STATE PUBLIC WORKS

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LEGISLATIVE COMMISSION

OF THE

LEGISLATIVE COUNSEL BUREAU

STATE OF NEVADA

October 1980

REPORT ON THE MEANS OF OBTAINING GREATER EFFICIENCY AND ECONOMY IN STATE PUBLIC WORKS

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Senate Concurrent Resolution No. 40—Committee on Government Affairs

FILE NUMBER...141..

SENATE CONCURRENT RESOLUTION—Directing the legislative commission to study means of obtaining greater efficiency and economy in state public works.

WHEREAS, The costs of planning, designing and erecting state buildings are significantly higher than the costs of comparable private buildings; and

WHEREAS, This disparity in costs may not be solely attributable to the more stringent requirements imposed for state buildings; and

WHEREAS, The traditional control by economic competition in the marketplace has been diluted in respect to the planning, design and erection of state buildings; and

WHEREAS, A study of the procedures used by the state public works board for the planning, design and erection of buildings and other structures could yield valuable answers for the avoidance of unnecessarily increased costs; and

WHEREAS, Incentives could be built into the procedures which would encourage more efficient planning, design and erection of state buildings and result in a savings to taxpayers; now, therefore, be it

Resolved by the Senate of the State of Nevada, the Assembly concurring, That the legislative commission is hereby directed to conduct a study of the procedures used by the state public works board for the planning, design and erection of buildings and other structures in order to determine ways to increase the efficiency of these procedures and the economy of construction; and be it further

Resolved, That the study include consideration of methods to encourage suggestions during construction and to develop incentives for economy of construction; and be it further

Resolved, That the legislative commission report the results of its study along with appropriate recommendations to the 61st session of the legislature.

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REPORT OF THE LEGISLATIVE COMMISSION

TO THE MEMBERS OF THE 61st SESSION OF THE NEVADA LEGISLATURE:

This report is submitted in compliance with Senate Concurrent Resolution No. 40 of the 60th Session which directed the Legislative Commission to study means of obtaining greater efficiency and economy in state public works.

The subcommittee appointed to conduct this study included Senator Clifford E. McCorkle, Chairman, Assemblyman Alan H. Glover, Vice Chairman, Senator Carl F. Dodge, member, Assemblyman James J. Banner, member, and Assemblyman Robert F. Rusk, member. The subcommittee was assisted in its study by Mr. Wilson G. Daniels, A.I.A., Mr. Fred Hummel, A.I.A., and Mr. Vernon Meiser, General Contractor.

Respectively submitted,

Legislative Commission
Legislative Counsel Bureau
State of Nevada

Carson City, Nevada

October 1980

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LEGISLATIVE COMMISSION

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

The subcommittee confirmed that state building construction costs are higher and that state building standards are more stringent than those of comparable private buildings. However, in confirming these facts, the subcommittee found that the differences between the two varied considerably depending upon whether the private building was being constructed for speculation or owner-occupancy. Not unexpectedly, the subcommittee found that state building costs were closer to owner-occupied buildings than to speculative buildings because of the higher standards being incorporated into owner-occupied buildings.

Additionally, the subcommittee found no evidence to indicate that the traditional control by economic competition in the marketplace had been diluted due to the availability of advance knowledge of project funding, or to procedures being followed by the State Public Works Board with respect to the planning, design and erecting of state buildings. The subcommittee also found that the procedures used by the State Public Works Board for the planning, design and erecting of state buildings were reasonable and were not a contributing factor to the high construction costs of state buildings.

The subcommittee did find other factors--in addition to confirming that the imposition of higher standards for state buildings was a prime reason for the construction cost differential between public and private buildings--contributing to higher construction costs for state buildings. These were:

1. The lack of flexibility by the State Public Works Board in selecting the construction delivery system best suited to the project. Currently, the State Public Works Board is authorized one construction delivery system for state projects.

2. The absence of funding for the State Public Works Board to advance plan major projects.

3. The option of allowing state agencies to retain project speciality consultants.

4. Additional fire safety requirements mandated by the State Fire Marshal and local governments during project construction.

5. Noncompliance by the project architect and the State Public Works Board to the contract design time schedule established.

6. The statutory limitation in reducing the contract price by more than 10 percent.

7. The statutory requirement that the state prevailing wage rate be paid on public projects.

The following is a summary of recommendations forwarded by the subcommittee to help reduce the high cost of state buildings:

1. Amend chapter 341 of NRS to include a new section providing the SPWB with authority to advance plan specific Capital Improvement Projects with the approval and funding by the Legislature or the Legislative Interim Finance Committee.

2. The SPWB, prior to each legislative session, will have a bill drafted to appropriate and authorize to the Interim Finance Committee the amount of funds estimated to advance plan selected Capital Improvement Projects for the next biennium.

3. The legislative money committees to provide letters of intent whenever they wish to direct the SPWB to follow a specific course of action.

4. Amend NRS 341 to provide that the SPWB shall approve all agreements by any department, board, commission, or the Board of Regents of the University of Nevada with persons, associations or corporations, to provide consulting services to the SPWB relating to the determination of construction work that may be necessary to meet the needs of the programs of those agencies and to plan future construction work that may be necessary.

5. The SPWB amend clause 2.1.4.J. of their "Basic Services for Professional Service Agreements with Architects and Engineers" to apply only to remodeling projects.

6. Require local governing bodies in towns, cities and counties to submit new and amended fire code ordinances, prior to their enactment, to the State Fire Marshal for review and written recommendations.

7. The General Design Principles established by the SPWB for public works projects be amended to include the objective that all project designs will insure maximum building

flexibility to accommodate agency's changing philosophy and programs in the building being constructed within the amount of funding approved for the project.

8. The SPWB should aggressively enforce compliance to the design time schedule by all parties involved in the project design stage.

9. The SPWB consider promulgating procedures to incorporate, as part of its standard operating procedures, the use of "value management" for Capital Improvement Projects.

10. The SPWB include on its inhouse project design review team a general contractor.

11. The SPWB, upon computerizing their "life cycle cost system" provide the legislature life costing alternatives for each project recommended in its Capital Improvements Program.

12. The SPWB index its "General Conditions of Contract for Construction" similar to the index used by the American Institute of Architects (A.I.A.).

13. Provide for the investment and quarterly payment of interest by the State Treasurer to general contractors on project progress payments withheld by the SPWB per NRS 338.160.

14. Amend NRS 341.150(f) to eliminate the 10 percent limitation that an awarded project contract amount can be decreased.

15. Amend chapter 338 of Nevada Revised Statutes to eliminate the prevailing state wage rate and require the State Labor Commissioner to secure and enforce the prevailing federal wage rate on public projects.

16. Amend chapter 338 to require contractors and subcontractors to provide a copy of monthly payroll reports to the State Labor Commissioner only if the commissioner has requested the report because of a wage complaint filed with his office.

17. Amend chapter 341 of NRS to provide authority solely to the SPWB to use a modified construction management/guaranteed maximum cost and design-build construction delivery systems. The designation of these systems for state projects will be at the discretion of the SPWB, but their implementation for specific projects must first be approved by the Interim Finance Committee or the Legislature, if in session.

18. The SPWB include in its 1981-83 biennial budget request, a Program Writer/Estimator and Administrative Aid position.

19. The SPWB include in its 1981-83 biennial budget request, $5,000 in out-of-state travel funds for reviewing unique facilities in other states similar to state facilities being recommended or approved for construction in Nevada.

20. The SPWB include in its 1981-83 biennial budget request, $10,000 in consulting service funds to retain consultants, as required, to advise the SPWB on specific problem areas and to review project designs.

21. The SPWB include in its 1981-83 biennial budget request, $2,500 to provide training for the SPWB staff in "Value Management" analysis techniques.

The majority of the subcommittee's recommendations, if implemented, will either help in reducing construction costs or slowing the rise in construction costs. In addition, several of the recommendations will promote better design and flexibility. Shown below is a recap of the estimated construction cost savings that were calculated on 3 of 21 recommendations advanced.

Recommendation	Estimated Savings
Advance Planning	$3,982,649
CM/GMC and Design-Build	$1,342,719
Program Writer/Estimator	$ 750,000

REPORT OF THE LEGISLATIVE COMMISSION'S SUBCOMMITTEE STUDYING MEANS OF OBTAINING GREATER EFFICIENCY AND ECONOMY IN STATE PUBLIC WORKS

I. INTRODUCTION

The reasons for state buildings costing more than comparable private buildings has posed a biennial question to the Legislature and the 1979 Legislative Session was no exception. In attempting to understand the disparity, the 1979 Legislature attributed the higher cost, in part, to "more stringent requirements imposed for state buildings." In addition to this fact, however, the Legislature also believed the differences between the two sectors must be attributable to other factors. Advanced as possible factors were:

(1) The traditional construction approach authorized by the legislature and followed by the State Public Works Board did not provide the necessary flexibility for the State Public Works Board to adopt new practices to minimize design and contruction time and maximize the use of cost saving techniques in attacking higher construction costs as is done in the private sector;

(2) The procedures used by the State Public Works Board are too cumbersome, restrictive and inflexible to either allow or encourage economical planning, designing and erecting of state buildings; and

(3) Incentives to promote efficient planning, designing and erecting of state buildings were lacking.

(4) Over-design.

In recognizing the above reasons, the 1979 Legislature enacted Senate Concurrent Resolution 40 which directs the Legislative Commission to conduct a study of the procedures used by the State Public Works Board for the planning, designing and construction of state buildings and to determine means of obtaining greater efficiency and economy in state public works.

The Nevada Legislative Commission, at its meeting of June 28, 1979, appointed a legislative subcommittee to study means of obtaining greater efficiency and economy in state public works. The members of this subcommittee are: Senator Clifford McCorkle, Chairman, Assemblyman Alan H. Glover, Vice Chairman, Senator Carl F. Dodge, Assemblyman James J. Banner and Assemblyman Robert F. Rusk. In addition to appointing the study subcommittee, the Legislative Commission authorized the subcommittee to hire architectural and construction consultants to assist it. The consultants selected are Mr. Wilson G. Daniels, President of the Nevada Chapter of the American Institute of Architects (A.I.A.), Mr. Fred Hummel, private architect and former California State Architect and Mr. Vern Meiser, general contractor, Meiser Enterprises.

The subcommittee held six hearings, five in Reno and one in Las Vegas. In addition, several members of the subcommittee met informally with the Associated General Contractors (A.G.C.), Nevada Chapter of American Institute of Architects, and made an on-site visit of several recently completed capital improvement projects at the Nevada Mental Health Institute.

Based upon the general consensus of legislators, the State Public Works Board and the architectual community, that state buildings cost more than private buildings, the subcommittee, at its initial hearing held in Reno on November 29, 1979, agreed the objective of the study was to identify the areas of increased costs and, where feasible, recommend changes to the State Public Works Board's policies and procedures and the Nevada Revised Statutes in order to eliminate or reduce any excessive costs. The subcommittee adopted the following study outline to guide them in attaining their objective.

Study Outline

Meeting No. 2: Construction

1. Is the Public Works Board using the most efficient methods of construction, techniques or systems? Are there others which will satisfy the needs of Nevada which could be tried and will save money? (Example: (a) construction management; (b) design/build; (c) cost-plus; (d) shared cost savings; (e) value engineering, etc.)

2. How can cost savings be encouraged prior to start of construction or during construction by either the contractor, Public Works Board or someone else?

3. Should the state mandate a system or technique or procedure to be used by the contractor, such as "Critical-Path"?

4. How do present labor laws affect cost of state projects?

Meeting No. 3: Design

1. Design procedures.

2. Selection of architects.

3. How can we encourage economy of design.

4. Relationship between architect and client--who is client, Public Works Board or a state administrator? Why?

5. Building materials selection and relationship to economy.

6. Useful life of building and functional obsolescence.

7. Fees.

8. Building quality and rating (Marshall Valuation Service Manuals).

9. Pre-appropriation design.

Meeting No. 4: Design and Building Codes

1. Continue discussion of design items not covered at previous hearing.

2. Differences between state codes and private.

3. Contract language, restrictions and quantity of paperwork; how it compares to private.

Meeting No. 5: Public Works Board

1. Staffing and Board membership and selection procedure.

2. General administration and staffing.

3. Staff job descriptions.

4. Procedures and policy.

5. Bidding and advertising procedures and evaluation of effect of announced budget for each building.

6. Public Works Board objectives and stated goals.

Meeting No. 6: Work Session

Attempt to bring together all pertinent data and suggestions into specific legislation. Invite all interested representatives of A.I.A., A.G.C., A.B.C., etc. to attend or send in specific suggestions. The objective is to adopt only those recommendations which can be lived with by architects, contractors, the Public Works Board, and government administrators, so a great deal of input is necessary from each.

Meeting No. 7: Final Report

Discuss subcommittee's final report with interested parties to assure that whatever is adopted will have reasonable support by the 1981 legislature.

The subcommittee in following the study outline held subsequent hearings on January 24, 1980, in Reno, to review construction delivery systems; February 13, 1980, in Las Vegas, to review design policies, procedures and building standards; March 13, 1980, in Reno, to consider and evaluate subcommittee findings on construction and design; and on June 4, 1980, in Reno, to review the State Public Works Board's organization and formulate the subcommittee's recommendations. The hearings in Reno and Las Vegas consisted of a formal and informal session to provide the greatest degree of dialogue among participants. Participants invited to each hearing included members of the State Public Works Board, the Secretary-Manager and Deputy Manager of the State Public Works Board, members of the A.I.A., A.G.C., Associated Building Contractors (A.B.C.) and the general public. In addition, two architects and construction consultants were retained to advise the subcommittee on architectural and construction systems used by the State Public Works Board, by the private sector and by other states.

The findings and recommendations of the subcommittee are set forth in the following sections. Section II provides an overview of the State Public Works Board and the procedures followed by it for implementing capital improvements. Section III discusses and recommends changes, where appropriate, to Nevada Revised Statutes and to the State Public Works Board's administration and procedures used for the planning, design and construction of state public works projects which are considered to be reasons for the higher construction costs between public and private projects. Section IV is proposed legislation to implement the subcommittee's recommendations and Section V is the Appendix.

II. STATE PUBLIC WORKS BOARD OVERVIEW AND PROCEDURES FOR IMPLEMENTING CAPITAL IMPROVEMENT PROJECTS

Board Overview:

The State Public Works Board (SPWB), previously known as the Nevada State Planning Board, was established in 1935 by Governor Richard Kirman and statutorily created by chapter 102, Statutes of Nevada 1937, to accept and administer U.S. Department of Interior Public Works Administration grants. The Legislature, in 1947, gave the Board the responsibility for the construction of state-funded structures.

Since that time, the Legislature has changed, added and vested the Board with: (1) the final authority for the supervision, completion and acceptance of construction of public buildings--on state property, or funded by the Legislature--except for highway maintenance buildings, (2) the periodic inspection of state buildings and physical plant facilities at all state institutions, (3) the review and approval of public school construction plans, (4) recommending the priority of construction of authorized or proposed projects, (5) providing architectural and engineering services to all state agencies, (6) review of local ordinances adopting Uniform Plumbing Codes (U.P.C.), and (7) implementing building modifications ordered by the State Fire Marshal. These responsibilities are carried out by a statutory 10-member Board appointed by the Governor and the Board's staff. The Chief of the Budget Division of the Department of Administration is an ex officio member of the Board. The Board's Chief Executive Officer is the Secretary-Manager who is appointed and serves at the pleasure of the Board. The Secretary-Manager is responsible for the supervision of the Board staff which is organized into four divisions--Administration, Architecture/Engineering, Accounting and Inspection. The SPWB organizational structure is shown as Appendix A.

Capital Improvement Projects - Current Implementation Procedures:

Commencing in December of odd-numbered years preceding a legislative session, the SPWB forwards to all state agencies instructions and forms for submitting requests, in priority order, for their Capital Improvement Projects (CIP). These requests, which must be returned by March 1 to the SPWB, together with the SPWB's state building inspection deficiencies and previously recommended but unfunded projects, will generate the information for CIP's that will be considered by the SPWB in developing its Recommended Capital Improvements Program for the ensuing Legislature.

Recommended capital improvements are justified by agencies on the basis of statutory directives; orderly development of the state's physical plants; physical buildings or plant requirements of state departments, agencies, commissions and boards; and economy of capital outlay and centralization of governmental activities. They are to include proposals for new construction and remodeling in excess of $5,000, land acquisition and site improvements.

Between March 1 and October, the proposed projects are defined and analyzed by researching project requirements, on-site inspections and formal and informal meetings with requesting agencies. The developed information is converted into criteria and preliminary scopes of work to which unit cost factors can be applied in establishing preliminary construction estimates. The CIP construction estimates are developed and refined by researching the cost of the SPWB's historical CIP records, analyzing costs of similar projects in Nevada or other states and utilizing published construction cost indexes. Each estimated CIP is adjusted for location costs, bid date, and projected inflation to the estimated mid-point of construction of project. The estimated costs for surveys, soil analysis, inspection, testing and advertising are based on architectural and engineering analysis of the projects and compared to recorded costs on similar projects.

Planning and design fees are calculated from published schedules for professional work based on type of project, size and budget. Plan checking estimates are based on current plan checking agreements and estimated construction costs. A sum, normally 3 percent for new construction and as much as 10 percent for remodeling projects, is designated as a contingency fund. Cost estimates for movable furnishings are formulated on a cost per square foot of building based on the recorded cost of furnishing similar buildings. Sewer connection fees, permits and legal fees are based on recorded data from similar projects and local ordinances.

After the Board's staff has defined the scope and budget of the CIP's, the SPWB reviews and prioritizes the requests and thus establishes its Recommended Capital Improvements Program. The program is then submitted to the Governor, via the Budget Director for coordination with the Executive Budget, and to the Legislature.

The Board's priorities for capital improvements are based on the following criteria: rehabilitation of the existing physical plants to provide greater safety, efficiency or economy; statutory requirements necessitating expanded or new capital improvements; new developments required to meet the needs of existing programs or services; and new developments required to meet the needs of new programs or services.

The Governor, in the Executive Budget, may reflect a modified Capital Improvements Program to that proposed by the Board. The Board's and the Governor's recommendations are reviewed for justification and cost by the legislative money committees and are either approved, modified or deleted.

Prior to the 1979 Legislature, the SPWB analyzed 147 projects and recommended 61. Out of the 147 projects that were reviewed, 10 percent were considered unnecessary and without merit.

Following legislative approval and signing of the Capital Improvements Program bill, the SPWB will review and approve the project budgets which have been updated by its staff to reflect legislative changes. The Board, based on recommendations by staff, designates the projects that are to be designed under contracts with resident private practice architectural firms and those to be designed by in-house staff. In-house design has been limited to projects under $100,000 as it is the Board's policy that contractual employment of private practice firms is preferable to developing a large, in-house staff production capability.

Approved projects are segregated and arranged into appropriate contract proposals to expedite design and construction schedules and to reduce costs. Under this procedure, design and construction work of a similar nature and in the same general geographic area are frequently combined even though they may be funded separately. Implementation schedules are developed which consider elements, such as, availability of funds, weather, required completion dates along with design, checking, bidding and construction times.

The selection of a private practice architectural firm is based on A.I.A. selection procedures as specified in NRS 625.530 by either using direct, comparative or limited Class A competition.

Negotiations with private practice firms are based on architectural/engineering contract provisions, project developed scopes of work and professional services required. The negotiated fee, which is a lump sum, covers all agreed upon professional and redesign services if a bid for construction within the established construction budget is not received.

All plans and specifications are reviewed and approved by the Board and its staff, private practice structural, mechanical and electrical engineers retained under contract with the Board, the agency who will have use of the project, the State Divisions of Consumer Health and Environmental Protection, the State Fire Marshal, and local fire and building departments. Design plans and specifications are to comply with all of the Adopted Standards and approved variances.

Upon approval of the plans and specifications, the Board provides the "boiler plate" documents and, if the project is estimated to cost in excess of $10,000 ($5,000 prior to the 1979 Session), it is advertised for bids in accordance with state law. If the project is estimated to cost less than $10,000, proposals are solicited from at least two licensed contractors.

All bidders are required to be properly licensed by the State Contractor's Board prior to bidding and must provide a bid bond, cash or certified check in the amount of 5 percent of their bid. They are also required to include with their bid a list of all subcontractors who have more than a 5 percent interest in the base bid and to provide a complete listing of all subcontractors within 48 hours after the notification of the award of a contract.

Bid documents are made available to all properly licensed general contractors and, on certain projects, to major subcontractors requesting them on a refundable plan deposit basis. Plans can be obtained by other subcontractors and material suppliers on a nonrefundable, cost-to-reproduce basis, and are distributed free to appropriate plan rooms and building exchanges. During the bid time, addenda are issued to clarify any aspect of the project questioned by a bidder. Contractors can submit bids on an "or equal basis." Pre-bid clarification conferences are scheduled for the more complex projects.

Construction contracts are awarded to the lowest responsible bidder having a bid less than the approved construction budget. Under the provisions of NRS 341.150, the Board is authorized, under certain prescribed circumstances, to negotiate with the low bidder to realize a lower bid.

Upon the approval of the Board to award a construction contract to the lowest responsible bidder, the Owner-Contractor Agreement and Bond Forms are sent to the contractor for execution. Upon execution of the contracts by the contractor, the Attorney General and the Secretary-Manager of the State Public Works Board, and on the receipt of insurance certificates, the Notice to Proceed is issued. On every project a pre-construction conference is scheduled wherein all procedures affecting the project are discussed in detail. At that conference the State Labor Commissioner and the Nevada Industrial Commission also reiterate the procedures that they want the contractor to follow.

Inspectors are assigned to every project by the SPWB. These inspectors are paid from funds appropriated for the project. An inspector may inspect one or more projects, depending on the size, nature and location. The SPWB's inspection force consists of not only the field inspector, but also specialized mechanical and electrical inspectors and a chief building inspector. Periodically, the projects are inspected by the staff project manager, the Deputy and the Secretary-Manager. The architects and engineers under contract with the Board are also required to oversee the work on a regular basis.

Progress payments submitted by the contractor are reviewed by the job inspector, the architect, project manager, chief building inspector and staff accountant, and approved by the Secretary-Manager. A detailed accounting of all obligations and expenditures is kept by the Accounting Division of the SPWB.

Contractor and agency requests for change orders and the approval of proposed substitutions are reviewed by the architect and the staff of the SPWB before being authorized. Final inspection of the completed work is conducted by the architect, the SPWB's staff, the using agency and the contractor. A deficiencies list is prepared and submitted to the contractor. Retention of 5 to 10 percent of the project's funding is not released until all deficiencies have been corrected.

As required by law, the Board retains 10 percent of the contract amount on all progress payments until the project is 50 percent completed and progress is satisfactory. Further retentions can be waived with the result that a project can be completed with a 5 percent retention. This retention is held for 43 days to satisfy lien requirements and then is released less any withheld amounts pending corrections of unsatisfactory work. Upon acceptance, a Notice of Completion is filed. Occasionally a Substantial Notice of Completion is filed, which allows the state to use a portion of the project prior to acceptance of the total project. All completed work is guaranteed by the contractor and subcontractors for a period of at least 1 year.

III. DISCUSSION, CONCLUSION AND RECOMMENDATIONS ON STATE PUBLIC WORKS BOARD CONSTRUCTION PROCEDURES

Construction of state capital improvement projects is sequentially ordered statutorily and by session law so that certain events operate consecutively. These events, consecutively listed, are project design, bid/award and build. This approach is the traditional construction delivery system most commonly employed by government and is the one most familiar to all. In the case of Nevada, it is the only authorized delivery system for constructing state capital improvement projects except where federal funds are involved. The Board may, in this instance, use a construction management delivery system if required to do so by the Federal Government.

This section of the study will discuss current SPWB administration and procedures used in the designing, awarding and constructing of capital improvement projects. Where appropriate, suggested organizational and procedural changes have been recommended.

A. Planning

Planning for capital improvement projects can be divided into two mamor areas. The first is overall, statewide, long-range (generally 5 to 10 years) capital improvement master plans for anticipated growth of state agencies and the second is the advance and actual planning of capital improvement projects.

According to testimony presented, capital improvement long-range master plans for state agencies are being done

by the SPWB in conjunction with individual state agencies. Also, testimony indicated that the effort presently being expended by the SPWB and state agencies on long-range master planning was adequate. Any additional effort or refinement in this area would not be very productive due to frequent changes in administration and programs, and because one legislature cannot commit future legislatures to fund projects.

The second area of planning which pertained to the actual planning of capital improvement projects was reviewed in depth by the subcommittee because of its direct relationship to the eventual project cost. Actual planning of a proposed project prior to its approval by the legislature is currently limited to an analysis of the need for the project, a preliminary scope of work, and estimated design and construction time to develop a project budget. (Discussion of criteria used by the SPWB to determine project need and cost is contained in Section II, page 6 of this report.) Rarely are any projects advance planned beyond this level. The reasons given by the SPWB for not doing more advance planning were primarily the lack of funding, lack of support by legislative money committees for its concept, and concern for risking funds because of the inability of one legislature to commit another legislature to fund advance planned projects.

Advance planning of major projects was considered by the construction associations, architects, contractors, and the SPWB to be an area where construction costs could be reduced. Project advance planning consists of a developed floor plan, cross sections, elevations, outline specifications, cost estimates by category of work, and a project's perspective rendering. This is a condensed version of the first design stage for a project. The design stages of a project are: schematic, design development, construction documents, plans checking and design approval.

In comparing the 1979 legislatively approved Capital Improvements Program to that recommended by the SPWB, it was observed that the majority of projects recommended were approved by the legislature. Included in the construction program approved by the legislature were 11 projects recommended to the legislature which, if authority and funding had been available, could have been advance planned. The current design status of these projects, according to the SPWB's project status report of April 1980, shows two projects in the first design stage, six

projects in the second stage, one in the third stage, and two projects in the final stage. The report indicates further that 10 months had elapsed from the date (June 1979) that the legislature approved the projects.

Testimony by the SPWB indicates that advance planning of projects would, on an average, forward the starting construction time by at least 5 months. The April 1980 report, however, reflects a longer time period than 5 months. If construction costs continue to escalate at 1 1/2 percent a month, advance planning of these 11 projects could have resulted in construction savings of 7.5 percent, or $4,197,861. The net saving, after the advance planning costs of $215,212 were deducted, would have been $3,982,649. This amount is a cost benefit ratio of approximately $19 saved for each dollar expended on advance planning. (A schedule of the 11 projects that could have been advance planned is shown as Appendix B.) In addition to this saving, there would be a saving in architectural fees since the first design stage of a project would already be completed.

Besides the dollar saving advantage noted, other advantages of advance planning would include:

1. The SPWB would have better information and additional time to review project requirements and estimated cost.

2. The SPWB could provide better information to legislative money committees for their review of major projects in order to eliminate "frills"; to determine and correct, if required, agency program intent and direction; to determine construction classification and quality; and, when necessary, resolve project differences between the SPWB and the using agency.

3. The SPWB could provide agency administrators with a conceptual idea, such as, floor plans, specifications and perspective rendering of projects prior to funding in order to determine if projects being constructed will meet the needs of their program.

4. Allow agency and the SPWB to review prototype projects in other states. (Note: To implement this advantage, out-of-state travel funds are being recommended in Section E of this report.)

A good example supportive of advance planning was noted by several members of the subcommittee during its tour of several mental health facilities in Sparks, Nevada. One facility in particular--the neuropsychiatric cottages--graphically showed the need for advance planning. This project, which cost $1,439,395, consists of three buildings, each having approximately 6,400 gross square feet and housing 16 inpatients each. It was noted that each building had two living rooms, two recreation rooms, two fireplaces, two skylights, tile bathrooms and many inside brick walls.

The SPWB indicated that this project exemplifies the need for advance planning because the economies and efficiencies of construction were overridden by the administration's program philosophy. The program philosophy should have been reviewed by the legislature prior to project construction since it is not within the SPWB's purview to dictate direction of an agency program. Although the SPWB cannot dictate agency program needs, it does have the responsibility to eliminate any project "frills" such as those cited above beyond the real needs of the program.

Considering the cost benefit ratio and the other advantages, the subcommittee recommends that chapter 341 of NRS be amended to include a new section providing the SPWB with authority to advance plan specific Capital Improvement Projects upon approval and funding by the Legislature or the Legislative Interim Finance Committee.

It was further recommended that the SPWB, prior to each legislative session, have a bill drafted to appropriate and authorize to the Interim Finance Committee the amount of funds estimated to advance plan selected Capital Improvement Projects for the next biennium.

During the last legislative session, members of the Assembly Ways and Means Committee inspected a number of state buildings. During their review, they noticed a considerable amount of office partitions. The committee felt that the office partitions were not needed and seriously reduce the flexibility of the state buildings. The committee, therefore, expressed its concern in a "letter of intent" to the Director of the Department of General Services, with a copy of the letter being sent to the SPWB, that all office partitions requested by state agencies for installation in existing state buildings must first be evaluated by the SPWB.

In addition to this letter of intent, the SPWB's staff was directed by the Assembly Ways and Means Subcommittee on Capital Improvement Projects that it is not necessary for every state employee to have a private office. As a result of this directive, which was recorded in the Assembly Ways and Means Subcommittee's meeting minutes, the SPWB's staff was able to successfully counter arguments made by agency heads when requesting private offices for their staff. The SPWB stated further that it found the legislative directive of last session most helpful and would welcome additional directives from future legislatures. The subcommittee commends the Ways and Means Committee for their positive action taken last session to limit the number of private offices in state buildings.

Based on the previous testimony, the subcommittee encourages that the legislative money committees make on-site inspections of proposed and completed state buildings and recommends that the use of legislative "letters of intent" when directing the SPWB to follow a specific course of action.

B. Design

The subcommittee, at its February 13, 1980, hearing in Las Vegas, reviewed the procedures followed by the SPWB in securing architectural engineering services, specialty consultants, selecting architects, determining architectural fees, project design criteria, time schedules, design review and approval, and standardization and reuse of design plans. In conducting this review, the subcommittee was assisted by Mr. Fred Hummel, a private architectural consultant and former State Architect of California.

Securing Architectural and Engineering Services

NRS 625.530 requires that state and local governments must secure the services of a registered architect or engineer to prepare plans, specifications and estimates, and to supervise actual construction of any public works project costing in excess of $15,000. The SPWB is responsible for providing architectural and engineering services to all state departments, boards and commissions.

Therefore, the SPWB's options in complying with this statute were to develop a large in-house staff, or contract with private practice firms, or a combination of both. The

Board has elected to rely on private practice firms for the majority of its architectural and engineering services. The in-house staff is primarily devoted to project management and occasional designing of small projects. The subcommittee supports the Board's selection of this option for securing the required services.

Specialty Consultants

A consultant specializing in a particular program discipline is sometimes required to assist the SPWB and the project architect in tailoring the project being designed to the agency program. The consultant may be retained by the SPWB or the agency requesting the project except that the consultant must be retained by the SPWB on University System projects. When the consultant has been retained by the agency, the agency's influence over project design is greatly enhanced. Primarily, this is because the consultant's loyalty and direction is dictated by the agency whose major concern is program and not necessarily project economy, efficiency and flexibility.

This was graphically demonstrated when several members of the subcommittee toured the in-patient neuropsychiatric cottages constructed for the Mental Health Division. The agency had retained a consultant for this project and, as previously mentioned in the section discussing planning, these cottages were over-designed in that each cottage contained two living rooms, two fireplaces, two recreation rooms, tile bathrooms and other amenities. The SPWB questioned the extra items but was convinced by the Mental Health Division that they were needed because of the consultant's input.

The subcommittee believes the latitude in allowing the agency to retain, at its discretion, an expert consultant, results in loss of project control by the SPWB, overdesign, incorrect design and increased construction costs. Therefore, it was the subcommittee's recommendation that NRS 341 be amended to provide that the SPWB shall approve all agreements by any department, board, commission, or the Board of Regents of the University of Nevada with persons, associations or corporations, to provide consulting services relative to the determination of construction work that may be necessary to meet the needs of the programs of those agencies and to plan future construction work that may be necessary.

Architect Selection

The method followed by the SPWB in selecting an architect begins with the SPWB's Secretary-Manager distributing a questionnaire to all registered Nevada private practice architectural firms requesting information of the firm's staffing, capabilities and areas of architectural interest. The information, once compiled, is used by the Secretary-Manager to develop his recommendations on which projects are to be designed in-house, which by private architectural firms (three firms are listed for each project in priority order), and which projects are appropriate for A.I.A. limited competition. The list developed by the Secretary-Manager is circulated to the SPWB 2 weeks in advance of the selection meeting.

The Secretary-Manager's recommendations are guided by SPWB criteria which give preference to qualified firms located in the project area, experience on projects of a similar nature, workload, and a satisfactory past performance record that would permit completion of the project in an expeditious manner. However, preference must be balanced by considering firms who are interested in doing the work but who have not had previous state work experience in order to avoid recommending the same firms for several different projects.

During a public hearing, the SPWB will establish for each project the scope of work and budget and designate three architectural firms, in order of preference, if the project is not to be designed in-house. Selection of architects and engineers, according to NRS 625.530, shall be based upon their competence and qualifications for the type of services to be performed and not on the basis of competitive fees. Beginning with the first firm, the Secretary-Manager will negotiate for the design of the project. If he is unable to negotiate an agreement within the scope of work and the budget established for the project with the first, second or third firms designated by the Board, he will request the Board's approval to revise the project's scope of work and budget and select three different firms. According to testimony, this has never occurred during the last 20 years.

Selection procedures authorized by the Board for negotiating agreements for professional services from private practice firms may be direct, comparative or limited Class A competition procedures and methods recommended by the A.I.A. The most prevalent procedure used for obtaining architectural and engineering services has been direct selection. The subcommittee supports the present procedures for selecting architectural firms.

Fees

Architectural and engineering fees are negotiated by the SPWB's staff either on a fixed fee basis or on a unit cost fee with a maximum fixed fee per project. Upon determining the building category of the project and prior to negotiating fees on a particular project, the staff will estimate the amount of the fee based upon fees recommended by the architectural and engineering professions, the Marshall-Swift Service and the Washoe and Clark County School District fee schedules. Negotiation with an architectural or engineering firm commences with the fee requested by the consultant for the project and, depending upon the defined scope of the project and professional services required, the fee is either revised upward or downward.

