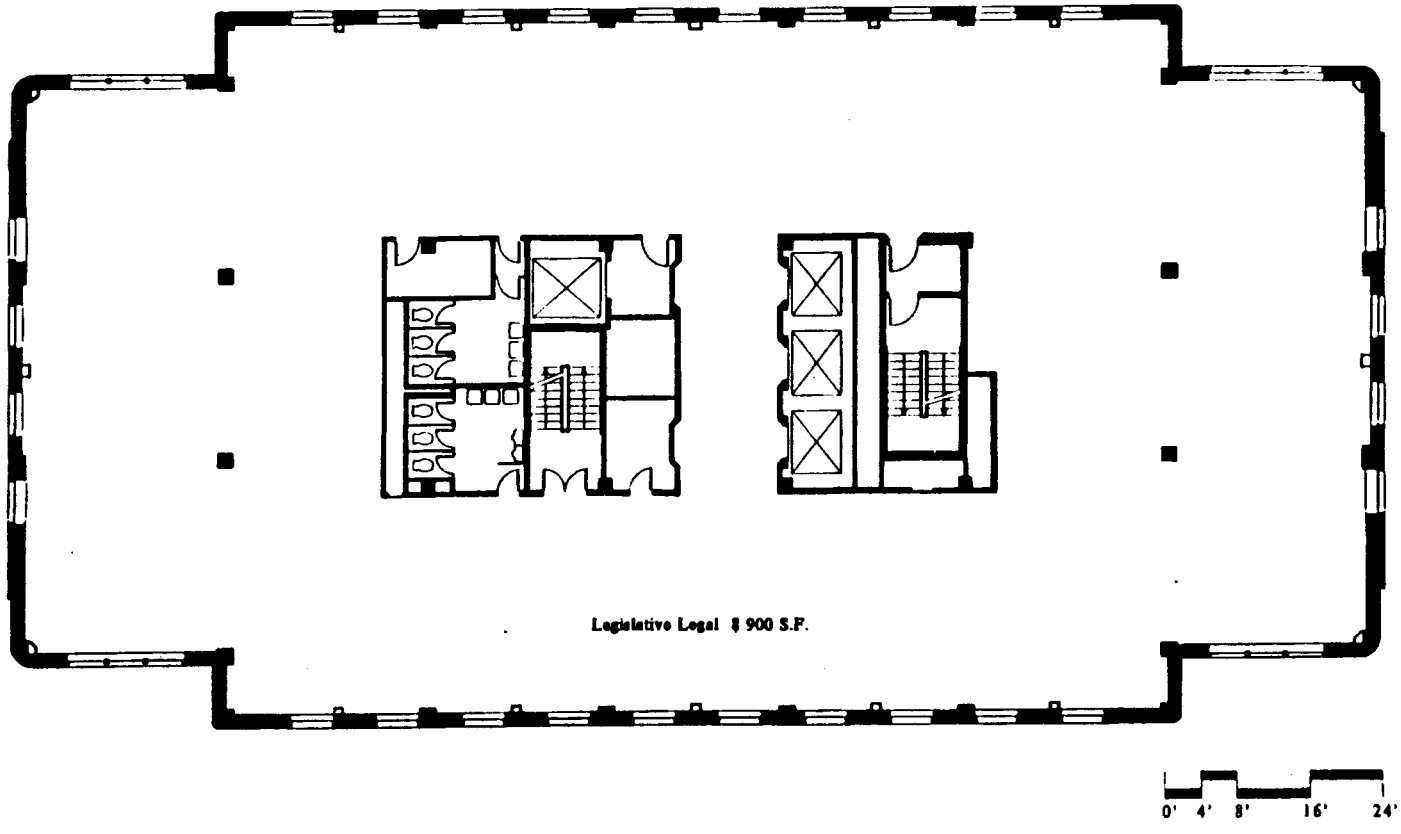
PHASE 4 - BASEMENT



COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 4 - 3RD FLOOR



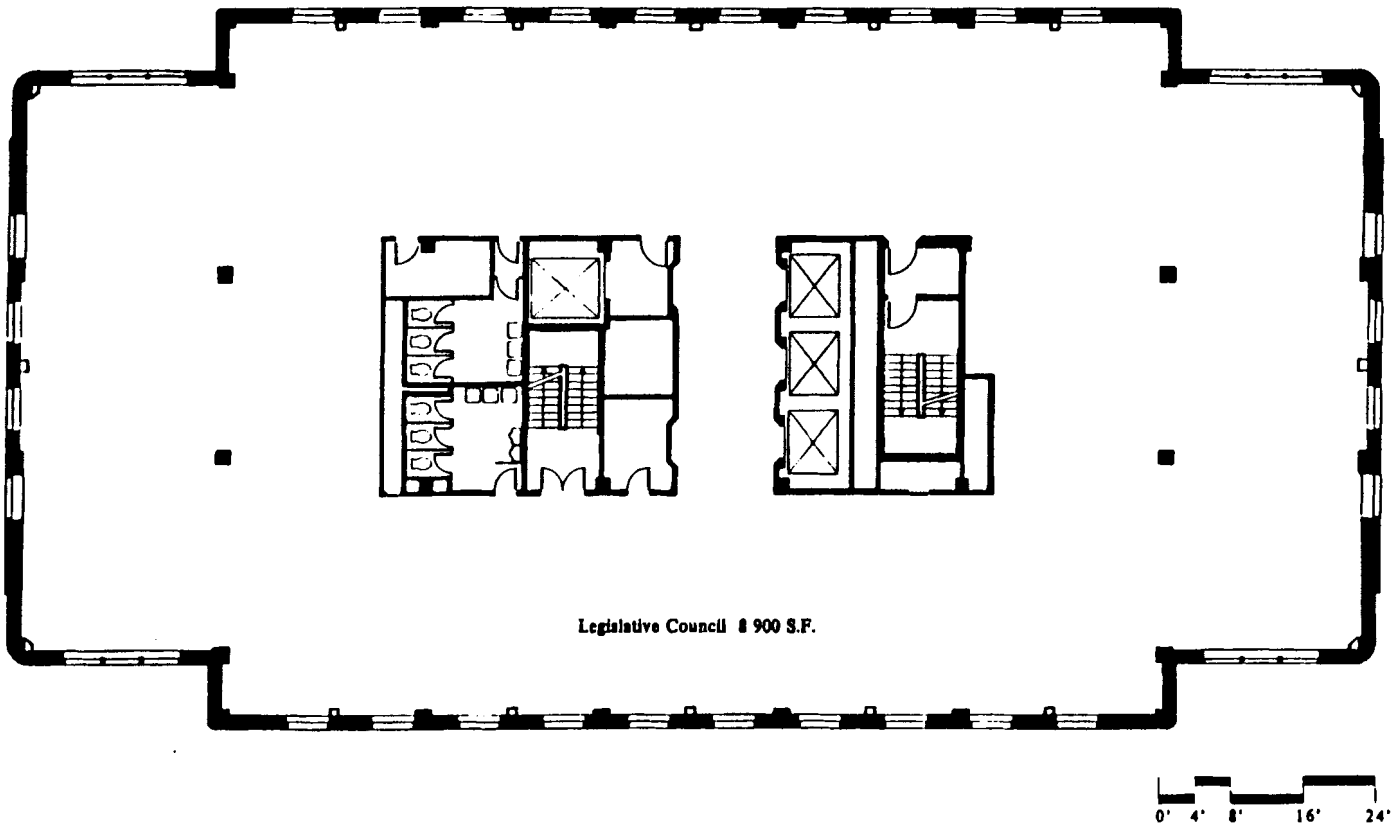
COLORADO STATE CAPITOL - LIFE SAFETY PROJECT - ALTERNATIVE TWO
PHASE 4 - 2ND FLOOR



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #2
Second Floor Plan

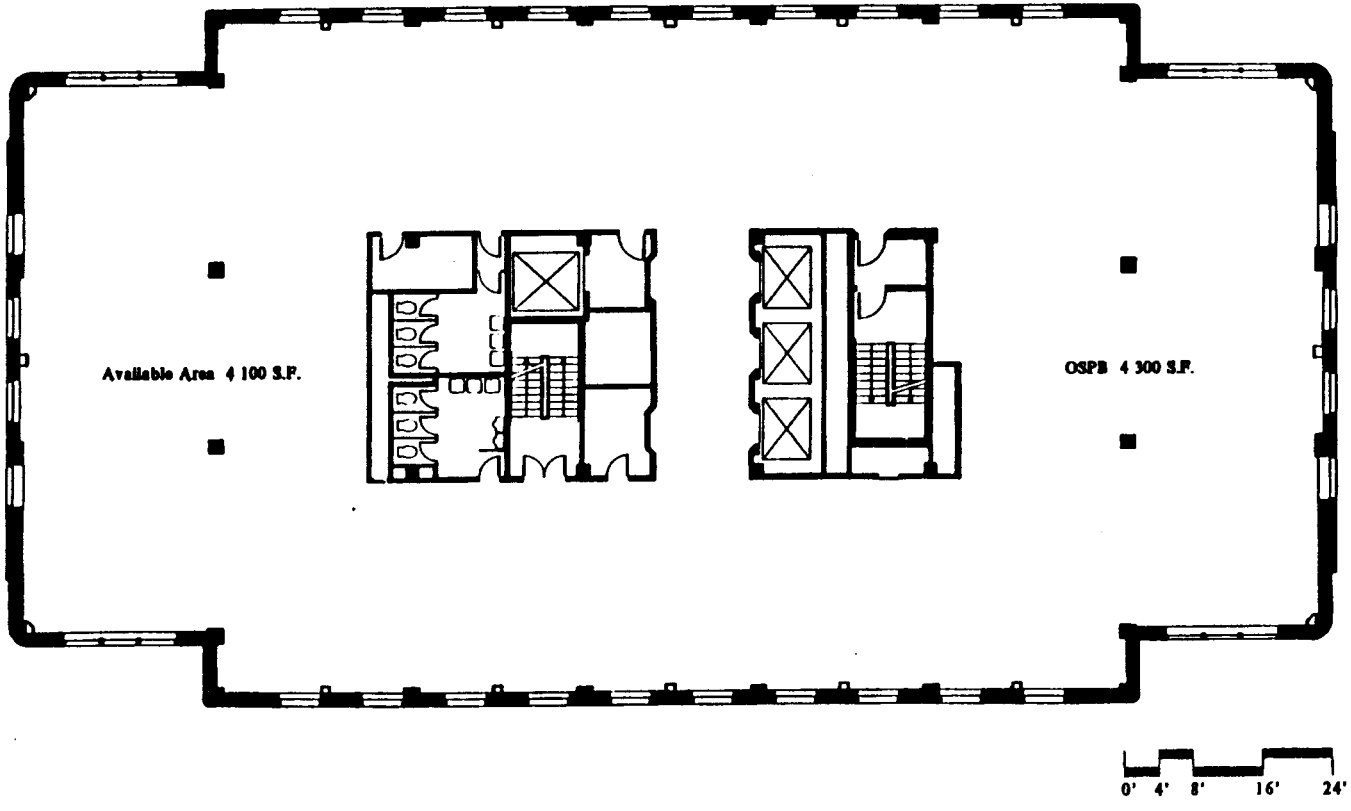
C.W. Pentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #2
Third Floor Plan

C.W. Fentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #2
Fourth Floor Plan

C.W. Pentress J.H. Bradburn and Associates, P.C.

Alternative Three Phases

Phase One

Install fire sprinklers in the sub-basement and dome. Complete.

Preparation for Phase Two

Relocate Revenue Department to another facility.

Renovate the Capitol Annex Building.

Renovate some areas of the Legislative Services Building (LSB).

Relocate the LSB Print Shop and Bill Room to the Annex for 2½ years.

Relocate all Capitol occupants to the Annex and LSB for 2½ years.

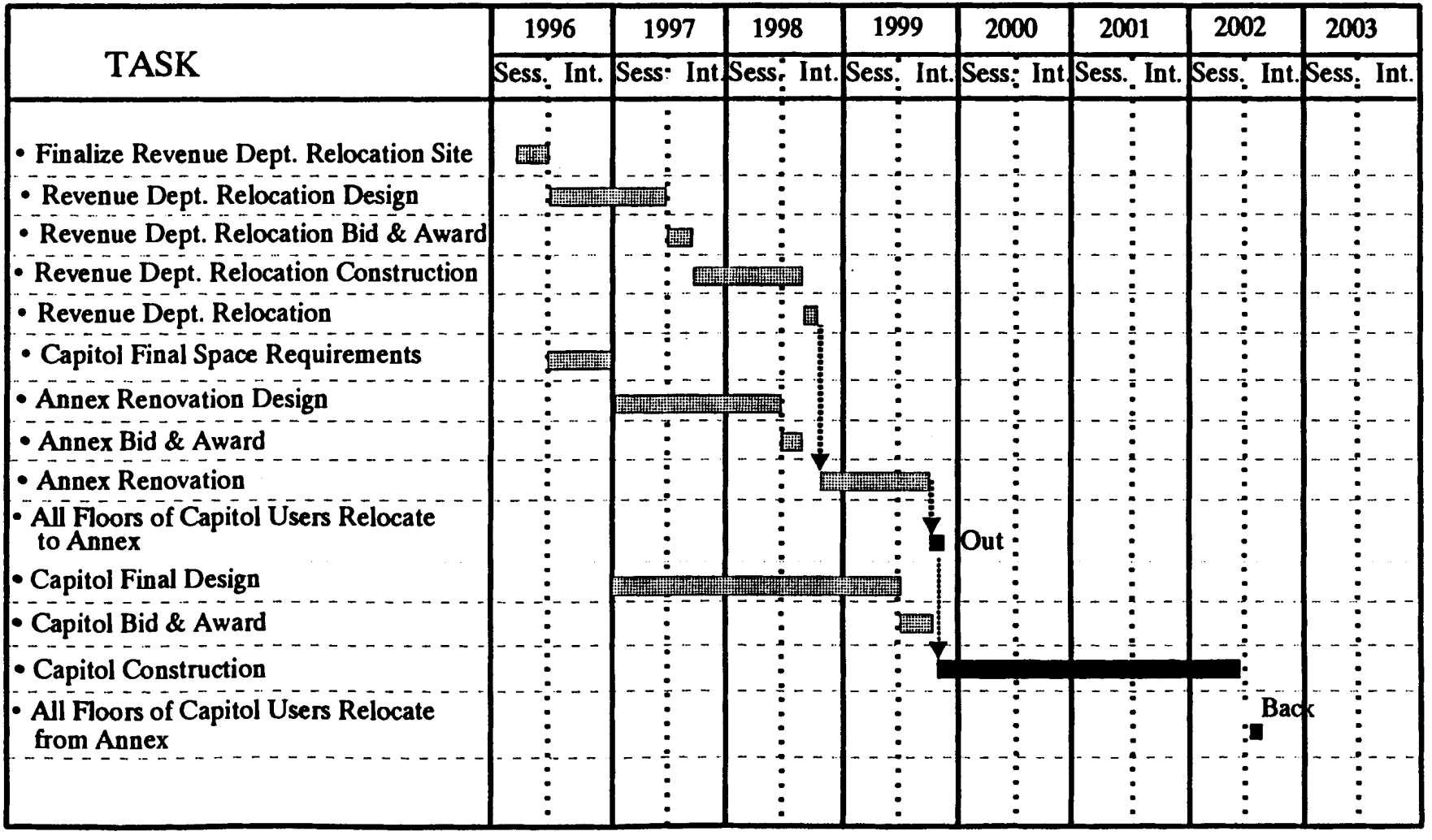
Phase Two

Install all life safety and additional systems improvements in the Capitol.

COLORADO STATE CAPITOL - LIFE SAFETY PROJECT

ALTERNATIVE NO. 3 SCHEDULE

October 2, 1995



= Miscellaneous Activities

= Capitol Construction

= Capitol Occupant Relocation

State Capitol Building Health and Life Safety Project
Alternative #3 Cost Estimate Matrix
(1995 Dollars)
Revised November 29, 1995

Item	FY 1996-97	FY 1997-98	FY 1998-99	FY 1999-00	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	Total
Sub-basement Space									0
Revenue Relocate/Facility	6,200,000	4,415,000							10,615,000
Renovate Annex	750,000	11,191,000							11,941,000
LSB Retrofit	35,000	180,000							215,000
New Capitol Complex Facility									0
Lead/Asbestos Abatement	17,000		150,000						167,000
Occupant Relocation			333,000						333,000
Capitol Life Safety *		1,239,000	11,586,000						12,825,000
Sub-total to Complete Life Safety	7,002,000	17,025,000	12,069,000	0	0	0	0	0	36,096,000
Telecommunications	100,000		719,000						819,000
Electrical	500,000		3,567,000						4,067,000
Mechanical	1,500,000		8,671,000						10,171,000
Restoration									0
Exterior Wall, Roof, and Site									0
Furniture									0
Sub-total to Complete Capitol Upgrades	2,100,000	0	12,957,000	0	0	0	0	0	15,057,000
TOTAL Capital Requirement	9,102,000	17,025,000	25,026,000	0	0	0	0	0	51,153,000
Appropriation Requirement	5,771,000	17,025,000	25,026,000	0	0	0	0	0	47,822,000

* Refer to the following pages for an itemization of Capitol Life Safety cost estimates.

COLORADO STATE CAPITOL – HEALTH AND LIFE SAFETY PROJECT
ALTERNATIVE NO. 3 COST BREAKDOWN
NOVEMBER 10, 1995

1	**CAPITOL LIFE SAFETY**	
1.1	Demolition	554,000
1.2	Concrete	5,000
1.3	Masonry	14,000
1.4	Steel and Stairs	2,132,000
1.5	Carpentry, Doors and Hardware	467,000
1.6	Plaster, Drywill & Ceilings	385,000
1.7	Flooring and Stone	610,000
1.8	Painting	217,000
1.9	Fire Protection	1,124,000
1.10	Mechanical	1,999,000
1.11	Fire Alarm	1,213,000
1.12	Electrical	880,000
1.13	Subtotal Direct Costs	9,600,000
1.14	General Conditions, Bonds & Insurance	985,000
1.15	Construction Reserve	544,000
1.16	Contractor Fee	457,000
1.17	Design Fee	0
1.18	Project Contingency	1,239,000
1.19	TOTAL ALTERNATE NO. 3 LINE 8, CAPITOL LIFE SAFETY	12,825,000
2	**RELOCATE REVENUE DEPARTMENT**	
2.1	Facility Purchase	6,000,000
2.2	Move Out	250,000
2.3	Abatement	50,000
2.4	Tenant Improvements	2,000,000
2.5	Furniture	625,000
2.6	Telecommunications	600,000
2.7	Design Fee	125,000
2.8	Project Contingency	965,000
2.9	TOTAL ALTERNATIVE NO. 2 LINE 2, RELOCATE REVENUE DEPARTMENT	10,615,000

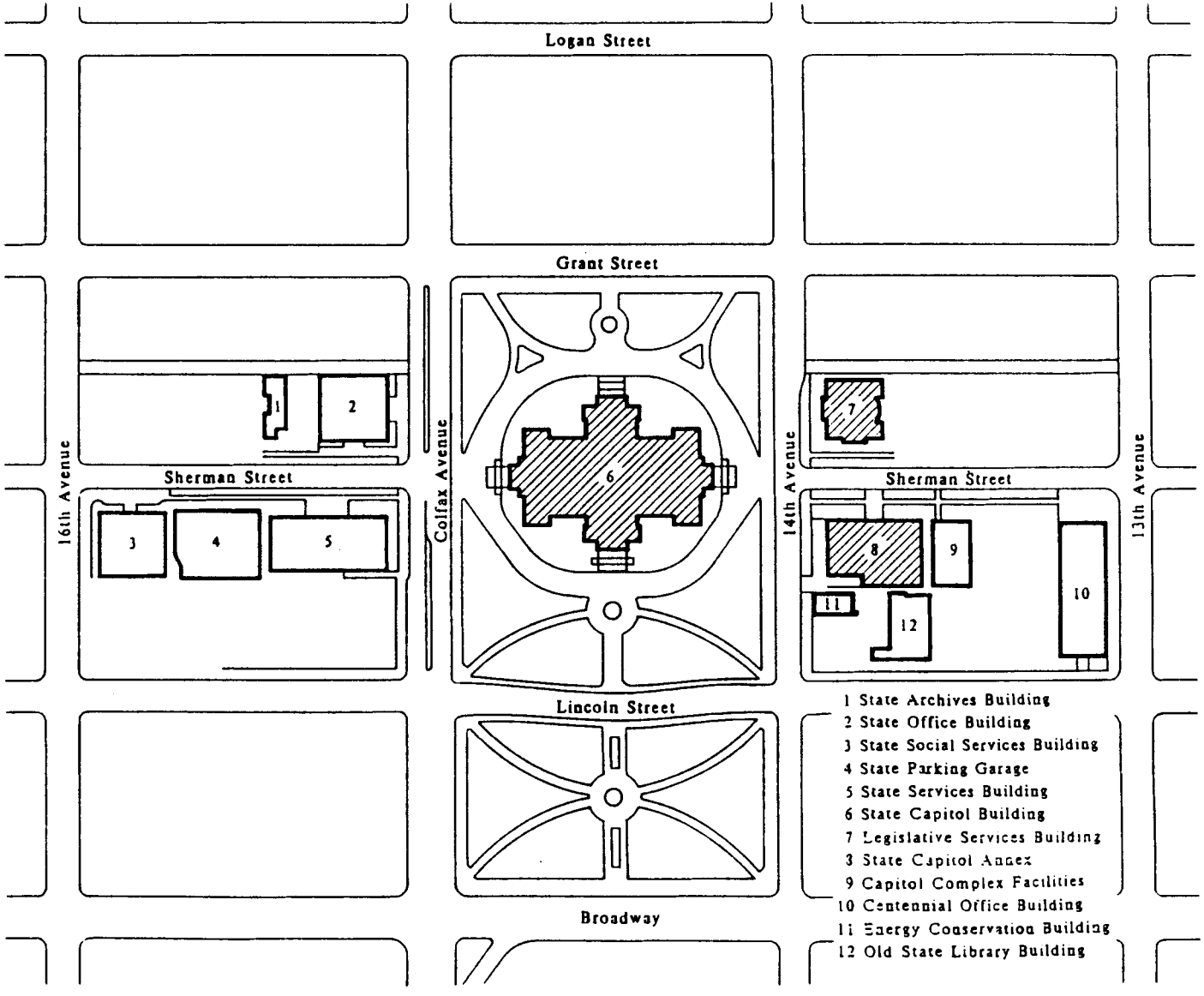
3 RENOVATE ANNEX

3.1	Abatement		100,000
3.2	Renovation (all floors finished)		9,525,000
	A. Demolition	257,000	
	B. Concrete	138,000	
	C. Stair Revisions	202,000	
	D. Masonry	60,000	
	E. Interior Glazing	28,000	
	F. Carpentry	852,000	
	G. Plaster, Drywall and Ceilings	921,000	
	H. Tile	320,000	
	I. Flooring	204,000	
	J. Painting	65,000	
	K. Specialties	200,000	
	L. Fire Protection	198,000	
	M. Mechanical	2,515,000	
	N. Electrical	818,000	
	O. Audiovisual	420,000	
	P. Food Service Equipment	107,000	
	Q. Elevators	269,000	
	R. Re–roof	49,000	
	S. Window Restoration/Replacement	243,000	
	T. Exterior Stone Cleaning & Restoration	114,000	
	U. Landscaping	200,000	
	V. General Conditions, Bonds & Insurance	818,000	
	W. Construction Reserve	151,000	
	X. Contractor Fee	376,000	
3.3	Furniture (re–use existing)		0
3.4	Telecommunications		350,000
3.5	Design Fee		983,000
3.6	Project Contingency		983,000
3.7	TOTAL ALTERNATIVE NO. 3 LINE 3, RENOVATE ANNEX		11,941,000

CLARIFICATIONS:

1.) All costs are in 1995 dollars
2.) Costs are based on the scope of life safety improvements defined in the 1990 Life Safety Plan and refined by the 1993/1994 Life Safety Project initial design
3.) The Capitol renovation is in one phase
4.) General conditions, bonds, and insurance include items such as the General Contractor's project manager, superintendent and project engineer; construction cleaning, power and temporary office, temporary barricades; premiums for systems connections between phases and similar items
5.) The construction reserve covers items not yet shown by the design documents and any potential variations between current estimates and bid amounts for each direct cost line item
6.) The project contingency covers potential additional scope items that the Owner may need or desire
7.) The Revenue Department relocation assumes:
   - Purchase of an existing 100,000 r.s.f. Class B office building with minor tenant finish layout revisions and minimal system modifications
8.) Refer to the recommended alternatives section for additional information on Annex Renovation scope

9.) The $300,000 reduction in Capitol mechanical line 1.10 results from a more overall building mechanical design that incorporates life safety smoke control and normal ventilation requirements. Refer to the existing systems and life cycle cost sections for additional information

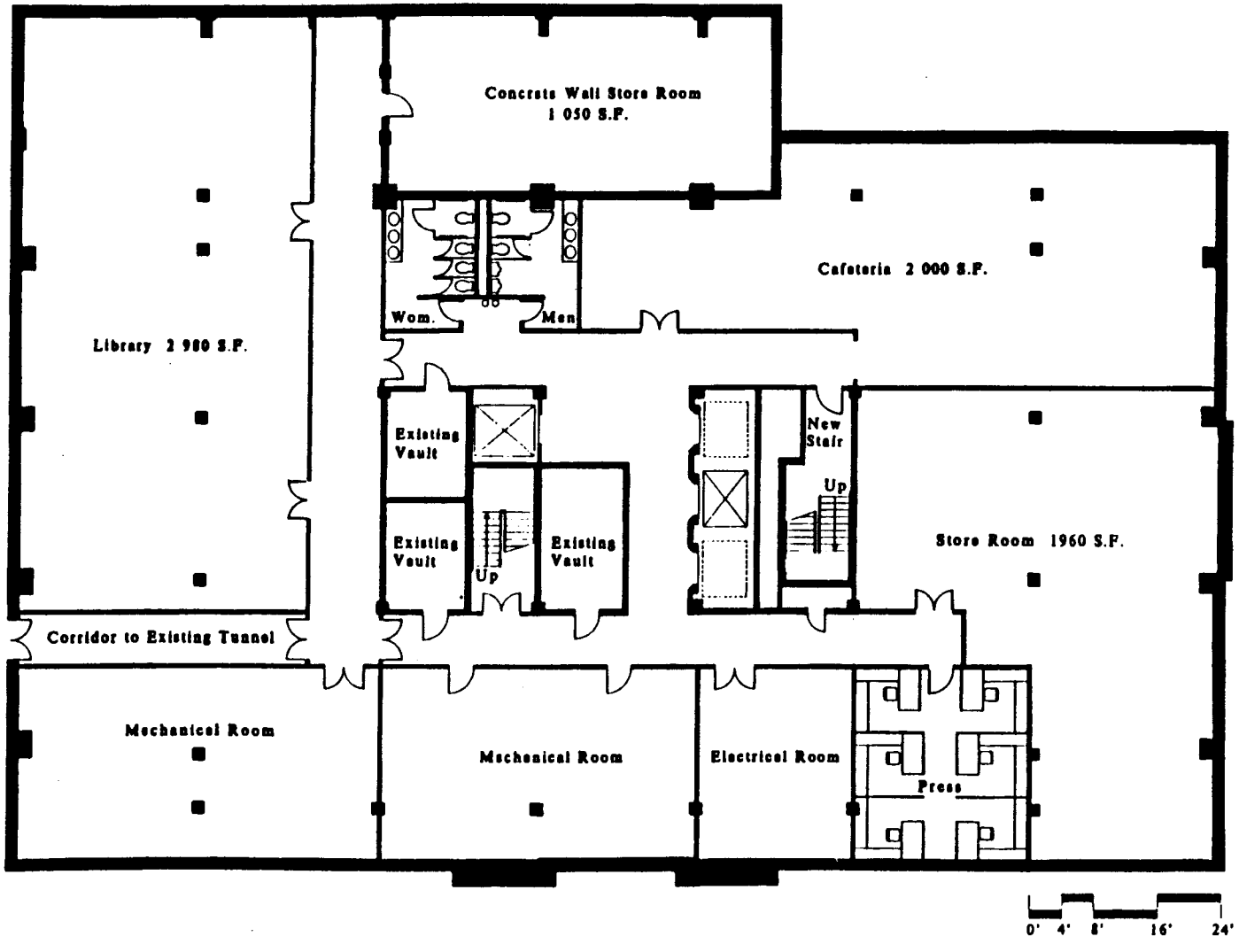


COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT

Capitol Complex Site Plan

Alternative Three

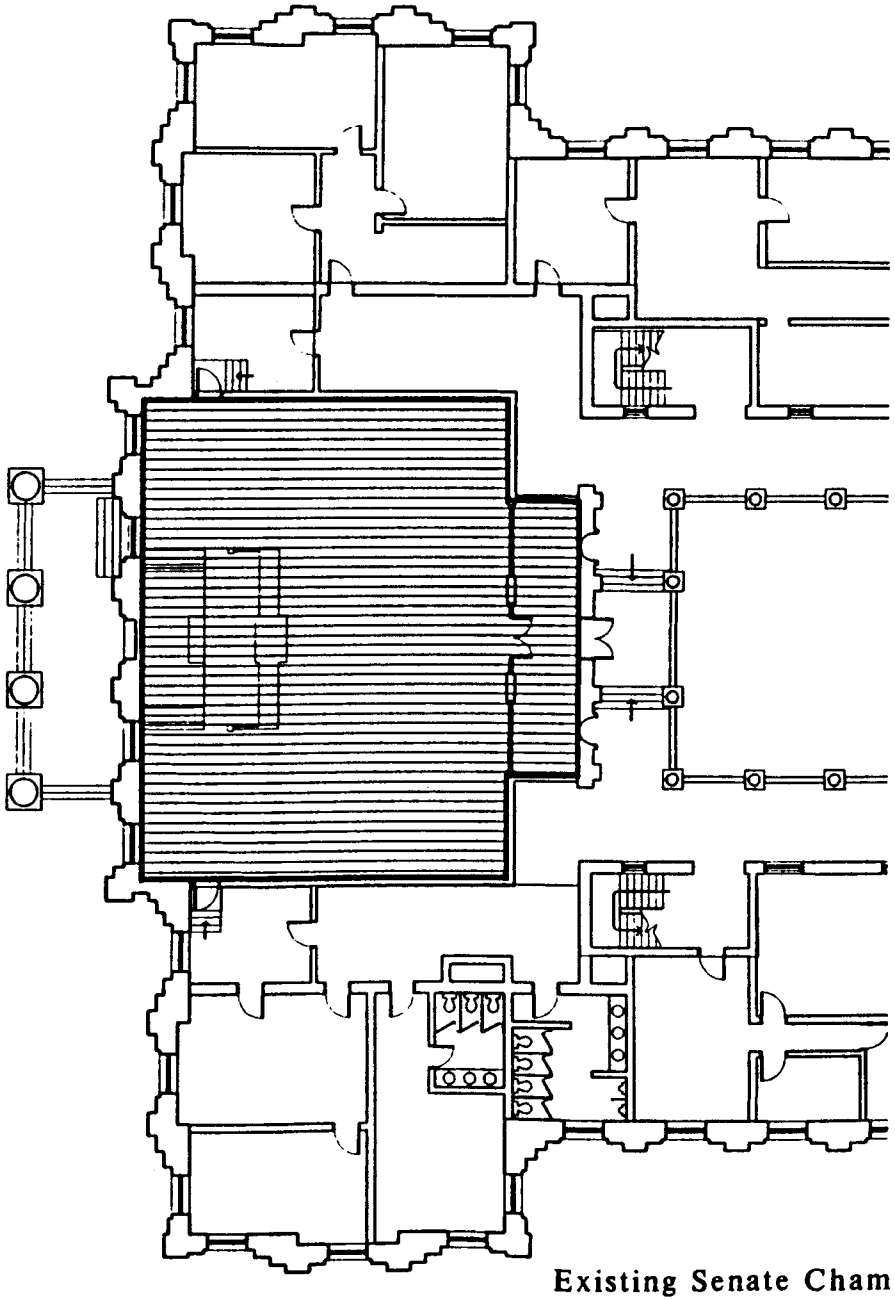
C.W. Fentress J.H. Bradburn and Associates, P.C.



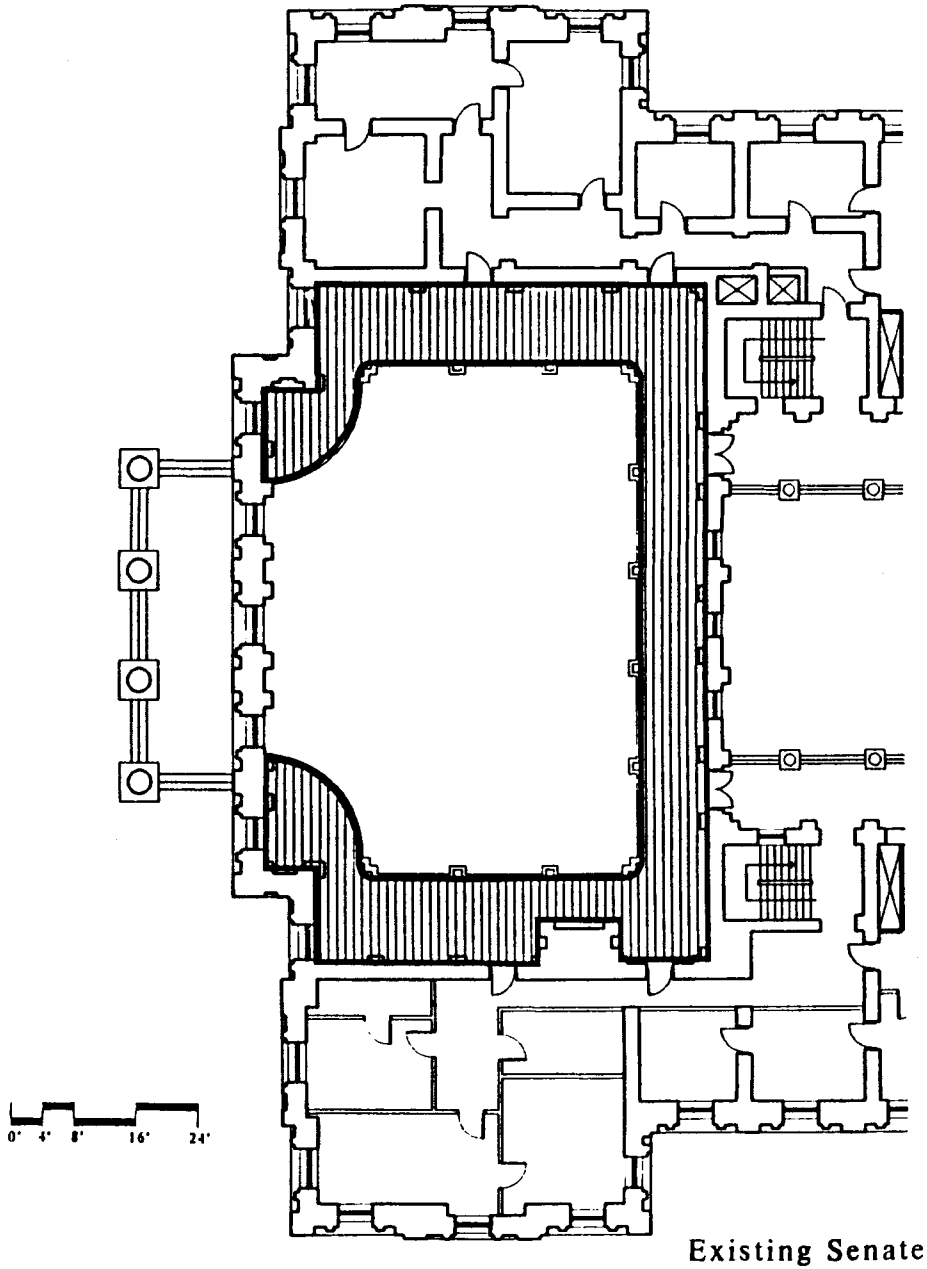
COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Sub-basement

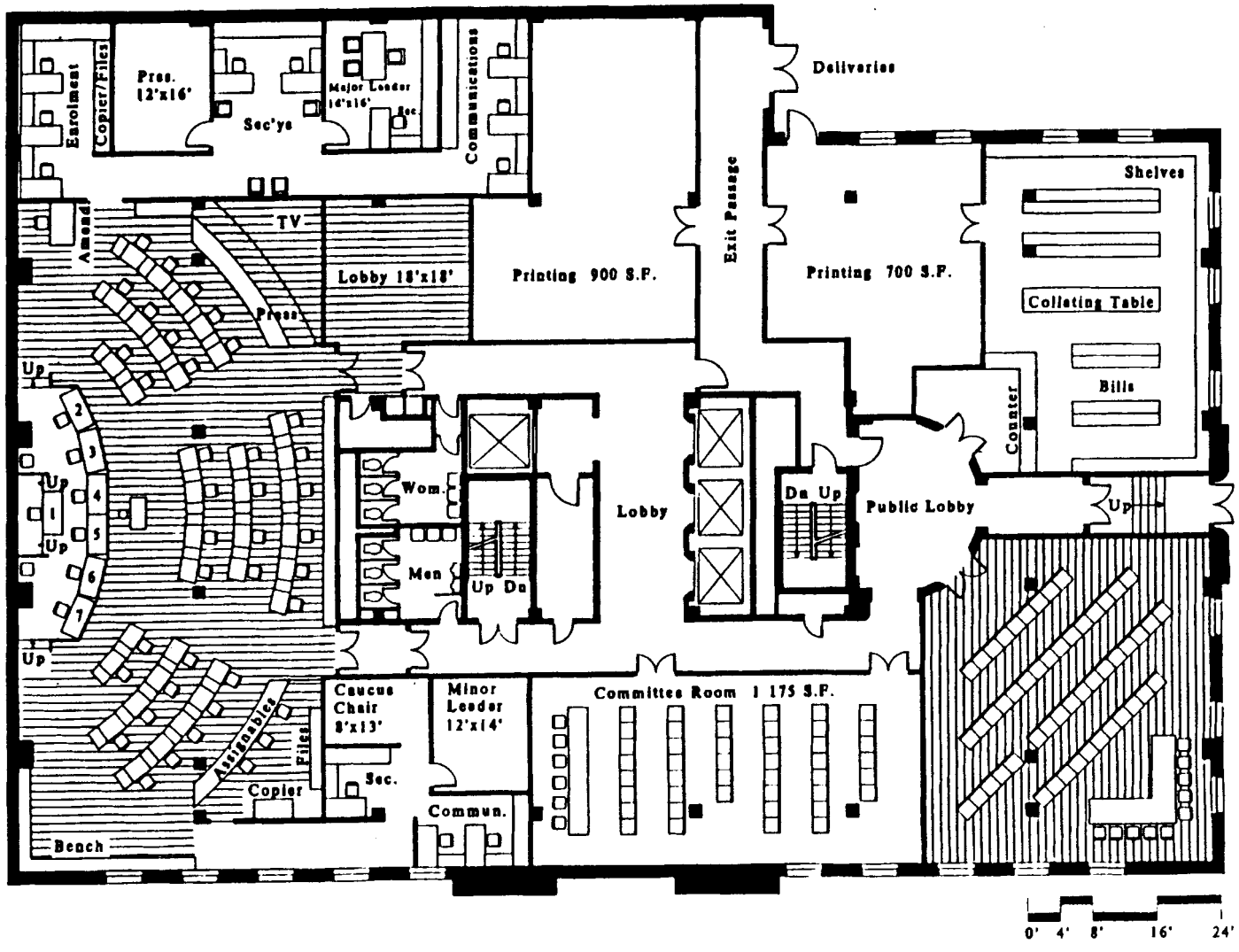
C.W. Pentress J.H. Bradburn and Associates, P.C.



Existing Senate Chamber



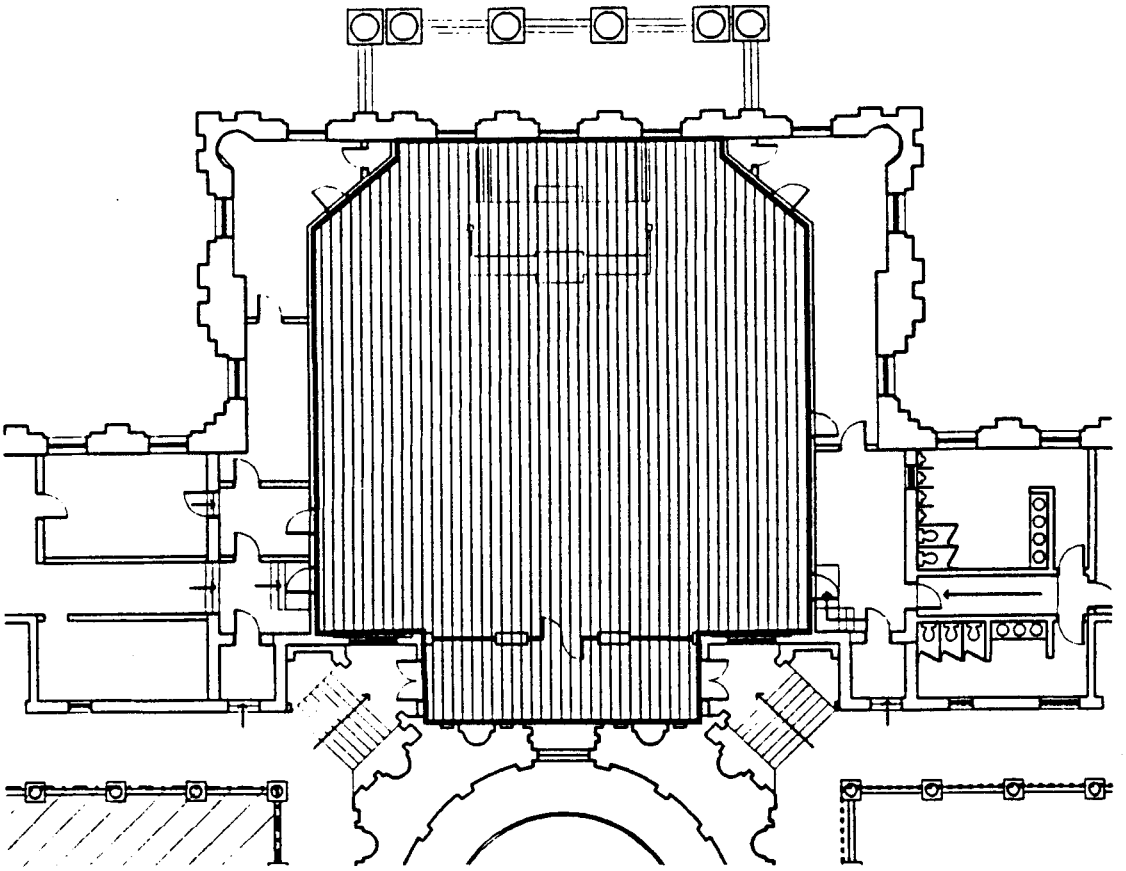
Existing Senate Galler



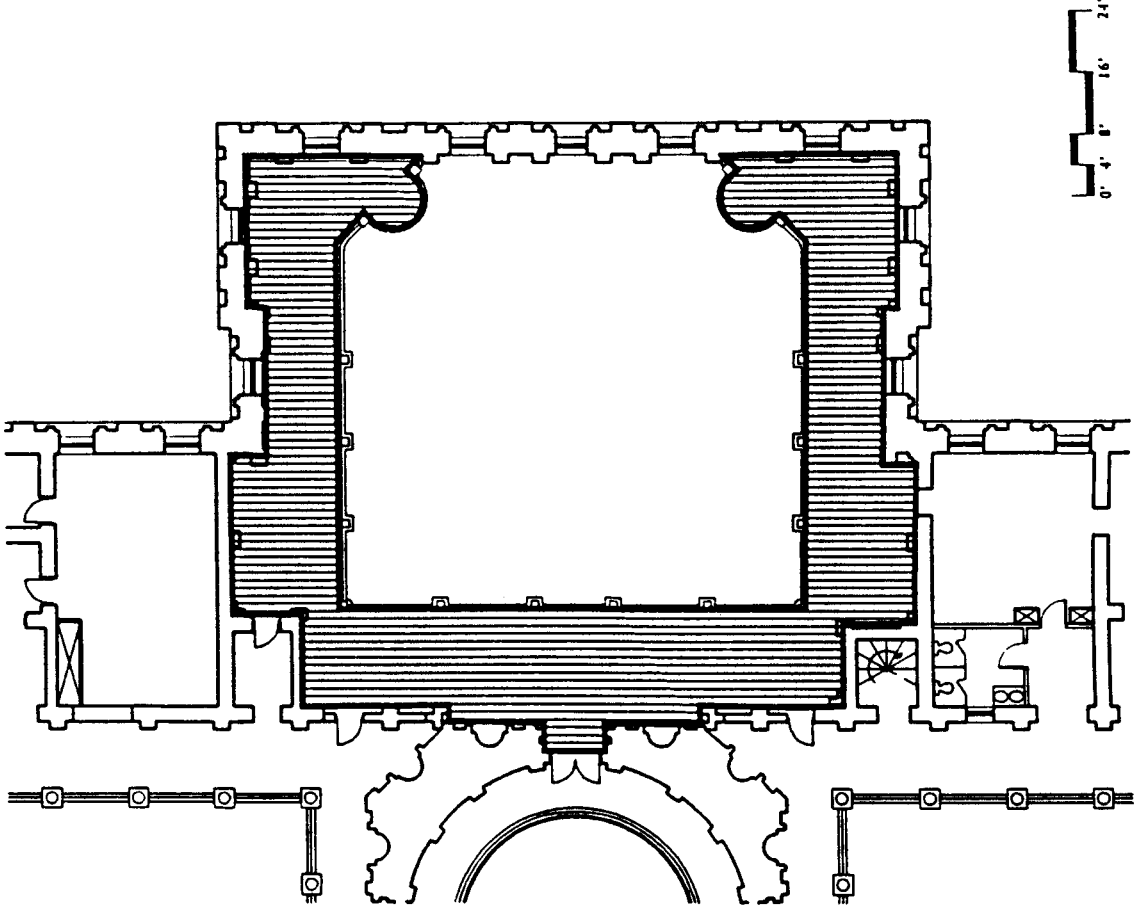
COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Basement Floor Plan

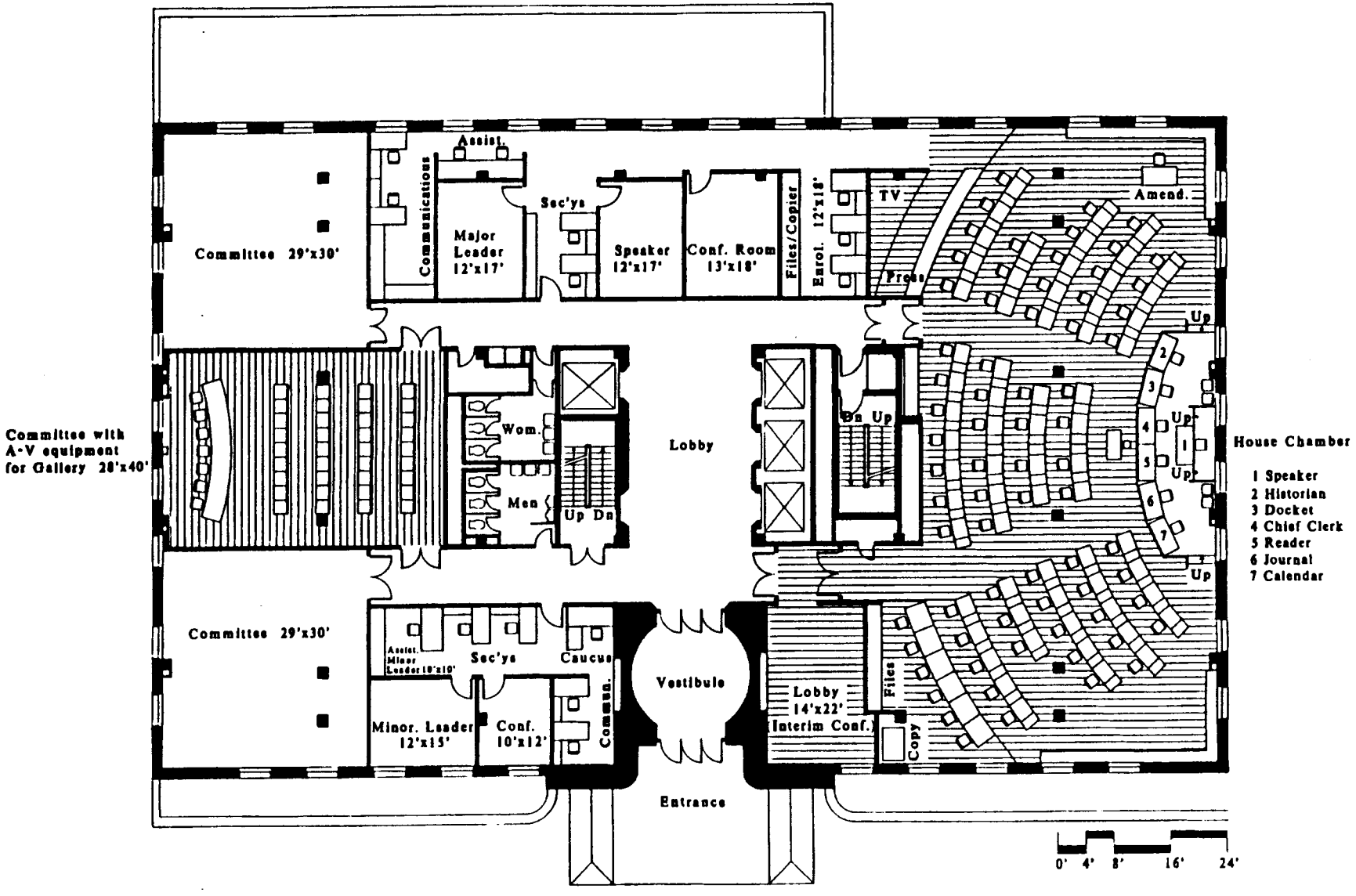
C.W. Fentress J.H. Bradburn and Associates, P.C.



Existing House Chamber



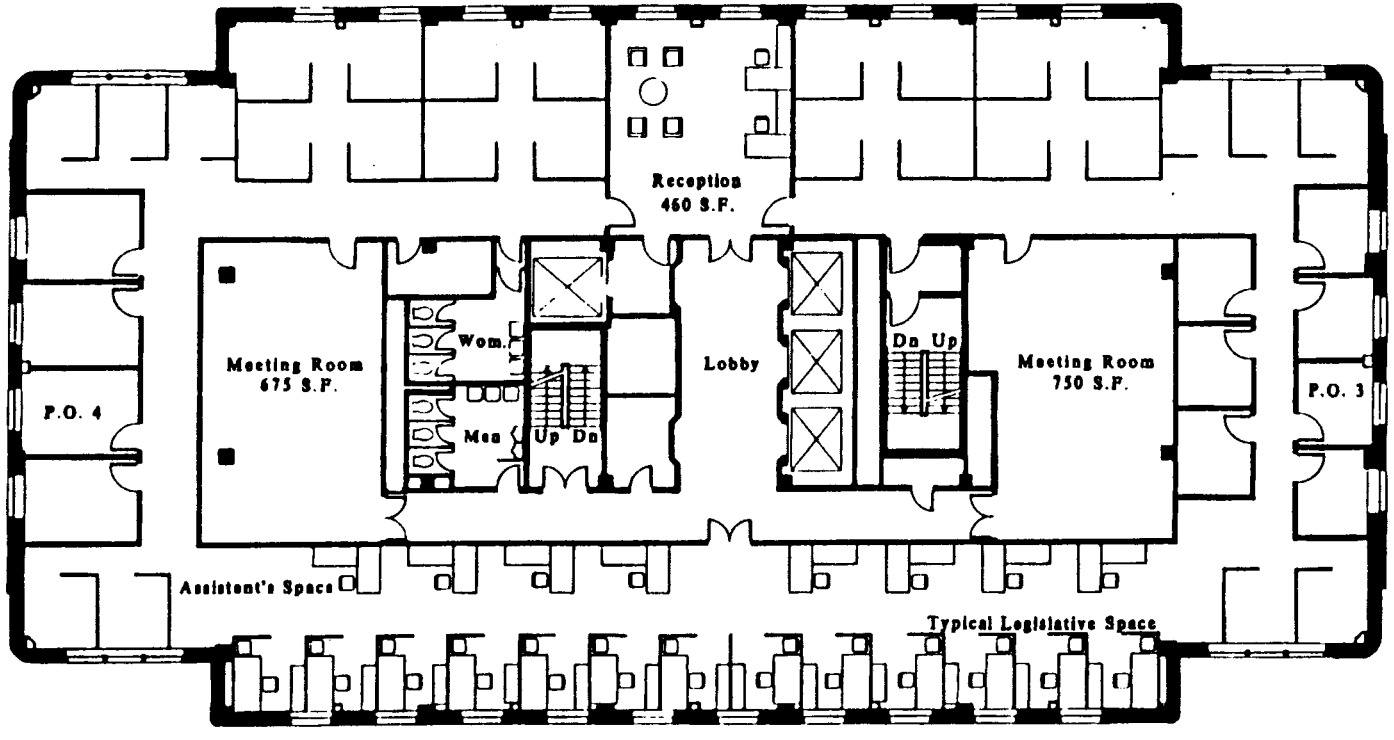
Existing House Gallery



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
First Floor Plan

C.W. Fentress J.H. Bradburn and Associates, P.C.



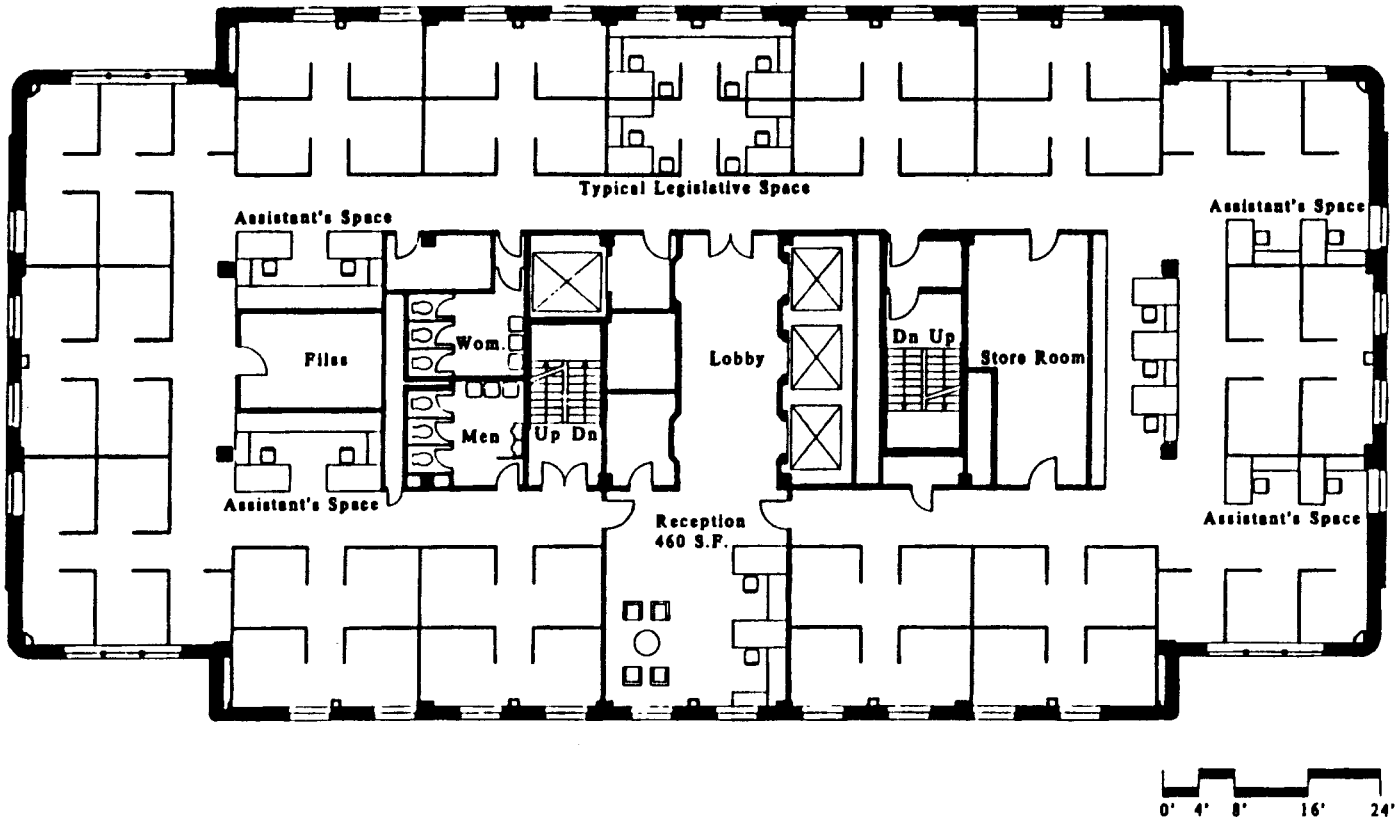
SENATE OFFICES 7 475 S.F.

35 Legislative Spaces	/64 S.F. each/
8 Assistant's Spaces	/64 S.F. each/
4 P.O. 3	/76 S.F. each/
6 P.O. 4	/110 S.F. each/

COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Second Floor Plan

C.W. Fentress J.H. Bradburn and Associates, P.C.



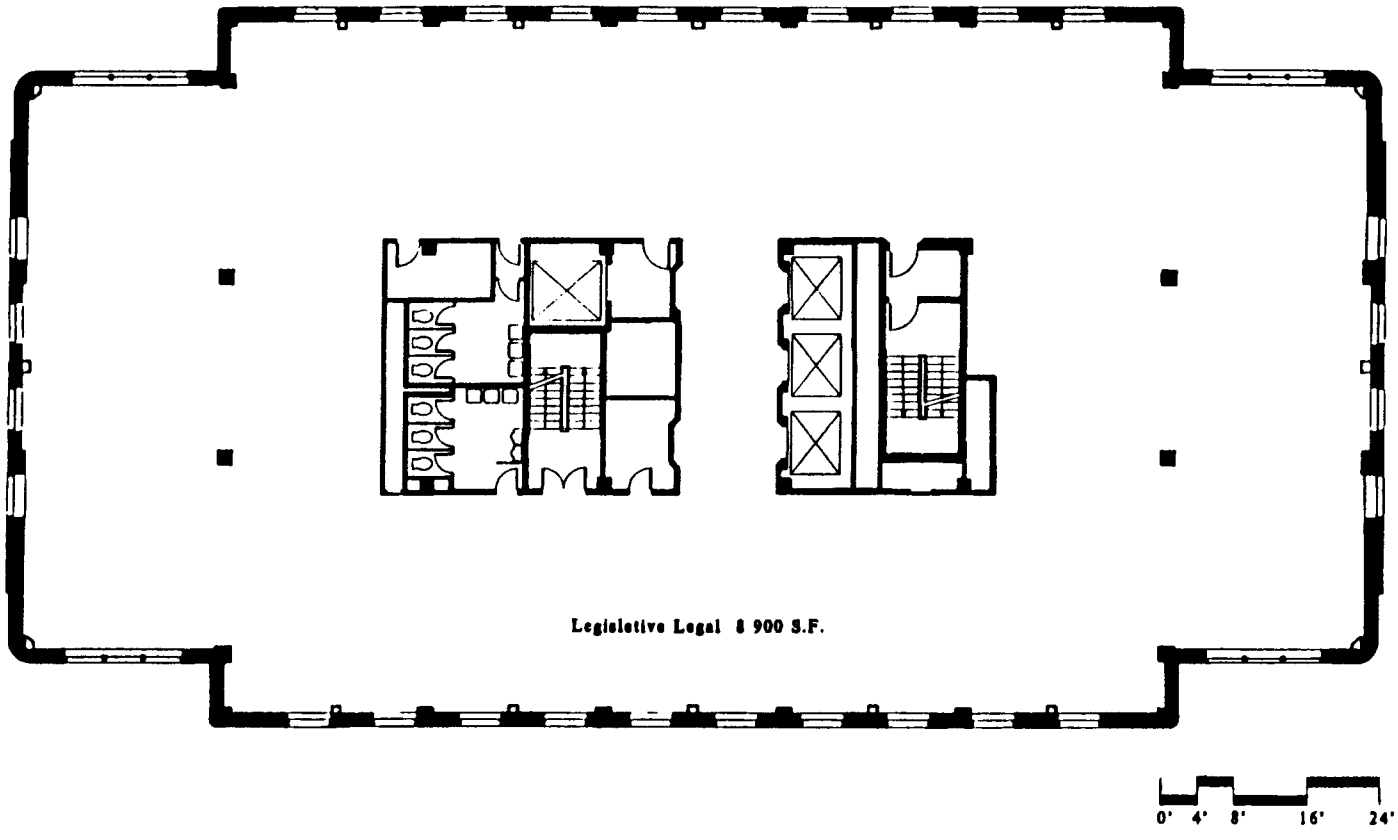
HOUSE OFFICES 8 900 S.F.