Based upon testimony received from the architectural community, the architectural fee paid by the state, which includes extra services and the redesigning of a project when the bid exceeds the project's budget, is consistently lower than the architectural community's recommended fees for basic services. The reason for the low fees is due to the bargaining ability of the SPWB and that designing of state projects provide a dependable source of income to private architects.

Advanced as a possible reason for state construction costing more than private construction was that the fee paid was not adequate compensation to an architect to explore different design solutions and their costs. The testimony from the architects present at the subcommittee's hearings did not confirm this statement, however. An architect, upon signing an agreement to design a project at the mutually agreed upon fee, will commit the necessary resources and effort necessary to produce the desired product at the lowest possible cost. Since architects are not allowed to advertise their services, the quality of their product is the basis for repeat and new business.

Although the subcommittee agreed that architectural fees paid by the state were less than those recommended, it was not convinced that this resulted in higher construction costs. The subcommittee was satisfied that the present method being pursued by the SPWB for negotiating fees was proper.

Although it does not involve the fee negotiation process but rather affects the eventual fee paid and/or services provided, a questionable procedure was noted relative to clause 2.1.4.J. in the Basic Services for Professional Service Agreements with Architects and Engineers. The clause states that "if the average of all bids received is less than 85 percent of the construction budget, the consultant's fee shall be either: (1) adjusted proportionally; or (2) the consultant shall provide additional services for such additional construction work as required to equal the established total construction budget. The state shall select either of the above two alternatives."

It was the subcommittee's belief that this clause actually penalizes the architect who designs a project which when bid is less than 85 percent of its estimated construction budget. Also, it was actually counterproductive to designing a project for less than 85 percent of its established construction budget. The purpose of this clause, as explained by the SPWB, was to prevent overpayment of architectural fees on remodeling projects. Generally, remodeling project construction budgets are difficult to estimate and, therefore, are estimated high.

The subcommittee recommends that the SPWB amend clause 2.1.4.J. of their "Basic Services for Professional Service Agreements with Architects and Engineers" to apply only to remodeling projects.

Design Criteria

Section 1.8 of the Basic Services for Professional Service Agreement with Architects and Engineers defines the design criteria adopted by the SPWB, the State Fire Marshal, the State Department of Human Resources, and the city and county in which the project is to be constructed. The design criteria adopted by the Board consists of Standards for Design and General Principles Covering the Design of

Public Works and are listed in the SPWB's Policies and Procedures Manual No. 2300-2302.20. This criteria is also detailed in the Board's Adopted Standards which is included as part of the agreement with the architect. The Board's Adopted Standards are included as Appendix C.

The Standards for Design lists the pertinent national building codes, federal and state agencies with applicable public health, safety and handicapped standards, and requirements for applicable local codes and ordinances with which the architect must comply. The design standards, adopted by the Board as minimum design standards, are identical to those required in the private sector with the exception of standards for the handicapped.

Even though the minimum design standards are the same, the design of Capital Improvement Projects incorporate higher standards than those in the private sector. This is one of the major factors contributing to construction costs of public works projects being higher than those in the private sector.

Testimony before the subcommittee indicated that construction costs of a private building are related to the desired objectives of the owner. A private building being constructed for speculation costs considerably less, in most cases, than does the same building constructed for owner-occupancy. As the owner's objectives for the building being constructed become more oriented toward health, safety, longevity, efficiency and maintenance economy, construction costs increased. Therefore, state building costs are closer to owner-occupied than they are to the speculative building. The higher standards are due to external factors, such as, a greater concern for public health and safety, liability suits and the economy of building maintenance and longevity.

Although the more stringent requirements imposed for state buildings (i.e., higher standards) are recognized in S.C.R. 40, it was the subcommittee's opinion that the SPWB should review the design of each project to insure that the higher standards incorporated are for public health and safety and that building economy is not unduly sacrificed for the sake of low building maintenance and longevity.

Testimony by the Board and architects stated that occasionally during the construction of a project the State Fire Marshal will require additional fire safety features to be incorporated into the project after he has approved the project design. Recent examples cited by the SPWB regarding this problem were:

1. The Truckee Meadow Community College--This project required the installation of additional doors and exits;

2. The Business and Humanities Building, UNR--This project required the installation of automatic sprinkler system to comply with City of Reno ordinance to sprinkle buildings over 55 feet, even though the Uniform Building Code (U.B.C.) indicates buildings over 65 feet.

3. The Nye Building elevator--This project required the installation of additional insulation on the boiler breaching.

These and other project modifications mandated by the State Fire Marshal are primarily due to the State Fire Marshal and the local governing authority overlooking a fire code design deficiency when reviewing the project design. These deficiencies, for the most part, were project design non-compliance with local government fire codes which are generally more restrictive than the Uniform Building Code adopted by the State Public Works Board and the State Fire Marshal. Additionally, it was stated that these local fire codes were often unbeknown to the State Fire Marshal. The reason the State Fire Marshal enforced local government fire codes on state construction projects is his interpretation that NRS 278.580 and 278.-585 statutorily required the state to comply with all local government ordinances. The State Public Works Board also believes the state should comply with local government ordinances because it is prudent to do so since fire protection for state buildings is provided by local governments, and from their interpretation of chapter 289 enacted by the 1971 Legislature requiring the state to comply with local ordinances which are applicable to private persons performing the same type of work.

However, according to an Attorney General opinion to the State Public Works Board (A.G.O. No. 140 - 8/23/1973,

Appendix D) and a memorandum dated 5/29/1980 from Legislative Counsel to the Legislative Commission's subcommittee developing a statewide fire protection and control master plan pursuant to S.C.R. 23 (Appendix D) the state is not required to comply with local building codes.

Although these legal opinions stated compliance is not required, the subcommittee believed the state should comply. The reason is that the state should follow the same minimum codes required of the private sector since the building code ordinances adopted are supposed to be in the public interest.

As previously mentioned, the State Fire Marshal is not aware of many of the local fire code ordinances enacted. Also, the enactment of these ordinances by local government is based primarily on information provided by the local fire chief and building departments. The subcommittee believes that local governments should, prior to the enactment or amending of any fire code ordinances, solicit the comments of the State Fire Marshal. Therefore, the subcommittee recommends that cities, counties and towns be required to submit new and amended building fire code ordinances, prior to their enactment, to the State Fire Marshal for review and written recommendations.

The General Principles (attached as Appendix E) cover the design of public works and establish the Board's design objectives and directives. These objectives and directives are concerned principally with design and construction economy, public health and safety, the project's basic accommodation, and the project's intended use and budget. For the most part, these general principles did not result in additional costs and, therefore, were supported by the subcommittee. Not included in the design principles, however, are the Board's objectives concerning building flexibility.

It was noted by the subcommittee that the current minimum building codes coupled with the state's higher standards to insure public health and safety automatically guarantee long building life. Therefore, buildings without flexibility become functionally obsolete long before they become structurally obsolete due primarily to program changes to meet the needs of the using agency.

It is the subcommittee's recommendation, therefore, that the General Design Principles established by the SPWB for public works projects shall include the objective that all project designs will insure maximum building flexibility to accommodate agencies' changing philosophy and programs in the building being constructed within the amount of funding approved for the project.

Design Schedule:

The time required to design a project is contingent upon the project's location, size, complexity, reviewing authorities and architect's workload. A typical project, according to the SPWB, from the time of the availability of funding until design approval encompasses approximately 11 months. (A typical project design and construction schedule are shown as Appendix F.)

Essential to the timely design of any project, especially in light of today's inflation rate, is prompt design startup upon project funding approval and compliance with schedules established for the different phases of design.

In reviewing the design schedule provided by the SPWB for a typical project, actual design does not begin until several months after the project funding has been approved. This delay was due to revision of the project's budget and program to reflect legislative changes and the actual writing of the project's program and resulted in increased construction costs because of delaying the beginning of construction. Under the current procedures followed by the SPWB, it did not appear possible to move forward the design without advance planning the projects or by adding a project program writer to the SPWB's staff. Advance planning and a project program writer are recommended and are discussed as subsections A and E of Section III.

Compliance by the project architect to the time schedule established for the schematic, design development, construction document and bidding document phases of design, is critical if project construction startup and completion target dates are to be met. The SPWB advised the subcommittee that approximately 70 percent of the projects are completed within the design schedule established. The remaining 30 percent that are not completed within the design time frame are delayed primarily due to the project architects and the SPWB.

The subcommittee believed that the SPWB should aggressively enforce compliance to the design time schedule by all project architects.

Design Review and Approval

The design review and approval process involves the SPWB, its staff, private practice engineers contracted to provide structural, electrical and mechanical plans checking for the Board, the State Divisions of Consumer Health and Environmental Protection, the State Fire Marshal, local fire and building departments and the operating state agency. Additionally, private practice architects may informally request design review and cost estimates from general contractors.

The design review and approval performed by the State Divisions of Consumer Health and Environmental Protection, the plans checker retained by the Board, the State Fire Marshal, and local fire and building departments is primarily an audit of the building design for compliance to required building codes, public health and safety standards, and conservation of energy standards. The review and approval process performed by the Board is limited only to approval of the schematic and final design to insure the project, from a lay point of view, is a reasonable building and fulfills what the legislature intended.

The Board's staff design review and approval include all of the above in addition to reviewing design, economy and efficiency of construction.

The subcommittee found no problem concerning the design approval process except for that previously noted and discussed with regard to the State Fire Marshal. However, regarding the design review process performed by the SPWB in conjunction with the project architect and the project general contractor, the subcommittee found that the design review did not include a formal "value management" (VM) and "life cycle costing" (LCC) analysis.

Value management is a systematic, objective and analytical study of an existing design, product, system or organization aimed at reducing cost without sacrificing desire performance level. Life cycle costing is the development

of competing alternative costs of acquiring, owning and using an item, system or building over a specified length of time that has been defined to satisfy the same basic function or sets of functions. LCC and VM are performed during the development stages of design.

These two construction concepts are formally used extensively by the Federal Government and, according to testimony, are only informally applied in the design and construction of state projects.

The informal applications of "value management" cited were: (1) the SPWB, under recently adopted procedures, has established an in-house review team consisting of five architects to "brainstorm" project design with the purpose of improving quality and reducing costs, (2) prior to the project general contractor's beginning construction, the SPWB does occasionally request the contractor to provide design change suggestions to improve quality and further reduce cost, and (3) a private project architect, during project design, will occasionally request the advice of a general contractor.

The subcommittee believes that a formalized "value management" review of appropriate projects would result in construction of a project where quality and cost have been combined to produce the essential functions of the project at the lowest overall cost.

It was, therefore, the subcommittee's recommendation that the SPWB consider promulgating procedures to incorporate, as part of its standard operating procedures, the use of "value management" for capital improvement projects.

The subcommittee commends the SPWB for taking the initiative in establishing an in-house design review team to "brainstorm" project designs. The subcommittee, however, believed the in-house team would be more effective if it included a general building contractor. A general building contractor would provide the team with current construction marketplace conditions, technology, methodology, scheduling, design feasibility, etc.

The subcommittee, therefore, recommends that the SPWB include on its in-house project design review team a general building contractor.

Although the Board at the present time provides the Legislature with a life cycle cost analysis for each project recommended as required by NRS 341.151, the analysis is meaningless since it is only a mathematical computation of construction cost plus estimated operating and maintenance cost on the expected useful life of the project. The SPWB is currently in the process of trying to purchase a computerized life cycle costing system program. Thus far, they have been unable to purchase a computerized system.

The subcommittee recommends that the SPWB, upon computerizing their "life cycle cost system" provide the Legislature life costing alternatives for each project recommended in its capital improvements program. In the event the SPWB is not able to obtain a computerized system, the SPWB should request legislation to repeal the statutory provision requiring them to provide the Legislature with life cycle costs information.

Construction and Bidding Documents

The final stage of the design phase is the preparation by the design consultant of the construction and bidding documents.

The subcommittee concluded from testimony and its review of this stage that the project documents prepared were clear, complete and explicit to produce the proposed objective. Even though the documents appear, for the most part, to be implicit enough for general contractors, it was suggested by the Associated General Contractors (A.G.C.) that the SPWB index its "General Conditions of Contract for Construction" similar to the index used by the American Institute of Architects (A.I.A.

The subcommittee supported this suggestion and recommended that the SPWB revise its indexing system accordingly.

Standardization and Reuse of Design Plans

Standardization and reuse of design plans was considered to be an area where the cost of capital improvement projects could be reduced. The SPWB informed the subcommittee that the standardization of design plans is not normally feasible because of the differing agency requirements.

The SPWB, however, stated that this was being done wherever possible, such as the design plans for the existing 90-man Northern Nevada Medium Security Prison being site adapted for the Southern Nevada Medium Security Prison that is being constructed near Indian Springs, Nevada. When a design plan is reused, the SPWB staff stated that the architectural fee is 2 1/2 to 4 percent compared to 7 to 8 percent for a new project design. This is a saving of 4 to 4 1/2 percent, depending on the problems encountered in site adapting a preexisting plan. It was noted, however, that design plans do become obsolete within 3 to 5 years due to changing codes and trends in the construction industry and public use of buildings.

One area considered by the subcommittee which could benefit greatly by standardizing and reusing design plans was the public schools. School building plans have been included in this report because of the SPWB's statutory requirement to review and approve design plans for school buildings.

The SPWB explained that school building plans are reviewed by the Board's staff or by independent design consultants contracted by the Board and that the State Department of Education is provided a set of plans by the SPWB. Upon the SPWB's approval of the design plans, the school district is notified by letter. A copy of the approved school design plan is maintained in the SPWB's files for a period of 4 years.

The statutory responsibility for standardized school building plans rests with the State Department of Education who may adopt the standardized plans and specifications for the construction of school buildings. Currently, the Department of Education has not adopted any standardized plans because there are no available funds for development of such plans.

The subcommittee's staff and the Secretary-Manager of the SPWB, at the direction of the subcommittee, met with staff of the State Department of Education to develop a procedure to notify and encourage school boards to consider the use of design plans already approved by the SPWB. The procedure that was developed is as follows:

> The Department of Education upon approval by the State Board of Education will:

1. Adopt procedures to approve and govern the use of Standard Plans received from school districts, builders, or pre-manufactured building suppliers;

2. Maintain a bibliography of Standard Plans and school design plans approved by the SPWB; and

3. Notify school districts annually that bibliography of these plans is available upon request.

The subcommittee endorses the above procedures and encourages school districts, when feasible, to use previously approved school design plans. (Note: As of this writing, the State Board of Education has approved the Department of Education's procedures.)

C. Awarding of Capital Improvement Projects

This is the second phase in the traditional construction delivery system followed by the SPWB. In examining the award phase, the subcommittee reviewed it in two parts. The first part discusses the conditions and contract requirements the general contractor considers as cost factors in developing a bid for a project. The second part sets forth the steps followed in awarding a project.

Bidding

Factors considered and discussed as having a relationship to the eventual bid submitted by general contractors were advance knowledge of the budgets for Capital Improvement Projects, project payment procedure, retention and paperwork.

Advance Knowledge of Capital Improvements Budget

Testimony indicated that to be assured of receiving competitive bids for a project, a minimum of four to five bids must be received. For the most part, however, this has not been the case during the past several years due to the adverse bidding atmosphere for public projects. These poor conditions, due principally to inflation and the large demand on material, manpower and management resources by the large private construction program in the Reno and Las Vegas areas, have resulted in fewer general contractors bidding and higher construction bids for public projects.

Because of poor bidding conditions, the SPWB has indicated that approximately 50 percent of the low bids it has received during the past few years have been in excess of the project's established construction budget but within the statutory negotiating amount of 10 percent. These conditions may be changing in the immediate future due to the economic downturn nationwide in private construction, but this remains to be seen.

Explained as one possible reason for Capital Improvement Project bids being higher than private projects was that the general contractors know in advance of bidding how much the Legislature is willing to pay for a project. However, testimony by several contractors, including the subcommittee's consulting general contractor, stated very positively that general contractors based their bids on either public or private projects on the prevailing costs of materials, manpower and management resources projected for estimated project construction time, profit margin, competing general contractors and construction projects available in the area and not on the published estimated cost of the project.

Additionally, testimony provided by the subcommittee's architectural consultants indicated that funding for a private project is known in advance by general contractors when bidding the project from the architect's estimated budget for the project. The subcommittee believed, for the most part, that this was an accurate assessment.

Project Payment Procedures

In order for a general contractor to receive a payment, whether a progress payment or final payment, the requested payment must be approved by the SPWB's project inspector, architect, project manager, chief building inspector, staff accountant and the secretary-manager of the Board prior to being forwarded to the Pre-Audit section of the state Budget Division and the state Controller for payment. In the private sector, payment approving authorities are the architect, owner's accounting section and the owner. The "General Conditions of Contract for Construction" which is adhered to by both the SPWB and the private sector, requires project payment within 15 days after approval by the project architect.

The slowness in approving payment to the contractor was pointed out by contractors and the Associated General Contractors (A.G.C.) Association as a reason for public projects being higher than private. A general contractor and subcontractor, in bidding their services, must factor into their bid the reimbursement time differential cost for advancing funds to pay for labor, material and overhead on the project.

The reimbursement time differential, according to testimony, is longer for public projects than private projects. This fact was not, however, substantiated by a sampling of payments from capital improvement projects. From the different projects sampled, from the date approved by the architect to the time the payment check was mailed, showed an 86 percent compliance to the term of the contract.

Retention

When processing project progress payments, the SPWB is required by NRS 338.160 to retain 10 percent from each payment until the project is 50 percent complete and progress is satisfactory. Further retentions can be waived upon request by the general contractor, which results in a 5 percent retention for a completed project. The present SPWB policy is to hold retained funds for 43 days after the notice of project completion has been filed. The purpose of retaining funds is to satisfy liens filed against the project for unpaid labor and/or materials and insure the successful completion of the project. It should be mentioned that these exposures are also covered by the performance, labor, material and completion bonds the general contractor must provide to the state.

Although retention of project funds was not cited as a reason for state projects being higher than private projects, since funds are also retained on private projects, it was suggested by the A.G.C. as an area in which project bids could be reduced. It was also suggested that the SPWB adopt the retention procedure followed by the state Department of Transportation, that is, allowing the general contractors the option of depositing project retained funds in a joint bank account to accrue interest. In addition, it was suggested that upon filing of a substantial notice or on notice of completion of the project, these funds be released since, according to a letter opinion from the Attorney General, dated February 5, 1980, state projects cannot be liened.

The State Public Works Board stated they were in agreement with the A.G.C. recommendations. They informed the subcommittee that the payment of retained funds upon filing of project completion notice could be implemented by the Board which, as of the writing of this report has been accomplished. However, the payment of interest on retained funds requires legislation. Regarding the payment of interest on retained funds, the SPWB indicated these funds could be invested by the State Treasurer along with other state funds. This would avoid the establishing of private bank accounts for each project which would create an additional workload for the accounting staff. The State Treasurer indicated there would be no problem in investing these funds and distributing them on a quarterly basis if authorized by the Legislature.

The subcommittee believes that payment of interest on retained funds is justified since these funds have already been earned by the contractor. Also, the payment of interest on these funds could, in a small way, reduce construction costs. Therefore, the subcommittee recommends that NRS 356.087 be amended to provide the investment and quarterly payment of interest by the State Treasurer to general contractors on funds withheld from progress payments by the SPWB per NRS 338.170.

Paperwork

According to testimony received by the subcommittee, the opinions were divided as to whether paperwork required from general contractors by the SPWB on Capital Improvement Projects was one of the reasons for the high cost of state projects. It was determined that the contractor considers this as a bid cost factor depending upon his own internal procedure for processing paperwork. It was also determined that the payroll reports required by the State Labor Commissioner and the Federal Government does have a cost influence on all public project bids. These payroll reports are discussed under subsection D of Section III in conjunction with the prevailing wage rates that must be paid on public projects.

Awarding of Contracts

The SPWB is statutorily required to advertise for sealed bids for each public works project in excess of $10,000.

Interested contractors who are properly licensed and provide a 5 percent bid bond, can submit a bid on a project. The low bidder is awarded the project providing: (1) the bid was properly submitted; (2) the bid was within the project's construction budget; (3) the bid was not in excess of 10 percent of the project's construction budget which can be negotiated to within the project's construction budget; (4) the bid is in the best interests of the state; and (5) the contractor is properly licensed by the State of Nevada and bonded.

In the event that none of the bids received meet the above conditions, all bids are rejected and new bids are solicited. The subcommittee did not see any problems in the awarding process for the present construction delivery system. However, there was some discussion on qualifying contractors. This discussion follows.

Qualifying of Contractor

Although the SPWB has the ultimate responsibility for the failure or success of a project, the control of qualifying a contractor is the responsibility of the State Contractor's Board and the bonding companies. Under the present system, contractors whose performance may be borderline or substandard regarding quality, timeliness, desire to perform, and other standards, cannot be excluded from bidding a capital improvements project. The SPWB has indicated that there have been occasional problems with general contractors under the present system but that thus far no major problems have occurred due to aggressive actions by the SPWB. In the majority of cases, general contractors awarded state projects have proven to be responsible.

The SPWB believes the present awarding system is adequate for the construction delivery system authorized and does not need to be modified. However, if other construction delivery systems are recommended to be authorized for use by the SPWB, the SPWB recommends prequalifying of contractors based on their experience, staff and financial capabilities, past performance, and other qualifications to insure they are capable of doing the work satisfactorily. The need to prequalify contractors is discussed in this section dealing with new construction delivery systems.

D. Construction

The final linear phase in the construction delivery approach followed by the SPWB is the actual construction of the project. Once the project reaches this phase, it is generally agreed that no major cost benefits are going to be realized because the major cost benefits are normally achieved early in the design phase of the project.

Although the subcommittee agreed with the above statement, it believed that there were several areas requiring improvements in the construction phase. These areas deal with change orders and the prevailing wage rate for public projects.

Change Orders

Successful bidders are questioned prior to commencing construction on a project as to whether there are any areas where construction changes can be made to reduce the project's cost without affecting the quality and function of the project. According to testimony by the Board, general contractors have recommended changes which have been authorized by the SPWB and which resulted in project budget reductions in approximately 60 percent of the projects awarded.

The only incentive to the contractor for these recommended changes is that his overhead and profit remain the same. Because of general contractors proven ability to reduce project costs and the extensive use of incentives to contractors by the Federal Government for value management ideas, the subcommittee discussed the possibility of the SPWB's offering additional incentives for cost saving value management ideas.

However, after some discussion, the subcommittee rejected the idea due to a strong possibility of design deterioration and construction delays which could occur because of the additional work and pressure placed on the SPWB's staff from general contractors trying to exploit the benefit.

Although this may or may not happen, the subcommittee believed additional study was needed in this area and therefore concluded that the principal incentives of overhead, profit and time were adequate at this time.

The subcommittee also noted that implementation of value management ideas resulting in more than a 10 percent differential in the awarded contract price for a project is prohibited by NRS 341.150(f). The subcommittee requested a legal opinion from the Legislative Counsel as to whether there were any prohibitions to removing this provision. The Legislative Counsel indicated that the provision could be deleted by legislation. (Legislative Counsel's opinion is attached as Appendix G.)

The subcommittee recommended amending NRS 341.150(f) to eliminate the 10 percent limitation that an awarded project contract amount can be decreased.

Prevailing Wage Rates

General contractors engaged on state public works projects are required to pay their employees the prevailing state wage rate or, if higher, the prevailing federal wage rate, on state projects supported with federal funds. The general contractors must also provide monthly payroll reports to the State Labor Commissioner and weekly reports to the Federal Government if a state project includes federal funds.

According to testimony, the prevailing state and federal wage rates and wage reporting requirements are one of the contributory reasons for public projects costing more than those in the private sector.

The prevailing state wage rate is determined by the State Labor Commissioner primarily from information gathered from the Federal Register on prevailing federal wage rates, and Nevada's labor organizations' wage scales. It was noted that the prevailing state wage rate is identical to the labor union wage scale and the prevailing federal wage rate appears to be slightly less than union scale.

Testimony by the building associations indicated that, if prevailing wage rates are to be required for public projects, the state should mandate the prevailing federal wage rate be applied in lieu of the state's. Also the building association representatives testified that, if the prevailing federal wage rates were adopted, then the monthly filing of payroll reports with the State Labor Commission should be discontinued since this is not a by-product of

the contractor's weekly payroll system as is the federal reports. The prevailing federal wage rate, according to the building association representatives, is uniformly enforced and provides a better appeals process.

In considering the testimony given and in the interest of elementary unnecessary paperwork, the subcommittee recommends amending chapter 338 of Nevada Revised Statutes to eliminate the prevailing state wage rate and require the State Labor Commissioner to provide and enforce the prevailing federal wage rate on public projects.

The subcommittee also recommends the statutory requirement that contractors and subcontractors provide a copy of monthly payroll reports be optional upon request by the State Labor Commissioner only if a complaint has been filed with his office.

Construction Delivery Systems

The most distinct construction advantage the private sector has over the public sector is flexibility. In the private sector, a firm or corporation constructing a new building can select the construction delivery system best suited to its project which may be design-award-build, or construction management, or design-build or turn-key. The contracting entity can also select the architects, engineers and contractors of its choice without following formal procedures and can incorporate minimum or higher codes and standards in the project to accomplish the entity's desired objective. However, this is not and should not be the case in the public sector for very good reasons, the foremost being that the public sector has a greater responsibility to insure maximum health and safety, and, secondly, to insure public funds are spent carefully and wisely.

Although the above-mentioned reasons mandate that laws governing public construction be enacted and formal rules and procedures be adopted, they should be structured to provide the maximum flexibility possible and updated, as needed, to meet changing technology and methods. This is extremely important if the public sector is going to contain, with any degree of success, the rapidly rising construction costs to within close proximity of the private

sector as the general public expects. In Nevada, the construction delivery system used for the construction and remodeling of state buildings by the SPWB has been limited to the design-award-build system. Other states, such as California, and the Federal Government have authorized other construction delivery systems to offset rising construction costs.

The 1979 Nevada Legislature authorized in excess of $167 million for the 1979-81 biennium for Capital Improvement Projects. These projects, with the exception of those having federal funds, must be constructed under the design-award-build system. On projects with federal funds the SPWB can use the construction management delivery system. Given the magnitude of public construction programs and the increasing costs of labor and material, the subcommittee believed it is not realistic, practical, or in the best interests of the taxpayers of Nevada to limit the SPWB to a single construction delivery system.

With this in mind, the subcommittee discussed both the oral and written testimony it had received as to whether the SPWB should be authorized to use additional construction delivery approaches. The two delivery approaches considered were a modified construction management/guaranteed maximum cost construction system and a design-build system. These systems procedurally would work as follows:

PROPOSED CONSTRUCTION DELIVERY SYSTEMS

PROCEDURE FOR GUARANTEED MAXIMUM CONSTRUCTION COST PROJECTS

This policy is intended to be used for construction projects at the discretion of the State Public Works Board (SPWB):

1. The SPWB will select an architect who will, along with the SPWB, develop schematics and outline specifications and estimated budget.

2. The SPWB will prequalify contractors for the specific project in accordance with procedures developed with the Associated General Contractors (A.G.C.) and the American Institute of Architects (A.I.A.).

3. The prequalified contractors will be asked to provide to the SPWB bids based on the following three elements:

   a. The lump sum cost for working with the architect during the project design phase until such time as the contractor can provide to the SPWB a guaranteed maximum cost for the project.

   b. The contractor's lump sum cost for obtaining all sub-contract bids which contractor will reveal to the SPWB.

   c. The lump sum amount for administering the sub-contracts and the general and supplemental conditions of the contract.

4. A contract is then awarded to the contractor with the lowest overall price of the above three bid elements.

5. The successful contractor will commence work with the SPWB and its designated architect to arrive at a guaranteed maximum cost that will be satisfactory to the SPWB and the contractor. If the contractor is unable to provide a guaranteed maximum cost for the project during or upon completion of the design stage, the contractor may abandon the job and be compensated for item 3. a. and b. above for the work performed with the architect and the SPWB. However, prior to this, the architect, the SPWB and contractor will try to arrive at a compromise that is satisfactory between them. The compromise could either be a reduction in the scope of the project or increasing the budget, or possibly both.

6. Upon arriving at a guaranteed maximum cost, the contractor would then sign an owner-contractor agreement for total job cost with bonds and the construction of the project would commence.

PROCEDURES FOR DESIGN-BUILD PROJECTS

This policy is intended to be used for construction projects which can be easily described in the scope of work narrative and sketch plan by SPWB. Under this policy, the contractor would design and construct the total project.

1. The SPWB would ask for proposals from prequalified contractors based on a project plan sketch, narrative and outline specifications as prepared by the SPWB staff.

2. Proposal submitted by prequalified contractors will be total cost for design and construction or cost plus with a guaranteed maximum for design and construction, depending on the project. The design of the project under this method can be done by the contractor's in-house design staff or an independent architect of his choice as may be required by the SPWB. In either case, approval of the design team by the SPWB would be required.

3. The lowest bidder would be awarded the contract.

4. The low bidder would design the project as described by the narrative and sketch plan. The final design must be acceptable to the SPWB.

Construction management as proposed by the subcommittee is defined in the Associated General Contractors of America Owner's Guide, Building Construction Contracting Methods, as "an agreement to perform the service and the work for a fixed fee with the qualified general contracting organization serving as the construction professional and expert on the building team with the owner and architect/engineer from the beginning of design throughout the completion of construction." Construction management is designed to be used where appropriate on multistory office buildings, complex design projects and other projects costing $5 million or more.

There are multiple advantages for employing construction management on large and/or complex construction projects. The major advantages include: general contractor on design team, reduced design time, construction may commence before design plans are complete (the bar chart in Appendix H illustrates this advantage by comparing conventional contracting to "fast tracking"), advance ordering of materials in short supply, and building of specialized mechanical and electrical systems. All of these advantages listed will, for the most part, result in lower project construction cost which also is a major advantage of construction management.

Primary among the advantages believed to be essential but formally lacking for achieving economy and efficiency in large, complex state projects is the inclusion of the general contractor as a working member of the design team. As is pointed out in this report, general contractors are equipped with information on the current construction marketplace conditions and can provide advice during the design stage on construction technology, methodology, feasibility, scheduling and cost. It is generally agreed by architects, engineers and contractors that the major, irrevocable design decisions are made in the early phases of projects and that the greatest cost benefit to be realized is to have all parties in the planning and designing of a project involved from the very beginning. Under the present system, however, this organized teamwork is missing because the major phases of the design-bid-award-build construction delivery system are completed separately, without any formal working relationship between the contractor and the designer.

Although the subcommittee believed the authorizing of a modified construction management system for the construction of large, complex state projects was warranted and generally supported by the architectural community and contractors appearing before the subcommittee, this construction approach was opposed by both the northern and southern divisions of the Associated General Contractors' Association (A.G.C.). The association's opposition, which was expressed to members of the subcommittee and its staff, and the Secretary-Manager of the SPWB was as follows: (1) comprehensive and personal prequalification criteria to screen out undesirable contractors would result in discrimination suits; (2) prequalification process would result in political favoritism; (3) other governmental agencies, lacking in-house expertise, would be allowed to use these new systems; and (4) encourage the use of out-of-state contractors.

In order to determine the validity of the first objection, the subcommittee requested from the Legislative Counsel a legal opinion on whether the A.G.C.'s prequalification questionnaire could be the basis of a discrimination suit by a rejected contractor. Counsel's opinion stated that "It does not therefore appear that using these forms--or some similar method of inquiry--would inherently involve any greater possibility of abuse than the present system." (Legislative Counsel's legal opinion is shown as Appendix I.

The second objection, regarding political favoritism, could occur if political pressure or for that matter any pressure, such as physical or economic, was brought to bear on the SPWB's members. However, considering the staggered terms of the Board's members, and the selection procedure for the Board members, which was purposefully designed to avoid "stacking" the Board, and due to the occupational diversification of the Board, the probability of this happening appears to be very slim.

Regarding the third opposition, Legislative Counsel has informed the subcommittee, through its staff, that the new delivery system can be selectively limited to the SPWB and need not apply to other governmental agencies. The final opposition--encouraging the use of out-of-state contractors--may be valid only to the point of encouraging in-state contractors to develop greater in-house expertise in

the use of the two proposed systems. It is believed in the long-range analysis that not only will Nevada citizens benefit through a saving of their tax dollars, but also the private construction sector will have better informed contractors.

The other construction delivery system proposed by the subcommittee integrates design and construction under one contract and is commonly referred to as design-build. Design-build would be used for construction projects easily described by a scope of work narrative and sketch plan developed by the SPWB. (An example of a design-build narrative and sketch plan is shown as Appendix J.)

Under this system, the owner is committed to a general contractor for the design and construction of a project for a given price (lowest bid from the prequalified contractors competing) without a fully detailed design based on a statement of requirements. This system could be used by the SPWB for predesigned and preengineered stock facilities, small, straightforward office buildings and warehouses which can be simply described by a word narrative and sketch plan. The advantages in using this system for these types of projects are that the project price can be firmly established earlier, reduced design time, shorter project delivery time, construction expertise is factored directly into design, and reduced construction costs.

The one major concern expressed regarding the design-build construction system, other than the prequalification of contractors previously discussed, was the lack of control over the project by the SPWB.

It was pointed out that the key to control for a design-build project is the delineation of the project's scope of work and sketch plan. If these documents are all inclusive, the SPWB will retain control over the project. To further strengthen the SPWB's control but at the same time not diluting the cost benefits of a design-build delivery system, the procedures established for this system by the subcommittee provided for the SPWB's approval of the project design and private architects where appropriate. The success or failure of a design-build delivery approach in the public sector depends heavily on the expertise of the public entity's in-house staff and the subcommittee believes the SPWB has this expertise.

Authorization by the Legislature of Construction Management/Guaranteed Maximum Cost (CM/GMC) and Design-build (DB) delivery systems in the construction of appropriate Capital Improvement Projects (CIP) would, as previously stated, result in lower construction costs. The following table illustrates the estimated construction cost saving for one of the advantages, reduced design time, which is cited for both systems. The savings shown are for 1979-81 CIP's considered appropriate by the SPWB for construction under CM/GMC and DB construction delivery systems.

The estimated savings shown are based on the SPWB opinion that the proposed delivery systems will reduce design time by 10 percent or 2 months for CM/GMC projects and 50 percent or 3 months for DB projects which then will advance construction startup by the same amount of time, thus saving 1 1/2 percent per month in construction costs. The design time reductions cited are based on the average design time required under the present system (design-bid/award-build) on projects costing $5 million or more being 18 months and on projects $1 million or less being 6 months.