60 Legislative Spaces /64 S.F. each/
4 Assistant's Spaces /90 S.F. each/
6 Secretary Positions

COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Third Floor Plan

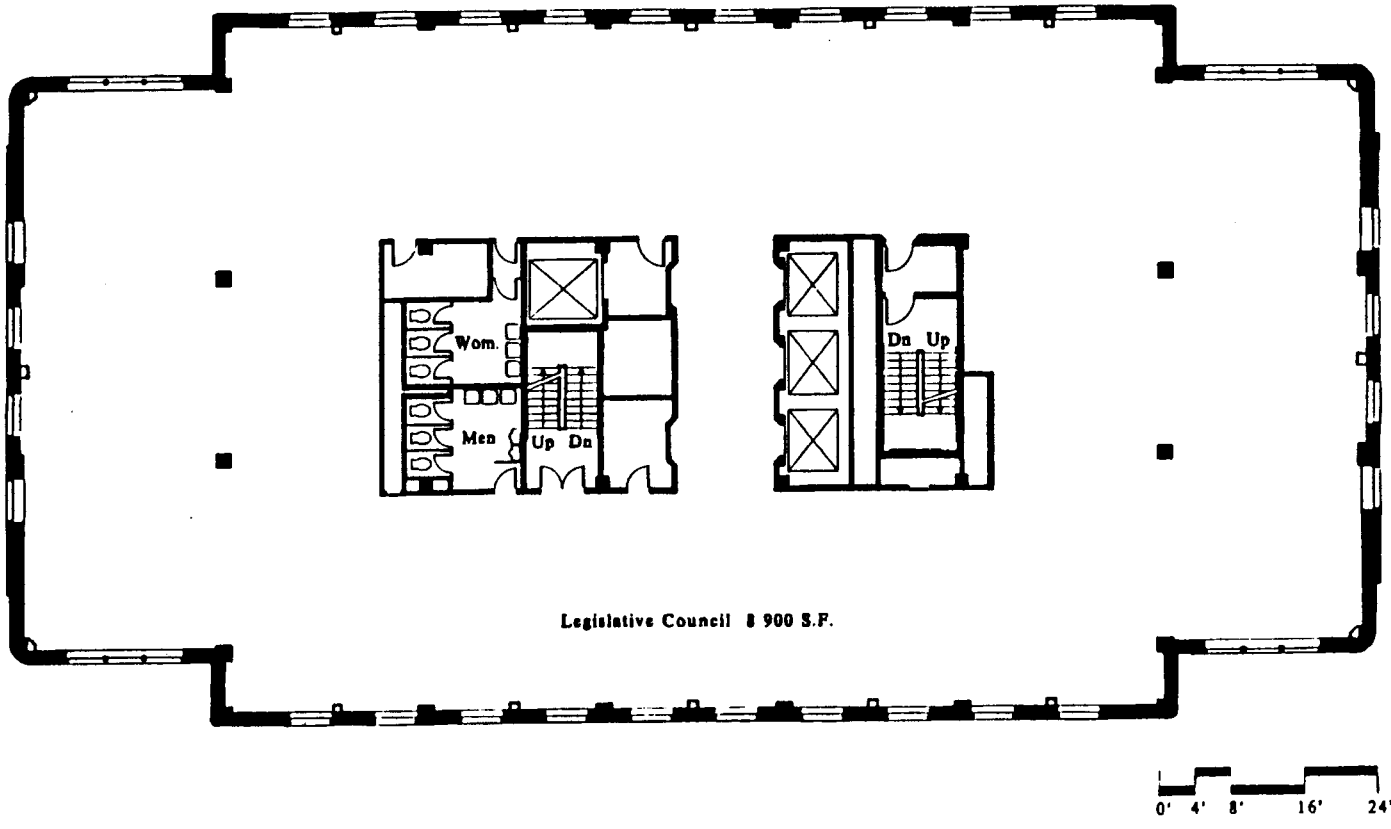
C.W. Fentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Fourth Floor Plan

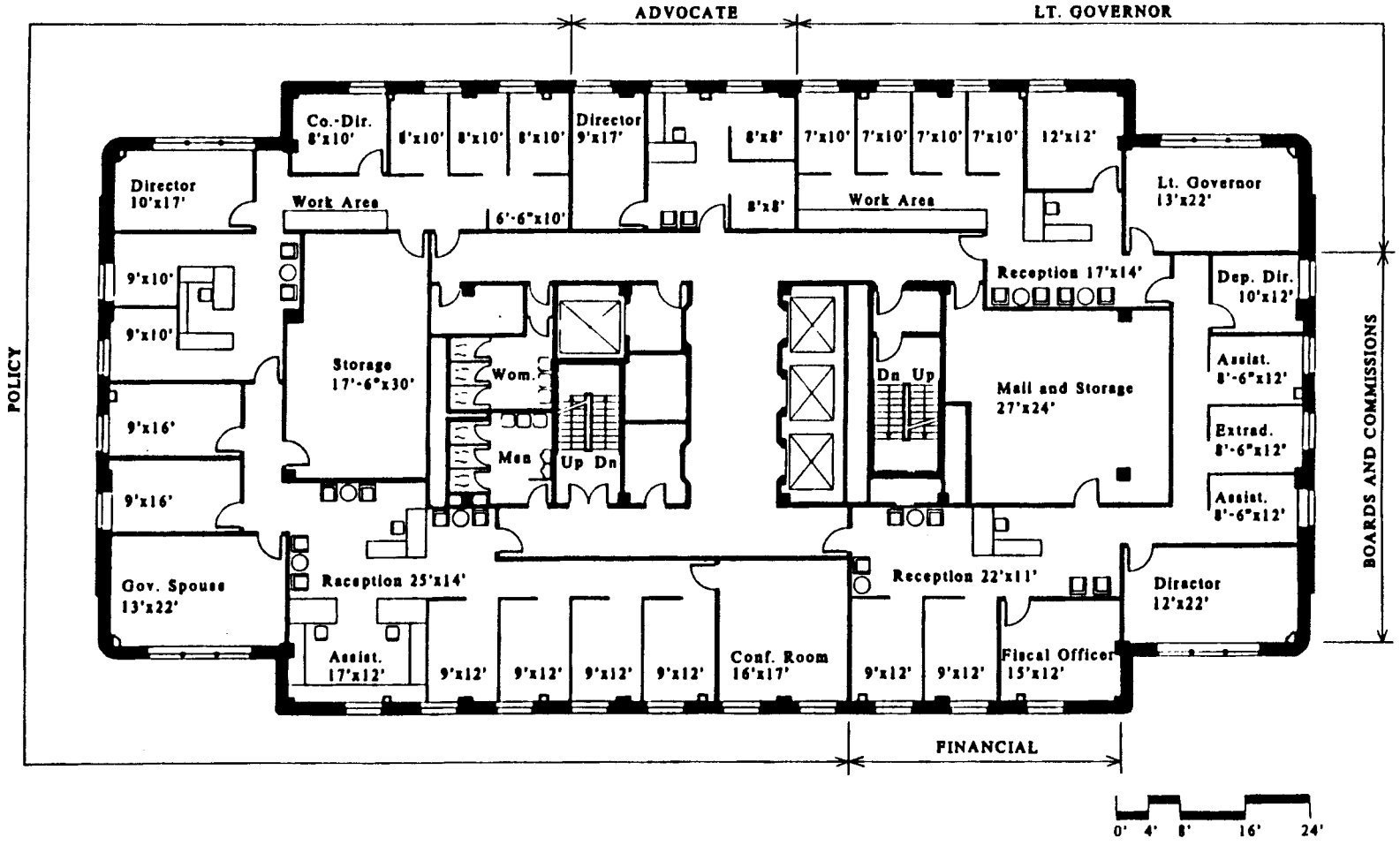
C.W. Fentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Fifth Floor Plan

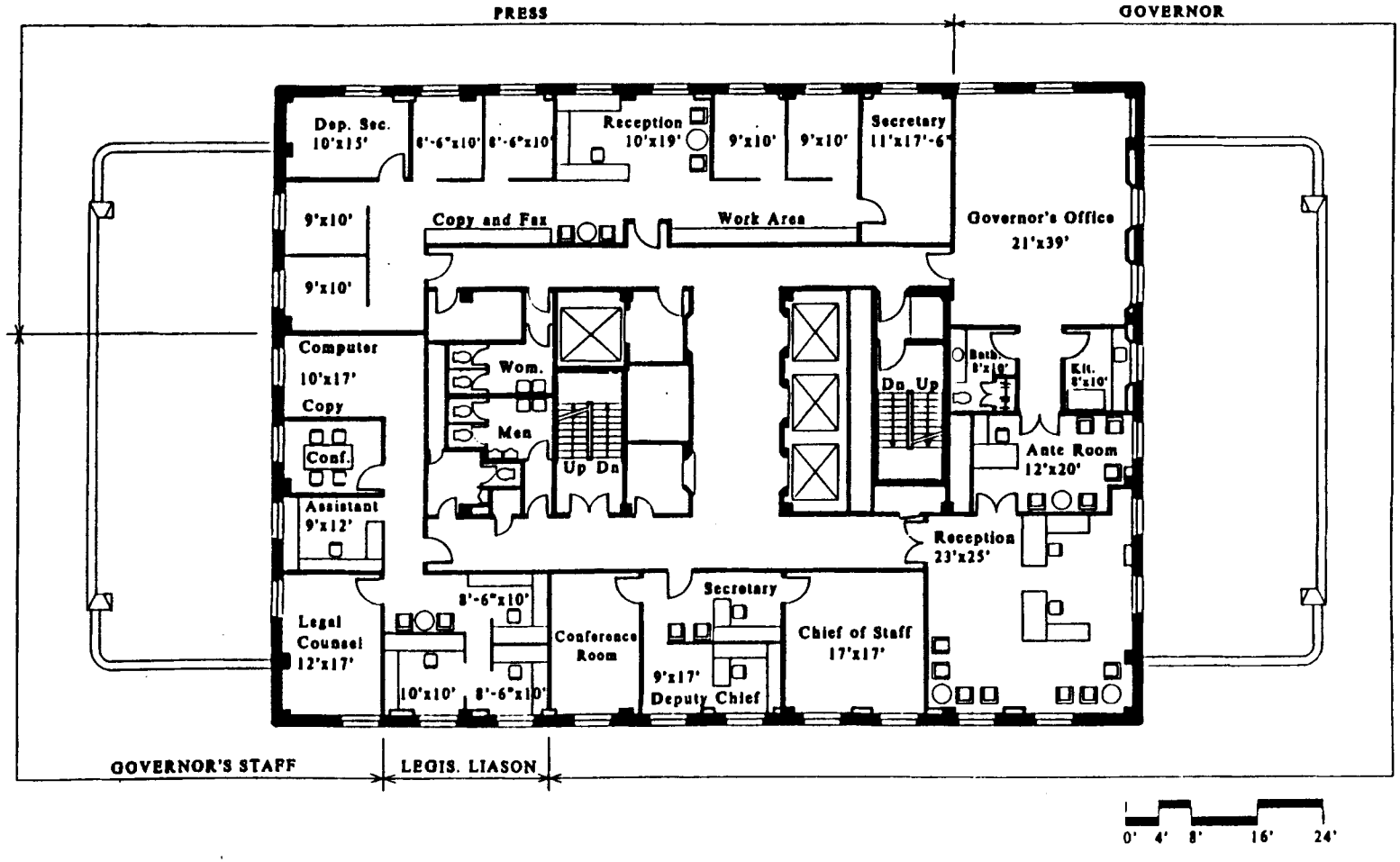
C.W. Pentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Sixth Floor Plan

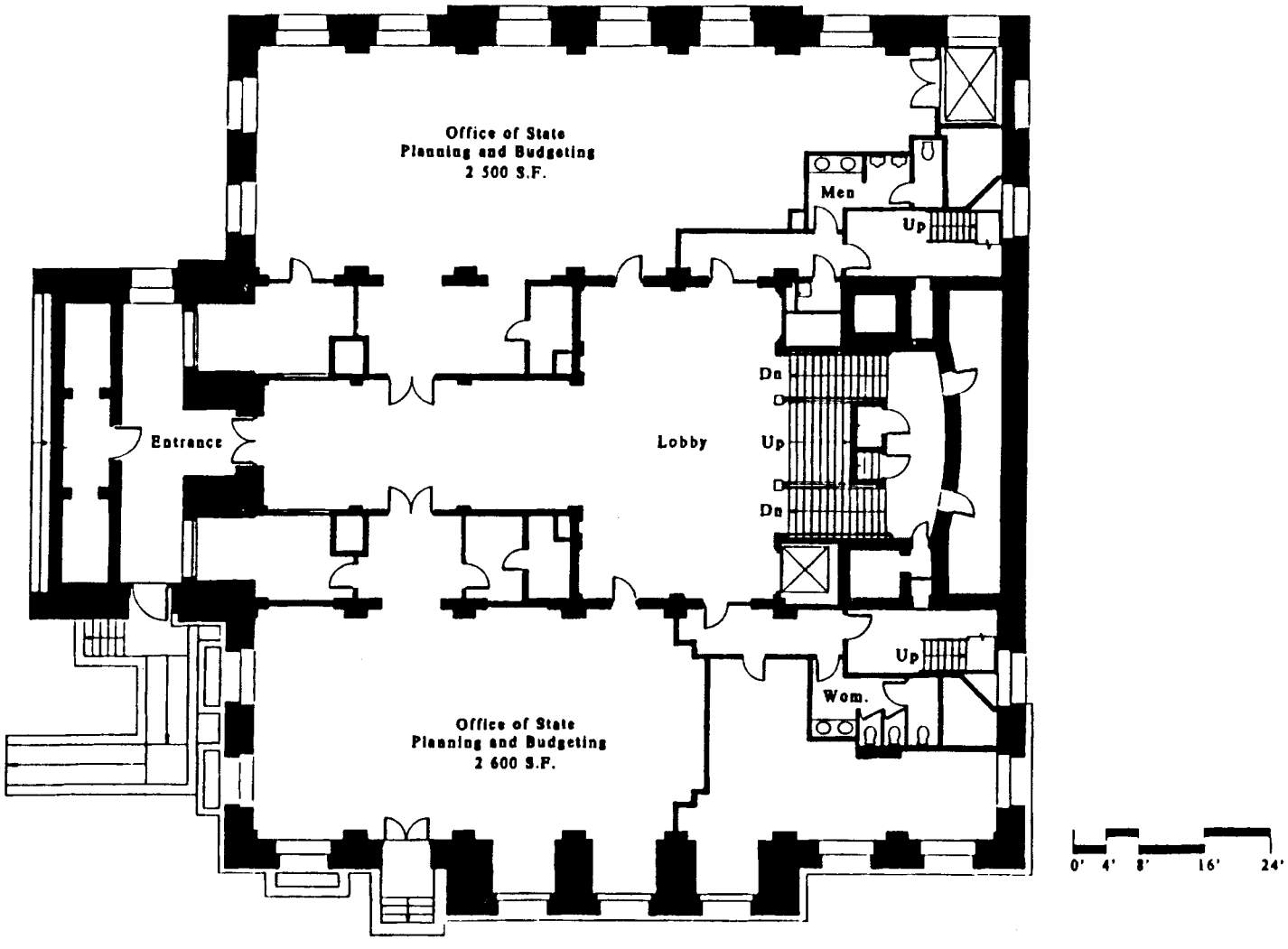
C.W. Fentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
STATE CAPITOL ANNEX

ALTERNATIVE #3
Seventh Floor Plan

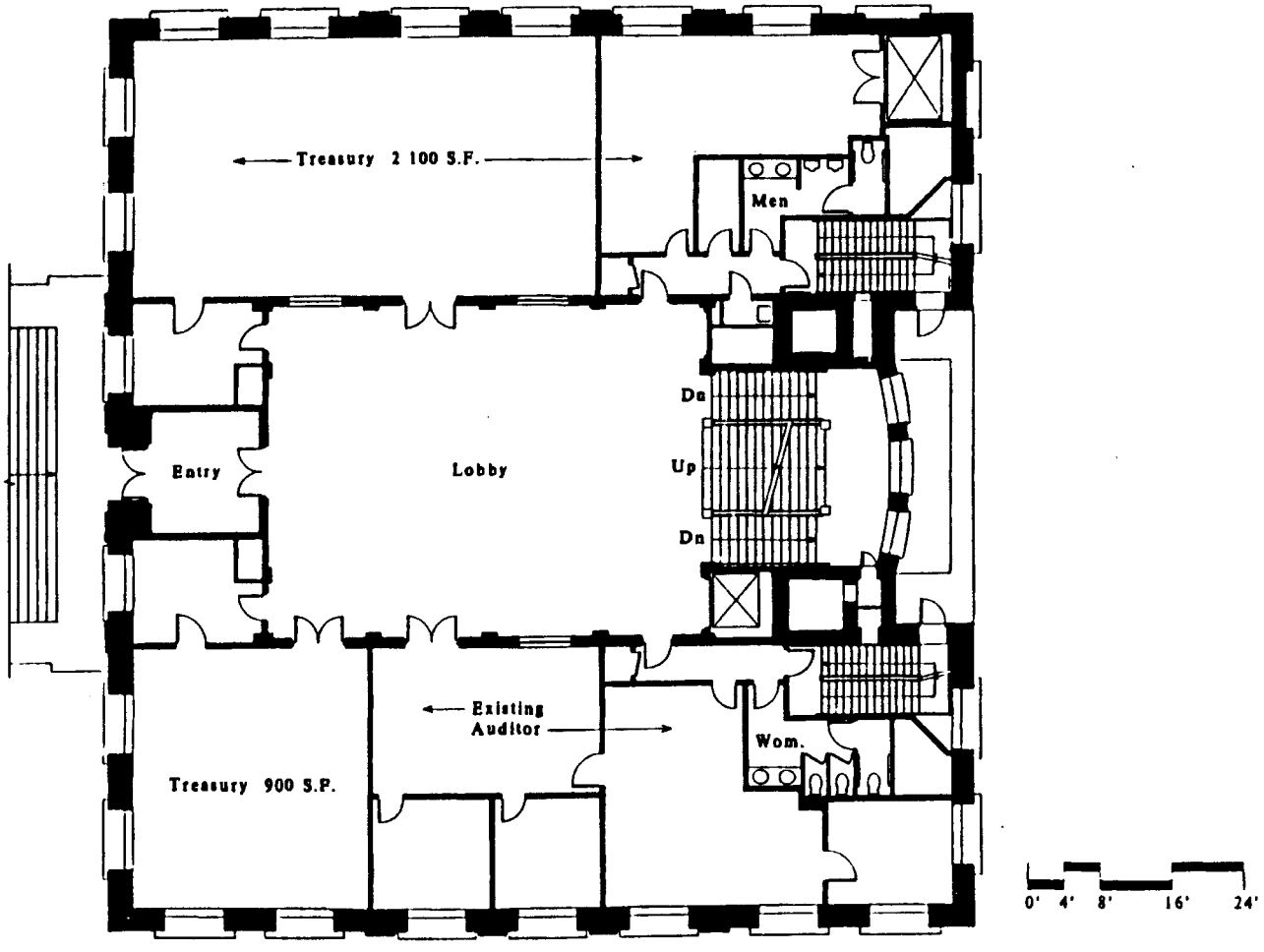
C.W. Pentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
LEGISLATIVE SERVICES BUILDING

ALTERNATIVE #3
Ground Floor Plan

C.W. Fentress J.H. Bradburn and Associates, P.C.



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT
LEGISLATIVE SERVICES BUILDING

ALTERNATIVE #3
First Floor Plan

C.W. Pentress J.H. Bradburn and Associates, P.C.

Alternative Four Phases

Phase One

Install fire sprinklers in the sub-basement and dome. Complete.

Preparation for Phase Two

Construct a new Capitol Complex Building.

Relocate all Capitol occupants to this building for three years.

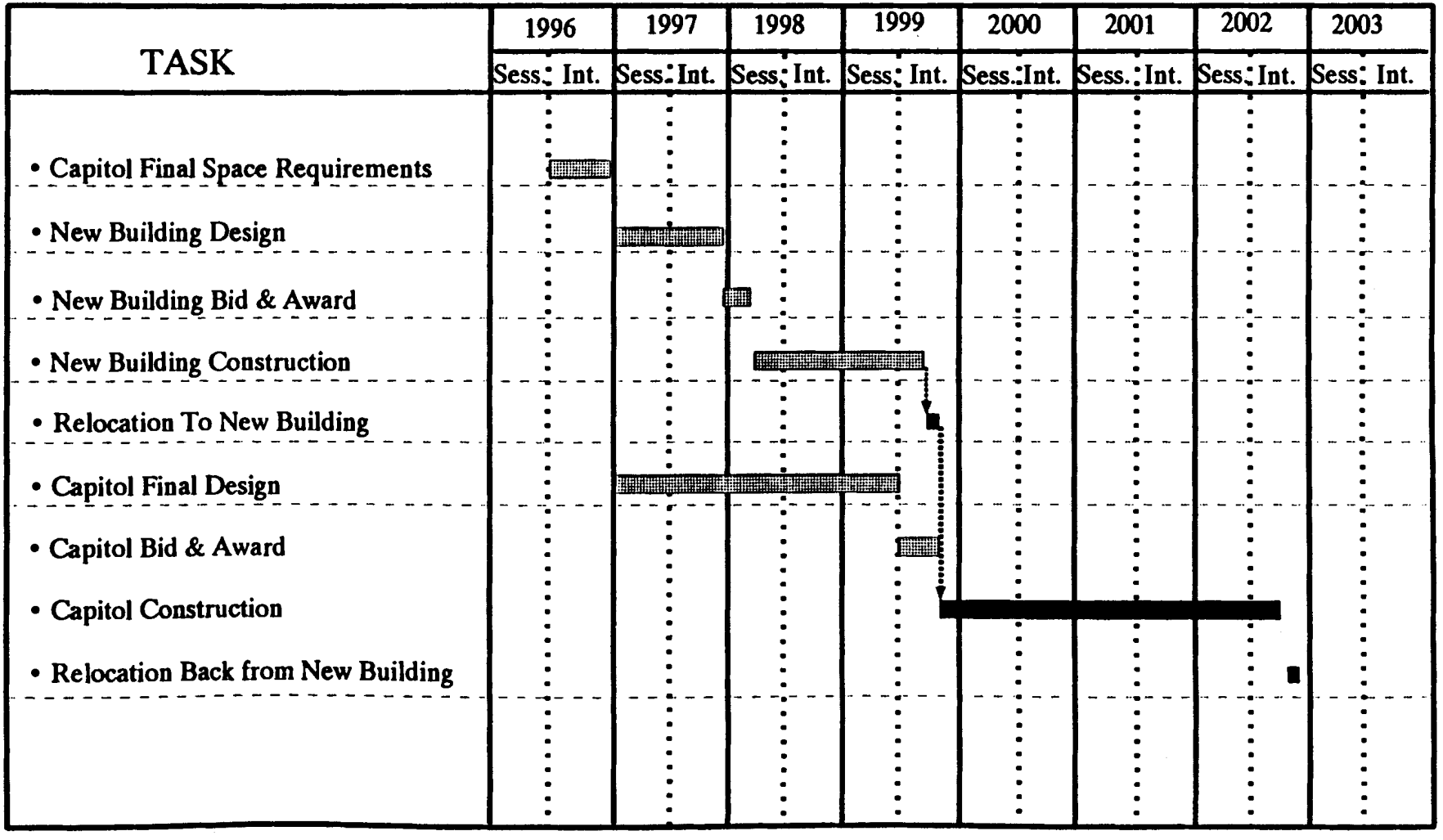
Phase Two

Install all life safety and additional systems improvements in the Capitol.

COLORADO STATE CAPITOL - LIFE SAFETY PROJECT

ALTERNATIVE NO. 4 SCHEDULE

October 2, 1995



State Capitol Building Health and Life Safety Project
Alternative #4 Cost Estimate Matrix
(1995 Dollars)
Revised November 29, 1995

Item	FY 1996-97	FY 1997-98	FY 1998-99	FY 1999-00	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	Total
Sub-basement Space									0
Revenue Relocate/Facility									0
Renovate Annex									0
LSB Retrofit									0
New Capitol Complex Facility	3,500,000	32,565,000							36,065,000
Lead/Asbestos Abatement	17,000		150,000						167,000
Occupant Relocation			333,000						333,000
Capitol Life Safety *		1,239,000	11,586,000						12,825,000
Sub-total to Complete Life Safety	3,517,000	33,804,000	12,069,000	0	0	0	0	0	49,390,000
Telecommunications	100,000	52,000	667,000						819,000
Electrical	500,000	232,000	3,336,000						4,068,000
Mechanical	1,500,000	331,000	8,340,000						10,171,000
Restoration									0
Exterior Wall, Roof, and Site									0
Furniture									0
Sub-total to Complete Capitol Upgrades	2,100,000	615,000	12,343,000	0	0	0	0	0	15,058,000
TOTAL Capital Requirement	5,617,000	34,419,000	24,412,000	0	0	0	0	0	64,448,000
Appropriation Requirement	2,286,000	34,419,000	24,412,000	0	0	0	0	0	61,117,000

* Refer to the following pages for an itemization of Capitol Life Safety cost estimates.

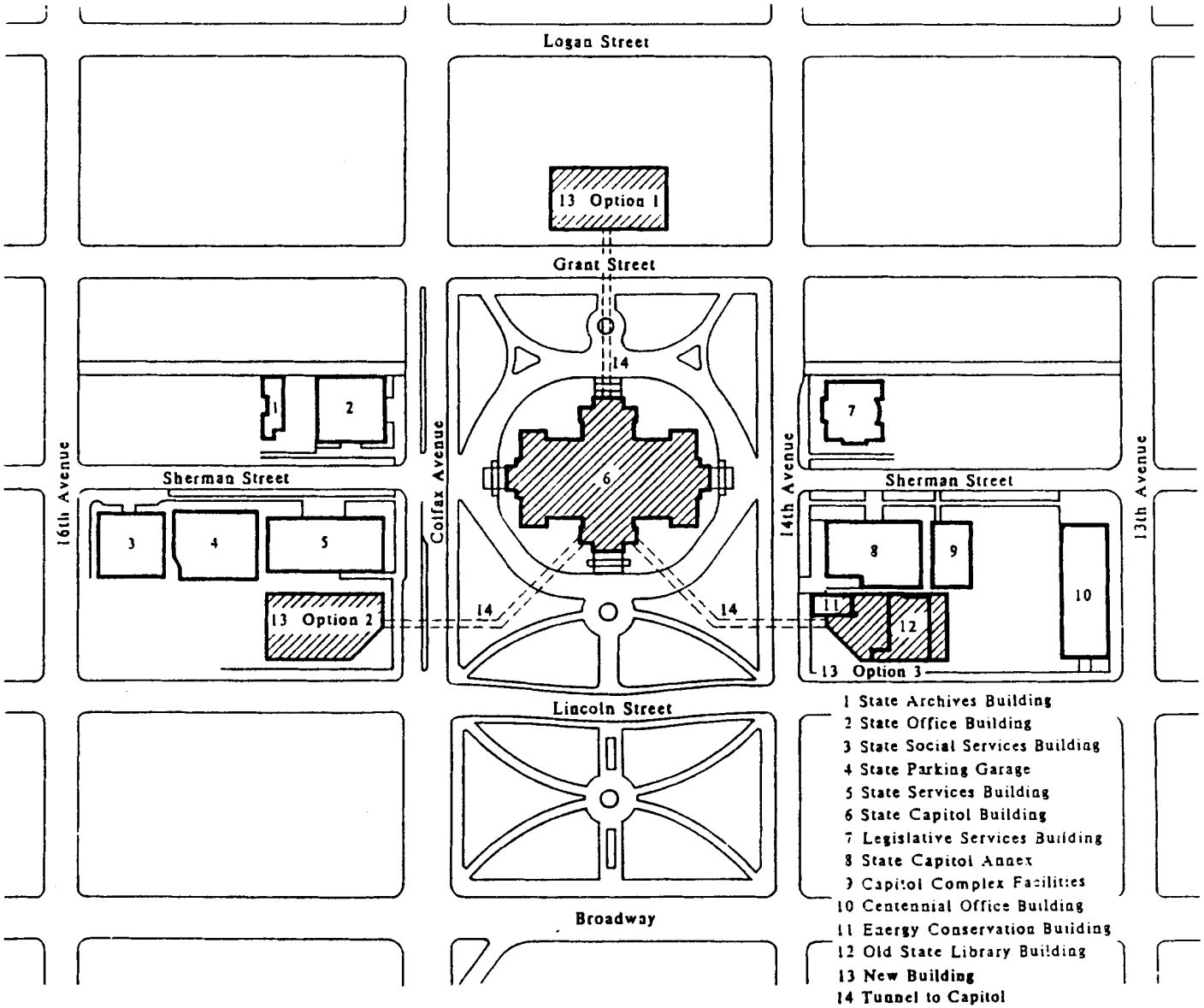
COLORADO STATE CAPITOL – HEALTH AND LIFE SAFETY PROJECT
ALTERNATIVE NO. 4 COST BREAKDOWN
NOVEMBER 10, 1995

1	**CAPITOL LIFE SAFETY**		
1.1	Demolition		554,000
1.2	Concrete		5,000
1.3	Masonry		14,000
1.4	Steel and Stairs		2,132,000
1.5	Carpentry, Doors and Hardware		467,000
1.6	Plaster, Drywill & Ceilings		385,000
1.7	Flooring and Stone		610,000
1.8	Painting		217,000
1.9	Fire Protection		1,124,000
1.10	Mechanical		1,999,000
1.11	Fire Alarm		1,213,000
1.12	Electrical		880,000
1.13	Subtotal Direct Costs		9,600,000
1.14	General Conditions, Bonds & Insurance		985,000
1.15	Construction Reserve		544,000
1.16	Contractor Fee		457,000
1.17	Design Fee		0
1.18	Project Contingency		1,239,000
1.19	TOTAL ALTERNATE NO. 4 LINE 8, CAPITOL LIFE SAFETY		12,825,000
2	**NEW BUILDING AND PARKING**		
2.1	Land Acquisition/Building Demolition		1,000,000
2.2	Tunnel to Capitol		2,000,000
2.3	Building Construction		19,142,000
	A. Demolition	150,000	
	B. Site Concrete	25,000	
	C. Foundations	563,000	
	D. Structural Steel Frame	2,250,000	
	E. Fireproofing	188,000	
	F. Granite Exterior Wall	1,700,000	
	G. Roofing	90,000	
	H. Windows & Glazing	483,000	
	I. Carpentry	375,000	
	J. Plaster, Drywall & Ceilings	975,000	
	K. Tile	295,000	
	L. Flooring	305,000	
	M. Painting	75,000	
	N. Specialties	251,000	
	O. Fire Protection	263,000	
	P. Mechanical	2,700,000	
	Q. Electrical	1,275,000	
	R. Audiovisual	500,000	
	S. Food Service Equipment	150,000	
	T. Elevators	600,000	
	U. Office Area Tenant Finish	1,200,000	
	V. Chambers & Committee Room Tenant Finis	1,000,000	
	W. General Condisions, Bonds & Insurance	1,321,000	
	X. Construction Reserve	1,672,000	
	Y. Contractor Fee	736,000	

2.4	Underground Parking	6,750,000
2.5	Sitework	960,000
2.6	Telecommunications	350,000
2.7	Furniture	650,000
2.8	Design Fee	2,228,000
2.9	Project Contingency	2,985,000
2.10	TOTAL ALTERNATIVE NO. 4 LINE 5, NEW BUILDING AND PARKING	36,065,000

CLARIFICATIONS:

1.) All costs are in 1995 dollars
2.) Costs are based on the scope of life safety improvements defined in the 1990 Life Safety Plan and refined by the 1993/1994 Life Safety Project initial design
3.) The Capitol renovation is in one phase
4.) General conditions, bonds, and insurance include items such as the General Contractor's project manager, superintendent and project engineer; construction cleaning, power and temporary office, temporary barricades; premiums for systems connections between phases and similar items
5.) The construction reserve covers items not yet shown by the design documents and any potential variations between current estimates and bid amounts for each direct cost line item
6.) The project contingency covers potential additional scope items that the Owner may need or desire
7.) Refer to the recommended alternatives section for additional information on Annex Renovation scope
8.) The $300,000 reduction in line 1.10 results from a more efficient overall building mechanical design that incorporates life safety smoke control and normal ventilation requirements. Refer to the existing systems and life cycle cost sections ior additional information.
9.) The new building and parking assumes:
   - Potential land acquisition for site option 1, building demolition (option 2), and a tunnel to the Capitol ;(options 1, 2 & 3). Refer to the alternative 4 site plan for additional information.
   - 150,000 g.s.f.; 125,000 r.s.f.; 120,000 u.s.f.
   - Steel frame superstructure, 7 floors, 20,000 g.s.f. floor plates; 10,000 g.s.f. penthouse or basement mechanical/electrical equipment area; 30' x 35' bay spacing; floor to floor height of 14'–0", granite cladding on concrete block exterior walls; 35% exterior wall area as windows
   - 500 car underground parking structure, no water table conflicts, no bedrock excavation, no underpinning of adjacent structures



COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT

Capitol Complex Site Plan

Alternative Four

C.W. Fentress J.H. Bradburn and Associates, P.C.

APPENDIX

PAGE

Alternatives Considered, But Not Recommended

The Working Group developed eight candidate alternatives that were evaluated against the feasibility criteria. Four of those candidate alternatives were determined to be feasible and were selected as the final alternatives to be recommended. The Working Group determined that the following candidate alternatives failed to comply with the conditions of the feasibility criteria.

First candidate alternative not recommended. This alternative would have required all construction activities to occur at night and on weekends during the interim. Building occupants would not have been relocated during construction but would have been required to remain in, or close to, the construction zones. In some cases, building occupants would have been required to temporarily share work space ("double bunk") within the building. This alternative was determined infeasible or unacceptable because:

1. Major structural demolition and installation activities would create a severely congested and unsafe working environment for building occupants and public visitors.

2. Construction in occupied construction zones would increase the risks of safety hazards and disruption due to an excessive exposure to construction activities, dust, dirt, noise, water, and unplanned power outages.

3. Construction would have to be completed during the interim in sufficient time to avoid disrupting the legislative session. The availability of space required for the legislative session could be severely jeopardized in the event that special legislative sessions during the interim, hidden existing conditions, material delivery delays, change orders, or significant design changes occurred.

4. Legislative chambers, committee rooms, and public areas may not be available in the event that special sessions were required during the interim.

5. In a totally occupied building, construction activities limited to evenings and weekends during the interim with no temporary office swing space or construction staging areas, would have increased the construction costs by up to $2 million.

Second candidate alternative not recommended. This alternative would have required approximately 20-40 building occupants to be relocated to temporary leased space during construction. Remaining building occupants would have been required to relocate within the building, to temporarily share work space ("double bunk") within the building, or to remain in, or close to, the construction zones. Construction activities would have occurred during the day and on occasional nights and weekends throughout the interim. This alternative was determined infeasible because:

1. Major structural demolition and installation of the stairwell extensions, air pressurization mechanical systems, and smoke evacuation shafts would create a severely congested and unsafe working environment for building occupants and public visitors.

2. Construction in occupied construction zones would increase the risks of safety hazards and disruption due to an excessive exposure to construction activities, dust, dirt, noise, water, and unplanned power outages.

3. Construction would have to be completed during the interim in sufficient time to not disrupt the legislative session. The availability of space required for the legislative session could have been severely jeopardized in the event that special legislative sessions during the interim, hidden existing conditions, material delivery delays, change orders, or significant design changes occurred.

4. Legislative chambers, committee rooms, and public areas may not have been available in the event that special sessions were required during the interim.

5. Construction activities limited to the interim, and in an occupied building, would have required a longer project schedule.

6. The availability and cost of commercial leased space within close proximity of the capitol complex were determined to be unpredictable and uncontrollable.

7. The state would have been required to expend significant funding for tenant finishes of temporary leased facilities.

Third candidate alternative not recommended. This alternative would have required the Department of Revenue to relocate from the Annex to another facility. The offices of the Treasurer, the Office of State Planning and Budgeting, the Lieutenant Governor, the Legislative Council, and Legislative Legal Services would have been relocated to the Annex for the duration of the project. The Annex would not have been renovated, other than to provide sufficient temporary space for the Capitol building occupants. Construction would occur within the Capitol building during the interim only. Minimal shared office space would have been required in the capitol building during construction, but all remaining occupants would have been relocated within the building to accommodate construction. Legislative committee rooms would have been used for office space during the interim for one phase of the project. This alternative was determined to be infeasible because:

1. Construction would have to be completed during the interim in sufficient time to avoid disrupting the legislative session. The availability of space required for the legislative session could have been severely jeopardized in the event that special legislative sessions during the interim, hidden existing conditions, material delivery delays, change orders, or significant design changes occurred.

2. Legislative chambers, committee rooms, and public areas may not have been available in the event that special sessions were required during the interim.

3. Construction activities limited to the interim, and in an occupied building, would have required a longer project schedule.

4. The State would have been required to expend significant funding for temporary tenant finishes in the Annex.

Fourth candidate alternative not recommended. This alternative would have required all occupants and functions of the Capitol building to be temporarily relocated to commercial leased space or another public facility (vacant school, Stapleton Airport) during construction. The Capitol building would have been closed and construction would have occurred in one continuous phase. This alternative was determined to be infeasible because:

1. The availability and cost of commercial leased space or other public facility were determined to be unpredictable and uncontrollable. Additionally, the state could be required to commit funding to significant lease costs several years prior to actually occupying the facility.

2. The state would have been required to expend significant funding for tenant finishes of temporary leased facilities.

Summary Assessment and Recommendations for Existing Capitol Building Systems

The following information is a summary of: 1) an assessment provided by Fentress Bradburn and Associates and ABS Consultants for a 1994 Capitol Building Health and Life Safety study, with an update for the current status of the project, and 2) interviews with representatives of the Divisions of Capitol Complex Facilities and Telecommunications. The recommendations included in the summary represent complete system refurbishment for Alternatives #3 and #4, and were developed by Fentress Bradburn and Associates, ABS Consultants, and the Divisions of Capitol Complex Facilities and Telecommunications.

Mechanical Systems

The mechanical systems consist of the heating, ventilating, air conditioning, plumbing, domestic water, and energy management systems (EMS) that serve the Capitol building. Recommendations for repair/retrofit are based upon requirements to comply with current codes and to maximize energy (gas, electric, and water) efficiencies.

Heating system. The existing system has had few upgrades since the building was first constructed 100 years ago. Control valves have been added to allow individual temperature control of the original cast iron steam radiators. The steam lines, condensate lines, and steam traps are continually being replaced as they fail. The age of the system mandates almost continual repair.

The consultants recommend that the steam supply lines, condensate return lines, steam traps and control valves be replaced prior to a major system failure. Additionally, the vertical risers may require abatement. It is recommended that the existing system be replaced with a hot water system that utilizes 30% propylene glycol. Heat exchanger with variable frequency drive pumps would supply heating water to the facility. Existing steam riser locations would be utilized for distribution throughout the building. Electronic controls would be incorporated into the EMS to maximize control and minimize recurring maintenance.

Heating, ventilation, and air conditioning (HVAC). Forty-three (43) air handling systems currently supply make-up air, exhaust air, and conditioned air to the building. These systems do not, at this time, have any connection or design integration with code required smoke control systems. Many of the systems have been in operation for approximately 50 years. Air conditioning systems provide conditioned air to approximately 31 percent of the space in the building. The remaining 69 percent of the space is conditioned by approximately 70 window mounted air conditioning units. Systems that serve the Office of the Governor and the Supreme Court chambers were installed within the last 15 years. The majority of the remaining systems are over 20 years old, have exceeded their useful lives, and require continuous maintenance.

Additionally, these systems are obsolete and replacement parts are not available, which requires custom repairs.

The consultants recommend that all units over 20 years old that serve office space be replaced with four pipe fan coil units to provide improved control with smaller zones and to eliminate air distribution from lay-in ceilings. The chilled water system would be provided with a plate and frame exchanger to maximize energy savings. Variable frequency drives would be incorporated into the pumping system.

A further recommendation is that larger areas such as the House and Senate be provided conditioned air by air handling units (located in the attic) to replace the existing HVAC units. Chilled water would be provided by the central plant, which is estimated to have adequate capacity to accommodate the increased cooling load.

The above HVAC recommendations would incorporate life safety zones within the offices, the House, Senate, and Supreme Court chambers if a complete systems renovation occurs. By creating pressurized, zoned smoke control systems throughout the building, the atrium smoke system would require substantially reduced air requirements. The benefits to a complete upgrade are enhancement of the overall life safety aspects of the building, HVAC systems, and greater occupant comfort. Substantial savings in initial costs and life cycle operating costs could be recognized because overlaps between general HVAC and smoke control would be minimized.

Plumbing and domestic water system. The pressure boosting system has been recently replaced; however, the domestic hot and cold water system is experiencing severe corrosion due to its age. The water closets do not comply with legislated flush rates, vertical waste lines are corroded and semi-plugged, and a drain system does not exist in the attic areas. Additionally, the existing air compressor line to the attic is inadequate and is not equipped with a refrigerated dryer.

The consultants recommend that the domestic hot and cold water lines, and associated branch lines, be replaced; that a drainage system be provided for the attic; and that the compressed air line to the attic be replaced and provided with a refrigerated dryer.

Energy management system (EMS). The existing EMS was recently replaced and is operating satisfactorily but does not incorporate all air handling systems or spaces into its database. This deficiency does not allow the EMS to maximize load shed, to provide optimum start/stop, to enhance maintenance, or to respond to equipment failures. It is recommended that all existing and new equipment, and all lighting/dimming systems, be incorporated into the EMS.

Electrical Systems

Office area lighting. Existing office area lighting consists of a variety of incandescent and fluorescent fixtures. These fixtures are not energy efficient and do

not meet current office environment needs. Computer usage is prevalent throughout office spaces and current lighting was not designed to accommodate video display terminal (VDT) screens. New energy efficient fixtures, appropriate for specific usage, are recommended for use throughout the office areas.

Emergency lighting. Emergency lighting and exit signage are non-existent, except at some stairwells. All emergency egress lighting system should be provided in all areas as shown by the current Health and Life Safety Project design.

Power distribution system. In order to accommodate any general building renovation or future system capacity, existing service entrance and main distribution system equipment will require modifications. Modifications include upsizing equipment for additional loads and providing an emergency power source for all emergency loads. In addition, existing panelboards and stepdown transformers are not built to adequately handle harmonic currents associated with computers, copiers, printers, etc. It is recommended that all electrical distribution equipment be modified to accommodate the special requirements for current, and anticipated, capacity expansion requirements.

Office area power. The 1982 re-wiring project replaced the building's original power wiring in office areas. However, typical current and future office practices have a much more intensive power requirement for computerized office equipment. Currently, office areas have too few convenience outlets to supply these computer and electrical needs adequately without the use of multi-outlet strips and extension cords. The consultants recommend that additional outlets be added to renovated areas to provide additional capacity for existing and potential future electrical loads. This improvement will require additional and/or upsized branch circuit panelboards.

Telecommunications

The telecommunications system consists of the telephone, video, and data transmission systems that serve (or are proposed for) the Capitol building and other capitol complex facilities.

Telephone. The existing telephone trunk lines originate at the switchgear located in the State Services Building. They are then routed through the tunnel under Colfax Avenue to the Capitol building where they terminate at approximately 25-30 telephone terminal boards in various areas of the sub-basement. Installation in the tunnel was accomplished by commingling the telephone trunk lines with other wiring and conduit in cable trays mounted to the ceiling of the tunnel. Telephone trunk lines are also hung from other piping and plumbing fixtures where cable trays do not exist.

Twisted pair telephone wiring is then routed from terminal boards to each telephone number in the building. Terminal boards are also interconnected with twisted pair wiring. The twisted pair wiring is routed from the sub-basement to the upper floors of the building through heating ducts, plumbing and piping cavities, and any

other available vacant cavity that provides access. In some cases, holes were drilled through the flooring to gain access to office areas in upper floors.

On each of the upper floors, the twisted pair wiring is then routed through walls, over doorways, above false ceilings, under carpet and floor coverings, stapled to wall baseboards, and through steam heat registers to all of the office areas. None of the telephone wiring is placed in conduit and no horizontal chases or vertical risers exist in the building to accommodate wiring installations. Additionally, no "as-builts" or engineering shop drawings of the telephone system in the Capitol building are available.

Video. Interactive video communications systems do not currently exist in the Capitol building. However, the State Services building is connected to universities, community colleges, other state administration facilities, and various correctional facilities via the state's digital data network. This capability is desired in the Capitol Building to provide legislators the ability to conduct interactive video transmissions with constituents or other legislative entities at remote locations and to provide closed circuit transmissions to the public within the building. This system could also serve as the host for an expanded security system within the capitol complex.

Data transmission. A variety of data transmission systems, comprised primarily of twisted pair wiring, currently serves individual networks for some offices in the Capitol building. No local area network (LAN) currently exists as a common, integrated host for these systems.

Fiber optics. A fiber optics loop, connected to other capitol complex buildings, currently exists in the Capitol building sub-basement. However, this loop is not distributed throughout the building. It is recommended that the fiber optics distribution be completed throughout the Capitol building to provide a host for an integrated communications LAN for the telephone, interactive video, and data transmission systems.

Summary Assessment of Existing Capitol Annex Building Systems

The Capitol Annex building has had no significant building systems renovation since it was constructed in 1937. Capitol complex facilities has accomplished a variety of minor upgrades under the State Controlled Maintenance Program, but the building is currently recognized as deficient in major systems requirements such as energy and maintenance efficiency, systems technology, and health and life safety.

Numerous studies and reviews have been commissioned and conducted since 1983 to address space utilization requirements of the occupants and users of the building, and to address the condition of the Annex building systems. Space utilization studies were conducted in 1985 and 1989 to evaluate the building's ability to provide sufficient and appropriate space and to identify potential space solutions for the Department of Revenue. The conclusions of those reports indicated that the Department of Revenue would require a larger facility by 1990 due to forecasted expansion and would require a facility that could be more easily accessed by the general public. The reports recommended that the Department of Revenue be relocated to a more suitable facility outside the capitol complex.

In 1983, the Department of Administration, State Buildings Division, conducted a survey entitled "Evaluation of the Condition of the Capitol Annex." This study primarily identified the inadequacies of the building's mechanical and electrical support systems and building code deficiencies. An additional analysis of the building's health and life safety provisions was commissioned and conducted in 1987. The task of the study was to review and compare the current building and fire code requirements to the Annex building's health and life safety provisions. The conclusions of those reports recommended significant renovation to correct current and projected building system deficiencies and to meet current health and life safety standards such as the following:

- automated fire detection, alarm, and suppression equipment; pressurized elevator refuge lobbies; air pressurization systems; fire pumps; emergency power and lighting; and certain emergency egress improvements to accommodate health and life safety requirements;

- floor slab, core, and exterior wall modifications to accommodate life safety pressurization fans, exhaust fans, and ductwork;

- structural and architectural modifications to accommodate new air handlers, emergency generator equipment, air supply and return ductwork, and plenums;

- ADA compliant toilet room fixture replacements, finish upgrades, and water supply and piping replacements;

- replacement windows, and perimeter wall and roof insulation to improve energy efficiency;

- interior and exterior wall restoration and sitework to improve overall appearance;

- elevator cab upgrades and replacement of worn elevator system components;

- asbestos abatement as a part of the mechanical system renovation;

- heating, ventilation, and air conditioning (HVAC) system and control renovations to provide sufficient conditioned air to all building occupants and to reduce operating costs; and

- electrical power distribution and lighting upgrades to accommodate increased capacity requirements and to reduce operating costs.

In summary, the reports above recommended that the Capitol Annex building, which is now listed on the Historical Register, be renovated to upgrade building system efficiencies and capabilities, and to correct all health and life safety deficiencies.

Reports of Other State Capitol Building Projects

The Working Group learned that similar renovation and restoration projects have been accomplished at other state capitol buildings throughout the country. Many of those projects emphasized the importance of life and health safety upgrades due to recent fire damage or due to the realization that existing fire safety systems were inadequate. The Working Group reviewed capitol building projects of the states of Georgia, Alabama, Texas, Michigan, and Ohio. The review emphasized how the scope of work, construction techniques, occupant location/relocation, and project phasing affected the executive and legislative occupants and public visitors of the buildings. Summaries of those reports are provided on the following pages.

Georgia State Capitol Building. The Georgia State Capitol building is similar to the Colorado State Capitol building. For example, characteristics of the building include:

1. approximately 100 - 120,000 square feet;

2. 4 floors with central rotunda and open staircase;

3. constructed before the turn of the century;

4. occupants include the offices of the Governor, the Secretary of State, the Senate, the House of Representatives, Senate and House chambers, and administrative support staffs for a total of approximately 250 people;

5. various "modernization" modifications to the building during the 1950s and 1960s to accommodate staff and storage expansions; and

6. no fire detection and suppression, or emergency fire exit provisions in the building prior to 1981.

The Georgia State Legislature is in session for 40 days each year, starting in the first week of January. Therefore, the session is usually completed by the first week of March. During the interim (March to December), the building is used by the State Legislature for interim committee meetings and by the public for non-profit organization meetings.

The fire safety improvements to the Capitol building have been under the general jurisdiction of the Legislative Services Committee, which is chaired by the Speaker of the House. A Capitol Preservation Committee was formed in 1994 to provide guidance to the Legislative Services Committee on capitol building construction requirements in public areas and space occupied by the General Assembly. The architectural firm for the project is Lord, Aeck, Sargent, Inc. of Atlanta, Georgia, phone (404) 872-0330. Principal architects are Susan Turner and Tony Aeck.

Fire safety improvements and general building renovations have taken place in two phases, with a third phase yet to be defined. Prior to Phase I, the Legislative Office building was renovated to accommodate approximately 60 legislative staff members permanently. Phase I was accomplished during two interims between 1981 and 1985 and provided fire safety and mechanical improvements to the public spaces and corridors in the building, including the following:

1. installation of fire pump, stand pipes, smoke detectors, fire alarms, and fire sprinklers;

2. removal of wood walls and paneling (installed in 1950s and 1960s) and replacement with sheet rock;

3. installation of HVAC systems upgrades;

4. installation of other building systems improvements and mechanical system upgrades; and

5. renovation of the legislative chambers, including general restoration, asbestos abatement, and fire system installation.

The finished improvements and upgrades in Phase I were concealed from public view to preserve the historical integrity of the facility in spite of the fact that the Capitol Preservation Committee did not exist at that time. The building was originally constructed with open stairwells that fully extend to all floors for emergency egress; therefore, no significant structural modifications were necessary. All construction was accomplished during extended-day working hours. Relocation of occupants within the building was kept to a minimum because Phase I concentrated on public spaces, corridors, and mechanical rooms. In spite of their success in accomplishing this phase in an occupied facility, the sources identified above would have preferred that the building be totally vacated during construction, but they had no other feasible alternative. They indicated that some construction interruptions (with associated extra costs and schedule delays) occurred due to special sessions during the interim. They also believe that the renovations in the legislative chambers at that time would not have been acceptable to the current Capitol Preservation Committee.

Phase II is now in progress and will be accomplished during the 1995 interim. The scope of the project includes the installation of fire detection, smoke alarms, fire alarms, piping, and fire sprinklers in office areas. These structures are being placed above false ceilings, where applicable, but special attention is not being given to preserve historical integrity in office areas. The contractors are trying to accomplish construction in some office areas during night hours to reduce disruptions during the day; however, some areas require extensive construction activities during the day with extended hours into the night. All occupants of the building are being temporarily relocated within the building (shared space) for a maximum of approximately two weeks per office area. Additional complications will also occur due to a special legislative session that has been called to take place during August and September 1995.

Phase III has not been fully defined, but that the final phase will probably concentrate on:

1. providing automatic fire/smoke doors in the central rotunda;

2. enclosing the existing stairwells; and

3. installing a positive air pressurization system.

The construction activities identified above have/will provide fire safety provisions, some renovation, and some system upgrades in the Georgia State Capitol building but will not provide any space reconfiguration for current or future building occupants.

Sources, August 16, 1995

Mr. Paul Lynch
Legislative Council
Georgia State Legislature
phone (404) 656-5054

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Assistant Director for Contracts
Georgia Building Authority
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RESTORATION OF THE TEXAS CAPITOL

David B. Mauzy
Senate Research Center
Texas Legislature

"The architecture of a civilization is its most enduring feature, and by this structure shall Texas transmit herself to posterity .... It would seem that here glitters a structure that shall stand as a sentinel of eternity, to gaze upon passing ages, and surviving, shall mourn as each star expires ...."

State Senator Temple Houston spoke those words at the dedication of Texas's most important public building, the state Capitol, on May 16, 1888. Houston, a scion of Texas's premier political family, was the youngest child of the hero of San Jacinto, Sam Houston, and was born during Sam's term as governor of Texas. (Sam Houston, who also served as president of the Republic of Texas and as a member of the U.S. Senate, saw his public career ended by his refusal to swear an oath of allegiance to the Confederacy.) Temple Houston was a lawyer, orator, and frontiersman — and the youngest member of the Texas Senate at the time of his address.

By 1983, there was a grave danger that the building Temple Houston had confidently asserted would stand "as a sentinel of eternity" would instead not last until its centennial celebration. A century of piecemeal remodelings, the strain of overcrowding, and decades of neglect had resulted in a dangerously unstable building.

In reality, though, there were problems with the building from the earliest date. No sooner had Temple Houston finished his speech, than a heavy rainstorm showered the Capitol and the assembled crowd learned that the magnificent edifice leaked! In addition, the basement windows would not close properly, and the superintendent of buildings and grounds submitted a five-page list of problems with the building. One state official, Attorney General Jim Hogg, who soon after became governor, opposed accepting the building and making the final payment to the contractor. Eventually, however, the building was officially accepted after months of wrangling and the contractor was paid.

Almost a century later, on the morning of February 6, 1983, Texans awoke to learn that a fire the night before had nearly resulted in the destruction of their pink granite icon. The fire, which began in an apartment set aside for the use of the lieutenant governor behind the Senate Chamber, killed a Capitol visitor. Although firefighters were able to contain the fire to the Capitol's East Wing, they warned state officials that it had come within minutes of spreading to the rest of the building and destroying the entire structure.

The Texas Legislature, meeting in its biennial session at the time, quickly arranged for repair of the fire-damaged East Wing. More importantly, the lawmakers enacted legislation to provide for the long-term renovation of the entire Capitol. The legislation established a State Preservation Board to oversee the renovation. The board, composed of six members (the governor, lieutenant governor, house speaker, one senator, one representative, and one private citizen), was charged with developing a master plan for the Texas Capitol Complex and for the restoration of the Capitol and its grounds.

At the time it was constructed, the Texas Capitol was said to be the seventh largest building in the world. Although that claim was never verified, it is true that Texas constructed a government seat that was taller than its federal counterpart in Washington. Those extra seven feet were intentional in a state where some residents could still remember the decade Texas spent as a republic. Texans were proud that their Capitol contained the latest technology and all the conveniences then becoming available to Americans at the end of the nineteenth century. The building contained elevators, telephones, and even electricity — all new inventions — along with indoor plumbing. The changes were coming so fast that the original plans, drawn in 1880, called for gas lighting. By the time the building was completed eight years later, electricity had been installed — although the building also contained tubing for gas lighting in the event electricity was only a passing fad. The state had its own power plant on the Capitol grounds to provide the building with electricity; unfortunately, the plant was never able to produce more than a third of the power needed to supply all of the outlets. Even so, the rest of the city of Austin had to wait another 10

years before the Colorado River was dammed to bring them electric power.

Nineteenth-century Texans were justifiably proud of their new Capitol. It was built at a time when the state was still recovering from the ravages of the Civil War and the vestiges of Reconstruction. The state had no money, but state officials arranged to trade three million acres of state-owned land in exchange for construction of the Capitol. In addition, the contractor used convict labor from the state prison system to reduce costs, and most of the stone (over 15,000 train carloads) was donated by a Central Texas landowner. In all, the building was estimated to have cost the state $3.7 million. When it was completed, the Capitol contained 392 rooms, 18 vaults, 924 windows, and 404 doors spread over almost 18 acres of floor space on five floors.

In 1888, the Capitol was large enough to house the entire state government, with the exception of one agency. By 1990, though, a building constructed for approximately 725 workers held more than 1300 — in spite of the fact that most agencies had long since moved out of the Capitol to other, more spacious quarters. Even so, the building had been divided time and again with cheap walls and false ceilings to create additional space. By lowering the ceilings, it was possible to create "mezzanine" offices on top of other offices. Even the vaults, which were constructed to hold not only the state treasury but important maps and documents, were being used as offices.

Planning the Restoration

In planning the restoration of the Capitol, officials examined the efforts of other states. A group of Texans traveled to Michigan, another state whose Capitol was designed by Elijah Myers. (In addition to the Capitols of Michigan and Texas, and a number of other public buildings, Myers also designed the Colorado Capitol.) One of the most valuable lessons learned by the officials on these tours was the importance of appropriating from the beginning an amount sufficient for the entire restoration. In many instances, one legislature would make restoration a priority and begin work and the next legislature would fail to appropriate funds to continue the process, with the result that work faltered and the initial work often had to be redone. Texas officials also became convinced that, in order to restore the building to its original grandeur, the number of people working in the Capitol had to be reduced. Accordingly, plans were drawn for an addition to the Capitol.

Construction

In 1989, the Texas Legislature appropriated $150.1 million to fund the interior and exterior renovation of the Capitol, the construction of a 666,000-square-foot extension, and the renovation of the old General Land Office on the Capitol grounds. (Because the building was in worse condition than originally thought, the total eventually rose to almost $180 million.) Since the original Capitol building is in the shape of a Greek cross (a 560-foot hall bisected by a 287-foot cross hall centered by a 309-foot tall rotunda), any obvious expansion would mar the symmetry of the building. Officials avoided this problem by planning an underground extension. The extension is four floors deep, including a two-level garage for 730 cars. The extension contains offices for 109 of the state's 181 legislators, a 300-seat auditorium, committee hearing rooms, conference rooms, and a cafeteria which serves both government workers and the public.

The restoration of the Capitol required the dislocation of state officials, including the governor, secretary of state, legislators, and their staffs. The occupants were scattered to three different buildings, with the senate housed for two years in an office building several blocks northwest of the Capitol. During that time, the legislature met in both a regular and a special session. During the 73rd Legislature in 1993, the senate met in that office building in a room quickly dubbed the "chamber-ette"; it marked the first time either legislative body had met outside of the Capitol building. By this time, only one wing of the Capitol, the House wing, remained open. Two thirds of the representatives had their offices in other buildings, but the House Chamber remained in use. Upon conclusion of the regular session, the remaining offices were vacated and the entire Texas Capitol was shut down for the first time in 105 years.

Interior Restoration

Restoration work took three years, 34 contractors, 2.5 million work hours, and $82.5 million. (The extension was constructed for $68.6 million.) Before the restoration began, portions of the basement ceiling were shored up by posts like those used to keep mine tunnels from collapsing. The

building contained asbestos and lead paint, which were removed, and miles of wiring — 60 percent of which was dead, useless, or of indeterminate use. The only sprinkler system in the building was in the basement; contractors discovered that the system had been turned off at the hydrant two years earlier.

Over 900 windows were refitted and insulated, the hallways were widened, and partitions and false ceilings were removed, in some instances raising ceiling heights from eight to 22 feet. The removal of partitions resulted in one-third fewer rooms and enough drywall, partitions, and ceilings were removed to fill 10 football fields.

As work progressed, it was discovered that workers installing air conditioning in previous decades had knocked holes the size of cars in fire walls. In addition, ornate cornices had been destroyed and entire rooms had been stripped of their hand-carved wainscoting. It required two years for a crew of 20 workers to restore the woodwork, which stretched for five miles. In order to recreate the missing woodwork, it was necessary to locate antique longleaf yellow pine; newer wood simply was not dense enough to match the existing wainscoting. Fortunately, it was possible to salvage wood from two century-old buildings elsewhere in the state which were demolished around the time the Capitol was being restored. Crews used over 500 variously shaped knives to replicate the 32 carved patterns found in the building. Each of the 404 doors involved 30 different pieces of molding; most modern doors use three to seven pieces.

The ornate plaster cornices were even more difficult to repair. Whole sections had been removed in earlier remodelings, while other sections, which appeared from floor level to be intact, crumbled when work near the ceiling began. Because the original cornices were handmade, modern prefabricated cornices did not match the originals; all of the new and restored cornices had to be created by hand. The level of skill involved in such work forced the contractor to bring plaster workers out of retirement and import workers from other states.

The restoration provided for the return of 11 "historically significant areas" to their appearance prior to 1915, when the first major remodeling took place. Those spaces include the senate and house chambers, the original governor's office, the governor's reception room, and the supreme court and court of criminal appeals courtrooms. The courtrooms are now used for large legislative hearings. The treasurer's business office was another area returned to its original appearance, including the vault and floor-to-ceiling steel bars, and is now used as the office of the Capitol Information and Guide Service. Those 11 areas also include original furnishings and replicas of original carpet and drapery treatments.

As the restoration was in process, the State Preservation Board began an effort to locate original Capitol furnishings. When the Capitol was constructed in the 1880s, it was necessary to purchase 4,000 to 5,000 items of furniture since the previous Capitol and its contents were destroyed in a fire in 1881. Eventually, the board was able to locate more than 2,000 of the original furnishings, many of which had been discarded as surplus or sold at auction in previous decades. Dozens of Texans contacted the board about items in their possession, and many of them donated those items to the state or loaned them to the board to be used as models for the creation of reproductions.

In August 1994, the senate, the Legislative Reference Library, and the secretary of state moved back into the Capitol, and in October the building was reopened to the public for the first time in 15 months. In December, the governor and the house of representatives returned, and in January 1995, members of the legislature convened in their restored chambers. State officials and visitors found a building that contains not only higher ceilings, wider hallways, and 10 million feet of new electrical and telecommunications wiring, but also new air conditioning and heating systems, fire protection and security systems, and an increased number of elevators. There are now almost double the number of restrooms, and the building is more accessible to the handicapped than at any time in its history. In the house chamber the members' desks are even equipped with laptop computers.

On April 21, 1995, the 159th anniversary of the Battle of San Jacinto, which ensured Texas' independence from Mexico, the Texas Capitol building was officially rededicated. A building constructed on the frontier, in a city of 13,000 people and a state of 1,000,000, is now well situated to face the 21st century, serving a population approaching 19,000,000, and, indeed, standing through the "passing ages" Temple Houston envisioned a century ago.

Texas' Capitol Grows Bigger, Better and More Beautiful

By 1994 (or so) the eyes of Texas will be gazing upon a completely restored Capitol and more.

Dave McNeely

The ambitious restoration and expansion of the Texas state Capitol, which will cost close to $185 million before it's through, began in 1983 after the historic building caught fire.