ESTIMATED CONSTRUCTION COST SAVINGS OF SELECTED 1979-81 CAPITAL IMPROVEMENT PROJECTS CONSTRUCTED UNDER CONSTRUCTION MANAGEMENT/GUARANTEED MAXIMUM COST DELIVERY SYSTEM AS COMPARED TO DESIGN-BID/AWARD-BUILD DELIVERY SYSTEM

Project	Design-Bid/ Award-Build*	Construction Management/ Guaranteed Maximum Cost	Savings
Southern Desert Correctional Center	$25,000,000	$24,250,000	$ 750,000
Business & Hotel Administration, UNLV	9,775,000	9,481,750	293,250
Mackay School of Mines, UNR	5,040,000	4,888,800	151,200
Total	$39,815,000	$38,620,550	$1,194,450

ESTIMATED CONSTRUCTION COST SAVINGS OF SELECTED 1979-81 CAPITAL IMPROVEMENT PROJECTS CONSTRUCTED UNDER DESIGN-BUILD SYSTEM AS COMPARED TO DESIGN-BID/AWARD-BUILD DELIVERY SYSTEM

Project	Design-Bid/ Award-Build*	Design-Build	Savings
Purchasing Warehouse	$ 732,000	$ 699,060	$ 32,940
Historical Society Bldg. Addition	480,000	458,400	21,600
Fallon Community College Bldg.	674,300	643,957	30,343
Sierra Developmental Center	337,600	322,408	15,192
Desert Developmental Center	341,700	326,324	15,376
Special Children's Clinic	635,000	606,425	28,575
Dept. of Wildlife Bldg., Fallon	94,300	90,057	4,243
Total	$ 3,294,900	$ 3,146,631	$ 148,269

Total Estimated Savings = $1,342,719

* SPWB's Estimated Construction Costs.

Although the AGC objected to the authorization of the proposed construction delivery systems, the subcommittee believes that it is not realistic nor in the best interest of the taxpayer to limit the SPWB to one construction delivery system and that the objections expressed as previously discussed were resolvable. Therefore, the subcommittee recommends that chapter 341 of NRS be amended to provide authority solely to the SPWB to use a Modified Construction Management/Guaranteed Maximum Cost and Design-Build construction delivery systems. The designation of these systems for state projects will be at the discretion of the SPWB, but their implementation for specific projects must first be approved by the Interim Finance Committee or the Legislature, if in session.

E. Board Organization and Administration

The State Public Works Board consists of 10 members appointed by the Governor, the Chief of the Budget Division (statutory ex officio member), and four divisions supervised by a manager appointed by the Board who also serves as secretary to the Board.

The duties and responsibilities of the State Public Works Board are listed in Section 2 of this report and the organizational chart is included as Appendix A.

The subcommittee's basic concern in their review of the State Public Works Board administration centered on the Board's composition and tenure, the role performed by the Board and its professional staff, the SPWB staffing and operating budget.

Regarding the Board's composition and tenure, the subcommittee originally believed that the Board's members should be statutorily selected and limited to a fixed number of terms, thus insuring proper representation and influx of new ideas. Upon its review of the Board, the subcommittee concluded that a recommendation in this area was not necessary since the Board's current membership appointed by the Governor included a banker, several engineers and businessmen, a general contractor and a labor leader and a statutorily selected state planning coordinator. In addition, it noted the Board's tenure was evenly distributed between old and new members. (There were five members with less than two terms and five members with more than three terms.)

The role performed by the Board as well as that by past Boards, according to testimony, is the adoption of policies, goals and procedures in the planning, designing and construction of capital improvement projects, the adoption of rules and regulations governing the daily administration of its staff, the arbitration of contract disputes between staff and private contractors, the recommendation of capital improvement projects to the Governor and to the Legislature, and the review of legislatively approved capital improvement projects to provide the lay person's point of view and to insure project budget compliance.

The subcommittee believed this was the proper role for the Board to perform and commended them for not being involved in the daily administration and technical implementation of the state's capital improvement program.

The Board, to carry on its statutory duties, is assisted by a legislatively approved professional staff consisting of a manager appointed by the Board, a deputy manager and chief assistant appointed by the manager, five registered architects, three registered professional engineers, two architectural draftsmen, a chief and assistant chief inspector, building inspectors as required, senior accountant, account clerk, and two administrative aides. The subcommittee concluded, from testimony provided by the Board and its manager, and a review of the professional staff's job descriptions and resumes, that the staff was adequate and qualified to provide the technical expertise necessary to carry out the Board's goals, objectives and responsibilities in implementing the state's capital improvement program except in the areas of capital improvement project program writing and estimating. Currently the responsibility for programing capital improvement projects to fit agency needs is assigned to five in-house project architects. Although these architects are capable of performing this duty, the time that they can devote from their primary duties of supervising projects that are being designed and under construction is extremely limited. Because of the limited time available, actual design of projects does not begin until several months after funding has been approved by the Legislature. The reasons for the delay are discussed in the section under the subsection titled "Design Schedule."

Testimony to the subcommittee by the former California State Architect (1968-1973) who was retained as a consultant, stated that the need for a position with primary responsibility to program capital improvement projects to meet the requesting agency's program need is essential to the successful design and construction of a project with a minimum of problems. He indicated that this type of position requires considerable expertise. A good program writer must be able to describe a project in clear, complete and concise terms easily and readily understandable by both the architect retained to design the project and the agency requesting the project. To demonstrate the importance of a program writer position, he cited as an example a $20 million highway patrol academy building in California which had been in the preliminary programing stage for 8 years because of the numerous individuals involved in its programing. However, once this program had been assigned to a program writer, the project was programed in 90 days.

Other advantages cited by the consultant for including a program writer on the State Public Works Board staff were: (1) project program is better written; (2) agency has clearer understanding of what project will provide; (3) better guarantee the project will fit agency program; (4) reduced design time resulting in earlier startup of construction; (5) reduced risk in having to redesign projects because design does not fit program or design exceeds construction budget; and (6) shorten time span between the approval of the capital improvement project by the Legislature and the project design startup.

In times of high inflation, it is critical that construction of a project begin as soon as possible. High inflation was the case when constructing the projects approved by the 1977 Legislature and, in part, some of those approved by the 1979 Legislature. The subcommittee believes that if a project program writer had been on the SPWB staff at the time, the construction startup of these projects could have been conservatively advanced by 1 month. Applying the monthly construction inflation rate of 1 1/2 percent prevalent for the 1977 legislative capital improvement program of $59 million, less nonconstruction costs (architectural, engineering fees, furnishings, land costs, inspection costs, etc.) of $9.0 million, it is estimated construction cost savings could have been in the neighborhood of $750,000.

Currently, capital improvement budgets submitted to the Legislature are prepared by the Deputy Manager from historical construction cost data of previous projects and from published construction and evaluation manuals and magazines such as, "The Dodge Digest," "Design Costs and Data," "Marshall Valuation Services," "University Building Space/Cost Data," etc.

The subcommittee noted from its review of this area that the time devoted by the Deputy Manager in developing project budgets was limited because of his other responsibilities of assisting in the administration of the Board's programs, supervising of the Architectural/Engineering Division, project management and development of training and emergency procedure programs. Additionally, it was noted that there was a lack of current construction cost data on public and private projects recently completed in various areas of the state. Even though historical and published data are reliable sources of information, the subcommittee believes that they should be augmented by local cost data to reflect the current economic conditions and construction marketplace.

Based on the benefits that would accrue to the state if the SPWB were to have a position devoted only to program writing and estimating project construction costs, the subcommittee recommends that the SPWB include in its 1981 biennial budget request a Project Program Writer/Estimator position. The rationale by the subcommittee in combining these two areas in one position is that the person writing the program is also the person with the most information on the project needed to estimate its cost. Additionally, the SPWB should include in its 1981 biennial budget an Administrative Aide to provide the Project Program Writer/Estimator position with the necessary clerical support.

The subcommittee, in its review of the SPWB 1979-81 operating budget, found that funds were not provided for staff to travel out of state to review unique facilities similar to those being considered for construction in Nevada, to retain expert consultants, to assist the SPWB in resolving specific problems unrelated to a capital improvement project and for training to educate staff in new construction techniques.

Generally, every session the Legislature will approve the construction of new facilities to house unique agency programs. An example of such a project authorized by the

Legislature this past session was the Multipurpose Pavilions for the University of Nevada's Reno and Las Vegas campuses. In these cases, review of similar facilities in other states would be invaluable to the SPWB and the agency in learning firsthand the design and construction problems these states encountered and whether the facility constructed met the needs of the agency programs. Such a review, the subcommittee believes, should result in construction savings and a facility's being harmonious with the agency's programs. In order to permit the SPWB and state agencies to review prototype facilities in other states, the subcommittee recommends the SPWB include in its 1981-83 biennial budget $5,000 in out-of-state travel funds.

Occasionally, the SPWB will encounter a problem requiring the services of a consultant in a discipline not available on its staff relating to a project that has been completed, and the funds have reverted. Cited as an example to point out this need by the SPWB was the problem encountered at the Southern Nevada Correctional Center (SNCC), in that the water being provided to SNCC by Jean Utility, Inc. was corroding the installation's plumbing and the sewage from SNCC was causing a film on the utility's sewage treatment ponds. The SPWB indicated it lacks in-house expertise in both of these areas, as well as funds to hire a consultant. However, because of the seriousness of the plumbing problem, the SPWB, through the assistance of other state agencies, was able to determine the cause of the problem. (As of this writing, corrective action has been taken to correct these problems.) Also, in addition to the need for consulting funds, as previously discussed, funds will also be needed to implement the subcommittee recommendation that the Board include a general contractor on its project design "brainstorming" team. This is discussed in this section under the subsection titled "Design Review and Approval." Therefore, the subcommittee recommends that the SPWB include in its 1981-83 biennial budget $10,000 for consulting services.

Also previously discussed in the subsection titled "Design and Approval" and recommended by the subcommittee was the implementation of the value management review of capital improvement projects. In order for the SPWB to implement this recommendation, it will be necessary for the SPWB staff to receive formalized training in this area. Therefore, it is recommended by the subcommittee that the SPWB include in its 1981-83 biennial budget the sum of $2,500 for training.

IV. IMPLEMENTING LEGISLATION

SUMMARY--Changes various requirements respecting wages and progress payments on public works projects. (BDR 28-79)
Fiscal Note: Effect on Local Government: Yes.
Effect on the State or on Industrial Insurance: Yes.

AN ACT relating to public works projects; requiring payment of the prevailing wage paid on federal projects; providing for the payment to certain contractors of interest earned by the state on money withheld from progress payments; and providing other matters properly relating thereto.

THE PEOPLE OF THE STATE OF NEVADA, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

Section 1. NRS 338.020 is hereby amended to read as follows:

338.020 1. Every contract to which a public body of this state is a party, requiring the employment of skilled mechanics, skilled workmen, semiskilled mechanics, semiskilled workmen or unskilled labor in the performance of public work, [shall] must contain in express terms the hourly and daily rate of wages to be paid each of the classes of mechanics and workmen. [The] Except as provided in NRS 279.500, the hourly and daily rate of wages [shall] must not be less than the rate of [such] wages determined by the Secretary of Labor to be then prevailing [in the county, city, town, village or district in this state in which the public work is located, which prevailing rate of wages shall have been determined in the manner provided in NRS 338.030.] for each of those classes of mechanics and workmen

engaged in similar construction activity under contracts entered into by, or financed with the assistance of, an agency of the United States.

2. When public work is performed by day labor, the prevailing wage for each class of mechanics and workmen so employed [shall apply and shall] applies and must be stated clearly to [such] the mechanics and workmen when employed.

3. The prevailing wage so paid to each class of mechanics or workmen [shall] must be in accordance with the jurisdictional classes recognized in the locality where the work is performed.

4. Nothing in this section [shall prevent] prevents an employer who is signatory to a collective bargaining agreement from assigning [such] the work in accordance with established practice.

Sec. 2. NRS 338.030 is hereby amended to read as follows:

338.030 1. The public body awarding any contract for public work, or otherwise undertaking any public work, shall ascertain from the labor commissioner the general prevailing wage [in the locality in which the public work is to be performed for each craft or type of workman.

2. When the labor commissioner is in doubt as to the general prevailing rate of per diem wage he shall hold a hearing in the locality in which the work is to be executed. Notice of the hearing shall be advertised in a newspaper nearest to the

locality of the work once a week for 2 weeks prior to the time of the hearing. At the hearing, organizations such as the crafts affiliated with the state federation of labor or other recognized national labor organizations and the contractors of the locality or their representatives shall be heard. From the evidence presented the labor commissioner shall determine the general prevailing rate of per diem wage.

3.] determined by the Secretary of Labor for each craft or type of workman engaged in similar construction activity under contracts entered into by, or financed with the assistance of, an agency of the United States. The wage scales so determined [shall] must be filed by the labor commissioner, and [shall] be available to all public works awarding bodies. [It shall be deemed necessary to hold additional hearings in the same locality only when evidence is presented to show that the prevailing wage has changed since the prior hearing.

4.] 2. Nothing contained in NRS 338.010 to 338.090, inclusive, [shall be construed to authorize] authorizes the fixing of any wage below any rate [which may now or hereafter be] established as a minimum wage for any person employed upon any public work, or employed by any officer or agent of any political subdivision of the State of Nevada.

Sec. 3. NRS 338.095 is hereby amended to read as follows:

338.095 1. Every contractor and subcontractor shall keep

an accurate record showing the name, occupation, and the actual per diem wages and benefits paid to each workman employed by him in connection with the public work.

2. The record [shall] must be kept open at all reasonable hours to the inspection of the public body awarding the contract and a copy of the record for each calendar month [shall] must be sent to the labor commissioner [no later than 1 week after the end of that month.] upon his request. The labor commissioner may request a copy of the record only in cases of a dispute concerning wages.

3. Any contractor or subcontractor, or agent or representative thereof, doing public work who neglects to comply with the provisions of this section is guilty of a misdemeanor.

Sec. 4. NRS 356.087 is hereby amended to read as follows:

356.087 1. Except as provided in subsections 2 and 3, all interest paid on money belonging to the State of Nevada must be deposited in the state general fund.

2. At the end of each quarter of each fiscal year, the state treasurer shall:

(a) Compute the proportion of total deposits of state money pursuant to the provisions of this chapter which were attributable during the quarter to [the] :

(1) The state highway fund, the motor vehicle fund and the

taxicab authority fund created by NRS 408.235, [NRS] 482.180 and [NRS] 706.8825, respectively; and

(2) The account in the state general fund to which money withheld under NRS 338.160 is deposited;

(b) Apply [such proportion] the proportions obtained in subparagraphs (1) and (2) of paragraph (a) separately to the total amount of interest paid during that quarter to the state treasurer on deposits of state money; [and]

(c) Credit to the state highway fund and the taxicab authority fund an amount equal to the amount arrived at by the computation in paragraph (b) [.] , applying the proportion obtained in subparagraph (1) of paragraph (a); and

(d) Pay to each contractor from whom money was withheld under NRS 338.160 during the quarter an amount equal to his pro rata share of the amount arrived at by the computation in paragraph (b), applying the proportion obtained in subparagraph (2) of paragraph (a).

3. The proportionate shares of the interest earned and received by:

(a) The dairy commission fund;

(b) The legislators' retirement fund;

(c) The public employees' retirement fund;

(d) The state permanent school fund;

(e) The silicosis and disabled pension fund;

(f) The wildlife account; and

(g) The Colorado River resources fund, the Colorado River research and development fund, the Eldorado Valley development fund, the Fort Mohave Valley development fund and any other special revenue fund, capital projects construction fund, trust fund, enterprise fund or agency fund for which the division of Colorado River resources of the department of energy is responsible,

must be accounted for as separate income and assets of those respective funds and account.

Sec. 5. NRS 607.205 is hereby amended to read as follows:

607.205 In aid of his enforcement responsibilities under the labor laws of [the State of Nevada,] this state, including but not limited to NRS [338.030,] 607.160, 607.170, 608.270 and chapter 611 of NRS, the labor commissioner or a person designated from the commissioner's regular staff may conduct hearings and issue decisions thereon in the manner provided by NRS 607.207.

SUMMARY--Provides for advisory review of local fire codes by state fire marshal. (BDR 20-78)
Fiscal Note: Effect on Local Government: No.
Effect on the State or on Industrial Insurance: No.

AN ACT relating to fire protection; requiring certain local governing bodies to submit any proposed ordinance which adopts or amends a fire code to the state fire marshal for his review and recommendations; and providing other matters properly relating thereto.

THE PEOPLE OF THE STATE OF NEVADA, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

Section 1. NRS 244.2961 is hereby amended to read as follows:

244.2961 The board of county commissioners may:

1. Organize, regulate and maintain a fire department.

2. Appoint and prescribe the duties of the fire chief.

3. Regulate or prohibit the storage of any explosive, combustible or inflammable material in or transported through the county, and prescribe the distance from any residential or commercial area where it may be kept.

4. Establish, by ordinance, a fire code and other regulations necessary to carry out the purposes of this section. <u>The board shall, at least 15 days before it adopts or amends a fire code, submit the proposed ordinance to the state fire marshal for his review and any written recommendations.</u>

Sec. 2. Chapter 268 of NRS is hereby amended by adding thereto a new section which shall read as follows:

The governing body of a city shall, at least 15 days before it adopts an ordinance which establishes or amends a fire code, submit the proposed ordinance to the state fire marshal for his review and any written recommendations.

Sec. 3. NRS 269.250 is hereby amended to read as follows:

269.250 1. [In addition to the powers and jurisdiction conferred by other laws, the town board or board of county commissioners shall have the power and duty in any] The governing body of an unincorporated town or city [in their respective counties:] shall:

(a) [To provide] Provide for the prevention and extinguishment of fires.

(b) [To organize,] Organize, regulate, establish and disband fire companies or fire departments.

(c) [To provide] Provide for the payment of fire companies or fire departments, and the appointment and payment of officers thereof.

2. The governing body shall, at least 15 days before it adopts an ordinance which establishes or amends a fire code, submit the proposed ordinance to the state fire marshal for his review and any written recommendations.

3. All payments authorized under the provisions of subsection 1 [shall] must be made from the separate fund of the city or town where service is performed or required when [such] the fire company or department operates in the city or town alone, and if used outside of the city or town the board of county commissioners may provide for contribution from general county funds if provided for in the county budget.

[3.] 4. A majority of the [town board or board of county commissioners] governing body shall name and appoint two-thirds of all such officers and employees, and the minority thereof shall name and appoint one-third.

[4.] 5. The fire chief and the personnel of the fire department shall receive such compensation as the [town board or board of county commissioners shall prescribe.] governing body prescribes.

SUMMARY--Makes various amendments to law relating to state public works board. (BDR 28-80)
Fiscal Note: Effect on Local Government: No.
Effect on the State or on Industrial Insurance: Contains Appropriation.

AN ACT relating to the state public works board; authorizing the design and construction of projects of capital improvement under a single contract; authorizing the advance planning of projects of capital improvement; removing a limitation upon change orders; changing requirements concerning contracts for consulting services and for the assistance of a contractor in the design of projects; making an appropriation; and providing other matters properly relating thereto.

THE PEOPLE OF THE STATE OF NEVADA, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

Section 1. Chapter 341 of NRS is hereby amended by adding thereto a new section which shall read as follows:

1. The board may, with the approval of the interim finance committee when the legislature is not in regular or special session, or with the approval of the legislature by concurrent resolution when the legislature is in regular or special session, let to a contractor licensed under chapter 624 of NRS a single contract for both the design and construction of a project of capital improvement. The board shall for that purpose prepare a comprehensive sketch plan and narrative of the scope of the work involved in a project.

2. The board shall adopt regulations establishing procedures for:

(a) The determination of the qualifications of contractors to bid for contracts for the design and construction of such projects. The board shall consult with the American Institute of Architects and the Associated General Contractors, or the successor of either if the named organization ceases to exist, before adopting procedures under this paragraph.

(b) The board's approval of designs and architects employed in a project.

(c) The bidding and awarding of contracts for the design and construction of projects based on a final cost of the project which the contractor guarantees will not be exceeded.

(d) The scheduling and controlling of projects.

Sec. 2. NRS 341.090 is hereby amended to read as follows:

341.090 [The] 1. Except as provided in subsections 2 and 3, the board may make expenditures necessary to carry into effect the purposes of its acts. [However, all]

2. All expenditures made by the board [shall] must be within the limits of the appropriation provided for the use of the board, or provided from [funds] money appropriated or authorized for expenditure by the legislature for construction work or major repairs.

3. The board may, with the approval of the interim finance committee when the legislature is not in regular or special session, or with the approval of the legislature by concurrent resolution

when the legislature is in regular or special session, expend money obtained from any source for advance planning of projects of capital improvement. For the purposes of this subsection, "advance planning" means the preparation of floor plans, cross sections, elevations, outlines of specifications, estimates of cost by category of work and perspective renderings of the project.

Sec. 3. NRS 341.150 is hereby amended to read as follows:

341.150 1. The state public works board shall furnish engineering and architectural services to [all] the University of Nevada and all other state departments, boards or commissions charged with the construction of any building constructed on state property or the money for which is appropriated by the legislature, except highway maintenance buildings. [All such] The board of regents of the University of Nevada and all other such departments, boards or commissions [are required and authorized to use such] shall use those services.

2. The services [shall] must consist of:

(a) Preliminary planning.

(b) Designing.

(c) Estimating of costs.

(d) Preparation of detailed plans and specifications.

The board may, with the approval of the interim finance committee when the legislature is not in regular or special session, or with the approval of the legislature by concurrent resolution when the

legislature is in regular or special session, plan a project in advance by preparing floor plans, cross sections, elevations, outlines of specifications, estimates of cost by category of work and perspective renderings of the project. The board may submit preliminary or advance plans or designs to qualified architects or engineers for preparation of detailed plans and specifications if the board deems such action desirable. The cost of preparation of preliminary or advance plans or designs, the cost of detailed plans and specifications, and the cost of all architectural and engineering services [shall be] are charges against the appropriations made by the legislature for any state buildings or projects, or buildings or projects planned or contemplated by any state agency for which the legislature has appropriated or may appropriate [funds.] money. The costs [shall] must not exceed the limitations that are or may be provided by the legislature.

3. The board [shall:

(a) Have] :

(a) Has final authority for approval as to the architecture of all buildings, plans, designs, types of construction, major repairs and designs of landscaping.

(b) [Solicit] Shall solicit bids for and let all contracts for new construction or major repairs.

(c) [Have authority to] May negotiate with the lowest responsible bidder on any contract to obtain a revised bid if:

(1) The bid is less than the appropriation made by the legislature for that building project; and

(2) The bid does not exceed the relevant budget item for that building project as established by the board by more than 10 percent.

(d) [Have authority to] May reject any or all bids.

(e) After the contract is let, [have] has supervision and inspection of construction or major repairs. The cost of supervision and inspection [shall] must be financed from the capital construction program approved by the legislature.

(f) [Have authority to] May authorize change orders, [prior to] before or during construction [, not] :

(1) In any amount, where the change represents a reduction in the awarded contract price.

(2) Not to exceed in the aggregate 10 percent of the total awarded contract price [.] , where the change represents an increase in that price.

(g) [Have] Has final authority to accept each building as completed or to require necessary alterations to conform to the contract, and to file the notice of completion.

(h) [Establish] Shall establish such capital projects construction funds as are necessary to account for the capital

construction program approved by the legislature. These funds [shall] must be used to account for all revenues, appropriations and expenditures restricted to constructing buildings and other projects which come under the supervision of the [public works] board.

Sec. 4. NRS 341.155 is hereby amended to read as follows:

341.155 [1. It is expressly prescribed to be the duty of the board of regents of the University of Nevada to use the services of the state public works board, as provided in NRS 341.150, for the construction of all buildings, the money for which is appropriated by the legislature, upon the real property of the university.

2.] With the concurrence of the board [of regents of the University of Nevada, the state public works board] , the board of regents of the University of Nevada and any other state department, board or commission may enter into agreements with persons, associations or corporations to provide [to the University of Nevada System educational] consulting services [relating to the determination of the future needs and the planning of necessary programs and facility needs at the university.

3. Any such contracts shall] to determine and plan the construction work that may be necessary to meet the needs of the programs of those agencies. These contracts must be for a term

not exceeding 5 years and [shall] must provide for payment of a fee for [such] those services not to exceed one half of 1 percent of the total value of :

1. In the case of the University of Nevada, building construction contracts relating to the construction of university campus facilities ;

2. In the case of another state department, board or commission, all construction contracts relating to construction for that agency,

during the term and in the area covered by the contract.

Sec. 5. NRS 341.270 is hereby amended to read as follows:

341.270 1. The board may [utilize contractors properly licensed under chapter 624 of NRS for construction management services on capital improvement projects, which are financed in part by the Federal Government, if such services are required by any department or agency of the Federal Government.] , with the approval of the interim finance committee when the legislature is not in regular or special session, or with the approval of the legislature by concurrent resolution when the legislature is in regular or special session, let to a contractor licensed under chapter 624 of NRS a contract for services which assist the architect in the design of a project of capital improvement. The board shall for that purpose participate in the development of plans, outlines of specifications and estimates of costs.

2. The board shall adopt regulations establishing procedures for:

(a) The [prequalifying] determination of the qualifications of contractors to bid for [construction management services;] contracts for services described in subsection 1.

(b) The bidding and awarding of [construction management service contracts;] such contracts, subject to the provisions of subsection 3.

(c) The awarding of construction contracts [based on a guaranteed maximum cost; and] , subject to the provisions of subsection 4, based on a final cost of the project which the contractor guarantees will not be exceeded.

(d) The scheduling and controlling of projects.

3. [A person furnishing construction management services] Bids on contracts for services which assist the architect in the design of a project of capital improvement must state separately the contractor's cost for:

(a) Assisting the architect in the design of the project.

(b) Obtaining all bids for subcontracts.

(c) Administering the construction contract.

4. A contractor who is:

(a) Qualified under the regulations of the board to bid for a contract for services described in subsection 1; and

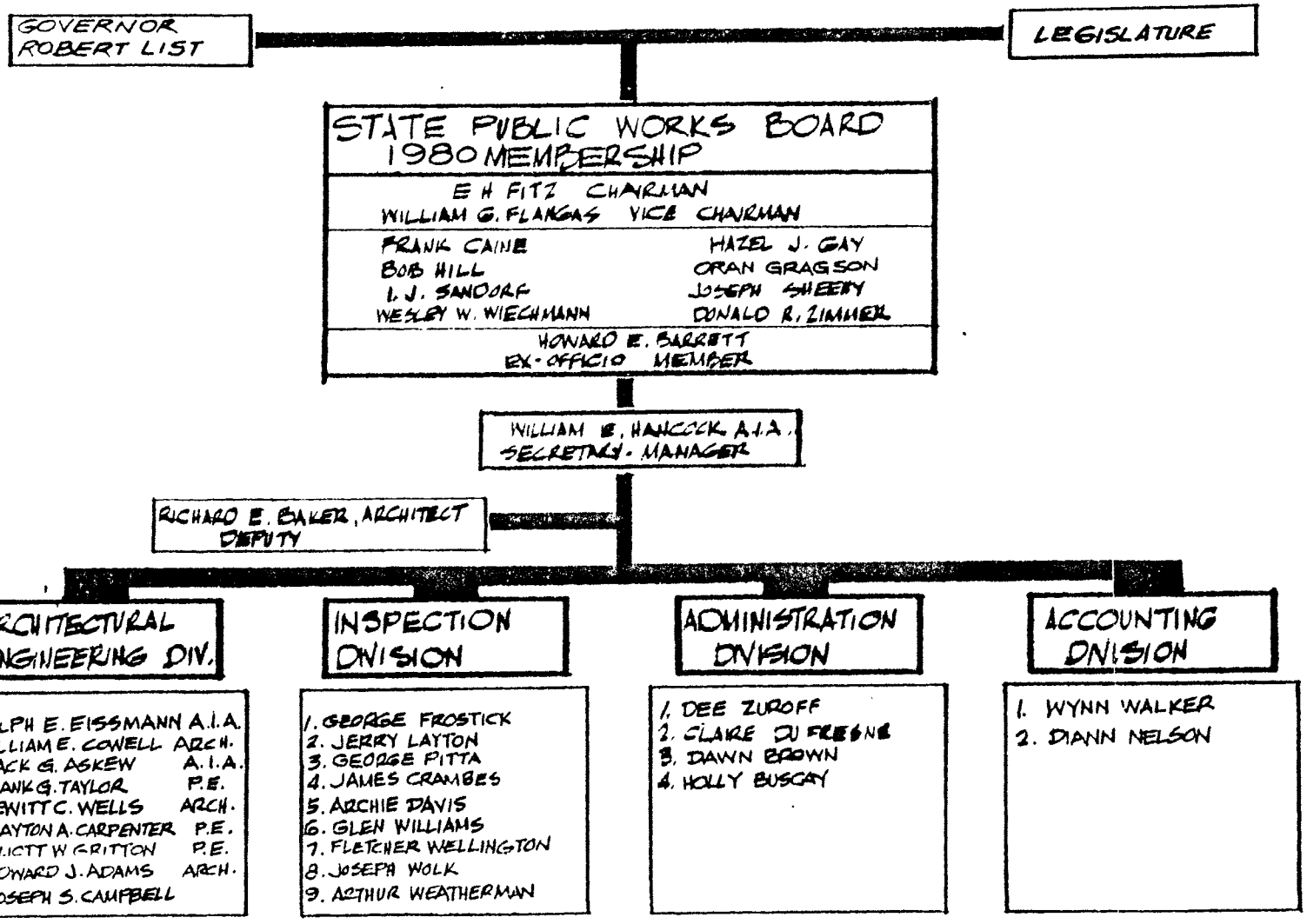
(b) Awarded that contract,

is entitled to be awarded the construction contract for the project if his work under the contract for services is satisfactory to the board and he guarantees a final cost for the project which the board is willing to accept.

5. A person who furnishes services under a contract awarded pursuant to subsection 1 is a contractor subject to all provisions pertaining to a contractor in Title 28 of NRS.

Sec. 6. There is hereby appropriated from the state general fund to the interim finance committee the sum of $..... for allocation to the state public works board for advance planning of projects of capital improvement. For the purposes of this section, "advance planning" means the preparation of floor plans, cross sections, elevations, outlines of specifications, estimates of cost by category of work and perspective renderings of the project.

APPENDIX A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ACCOUNTING DIVISION
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APPENDIX B

ESTIMATED CONSTRUCTION COST SAVINGS OF SELECTED 1979-81 CAPITAL IMPROVEMENT PROJECTS IF PROJECTS HAD BEEN ADVANCE PLANNED

	Construction Costs W/O Advance Planning*	Construction Costs With Advance Planning	Advance Planning Costs	Savings
So. Desert Correctional Ctr.	$25,000,000	$23,125,000	$ 25,000	$1,850,000
Nv. Women's Correctional Ctr., Activity Bldg.	1,556,000	1,439,300	15,560	101,140
No. Nv. Correctional Ctr., Psychiatric Unit	1,050,000	971,250	10,500	68,250
L. V. Mental Health Ctr., Adolescent Fac.	2,275,700	2,105,023	22,757	147,920
Rehab. State Office Bldg., Las Vegas	398,300	368,428	3,980	25,892
Motor Vehicles Bldg. Addition, Carson City	4,058,000	3,753,650	25,000	279,350
Southern Nevada Museum	2,183,500	2,019,738	21,835	141,927
Business & Hotel Admin. Bldg., UNLV	9,775,000	9,041,875	25,000	708,125
Clark Co. Community College Learning Res. Ctr.	3,055,000	2,825,875	25,000	204,125
Clark Co. Community College, Henderson Ctr.	1,580,000	1,461,500	15,580	102,920
Mackay School of Mines, UNR	5,040,000	4,662,000	25,000	353,000
Total	$55,971,500	$51,773,639	$215,212	$3,982,649

* SPWB Estimated Project Construction Costs.

APPENDIX C

APPENDIX C

ADOPTED STANDARDS

INDEX

SECTION 1 DEFINITIONS AND PURPOSE

1.1 "Board" shall mean the State Public Works Board.

1.2 "Fire Zone" shall mean the fire zone established by the City or County in which the project is to be located.

1.3 "Adopted" means adopted by the Board.

1.4 "UBC" means the latest adopted edition of the Uniform Building Code.

1.5 "Appropriate authorities" means the private, city, county, State, regional or Federal agencies that are involved in any aspect of the project.

1.6 "Construction Budget" means the amount of the appropriation that is allocated by the Board for the award of a construction contract.

1.7 "Using Agency" means that State agency having custody or control of the building or project upon completion of construction work.

1.8 These Standards shall be considered as a guide for the design and construction of State facilities. Except when required by law or ordinance, their application is subject to the overall requirements of the project.

1.9 "NFPA Standards" means the National Fire Codes as published by the National Fire Protection Association.

1.10 "A.M.C.A." means Air Moving & Conditioning Association, Inc.

1.11 "ASHRAE" means the American Society of Heating, Refigerating and Air Conditioning Engineers.

1.12 "A.S.M.E." means American Society of Mechanical Engineers.

1.13 "A.N.S.I." means the American National Standards Institute.

1.14 "A.S.T.M." means the American Society for Testing and Materials.

1.15 "HVAC" means heating, ventilating and air conditioning.

1.16 "Low-flush" water closet means a water closet that uses less than 3½ gallons of water during any single flushing operation.

SECTION 2 ADOPTED CODES, RULES AND REGULATIONS

2.1 The following standards are subject to modifications as deemed necessary by the Board. The Board retains authority in matters of interpretation. It has available and uses code interpretation services, the assistance of qualified committees of the A.I.A. and N.S.P.E., and other sources of technical advice. Requests for code interpretations, recommendations for changes in design standards and suggestions for improvement of policies governing construction are solicited and welcome.

2.2 All design and construction work shall conform to the latest edition of the following adopted codes, rules and regulations. Any proposed deviation shall be approved in writing by the Board.

2.2.1 The following publications of the International Conference of Building Officials are the basic building code references of the Board. The cost of such publications shall be as determined by the Conference.