In the early morning hours of Feb. 6 that year, a defective television set touched off a blaze in the Capitol apartment of the lieutenant governor. It claimed the life of a young friend of one of the daughters of then-Lieutenant Governor Bill Hobby.

It also almost claimed the entire building. Fire officials said that the drafty old Capitol, completed in 1888, with no fire barriers between its compartments and a dome that acted as a chimney to fan the flames, came very close to being completely consumed, despite its three-foot-thick walls of pink Texas granite.

The immediate result was that members of the Texas Senate whose offices were above the lieutenant governor's apartment at the back of the Senate chamber were forced to relocate to a nearby state office building while the Senate wing of the Capitol was rebuilt. In the process, the senators, led by Lieutenant Governor Hobby, also decided to return their end of the Capitol to the grandeur of its origins almost a century earlier.

And that accelerated a modest restoration effort that has now grown to the point that the whole Capitol is being restored. In addition, a huge, four-story underground office building and parking garage that will double the available office space of the Capitol is under construction behind the existing structure.

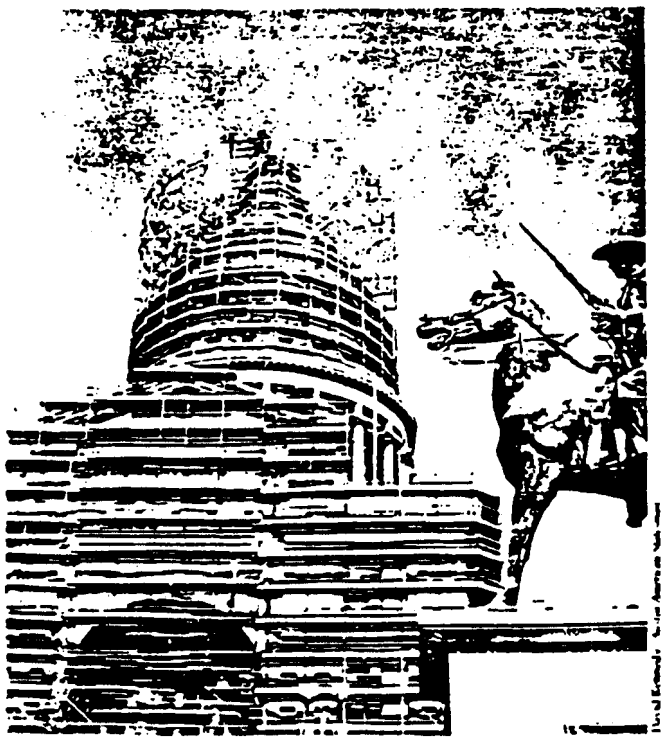
The off-again, on-again nature of the decisions that eventually led to the complete restoration are reminiscent of the attitudes toward the huge building, seven feet taller than the nation's Capitol, from the time it was first conceived more than a century ago. The building and refurbishing of the Texas Capitol has always involved a struggle for money and almost continual changes of plans in the 1980s just as it did in the 1880s. Changes of administrations and changes of mind continually threaten to change the plans, or to take the money for the Capitol and spend it on pressing needs like education.

The current Texas Capitol building was conceived at a time when Texas had thrown off the yoke of post-Civil War Reconstruction. Delegates to a constitutional convention in 1875, with no cash in the state till, agreed to sell off more than 3 million acres of public land in the Panhandle, at 50 cents an acre, to pay for a world-class edifice that would make folks sit up and take notice.

In 1876, Texas voters approved the new constitution, including the land deal. In 1879, the Texas Legislature decided to build the new structure on the site of its three-story, 60-by-100 foot limestone Capitol. In 1881, a committee decided on a design by Elijah E. Myers, the same architect who designed Michigan's and Colorado's Capitol. As if to ratify the decision, in November 1881 the existing Capitol burned.

Its replacement "was claimed to be the seventh largest building in the world, rising in a town of 16,000 people in a state that was broke," said M. Allen McCree, the most recent architect of the Capitol, in a 1988 interview. The financing of the Capitol by the sale of what became the famous XIT ranch, and the construction of the granite building with the help of prison labor, "is a story unequaled in the history of Texas for its boldness and the way the project was carried out."

Although ground was broken in 1882, it was 1888 before the Goddess of Liberty, a 16-foot zinc maiden, was set atop the dome—round, like the nation's Capitol, instead of square as Myers had originally planned. The torch the metal goddess lifted set the building's height at 311 feet.



A devastating fire in 1983 launched a $185 million restoration and expansion project in Texas that will return the 1888 Capitol to its former grandeur.

Dave McNeely, who has covered politics in the Texas Capitol on and off since 1962, is political editor of the *Austin American-Statesman*.

Making sure that they all fit, the Texas Legislature posed in the giant hole that has become offices for 99 House members and 10 senators, as well as committee rooms, an auditorium, a cafeteria and parking for 650 vehicles. Tunnels connect the underground complex to the historic Capitol.

Temple Houston, 27-year-old youngest son of the fabled Sam Houston, blessed the "noble edifice" with words almost as ornate as the building:

"The architecture of a civilization is its most enduring feature, and by this structure shall Texas transmit herself to posterity, for here science has done her utmost. . . . It would seem that here glitters a structure that shall stand as a sentinel of eternity, to gaze upon passing ages, and, surviving, shall mourn as each separate star expires," Houston intoned. "This building fires the heart and excites the minds of all."

Despite the young Houston's high-flown prose, the roof leaked from day one. And as would be the case with several other state capitols built in the same period, it was in constant danger of becoming a glorified torch.

"That the Capitol at Austin is a fire trap is obvious to any casual observer," commented former Senator George C. Purl in 1931. "I have several times during the last eight years made a sincere effort to make this structure as nearly fireproof as possible to do so, but I must confess that I have never been able to get through the necessary appropriation."

Fortunately for Texas, its most recent capitol would narrowly escape being consumed by fire, unlike several state capitols built during the same era. Among states whose capitols burned down or were much more seriously damaged than the Texas structure were Illinois, Iowa, Kentucky, Missouri, New York, North Dakota, Oregon and West Virginia.

Yet as recently as 1989, architect McCree was taking reporters and others on "deficiency tours" of the building. His purpose was to show evidence for his argument that carrying out a master plan to rebuild the structure, which housed 1,300 people in a space designed for fewer than 500, was a race against time.

"With limited exits and all the problems, the building is a disaster waiting to happen," McCree said. "This is not just a restoration project—it's a project to save the building."

Later that year, a small fire in the basement beneath the House chamber contaminated the air with asbestos fibers, and the building had to be evacuated for a weekend while the damage was cleaned up. The event helped make believers of those who might have doubted McCree's sense of urgency.

The Capitol originally was to have been built of Texas limestone. But after the process of mining the limestone was well under way, it was decided the white limestone would be too hard to keep clean. So pink Texas granite was chosen.

That change added to the price, since the granite was farther away and harder to cut. A 16-mile railway had to be built to get the heavy blocks from the granite mountain where they were cut to an existing railhead at Burnet, to be lugged to Austin. The added expense caused some other corners to be cut, making the Texas Capitol less ornate than its Michi-

Idaho Restores Its Capitol After a Fire

The fire that swept through Idaho's 72-year-old Capitol New Year's Day severely damaged the rotunda and offices in the north wing, blackened ornamental plasterwork and marble, and discolored and cracked the exterior sandstone. Repairs will be laborious and expensive; nonetheless, the state is taking great care to preserve historic accuracy. Restoration is expected to take until May 1993.

Jan Frew, the architect from the state's Division of Public Works who is overseeing the restoration, says the construction manager will work with historic preservation experts to see that the job is done right.

At first, the restoration team—made up of architects, engineers, historians and designers—thought they would be unable to match the original sandstone used in the 1920 building to repair the severely damaged east wall of the north wing. However, architects have learned that the original sandstone was quarried only a few miles from Boise and have found stone of similar strength and color to match it.

Inside, smoke stains cannot be removed from some of the marble, and it will be hard to match the original, which came from Vermont, Georgia, Alaska and Italy.

Luckily, one of the most unusual features of the Idaho Capitol escaped major damage. Beautiful scagliola—plasterwork painted by an artist to look like marble—is being cleaned to its original luster.

Whenever possible, local architects and craftspeople will do the reconstruction. Idaho craftspeople will rebuild plaster moldings and wooden window frames. One architect working on the project is the grandson of one of the original architects of the Capitol.

The Division of Public Works estimates that repairing damage from the fire, including restoration and cleaning, restoring lost files and replacing equipment, may cost more than $4 million.

—Mary Renstrom, NCSL

gan cousin—though, in the Texas way, what it lost in detail it made up in bulk: The Texas Capitol was far larger than the one in Michigan.

The continuing changes put Myers at odds with some state officials and others involved with the project, and eventually, he was dismissed from the project.

When the building was finished, it was 566 feet and six inches long and 288 feet and 10 inches wide. It originally had 392 rooms, 924 windows, 404 doors and 18 vaults.

Over the years, particularly in the 1960s when legislators decided to chop up and double-deck some of the old, high-ceilinged rooms to make offices for the 181 legislators, there were many more rooms.

Other changes have been made to accommodate advances in technology. The original building had gas pipes laid to the 3,200 lights in the Capitol—just in case electricity turned out to be a passing fad. The gas lights were never used.

The original Capitol was designed to have air circulated from the cool basement during the hotter months to the second floor where legislators met, and other areas higher in the building. In the 1950s, air conditioning ducts were added, which also added to the clutter of wiring conduits and other unsightly afterthoughts in the increasingly altered building.

The initial stages of the restoration, following the fire in the Senate wing, concentrated on rebuilding particularly that end of the building to its original grandeur. The lieutenant governor abandoned his apartment, substituting instead more office space and a large reception room, which has become a popular spot for official entertainment. Several of the wonderful arches that had been covered over in various earlier "improvements" were restored.

Democratic Governor Mark White, who wrested the office from Republican Bill Clements in a bitter 1982 election, enjoyed living in a refurbished mansion that Clements had restored by hustling private donations. White sought to continue the restoration efforts in the Capitol, again with private funds.

A successful effort was made for such visible but relatively insignificant modifications as removing the almost century-old Goddess of Liberty, and replacing her zinc majesty with a duplicate cast of aluminum. In the dicey process of dropping the new goddess onto her perch by helicopter, builders wondered anew how the original goddess got to the top. The Capitol's records did not say.

Dying elms on the Capitol driveway were also replaced, but not without some controversy about what types of trees should be used. Some preferred live oaks, a hardy staple in arid Texas. Others wanted the original sycamores of the 1880s, even though they had proved to be problems. Others wanted the state tree, the pecan. Eventually, elms, which had replaced the original sycamores, were chosen. Several live oaks on parts of the grounds were set up in huge planter boxes, to be replanted over the underground addition when it is completed.

Former Governor White's private fund-raising efforts were set in motion in the early 1980s. But most conceded, especially after the oil bust that pounded Texas in the mid-1980s, that state money would have to be used.

When Clements got his revenge and unseated White in 1986, he, along with Lieutenant Governor Hobby and House Speaker Gib Lewis, helped push through a Texas Capitol master plan that would restore the Lone Star State's seat of government to its original splendor—but of course with unobtrusive modern conveniences—and with a great deal more office space. There was some wrangling over whether to do it with bond funds, and some efforts to reclaim the money, once committed, for expenditures on such vital needs as public education.

In 1988, the idea of the underground addition for more office space for legislators, and for cars, was added. It was the brainchild of architect McCree, after noting that a Capitol restoration in another state had stalled because there was nowhere to put all the legislative offices while the renovation was going on.

"You can't restore this building unless you get the people out of it," said Dealey Herndon, the former State Preservation Board member who has since become its executive director. The preservation board computed what it would cost to move legislators to other nearby state buildings, displacing the employees in them, and then to move them back—and found that in the long run, it was cheaper to build the underground annex.

Some legislators questioned the need to restore and expand the Capitol at all—particularly when Austin, in the wake of

the oil bust, had several half-empty office buildings. But a critical mass of decision makers, not eager to walk more than a short distance to the House and Senate chambers, pressed ahead.

The new space, with 230,000 square feet of usable office space, will contain 16 committee rooms, an auditorium, a cafeteria and offices for 99 of 150 House members and 10 of the 31 senators whose offices will not be in the old structure. The annex will also have underground parking for 650 cars and will contain the power plants and other machinery necessary to run the old building as well as the new one. The offices in the annex will be connected by underground tunnels to the Capitol and adjacent office buildings. The total cost of the expansion and redoing the Capitol inside and out is expected to have a $185 million price tag before it is through.

In the process of seeking to refurbish the building, Texans studied the efforts of a dozen other Capitol restorations. As a result of that process, decisions were made to:

—Build a Capitol addition to avoid the problems some other states had encountered of where to put legislative offices.

—Start digging a 55-foot-deep hole in the solid limestone behind the Capitol for the underground addition of office and parking spaces early, so that there would be plenty of time for archaeological inspection.

—Use strip-mining techniques, rather than blasting, to remove the almost 40,000 truckloads of limestone necessary for the expansion without damaging nearby buildings.

—Search for historical items from the original Capitol and grounds that could be included. As a result, some of the gates that once surrounded the 26-acre grounds have been located, along with decks, chairs, skylights and other pieces of the original building and its furnishings that had been scattered during previous refurbishings.

—Schedule the restoration of the House and Senate chambers around the 140-day regular legislative sessions in the first five months of odd-numbered years. Texas has also been able to juggle some of the restoration to allow use of the chambers for some special sessions for restructuring education finance and for redistricting.

—X-ray walls for structural problems, to see what might need to be done to make sure the building will be safe for its second century of existence.

—Make air conditioning, wiring and other modern conveniences so unobtrusive that they will be largely unnoticed. Air conditioning, for instance, will go through slits rather than ducts. Electric and telephone wires will be hidden.

—Original spaces are being restored—90 percent of them to their exact configurations from the original building. Modern offices are being integrated by having 8-foot wooden partitions, topped by glass that continues to the high ceilings.

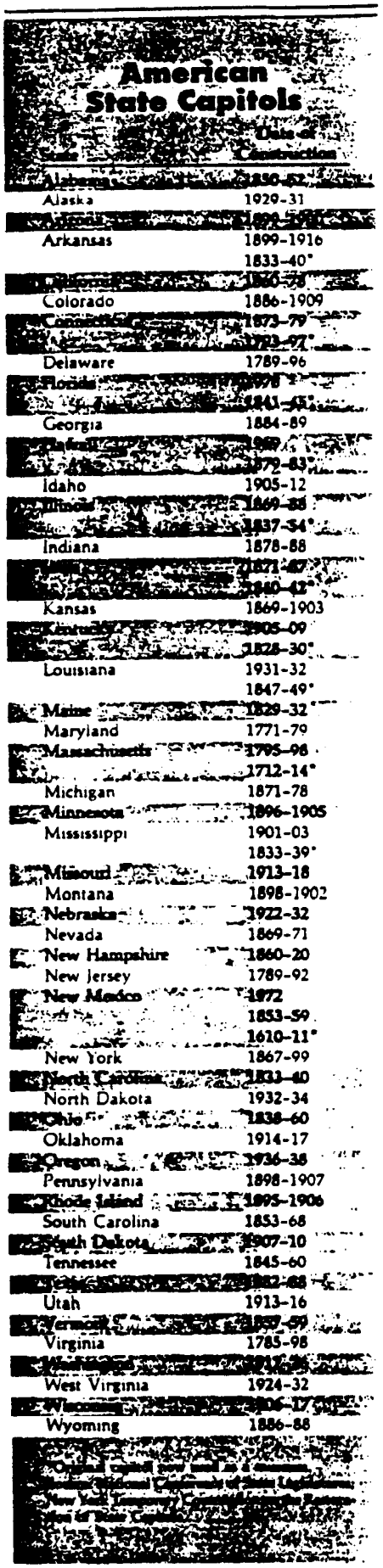
As the fever to get something done about the Capitol increased, the State Preservation Board (which includes the governor, lieutenant governor and speaker of the house) removed architect McCree from the overall responsibility for getting the project done. It left the aesthetic and architectural details to him, but entrusted the straw-boss, general contracting oversight to Herndon, a member of the family that owns *The Dallas Morning News* who had been appointed to the State Preservation Board by Clements.

The new governor, Ann Richards, left Herndon on the board until the Capitol restoration bidding process could be completed, but Herndon moved into the executive director position before the bids were finalized. Herndon's direction of the project was welcomed by some people who thought the project was dragging.

"I think the idea here is to get the job done," Herndon said. She credited the presence of the executive and legislative leaders on the preservation board with the project's progress. Even through changes of administrations, those officials have continued to push to get the restoration done, Herndon said.

Although the underground expansion and the exterior restoration are proceeding on schedule, the interior of the Capitol is presenting problems. The lone bid for the project came in well over the budgeted amount, and as rebidding goes on, there is a very real question whether the project can be completed by the end of 1994, while still accommodating an expected special legislative session in 1992 and the regular legislative session in 1993.

But as was the case with building the Capitol in the first place, it's never easy.



Michigan Recaptures Capitol's Glory

Despite complaints about extravagance in hard times, politicians persisted in restoring the state's venerable Capitol to its Victorian splendor.

Jacquelynn Boyle

Bill Ballenger strode through the first-floor corridor of the Michigan Capitol's south wing recently, past piles of lumber and carpet scraps, empty paint cans and doorways cordoned off by yellow warning tape.

Like most who have worked or spent much time in the 113-year-old building during restoration, Ballenger has come to ignore the unpleasant aspects of restoration: paint remover fumes, layers of sawdust covering the black-and-white tiled floor and, above all, the ear-splitting cacophony of power drills, jackhammers and sanders.

On this day the former state senator, who now publishes a political newsletter, found himself a few steps from the office he'd occupied more than 20 years ago. Although it was far from finished, Ballenger couldn't resist a peek inside.

"My office had been considered one of the last bastions of the old Capitol," said Ballenger, who was there during the first year of his 1971-74 term. "But when I looked at what they had uncovered, I was shocked.

"Compared to what I remembered, it was obvious that even when I had it, it had been bastardized. I was so excited when I saw what they'd done. They had completely opened up stuff I never even knew was there."

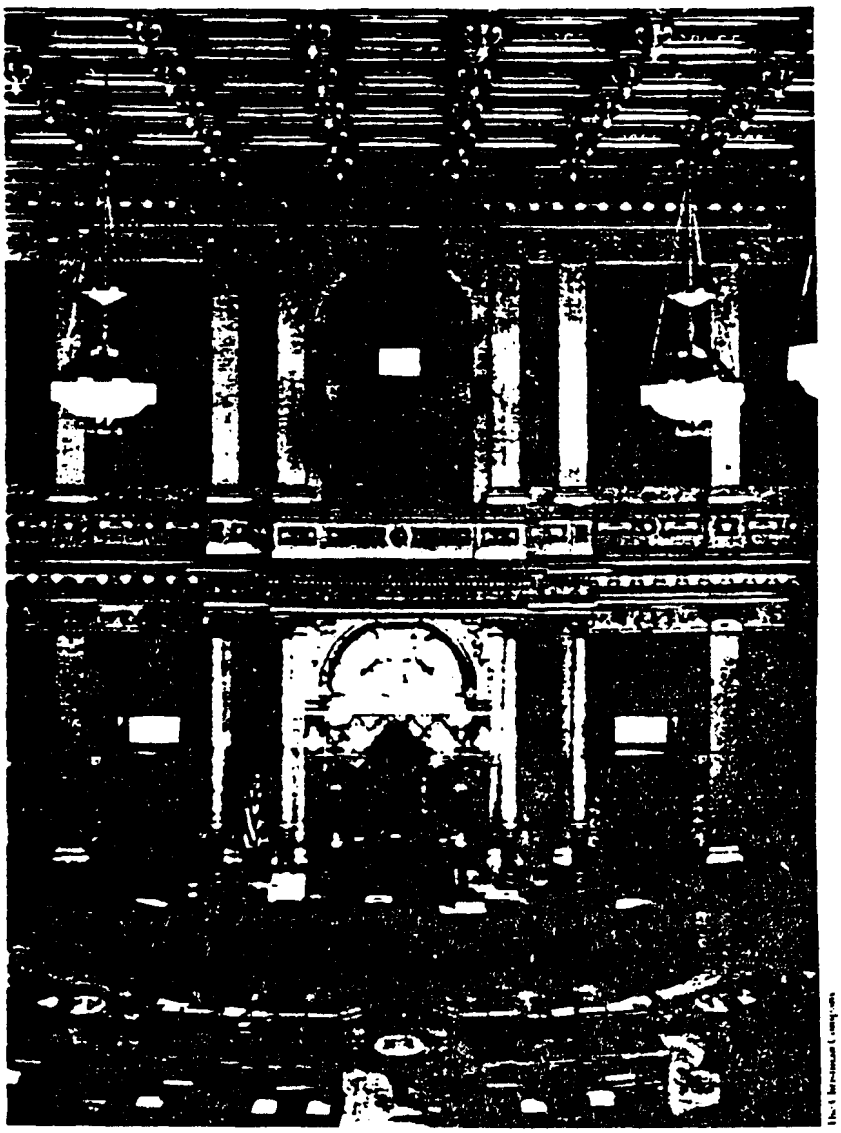
Ballenger found no trace of the tiny bathrooms that had been in his office. And the carved ceiling was quite a bit higher than he recalled. Talking with a work crew, he discovered his bathroom had originally been part of the office next door—and had been returned to it.

Michigan's Capitol is in the final throes of a $38.1 million renovation. Completion is just a few months away, with the interior finished this summer and the exterior slated to be done by early fall.

The results so far are spectacular. Gone are the dilapidated dome, dingy sandstone, peeling paint and marred woodwork. The building, originally designed by architect Elijah Myers in 1871, is once more the painted, paneled, richly furnished Victorian showpiece it was when the heavy carved-wood front doors first opened in 1879.

On the outside, the cast-iron and sheet-metal dome—covered for months with charcoal-colored plastic during repairs—has been painted a gleaming buff. Eroding stone steps have been replaced, wall cracks plugged and the entire outside cleaned.

Inside, all electrical and mechanical systems were updated. Thousands of square feet of "overfloors"—new floors installed halfway up in high-ceilinged rooms to create more office space—have been removed. When the project is finished, only 11 of the 88 legislators who had of-



Michigan's beautifully restored Senate chamber boasts intricately painted walls and ceilings, carved moldings and heavy, ornate furniture

Jacquelynn Boyle is a staff writer for the *Detroit Free Press*.

fices in the Capitol in 1988 will get space. The rest have already moved to a renovated building across the street.

After extensive research based on old newspaper accounts and archival photographs and blueprints, workers uncovered doors and windows that had been bricked over, re-erected walls that had been torn out and peeled away layers of wallpaper and paint to find original wall colors and patterns.

The House and Senate chambers have been repainted, recarpeted and relit. At the turn of the century, each chamber's coffered ceilings set with etched glass panels allowed natural light to filter in through skylights in the roof. But by the 1950s, the skylights had been patched over, and the panels removed.

Few original panels survived, but new ones emblazoned with the emblems of other states were installed, and the skylights were uncovered. In addition to sunlight, crystal and brass chandeliers help show off the elaborately stenciled and gilded walls.

"It's absolutely marvelous what they've done," said Ballenger, a longtime history enthusiast who sits on the board of the Michigan Historical Society.

With a few exceptions, that sentiment is shared by Michigan Governor John Engler, lawmakers and the hundreds of visitors who have seen the building transformed over the past few years.

Also marvelous is the fact that politics has, for the most part, not interfered with this project. Despite the expense—$13 million more than initially planned—it has gone forward in the midst of massive budget problems that resulted in service cuts and layoffs.

"It's surprising, because the people responsible for this are elected to office. Their lives are in two- and four-year chunks. But since this is a long-term project, they had to look at it as an investment in Michigan, since some of them may never personally reside in the building," said Bill Kandler, aide to Democratic House Speaker Lewis Dodak. Kandler is a founding member of Friends of the Capitol, a nonprofit group that works to increase awareness of the building's historical and architectural value.

He added, "These factors made me think this would go in fits and starts, but that never happened."

Unlike many projects undertaken by government, this one has been bipartisan from the beginning. It was conceived during the administration of Republican Governor William Milliken in the late 1970s, began under Democrat James Blanchard during the late 1980s and will be finished by Republican Engler in the 1990s.

Discussions about what to do with the Capitol began in the late 1960s—a period when grand old buildings in many cities were facing the wrecking ball.

The Capitol was in sad shape, and many thought it, too, should be torn down. Lawmakers even commissioned architects to draw plans for a new "atomic age" Capitol, but the result—three huge cube-shaped structures with a tall central pylon—drew public ridicule. In 1982, Milliken finally appointed a committee to decide the building's future. It recommended renovation.

Engler, who was Senate majority leader during most of the Blanchard administration, was an early proponent of restoration, as was his counterpart in the House, Speaker Dodak.

Overseeing it all is the Capitol Committee, a 12-member panel of top officials, legislators from both parties and chambers; the Christman Co., the construction firm that manages the dozens of plasterers, carpenters, electricians and artisans; and architect Richard Frank of Saline.

Last year, Engler and the Democrat-controlled House battled for months over painful cuts Engler said were needed to plug a $1.8 billion deficit in the budget. When the fight was over, hundreds of state employees had been laid off, and nearly 83,000 single adults

Lawmaking takes on a sense of history in the newly restored Victorian splendor of the House chamber and committee rooms in the 114-year-old Michigan Capitol.

Dome Trivia

- Colorado, Connecticut, Georgia, New Hampshire, New Jersey, Iowa, Massachusetts, Nebraska, Vermont, West Virginia and Wyoming all have gold domes.
- Utah, Montana, Arizona, California and North Carolina (the old Capitol) have copper domes.
- Several states have stone domes: limestone in Illinois, marble in Rhode Island, granite in Wisconsin and sandstone in Idaho.
- Pennsylvania's dome is green tile; Maryland's is made out of wood—cypress with cypress pegs.
- Minnesota and Rhode Island have famous world-record domes. They are listed among the four largest unsupported marble domes in the world–the others being St. Peter's in Rome and the Taj Mahal in India.
- During World War II, Massachusetts had a black-painted dome—a precaution in case of an air raid.
- Alaska, Hawaii, Louisiana, New York, North Dakota, New Mexico, Ohio, Virginia and Oklahoma have no dome at all.
- But Oklahomans want a dome. The original 1917 architectural plans for the Sooner State Capitol call for a dome. It wasn't built because it seemed like a frill during the hard times of the Depression and two world wars. Even in the flush days of the 1980s, the Legislature just couldn't justify spending $7.5 million on a dome. Today, a nonprofit group is trying to raise $14 million in private funds so Oklahoma can have its dome. For a $250 tax-free contribution, citizens can buy memorial blocks that will pave a plaza in front of the Capitol and complete the dome.

had lost their general assistance welfare benefits.

This year, the tide of red ink is rising again. State fiscal analysts are guessing that when the 1992 fiscal year ends in September, the budget will have a deficit of at least $800 million.

And though these money woes have led some to question the wisdom of spending millions on the Capitol and its fixtures and furnishings, the overall project is too close to completion for it to be shut down.

"It would be too late. We've already spent $46.7 million," said Jerry Lawler, executive director of the Capitol Committee.

Still, it's come close to stopping several times. A couple of years ago some lawmakers insisted that the state had no business spending millions on a building when it lacked the cash to adequately fund human services and education. At that time, consideration was given to halting construction and boarding up unfinished areas.

Instead, costs were trimmed, including $400,000 for an electronic projection system for the House Appropriations Committee room as well as money for a voice-activated security system for the entire building.

Complaints became a common thread of the debate over welfare, but the work continued. Late in 1991, however, critics found a new whipping boy—the offices and furniture.

There was some grousing about efforts to restore the authenticity of the offices of top officials such as the governor, speaker, majority leader and others. Suites for the speaker and majority leader are about 2,600 square feet, and each man's private office is about the size of a racquetball court.

Public outrage greeted the news that the state was acquiring antique and replica period furniture, often at a cost of several thousand dollars per item. The purchases included a $5,700 marble-topped cabinet, $3,100 handcrafted desks and $2,500 chairs.

After weeks of squabbling over who was responsible, Senate Majority Leader Richard Posthumus put a stop to Senate purchases. On Feb. 21, he cut by 60 percent plans to spend $738,000 on museum-quality furniture. Already purchased items were either returned or put up for sale.

For now, those who have offices in the Capitol will use more ordinary furniture from state stockpiles while House and Senate carpenters build new pieces at a much lower cost.

Senator Lana Pollack supports the restoration, but believes it should have been done on a much smaller scale and over a much longer period of time.

"We have an obligation to maintain the Capitol and other public buildings. But it's the opulence that's out of balance," said Pollack, a frequent critic of the project.

"Why should we let science laboratories at our colleges be destroyed because we don't fix the roof, and then invest in $2,000 tables for a legislator? I support restoration but not decoration," she said.

Pollack complained that some of the work has been thoughtless. On the fourth floor, for example, work was done and then redone because no one liked the initial results. The same thing happened with the vestibules of the House and Senate, she said.

"They were spending money as if it were play money and not real. They—and I mean both parties—didn't demand of themselves the scrutiny that they would have given their own personal budgets," Pollack said.

But the project is not as extensive as originally planned. Renovation blueprints called for surrounding the building with 300,000 square feet of underground offices sunk three stories deep to replace those displaced by the Capitol changes.

The subterranean complex would have given each legislator a skylight view of the dome and would have been linked to the main Capitol by tunnels. The Legislature ultimately decided it was unwise to invest more than $100 million in what one lawmaker described as "a great bomb shelter."

In early March, several state leaders signed a letter asking the U.S. Department of Interior to designate the Capitol a national historic landmark. And the project has been nominated for a coveted Honor Award from the National Trust for Historic Preservation.

Says Lieutenant Governor Connie Binsfeld, "This beautiful old building is quickly reaching the stage when Michigan residents will take pride in it as they did in 1879. It was designed to be a monument to our state and its people, and I can think of no better tribute to that original thinking."

Fire Department and Building Code Consultant Reviews

The Working Group requested that representatives of the Denver Fire Department and building code consultants to the State Building Engineers review the health and life safety requirements that were developed by previous studies. These reviews were conducted to ensure that the Working Group had identified the proper minimum requirements to correct the existing health and life safety deficiencies in the building. The Working Group also requested these representatives to provide professional opinions on the merits of the alternatives that were selected for recommendation. These representatives provided verbal and written commentary regarding their opinions of the health and life safety requirements and of the alternatives that were developed.

Copies of letters from the Denver Fire Department and A.E. West, building code consultants, are provided on the following pages. Also provided is a copy of a comparative summary matrix of the major code requirements, and supporting matrix notes, that were used to evaluate five building code standards. These standards were used to develop the final health and life safety requirements.

WELLINGTON E. WEBB
Mayor

CITY AND COUNTY OF DENVER

DEPARTMENT OF FIRE

FIRE PREVENTION BUREAU
745 WEST COLFAX
DENVER, COLORADO 80204
(303) 640-5522

November 1, 1995

Mr. Dennis L. Larsen, Project Manager
State of Colorado
General Support Services, Capital Complex Facilities Planning
1341 Sherman Street
Denver, Colorado 80203
fax 866-2592

Re: State Capital Building Life Safety Systems

Dear Mr. Larsen:

The Denver Fire Prevention Bureau over the past several years has participated in the development, review and approval of the "Fire Protection and Life Safety Plan" for the State Capital. This program is obviously not code compiling with current building and fire codes, however, it is a reasonable minimal standard that is consistent with other redevelopment and historical preservation projects in Colorado and across the country.

In review of the attached Fire Protection and Life Safety Plan and "matrix", the Fire Prevention Bureau concurs with the approach recommended for implementation and the apparent priority established by the matrix. We strongly support the overall concept of significantly improving the fire and life safety of the occupants by providing the following improvements:

* **Improvement of the exiting system including exit stairs as described the Fire Protection and Life Safety Plan.**
* **Installation of a complete fire suppression system in accordance with NFPA.**
* **Installation of a fire alarm system with annunciation.**
* **Installation of an emergency power system and emergency lighting.**
* **Installation of a smoke control system.**

Conclusion and Recommendation:

The Denver Fire Department considers the Colorado State Capital to be an irreplaceable historical monument to the citizens of Colorado. Based on its present condition without the proposed fire protection and life safety improvements, the occupants safety is compromised. Additionally the safety of the fire fighters should be considered if a fire were to occur in a building of this complexity. Therefore, the Denver Fire Department recommends and strongly encourages the Capital Building Health and Life Safety Project Working Group to maintain the Fire Protection and Life Safety Plan as a base document providing "minimal life safety standards". If financial constraints must guide the overall implementation of this plan, then consideration should be given to prioritize the project over several years. But in any event the installation of these minimum life safety requirements should be done completely and in accordance with nationally recognized standards and fire protection and life safety practices.

If you have any questions regarding these comments please contact my office at 640-7515.

Sincerely:

Roderick Juniel, Division Chief Fire Prevention Bureau

cc: Richard Gonzales, Chief of Fire Denver Fire Department
Stephen Rondinelli, Fire Protection Engineer

a west
ARCHITECTS DESIGNERS PLANNERS CODE CONSULTANTS (303) 750-8181

November 6, 1995

Dennis Larsen
Capitol Complex Facilities
Department of Administration
1341 Sherman Street
Denver, Colorado 80203

Re: Life Safety Plan - Colorado State Capitol Building

Dear Mr. Larsen,

These are summarized concepts related to the Final Report, dated September 1990, including subsequent revisions in the Schematic Design version of the Life Safety Improvement Matrix received from CWF/JB October 20, 1995. Full implementation of this program will achieve less than 100% equivalence with today's fire and life safety standards; and therefore we consider it a minimum guide for maintaining and extending the significant role of the building on a scale at least equal to commerce and industry.

We believe the report is a comprehensive analysis which has identified the major life and fire-safety deficiencies based on current codes and standards, including input from the Denver Fire Department. A reasonable assessment is that full implementation of this program would correct 80% of the known deficiencies through completion of all four (4) phases of work. We also recognize that 100% could only be achieved through unacceptable modifications of the original structure.

The up-grades are not mandated by any existing code. The deficiencies cited in the report are not violations of regulatory code enforcement bodies. The State

would be administering this program through its own diligence and initiative for safeguarding the fiduciary functions embodied by the capitol building.

In our role as code consultant to State Buildings Programs, we believe the up-grades omitted from the program are truly non-feasible; or properly not required of existing buildings. These are up-grades to Type I-Fire-Resistive, non-combustible construction, corridor reconstruction and enclosure of stairs. Corridor up-grades are generally exempted in existing buildings with automatic sprinklering throughout; and thus not considered detractions from full compliance. UBC/DBC Appendix 1 (1991) or UBC Appendix 34 (1994).

Smoke Control & Stair Enclosures

The addition of Atrium smoke control can be used to off-set the omission of enclosures for stairs in, or open to, the Atrium. (UBC 402.2) This includes the existing four (4) stairs which connect the 2nd and 3rd Floor Levels; and the four (4) new stairs proposed to connect the 1st and 2nd Floor Levels as shown on pages 156 and 158.

We estimate that the addition of smoke control in the Schematic Design revision has elevated the compliance level to the current 80% level of protection.

Exits through Atrium

Open stairs may be used within an Atrium as long as the travel distance to an exit does not exceed 100'. (UBC 402.4)

The length of unprotected travel along these stairs must then be considered an increment toward the prescribed maximum within an Atrium. (UBC 402.4) The

100' limit will be exceeded if the stair enclosures are omitted; so this will remain an issue which does not meet full compliance for all of the occupants on and above the 2nd Floor Level. This impacts roughly one-half of the building occupants.

Another observation regarding the original report is that the NFPA 101M Equivalency evaluations (Pages 35 - 107) show a deficiency under the Egress Provided category for all but the Attic in the summary on Page 37. It appears that the scoring for equivalent safety will suffer a further reduction in the individual area of Item 10, Exit Access, because of the excessive exit travel.

Elimination of 2nd Floor Stairs discharging directly to the outside

Footnote 16 indicates that direct exits from the 2nd Floor will be further investigated. This is related to the previous issue in that the new stairs from the 2nd Floor will remain open; and thus contribute to the 100' travel limitations within an Atrium. If additional direct exits to the outside can be provided from the 2nd Floor, the issue of travel distance within the building is neutralized for a good portion of the building. This will increase the assessment of compliance.

The addition of a powered Atrium smoke control system and the operation of elevators for emergency rescue will be additional loads on the emergency power system which unfortunately has been relegated to the final phase of construction. Therefore, the benefits of full implementation cannot be realized until the final phase is completed. This leaves an open potential for losses during the interim phases.

If a minimal program must be established, we suggest that of all of the identified up-grades, automatic sprinklering throughout, installed in accordance with NFPA

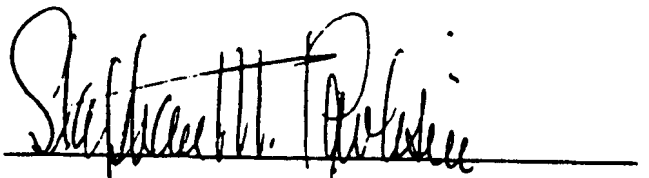
13 standards, will provide the biggest return. An active fire suppression and alarm system in place for the earliest stages will assure that a progressive attainment of the 80% objective can be achieved without interim losses. By itself, the sprinkler protection is considered a major part of the 80% package. Without it, or with only part of the building sprinklered, the up-grade package comes closer to being 80% incomplete.

NFPA provides assuring information to support the effectiveness of automatic sprinkler systems in their documentation of fire events for the last 100 years. Quoting from Appendix 3, NFPA 101 (Life Safety Code), "NFPA has no record of a fire killing more than two people in a completely sprinklered building where the system was properly operating, except in an explosion or flash fire or where industrial or fire brigade members or employees were killed during fire suppression operations."

The second most important aspect is the addition and improvement of exits and exit routes as have been identified in the report. The existing deficiencies for all levels above the 1st floor and at the subbasement are noteworthy and significant.

Thank you for providing this opportunity to evaluate the proposed Life Safety Plan. We believe the plan will achieve the safeguards for life and property which are the basic minimums in current code applications.

A E WEST, LTD. / ARCHITECTS & CODE CONSULTANTS



Stephen M. Pavlisin, R. A.
ICBO #4495

COLORADO STATE CAPITOL
LIFE SAFETY PLAN

The following matrix is a comparative summary of major code requirements derived from all five code standards, as well as the recommendations of this Plan:

LIFE SAFETY IMPROVEMENT	NFPA 101	NFPA 101M	UBC	UCBC	LCSM	LSP	FINAL
EXITING							
- Additional dome exit	YES	YES[3]	YES	YES	YES	YES	YES
- Enclose existing dome exit with 2-hr rated construction	YES	YES	YES	YES	YES	YES	YES
- Additional attic exit	YES	YES	NO[1]	NO[1]	YES	YES	YES
- Additional 2nd floor exit stairs that discharge directly to outside	YES[2]	YES[2]	YES[2]	*YES	YES	YES	*NO[16]
- Additional Sub-basement exit stair	YES	YES	YES[1]	YES[1]	YES	NO	YES
- Additional exits for assembly rooms	YES	YES	YES	YES	YES	YES	YES
- Correct dead end corridors	YES	YES	YES	NO[4]	YES	NO	NO
- Additional exit signs	YES	YES	YES	YES	YES	YES	YES
- Upgrade emergency exit plans and graphics	YES	YES	YES	YES	YES	YES	YES
- Unlock 1st floor main exit doors	YES	YES	YES	YES	YES	YES	YES
- Lighting on emergency power for all exits	YES	YES	YES	YES[6]	YES	YES	YES
FIRE PROTECTION							
- Complete fire sprinkler system	YES	YES	YES	YES	YES[8]	YES	YES
- Replace standpipes	—	YES	YES	—	YES	YES	YES
- Additional fire extinguishers	YES	YES	YES	—	YES	YES	YES
CONSTRUCTION							
- Enclose exit stairs	YES	YES	YES	*YES[10]	YES	YES	*NO[17]
- Enclose non-stair shafts and vertical openings	NO[9]	NO[9]	YES	NO	YES	NO	NO
- Rated exit corridors	YES	YES	NO	NO	—	NO	NO
- Fire rated structural systems	YES[11]	YES[11]	YES	NO[12]	—	NO[7]	NO[7]
- Separations between Sub-basement and tunnels	YES	YES	YES	NO	—	YES	YES
- Upgrade interior finishes to at least Class "B" in exits	YES	—	YES	NO[13]	—	NO	NO
FIRE DETECTION/ANNUNCIATION							
- Complete fire alarm system	YES	YES	YES	*NO[14]	YES	YES	YES
- Smoke detection system	YES	YES	YES	*NO[14]	NO	YES	YES
SMOKE CONTROL							
- Smoke resistive barrier at corridor openings	YES	YES	YES	YES	—	YES	YES
- Automatic and Manual shut-off of HVAC systems from central locations	—	—	YES	YES	—	YES	YES
- Elevator shaft ventilation	—	—	YES	YES	—	YES	*YES[18]
- Stair shaft pressurization	—	—	YES	*NO[15]	—	YES	*YES[17]
- Smoke detectors at air handling units	—	—	YES	—	—	YES	YES
- Atrium smoke control system	—	—	YES	—	—	NO	*YES

MATRIX KEY

YES	= Improvement is required by code standard/recommended by Life Safety Plan
NO	= Improvement is not required by code standard/recommended by Life Safety Plan
—	= Code standard does not address this improvement
NFPA 101	= National Fire Protection Association, Life Safety Code, 1988 Edition
NFPA 101M	= National Fire Protection Association, Alternative Life Safety Code, 1988 Edition
UBC	= Uniform Building Code, 1988 Edition
UCBC	= Uniform Code for Building Conservation, 1987 Edition
LCSM	= State of Colorado Loss Control/Safety Manual, 1988 Edition
LSP	= Colorado State Capitol-Life Safety Plan
FINAL	= Colorado State Capitol-Life Safety Project, Schematic Design

CODE REQUIREMENTS MATRIX NOTES

1. One sub-basement and attic exit is acceptable if the entire floor is dedicated to service functions (UCBC 402(c), exception 4).

2. All four corner exit stairs must discharge directly to the exterior unless the level(s) of discharge are protected throughout by an approved automatic sprinkler system and the entire discharge level(s) are separated from areas below by two-hour fire resistive construction. If these protection and separation requirements are met, then only two stairs must discharge directly to the exterior (NFPA 101/5-7.2, 9-2.3, 27-2.3).

3. The common path of travel concept permits a combined dome exit for the first 75'-0" of distance. A second exit stair would be provided from the attic to the third floor primarily to serve dome occupants, but a second attic exit could be provided with the simple addition of a door (NFPA 101__).

4. Dead end corridor lengths need not be limited in office occupancies (UCBC Table A2-A, item 18).

5. The dome should be limited to 50 occupants. Dome exits should be supplemented with a pressurization system as additional protection since these exits are in a high-rise zone, are discontinuous and discharge to the third floor corridor.

6. Emergency powered lighting in exit corridors is not required in business occupancies (UCBC Table A2-A, item 21).

7. Structural systems will remain generally unprotected. However, additional fire rating of the basement floor system is recommended as noted in Section II.

8. Sprinklers are only required in sub-basement, attic and assembly areas (LCSM 4.23n).

9. Enclosure of non-stair openings is not required if a complete fire sprinkler system is provided, and 50% of exit stairs are in two-hour rated enclosures and discharge directly to outside (NFPA 101/27-3.1.2) and UCBC A206(b).

10. Enclosure of required stairways may be of non-rated construction if a complete fire sprinkler system is provided (UCBC A206(b)).

11. Fire rating is required at the basement and first floor only (NFPA 101/27-3.1.2).

12. Although fire rated structural systems need not be provided (UCBC 605(c)), non-rated wood, cast iron and wrought iron members are a serious deficiency in a building without fire detection or fire suppression systems.

13. Interior finish upgrades (refinishing of wood trim for lower flame spread), are not required if a complete fire sprinkler system is provided (UCBC A206(b)).

14. A fire department communication system is required only if a portable fire department radio system is ineffective. Smoke detectors and an occupant voice notification system are not required in an office occupancy. A manual fire alarm system is not required if a complete fire sprinkler system is provided (UCBC Table A2-A, items 2, 3, 4 and 5).

15. Stair shaft pressurization/ventilation is not required if a complete fire sprinkler system is provided (UCBC Table A2-2, item 11).

16. Direct exits to the outside are an alternate that will be investigated further.

17. An exit stair directed air movement system is provided in lieu of physical enclosures at all levels, all stairs (a physical enclosure is provided at some locations where historically compatible).

18. Pressurized elevator shafts are NOT provided.

Functional Space Planning Summary

The Study Resolution authorizing the Health and Life Safety Project required that a functional space planner be retained to assist the Working Group in developing the alternatives. The Working Group recognized that the implementation of any of the alternatives would affect the executive and legislative functions in the Capitol building. Therefore, the Working Group requested the functional space planner to develop feasible space plans for each alternative that would minimize disruption to those processes and to the occupants and visitors of the building.

A copy of the Functional Space Planning Summary, prepared by C.W. Fentress, J.H. Bradburn, and Associates, the functional space planner, is provided on the following pages.

Study of the various life safety alternatives focused on maintaining the smooth function of government. This study indicated that occupants should be temporarily relocated while construction in that area took place. This relocation might take place in other areas of the Capitol Building, to another existing building, or to a new facility.

In order to ascertain how much space would be required, a detailed analysis was made of the space requirements and the functional relationship between departments or user groups. Each group (Governor's Office, Lt. Governor's Office, OSPB, House, Senate, Legislative Council, State Patrol, Legislative Legal Services, Treasurer's office) was interviewed to determine how the group was organized, how it interfaced with other groups or state agencies within or outside the building, a listing of the current space needs, equipment requirements and future space requirements.

Utilizing the gathered data, it was possible to examine each alternative proposal to determine how must space would be required to accommodate the temporary relocation of the various departments or groups. A decision was made by the Working Group that existing space allocation for some groups could be reduced slightly, if necessary, since the relocation is on a temporary basis during the period of construction. The allocation varies by alternative and the length of relocation (i.e., several 6 month periods for Alternative One vs. one 2½ year period for Alternative Three).

Each of the alternatives proposed has been planned to meet the space requirements of the assigned user groups. For alternative number three, for instance, the space on each floor of the Annex Building was laid out in enough preliminary detail to ensure that there was adequate space to accommodate the requirements of the department assigned to that floor. These layouts were reviewed, refined and approved with the Working Group and a representative of each user group.

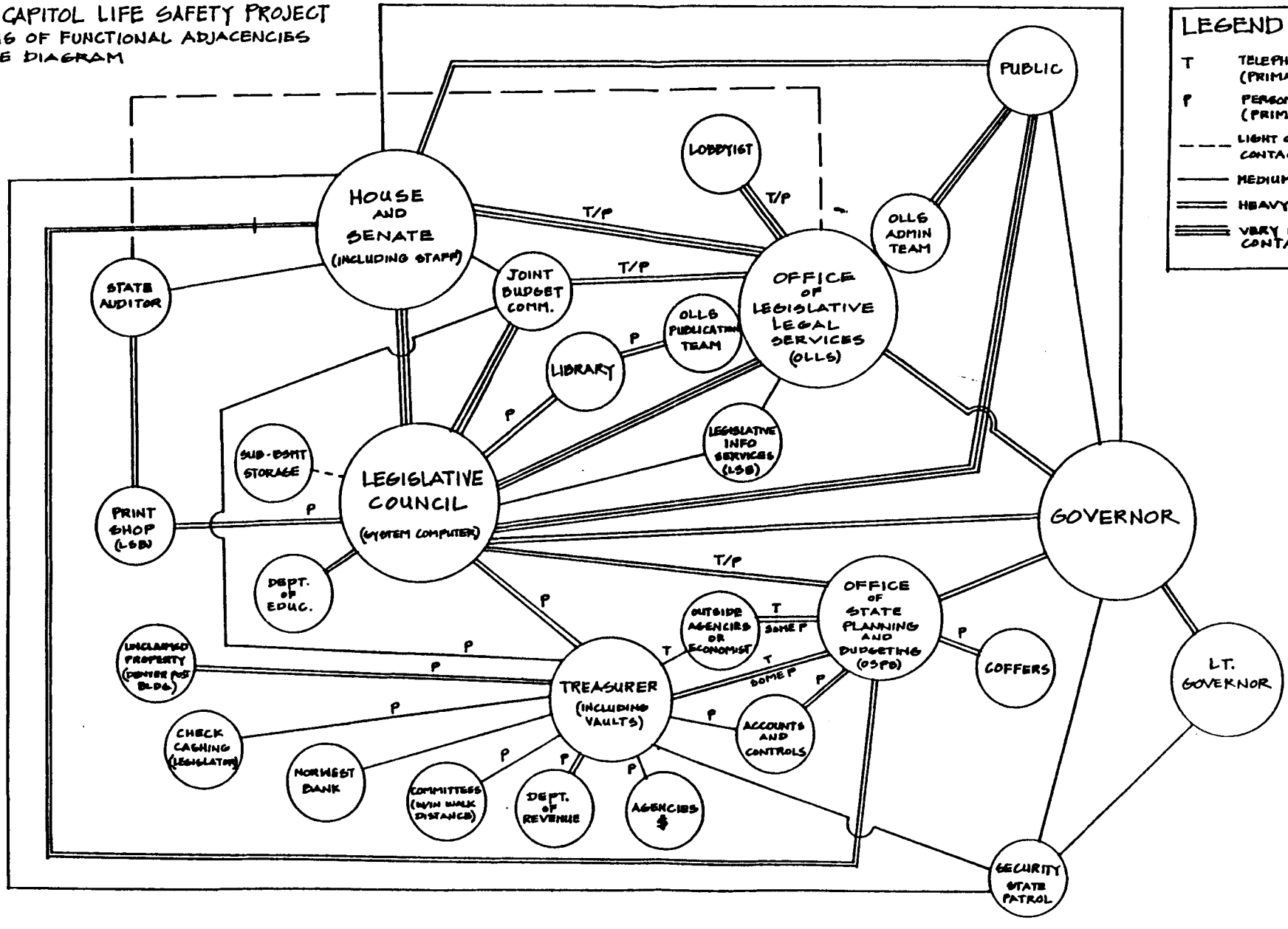
Upon adoption of a specific alternative, additional work will be required to complete the functional space planning process. A final survey of each group will be made to determine all detailed space, equipment and functional requirements. These requirements will be documented in a manual of space needs requirements. Detailed layouts will then be prepared for each user group. These will be reviewed with the head or representative of each group and modified as necessary to achieve the best possible utilization of the available space. This phase will include the indication of furniture, equipment, audiovisual, security, cafeteria equipment, and other specialty systems on the floor plans so that the users can be sure that all needs are met. The final step will involve the selection of floor, ceiling, and wall finishes and colors, as well as the location of all required services such as lighting fixtures, power and telephone outlets, fire sprinkler heads and air supply grilles.

A comparison matrix of existing space use and temporary relocation space for alternative proposal #3 in the State Annex Building and the Legislative Services Building is shown on the following page.

COLORADO STATE CAPITOL – HEALTH AND LIFE SAFETY PROJECT
Space Matrix
October 30, 1995

Item	Governor's Office		Lt. Governo		House		Senate		Legislative Legal		Legislative Council		OSPB		Treasurer		State Patrol		TOTAL
	#	Area	#	Area	#	Area	#	Area	#	Area	#	Area	#	Area	#	Area	#	Area	
P01/250 s.f.	1 2	1200 500	1 2	500 500	1	250	3	750	1	250	6	1500	2	500	2	500			
P02/200 s.f.	3	600	- -		3	600	6	1200	3	600	1	200	- -		- -		2	600	
P03/150 s.f.	- -		- -		65	9750	35	5250	16	2400	- -		- -		- -				
P04/100 s.f.	8	800	2	200			5	500	- -		4	400	16	1600	- -				
001/120 s.f.	13	1560	1	120	6	720	9	1080	3	360	26	3120	2	240	10	1200			
002/84 s.f.	20	1680	2	168			- -		20	1680	8	672	- -		5	420			
003/45 s.f.	6	270	- -				- -		- -		- -		- -		- -				
Subtotal		6610		1488		11320		8780		5290		5892		2340		2120		600	
30% circulation/stor		1983		446		3396		2634		1587		1768		702		636		180	
Total Calculated	53	8593	8	1934	75	14716	58	11414	43	6877	45	7660	20	3042	17	2756		780	57772
Existing Office Space in Capitol Building		10130		1620		18784		11063		9747		8641		4359		2998		500	67842
Mtg. & Comm. Rooms		- -		- -		3500		4200		- -		- -		- -		- -		- -	7700
Chambers		- -		- -		4220		3185		- -		- -		- -		- -		- -	7405
Library		- -		- -		- -		- -		2685		- -		- -		- -		- -	2685
Cafeteria		- -		- -		- -		- -		- -		- -		- -		- -		3480	3480
Total Existing		10130		1620		26504		18448		12432		8641		4359		2998		3980	89112
Space in Annex Bldg.	53	13485	8	1175	75	12760	58	14045	43	13380	45	7400						2300	64774
Annex Chambers						4150		3200											7350
Annex Mtg. & Comm. Rooms						2860		4040											6900
Space in Legis. Services Bldg.													20	4100	17	3000			7137
Total Temp. Space		13485		1175		19770		21285		13380		7400		4100		3000		2300	85895

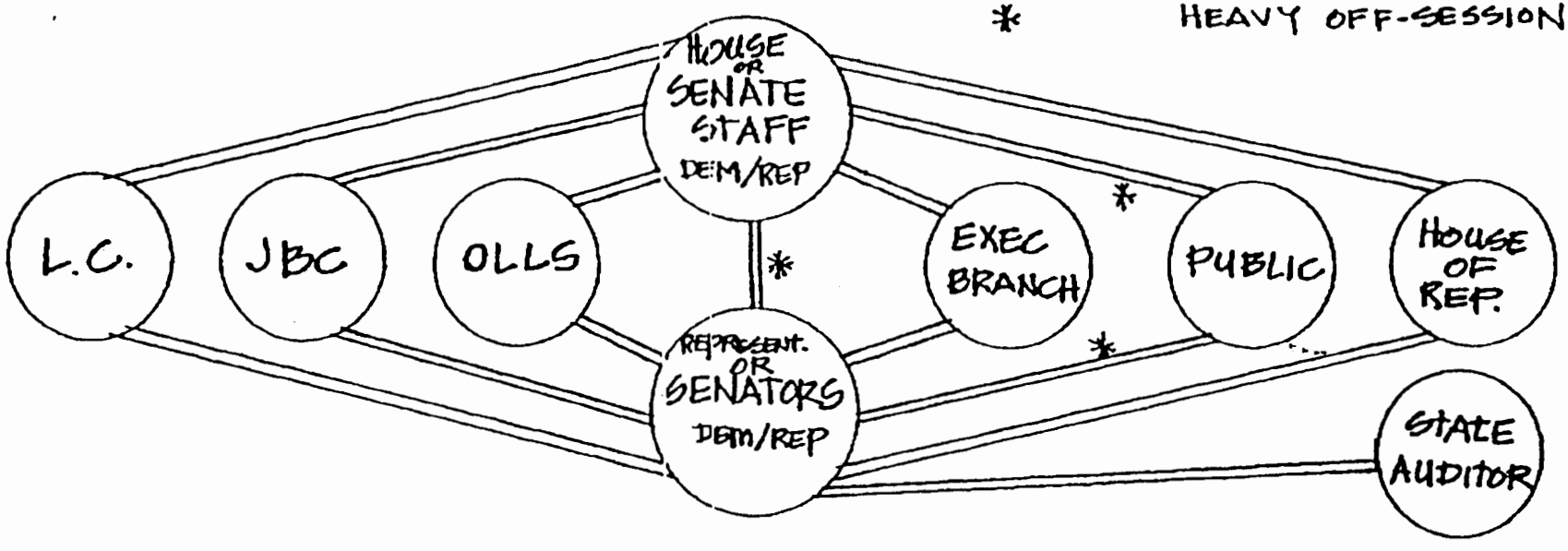
STATE CAPITOL LIFE SAFETY PROJECT
ANALYSIS OF FUNCTIONAL ADJACENCIES
BUBBLE DIAGRAM



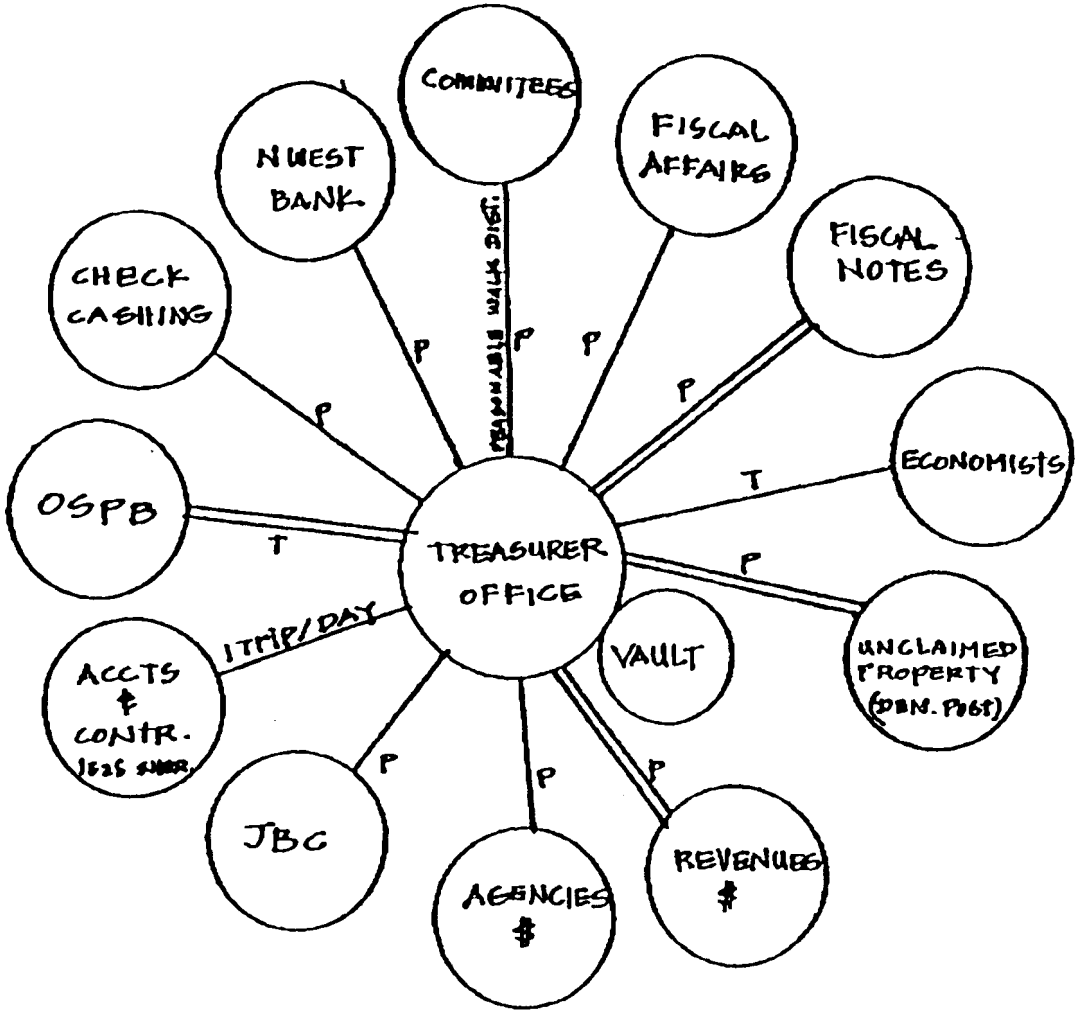
LEGEND

T = TELEPHONE CONTACT (PRIMARILY)
P = PERSONAL " "