2.2.1.1 Uniform Building Code.

2.2.1.2 Uniform Mechanical Code.

2.2.1.3 Uniform Building Code Standards.

2.2.2 The National Electrical Code as published by the National Fire Protection Association International.

2.2.3 The Uniform Plumbing Code as published by the International Association of Plumbing and Mechanical Officials.

2.2.4 ASHRAE Guide and Data Book and ASHRAE Handbook of fundamentals as published by the American Society of Heating, Refrigerating and Air Conditioning Engineers.

2.2.5 IES Lighting Handbook published by the Illuminating Engineers Society.

2.2.6 The Acoustical Society of America's Recommended Standards of Noise Control.

2.2.7 A.S.M.E. Code for Unfired Pressure Vessels.

2.2.8 Nevada State Industrial Commission Rules and Regulations.

2.2.9 The Regulations of the Bureau of Consumer Health Protection Services, Division of Health, Nevada State Department of Human Resources.

2.2.10 The regulations of the Division of Environmental Protection, Nevada Department of Conservation and Natural Resources.

2.2.11 Municipal and County Ordinances in effect at the location of the work.

2.2.12 Rules and Regulations of the State Fire Marshal.

2.2.13 A.N.S.I. Specification for Making Buildings and Facilities Accessible to, and usable by, the Physically Handicapped.

2.2.14 State of Nevada Energy Conservation Standards for New Building Construction.

2.3 The N.F.P.A. Life Safety Code Pamphlet 101, shall be used as a basis of occupancy approval in the following:

2.3.1 "I" occupancies and health care facilities.

2.3.2 When required in federally funded projects.

2.3.3 In matters pertaining to Life Safety in existing State Buildings.

2.3.4 In matters pertaining to Life Safety where the building codes are silent.

2.3.5 On all other projects, the other adopted codes shall have precedence over N.F.P.A. Pamphlet 101.

2.4 It is the responsibility of the consultant to make all adopted standards available to his design consultants and to insure compliance with all adopted standards in all phases of the work.

SECTION 3 GENERAL STANDARDS

3.1 Locally available materials shall be used whenever possible if consistent with the budget and the desired function.

3.2 Designs for State facilities shall be directed toward the elimination of public hazards and the improvement of the environment.

3.3 Designs for all State building projects shall include complete site development work such as irrigated landscaping, parking, roads, fencing, walks, etc., unless otherwise stipulated in the Scope of Work.

3.4 The realization of adequate fallout shelter space in all State buildings shall be a desired design objective. Slanting techniques shall be used in the design of such projects to develop all potential shelter space within budget limitations.

3.5 All State building projects, except for the expansion of a State activity existing prior to April 23, 1971, shall comply with the provisions of local zoning ordinances.

3.6 All projects shall be designed to produce the most economical type of construction possible consistent with good construction practices and low maintenance.

3.7 Projects shall be designed to realize low maintenance and operating costs.

3.8 Cornerstones, in accordance with standard State details, shall be included in the design of all major University buildings and appropriate State buildings.

3.9 State utility systems shall not be constructed if other public utilities are available or can be made available to serve the proposed project.

3.10 Designs shall permit construction to be accomplished with maximum conservati of man hours, materials, energy and transportation.

3.11 Only materials and products of proven quality shall be incorporated into the design of a public project.

3.12 As a means of conserving space, microfilming of records shall be encouraged.

3.13 Project budgets for public buildings shall include funds for adequate landscaping. Proposed interior and exterior artistic decorations and works of art shall be approved by the Board.

3.14 The Board requires all architects and engineers to emphasize energy conservation on State building projects, and to comply with the State of Nevada Energy Conservation Standards for New Building Construction for specific requirements.

SECTION 4 ARCHITECTURAL STANDARDS

4.1 All buildings customarily used by the general public shall have entrance and curb ramps with a grade not exceeding 1' in 12', toilet facilities, drinking fountains, doors and a public phone meeting ANSI Standards for making a building accessible and usable for the physically handicapped. See barrier free design standards.

4.2 State office buildings shall include facilities for a vending stand or snack bars to be operated by the blind.

4.3 All walkways, steps, platforms and ramps shall have non-slip surfaces.

4.4 Entrance vestibules shall be included in the design of ground floor public lobbies or reception areas.

4.5 Entrance doors shall have automatic closures and appropriate graphics to clearly indicate the direction of the door swing.

4.6 All roofs shall be designed to insure positive drainage. Roofing designs shall be carefully detailed to insure a leak proof roof.

4.7 Appropriate graphics shall be included in designs. Each lobby shall contain a building directory. Exterior graphics shall be made of non-staining materials. No smoking signs shall be installed in meeting rooms, corridors, lobbies and elevators.

4.8 Toilet rooms shall be located so that occupants will not be required to travel more than 150 feet on one floor to reach them. Water closets and urinals shall be enclosed with stall partitions. One stall, a urinal and a lavatory shall be designed to accommodate the physically handicapped. Coin operated stalls are prohibited by law.

4.9 Drinking fountains, suitable for use by the handicapped, shall be located so that a person will not need to travel more than a hundred feet (100') on one floor to reach same. One fountain shall be installed in the lobby. There shall be a minimum of one fountain on each floor.

4.10 Janitor closets, containing a service sink with hot and cold water supply and ample storage space for cleaning equipment, materials and supplies, shall be provided on each floor.

4.11 All ceilings except in toilet rooms, shall have a minimum average height of 8'-0". Acoustical ceilings where required shall have a noise reduction coefficient range of 0.65 to 0.80. Ceiling materials shall be non-combustible and have a maximum rating of 25 for flame spread. Ceilings shall be designed to resist earthquake loads.

4.12 Drapes shall be full length of opening and fade resistant, glareproof and have an acceptable fire resistant rating.

4.13 All openings to occupiable rooms shall be a minimum of 32" wide. Sliding glass doors shall have laminated, tempered or wire glass and protective horizontal mullions.

4.14 Hardware shall be heavy duty non-corrosive metal of standard manufacture. All locks shall have changeable cylinders and be master keyed.

4.15 Wall mounted ash receptacles, with removable ash buckets, shall be provided at suitable locations in the entrance, main corridors and in elevator lobbies.

4.16 Elevators, dumbwaiters and escalators shall comply with the requirements of the rules and regulations of the Nevada State Industrial Commission. Elevators shall be equipped and sized for use by the handicapped and for medical emergencies. Elevators shall contain an emergency light and phone; an emergency signal system may be substituted for the telephone where desirable, as in school installations. When elevators will be used for both freight and passengers, they shall be sized and finished to handle typical office furniture.

4.17 Exterior butt joints which rely on caulking to insure water tightness, are to be avoided.

4.18 Space for adequate bicycle stands shall be included in the design of all office buildings.

4.19 All new buildings or additions to existing buildings shall conform to the State of Nevada Energy Conservation Standards for New Building Construction.

4.20 When the number of toilets is not specifically required by adopted codes, rules or regulations, the following criteria shall apply

	MEN			WOMEN	
Number of Persons	Water Closets	Urinals	Lavatories	Water Closets	Lavatories
1 to 8	1	1	1	1	1
9 to 24	2	1	1	2	2
25 to 36	2	1	2	3	2
37 to 56	3	2	2	4	3
57 to 75	4	2	2	5	4
76 to 96	4	2	3	6	4
97 to 119	5	2	3	7	5
120 to 144	6	3	4	8	5
145 to 171	6	3	4	9	6
172 to 200	7	3	4	10	7
201 to 220	8	4	5	11	7
221 to 240	8	4	5	12	8
241 to 260	9	4	5	13	9
261 to 280	10	4	6	14	9
281 to 300	11	4	6	15	10

4.20.1 The design shall provide detail and description of support anchorage or any other provisions necessary for the safe and reliable installation of toilet partitions, fixtures and accessories.

4.21 Mechanical equipment rooms shall be sized to permit easy access and proper maintenance of equipment.

SECTION 5 STRUCTURAL STANDARDS

5.1 General

5.1.1 Structural systems shall be constructed of maintenance free, fire protected materials which shall not produce or retain odors nor sustain organic media.

5.1.2 The external surface configuration of finished structural systems shall permit proper drainage.

5.1.3 Structural systems shall not impair compliance with ANSI Standards for making buildings accessible and usable by the physically handicapped.

5.1.4 Structures shall sustain any combination of required gravity and wind or gravity and earthquake loads, full or partial, in addition to concurrent stresses due to volume changes and/or temperature changes and occupant or other live loads.

5.1.5 All mechanical and electrical equipment, their supports, and suspended ceilings shall be securely anchored to resist seismic loads.

5.1.6 Live load deflection of beams supporting plaster or masonry shall be limited to span/360. All other deflections shall be limited to span/280.

5.1.7 Exposed joints and surfaces shall be designed in a way that cracks developing under any combination of stresses due to vertical or horizontal loads and/or temperature or volume changes will be consistent with the aesthetic and functional concepts of the project.

5.2 Concrete

5.2.1 Cement: All cement used, including that in mortar or grout shall be Portland Cement, ASTM C 150, Type II or Type V. Different types of cement shall not be used within the same piece or member.

5.2.2 Aggregates: Aggregates for normal weight concrete shall be composed of hard, durable, uncoated and clean rock or gravel. Lightweight aggregate shall conform to ASTM Specification C-331.

5.2.3 Reinforcing steel bars and wire.

5.2.3.1 Certified copies of mill reports shall accompany deliveries of reinforcing steel on projects using 15 tons or more.

5.2.3.2 All steel chairs, bolsters, spacers, etc., supporting reinforcing bars shall have stainless steel wire legs, wherever adjacent surfaces may be exposed to view or weather.

5.2.3.3 Reinforcing bars shall conform to ASTM A 615-72; steel wire to ASTM A 82-72 or 185-72; steel mesh to ASTM A 184-65.

5.2.4 Concrete slabs shall be carefully designed with expansion and control joints to eliminate unsightly cracking or unevenness in exposed surfaces.

5.3 Masonry

5.3.1 Plans, specifications and calculations shall indicate the class, according to U.B.C. Standards, of all masonry to be incorporated in the work including ultimate compressive strengths and requirements for special inspections.

5.3.2 All masonry except veneers used for appearance shall be of load bearing type and shall be reinforced in accordance with U.B.C. requirements for reinforced masonry. All masonry shall comply to ASTM Standards.

5.3.3 Where stack bond is employed, either an open-end block shall be used and cells at joints filled with cement grout, or an approved type of in-joint reinforcing shall be used (Dur-O-Wal or similar).

5.4 Wood

5.4.1 Plans, specifications and calculations shall indicate species and grade of all lumber, plywood, laminated members, etc., incorporated in the structure. Moisture content shall be specified where significant.

5.4.2 Manner of establishment of allowable unit stresses in consideration of conditions of use, duration of load, etc., shall be set forth in the analysis presentation.

5.4.3 The specifications shall insure that all lumber, plywood, particleboard, structural glued laminated timber, piles and poles incorporated in the work conform to grading rules specified by the Uniform Building Code and are so identified by the grade mark or a Certificate of Inspection issued by an approved agency. Materials shall be so delivered, piled and handled on the work as to maintain identification.

5.4.4 Wood preservatives shall be paintable and non-toxic.

5.5 Steel and Iron

5.5.1 The specifications shall clearly establish the grade of all steel and iron to be used in the work. All steel delivered to the job shall be properly identified in accordance with Uniform Building Code Standards. Certified mill certificates shall be required for all structural steel.

5.5.2 All field connections, splices and erections shall be detailed in the plans.

SECTION 6 HVAC STANDARDS

6.1 For new buildings, or additions to existing buildings, heating, air conditioning and ventilating systems shall be designed in accordance with the State of Nevada Energy Conservation Standards for New Building Construction. Indoor and outdoor design temperatures shall conform to these standards.

6.2 All boilers shall be capable of dual firing by either natural gas or oil. Suitable piping and an oil storage tank shall be provided in the design for standby oil firing, if the budget permits. If the budget does not permit a piping and storage tank, the combination burner shall be furnished with oil piping stubbed outside the building for a future tank installation. All boiler flue material is to be suitable for gas or oil firing.

6.2.1 Propane standby firing may be used with the approval of the Board.

6.3 Special Ventilation Systems: Particular attention shall be given to ventilation system designs for specialty areas such as woodworking shops, welding shops, spray painting booths, automotive repair shops, degreasing tanks, kitchens, etc. Individual hoods, dust collection devices, ductwork and boots shall be proved to suit the application.

6.3.1 Adequate provisions shall be made for the introduction of make-up air for the special exhaust systems. Where appropriate and necessary for comfortable working conditions, make-up air shall be tempered.

6.3.2 Non-residential type kitchen exhaust hoods shall conform to the requirements of the Uniform Mechanical Code, latest edition, and shall contain fire extinguishing systems conforming to N.F.P.A. Standard 96.

6.4 HVAC systems must provide for exhaust of stale air, proper circulation of air without creating objectionable drafts, and introduction of fresh air to provide for occupancy comfort. Fresh air quantities shall conform to the requirements of the State of Nevada Energy Conservation Standards for New Building Construction.

6.5 Ventilation in boiler rooms shall prevent both the ambient temperature from exceeding operating limits of electrical equipment, and the freezing of fluids in the room.

6.6 The HVAC system engineer shall coordinate with the electrical engineer to insure adequate ventilation is provided for transformer and water heater rooms to keep ambient temperatures therein within operating limits.

6.7 Toilet rooms requiring mechanical ventilation shall exhaust sufficient quantities of air to maintain a negative pressure with respect to the adjacent areas and insure rapid removal of odors. Mechanical exhaust shall be provided for the following toilet rooms.

6.7.1 A toilet with an openable window area less than 5% of its floor area.

6.7.2 A toilet having windows opening on a court or vent shaft which has an area less than 9 square feet or 0.2 square feet for each foot of height.

6.7.3 Toilets in or adjoining air conditioned areas.

6.8 All mechanical equipment and system components shall be properly anchored and supported to resist earthquake loads.

6.9 Air shall be distributed in the occupied rooms or spaces in conformance with the principles recommended by ASHRAE and other State Standards.

6.10 The HVAC system shall be designed to minimize drafts in occupied zones and maintain noise levels within acceptable standards as established by the ASHRAE Guide and Data Book.

6.11 The HVAC system and its components shall comply with N.F.P.A. Standard for flame spread and smoke developed ratings.

6.12 Fire dampers shall be installed where required and shall have convenient access. All fire dampers required shall be shown on the drawings.

6.13 The HVAC system shall provide accessibility for maintenance, repair, adjustment and balancing.

6.13.1 The design shall comply with Nevada Industrial Commission Rules and Regulations which require three (3) feet clear around boilers and five (5) feet clear in front of all manholes.

6.14 The HVAC system shall have a manual emergency stop switch, with a protective cover approved by the local fire department, which is separate from the main panel, independent of the lighting system, and located near the main entrance.

6.15 All gas-burning heating appliances shall be equipped with a listed device or devices which will shut off the gas to the main burner or burners in the event of pilot failure.

6.16 Liquefied petroleum gas-air burning comfort heating appliances shall be equipped with a listed automatic device or devices which will shut off the flow of gas to the pilot and main burner or burners in the event of ignition failure.

6.17 Liquid fuel-burning comfort heating appliances shall be equipped with a listed device or devices to shut off fuel supply to the main burner or burners of the appliance in the event of ignition failure.

6.18 All comfort heating appliances whose manual fuel controls are not readily accessible from the main portion of the building being heated shall be equipped with remote controls.

6.19 All forced-air and gravity-type warm-air furnaces shall be equipped with a listed air outlet temperature limit control which cannot be set for temperatures higher than 250° F. Such controls shall be located in the bonnet or plenum, within two feet (2') of the discharge side of the heating element of gravity furnaces, or in accordance with the conditions of listing

6.20 Controls in a heater room which may be entered through a door from the main portion of the building are judged to be "readily accessible". If a lengthy route must be followed from the interior of the building to an exterior access to the controls, or similar conditions exist, then the controls are not readily accessible from the main portion of the building.

6.21 The HVAC system, where applicable, shall be equipped with automatic shut-off devices as required by the Uniform Mechanical Code, with the exception as contained herein.

6.21.1 Group "I" occupancies, shall comply with the provisions of Chapter 10 of the N.F.P.A. Life Safety Code No. 101, latest edition with reference to Appendix B of the Code. Standard 90A, N.F.P.A. shall be used in this case as the applicable standard for controls and devices on heating, air-conditioning, and ventilating systems.

6.21.2 For the purposes of this section, commercial "packaged" HVAC units serving a common area or zone of a building are considered individual "single systems" unless ductwork from one unit(s) is physically interconnected with ductwork of another unit(s), in which case the total capacity of all units shall be considered in the determination of applicability of Section 1009 of the Uniform Mechanical Code.

6.22 Access panels are to be provided for all concealed devices that require servicing or accessibility.

6.23 Motors and motor-driven equipment shall be mounted on suitable isolators to eliminate vibration transmission.

6.24 Field system thermometers and gauges.

6.24.1 Thermometers shall be installed in piping, duct work, plenums, etc., for ease of testing and maintaining the systems.

6.24.2 Gauges shall be installed on the suction and discharge piping of each hot water space heating, chilled water and condenser water circulating pump.

6.24.3 Each bank of air filters for central station air handlers shall be provided with a pressure gauge to show the pressure drop across the filter bank for determining the filter resistance.

6.25 Fans shall be certified to be in accordance with Standard Test Code for Centrifugal and Axial Fans adopted jointly by A.M.C.A. and ASHRAE, and shall have the Certified Rating Seal of A.M.C.A.

6.26 Boiler Safety Controls.

6.26.1 All automatically fired hot water and steam boilers shall be equipped with controls limit, and safety devices as required by the Uniform Mechanical Code, Appendix B, Chapter 21, latest edition, and the Nevada Industrial Commission.

6.26.2 In addition, all automatically fired hot water and steam boilers shall be equipped with an automatic feeder and a low water cut-off. The low water cut-off shall be the manual re-set type. A combination automatic feeder and low water cut-off device with manual re-set will also satisfy their requirements.

6.27 Controls. Proper functional operation of the control system shall be the responsibility of the mechanical contractor. Wiring of the control system may be by others.

6.28 A chemical water analysis shall be made for all project areas where such information is not available from the State.

6.28.1 Consideration shall be given to water treatment in the design of all HVAC systems. As a minimum standard, all closed water systems shall have at least a pot-type chemical feeder, and all open water systems shall have an automatic chemical feeder.

6.29 In the design of the HVAC systems, freeze protection shall be provided as necessary wherever it is determined that freezing could occur.

6.30 All underground piping shall be adequately protected from corrosion necessitated by site soil conditions.

6.31 Unions are to be provided where necessary for proper servicing of valves, piping and equipment.

6.32 Dielectric pipe unions shall be utilized in connections and joints between dissimilar metals.

6.33 Piping subject to expansion or contraction shall be anchored in a manner to permit the strains to be evenly distributed and alleviated by swing joints, expansion loops, expansion joints or other approved devices which shall be installed as required.

6.34 Welding of steel with weld fittings is to be done by qualified welders in a first class and workmanlike manner, conforming to the American Standard Code for Pressure Piping A.S.A B 31.1, A.S.A. B 31.5 and A.S.A. B 31.6, latest edition.

6.35 Hangers and supports shall be designed to support the weight of the pipe, weight of the fluid, weight of the pipe insulation, and shall have a minimum factor of safety of five based on the ultimate tensil strength of the material used.

6.36 Valves.

6.36.1 Globe valves shall be furnished with composition discs suitable for the service on which used.

6.36.2 All relief valves shall be ASME rated.

6.37 Air quality regulations require registration certificates by County Health Departments in Washoe and Clark Counties for fuel-burning heating and air conditioning apparatus having a rated capacity over one million BTU's per hour. In all other areas, registration certificates are required by the State Division of Environmental Protection for fuel-burning heating and air conditioning apparatus having a rated capacity over four million BTU's per hour.

6.37.1 Construction and operating permits for incinerators having 25 lbs. per hour (or larger) burning capacity are required by the County Health Department in Washoe and Clark Counties, and the State Division of Environmental Protection in all other areas.

6.37.2 Applicable designs shall be reviewed with respective State or County agencies during the design stage. The specifications for the work shall require the necessary certificates.

6.38 Energy Conservation. Refer to the State of Nevada Energy Conservation Standards for New Building Construction.

6.39 Piping Materials.

6.39.1 Materials used for piping systems which are part of any HVAC system shall comply with the requirements of the Uniform Mechanical code, latest edition. For purposes of this Standard, plastic of any type or composition is not an approved piping material for installation in interior building HVAC systems except as noted herein. Specifically, plastic piping shall not be allowed for chilled, hot or condenser water systems inside of buildings.

6.39.2 Under certain conditions and for special applications, such as temperature control air piping and condensate drain installations, plastic piping is allowed in building interiors.

6.40 Dampers and Outdoor Air Intakes.

6.40.1 All outdoor intake and exhaust air dampers, whether gravity or motor-operated, shall be equipped with blade and side sealing materials to minimize leakage.

6.40.2 Outdoor air intakes for HVAC equipment shall be designed and located to minimize the entry of snow and rainwater.

6.40.3 Outdoor intake and exhaust hoods located on roofs shall be located a sufficient height above the roof to prevent entry of snow and rainwater. Filter devices to prevent entry of snow into outdoor intake hoods shall be provided as required.

SECTION 7 PLUMBING STANDARDS

7.1 Fire hose cabinets containing fire hose and an appropriate type portable fire extinguisher shall be located as required. Where space does not permit, portable extinguishers may be located in separate cabinets. Stand pipe valves shall be located in cabinets, except for stairwells where open valves are permitted.

7.2 Access panels shall be provided for all concealed devices that require servicing, adjustment or accessibility.

7.3 Utilities shall not be constructed if public utilities are reasonably available.

7.4 All water supply lines serving batteries of plumbing fixtures shall be controlled by accessible valves.

7.5 Water supplies to all plumbing fixtures shall be furnished with accessible stops.

7.6 Unions are to be provided where necessary for proper servicing of valves, piping and equipment.

7.7 Dielectric pipe unions shall be utilized in connections between dissimilar metal pipe.

7.8 Piping subject to expansion or contraction shall be anchored in a manner to permit the strains to be evenly distributed and alleviated by swing joints or expansion loops.

7.9 Welding of steel with weld fittings is to be done by certified welders in a first class and workmanship manner, conforming to the American Standard Code for Pressure Piping A.S.A. B31.1 and A.S.A. B31.8, latest edition.

7.10 Hangers and supports shall be designed to support the combined weight of the pipe, its fluid and insulation, and shall have a minimum factor of safety of five based on the ultimate tensile strength of the material used.

7.11 Valves.

7.11.1 Globe valves shall be furnished with composition discs suitable for the service on which used.

7.11.2 All relief valves shall be ASME rated.

7.11.3 Flush valves shall be equal to those manufactured by the Sloan Valve Company

7.11.4 Local water supply conditions shall be checked for excessive pressure, and pressure reducing valves as required by the latest edition of the Uniform Plumbing Code shall be provided if necessary.

7.12 Thermometers shall be installed in piping and hot water storage tanks, for ease of testing and maintaining the systems.

7.13 In the design of the plumbing systems, freeze protection shall be provided as necessary wherever it is determined that freezing could occur.

7.14 Water Hammer.

7.14.1 The plumbing piping system shall be protected from damaging effects of water hammer as required, either by use of patented shock arresters or air chambers.

7.14.2 As a minimum, all plumbing fixtures must be protected by air chambers on the water supply piping if shock arresters are not used.

7.15 All underground piping shall be adequately protected from corrosion because of soil conditions.

7.16 Potable water supplies shall be protected from contamination by use of appropriate backflow prevention devices. All hose bibbs shall be equipped with integral vacuum breakers.

7.17 New water supply systems and existing water supply systems which may have become contaminated accidentally or otherwise shall be disinfected in conformance with the Nevada State Board of Health Water Supply Regulations.

7.18 Hot water demands shall be engineered in accordance with the building requirements. Institutional requirements are generally in excess of ordinary buildings and shall be given special analysis to assure ample supply based on their usage 24 hours per day.

7.19 Piping materials.

7.19.1 Materials used for piping systems which are part of any plumbing installation shall comply with the requirements of the Uniform Plumbing Code and the applicable Standards of the International Association of Plumbing and Mechanical Officials (IAPMO). For purposes of this Standard, plastic of any type or composition is not an approved material for use for water supply inside of or under State buildings.

7.19.2 ABS or PVC plastic piping material may be used for drainage, waste, and vent systems inside of buildings above grade for residential type construction two stories and less.

7.20 Clearances.

7.20.1 The plumbing system shall provide accessibility for maintenance, repair and adjustment.

7.20.2 The design shall comply with Nevada Industrial Commission Rules and Regulations which require three (3) feet clear around boilers and five (5) feet clear in front of all manholes.

7.21 Water conservation.

7.21.1 All plumbing systems shall be specifically designed to conserve water.

7.21.2 All tank type water closets and all urinals shall be water saver models certified by the manufacturer to be specifically designed for the purpose of water conservation.

7.21.3 Upon market availability, all flush valve type water closets shall be water saver models certified by the manufacturer to be specifically designed for the purpose of water conservation.

7.21.4 All flush valves shall be of the manufacture and model number recommended by the closet and urinal manufacturers as meeting the requirements for their water conserving designs. All flush valves for urinals and closets are to be adjusted for minimum flow by the Contractor during the construction phase of the project.

7.21.5 For purposes of these standards, a floor mounted urinal with washdown action such as an American Standard "Stallbrook" or equal with an adjustable flush valve capable of restricting water flow equal to a Sloan Royal 186 shall be considered as meeting the water conservation and barrier free standards. For batteries of urinals, consider automatic flushing.

7.21.6 All showerheads or supply piping to showerheads shall be equipped with automatic flow regulating devices which limit the flow from the showerhead to a maximum of 3 gallons per minute or less. Automatic shutoffs for institutional showers shall be considered.

7.21.7 All lavatories in rest rooms open to use by the public in any building shall be equipped with single self-closing adjustable metering valve faucets. The flow of hot water shall be limited as required by the State of Nevada Energy Conservation Standards for New Building Construction.

7.21.8 All lavatories in restrooms other than those open to the public shall be equipped with one of the following:

1. Self-closing adjustable metering valve faucets as required for Paragraph 7.21.7,

2. Faucets equipped with automatic flow regulating devices which limit the total combined hot and cold water flow from a single spout to 4 gallons per minute maximum or less, or

3. Faucets equipped with automatic flow regulating devices which limit the maximum flow from a single valve to 2.5 gallons per minute or less from each valve.

7.21.9 All sink faucets, including kitchen sinks, service sinks, laboratory sinks, laundry sinks, etc., shall be equipped with automatic flow regulating devices as prescribed for lavatories in Paragraph 7.21.8 of these Standards.

7.21.10 The choice of faucets for lavatories and sinks shall be coordinated with the barrier free standards.

7.21.11 All interior hose bibbs shall be equipped with automatic flow regulating devices in the supply piping to the hose bibb which limits the maximum flow to 2.5 gallons per minute or less. All outside hose bibbs are exempted.

7.22 Energy Conservation.

7.22.1 For new buildings, or additions to existing buildings, the plumbing system design and equipment selected shall conform to the State of Nevada Energy Conservation Standards for New Building Construction.

7.23 Cold water piping and fire sprinkler piping that is above ceilings shall be insulated to protect against freezing and to avoid condensation.

7.24 Water heaters in occupiable rooms shall be set in a protective metal pan and connected to the drainage system.

SECTION 8 ELECTRICAL STANDARDS

8.1 Main service facilities shall be housed in a suitable enclosure which is readily accessible for inspection.

8.2 Distribution panels shall contain a minimum of 10% spare circuits.

8.3 Duplex outlets shall be provided in toilet rooms, corridors, lobbies and vending areas. Ground fault types as required by the NEC, and in other area where a need for safety is required.

8.4 Lighting systems are to be designed to conform with the recommendations and practices as set forth in I.E.S. Lighting Handbook, but modified to conform with the State of Nevada Energy Conservation Standards for New Building Construction.

8.5 One telephone, accessible for the physically handicapped shall be installed on each floor.

8.6 Required fire alarm systems shall be approved by Underwriter's Laboratory or by the Factory Mutual Laboratories.

8.7 All electrical equipment, light fixtures, etc., shall be securely anchored to resist earthquake loads.

8.8 Electrical installations shall be grounded and bonded to provide uninterruptible systems.

8.9 Utility facilities shall not be constructed if public utilities can be made available reasonably.

8.10 All building interior power, telephone, signal and other low potential wirir shall be installed in raceways.

8.11 All standard convenience receptacles for 120 volt, single phase use, shall be three pole gound type.

8.12 All interior lighting panels shall be equipped with a minimum of one spare breaker for each five active breakers and in no case less than three spare branch breakers.

8.13 Generally, all exterior doors and entries shall have illumination on the outside and where exposed to weather the fixtures shall be completely weatherproof and modified as called for in Section 8.4.

8.14 All corridors or hallways shall have duplex receptacles spaced not over 50 feet apart.

8.15 Generally, building systems will be 120/208 volt, 3 phase, 4 wire or 277/480 volt, 3 phase, 4 wire, except in areas where local power companies will not provide this type of service. Choice of voltage will depend on a study of the requirement of the building to determine which is the most economical.

8.15.1 Electrical services for small buildings with no large power loads may be single phase.

8.15.2 When 120/208 volt, 3 phase, 4 wire service is available, lighting and small phase power may be combined in one panel and cabinet.

8.16 Special use areas or areas used for multiple purposes which may require unusual levels of illumination should be reviewed with the State Public Works Board and approved during the early stages of design.

8.17 Wiring Methods.

8.17.1 No wire shall be drawn into conduit until all work of any nature that may cause injury is completed.

8.17.2 No wire smaller than #12 AWG shall be used for light and power circuits. Field control wiring may be #14 AWG, or smaller where systems can be adequately served (Solid State Controls, etc.).

8.17.3 No joints will be permitted except in outlet boxes, pull boxes and in panel board gutters.

8.18 Wire -- 600 volts or less.

8.18.1 Branch circuits in conduit in dry locations -- Type THHN or Type TW; wet locations -- Type TW.

8.18.2 Feeders in conduit and ducts -- Type THW or THWN.

8.18.3 Wiring within incandescent fixtures -- Type AF, fluorescent fixtures -- Type THHN or RHH.

8.18.4 Wiring in hoods over ovens, heater rooms and other areas adjacent to boilers or furnaces -- Type AVA.

8.18.5 Aluminum conductors to be limited to feeders and be rated to copper equivalent and not smaller than size #1/0 AWG. Connections to be made with Swedge Type Lugs properly bolted to the surface.

8.19 Interior conduit.

8.19.1 Electric metallic tubing fittings shall be watertight, gland-ring, insulated-throat type.

8.19.2 Conduit in ground, concrete floors or walls in moist locations, feeders and areas requiring mechanical protection shall be galvanized rigid; all others may be electric metallic tubing in sizes to 2". In lieu of rigid galvanized conduit for horizontally secondary service raceways and branch circuit wiring in or under floor slab, Schedule 40 "PVC" with Code Size minimum bare or insulated No. 12 ground wire, in accordance with the NEC Article No. 250, shall be used with rigid steel conduit termination stub-ups out of ground or slab, and into the building. All rigid steel conduits, couplings and elbows in soil or under membrane to be ½ lap wrapped with Scotch #50 tape.

8.19.3 No conduit in concrete slab shall exceed 3/4 inch I.P. size and shall be spaced at not less than 8 inch centers except at panel and junction boxes where they will be spread as widely as possible; special framing may be required where conduits enter a panelboard. Conduits parallel to slab supports such as beams, columns and structural walls shall be installed not less than 12 inches from such structure.

8.19.4 Where panels are installed flush with the walls, empty conduits shall be extended from the panel to an accessible space above or below. Where an underfloor space is accessible spare conduits shall be extended there in preference to the ceiling space. A minimum of one 3/4 inch conduit shall be installed for every three single pole spare circuit breakers or spaces, or fraction thereof, but not less than two conduits.

8.20 Panelboards. Panels shall have a typewritten directory giving circuit numbers and complete description of all outlets controlled by each panel circuit breaker.

8.21 Outlets. Outlet boxes, covers, rings or other fittings shall be galvanized. No outlet shall be smaller than 4 inches; for 1 inch conduit, boxes shall be 4-11/16 inches.

8.22 Main Building Switchboards. Switchboards shall be built in conformity with AIEE, NEMA, ASA and Underwriters Standard. Where feasible, exterior weatherproof switchboard location should be considered.

8.22.1 Interior building switchboard main breaker is to be provided with shunt-trip exterior switch location to be coordinated with the local fire department.

8.22.2 Ground fault protection devices and system are to be provided in building switchboard, with buss ratings of 1000 amperes or greater.

8.22.3 Aluminum buss connections to be made with swedge type lugs properly bolted to the surface with Belleville washers. Aluminum buss capacity to be equivalent to copper, all termination to have oxidation inhibitors.

8.23 Wall toggle switches.

8.23.1 1200 watts shall be the maximum connected load on a 15 ampere rated switch.

8.23.2 1800 watts shall be the maximum connected load on a 20 ampere rated switch.

8.23.3 The above switches are to be approved for use up to their full rating on inductive, fluorescent and tungsten lamp loads.

8.23.4 Wall switches near doors shall be mounted not more than 12 inches from trim and in accordance with barrier free design standards.

8.24 Receptacle and switch plates. Gang type plates shall be used for multiple units.

8.25 Light fixtures. Fluorescent fixtures shall be provided with high-power factor, quiet operating NEC Class "P" automatic reset ballast with Underwriter's label, and ETL Certified ballasts conforming to CBM Standards with minimum sound rating of "A" in accordance with General Electric sound rating standard. Fluorescent fixtures shall use 4'-0" or 2'-0" long, cool-white, rapid start tubes with medium bi-pin bases. Fixture enclosures and

bottom panels to be glass or acrylic plastic. Fixture selection to conform with Section 8.4, as modified.

8.26 Transformers.

8.26.1 Transformers shall be furnished with above and below normal FC taps.

8.26.2 Transformers shall conform with applicable ASA, AIEE and NEMA Standards.

8.26.3 Where feasible, exterior weatherproof transformer locations should be considered. Transformers installed in interior rooms are to have adequate ventilation to dissipate the heat generated to maintain a suitable ambient temperature to assure the proper operation of the transformer and any electrical equipment.

8.26.3.1 Transformers manufacturer is to be consulted to obtain the heat generated which is to be coordinated with the mechanical engineer to provide proper ventilation.

8.27 Emergency lighting shall be provided in corridors and at exits in hospital in-patient areas and other areas as may be required.

8.28 Fire Alarm. Fire alarm systems shall be provided, connected to the local fire department if feasible. Systems shall be coordinated with and approved by the Nevada State Fire Marshal, local jurisdictions and barrier free design standards.

8.29 Light Dimming. Fluorescent fixtures shall not be dimmed unless special precautions are taken to ensure proper operation otherwise, light control can be accomplished by switching fluorescent fixtures in banks or by a light bulb within the fixture.

8.30 Electrical Field Test. Insulation resistance test of all power, lighting and control wiring with 600 volt insulation is to be made with a direct reading megger having a minimum voltage rating of 500 volts D.C.

8.30.1 Phase unbalance tests of feeders to be made at maximum loads available at time of tests.

8.31 Energy Conservation.

8.31.1 For new buildings or additions to existing buildings, the design of the electrical power and lighting systems shall comply with the State of Nevada Energy Conservation Standards for New Building Construction.

9.1 The following plants are classified as poisonous and shall not be used in landscaping:

9.1.1 House Plants

Plants	Toxic Part	Symptoms
Hyacinth Narcissus Daffodil	Bulbs	Nausea, vomiting, diarrhea. May be fatal.
Oleander	Leaves, Branches	Extremely poisonous. Affects the heart produces severe digestive upset and has caused death.
Dieffenbachia (Dumb Cane) Elephant Ear	All parts	Intense burning and irritation of the mouth and tongue. Death can occur if base of the tongue swells enough to block the air passage of the throat.
Rosary Pea Castor Bean	Seeds	Fatal. A single rosary pea seed has caused death. One or two caster bean seeds are near the lethal dose for adults.
Mistletoe	Berries	Fatal. Both children and adults have died from eating the berries.

9.1.2 Flower Garden Plants

Larkspur	Young plant, seeds	Digestive upset, nervous excitement, depression, may be fatal.
Monkshood	Fleshy roots	Digestive upset and nervous excitement.
Autumn Crocus Star-of-Bethlehem	Bulbs	Vomiting and nervous excitement.
Lily-of-the-Valley	Leaves, Flowers	Irregular heart beat and pulse, usually accompanied by digestive upset and mental confusion.
Iris	Underground stems	Severe, but not usually serious digestive upset.
Foxglove	Leaves	One of the sources of the drug digitalis used to stimulate the heart. In large amounts, the active principals caused dangerously irregular heartbeat and puls usually digestive upset and mental confusion. May be fatal.
Bleeding Heart (Dutchman's Breeches)	Foliage Roots	May be poisonous in large amounts. Has proved fatal to cattle.

9.1.3 Vegetable Garden Plants

Rhubarb	Leaf Blade	Fatal. Large amounts of raw or cooked leaves can cause convulsions, coma, followed rapidly by death.

9.1.4 Ornamental Plants

Daphne	Berries	Fatal. A few berries can kill a child.
Wisteria	Seeds Pods	Mild to severe digestive upset. Many children are poisoned by this plant.
Golden Chain	Bean-like-capsules in which the seeds are suspended	Severe poisoning. Excitement, staggering, convulsions and coma. May be fatal.
Laurels Rhododendron Azaleas	All parts	Fatal. Produces nausea and vomiting, depression, difficult breathing, prostration and coma.
Jessamine	Berries	Fatal. Digestive disturbance and nervous symptoms.
Lantana Camara (Red Sage)	Green berries	Fatal. Affects lungs, kidneys, heart and nervous system. Grows in the southern U.S. and in moderate climates.
Yew	Berries	Fatal. Foliage more toxic than berries. Death is usually sudden without warning symptoms.

9.1.5 Trees and Shrubs

Wild and cultivated Cherries	Twigs Foliage	Fatal. Contains a compound that releases cyanide when eaten. Gasping, excitement and prostration are common symptoms that often appear within minutes.
Oaks	Foliage Acorns	Affects kidneys gradually. Symptoms appear only after several days or weeks. Takes a large amount for poisoning. Children should not be allowed to chew on acorns.
Elderberry	All parts, especially roots	Children have been poisoned by using pieces of the pithy stems for blowguns. Nausea and digestive upset.
Black Locust	Bark, sprouts, Foliage	Children have suffered nausea, weakness and depression after chewing the bark and seeds.

9.1.6 Plants in Wooded Areas

Jack-in-the Pulpit	All parts, expecially roots	Like dumb cane, contains small needle-like crystals of calcium oxalate that cause intense irritation and burning of the mouth and tongue.
Moonseed	Berries	Blue, purple color, resembling wild grapes. Contains a single seed. (True wild grapes contain several seeds.) May be fatal.
Mayapple	Apple, foliage, roots	Contains at least 16 active toxic principles, primarily in the roots. Children often eat the apple with no ill effects, but several apples may cause diarrhea.

9.1.7 Plants in Swamp or Moist Areas

Water Hemlock	All parts	Fatal. Violent and painful convulsions. A number of people have died from hemlock.

9.1.8 Plants in Fields

Buttercups	All parts	Irritant juices may severely injure the digestive system.
Nightshade	All parts, especially the unripe berry	Fatal. Intense digestive disturbances and nervous symptoms.
Poison Hemlock	All parts	Fatal. Resembles a large wild carrot. Used in Greece to kill condemned prisoners.
Jimson Weed (thorn apple)	All parts	Abnormal thirst, distorted sight, delirium, incoherence and coma. Common cause of poisoning. Has proven fatal.

9.2 Water Conservation

9.2.1 All landscaping design and construction shall realize the maximum conservation of water.

9.2.2 Water conserving, native type plant materials shall be used to the maximum.

9.2.3 Water conserving automatic irrigation systems shall be used to the maximum.

9.3 Paved areas shall be limited to the minimum necessary to the satisfactory functioning.

9.4 Dust and weed control, curbs, gutters, streets, off-street parking and sidewalks shall conform to local ordinances.

9.5 All site development shall insure positive drainage and minimum erosion.

9.6 Existing healthy trees shall be saved to the maximum possible extent.

9.7 Exterior lighting shall be limited to that required for safety and function.

9.8 Above grade piping shall be arranged inconspicuously and shall be adequately protected against damage.

9.9 Flood plain requirements shall be carefully considered in design.

SECTION 10 ENVIRONMENTAL STANDARDS

10.1 Certain State building construction projects will require the preparation and approval of an Environmental Impact Study. On projects involving Federal funds, the Impact Study will require approval of Federal, State and local agencies. Projects involving only State funds may require local approval as well as State approval. If required, the Impact Study should be prepared and submitted for approval with the Design Development Documents.

10.1.1 For the purpose of obtaining the necessary approvals, the following format describing the minimum acceptable information has been prepared for use by architects and engineers commissioned by the Board to design capital improvements.

Project Title:_____ Estimated Cost:_____

Architect or Engineer:_____ Date of Impact Study:_____

10.1.2 Provide a brief statement on the following environmental factors existing on or at the site without the proposed improvement.

10.1.2.1 Physical Factors:

Climatic conditions
Vegetation
Soil Characteristics and ground water table
Topography
Geology and specifically seismic hazard classification
Utilities
- Potable water
- Sanitary sewer
- Power; overhead or underground
- Telephone; overhead or underground
- Gas
- Storm sewer
- Fire hydrant

Air
- Noise
- Odor
- Pollution

Special factors requiring design condition
Vehicle and pedestrian traffic volume
Potential for natural catastrophies such as earthquakes or floods
Availability of mass transportation

10.1.2.2 Land Use:

Urban or suburban characteristics
Zoning and fire zone
Livestock grazing
Wildlife habitat
Recreation
Archaeology
Minerals
Access

10.1.3 Provide a brief description on the following factors of the proposed project:

Gross square footage of building and type of occupancy
Parking capacity
Landscape
Seismic risk design
Utilities, both overhead and underground
Design character; commerical, residential, institutional
Special design considerations
Occupancy capacity
Visitor usage
Access and traffic provisions
Orientation
Potential for man-caused accidents such as personal injury or fire
Type and seasonal quality of fuel to be used
Estimated seasonal consumption of electricity and water
Waste disposal; method, type of material, volume.

10.1.4 Provide a brief statement on the probable impact of the project on the items set forth above, noting any adverse affects that cannot be avoided by alternate design solutions.

10.1.5 Identify any irreversible or irretrievable commitment of natural resources if project is completed.

10.1.6 Cite any public or private objections heard concerning the project.

10.1.7 List project approvals required and those received to date.

SECTION 11 PLAN CHECKING STANDARDS

11.1 Approvals required.

11.1.1 Public Works Board approval is issued after receipt by the Board of approvals by the following entities after their review of plans and specifications:

11.1.2 Approval by registered professional engineers (normally structural, mechanical and electrical) under contract to the Board for the checking service. Where possible, these assignments are made to engineers located i the vicinity of the work to facilitate the checking process. This checking is essentially a check of technical and code requirements of the basic elements of the work and leaves full responsibility for details and conformi to the consultants. When checking indicates lack of conformance, plans wil be returned to the architect for re-submittal and correction.

11.1.3 Mechanical and electrical plan checking is not begun until plans and specifications are complete; structural checking may be begun at an early stage of development of the project, with architect and checker authorized to work directly together toward resolution of problems noted. Calculations and any supplementary information required by the checker must be provided by the architect and the checker must verify that appropriate corrections have been incorporated in final plans and specifications. In special instances the Public Works Board staff performs these checks without assignment of a contract checker.

11.1.4 Approvals by the Bureau of Consumer Health Protection Services of the State Department of Human Resources and the Division of Environmental Protection of the State Department of Conservation and Natural Resources, with particular reference to sanitary and environmental provisions. In general, this approval evidences to the Board that water and air pollution control standards have been met. Special submissions may be required where local Boards have jurisdiction in addition to that of State agencies.

11.1.5 Approval by the State Fire Marshal. In general, this approval evidences, to the Board, Fire Marshal approval under NRS 477.030; any required approval of incorporated factory-built-units under NRS 461; and local fire department approval. Coordination of fire service checking is accomplished by the State Fire Marshal.

11.1.6 Approval by local jurisdiction. State projects are required to conform to local regulations. In design analysis the designer must review local requirements and conform his design to them. Because no permit or checking fees are paid by the State to the local jurisdictions, detailed plan checking by them is not anticipated; however, the designer must submit the plans to the local building department and provide evidence of conformity with local requirements.

11.2 Limitation of review authority.

11.2.1 It is expressly understood that plan reviews and comments by State agencies and contract plan checkers are made solely (a) as a convenience to the consultant in the performance of his services under the contract, and (b)

in the State's best interest. Neither plan reviews or comments, nor any requests for modifications brought forth by the State or its plan checker within the scope, intent and budget of the project shall relieve or lessen the consultant's primary responsibility to develop project contract documents conforming in all respects to all adopted standards. The consultant may dispute any review comments and recommendations on the basis of good practice, aesthetics, or for technical, industrial or budgetary reasons and final resolution of such disputed items will be by the Public Works Board.

11.3 Variances.

11.3.1 Variances from code requirements may be granted by the Board where special conditions are such as to make them desirable and acceptable. In such instances the architect recommends the variance, stating his justification for it, the checker recommends approval or disapproval and the Board, after all necessary coordination, approves or disapproves the request. If the variance involves exiting or fire protective aspects of the building the Fire Marshal is consulted by the Board and an agreed determination is made.

11.3.2 The Board has at its disposal the code interpretation services of the International Conference of Building Officials and, in addition, may choose to secure the recommendations of local committees of the American Institute of Architects and the Nevada Society of Professional Engineers. It is accordingly desirable that requests for variances be submitted at the earliest possible time in order to avoid delay.

11.4 School Plan Checking shall be in accordance with Section 5000 of the Policy and Procedures of the State Public Works Board.

11.4.1 School Plan Checking shall not include mechanical and electrical checking.

SECTION 12 DOCUMENT STANDARDS AND PLANS AND SPECIFICATIONS

12.1 A design analysis in accordance with the following format shall be submitted with both the Schematic Design Documents and the Construction Documents to facilitate plan checking.

12.1.1 The design analysis for the schematic design documents shall include:

12.1.1.1 A summary of the requirements of local codes and regulations as they affect the project. The State is required to conform with such regulations and it is the designer's responsibility to review them. These include roof, wind and seismic loadings, special plumbing and electrical requirements, etc. Where conflicts exist between adopted State codes and local ordinances, the designer shall call the conflicts to the attention of the Board for resolution.

12.1.1.2 The plot plan, to scale, must show the proposed building outline and all existing buildings, giving distances to property lines and to adjacent buildings on the same parcel, utilities, etc.

12.1.1.3 The building area, aggregate and broken down as necessary to demonstrate conformance to allowable floor area requirements.

12.1.1.4 The occupancy and occupancy separations as established by UBC or NFPA Pamphlet 101.

12.1.1.5 The fire zone as established by local government.

12.1.1.6 The seismic probability zone as established by the UBC and "K" factor used in design.

12.1.1.7 The type of construction by UBC classifications, giving brief description of building and method of structural support.

12.1.1.8 The live loads: roof, wind, seismic and any special loading as incorporated in design.

12.1.1.9 The structural materials incorporated with allowable stresses and appropriat references to Building Code section.

12.1.1.10 Describe and include calculations of the fire retardant value of roof systems.

12.1.1.11 An exit plan including occupancy load calculations and basis therefor, indicating separations and openings.

12.1.1.12 Describe any special hazards and provisions therefor. Include a descriptive statement of any fire extinguishing systems to be provided.

12.1.1.13 Outline light, ventilation and sanitary requirements with a statement indicating how these are to be met.

12.1.1.14 Structural design basis and assumptions.

a) For foundations note test results, allowable soil pressure used, frost depth assumed, any special considerations.

b) For the building frame describe type of construction and seismic resisting structural frame; i.e. for steel frame note Type I (rigid frame), Type II (conventional), or Type III (semi-rigid). Note any special assumptions or methods used; i.e. plastic or ultimate strength design, etc.

12.1.1.15 Fallout Protection Analysis. Preliminary information shall be submitted with the schematic design documents concerning the proposed building as necessary to determine whether or not slanting possibilities exist. The information in this preliminary submission shall include: small scale floor plans; right angle cross sections showing general relationship of the building and adjacent lands; materials for construction with estimated weights per square foot of all walls, floors, roofs; intended window sill heights and estimated percentages of each wall opening.

12.1.1.16 Criteria for Fallout Protection. Shielding methods and techniques have been developed by the Office of Civil Defense, Department of Defense. Where the services of a Fallout Shelter Analyst certified by the Department of Defense are not available, the State will endeavor to make arrangements through the State Civil Defense organization for guidance and advice on how to achieve fallout protection through the firm's design effort.

12.1.2 The final design analysis presentation, to be submitted with construction documents, shall consist of the following:

12.1.2.1 Finalized code analysis, items 12.1.1.1 through 12.1.1.14 of 12.1.1 above.

12.1.2.2 Complete structural calculations.

12.1.2.3 Plumbing.

a) Cold Water Services: Summary of data and calculations indicating basis for demand load, available pressure at the street main, pressure drop available for overcoming friction in pipe and fittings, permissible pressure loss per 100 feet of equivalent pipe, pipe classification and computations of building main, branch and riser sizes with specific reference to the drawings.

b) Domestic Hot Water: Basis for the selection of the heater size and storage tank capacity, summary of computations for pipe sizes with specific reference to the drawings.

c) Sanitary Systems:

Drainage System: Data indicating the total fixture unit equivalents and the section of the building sewer, vertical and horizontal pipe sizes, with specific reference to the drawings.

Venting System: Data indicating the selection of the roof vent stack sizes with specific reference to the drawings.

d) Rainwater Systems: Data indicating the maximum rainfall per hour used and the selection of the pipe sizes with specific reference to the drawings.

e) Fuel Gas: Data indicating the maximum demand with individual appliance demands, specific gravity and pressure available at the source outlet, and summary of pipe size computations with specific reference to the drawings.

f) Vacuum, Compressed Air, Oxygen Systems, etc.: Basis for selecting equipment capacities, summary of computations for pipe sizes with specific reference to the drawings.

g) Fire Extinguishing System: Indicate UBC Group classification, NFPA Occupancies classification, and any other pertinent data necessary for checking as to conformance with UBC and NFPA requirements and standards.

12.1.2.4 HVAC

a) Heating and Cooling Loads: Indicate summer-winter outdoor and indoor design conditions, heat loss of each room or space with surface areas and coefficients; cooling load calculations for each room or space with surface areas and all data involved to clearly illustrate the determination of loads.

b) Equipment: Provide computations for selecting fuel burning systems, capacities, fans, refrigeration systems, circulation pumps, heat exchangers, expansion tanks, heating and cooling coils, temperature control valves, etc.

c) Air, Steam and Hot Water Systems: Provide computations for sizing duct work and piping with specific reference to the drawings.

12.1.2.5 Electrical.

a) Illumination: Provide illumination levels, with calculations, for eac room or space.

b) Feeders: Provide computations for wire sizes and voltage drops.

c) Service: Provide summary indicating the demands and power factors use for sizing the main switch, incoming wires, transformers, etc. Where applicable, provide short circuit calculations from Power Company's Fault Current Figures.

12.1.2.6 Acoustical.

a) Indicate noise and vibration insulation provided for mechanical units and attached piping, conduits and ducts.

b) For music rooms, lecture rooms, auditoriums, and similar areas where acoustical considerations are essential, indicate:

Designed transmission loss of walls and (if over one story) floors.

Reverberation time of rooms.

12.1.2.7 Fallout Protection. A statement of the design consideration given to providing fallout protection shall be included in the final plans and specifications submitted for approval. The statement shall incorporate, where appropriate, a simple delineation of the building showing location of the shelter space with particular reference to access and number of spaces provided, with their protection factor.

12.1.2.8 If provision of fallout protection is not technically feasible and/or if the project budget does not permit design considerations providing fallout protection, the consultant shall submit a statement to that effect.

12.2 Drawings. The State requires a high standard of craftsmanship in architectural drawing, detailing and coordination of information contained on drawings. The State reserves the right to reject any work which does not meet the highest standards of professional presentation and architectural practice.

12.2.1 In addition to normal plan architectural sheets, each set of plans shall include cross sections and longitudinal sections, roof drawing plans, and complete door and window schedules. A title sheet or cover sheet shall be included and contain the following data:

12.2.1.1 Name of Project.

12.2.1.2 Address of Project.

12.2.1.3 Name, address and seal of designing architect or engineer and all professional consultants.

12.2.1.4 Signatures of approving authorities are not required on the title sheet.

12.2.1.5 Standard sheet size of 24" x 36" is preferred.

12.2.2 A "limit" of work area designating the area allowed the contractor for storage and operation shall be shown on the site plan.

12.2.3 A 3/16" scale shall be avoided.

12.2.4 Permanent design data shall be shown on the first sheet of the architectural drawings, heavily boxed in, and including the following: Occupancy Group; Type of Construction; Floor Area; Occupancy Load; Required Separations; Fire Zone; Sprinklers; Alarm Systems; Number of Stories; Height; Fallout Shelter Provision; Live Loading; Roof, Floor-normal, Floor-special, Wind, Seismic, Design Stresses; Soil Bearing, Concrete, Masonry, Rebar, Structural Steel, Lumber; Allowable Stress Increases; Snow Loading, Lateral Loading. The following can be used as a guide:

BASIS OF DESIGN	
OCCUPANCY GROUP _____ TYPE OF CONSTRUCTION _____ FLOOR AREA _____ OCCUPANCY LOAD _____ REQUIRED SEPARATIONS _____ FIRE ZONE _____ SPRINKLERS _____ NO. STORIES _____ HEIGHT _____ FALLOUT PROVISIONS: ALARM SYSTEM: INSULATION PROVIDED:	LIVE LOADING ROOF _____PSF FLOOR - NORMAL _____PSF FLOOR - SPECIAL _____PSF WIND _____PSF SEISMIC _____ DESIGN STRESSES SOIL BEARING CONCRETE REBAR STRUCTURAL STEEL LUMBER MASONRY ALLOWABLE STRESS INCREASES SNOW LOADING: LATERAL LOADING: OTHER:

12.2.5 Structural. Plans shall include the following in addition to normal drawings:

12.2.5.1 A framing plan shall be required for each floor, and the roof, showing all structural connections and support systems.

12.2.5.2 A foundation plan shall be required (footing width shall be shown in plan).

12.2.5.3 Sufficient sections shall be required to describe the structure completely.

12.2.5.4 Sections shall be cross referenced to every plan that they pierce.

12.2.5.5 Column sizes shall be shown on each structural plan, or in a schedule.

12.2.5.6 Detailing of reinforced concrete structures shall conform to the ACI Manual of Standard Practice.

12.2.6 HVAC and Plumbing. Plans shall include the following in addition to normal drawing:

12.2.6.1 Graphical symbols and abbreviations shall conform to those recommended by ASHRAE.

12.2.6.2 Detail section and floor plan drawings shall be 1/4 inch scale or larger.

12.2.6.3 Extensive plumbing systems shall be clearly illustrated with:

a) A floor plan showing under floor piping.

b) A floor plan showing above floor piping in areas where batteries of fixtures. Such floor plans shall be 1/4 inch or larger.

12.2.6.4 Piping riser diagram shall be shown for multiple story buildings with extensive piping systems.

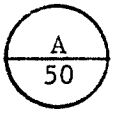
12.2.6.5 Boiler and mechanical equipment rooms shall be clearly illustrated by detail floor plan drawings, and in addition detail sections or isometric piping diagrams or piping flow diagrams.

12.2.6.6 Special pipe and equipment anchors, supports, fasteners, etc., shall be fully detailed where necessary to clarify the designer's intent.

12.2.6.7 Control wiring diagrams shall be included for all systems requiring field installations.

12.2.7 Electrical. Plans shall conform as follows:

12.2.7.1 Graphical symbols as illustrated by American Standard Association are to be generally followed. Symbol designation for lighting fixtures shall be similar to the following:



Letter is fixture type
Number is total wattage, including ballast.

12.2.7.2 Buildings with extensive electrical systems shall be clearly illustrated with two separate floor plans of the same floor. One floor plan to indicate the power systems, other floor plan to indicate the lighting system.

12.2.7.3 All lighting and miscellaneous power panel schedules shall be included on the drawings; connection diagrams shall be shown for power panels. Schedules and connection diagrams shall be similar to the attached illustration. (Illustrations are on the next page.)

12.2.7.4 Separate floor plans shall be included for building areas with extensive electrical equipment.

12.2.7.5 Special fixture and equipment supports shall be fully detailed where necessary to clarify the designer's intent.

12.2.7.6 All electrical circuit outlets shall be shown interconnected with the required number of wires.

12.2.7.7 Wiring diagrams shall be included, where necessary for clarification for all special control systems.

LIGHTING AND MISC. POWER PANEL SCHEDULE

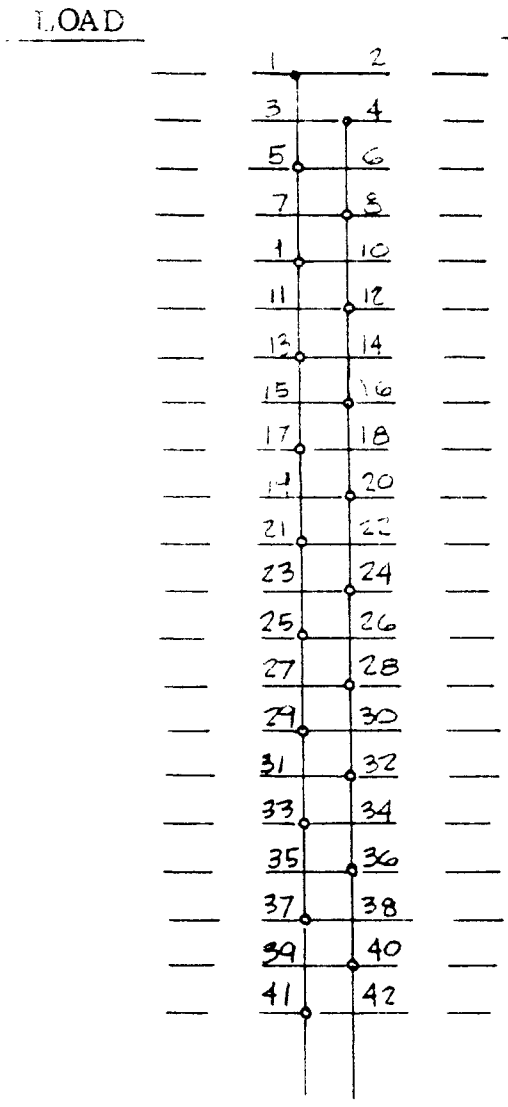
PANEL " "							
C T	OUTLETS	Wattage A	Wattage B	Wattage C	WIRE SIZE	BKR P	BKR A
TOTALS							

PANEL " "					
C T	OUTLETS	Wattage A	Wattage B	Wattage C	WIRE SIZE
TOTALS					

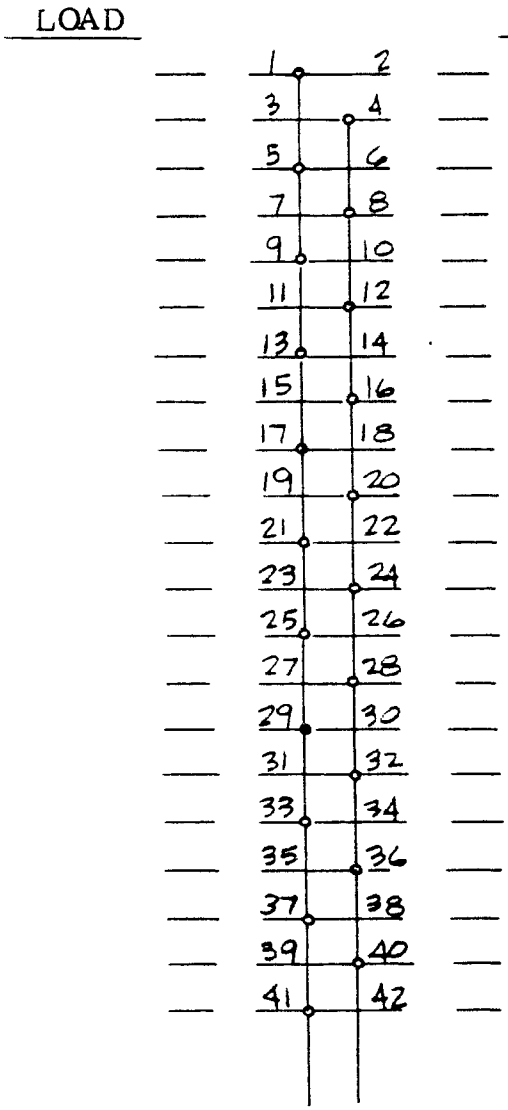
PANEL CONNECTION DIAGRAM

3 WIRE, 1 PHASE

PANEL _____



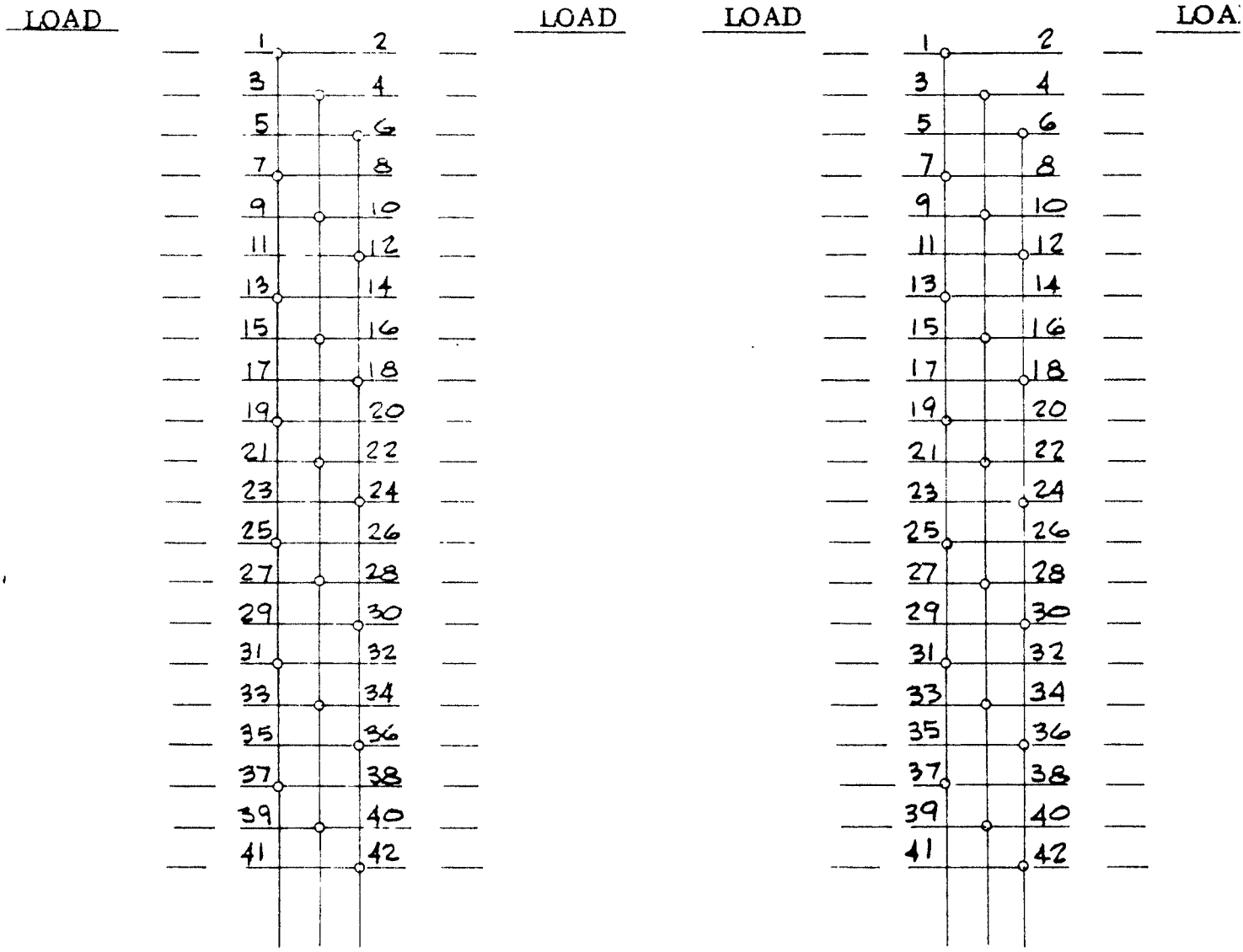
PANEL _____



PANEL CONNECTION DIAGRAM

4, WIRE, 3 PHASE

PANEL _____ PANEL _____



12.3 Specifications.

12.3.1 Proprietary specifications shall be avoided in accordance with NRS 338.140. Except in those cases where the product is designed to match others in use in a particular public improvement, either completed or in the course of completion, specifications shall not call for a designated material, product, thing or service by specific brand or trade name unless the specification lists at least two brands or trade names of comparable quality or utility and is followed by the words "or equal". In those cases involving a unique or novel product application required to be used in the public interest, only one may be listed. Specifications shall provide a period of at least seven days after award of the contract for submission of data substantiating a request for the substitution of an "or equal" item.

12.3.2 All references to technical standards for materials regulated under the Uniform Building Code shall be to the Standards published by the Uniform Building Code (2.2.1.3).

12.3.3 Specifications pertaining to built-up roofing shall require a guarantee that all roofing, membranes, flashings, counterflashings, reglets, copings and other elements necessary to the watertightness of the roof will be watertight for a period of one year after the date of the Notice of Completion. In addition to the guarantee the construction documents shall require a 20 year bond and flashing endorsement. The bond shall carry a $20.00 per square penal sum with a minimum total of $1,500.00.

12.4 Contract Documents

12.4.1 Contract Documents shall stipulate the unit amount of liquidated damages in accordance with the following schedule.

Contract Cost	Unit of Liquidated Damages
$ 10,000 to $ 100,000	$ 75.00 per day
$ 100,000 to $ 300,000	$ 100.00 per day
$ 300,000 to $ 600,000	$ 150.00 per day
$ 600,000 to $ 1,000,000	$ 200.00 per day
$1,000,000 to $ 2,000,000	$ 250.00 per day
$2,000,000 to $ 4,000,000	$ 400.00 per day
$4,000,000 to $ 6,000,000	$ 500.00 per day
$6,000,000 to $ 8,000,000	$ 600.00 per day
$8,000,000 to $10,000,000	$ 800.00 per day
above $10,000,000	$1,000.00 per day

12.4.2 All State construction work is scheduled in terms of WORKING DAYS. For the purpose of computing construction time in this manner, it is necessary to define those days officially declared holidays in the State of Nevada. In addition to the holiday schedule listed hereinafter, Saturdays and Sundays are not working days.

January 1st	New Years Day
Third Monday in February	Washington's Birthday
Last Monday in May	Memorial Day
July 4th	Independence Day
First Monday in September	Labor Day
October 31st	Nevada Day
Fourth Thursday in November	Thanksgiving Day
December 25th	Christmas Day

12.4.2.1 Any day that may be appointed by the President of the United States for public fast, Thanksgiving or as a legal holiday.

12.4.2.2 Any day proclaimed as a holiday by the Governor.

12.4.2.3 If January 1st, July 4th, October 31st, or December 25th fall upon a Sunday, the Monday following shall be declared a holiday.

12.4.2.4 If January 1st, July 4th, October 31st, or December 25th fall upon a Saturday, the Friday preceding shall be observed as a holiday.

12.4.3 The consultant shall recommend to the State the advisability of requiring subcontract bonds on certain contract work. If approved, such bonds shall be called for in the contract documents.

12.4.4 A copy of the "boilerplate" documents and standard forms to be included in the bid documents will be provided the design consultant by the State.

12.4.5 The technical specifications and "boilerplate" documents shall be carefully coordinated by the design consultant.

SECTION 13 BUDGET STANDARDS

13.1 A detailed Project Budget for approval by the Board shall be developed for every project.

13.1.1 While the Manager can make minor adjustments in the approved budget, it will provide the basis for all expenditures.

13.2 The construction budget shall be clearly established in all Professional Service Agreements for building design and it shall be the contract obligation of the designer to realize the construction of a usable facility within that amount.