- - - - - VARIABLE CONTACT
——— LIGHT "
═══ MEDIUM "
═══ HEAVY "
* HEAVY OFF-SESSION



HOUSE OR SENATE DIAGRAM



TREASURER'S DIAGRAM

LEGEND

T = TELEPHONE

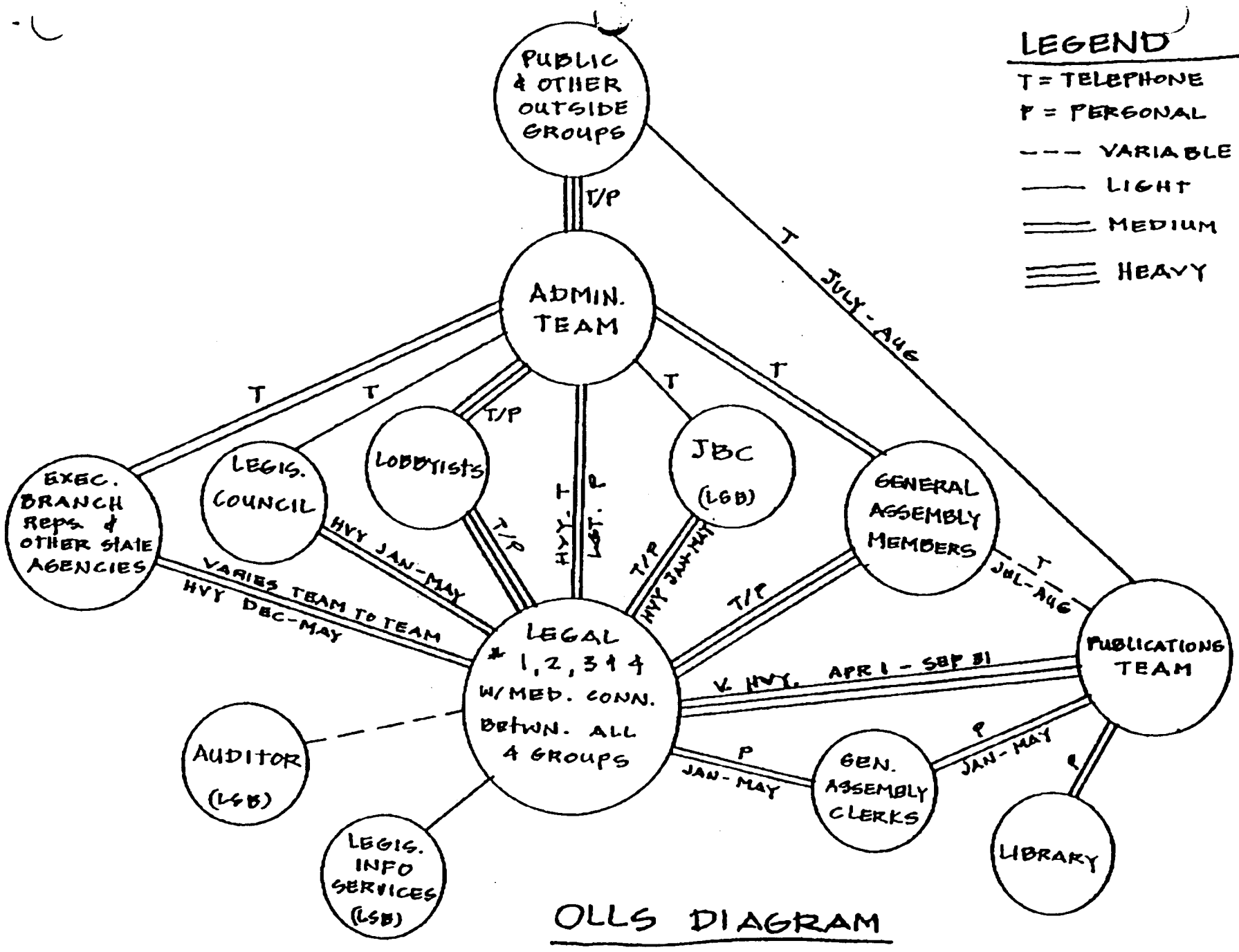
P = PERSONAL

--- VARIABLE

—— LIGHT

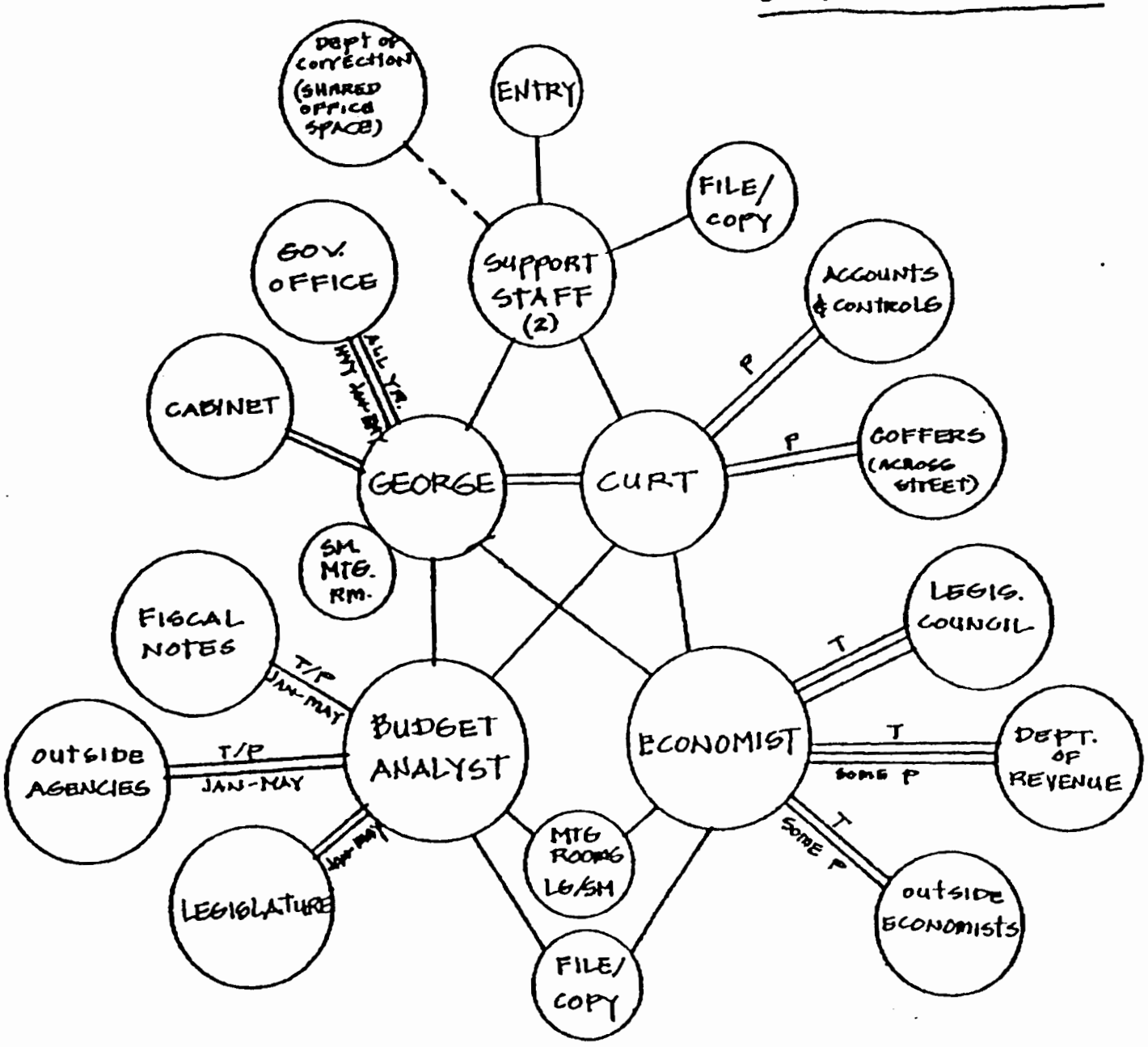
═══ MEDIUM

═══ HEAVY



OLLS DIAGRAM

OSPB DIAGRAM



LEGEND

T = TELEPHONE

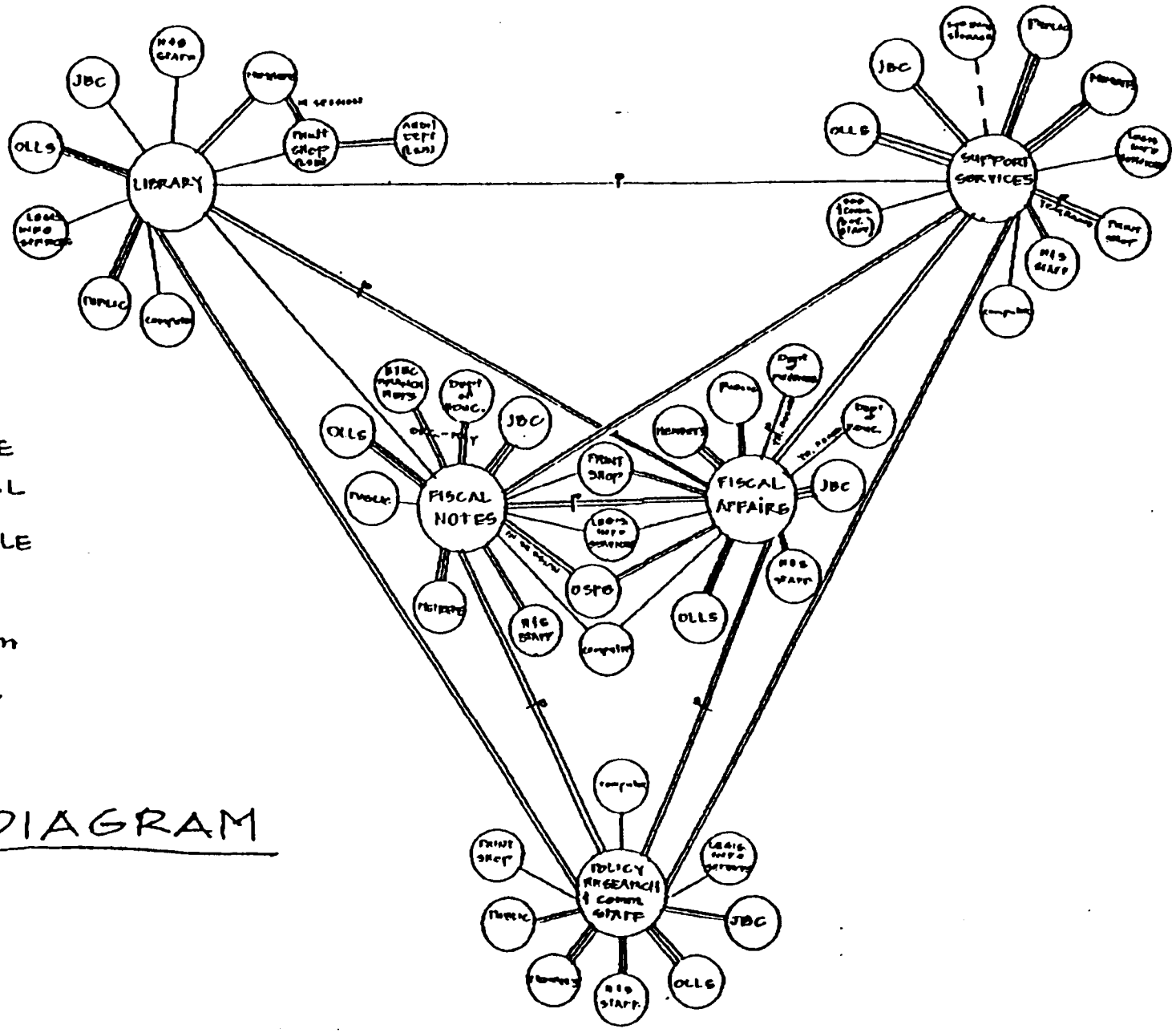
P = PERSONAL

- - - → VARIABLE

——— LIGHT

═══ MEDIUM

═══ HEAVY



T = TELEPHONE

P = PERSONAL

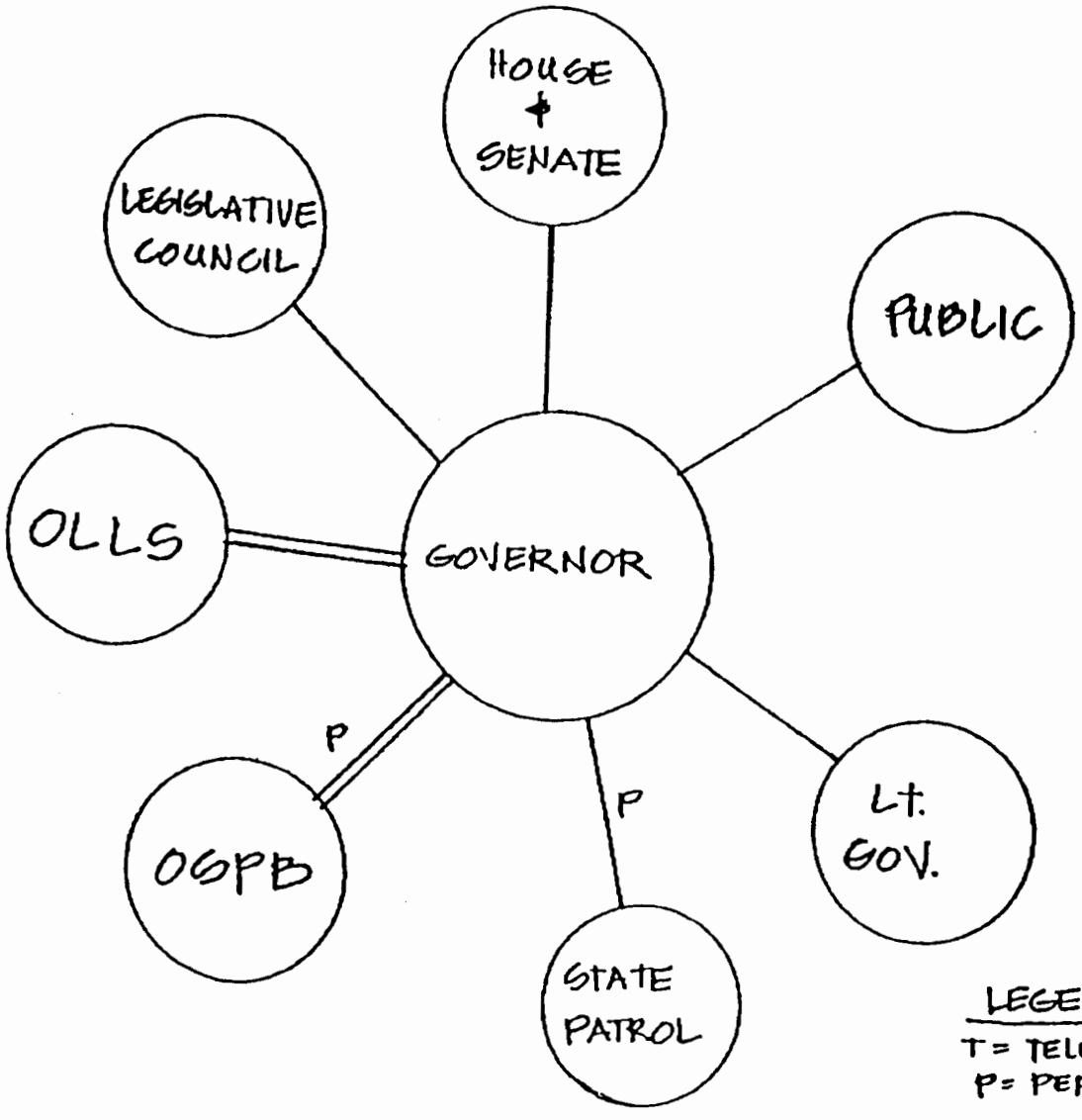
--- VARIABLE

—— LIGHT

═══ MEDIUM

═══ HEAVY

L.C. DIAGRAM



LEGEND

T = TELEPHONE CONTACT (PRIMARILY)
P = PERSONAL CON "
--- VARIABLE OR LIGHT CONTACT
——— MEDIUM CONTACT
═══ HEAVY CONTACT
═══ VERY HEAVY CONTACT

GOVERNOR'S DIAGRAM

MAY 16, 1994

Life Cycle Operating Costs and Leased Space Summary

Many of the existing Capitol building systems have outlived their normal useful lives, they have become extremely inefficient, and recurring maintenance costs are escalating. In the event that building systems renovations are accomplished, the cost of operating and maintaining those systems would be affected. New mechanical and electrical systems would be more energy efficient and would substantially reduce the per unit consumption of electricity, water, and gas utilities. Likewise, the recurring maintenance costs per new unit would be substantially reduced during the initial years of operation. However, proposed renovations would introduce more air handling units, air conditioners, pumps, switches, and electric motors into the systems, which would increase the total utility consumption and long-term maintenance requirements.

Some state agencies that are currently occupying leased commercial space in the metro-Denver area would be likely candidates to occupy some or all of the resulting finished space that could be provided by Alternatives #2, #3, and #4. Long-term state expenditures for office space lease costs could be reduced by eventually relocating state agencies from commercial space to state owned facilities.

Therefore, the Working Group resolved that each alternative to be developed should identify the resulting potential impacts to building systems life cycle operating costs and to state lease costs. Copies of summaries of the life cycle cost report and the facility lease cost report, prepared by C.W. Fentress, J.H. Bradburn, and Associates, the project architect, are provided on the following pages.

SYSTEMS LIFE CYCLE COST MATRIX

Mechanical Summary

The existing mechanical systems in the Capitol range from 45 years of age in the Senate and House chambers to 6 years in the Governor's offices. Piping systems for domestic water and steam piping are those originally installed and many will probably fail within the next 20 years. Although excellent chemical treatment of the steam system has been maintained for several years, deterioration due to age and previous inadequate treatment have created a situation that is tenable but will become worse in the next 20 years. The Current 20 Year summaries for Alternatives #1 and #2 do not incorporate failure of any system but do anticipate significant increased labor and material costs for the systems. At the end of the next 20 years, some systems may still be operable. However, comfort requirements, energy and codes will probably require replacement of the systems. Costs for complete replacement of these systems are not included in the operation and maintenance costs.

By replacing and upgrading the heating systems throughout the Capitol, an estimated $2,892,435 will be saved over the next 20 years without considering inflation. With inflations at 5 percent per year, the savings is estimated at $5,959,998 between Alternative #1 and Alternatives #3 and #4. The savings is a result of reduced Public Service Company (PSCO) steam usage due to mechanical equipment efficiency, the HVAC Energy Management System, and reduced material costs. Labor costs will increase as a result of the HVAC equipment that is being added. Alternatives #3 and #4 provide for HVAC throughout the Capitol and increase the cooling load requirements from 385 tons to an estimated 1,100 tons. The increased costs are incorporated into the electrical loads since the chiller plant, pumps, fans, etc., all increase electrical power requirements. Another important factor in replacing the existing HVAC systems is the incorporation of fire zones with each system. Fire zones would reduce atrium smoke control requirements and save approximately $300,000 as compared to the life safety system provided by Alternatives #1 or #2.

Upgrade of the mechanical systems in the Annex does not appear to be cost effective for energy and maintenance savings alone. Savings in operational costs in 1995 dollars is estimated to be $819,285 and $1,672,442 with inflation. Savings is obtained primarily from PSCO reduced steam usage, not maintenance costs. Renovation and upgrade costs for the systems are estimated to be $2,500,000. However, in addition to operational savings, life safety, comfort and control of space conditions is enhanced considerably. Currently, the Annex mechanical system is essentially a one pass system with minimal return air to the air handling system and cannot be balanced. Large volumes of conditioned air are continuously exhausted, wasting significant energy. Balancing assures the proper volume of air is directed to each space in the Annex to satisfy the needs of the occupants.

Electrical Summary

The operational and maintenance (O&M) costs for each alternative are based on specific assumptions which have been listed elsewhere in this report. The "Current" assumption list contains the base assumptions, and the various alternatives show the deviations from the "Current."

Some observations are readily made. Without electrical equipment and lighting replacement, the maintenance costs rise substantially as equipment is replaced upon failure. For example, comparing Current 20 Year values with Alternative #3 costs at the Capitol, maintenance costs are an additional $2,206,868 (in 1995 dollars) without electrical systems replacement. This accounts for the fact that the overall O&M costs are reduced with Alternative #3, even though electrical loads increased by $1,068,028 (in 1995 dollars) over the period with the additional HVAC loads and increase in computer usage after Alternative #3 construction.

It should be noted that with electrical and lighting systems replacement, such as with Alternative #3, the overall O&M costs are reduced, but material costs for routine maintenance increase. This increase is due to higher costs for energy efficient equipment such as T8 fluorescent lamps.

The new building, being similar in size as the Annex, has similar O&M costs to the Annex renovation alternate.

Mechanical Assumptions - General

1. A labor rate of $37.46 per hour is the base rate used. This rate includes all benefits such as medical, vacations, FICA, etc.

2. Fuel usage is based on $8.17 per 1,000 pounds of steam (MLB) provided by PSCO. Rate and annual usage is based upon an average over the last 3 years usage data provided by PSCO.

3. MLB of steam for each facility was proportioned by the square footage percent of each building's portion of the capitol complex square footage. The Capitol and the Annex were weighted heavier to account for large atrium spaces in the Capitol and the inefficiency of the Annex.

4. Operating costs include PSCO steam. Maintenance costs include personnel, in house material, and contracted labor/material costs.

5. Operating hours of the facilities are between 6:00 a.m. and 7:00 p.m. for normal operations with extended hours during legislative sessions.

6. All new systems will be incorporated into the Building Management System. Both the Annex and the Capitol will have meters for energy usage installed.

7. Architectural maintenance requirements and costs such as janitorial services are not included.

8. No systems are replaced except where new systems are identified in the Life Cycle Cost Matrix Outline. O&M costs do not include any systems replacement, although systems may require partial or complete replacement due to a significant failure that might occur during the 20 year period due to the age of the systems. Domestic systems and steam systems that are original and air systems in excess of 20 years are strong candidates for failure and probably require replacement.

9. O&M costs at reduced rates are carried in the estimates for areas under construction to accommodate construction requirements and to maintain systems functionability for domestic water, life safety, and heating. These costs include basic system requirements when an entire building is off line.

10. Inflation was based on 5 percent per year.

11. Water consumption was not included as a part of the analysis since it was identified as a minor cost for these facilities.

12. Electrical requirements for mechanical fans, pumps, and chilled water generation are based upon estimated consumption rates for the existing equipment, plus equipment added or replaced during renovation or upgrades. Electrical costs are included in power usage.

13. The life cycle analysis is based on several assumptions for O&M costs. Since these costs are not currently individually metered or tracked for each building in the capitol complex, the analysis pro-rates total complex O&M costs for the Capitol and the Annex. Additionally, several assumptions for new systems design features are included. The analysis makes reasonably conservative assumptions on these issues to identify order-of-magnitude comparison of life cycle costs for each alternative. The actual life cycle cost for the selected alternative will likely vary slightly from the amounts included in the analysis.

Mechanical Assumptions — Capitol

Current 20 Year Projection

Due to the age of mechanical equipment to include HVAC and domestic hot water systems, labor requirements were increased 5 percent per year. Material to include parts, controls, and piping were increased 15 percent per year. The basis for labor and material was extrapolated from data provided by Capitol Complex Facility personnel and consideration for significant repairs due to the age of the steam system, domestic system, and several air handling systems.

Alternative #1 — 20 Year Projection

Increases were similar to current 20 Year Projections except fuel cost increases for the sub-basement HVAC upgrade to accommodate swing space, as well as atrium heating requirements for ventilation introduced via the Life Safety system fans starting 1998.

Alternative #2 — 20 Year Projection

The existing steam heating is replaced and new ventilation and air conditioning systems are provided for 45 year old systems in the House and Senate chambers. Only O&M costs are incorporated in the matrix.

Alternatives #3 and #4 — 20 Year Projection

1. These costs incorporate the Life Safety requirements and new HVAC systems. Fuel usage decreases are due to more efficient systems. Labor and material costs were also reduced.

2. Labor is increased by 1 percent per year after completion of construction. Material costs are increased 5 percent per year.

Mechanical Assumptions — Annex

Current — Alternative #1 and Alternative #4

No change in current operations. Labor increased 4 percent per year and capitol costs 12 percent per year due to age and deterioration of equipment.

Alternative #2 and Alternative #3

After construction, labor is increased by 1 percent per year and material costs by 5 percent per year. Fuel usage and labor costs are reduced over current costs due to more efficient and newer equipment.

New Building — Alternative #4

1. Steam was considered as the heating fuel source for consistency in the overall analysis.

2. Heating costs were estimated based upon 100,000 square feet of finished office space.

Electrical Assumptions

Current 20 Year Projection

1. The life cycle analysis is based on several assumptions for operating and maintenance costs. Since these costs are not currently individually metered or tracked for each building in the capitol complex, the analysis pro-rates total complex O&M costs for the Capitol and the Annex. Additionally, several assumptions for new systems design features are included. The analysis makes reasonably conservative assumptions on these issues to identify order-of-magnitude comparison of life cycle costs for each alternative. The actual life cycle cost for the selected alternative will probably vary slightly from the amounts included in the analysis.

2. Due to age of electrical equipment, maintenance costs increase every 5 year period by 5, 10, 20, and 40 percent over 20 years for materials and 5 percent each year for labor.

3. A 5 percent per year increase for lighting materials and labor is included after the first 10 years due to the age of the fixtures.

4. Without any electrical upgrades, the capacity for additional office loads such as computers, printers, etc., is not available. Therefore, it is assumed the electrical load remains the same over the 20 year period.

5. Based on Complex square footage and PSCO information, the average electric power usage over the last 36 months is 5,041,169 KWH per year.

6. Further assumptions:

   - $9,300 per year spent for lighting ballasts, lamps, etc;
   - 2,080 man hours per year (1995) for maintenance at $37.46 per hour. 25 percent of the labor is for lighting;
   - Lighting is 40 percent of KWH used;
   - Fluorescent ballasts replaced once very 20 years;
   - Fluorescent lamps replaced every 3 years, incandescent twice a year.
   - Cost per KWH is $0.059.

Electrical Assumptions — Capitol

Alternative #1 (Changes from Current)

1. Additional electrical load for life safety fans and sub-basement HVAC = 781,695 KWH per year.

2. Additional sub-basement receptacle load = 100,000 KWM per year.

3. Additional sub-basement lighting load = 140,000 KWM per year.

4. Additional maintenance man hours per year = 68.

5. Additional miscellaneous electrical materials = $325 per year.

6. Additional ballasts, lamps, etc. = $300 per year.

7. Reduced power usage during construction.

Alternative #2 (Changes from Current)

1. With additional receptacles in office areas and associated increase in power usage, power consumption increases by 480,000 KWH per year.

2. Additional electrical loads for life safety fans and HVAC additions = 589,136 KWH per year.

3. Reduced lighting load by 25 percent.

4. Lighting material cost reduced to $7,500 per year.

5. Lighting maintenance reduced 25 percent.

6. After 15 years, lighting materials and labor increases by 5 percent per year.

Alternatives #3 and #4 (Changes from Current)

1. Additional electrical load for new HVAC units throughout = 912,475 KWH per year.

2. Additional power consumption from increase in computer usage, etc. = 480,000 KWM per year.

3. Lighting load reduced by 25 percent.

4. Lighting material costs reduced to $7,500 per year.

5. Maintenance man-hours reduced to 1,040 hours per year.

6. With all main electrical equipment replaced, equipment age is not a factor. However, after 15 years, lighting materials and labor increases by 5 percent per year.

7. Miscellaneous electrical materials cost reduced to $4,000 per year.

Electrical Assumptions — Annex

Current — Alternative #1 and Alternative #4

1. Due to age of electrical equipment maintenance, costs increase every 5 year period by 10, 20, 30, and 40 percent over 20 years for materials and 5, 10, 15, and 20 percent for labor.

2. A 5 percent per year increase for lighting materials and labor is included due to the age of fixtures.

3. 832 man hours per year (1995) for maintenance at $37.46 per hour. 25 percent for lighting.

4. $6,000 per year for miscellaneous electrical materials.

5. $4,000 per year for ballasts, lamps, etc.

6. Electric power usage = 1,810,383 KWH per year based on Complex square footage and PSCO information (for last 12 months).

7. Lighting is 40 percent of KWH used.

Alternatives #2 and #3 (Changes from Current)

1. Mechanical electrical load reduced by (130,983 KWM per year).

2. Lighting load reduced by 25 percent.

3. Lighting material costs reduced to $3,000 per year.

4. Miscellaneous electrical materials reduced to $3,000 per year.

5. Electrical equipment age is not a factor after the replacement of all the main electrical equipment.

6. After 15 years, lighting materials and labor increase by 5 percent per year.

New Building — Alternative #4

1. Mechanical electrical loads are the same as the Annex renovation alternatives.

2. With similar square footage as the Annex, the electrical loads and maintenance requirements are assumed to be the same as the Annex renovation alternative.