13.2.1 The budget shall have precedence over the Scope of Work.

13.3 When the low bid exceeds the appropriation all bids are to be rejected.

13.4 When the low bid is less than the appropriation and within 10% of the construction budget negotiations with the low bidder can be initiated.

13.5 Only in extreme emergency, and after assuring that there is no other alternative, shall the Board consider requesting additional funds from the Interim Finance Commitee via the Board of Examiners.

SECTION 14 TESTING STANDARDS

14.1 The Architect shall be required to prepare the specifications and other contract documents to assure consistency with the stipulations of the General Conditions concerning testing.

14.2 All specification references to technical standards for materials regulated under the Uniform Building Code shall be the Standards published by the Uniform Building Code.

14.3 Initial Site Investigations. Where a soils report, survey or other site investigation is necessary, the Architect shall be requested to recommend an appropriate firm for the accomplishment of these investigations, outline the Scope of Work to the firm and request the firm submit its proposal, outlining the work proposed for accomplishment and quoting his guaranteed maximum fee under a time and materials contract, to the Board. With the approval of the firm and its proposal, the Board will submit a contract for execution by the selected firm.

14.4 Selection of testing laboratory. The testing laboratory should be selected early in the design process in order that the Architect may confer with testing personnel prior to establishing the specification requirements for testing. The Architect is requested to recommend a testing laboratory to the Board soon after accomplishment of initial site investigations; consideration should be given to selection of the same firm which carried out the initial investigations when this is appropriate. The Board considers the function of the testing laboratory to require professional qualifications and accordingly the recommendation should be of a firm so qualified. The Board then makes appropriate arrangements with the laboratory or another acceptable to the Architect, and issues a letter of intent to the laboratory. The laboratory then meets with the Architect to outline a testing program and test procedures meeting the project requirements.

14.5 Testing Contract. After bidding and determination of the identity of the subcontractors and sources of materials for the project, the selected laboratory submits its testing service proposal to the Public Works Board. Preliminary costs incurred by the laboratory prior to execution of the testing contract are assumed to be overhead costs covered by the rates charged for testing and are not separately reimbursed by the Board. An indication of maximum contract amount or at least an estimate of cost of testing for the entire project must be included in the proposal since funds available are fixed in amount and the Public Works Board must at that time finalize its budget for all costs of the project. After resolution of any questions, the contract is executed between Board and laboratory. The Board maintains a qualified inspector on each of its projects. Full time inspection by the testing laboratory is authorized only in specific instances agreed in advance. Generally, the Board strives to hold testing costs to reasonable minimums. Any special investigation or inspection for which the laboratory expects compensation must be agreed on in advance by laboratory and Public Works Board.

SECTION 15 STANDARDS FOR PUBLIC FACILITIES TO ACHIEVE BARRIER-FREE DESIGN

15.1 GENERAL PRINCIPLES AND CONSIDERATIONS.

15.1.1 Wheelchair Specifications.

a) Length: 42".

b) Width: 25" (27" for active adults).

c) Height of seat from floor: 16.5".

d) Height of armrest from floor: 29".

e) Height of pusher handles (rear) from floor: 36".

15.1.2 Functioning of Wheelchair.

a) Fixed turning radius, wheel to wheel, 18".

b) Fixed turning radius, front structure to rear structure, 31.5".

c) Average turning space required (180° and 360°) is 60" x 60".

d) 60" minimum width for two wheelchairs to pass each other.

15.1.3 Adult Individual Functioning in Wheelchair.

a) Unilateral vertical reach: Average 60". Range 54" to 78".

b) Horizontal working reach: Average 30.8". Range 28.5" to 33.2".

c) Bilateral horizontal reach: Average 64.5". Range 54" to 71".

d) Diagonal reach on the wall: Average 48" from the floor.

15.1.4 Individual Functioning on Crutches.

a) Individual 5'-6" tall: 31" between crutch tips.

b) Individual 6'-0" tall: 32.5" between crutch tips.

15.2 SITE DEVELOPMENT.

15.2.1 Walks.

a) 5'-0" minimum width.

b) 5 per cent maximum gradient for walks, curb ramps, etc.

c) Continuing travel surface not interrupted by steps or abrupt changes in level.

d) Surfaces of walks, driveways and parking lots shall blend to common level (by means of ramps), with non-slip surface.

e) Color code curb depressions and curbs at handicapped parking spaces.

f) Platforms at doors or doorways, see 15.5.5, Doors and Doorways.

15.2.2 Parking Lots.

a) Accessible level parking space near building.

b) Identified by International symbol for use by physically handicapped only. Symbol shall be placed 4'-6" above parking grade.

c) Open one side on level surface at parking space.

d) 12'-0" minimum width parking space, consisting of 9'-0" parking space with 3'-0" striped side path.

e) Physically handicapped shall not be compelled to walk or wheel behind parked cars.

f) Provide minimum of one space, or not less than 2% of total available spaces. Locate spaces close to building entrance, and at end of parking rows.

15.2.3 Curb Ramps.

a) A "flared" ramp is preferred. See drawings.

b) Maximum gradient shall be 1:6, or 17%.

15.3 BUILDING RAMPS.

15.3.1 Width: 4'-0" one way. 5'-0" two way.

15.3.2 Maximum slope of 1:12.

15.3.3 Handrail on at least one side, 2 sides preferred if ramp raises more than 1'-0" vertical height.

15.3.4 Handrail to be 32" above ramp surface and extend 1'-0" minimum beyond top and bottom of ramp. Curb on both sides 2" high, 4" wide. Double railings desirable for children's use. Handrail installed on top of curb.

15.3.5 Non-slip surface. Consider electric heat.

15.3.6 Minimum size platform at top 5' x 5' and bottom 6' x 4'. Intermediate platform 5' x 4' minimum.

15.3.7 6'-0" of straight clearance at bottom.

15.3.8 Level rest platform at 30'-0" maximum intervals and at turns.

15.4 BUILDING ENTRANCE.

15.4.1 At least one primary entrance usable by individuals in wheelchairs.

15.4.2 At least one entrance available to wheelchair users that will make elevators accessible.

15.5 DOORS AND DOORWAYS (EXTERIOR AND INTERIOR).

15.5.1 32" minimum clear opening (2'-10" wide door). Recommend 3'-0" wide door as a standard for all doors used for people traffic.

15.5.2 Operable by single effort. Door closers adjusted to 10 lbs. push or pull effort. Automatic, bi-parting, break-away door preferred.

15.5.3 Kickplates extend 12" above door bottom.

15.5.4 View panel at double acting doors, 3'-0" maximum above floor. Use tempered or wire glass.

15.5.5 Level 5' wide platform at doors, ramps and walks. Extend 5'-0" in direction of door swing. Extend minimum 3'-0" in direction opposite to door swing. Extend minimum 1'-0" beyond each side of door.

15.5.6 No sharp incline or abrupt change in level at door sill.

15.5.7 Door sill flush with floor. Maximum differential is ½ inch.

15.5.8 Time delay door closers.

15.6 STAIRS.

15.6.1 No abrupt square nosings.

15.6.2 Handrails 32" above tread at face of riser. Dual handrails recommended if small physically handicapped children are involved.

15.6.3 At least one handrail extended 1'-0" beyond top and bottom step parallel to floor or landing. Return handrail to wall to avoid creation of a hazard.

15.6.4 7" maximum riser conforming with existing formulas and codes.

15.7 FLOORS.

15.7.1 Non-slip surface, all at one level at any story.

15.7.2 Two or more levels connected by ramp. (There shall be no differences in level between corridor and adjacent rooms.)

15.8 TOILET ROOMS.

15.8.1 A 5' x 5' clear floor space in front of lavatory and urinals is required for wheelchair movement.

15.8.2 Provide space to allow traffic of individuals in wheelchairs in entrance vestibules and toilet room interior.

15.8.3 At least one toilet for each sex.

15.8.4 Stall should be a minimum of 3'-0" wide, 5'-0" deep, with a 2'-8" wide outswinging door. Clear door opening 2'-8" minimum. Space in front of stall 3'-6" minimum.

15.8.5 Handrail each side parallel to floor. If stall is over 3'-4" wide, add rail at rear wall. 33" floor to top of rail. 1½" O.D., 36" minimum length 1½" clearance between rail and wall. Security fastened at ends and center. Rail to support weight of 250 lbs. pull. Toilet paper holder mounted above rail. Provide continuous unwinding paper holder. Locate within reach.

15.8.6 Water Closet: Wall mounted preferred, top of seat 18" above floor.

15.8.7 Lavatory with narrow apron. Maximum projection desirable. Floor to apron clearance 2'-6" minimum. Cover and insulate hot water line and trap (turn trap flat against wall to avoid leg contact). Faucet handles, single lever type, for easy operation (recommended).

15.8.8 Mirror and shelf, mount over lavatory. Shelf and bottom of mirror 40" maximum above floor.

15.8.9 Urinal. Floor mounted fixtures strongly recommended. Wall mounted fixtures 19" above floor.

15.8.10 Accessories mounted not over 40" above the floor.

15.8.11 Towel bar near lavatory. Towel, soap and other dispensers. Locate soap dispenser near front of lavatory.

15.9 WATER FOUNTAINS.

15.9.1 Upfront spouts and controls.

15.9.2 Hand-operated or hand and foot-operated controls.

15.9.3 Conventional floor-mounted water cooler with small side-mounted fountain 30" above floor.

15.9.4 Wall-mounted hand-operated cooler mounted with basin 36" above floor, maximum (33" preferred). Projection from wall shall not be hazardous to the blind.

15.9.5 Fully recessed installation. Recess wider than wheelchair.

15.10 PUBLIC TELEPHONES.

15.10.1 An appropriate number accessible to individuals in wheelchairs. One phone in each bank preferred.

15.10.2 Conventional telephone booths are not usable by most physically disabled individuals. Special booths shall be 42" x 42" clear floor space, with 32" clear door opening.

15.10.3 Dial, hardset and coil slot not over 56" above floor.

15.10.4 Headset should have adjustable volume control with instructions.

15.10.5 Push button phones with large numerals preferred.

15.11 ELEVATORS.

15.11.1 Accessible to and usable by physically handicapped at level they use to enter building and at all levels used by the public.

15.11.2 When stopped, elevator floor shall conform exactly with building floor level.

15.11.3 Minimum cab size: 5' x 5' minimum. An approximately square cab configuration is preferrable.

15.11.4 Safety edge door with sensing device and delay closure (8 seconds).

15.11.5 Control no higher than 48" above elevator floor. All buttons should have raised numerals.

15.11.6 Bottom of control panels not lower than 4'-0", top not higher than 5'-0".

15.11.7 Elevator call buttons in lobbies shall be mounted not higher than 4'-0" above the floor.

15.11.8 Elevator cab walls shall have a railing.

15.12 CONTROLS.

15.12.1 Locate light switches, thermostats, drapery and window operators, fire alarms and similar controls at 3'-9" maximum from floor and in locations accessible to a wheelchair.

15.13 HAZARDS.

15.13.1 Obviate hazards to individuals with physical disabilities such as access panels or manholes in floors, walks and walls, low hanging door closers protruding dangerously into corridors or traffic ways when door is closed, low hanging signs, ceiling lights or fixtures, minimum height above floor 7'-0".

15.13.2 Lighting on ramps: Not less than one footcandle per square foot.

15.13.3 Exit signs: In halls and over each required exit doorway -- painted signs shall have letters 6" high and the "stroke" of the letters shall be 3/4" wide. Illuminated signs as per codes.

15.13.4 Gratings: Avoid use in pedestrian traffic ways. If unavoidable, openings in gratings shall not exceed ½" x ½".

15.13.5 Avoid open or rake joints in brick paving: Uncomfortable to wheel over. Narrow wheels may be wedged into joints.

15.13.6 Avoid downspouts discharging onto walk.

15.13.7 Avoid door closers with stiff action.

15.14 GUIDELINES FOR SPACES REQUIRING SPECIAL ATTENTION.

15.14.1 Dining Areas: Access direct, not through kitchen, dishwashing, or other services areas. Table tops: 30" clear to under surface. Width between tables, 5'-6" minimum. Tray slides, 34" maximum height of outside rail. Aisle between tray slide and control railing 2'-10" minimum.

15.14.2 Lecture Halls: Level space with movable seats; no special consideration. Seating fixed; provide level space in optium viewing areas. Platform to be accessible. Student stations for handicapped; one percent, or minimum one station provided for handicapped.

15.14.3 Laboratories. Student stations: one percent or minimum one station provid for handicapped. Handicapped station: Low workbench, 2'-6" minimum clear floor, with no apron. Fixed stations, aisles 3'-0" minimum clearance.

15.14.4 Audio Visual Control Rooms. No step access. 3'-0" wide aisle between equi

15.14.5 Spectator Spaces. One percent provided for ambulatory handicapped. Exits easily accessible. Level spaces for wheelchairs.

15.14.6 Physical Education. One percent lockers appropriate for ambulatory handicapped. Toilet and shower facilities accessible to and usable by physically handicapped.

15.14.7 Libraries. Study carrells: One percent accessible to wheelchairs. Aisles between stacks: 4'-0" width. Tables: 2'-6" clear floor to underside of work area.

15.15 SPECIALTIES.

15.15.1 Electric Outlets: 18" minimum above floor. 24" above floor in areas specifically designed for handicapped.

15.15.2 Light Switches: 2 maximum on plate. Height above floor: Minimum 3'-0", maximum 3'-6".

15.15.3 Vending Machines: Controls and access 2'-0" minimum, 4'-0" maximum above floor.

15.16 DORMITORIES.

15.16.1 Spaces for ambulatory handicapped on a campus, two percent minimum.

15.16.2 Space between major elements, 4'-3" minimum.

15.16.3 Space between bed and wall, 3'-2" minimum.

15.16.4 Mattress height 22" above floor.

15.16.5 Clothing Storage: Partial entrance of wheelchair. Accessible to individual in wheelchair.

15.16.6 Windows operable by person in wheelchair.

15.16.7 Telephone accessible from bed.

15.17 SHOWERS.

15.17.1 Floor surface non-slip.

15.17.2 Seat (one righthand, one lefthand).

15.17.3 Height above floor: 1'-7".

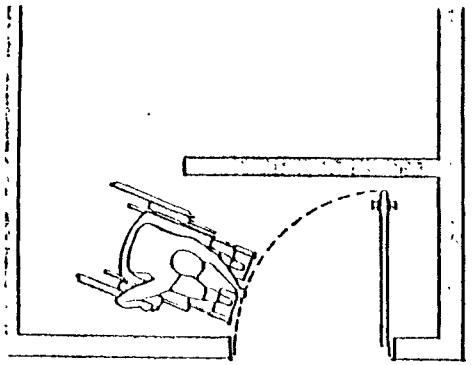
15.17.4 Hinged to fold against wall.

15.17.5 Grab bar on wall opposite seat extending to back wall.

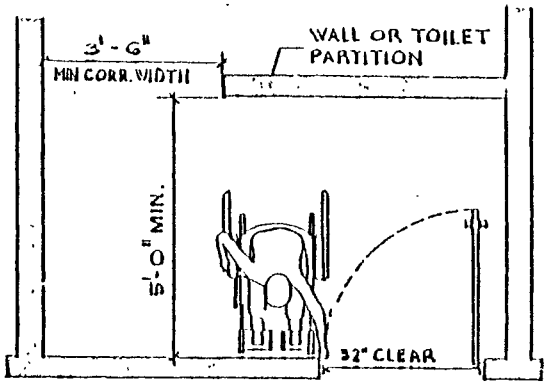
15.17.6 Water control, diversionary spray and soap tray, 3'-6" above floor.

15.18 TURNSTILES.

15.18.1 Provide by-pass for wheelchairs.



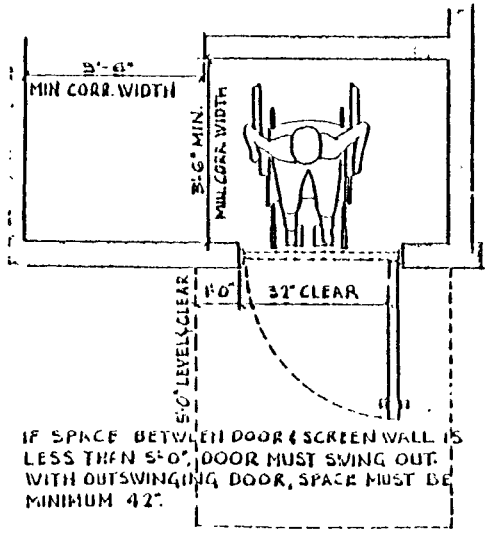
PROBLEM: INSWINGING TOILET ROOM DOOR WITH PRIVACY SCREEN & INSUFFICIENT SPACE FOR CHAIR TO TURN PERPENDICULAR TO WALL BESIDE DOOR REQUIRES LONG LATERAL REACH AND POWER TO OPEN DOOR WHILE MOVING FOWARD & TURNING 90° TO GET THROUGH DOOR.



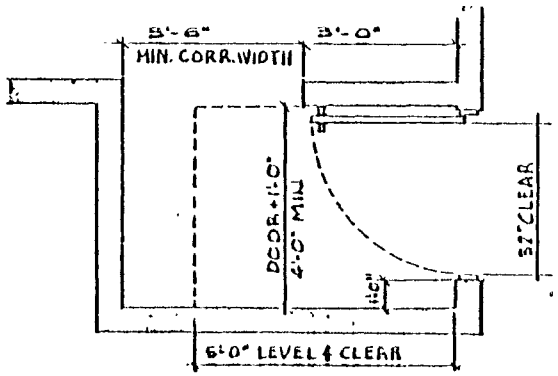
DOOR MAY SWING IN, IF 5'-0" LEVEL & CLEAR FLOOR SPACE IS AVAILABLE.

TOILET ROOM DOORS & THEIR PROBLEMS.

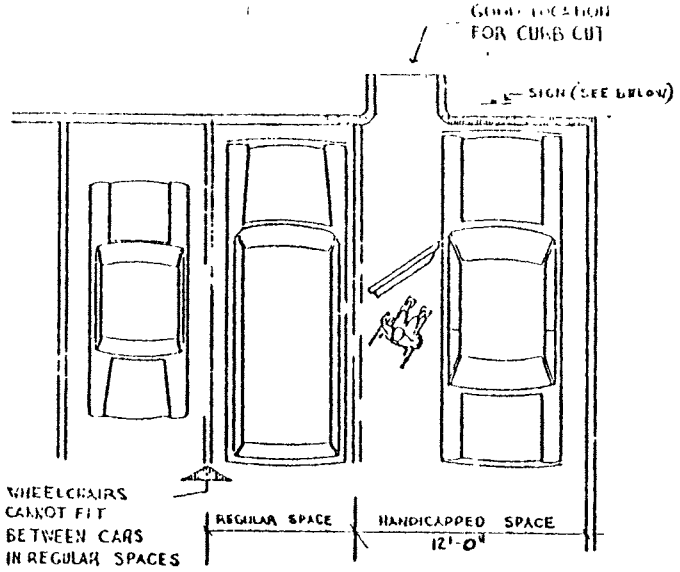
WHERE TOILET ROOM DOORS SWING IN, 5'-0" LEVEL & CLEAR FLOOR SPACE IS REQUIRED BEYOND DOOR WHERE TOILET ROOM DOORS SWING OUT, THE FLOOR AREA ON THE TOILET ROOM SIDE MAY BE TREATED AS A CORRIDOR, 42" MINIMUM WIDTH.



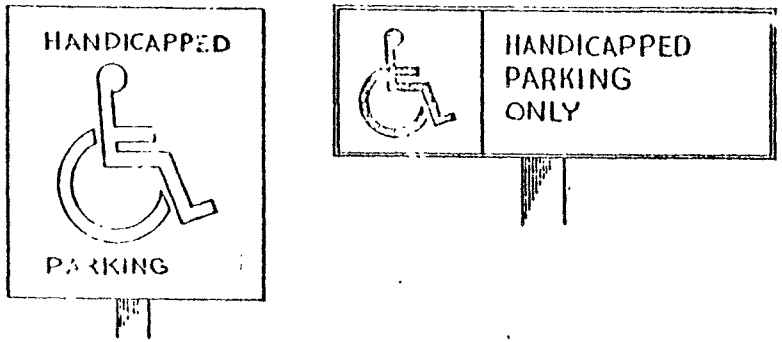
IF SPACE BETWEEN DOOR & SCREEN WALL IS LESS THEN 5'-0", DOOR MUST SWING OUT. WITH OUTSWINGING DOOR, SPACE MUST BE MINIMUM 42".



SMALLEST POSSIBLE VESTIBULE WITH INSWINGING DOOR AT PRIVACY SCREEN.



THE 2% REQUIREMENT FOR HANDICAPPED PARKING SPACES IS 1 IN 50. THIS IS CONSIDERED TO BE VERY MINIMAL.



SUGGESTED SIGNS DISPLAYING THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY

parking lots

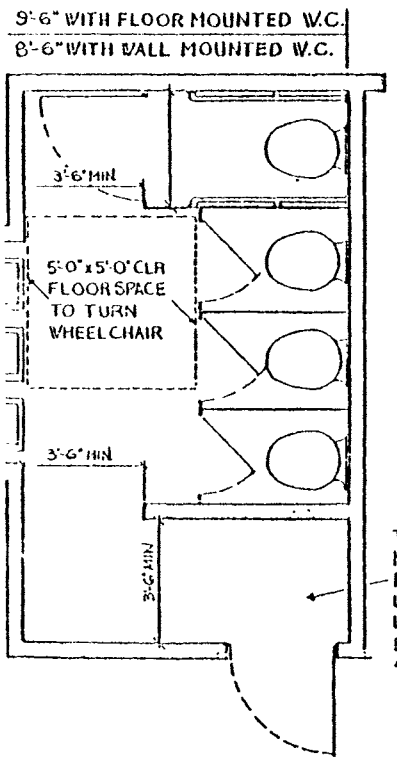
2% OF TOTAL NUMBER OF SPACES OR A MINIMUM OF ONE SHALL BE SET ASIDE & DESIGNATED FOR USE OF PHYSICALLY DISABLED.

SUCH PARKING SPACES SHALL BE CLEARLY MARKED BY SIGNS FOR USE OF HANDICAPPED.

HANDICAPPED PARKING SPACES SHALL BE A MINIMUM OF 12'-0" WIDE & LOCATED AS NEAR AS POSSIBLE TO BUILDING ENTRANCES OR CENTRALLY LOCATED IN PARKING LOTS BETWEEN BUILDINGS.

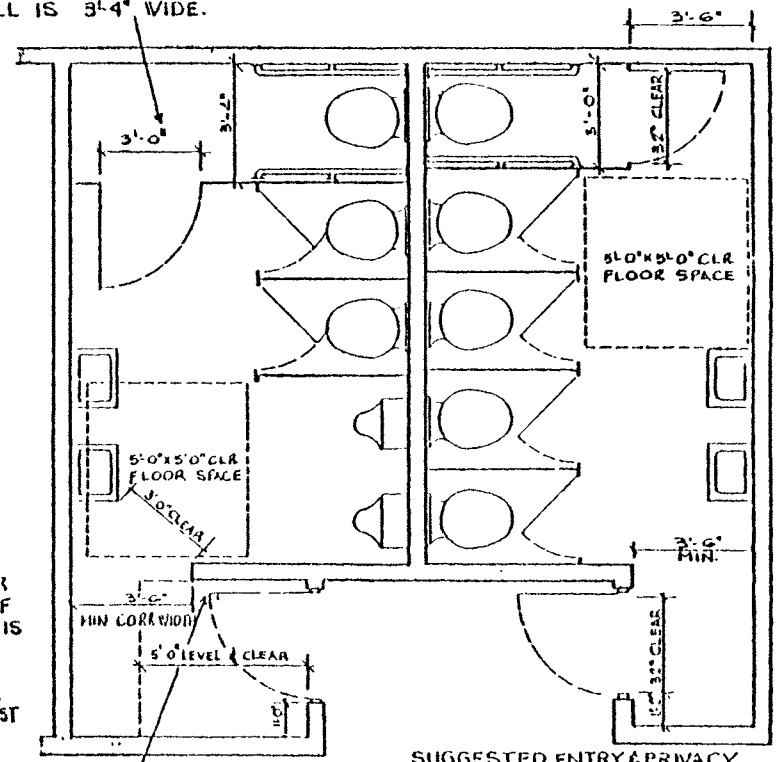
TOILET ROOM PLANS

DUE TO ADDITIONAL LENGTH OF HANDICAPPED TOILET STALLS IT IS SUGGESTED THEY BE LOCATED AT END OF TOILET ROOMS THUS



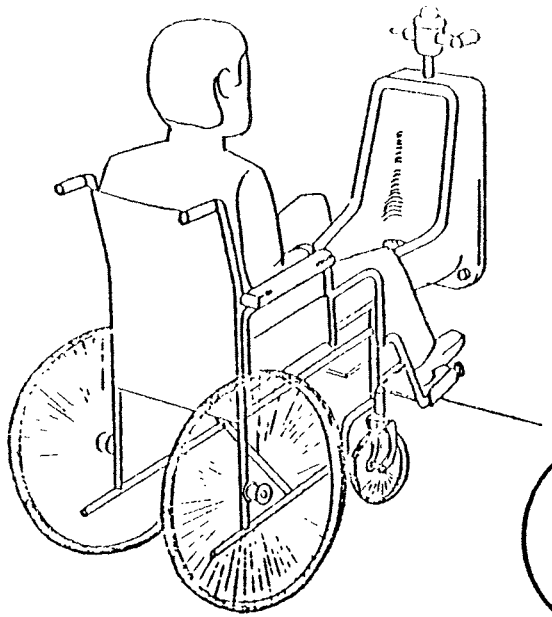
TOILET ROOM DOOR MUST SWING OUT IF PRIVACY SCREEN IS USED AS SHOWN UNLESS SPACE BETWEEN DOOR & SCREEN IS AT LEAST 5'-0"

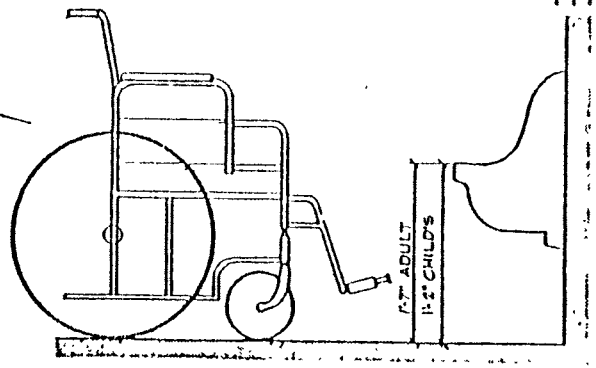
STALLS MAY OCCUPY END OF ROOM & BE ENTERED FROM THE SIDE IF DOOR IS 3'-0" WIDE & STALL IS 3'-4" WIDE.



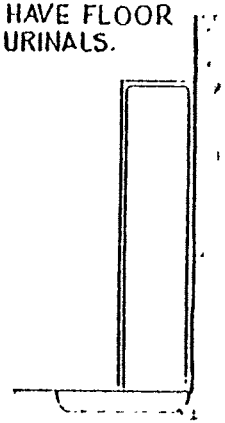
OPEN DOOR MUST NOT OVERLAP 3'-6" MIN. CLEAR CORRIDOR WIDTH.

SUGGESTED ENTRY & PRIVACY SCREEN ARRANGEMENT TO PREVENT DOOR SWINGING OUT INTO THE CORRIDOR. DOORS MAY SWING IN OR OUT.





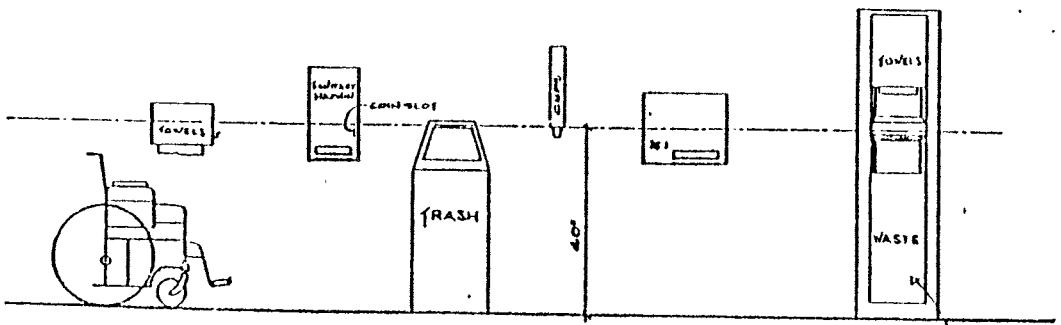
WALL HUNG URINAL



FLOOR TYPE

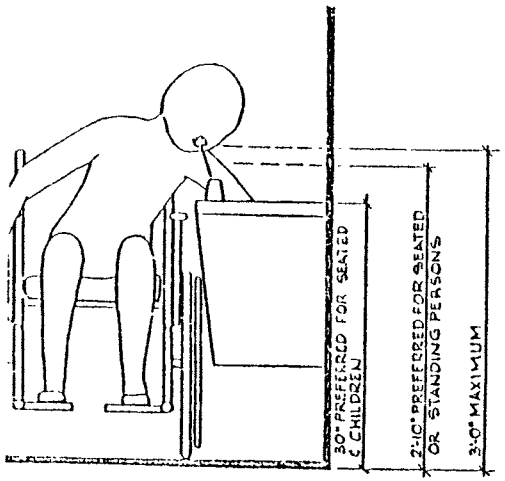
TOILET ROOMS

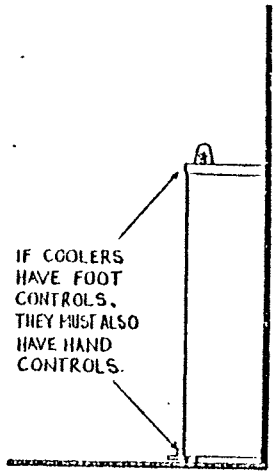
TOILET ROOMS FOR MEN SHALL HAVE AT LEAST ONE WALL MOUNTED URINAL WITH ELONGATED LIP, WITH THE BASIN OPENING 19" FROM THE FLOOR, OR SHALL HAVE FLOOR TYPE URINALS.



THIS TYPE NOT ACCEPTABLE UNLESS SEPARATE TOWEL DISPENSER IS ALSO INSTALLED AT 40"

WHERE TOWEL RACKS, DISPENERS, DISPOSAL UNITS, VENDING MACHINES & APPLIANCES ARE PROVIDED IN TOILET ROOMS, ONE OF EACH TYPE SHALL BE MOUNTED WITH ALL OPERATING MECHANISMS (CRANKS, COIN SLOTS, BUTTONS, ETC.) AND ITEMS THEMSELVES NO MORE THAN 40" ABOVE THE FLOOR.





water fountains

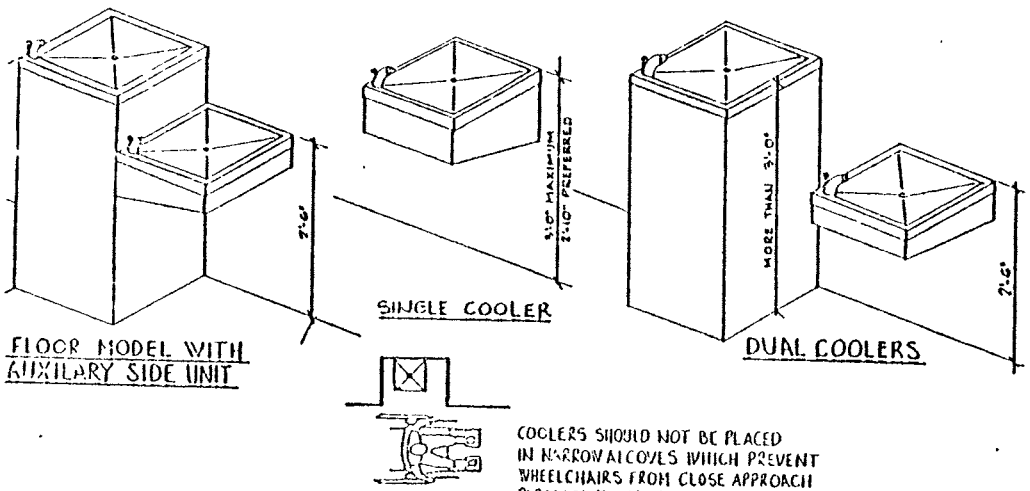
WHEREVER WATER FOUNTAINS ARE PLANNED, AT LEAST ONE PER FLOOR SHALL MEET WITH THE FOLLOWING REQUIREMENTS.

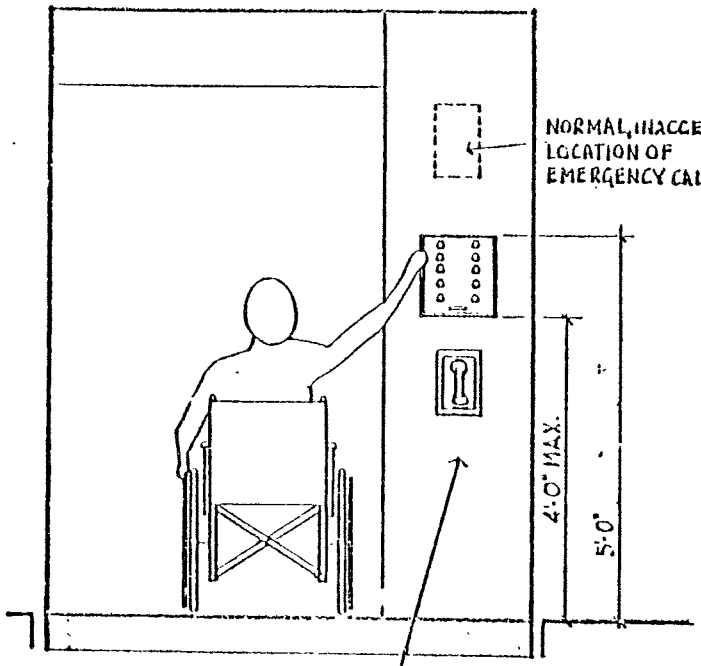
WATER FOUNTAINS & COOLERS SHALL HAVE UPFRONT SPOUTS & CONTROLS.

FOUNTAINS & COOLERS SHALL BE HAND OPERATED OR HAND & FOOT OPERATED.