3. During construction, power usage is part of Construction Costs.

COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT SYSTEMS LIFE CYCLES COST MATRIX
NOVEMBER 20, 1995

CURRENT - 20 YEAR PROJECTION

ITEM	YEARS 1-5	YEARS 6-10	YEARS 11-15	YEARS 16-20	TOTAL '95 $	TOTAL W/INFLATION
CAPITOL						
- Mechanical	Existing Mechanical Systems remain as is. Maintenance to include labor and materials is increased significantly due to equipment obsolescent and piping systems deterioration.					
	1,293,207	1,635,285	2,192,175	3,144,886	8,265,553	15,749,558
- Power	Additional Maintenance Due to Age					
	1,270,449	1,386,034	1,593,077	2,310,023	6,559,583	12,187,803
- Lighting	Additional Maintenance Due to Age					
	738,755	738,755	761,833	807,965	3,047,308	5,334,167
ANNEX				**CAPITOL SUBTOTAL**	**17,872,444**	**33,271,528**
- Mechanical	Existing Mechanical Systems remain as is. Maintenance to include labor and materials is increased significantly due to equipment obsolescence and piping systems deterioration.					
	427,668	515,469	643,436	836,386	2,422,959	4,513,774
- Power	Add Maintenance Due to Age					
	486,336	589,797	932,218	2,386,118	4,394,570	9,104,649
- Lighting	Add Maintenance Due to Age					
	278,852	296,854	319,829	349,152	1,244,687	2,213,289
				ANNEX SUBTOTAL	**8,062,216**	**15,831,712**
TOTAL					**$25,934,660**	**$49,103,240**

COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT SYSTEMS LIFE CYCLES COST MATRIX
NOVEMBER 20, 1995

ALTERNATIVE #1 - 20 YEAR PROJECTION

ITEM	YEARS 1-5	YEARS 6-10	YEARS 11-15	YEARS 16-20	TOTAL '95 $	TOTAL W/INFLATION
CAPITOL						
- Mechanical	Existing Mechanical Systems remain as is. Life safety systems are installed providing ventilation for atrium. New HVAC systems installed for the sub-basement swing space only.					
	1,329,952	1,757,772	2,314,662	3,267,374	8,669,760	16,503,343
- Power	+ Mechanical & Electrical Load for Life Safety Fans and Sub-basement.					
	1,424,186	1,641,747	1,849,660	2,581,062	7,496,654	13,894,057
- Lighting	+ Lighting Load for Sub-basement.					
	766,345	784,739	808,569	856,202	3,215,855	5,650,682
ANNEX				**CAPITOL SUBTOTAL**	**19,382,269**	**36,048,082**
				- CURRENT YR. CAPITOL SUBTOTAL	**-17,872,444**	**-33,271,528**
					1,509,825	**2,776,554**
- Mechanical	Existing Mechanical Systems remain as is. Maintenance to include labor and materials is increased significantly due to equipment obsolescence and piping systems deterioration. Same as Current Conditions.					
	427,668	515,469	643,436	836,386	2,422,959	4,513,774
- Power	Add Maintenance Due to Age. Same as Current Condition.					
	486,336	589,797	932,218	2,386,118	4,394,570	9,104,649
- Lighting	Add Maintenance Due to Age. Same as Current Condition.					
	278,852	296,854	319,829	349,152	1,244,687	2,213,289
				ANNEX SUBTOTAL	**8,062,216**	**15,831,712**
					27,444,485	**51,879,794**
				CURRENT YR. ANNEX SUBTOTAL	**8,062,216**	**15,831,712**
					- 0 -	**- 0 -**
TOTAL						

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COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT SYSTEMS LIFE CYCLES COST MATRIX
NOVEMBER 20, 1995

ALTERNATIVE #2 - 20 YEAR PROJECTION

ITEM	YEARS 1-5	YEARS 6-10	YEARS 11-15	YEARS 16-20	TOTAL '95 $	TOTAL W/INFLATION
CAPITOL						
- Mechanical	Mechanical Systems remain essentially the same with some upgrade of (E) systems and addition of Atrium Life Safety System. The House and Senate Chambers as well as some AC in areas currently without have been included in operational and maintenance. Approximately 96 tons of cooling have been added.					
	1,300,816	1,709,186	2,266,076	3,218,787	8,494,865	16,186,870
- Power	Reduced Maintenance with some upgrades. Additional Mechanical loads for LS.					
	1,231,107	1,407,978	1,766,872	2,483,818	6,889,775	12,933,489
- Lighting	Additional Maintenance Due to Age. Same as Current Conditions.					
	701,817	555,641	556,691	574,421	2,388,570	4,072,655
ANNEX				**CAPITOL SUBTOTAL**	**17,773,210**	**33,193,014**
				CURRENT YR. CAPITOL SUBTOTAL	**-17,872,444**	**-33,271,528**
					<99,234>	**<78,514>**
- Mechanical	Renovation and upgrade of existing mechanical systems to improve efficiency and comfort.					
	359,923	388,866	413,160	441,725	1,603,674	2,841,332
- Power	Upgrade of existing systems. Maintenance reduced from current.					
	386,578	413,779	413,779	434,930	1,649,066	2,889,020
- Lighting	More efficient fixtures. Lighting load reduced.					
	220,071	214,230	214,230	222,884	871,417	1,512,206
				ANNEX SUBTOTAL	**4,124,157**	**7,242,558**
				CURRENT YR. ANNEX SUBTOTAL	**8,062,216**	**15,831,712**
					<3,938,059>	**<8,589,154>**
TOTAL					$21,897,367	$40,435,572

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COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT SYSTEMS LIFE CYCLES COST MATRIX
NOVEMBER 20, 1995

ALTERNATIVE #3 - 20 YEAR PROJECTION

ITEM	YEARS 1-5	YEARS 6-10	YEARS 11-15	YEARS 16-20	TOTAL '95 $	TOTAL W/INFLATION
CAPITOL						
- Mechanical	Complete renovation of mechanical systems to include life safety, ventilation and additional AC for area requiring it. More efficient equipment incorporated into the building management system. Enhance monitoring, response comfort and control of mechanical systems.					
	1,180,070	1,230,051	1,538,4027	1,828,802	5,777,325	10,543,345
- Power	New electrical systems. Reduced mintenance					
	1,069,844	1,046,023	1,469,162	1,495,801	5,080,830	9,202,958
- Lighting	New efficient lighting fixtures. Reduced lighting load.					
	627,942	393,281	532,342	546,167	2,099,731	3,637,816
ANNEX				**CAPITOL SUBTOTAL**	**12,957,886**	**23,384,119**
				CURRENT YR. CAPITOL SUBTOTAL	**-17,872,444**	**-33,271,528**
					< 4,914,558 >	**<9,887,409 >**
- Mechanical	Renovation and upgrade of existing mechanical systems to improve efficiency and comfort.					
	359,923	388,866	413,160	441,725	1,603,674	2,841,332
- Power	Upgrade of existing systems. Maintenance reduced form Current.					
	386,578	413,779	413,779	434,930	1,649,066	2,889,020
- Lighting	More efficient fixtures. Lighting load reduced.					
	220,071	214,230	214,230	222,884	871,417	1,512,206
				ANNEX SUBTOTAL	**4,124,157**	**7,242,558**
				- CURRENT YR. ANNEX SUBTOTAL	**8,062,216**	**15,831,712**
					<3,938,059 >	**<8,589,154 >**
TOTAL					**$17,082,043**	**$30,626,677**

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COLORADO STATE CAPITOL - HEALTH AND LIFE SAFETY PROJECT SYSTEMS LIFE CYCLES COST MATRIX
NOVEMBER 20, 1995

ALTERNATIVE #4 - 20 YEAR PROJECTION

ITEM	YEARS 1-5	YEARS 6-10	YEARS 11-15	YEARS 16-20	TOTAL '95$	TOTAL W/INFLATION
CAPITOL						
- Mechanical	Complete renovation of mechanical systems to include life safety, ventilation and additional AC for area requiring it. More efficient equipment incorporated into the building management system. Enhance monitoring, response comfort and control of mechanical systems.					
	1,180,070	1,230,051	1,538,402	1,828,802	5,777,325	10,543,345
- Power	New electrical systems. Reduced maintenance.					
	1,069,844	1,046,023	1,469,162	1,495,801	5,080,830	9,202,958
- Lighting	New efficient lighting fixtures. Reduced lighting load.					
	627,942	393,281	532,342	546,167	2,099,731	3,637,816
ANNEX			**CAPITOL SUBTOTAL**		**12,957,886**	**23,384,119**
			- CURRENT YR. CAPITOL SUBTOTAL		**-17,872,444**	**-33,271,528**
					< 4,914,558>	**< 9,887,409>**
- Mechanical	Existing Mechanical Systems remain as is. Maintenance to include labor and materials is increased significantly due to equipment obsolescence and piping systems deterioration.					
	427,668	515,469	643,436	8363865	2,422,959	4,513,774
- Power	Add Maintenance Due to Age					
	486,336	589,797	932,218	2,386,118	4,394,570	9,104,649
- Lighting	Add Maintenance Due to Age					
	278,852	296,854	319,829	349,152	1,244,687	2,213,289
			ANNEX SUBTOTAL		**$8,062,216**	**$15,831,712**
			- CURRENT YR. ANNEX SUBTOTAL		**8,062,216**	**15,831,712**
					- 0 -	**- 0 -**

ITEM	YEARS 1-5	YEARS 6-10	YEARS 11-15	YEARS 16-20	TOTAL '95$	TOTAL W/INFLATION
NEW BLDG						
- Mechanical	Operation and Maintenance costs not included for 1996 thru 1998 during construction.					
	109,761	390,368	486,838	634,173	1,621,139	2,749,396
- Power	New efficient systems.					
	82,756	413,779	413,779	434,930	1,345,244	2,551,076
- Lighting	New efficient lighting.					
	42,846	214,230	214,230	222,884	694,191	1,315,077
			NEW BLDG SUBTOTAL		$ 3,660,574	$ 6,615,549
TOTAL					$24,680,676	$ 45,831,380

Colorado State Capitol – Health and Life Safety Project

Facility Lease Cost Matrix

November 1, 1995

Item	Current Annual Lease Cost	Current 20 – year Lease Cost 1996 – 2016	Alternative 1 20 – year Lease Cost 1996 – 2016	Alternative 2 13 – year Lease Cost Savings 2003 – 2016	Alternative 3 13 – year Lease Cost Savings 2003 – 2016	Alternative 4 13 – year Lease Cost Savings 2003 – 2016
STATE AGENCY CURRENT LEASES						
40,000 r.s.f. x $ 9 s.f.	360,000	7,200,000	No Change	4,680,000	4,680,000	
12,000 r.s.f. x $ 10 s.f.	120,000	2,400,000	No Change	1,560,000	1,560,000	
30,000 r.s.f. x $ 11 s.f.	330,000	6,600,000	No Change	4,290,000	4,290,000	
TOTAL 82,000 r.s.f. (ALT. 2 & 3)	810,000	16,200,000	16,200,000	10,530,000	10,530,000	
45,000 r.s.f. x $ 9 s.f.	405,000	8,100,000	No Change			5,265,000
40,000 r.s.f. x $ 10 s.f.	400,000	8,000,000	No Change			5,200,000
40,000 r.s.f. x $ 11 s.f.	440,000	8,800,000	No Change			5,720,000
TOTAL 125,000 r.s.f. (ALT. 4)	1,245,000	24,900,000	24,900,000			16,185,000

Notes: 1. Lease area (s.f.) and rate ($/s.f.) are examples only for agencies that are likely candidates to locate in the Capitol Complex. Example costs will be refined for actual agency leases that may be absorbed in the renovated Annex or new building.

2. All costs are in 1995 dollars.

Restoration Summary

During construction, historical restoration could be incorporated into the health and life safety project and be accomplished in an efficient and cost-effective manner. For this study, the Working Group resolved that all the alternatives to be recommended should focus on health and life safety provisions with explicit consideration given to maintaining the existing historical integrity of the building. However, in the event that historical restoration were to become a priority, the Working Group requested that restoration recommendations be developed for future consideration. A copy of the Restoration Summary, as prepared by C.W. Fentress, J.H. Bradburn, and Associates, the project architect, is provided on the following pages.

COLORADO STATE CAPITOL
RESTORATION SUMMARY

October 25, 1995

1. Historic Preservation Zone, Highest Finish ("Public Areas")

1.1. Areas

- First Floor public corridors.
- First & Second Floor rotunda.
- House, Senate and old Supreme Court chambers.

1.2. Scope of Work

A. Public corridors and rotunda.

- Re-painted plaster walls, ceilings and ornamental trim to match original design, including decorative paint.
- Light fixtures to match original where fixtures are currently missing (allowance of forty fixtures).
- Clean floor and wall stone surfaces.
- Miscellaneous demo and repair.
- Refinish woodwork and wood doors in most areas.

B. Chambers

- Restore House and Senate ceiling vaults to original conditions.
- Retrofit or replace lighting in all three chambers to match original.
- Upgrade existing audiovisual systems in all three chambers.
- Remove existing raked floor and seating in Supreme Court to restore original flat floor and seating layout. Retrofit entrances for flat floor. (Need further field verification that this was the original design; coordinate with ADA improvements.)

- Carpet to match original all three chambers.

- Retrofit existing desks and provide new member chairs in House and Senate chambers.

- Replace existing gallery seating in House and Senate chambers, to more closely match original.

- Consider revising vestibules for House and Senate Chambers to restore original corridor condition in these areas (Need further functional discussion on this item.)

- Remove adhesively applied acoustic tile on House and Senate chamber walls. Restore decorative painted plaster wall and ceiling surfaces to match original. Add fabric-wrapped acoustic wall panels in some areas for necessary sound control.

- Restore decorative painted plaster wall and ceiling surfaces in Supreme Court.

- Miscellaneous demolition and repair.

2. Historic Preservation Zone, Medium Finish ("Public Areas")

2.1. Areas

- Second and Third Floor public corridors.
- Third Floor and Dome Level rotunda.
- Second and Third Floor existing corner stairs.

2.2. Scope of Work

- Repaint plaster walls, ceilings and ornamental trim to match original design; assume minimal decorative painting these areas, just polychrome paint scheme.

- Light fixtures to match original (allowance of ten fixtures).

- Remove existing vinyl tile flooring at Dome and restore original floor (verify original materials).

- Clean stone floor and wall surfaces.

- Remove existing stainless steel guardrail at Dome interior; retrofit with railing system more compatible with original guardrail.

- Refinish woodwork and wood doors in most areas.

- Miscellaneous demo and repair.

3. Historic Preservation Zone, Lower Finish

3.1. Areas

- Basement public corridors and rotunda.

3.2. Scope of Work

- Repaint plaster walls, ceilings and ornamental trim to match original; assume no decorative painting these areas.

- Clean stone floor and wall surfaces.

- Refinish woodwork and wood doors in most areas.

- Replace all light fixtures to match original (allowance of 150 fixtures). Need philosophy discussion on this item.

- Provide new public toilets.

- Provide new entrances at east, west, south and north exterior vestibules to match original. (Need further functional discussion on this item).

- Verify extent of public corridor area with functional requirements (further discussion on this item, see Section 4 below)

4. Rehabilitation Zone, Highest Finish ("Work Area")

4.1. Areas

- Governor's office.

- Basement committee rooms and committee room corridor.

- Basement library.

- Basement cafeteria and miscellaneous public corridor added work areas.

- Elevator cabs.

- Treasurer's office.

- House Service Center.

- Third Floor committee rooms and committee room corridor.

4.2. Scope of Work

- Remove added walls, ceilings and finishes all areas to restore original layouts and finishes. Need extensive philosophy and functional discussions on this item, see 4.3 below. Assume:

  -- New floor wall and ceiling finishes all areas (except public corridor areas: repair original marble floor in these spaces).

  -- Extensive ornamental plaster cornice repair in most areas.

  -- Decorative paint in Governor and Treasurer offices.

  -- New lighting to match, or to be compatible with, original - all areas.

  -- New HVAC plumbing and power systems as required.

  -- New finishes in existing elevator cab shells.

4.3. Alternate

- Provide reduced cost for rehabilitating Basement Cafeteria, miscellaneous Basement work areas added in public corridor, Second Floor House Service Center and Third Floor Committee Rooms. Keep existing layouts these areas.

5. Rehabilitation Zone, Medium Finish ("Work Area")

5.1. Areas

- Other primary offices and work areas on First, Second and Third Floors.

5.2. Scope of Work

- Remove added or dropped ceilings, wall finishes and floor finishes all areas.

- Provide new lighting floor, wall and ceiling finishes similar to original. Maintain existing space layouts in many areas, revise to original layouts where possible.

- New HVAC, plumbing and power systems as required.

- Assume a higher level of finish than Category 6 spaces

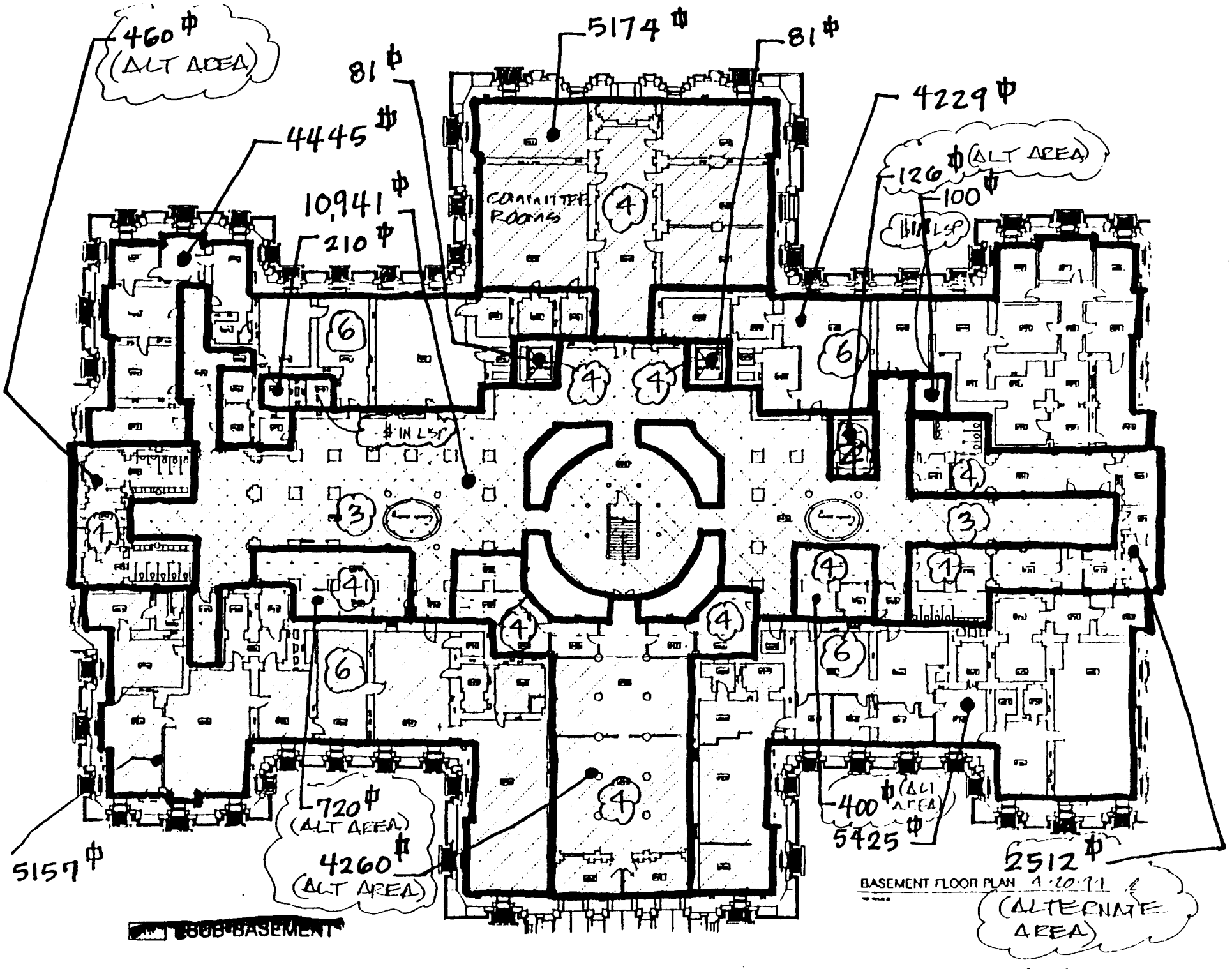
6. Rehabilitation Zone, Lower Finish ("Work Area")

6.1. Areas

- Basement office and work areas.

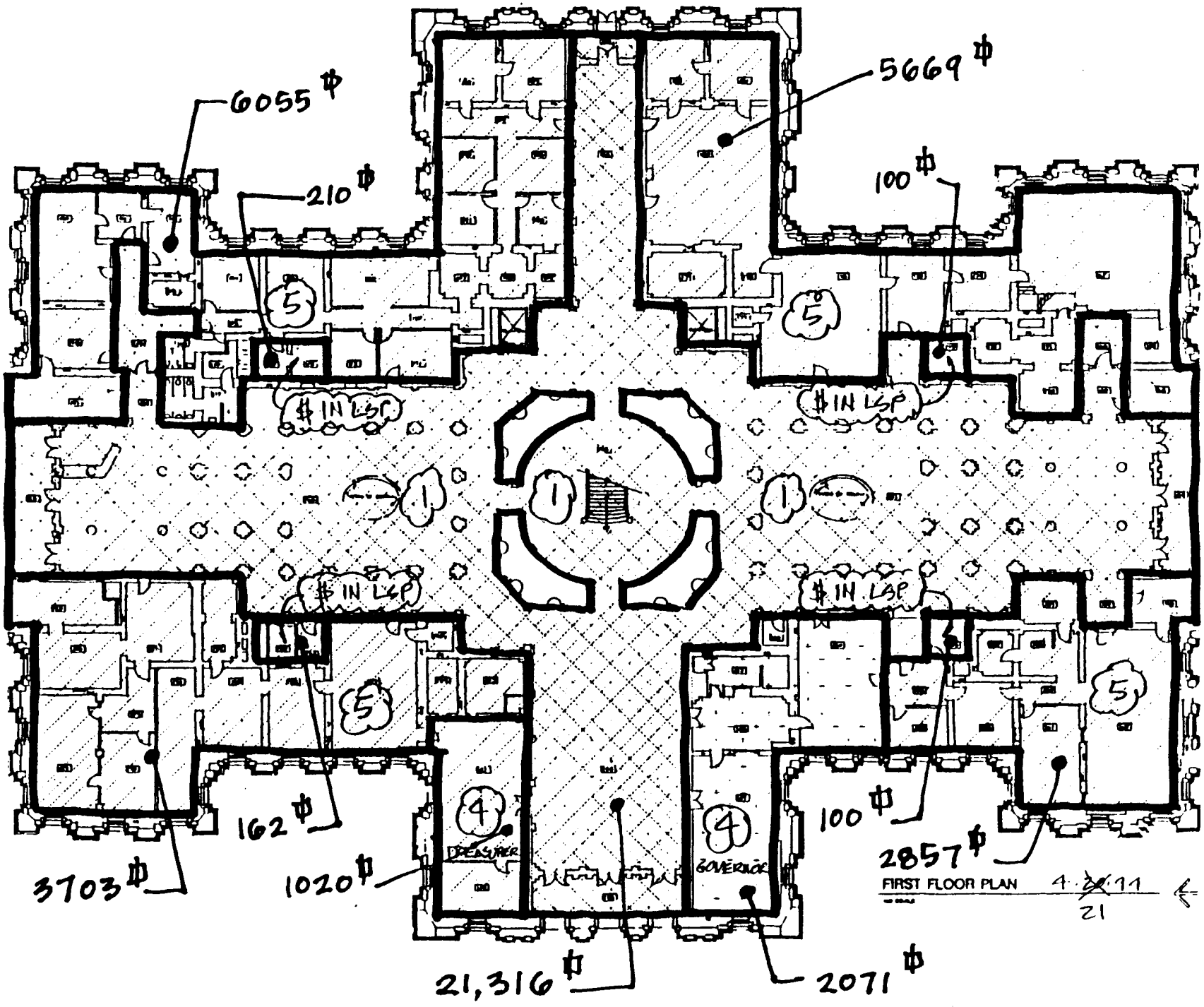
6.2. Scope of Work

- Same as Category 5 except simpler floor, wall and ceiling finishes.



BASEMENT FLOOR PLAN 1·20·94

4·21·94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FIRST FLOOR PLAN 4-20-11
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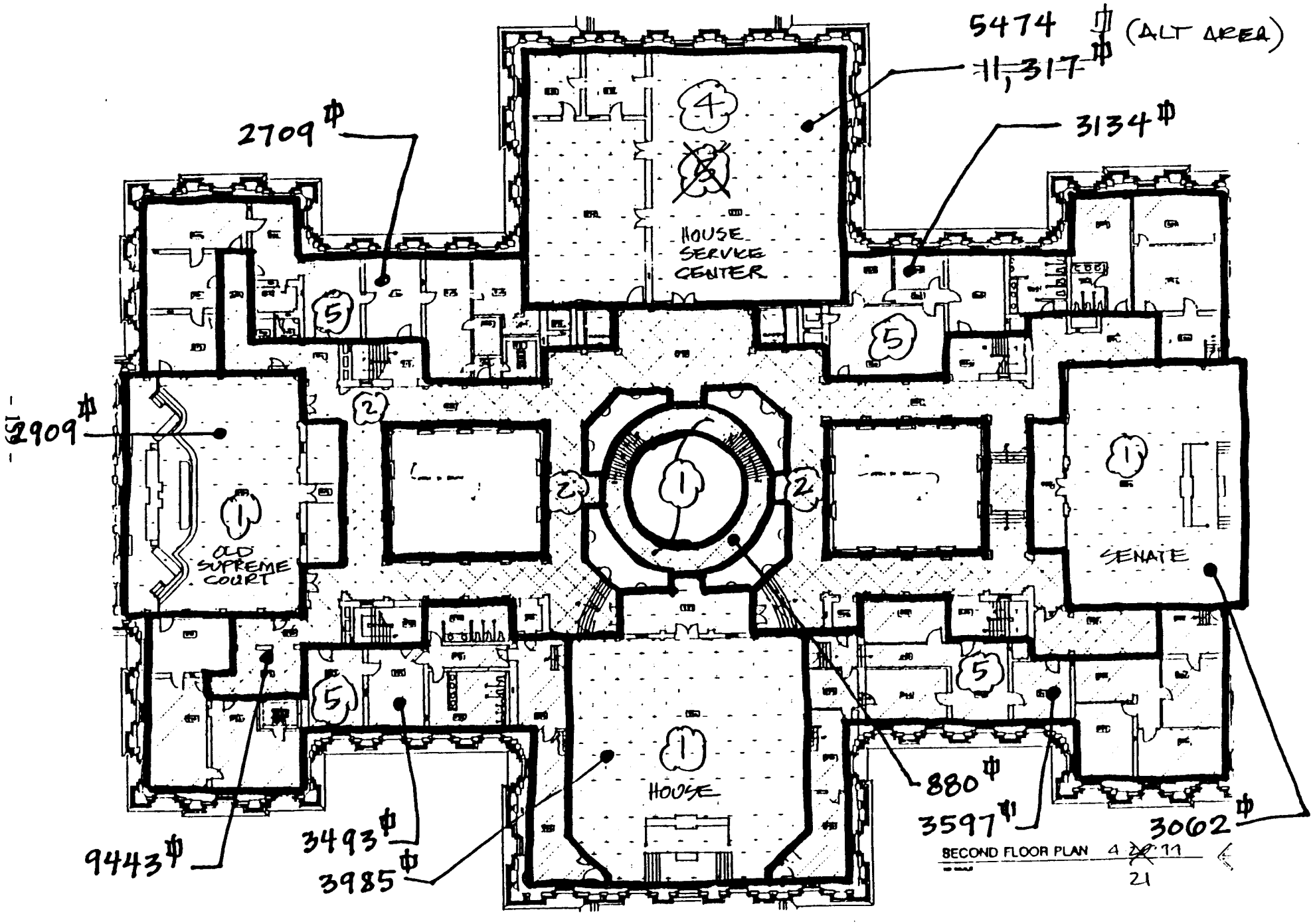
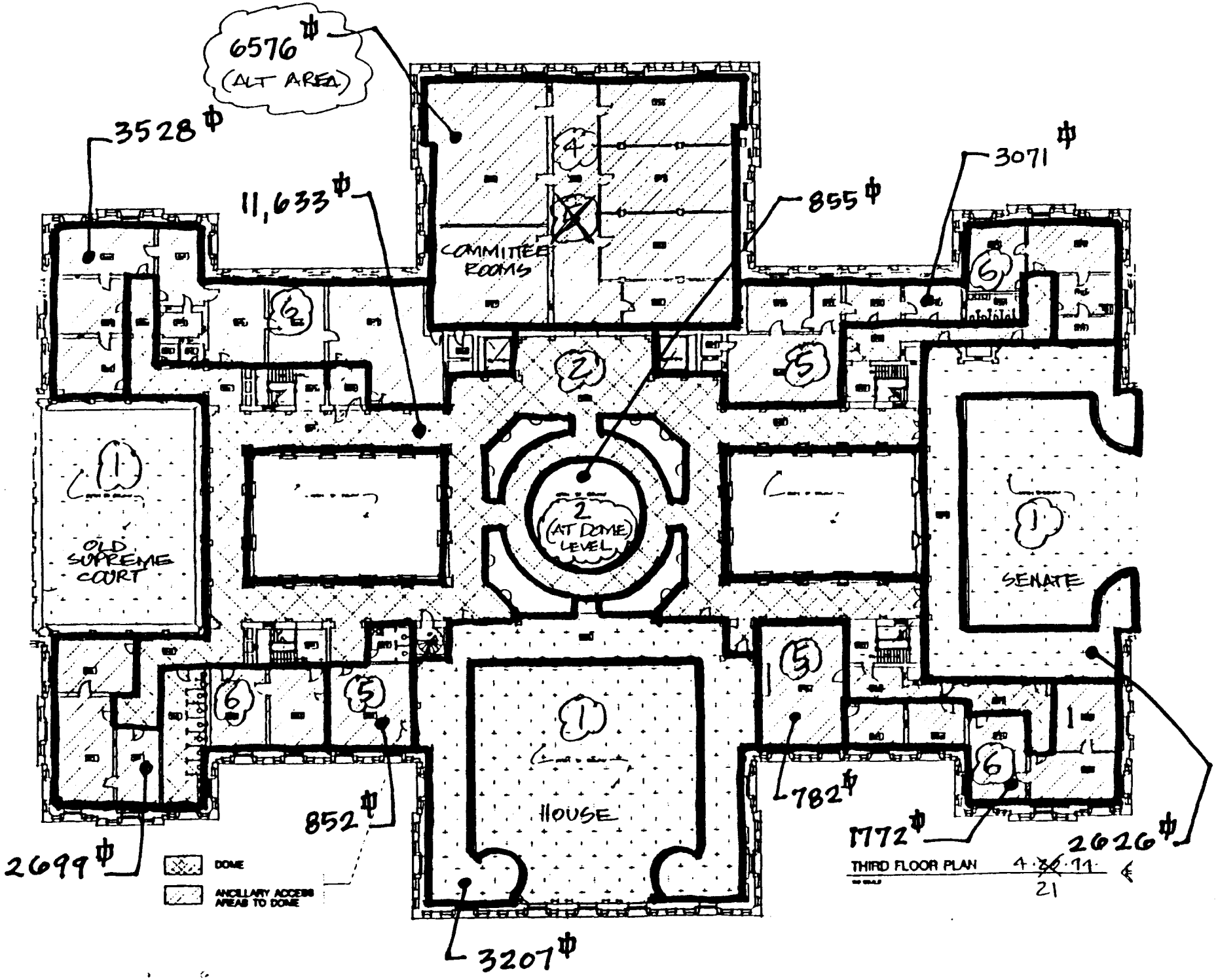


SECOND FLOOR PLAN 4 ~~20~~ 11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OLD SUPREME COURT
2 (AT DOME LEVEL)
SENATE
HOUSE
852 ℄
782 ℄
1772 ℄
2626 ℄
2699 ℄
3207 ℄
DOME
ANCILLARY ACCESS AREAS TO DOME
THIRD FLOOR PLAN 4·30·11
21

Materials Available

The following materials relevant to the Study of the Capitol Building Health and Life Safety Project are available from the Office of the Legislative Council.

Legislative Council Staff Meeting Summaries

July 26, 1995	Resolution objectives; project history; potential barriers; and scope of study
August 4, 1995	Study schedule; basic premises and major concerns; proposed alternatives; evaluation matrix; and evaluation of alternatives
August 8, 1995	Review of evaluation matrix criteria and evaluation of alternatives
August 9, 1995	Review of evaluation criteria; review of alternatives; and slide presentation and tour
August 15, 1995	Space requirements; review of alternative #7; review of Annex building; and review of interim activities in the Capitol building
August 16, 1995	Space requirements; cost estimates and timelines; and review of Georgia State Capitol Building project
August 23, 1995	Review of Georgia State Capitol Building project; review of Alternative #7; and review of planning graphics
August 31, 1995	Review of City and County of Denver Building project and review of planning graphics
September 8, 1995	Review of revised planning graphics; and decision items summary and matrix
September 13, 1995	Review of revised planning graphics; review of revised alternatives matrix; assessment of existing Capitol building systems; and review with JBC Staff and the State Auditor
September 20, 1995	Review of revised planning graphics; review of Alternative #1; review of revised alternatives matrix; review of schedules; and review of existing capitol building systems
September 27, 1995	Review of cost estimates; review of schedules; review of alternatives matrix; life cycle operating costs; review of the

	Alabama State Capitol Building project; and review of alternatives not recommended
October 12, 1995	Project cost estimates; life cycle operating costs; Denver Fire Department report; and draft of the final report
October 18, 1995	Revisions to the final report; revisions to the alternative matrix; revisions to the cost estimates; and proposal to modify Alternative #1
October 25, 1995	Revised cost estimates; bill drafts; final report distribution; and proposed alternative from the Office of the State Treasurer
November 2, 1995	Review of preliminary draft of the final report; Denver Fire Department and AE West recommendations; and review of bill drafts
November 8, 1995	Revised Department of Revenue estimates, final report presentation, and additional recommendations
November 15, 1995	Revised summary matrices; cost estimates for Alternative #1 with no swing space; construction techniques at GSA facilities; telecommunications provisions of Alternatives #2 and #3; summary report to the General Assembly; and preparation for final report presentation
December 5, 1995	Break-even point analysis; review of GSA facility construction projects; appropriation requirements; and preparation for final report presentation

Legislative Council Staff Memorandum

Copies of all Legislative Council staff memorandum and other related materials are included in two black binders entitled "State Capitol Building Health and Life Safety Project, 1995 Interim Study." These binders are available from the Office of Legislative Council.

Reports

Copies of the following reports that were used as references for the study are available from the Office of Legislative Council.

"Department of Revenue Space Requirements," Interplan Incorporated, 1985.

"State Capitol Annex Building, Life Safety Study," C.W. Fentress and Associates, June 1987.

"Evaluation of the Condition of the Capitol Annex," Department of Administration, State Buildings Division, 1989.

"State of Colorado, Space Master Plan for State Capitol Complex," Pouw and Associates, Inc., May 1989.

"Colorado State Capitol Life Safety Plan, Final Report," C.W. Fentress, J.H. Bradburn, and Associates, September, 1990.

"Colorado State Capitol Life Safety Project," C.W. Fentress, J.H. Bradburn, and Associates, November 1994.