WHERE A SINGLE CONVENTIONAL COOLER IS USED, IT MUST BE NO MORE THAN 36" ABOVE THE FLOOR, 34" IS PREFERRED.

WATER COOLERS HIGHER THAN 36" MUST HAVE AN ADDITIONAL SMALL FOUNTAIN MOUNTED ON THE SIDE OF THE COOLER WITH THE RIM OF THE SMALL FOUNTAIN BASIN NO HIGHER THAN 30" ABOVE THE FLOOR, OR HAVE AN ADDITIONAL SEPARATE COOLER WITH ITS RIM 30" ABOVE THE FLOOR.





BOTTOM OF CONTROL PANELS MUST BE NO HIGHER THAN 4'-0". TOP OF CONTROL PANEL SHOULD BE NO HIGHER THAN 5'-0" AS AVERAGE UNILATERAL REACH FROM WHEELCHAIR IS 60".

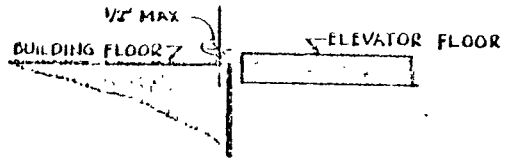
ALL BUTTONS SHOULD HAVE TACTILE IDENTIFICATION BESIDE THEM.

ELEVATOR CONTROLS

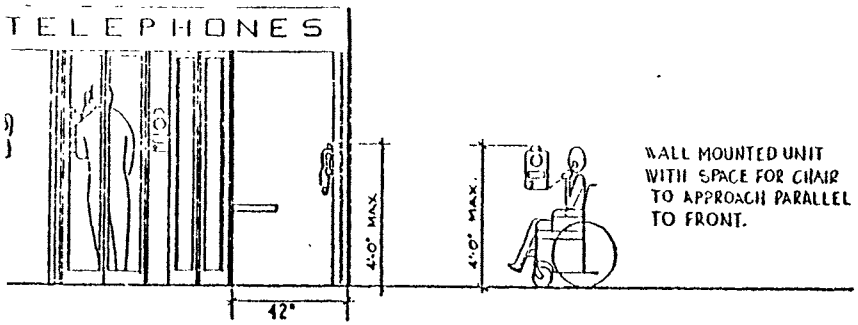
EMERGENCY CALL BOX & CONTROLS ARE PREFERRED TO BE LOCATED LESS THAN 4'-0" HIGH TO BE WITHIN REACH OF SEATED PERSON

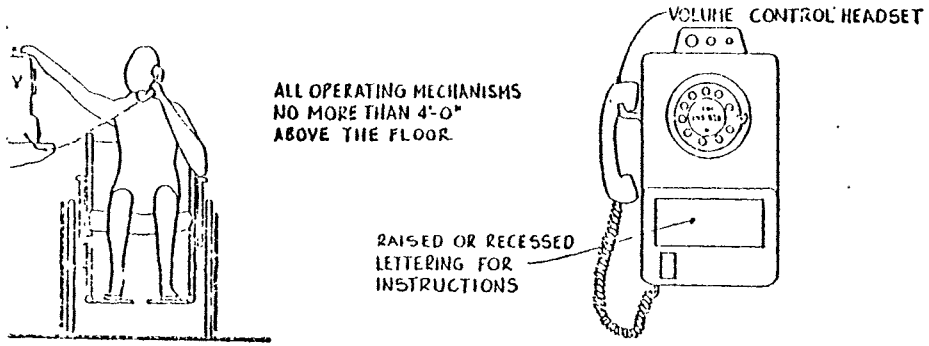
AUDIBLE, PREFERABLY VERBAL SIGNALS ARE PREFERRED TO IDENTIFY EACH FLOOR LEVEL SERVED TO FACILITATE USE BY THE BLIND

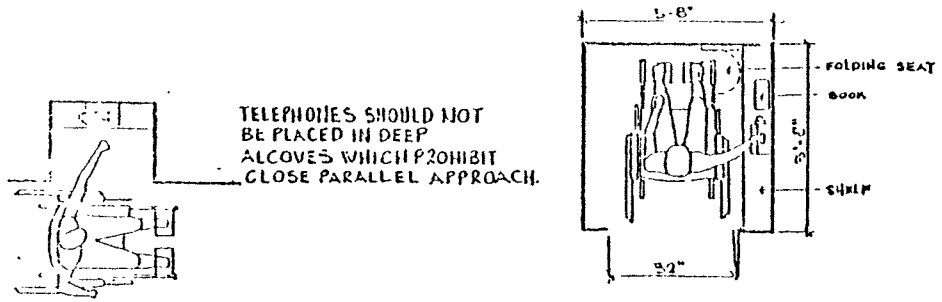
ELEVATOR CALL BUTTONS IN LOBBIES SHALL BE MOUNTED NO HIGHER THAN 4'-0" ABOVE THE FLOOR.



ELEVATOR FLOOR LEVELS MUST STOP WITHIN ½" MAXIMUM OF BUILDING FLOOR LEVELS.







telephones

ALL BANKS OF TELEPHONES SHOULD HAVE AT LEAST ONE TELEPHONE ACCESSIBLE TO THE PHYSICALLY HANDICAPPED AND EQUIPPED AS FOLLOWS.

1) ALL OPERATING MECHANISMS (DIAL, HEADSET, COIN SLOT) SHOULD BE 4'-0" ABOVE THE FLOOR OR LESS

2) HEADSET SHOULD HAVE ADJUSTABLE VOLUME CONTROL WITH INSTRUCTIONS.

3) VISUAL & TACTILE INSTRUCTIONS FOR USE SHOULD BE IN RAISED OR RECESSED LETTERING

4) SINCE STANDARD ENCLOSED TELEPHONE BOOTHS ARE INACCESSIBLE TO WHEELCHAIRS, BOOTHS FOR HANDICAPPED USE SHOULD HAVE:

   a) 41" CLEAR FLOOR SPACE BETWEEN WALLS.

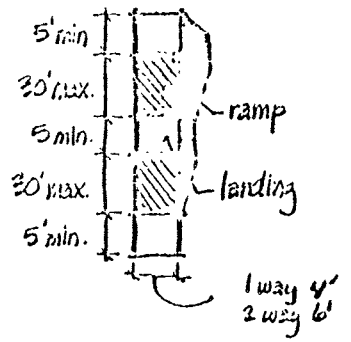
   b) 32" CLEAR DOOR OPENING WITH OUTSWINGING, SLIDING, OR FOLDING DOOR.

ALSO, c) PHONE UNIT SHOULD BE MOUNTED ON SIDEWALL.

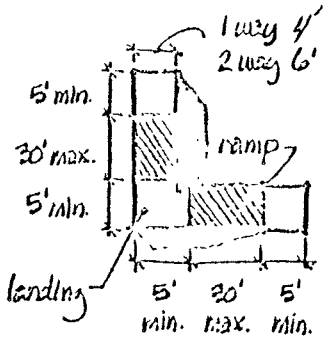
AND, d) SEAT SHOULD FOLD OUT OF THE WAY.

Ramps for Outdoor Use

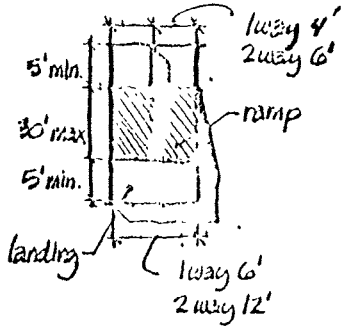
1. Straight-Run



2. Angled Landing

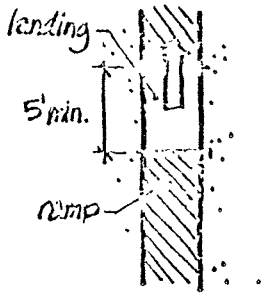


3. Intermediate/Switch-Back Landing

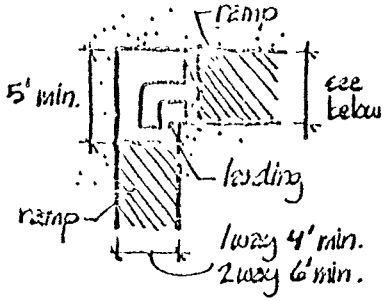


Conditions at Tops & Bases of Ramps

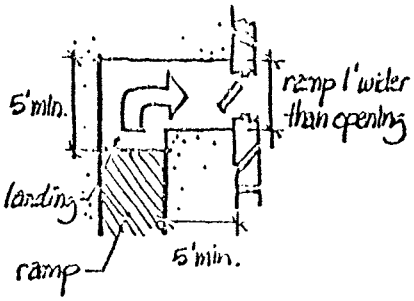
1. Traffic Goes Straight

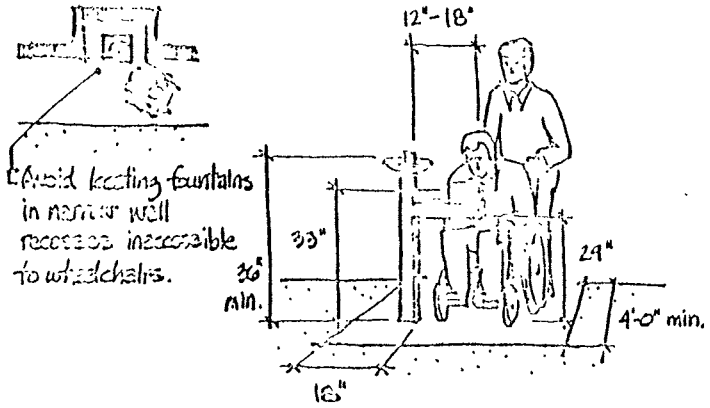


2. Traffic Turns



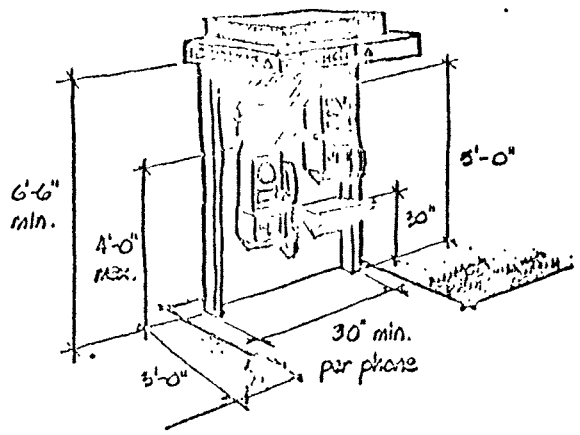
3. Traffic Turns to Gate/Doorway





Drinking Fountains

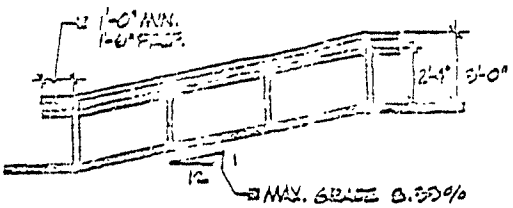
- Hand operated knobs or buttons and foot pedals are difficult for many handicapped people to operate. Push bars are preferred.
- Provide a minimum 21" vertical clearance below fountain nozzle to allow wheelchairs leg room for access.
- Nozzle heights should be approximately 33" for wheelchairs and children and 36"-42" for adults.
- A minimum 18" wide paved area around outdoor fountains for both wheelchair and foot traffic.



Outdoor Telephones

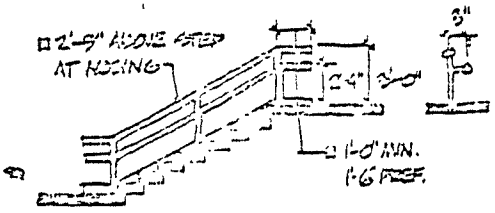
- All groups of telephones should have at least one lower height telephone for use by the handicapped and children.
- Phones for the handicapped should be no higher than 4'-0" at the coin slots. Provisions for braille instructions, volume controls on handsets, and push button dials are helpful for many handicapped individuals.
- Provide adequate lighting on the underside of overhangs for nighttime use.
- Ledges or rests are a helpful convenience to all people.

Handrails for Ramps



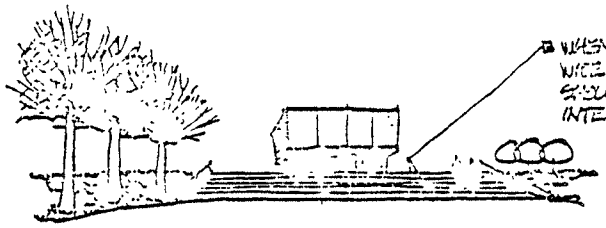
- 2'-0" IS THE MOST COMFORTABLE HT. FOR HANDRAILS ON RAMPS.
- A SECOND HANDRAIL, USEFUL TO PEOPLE IN WHEELCHAIRS AND CHILDREN SHOULD BE PLACED AT 2'-4".
- HANDRAILS SHOULD EXTEND A MIN. 1'-0" BEYOND BOTH ENDS OF A RAMP.

Handrails for Stairways



- 2'-0" IS THE MOST COMFORTABLE HT. FOR RAILINGS AT BOTH ENDS OF STAIRWAYS. 2'-0" IS THE ACCEPTED HT. ON STAIRWAYS.
- A SECOND HANDRAIL, USEFUL TO CHILDREN SHOULD BE PLACED AT 2'-4"
- HANDRAILS SHOULD EXTEND A MIN. OF 1'-0" BEYOND STAIRWAYS.

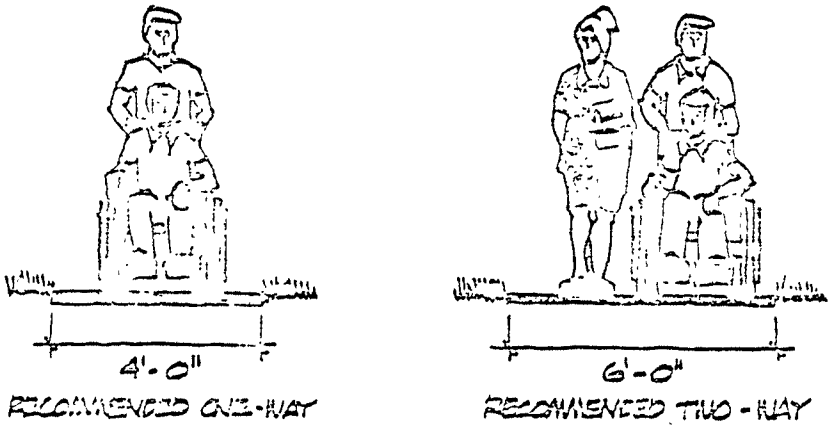
Handrails for Extra-Wide Stairways



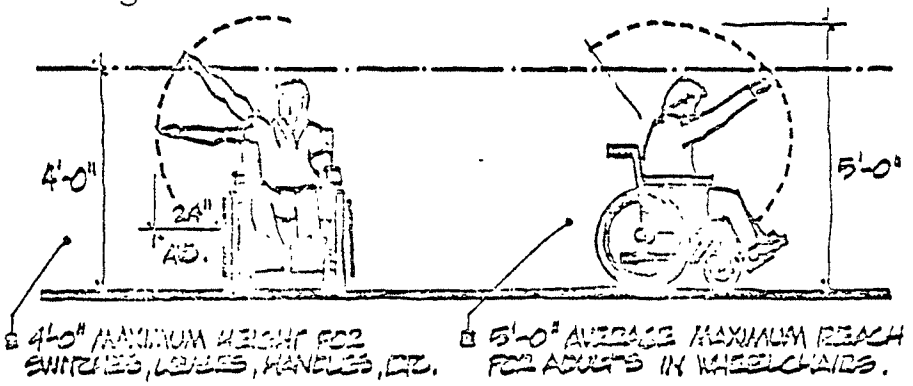
- WHEN STEPS EXCEED EXCEPTIONALLY WIDE, INTERMEDIATE HANDRAILS SHOULD BE PROVIDED AT 20'-30' INTERVALS.

(12/78)

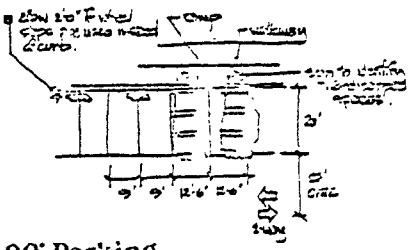
Recommended Widths for Straight-Line Travel



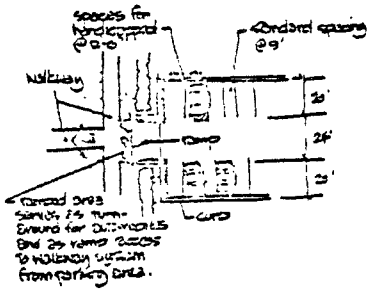
Average Reach Limits for Adults in Wheelchairs



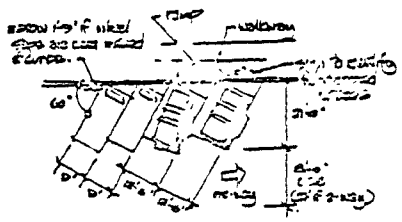
(12/78)



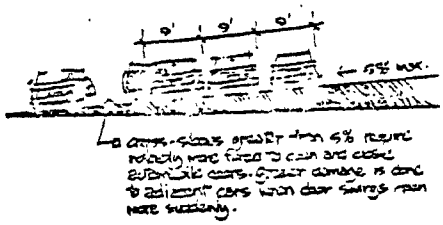
90° Parking



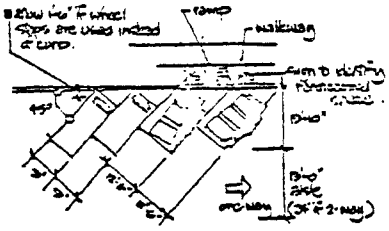
Parking Using End-Lot Access



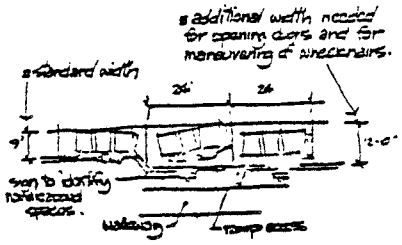
60° Parking



Cross-Slope in Parking Areas



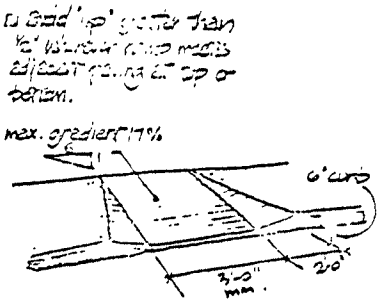
45° Parking



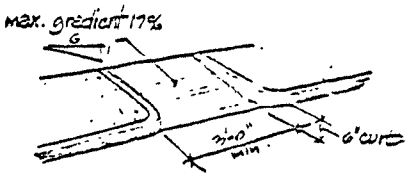
Parallel Parking

(12/78)

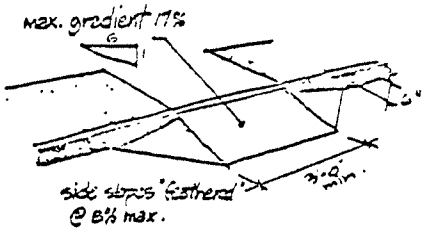
Curb Ramps



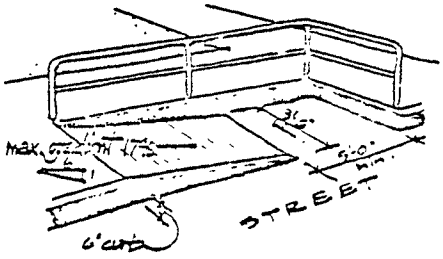
1. Flared Ramp



2. Ramp With Continuous Curb



3. Extended Ramp



4. Parallel Ramp

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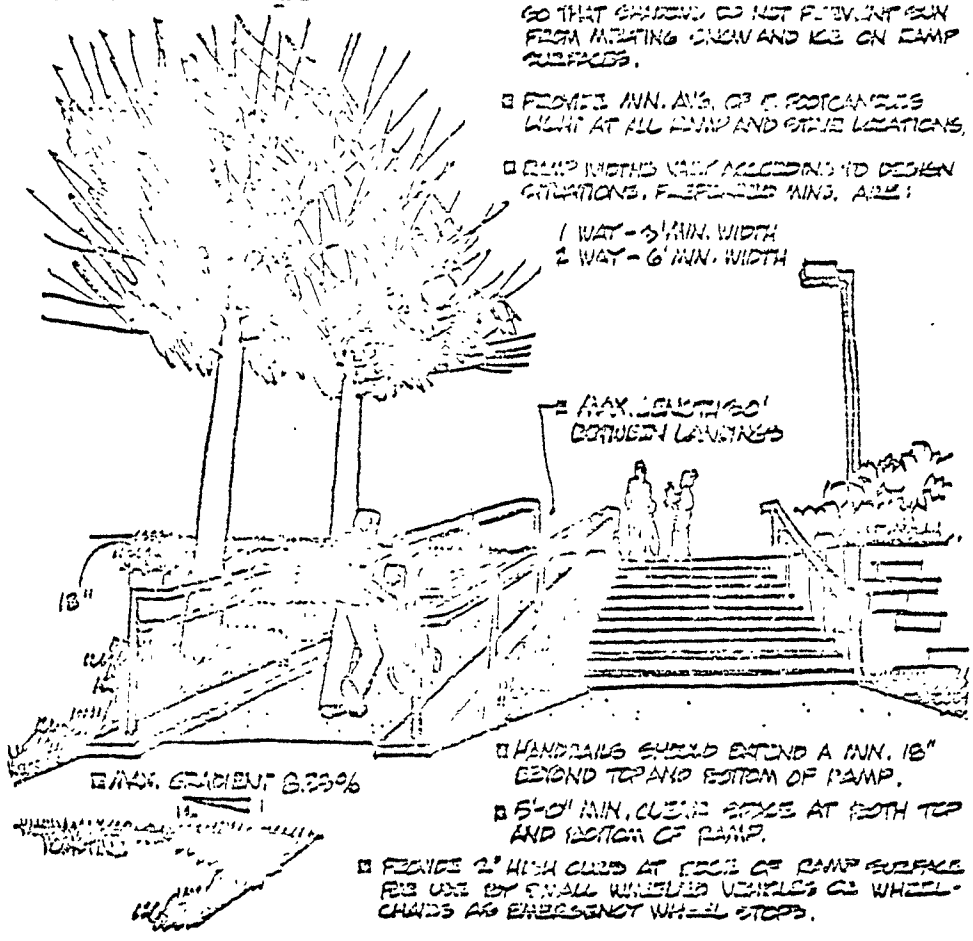
Outdoor Ramps



(12/78)

APPENDIX D

140 Applicability of Local Building Codes to State Construction Projects—The State is not required to adhere to local building codes in the absence of an express legislative authorization.

CARSON CITY, August 23, 1973

MR. WILLIAM E. HANCOCK, *Manager, State Public Works Board,* Legislative Building, Room 306, Carson City, Nevada 89701

DEAR MR. HANCOCK:

You have requested an opinion on the effect that Chapter 565, 1973 Statutes of Nevada, may have on state construction projects.

FACTS

Attorney General's Opinion No. 234, dated July 21, 1961, concluded that construction of state public works projects under the jurisdiction of the State Planning Board was not subject to the requirements of local building codes and regulations. As a result of this opinion and authority conferred under Chapter 341 of NRS, the Public Works Board (formerly the Planning Board) exercises full and final authority over all state building projects. Although the Public Works Board, as much as possible, attempts to adhere to local building codes, which usually consist of variant forms of the Uniform Building Code, the Public Works Board does not obtain building permits, and it administers the Uniform Building Code, as the basis of its construction, by making such interpretations and granting such variances as it sees fit.

The 1973 Legislature, however, enacted Chapter 565, 1973 Statutes of Nevada, which reads as follows:

> Notwithstanding any other provision of law, all persons, firms, associations or corporations, whether public or private, shall comply with the appropriate city or county building codes, which have been duly adopted by the respective governing bodies.

The question, formerly resolved by Attorney General's Opinion No. 234, is now open again. You have asked the following question:

QUESTION

As a result of Chapter 565, 1973 Statutes of Nevada, must the State comply with local building codes?

ANALYSIS

The basis of Attorney General's Opinion No. 234, with regard to state building projects, is that the State need not comply with local building codes because the State is not bound by any local law or regulation unless it is expressly provided by statute that the State is bound. The question to be considered, then, is whether Chapter 565 constitutes such an express statute.

Nowhere in Chapter 565 is the "State" mentioned. Instead, the statute applies to "* * * all persons, firms, associations or corporations, whether public or private. * * *" Unless these terms can be construed to mean "State," the State does not come under the provisions of the act. Omissions in a legislative act cannot be supplied. The act must be enforced as it is found. Maynard v. Johnson, 2 Nev. 16, 24 (1866).

A "state" is defined as a body politic or political society organized by common consent for mutual protection and defense. State v. Inman, 239 Ala. 348, 195 So. 448 (1940). Although under particular statutes a state, for the purposes of particular transactions, may be defined as a "person," generally speaking, a state is not a person. Charleston v. Southeastern Construction Co., 134 W. Va. 666, 64 S.E.2d 676 (1951); Baker v. Kirschnek, 317 Pa. 225, 176 A. 489 (1935).

Obviously, a state it not a "firm," as the term means a commercial house or a partnership which transacts commercial business. Firestone Tire & Rubber Co. v. Webb, 207 Ark. 829, 182 S.W.2d 941, 943 (1944). Nor is a state an "association," as that term is used in law. An association is any body of persons invested with some, yet not full, corporate rights, but does not include a state. State v. Taylor, 7 S.D. 533, 64 N.W. 548 (1895).

Is, then, a state a public corporation? The word "corporation," in its largest sense, has an extensive meaning. Any body politic is a corporation. But there is a distinction between the State as a corporation and those "subordinate corporations" whose creation and powers are limited by law. Chisholm v. Georgia, 2 U.S. 419, 447 (1793). When applied to the term "State," the word "corporation" is used in its broadest sense, but when applied to those subordinate bodies which are created by the State and dependent upon the State for their continued existence, the word "corporation" is used in its usual and natural sense. Statutory construction is not to be strained; words should be used in their natural context. Therefore, unless a statute particularly proclaims that "corporation" means State, the use of the word "corporation" will not mean the State, but only those subordinate corporations created by the State. State v. Atkins, 35 Ga. 315, 10 F.Cas. No. 5, 350 (1866).

This interpretation is derived from common law views of sovereignty. Thus Blackstone states:

> * * * the king is not bound by any act of parliament, unless he be named therein by special and particular words. The most general words that can be devised (any person or persons, bodies politic or corporate, & etc.) affect not him in the least, if they may tend to restrain or diminish any of his rights or interests. 1 Blackstone's Commentaries, 261–262.

Under Article 1, Section 2 of the Nevada Constitution, all political power is inherent in the people. They are the State itself, which alone inherited from the common law the prerogative of sovereignty.

> * * * But while the prerogative of the state may be invoked for the protection of the rights of the county, municipality, school district, and citizen, it does not follow that any of these possess that power. It must be held that the sovereign right, the prerogative, is lodged in the political power which is created by and is the representative of all the people—the state itself, and that the prerogative of the state may not be exercised by its creature *in the absence of express authority granted to the creature.* (Italics added.) Lothrop v. Seaborn, 55 Nev. 16, 21, 23 P.2d 1109 (1933).

Therefore, there being no express provision in Chapter 565 that the "State" must comply with local building codes, and since the terms "persons," "firms," "associations" and "corporations" are not synonymous with the term "State," the State, for the reasons outlined in Attorney General's Opinion No. 234, need not comply with local building codes. Since state agencies are part of the State, this means that the Public Works Board, as authorized by Chapter 341 of NRS, has final authority over all state building projects and need not comply with local building codes. The local governments, therefore, may not require building permits from the State or its contractors, nor may the local government require building inspections by local building inspectors of state building projects.

This does not mean that the Public Works Board utterly disregards the local building codes, for the board's policy, as indicated by the Standard Design Conditions it issues for its projects, requires as much adherence to local ordinances as possible. But the final authority for drawing plans and specifications and conducting inspections has been vested with the Public Works Board by the Legislature through Chapter 341 of NRS. Without express statutory authorization, the local governments may not interpose themselves into responsibilities, functions and powers reserved to the State.

CONCLUSION

The State is not a person, firm, association or public corporation. Therefore, Chapter 565, 1973 Statutes of Nevada, does not apply to the State. The State, through the Public Works Board, need not comply with local building codes. The Public Works Board has the sole authority for promulgating a building code for state building projects, conducting inspections and granting variances thereto. In the absence of express legislative authorization, local governments may not bind the State by local building codes.

Respectfully submitted,

ROBERT LIST, *Attorney General*

By DONALD KLASIC, *Deputy Attorney General*

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Memorandum

To: The Legislative Commission's Subcommittee to develop a statewide master plan for fire protection and control pursuant to SCR 23.

From: George Postrozny
Deputy Legislative Counsel

Subject: The extent of applicability of regulations adopted by the state fire marshall.

Date: May 29, 1980

NRS 477.030 grants the state fire marshal the authority to adopt regulations which relate to fire prevention. These regulations apply throughout the state. The state fire marshal may enforce them against all state-owned or state-occupied buildings irrespective of the population of the county within which they are located. With respect to other buildings he may only enforce them in counties which have a population of less than 100,000 unless he is asked by a fire chief to enforce them within the jurisdiction of the chief's department.

NRS 244.3673 grants the authority to enforce the regulations of the state fire marshal in counties which have a population of 100,000 or more to the board of county commissioners of that county.

Subsection 4 of NRS 244.2961 grants every board of county commissioners the authority to establish a fire code and NRS 244.3675 grants them authority to regulate all matters relating to the safety of buildings. NRS 268.413 grants the same authority to the governing body of an incorporated city.

The regulations of the state fire marshal would preempt any local regulations which are less restrictive. NRS 244.2961, 244.3675 and 268.413 must be read as statutory authority for a local governing body to only adopt and enforce a more restrictive fire code.

But pursuant to the provisions of NRS 477.030 the state fire marshal would retain exclusive jurisdiction over all buildings of the state. Without an express statutory provision to the contrary, buildings of the state remain outside the jurisdiction of local codes.

APPENDIX E

2302 The General principles covering the design of public works shall be:

2302.1 Economy in construction shall be paramount, consistent with the functional requirements and considering both initial cost and future maintenance.

2302.2 Locally available materials shall be used to the maximum extent possible, consistent with requirements of code, design, economy, function and quality.

2302.3 Utilities shall not be constructed if public utilities are available or can be made available to serve the proposed project.

2302.4 Unduly restrictive or proprietary specifications and the indiscriminate use of critical materials shall be avoided unless such are required to match existing installations or are specifically approved in advance by the Public Works Board.

2302.5 Designs shall permit construction to be accomplished with a maximum conservation of man-hours, materials and transportation.

2302.6 Designs shall promote and protect public safety.

2302.7 Only materials and products of proven quality shall be incorporated into the design of public projects.

2302.8 Designs for buildings which are normally used by the Public shall have entrance ramps, toilet facilities, drinking fountains, doors, and public telephones accessible to and usable by the physically handicapped.

2302.9 Public lobbies in public buildings shall be designed to permit the installation of vending stands.

2302.10 Designs shall endeavor to eliminate all forms of pollution and improve the environment.

2302.11 As a means of space conservation, the use of microfilm shall be encouraged in libraries and other appropriate types of buildings.

2302.12 Project budgets for public buildings shall include funds for appropriate landscaping and exterior and interior works of art as established by the Board and by legislation. Decorations and art forms shall be selected and approved by the Board, in cooperation with the State Council on the Arts in accordance with Policy 4200.

2302.13 Designs shall insure the construction of a usable facility within the amount of the approved construction budget.

2302.14 The provision of fallout shelter space is a desired objective in public buildings where "slanting" techniques can be employed to provide such space without significant increase in cost or significant detriment to efficiency or aesthetics.

2302.15 Designs shall comply with the scope of work presented to the Legislature and endeavor to fulfill the needs of the operating agency.

2302.16 Architects and engineers shall be advised of the construction budget and required to prepare contract documents necessary to obtain an acceptable bid within the amount, or to re-design the work at no cost to the State to obtain an acceptable bid.

2302.17 Plan checking, surveys and material testing shall be accomplished on all appropriate projects.

2302.18 Approved budgets shall have precedence over the scope of work.

2302.19 The design of all State buildings shall comply with local zoning, except buildings which are expansions of an existing State institution or activity that existed prior to April 12, 1971.

2302.20 Certifications from the State Land Registrar describing the land, title encumbrances and certifying the location of a proposed building shall be obtained prior to the award of a construction contract.

APPENDIX F

Typical Design Period

June 1, 1979	Capital Improvement bills signed by Governor. Contracts can be signed and money committed.
July 6, 1979	Board Meeting: Selection of architectural and engineering firms & designation of staff projects.
July 1979	Scope of work for A/E contracts written by SPWB staff, reviewed and approved by using agency.
August 3, 1979	Funds deposited in project account. Checks can be drawn for project costs.
August 1979	Contract negotiated with architect.
September 1979-April 1980	Projects designed by A/E and reviewed by staff.
October-November 1979	Topographic survey and soils analysis performed by independent consulting engineers.
May 1980	Final plans and specifications checked by contract structural, mechanical, and electrical plan checkers and by SPWB staff.

Typical Construction Period

June 1980	Bidding period.
July 1980	Bids received; negotiation with low bidder; contract awarded; bonds obtained and construction contract signed.
August 1980-July 1981	Project under construction. Inspectors assigned.
December 1980	Furnishings requirements discussed with using agency.
January 1981	Specifications for furnishings drawn up by SPWB staff and sent to State Purchasing.
February 1981	Bids prepared by State Purchasing for furnishings.
March 1981	Bids received and purchase orders issued for furnishings.
August 1, 1981	Construction completed; project accepted by State and using agencies.
May-August 1981	Furnishings installed.

APPENDIX G

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December 28, 1979

Mr. Gene Pieretti
Deputy Fiscal Analyst
Fiscal Analysis Division

Dear Gene:

In answering the subcommittee's question concerning the two 10-percent limitations in NRS 341.150, the first point to be noted is that competitive bidding on public contracts is purely a statutory requirement. Nothing in the state or federal constitution implies such a requirement, though apparently some states do have it. 64 AM. JUR. 2d, PUBLIC WORKS & CONTRACTS § 34. This being so, the legislature may change the percentage at will, or repeal either or both provisions entirely, without creating any legitimate grievance on the part of an unsuccessful bidder.

The real question, if I may suggest, is not legal but economic: At what point would an increased percentage allowance for renegotiation or change orders or both so alter the bidding procedure that it would no longer be truly competitive? Because this is not really a legal question, none of the cases that I have read undertakes to answer it.

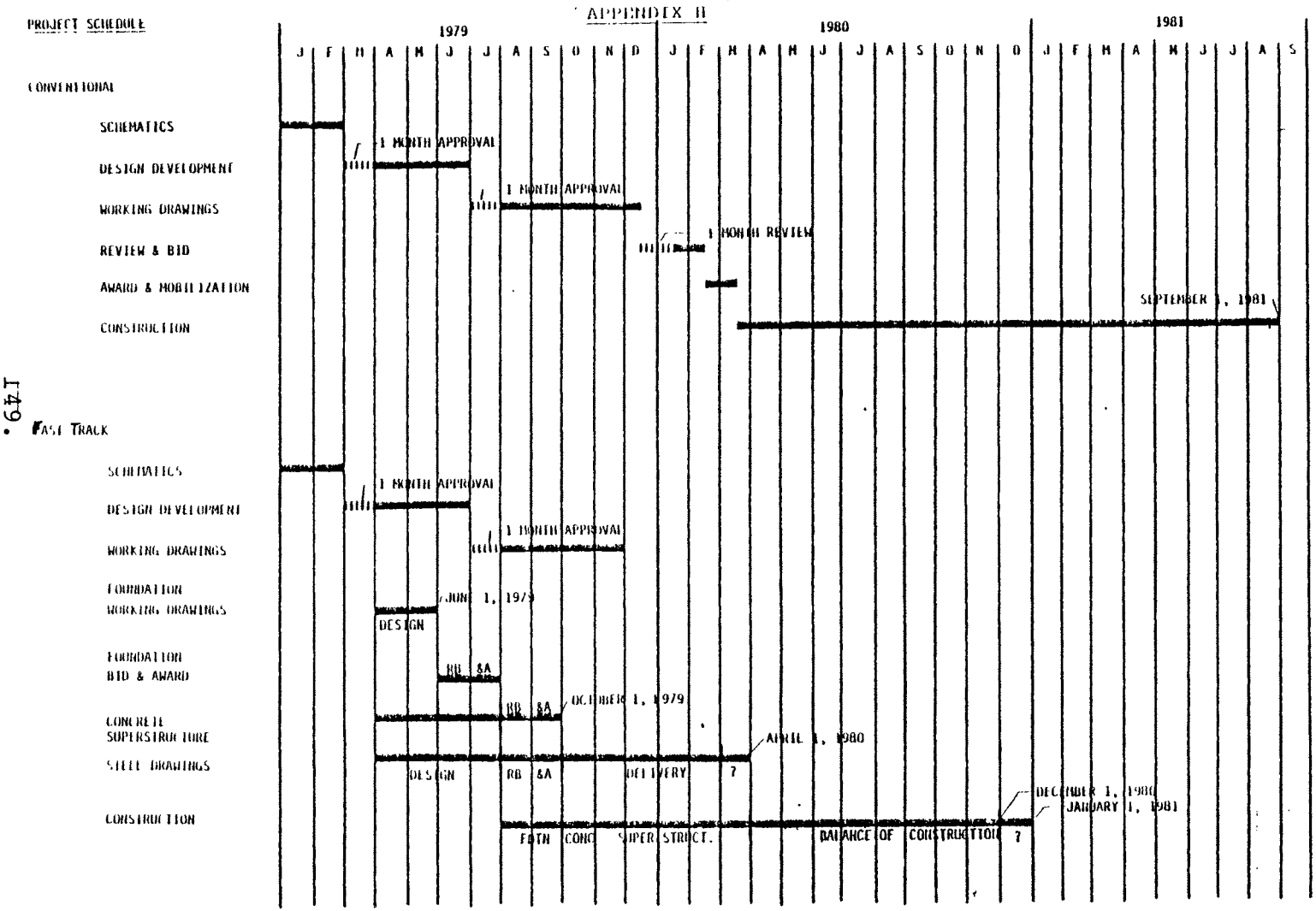
Very truly yours,

Frank

Frank W. Daykin
Legislative Counsel

FWD:cb

APPENDIX H



Multi-Purpose Pavilion, U.N.L.V.

APPENDIX I

STATE OF NEVADA
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February 11, 1980

Senator Clifford McCorkle
Chairman of the Subcommittee to Study
Means of Obtaining greater Efficiency
and Economy in State Public Works (S.C.R 40)

Dear Cliff:

Through Gene Pieretti, deputy fiscal analyst, you have inquired whether the state public works board could be authorized to use, as alternatives to the present system of letting contracts for public works, one or more systems which, because they involve participation by the contractor in the design of the work to be done, have in common the requirement that the board deal in preparation for any particular job with a group of contractors previously ascertained to be capable of doing the work satisfactorily. You have submitted with this request Standard Forms Nos. 24, 28, 40, 41 and 42 of the Associated General Contractors of America, Inc., for examination as a possible means to be used in making this determination. Your concern is that this preliminary selection might be used, or attacked by unsuccessful applicants, as a means of improperly favoring certain contractors.

First, we must note that in the absence of any constitutional provision, the legislature is not required to provide for competitive bidding on public contracts at all. See 64 AM. JUR. 2d, PUBLIC WORKS AND CONTRACTS § 34, cases collected in footnote 71; and Riter v. Douglas, 32 Nev. 400 (1911), discussion of legislative authority beginning at page 412. If the legislature finds that the public interest in economy and efficiency in public works, at any level of government, is served by one or several of the proposed systems, it may amend the statutes to provide for them. The only constitutional restraint upon a statute alleged to discriminate improperly among persons in economic matters is that some "state of facts reasonably may be conceived to justify it. "McGowan v. Maryland, 366 U.S. 420, at 426; Dandridge v. Williams, 397 U.S. 471, at 485 (1970).

The forms submitted deal with equipment, experience and financial status. All are certainly relevant to the likelihood that the contractor will complete the work undertaken, and do it properly. I noticed no question which seemed to ask for anything irrelevant. The forms seem therefore acceptable on their fact.

Under the present system, in which design of a project is completed before bids are invited, a common form of statutory language requires letting the contract to the "lowest responsive and responsible bidder" (NRS 332.065). In construing the phrase "lowest responsible bidder," our supreme court has long held that the body awarding the contract must exercise judgment--Hoole v. Kinkead, 16 Nev. 215 (1881)--and a court will not interfere unless that discretiaon is abused: Douglas County Board v. Pederson, 78 Nev. 106 (1962). The criteria mentioned in Hoole at page 221 are the same ones which the submitted forms consider in detail. It does not therefore appear that using these forms--or some similar method of inquiry--would inherently involve any greater possibility of abuse than the present system.

I therefore believe that the legislature may constitutionally authorize the state public works board to use one or more of the systems described.

Very truly yours,

Frank

Frank W. Daykin
Legislative Counsel

FWD:cb
Enclosures

APPENDIX J

EXAMPLE PROJECT

PROJECT DESCRIPTION AND TECHNICAL SPECIFICATIONS

Storage Warehouse, Nevada State Museum
State Museum Educational/Cultural Complex, Carson City, Nevada
April 18, 1980

I GENERAL

The project will consist of a storage warehouse, associated site improvements, and all utility connections. It is to be located on the land owned by the State in the name of the State Museum approximately four miles south of Carson City, Nevada, and one-half mile east of U. S. Highway 395. A small scale site plan and aerial photograph is attached.

II WORK TO BE INCLUDED IN THE BID

The Contractor's bid shall include all architectural and engineering work to produce a design satisfactory to the State within the parameters of this Project Description, and all materials, labor, equipment, etc., required to construct the finished building, site improvements, utility connections, etc.

The architectural and engineering design of the project shall be done by registered architects and/or registered professional engineers who are properly registered in the State of Nevada for their type of work. As a minimum, there shall be a registered structural engineer, a registered mechanical engineer, and a registered electrical engineer employed for the project. The names of all registered architects and engineers to be used on the project shall be included in the Contractor's bid.

III SITE INFORMATION

A legal description and map of the entire property is attached. The building will be located approximately as shown on the attached site plan and aerial photograph. Final location will be established during the design process by mutual agreement between the Contractor and the State. In case of a disagreement between the State and the Contractor, the State shall govern.

A copy of a topographical survey and a soils analysis report is attached for the information of the Contractor. (Not provided in this example.)

The land is zoned "Governmental," which is proper for this project.

An existing well is located near the building site, with an operating pump. This is the water source for this building. A power line serves the adjacent residences and will be utilized for this project. Sewage will be handled by means of a new septic tank and leach field to be furnished and installed by the Contractor. No natural gas lines exist in this area.

IV BUDGET

The entire project including all aspects must be constructed for THREE HUNDRED THOUSAND DOLLARS ($300,000.00) or less.

V TIME

The project must be completed within 160 working days from the date of the executed agreement.

VI PROJECT DESCRIPTION

The building shall contain a minimum of 12,800 gross square feet, measured to the outside face of the walls. The construction shall be equivalent to an "Average Class C Warehouse" as described by the Marshall Valuation Service, Marshall and Swift Publication Co., Los Angeles, California. It shall be divided into the following spaces:

1. Office: 20' x 40'
2. Men's Restroom: 7' x 7'
3. Women's Restroom: 7' x 7'
4. Storage Area: All remaining area

The office shall be finished as follows:

1. Concrete slab floor with 1/8" vinyl-asbestos tile.
2. Wood frame walls between office and storage area: 2 x 4's @ 16" o.c., with 5/8" gypsum board both sides painted with two coats latex paint.
3. Wood frame ceiling with 5/8" gypsum board below and 3/4" plywood sub-floor above. Ceiling height 8'-0" clear. Gypsum board shall be painted with two coats of latex paint. Ceiling joists shall be designed for 100 psf live load.
4. Door to the outside (one required): 3'-0" x 7'-0" x 1-3/4" hollow metal flush door and frame with closer, commercial grade cylinder lock, stop, metal weatherstripping and threshold. Paint door and frame with three coats enamel.

5. Door to the Storage Area (one required): 3'-0" x 7'-0" x 1-3/4" solid core flush wood door and wood frame with closer, latch set and stop. Paint door and frame with three coats enamel.

6. Windows between Office and Storage Area (two required): 6'-0" wide by 4'-0" high, set to match door head height, with wood frame. Single pane glass. Paint frame with three coats enamel.

7. Wood base all around walls (both sides of wood frame walls). Paint with three coats enamel.

8. Light fixtures shall be surface mounted commercial fluorescent type, equipped with 3-E radialens acrylic diffusers. Light level in the office shall be a minimum of 70 foot candles maintained.

9. Provide two telephone outlets, and electrical convenience outlets at 12'-0" o.c. along the walls.

10. Heating and cooling shall be provided as required by the attached Acopted Standards and the State of Nevada Energy Conservation Standards for New Building Construction, latest edition.

The Restrooms shall be finished similar to the Office except as follows:

1. Floors shall be covered with 1/8" thick vinyl-asbestos tile.

2. Walls and ceilings shall be painted with three coats of enamel.

3. Lighting shall be provided by commercial grade incandescent fixtures. Light level shall be a minimum of 50 foot candles maintained.

4. Doors to the Storage Area shall be 3'-0" x 7'-0" x 1-3/4" hollow core flush wood doors and wood frame with latchset and stop. Paint door and frame with three coats enamel.

5. Plumbing fixtures shall include one tank-type floor mounted water closet and one wall mounted vitreous china lavatory with hot and cold water.

6. Accessories shall include (in each restroom): one toilet paper dispenser, one paper towel dispenser and receptacle (combination wall mounted), one toilet seat cover dispenser and one sanitary napkin dispenser (in Women's Room only).

The Storage Area shall be finished as follows:

1. Exposed concrete slab floor.

2. Smooth surface walls of exposed construction. If insulation is placed on the interior of the walls it shall be covered by gypsum board with all joints taped.

3. Exposed structure of roof, 16'-0" clear to structure.

4. Personnel doors to the outside (two required): Same as noted for office.

5. Vehicle doors to the outside (two required): 14'-0" x 14'-0" steel overhead doors with insulated panels, electrically operated.

6. Skylights throughout the roof area to provide minimum of five foot candles of light throughout on a sunny day. Skylights shall be a double layer type for minimum heat loss or gain and shall be translucent, not transparent.

7. Light fixtures shall be an industrial fluorescent type mounted between the roof structural members to provide a minimum of 16'-0" clear height from the floor. Light level shall be a minimum of 10 foot candles maintained.

8. Provide electrical convenience outlets at 20'-0" o.c. around the walls.

9. Heating shall be provided as specified in the State of Nevada Energy Conservation Standards for New Building Construction, paragraph 10.02.3.4, Alternate heating design criteria for factories, warehouses, garages, service stations, aircraft hangers, and similar construction.

General building requirements:

1. The floor level shall be 6" minimum above the existing and finish grade.

2. Exterior walls shall be concrete or concrete block, painted on the outside with 1 coat concrete primer or masonary filler and two coats of flat latex exterior paint.

3. Roof structure may be wood frame, steel frame, or other code-conforming structure. Roofing shall be built-up composition type, twenty-year bondable. A standard State Public Works Board guarantee shall be supplied to the Owner (copy attached).

4. No windows in exterior walls or doors.

5. Slope finish grade away from the building for a distance of twenty feet minimum.

6. Remove brush, rocks, debris, etc., all around the building for a distance of twenty feet. Finish grade shall be compacted to reduce dust hazard and permit access by vehicles.

7. Connect to all utilities for complete use of all building systems.

8. Provide two exterior freeze-proof hose bibbs, one at each vehicle door.

9. Provide exterior lights at each exterior door to provide a minimum of 10 foot candles.

10. Provide a 1 year guarantee against defects in materials and workmanship.

Mechanical Systems

1. Heating, Air Conditioning and Ventilation

   a. A heating, air conditioning and ventilating system shall be installed in the office area which is capable of maintaining year-around interior comfort condition for occupants conforming to the Carson City area design criteria of the "State of Nevada Energy Conservation Standards for New Building Construction."

   b. A system to provide heating only shall be installed in the warehouse area. The system shall be designed to prevent freezing conditions (minimum temperature of 42° F.) and not to provide personnel comfort.

   c. Ventilation shall be provided in office and warehouse areas in conformance with the requirements of the Uniform Building Code and the State of Nevada Energy Conservation Standards for New Building Construction.

   d. Ventilation for toilet rooms shall be provided in conformance with the Adopted Standards of the State Public Works Board.

e. The heating system fuel may be either oil or propane. A storage tank shall be provided, sized to provide heat for a 40 day period on one filling and during the coldest periods. Electric heat may be used in spot applications only, such as toilet rooms, and not as the primary heat source for office and warehouse areas.

f. The design and installation of the heating, ventilating and air conditioning systems shall conform to the Uniform Mechanical Code, latest edition, the Adopted Standards of the State Public Works Board and the State of Nevada Energy Conservation Standards for New Building Construction.

2. Plumbing

a. The plumbing system design and installation shall conform to the Uniform Plumbing Code, latest edition, the Adopted Standards of the State Public Works Board and the State of Nevada Energy Conservation Standards for New Building Construction.

b. The plumbing system shall be specifically designed to conserve water as required by Section 7.21 of the Adopted Standards of the State Public Works Board.

VII CODES AND STANDARDS

All work shall comply with:

1. State Public Works Board's Adopted Standards (copy attached).

2. All adopted applicable local codes.

VIII APPROVALS

The Contractor will be required to obtain plan approvals from the following agencies:

1. State of Nevada

a. Public Works Board

b. State Museum

c. Fire Marshal

d. Division of Health, Consumer Health Protection

2. City of Carson

   a. Department of Public Works

   b. Fire Department

3. Utility Companies

   a. Sierra Pacific Power Company

   b. Nevada Bell

   c. Southwest Gas Corporation

IX ENERGY DEMANDS

Provide the Owner and Utility Companies an estimate of total energy demands. Provide the Utility Companies with an estimated date that connections will be required and request that the Owner be notified when the energy demands can be provided.

(For Built-up Roofs on State Building Projects) NO BOND

DRAFT

ROOFING SERVICE MAINTENANCE AGREEMENT
Five Year Duration

SERVICES:

1. Perform six (6) complete inspections of all roof areas according to the following schedule:

First	- 6 months	after	date	of	Notice	of	Completion
Second	- 1 year	"	"	"	"	"	"
Third	- 2 years	"	"	"	"	"	"
Fourth	- 3 years	"	"	"	"	"	"
Fifth	- 4 years	"	"	"	"	"	"
Sixth	- 5 years	"	"	"	"	"	"

and within 15 days of the date of each inspection, do the following:

a. Make any necessary repairs to roofing, sheet metal and flashings on the roof top which are necessary to maintain the roofing and flashing in a watertight condition, and

b. Prepare and forward to the Nevada State Public Works Board, within 15 days of each inspection, a report of roofing and flashing condition as determined during the inspection. Itemize the repair work done under this agreement, and list recommendations for work which should be done over and above repairs covered as a part of this Agreement.

2. Furnish emergency repair work service within 48 hours of notification by the Using Agency , the State Public Works Board or their authorized representative.

a. If this repair work is of a major nature, such as wind damage or structural failure, and is not included as a part of the 2-year roofing and flashing guarantee, to perform the work on a time and material basis for the amounts entered below:

1. Materials: Actual delivered cost.
2. Labor: Actual labor cost, including taxes and insurance.
3. Overhead: _____%
4. Profit: _____%

b. Any minor patching and repair work is to be done as a part of this Agreement, at no additional cost to the State of Nevada.

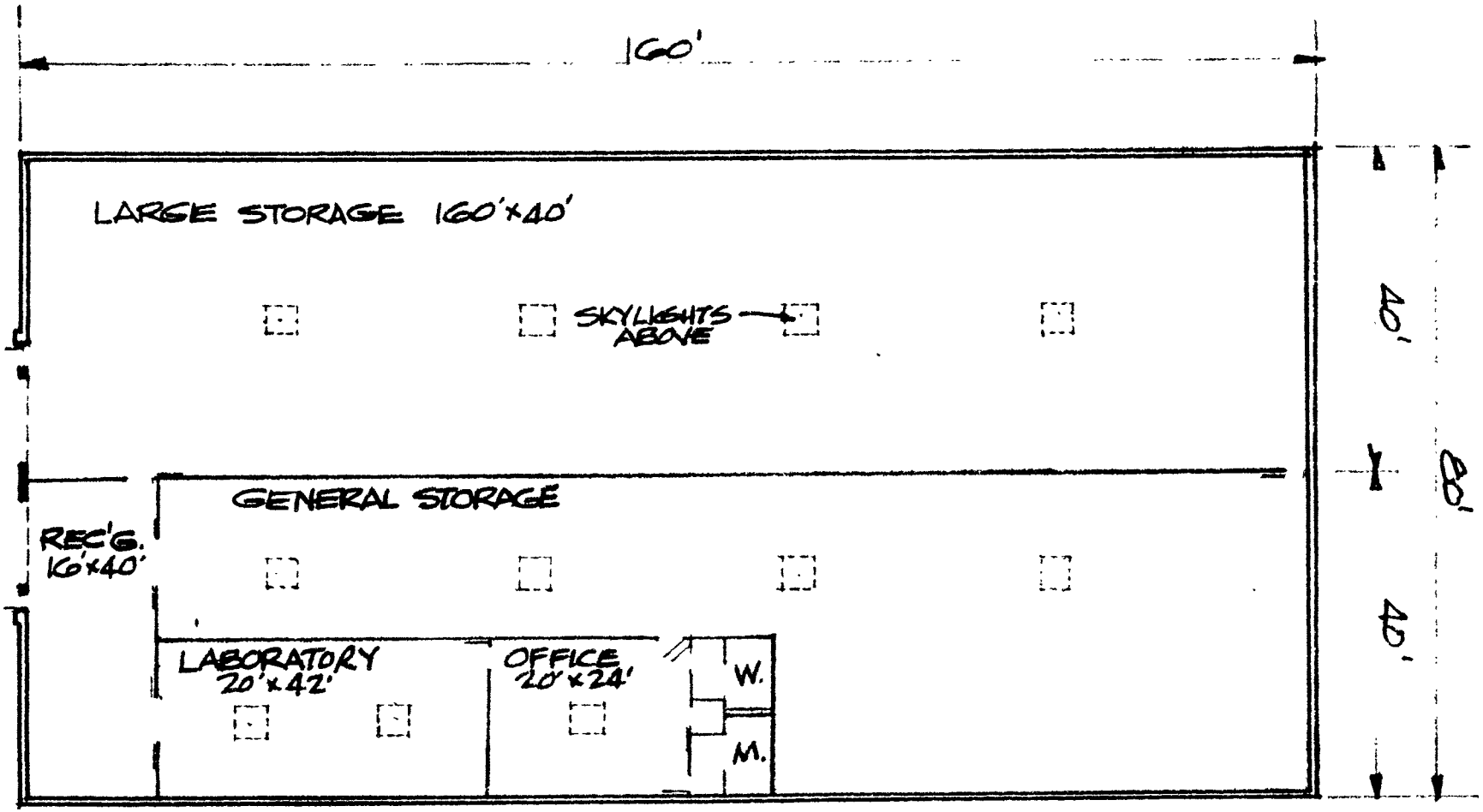
Signed and sealed this _____ day of _____, 19___.

CONTRACTOR: _____ BY _____

Address:

Telephone:

ACCEPTED: DATE: _____ BY: _____
For the State of Nevada



WAREHOUSE FOR DEPT. OF MUSEUMS & HISTORY; DOUGLAS CO., NEVADA.

NEVADA STATE PUBLIC WORKS BOARD.
C.I.P. # 79-41

N.

FLOOR PLAN
SCALE 1" = 20'

EIA 4.21.80

JACKS VALLEY ROAD
U.S. HIGHWAY 395
HIGHWAY R/W LINE
HIGHWAY R/W LINE
PROPOSED PROJECTS
79-41 STORAGE WAREHOUSE AND WELL
TOPSY LANE
PROPOSED PROJECT
79-41
79-41
N
0 100 200 600 1000
NEVADA
STATE PUBLIC WORKS BOARD
CARSON CITY
JANUARY 1979
MASTER SITE PLAN
STATE MUSEUM, EDUCATIONAL/CULTURAL COMPLEX
CARSON CITY AREA NEVADA
SHEET OF
DWG. NO.

N
5
STATE MUSEUM
EDUCATIONAL/CULTURAL COMPLEX
CARSON CITY AREA
0
1/8
1/4
MILE

APPENDIX K

State Public Works Board
Status Report:
'75 and '77 Capital Improvement Programs
preparation date: 7/18/80

	Appropriation/ Authorization	Budget Revisions: Transfers among projects	Budget Revisions: Supplemental Funds	Project Costs * denotes current project; cost estimate	Reversions
75- 1 Roof Repairs, Youth Training Ctr	$ 157,050.00	$- 53,874.60	$	$ 95,162.10	$ 8,013.30
75- 2 Roof Repairs, Blasdel Bldg	16,200.00	- 3,156.50		13,043.50	
75- 3 Water Main, UN Reno	44,280.00			39,598.19	4,681.81
75- 4 Sewer Connection, Medium Security	67,500.00	+ 7,500.00		75,000.00	
75- 5 Repair Track, UN Reno	59,850.00			57,932.13	1,917.67
75- 6 Fire Protection, UN Reno	26,550.00	+ 1,850.00		27,576.40	823.60
75- 7 Main Entrance, UN Reno	81,900.00			74,425.61	7,474.39
75- 8 Infirmary, Medium Security	200,700.00	+ 1,885.25		202,585.25	
75- 9 Walks, UN Reno	77,400.00			76,075.00	1,325.00
75-10 Lights, UN Reno	156,200.00			146,569.62	9,630.38
75-11 Gas Main, UN Reno	35,550.00	- 11,345.00		22,170.02	2,034.98
75-12 Storm Drain, UN Las Vegas	265,500.00	- 2,000.00		235,162.75	28,337.25
75-13 Design Capitol Rehabilitation	322,290.00	+ 35,810.00		358,100.00*	
75-16 Clark Correctional Center	6,716,700.00	+ 11,442.48	+1,000,000.00 1)	7,728,142.48*	
75-17 Desert Development Center	2,494,800.00	- 21,752.00	+ 25.00 2)	1,864,473.87	608,599.13
75-18 Two Cottages, Girls Training Ctr	745,200.00			686,457.18	58,742.82
75-19 Emotionally Disturbed Children's Facility	1,450,800.00			1,450,800.00*	
75-20 Site Development, NMHI	675,000.00			673,967.52	1,032.48
75-21 Improve 6 Bldgs, NMHI	540,900.00	- 13,400.00		527,500.00*	
75-22 Day Activities Facility, NMHI	391,500.00	+ 33,944.00		418,970.15	6,473.85
75-23 SUPPLEMENT: WNCC, Phase II '73 CIP					
75-24 SUPPLEMENT: CCCC, Phase III '73 CIP					
75-25 SUPPLEMENT: DRI, '73 CIP					
75-26 Verdi Hatchery	432,900.00	+ 14,000.00		443,849.59	3,050.41
75-27 Heroes' Memorial	540,900.00	+ 653.26	+ 4,981.00 1)	546,534.26	
75-28 Management System, UN Reno	482,900.00	+ 9,495.00		488,901.69	3,493.31
75-29 Boiler Replacement, UN Reno	50,400.00	- 3,681.00		45,246.12	1,472.88
75-30 Exhaust System, UN Reno	203,000.00			192,545.09	10,454.91
75-31 Land Acquisition, UN Las Vegas	530,100.00	+ 54,000.00		583,044.74	1,055.26
75-32 Industrial/Rec Bldg, Maximum Security	329,400.00	- 22,827.73		306,572.27	
75-33 Gymnasium, Youth Training Ctr	780,300.00	+ 73,575.60		853,563.53	312.07
75-34 In Patient Residence, NMHI	1,335,600.00	- 33,944.00		1,201,540.86	100,115.14
75-35 Renovate Building #11, NMHI	135,900.00	+ 13,400.00		143,520.75	5,779.25
75-37 Athletic Fields, UN Las Vegas	247,500.00	- 22,000.00		152,090.93	73,409.07

	Appropriation/ Authorization	Budget Revisions: Transfers among projects	Budget Revisions: Supplemental Funds	Project Costs * denotes current project; cost estimate	Reversions
75-38 Athletic Fields, Youth Training Ctr	$ 116,100.00	$+ 3,570.00	$	$ 118,597.57	$ 1,072.43
75-40 Air Condition Classroom, Youth Training Center	87,300.00	- 23,271.00		56,891.08	7,137.92
75-41 USPFO, Military Dept.	966,027.00	- 9,390.53	- 241,189.24 1)	585,353.56	130,093.67
75-42 Sunshades, Lake Mead Hatchery	160,400.00	- 14,000.00		140,269.90	6,130.10
75-43 Office/Lab, Dept. of Agriculture	221,400.00	- 23,600.00		190,774.42	7,025.58
75-44 Handicap Curb Cuts	17,100.00	- 12,640.95		4,459.05	
75-45 Animal Disease Lab, Agriculture	122,400.00	+ 23,600.00		145,674.41	325.59
75-46 Commissary, NN Children's Home	108,900.00			107,594.30	1,305.70
75-47 State Health Lab	788,400.00	+ 21,752.00	+ 9,000.00 1)	814,591.44	4,560.56
75-48 Chemistry Labs, UN Reno	140,400.00	+ 3,681.00		134,571.69	9,509.31
75-49 Complete State Library	86,400.00	- 10,579.01		75,820.99	
75-50 Security Lights, Medium Security	22,500.00	+ 2,000.00		24,500.00	
75-51 Parking Lot, UN Las Vegas	296,100.00	- 30,000.00		245,711.45	20,388.55
75-G1 Kitchen, Mental Health Center	488,481.00		+ 21,530.00 1)	406,243.83	103,767.17
75-L1 Solary Energy Facility	370,000.00		+ 49,494.00 3)	413,281.83	6,212.17
75-L2 Lighting/Parking, NN Community College	14,400.00			8,241.20	6,158.30
75-L3 Museum Toilets	22,500.00	- 528.87		21,971.13	
75-L4 Governor's Mansion Steps	9,900.00	+ 167.40		9,732.60	
75-L5 Remodel Legislative Office	252,000.00			198,701.92	53,298.08
75-L6 Morrill Hall Restoration	500,000.00		+ 315,592.90 3)	815,592.90	
75-L8 V & T Railroad Building	300,000.00		- 50,000.00 4)	218,658.56	31,341.44
Totals, '75 Capital Improvement Program	$24,685,478.00	$ -0-	$ 1,109,433.66	$24,468,355.43	$1,326,556.23

note: Supplemental Funds..
1) Federal Funds
2) Plans Forfeiture
3) Agency Funds
4) Interim Finance

	Appropriation/ Authorization	Budget Revisions: Transfers among projects	Budget Revisions: Supplemental Funds	Project Costs * denotes current project; cost estimate	Reversions
77-01 Rehabilitate Maximum Security	$ 8,522,400.00	$	$+ 20,000.00 5)	$ 8,542,400.00*	$
77- 2 Improvements, NN Correctional Ctr	654,600.00			654,600.00*	
77- 3 Addition to Women's Prison	150,200.00			150,200.00*	
77- 4 Sierra Development Center	1,649,000.00			1,649,000.00*	
77- 5 Special Children's Clinic	438,000.00		+ 35,000.00 3)	473,000.00*	
77- 6 Parking Lot, National Guard; LV	57,600.00			51,596.55	6,003.45
77- 7 Museum Improvements	155,200.00			135,428.20	19,771.80
77- 8 Re-roof Historical Society Bldg	32,800.00			18,000.30	14,799.70
77- 9 Site Clearance, LV Complex	41,600.00			24,964.53	16,635.47
77-10 Fencing, NN Children's Home	4,200.00			1,544.60	2,655.40
77-11 Entrance, Computer Facility	28,400.00			26,300.47	2,099.53
77-12 State Water Tank	885,000.00		+ 184,000.00 4)	1,069,000.00*	
77-13 Effluent Treatment, 3 Hatcheries	359,000.00		+ 75.00 2)	359,075.00*	
77-14 Improvements, NMHI	995,200.00		+ 75.00 2)	995,275.00*	
77-15 Improvements, UN Reno	1,757,200.00			1,757,200.00*	
77-17 Rehabilitate Youth Training Ctr	25,100.00			17,997.20	7,102.80
77-18 Remodel DMV Driver's License area	30,000.00			26,984.93	3,015.07
77-19 Remodel Water Resources Bldg, UN Reno	245,000.00			245,000.00*	
77-20 Remodel B & G Building for Archives	124,200.00			122,133.74	2,066.26
77-21 Improvements, UN Las Vegas	2,028,000.00		+ 743.01 6)	2,028,743.01*	
77-22 Add'n Program Facilities, Jean	268,200.00			268,200.00*	
77-23 Highway Patrol Office, Jean	22,000.00			22,000.00*	
77-25 WN Community College, Phase III; Reno	6,903,000.00		- 500,000.00 3)	6,403,000.00*	
77-26 Dickinson Library, UN Las Vegas	6,927,000.00			6,927,000.00*	
77-29 Lee Canyon Guard Station	83,500.00			83,500.00*	
77-30 Fish & Game Office Add'n; Las Vegas	197,000.00			197,000.00*	
77-31 Plant Materials Ctr; Tule Springs	69,300.00			69,300.00*	
77-32 Business Admin Building, UN Reno	5,892,000.00			5,892,000.00*	
77-34 Aviation Armory, Stead	232,700.00			232,700.00*	
77-37 Armory Add'n, Elko	47,100.00		- 25,970.80 1)	2,397.64	18,731.56
77-38 OMS, Carson City, Military	154,500.00		+ 36,680.00 1)	191,180.00*	
77-42 Fish Brood Station, Gallagher Hatchery	637,000.00			637,000.00*	
77-44 Rehabilitate Capitol	6,000,000.00		+ 400.00 2)		
			+ 5,108.62 6)		
			+ 140,000.00 4)	6,145,508.62*	

		Appropriation/	Budget Revisions: Transfers among projects	Budget Revisions: Supplemental Funds	Project Costs * denotes current project; cost estimate	Reversions
77-45	Housing Unit 5, UN Correctional Ctr	$ 1,762,000.00	$	$	$ 1,665,823.11	$ 96,176.89
77-46	Expansion, Jean	3,137,000.00		+ 517,713.00 4)	3,654,713.00*	
77-56	WN Community College, Phase IV	1,383,000.00			1,383,000.00*	
77-66	Elevator, Nye Building	102,000.00			102,000.00*	
77-73	Landscaping, WNCommunity College,IV	92,000.00			92,000.00*	
77-81	Improvements, NN Community College	126,000.00			82,344.58	43,655.42
77-G2	Mackay Stadium, UN Reno	532,000.00		+ 250,000.00 4)	782,000.00*	
77-L1	Office/Storage, Forestry; Elko	114,000.00			114,000.00*	
77-L2	Refurbish Tonopah Hall, UN Las Vegas	100,000.00			96,869.65	3,130.35
77-L3	Western Headquarters, Forestry	746,535.00			746,535.00*	
77-L4	Street Improvements, BC Children's Home	29,000.00			29,000.00	
77-L5	Governor's Mansion Fence	12,500.00			12,447.91	52.09
77-L6	Las Vegas Motor Pool	185,000.00			185,000.00*	
77-L7	Power, Jean	216,000.00			200,415.12	15,584.88
77-L8	Dental Program, CC Community College	134,100.00			133,336.02	763.98
EDA	Housing Unit, Women's Prison	1,540,000.00		- 13,047.00 1)	1,526,953.00	
EDA	Clear Creek Gymnasium	257,017.00		+ 25.00 2)	256,858.00	184.00
EDA	Paving/Site Work, Girls' Training Ctr	74,400.00		- 2,696.10 1)	71,703.90	
	Totals, '77 Capital Improvement Program	$56,158,552.00		$ 648,105.73	$56,554,229.08	$ 252,428.65

note: Supplemental Funds ..
1) Federal Funds
2) Plans Forfeiture
3) Agency Funds
4) Interim Finance
5) Local Funds
6) Misc; unspendable revenue