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REPORT TO THE CONGRESS

Improvements Needed In
Evaluating Design⁴⁰ Requirements¹
For Construction
And Modernization⁴⁷ Of
Veterans Administration
Hospitals⁴⁸ B-133044

BY THE COMPTROLLER GENERAL
OF THE UNITED STATES

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DEC. 29, 1970

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D C 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This is our report on improvements needed in evaluating
design requirements for construction and modernization of
Veterans Administration hospitals

Our review was made pursuant to the Budget and Account-
ing Act, 1921 (31 U.S C. 53), and the Accounting and Auditing
Act of 1950 (31 U S C 67).

Copies of this report are being sent to the Director, Of-
fice of Management and Budget, and to the Administrator of
Veterans Affairs

A handwritten signature in black ink that reads "James B. Stacks".

Comptroller General
of the United States

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ABBREVIATIONS

GAO General Accounting Office

VA Veterans Administration

D I G E S T

WHY THE REVIEW WAS MADE

During a survey of the Veterans Administration (VA) hospital construction program, the General Accounting Office (GAO) noted that (1) certain less costly materials and methods proposed by architect-engineers were used in the construction of specific hospital projects but their use was not provided for in the VA design criteria applicable to all hospital construction and (2) some hospital modernization projects were canceled after working drawings and specifications had been started or completed. GAO made this review to determine the reasons that these situations occurred.

FINDINGS AND CONCLUSIONS

Design criteria not revised

VA requires architect-engineers to design VA hospital buildings so that such buildings can be constructed within a specified cost target figure. The architect-engineer recommends changes to reduce the construction cost if, during the development of working drawings and specifications, it appears that costs will exceed the target figure.

VA did not always fully investigate architect-engineers' proposals for the use of less costly materials and methods to determine whether their use should be provided for in the VA design criteria. VA design criteria are guides for developing working drawings and specifications for all VA hospital construction. VA took from 1 to 4 years to revise its design criteria for four architect-engineers' cost reduction proposals which VA had accepted for the construction of certain hospital building projects. The savings resulting from the proposals were estimated at about \$176,500. The four proposals were (1) substituting wood doors for hollow core metal doors, (2) installing flexible--instead of rigid--insulation around concealed rectangular ductwork, (3) installing 1-inch insulation--instead of 1-1/2-inch--around certain air-conditioning components, and (4) eliminating insulation around cold-water pipes. (See pp. 11, 13, 15, and 17.)

Following acceptance of those four cost reduction proposals, VA awarded 10 major construction contracts. Only one of these contracts provided for use of the proposed materials and methods. GAO believes that one or

more of the other nine contracts should have similarly provided for their use. GAO estimated that the resultant savings to VA would have been about \$486,000.

Modernization projects canceled

VA canceled four modernization construction projects during the development, or shortly after completion, of the working drawings and specifications. These documents were developed at a cost of about \$338,000. The projects were canceled because the planned construction would not have satisfied the needs of the hospitals, would have taken needed hospital beds out of service, or would have cost more than estimated and the cost could not be justified (See p. 20.)

GAO believes that VA had enough information on these matters to raise serious questions about the modernization projects. The questions should have been resolved before VA authorized the working drawings and specifications. (See pp 24, 26, and 29.) GAO was unable to determine VA's reasons for proceeding with the working drawings and specifications in view of such available information. (See p. 21.)

RECOMMENDATIONS OR SUGGESTIONS

The Administrator of Veterans Affairs should require the VA Office of Construction to.

- Promptly and adequately investigate cost reduction proposals to determine whether they are applicable to hospitals to be constructed and, if so, to revise the design criteria. (See p. 19.)
- Make more effective reviews and evaluations of planned hospital modernization projects, including documentation of findings, before the development of working drawings and specifications is undertaken. (See p. 34.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

VA agreed with GAO about revising its design criteria on the basis of investigations into architect-engineers' cost reduction proposals. The Deputy Administrator of Veterans Affairs said that VA would formalize procedures for applying proposals to future construction. (See p. 19.)

The Deputy Administrator further stated that VA agreed to GAO's objective concerning review and evaluation of hospital modernization projects before award of the architect-engineer contract. He said that VA would thoroughly examine into its review practices to determine whether they needed strengthening. VA did not agree, however, that projects were not reviewed as to need prior to award of the architect-engineer contract. VA's detailed comments and GAO's evaluation are discussed on pages 32 through 34.

MATTERS FOR CONSIDERATION BY THE CONGRESS

GAO is reporting these matters to inform the Congress of VA's opportunity to achieve economies through more effective administration of hospital construction and modernization projects.

CHAPTER 1

INTRODUCTION

The General Accounting Office has made a review of certain aspects of the Veterans Administration's (VA's) activities relating to the design of hospitals and related facilities. Our review was directed primarily toward an examination into VA's policies, procedures, and practices for revising its construction standards¹ and master specifications² (design criteria) on the basis of architect-engineers' cost reduction proposals. Architect-engineers' cost reduction proposals are proposed changes to the planned construction for reducing construction costs when it appears that the estimated construction costs will exceed the target cost.

Also, we examined into the conditions that resulted in the cancellation of modernization projects after the preparation of working drawings and specifications.

This review, which was part of our continuing examination into the VA hospital construction program, was directed primarily toward an examination into those aspects of the VA hospital design activities that appeared to be in

¹Construction standards are generalized criteria governing the use of materials, equipment, design methods, and construction techniques for the VA hospital construction program.

²A master specification is written for each major system or component to be used in construction. It describes the optional systems, components, and materials to be supplied and functions to be performed; the method of construction; and the quality of performance required. After VA employees or architect-engineers make appropriate revisions, the master specifications become contract specifications for VA projects.

particular need of attention rather than toward an overall evaluation of the activity. The scope of our review is described in chapter 4 of this report.

The principal officials of VA responsible for the administration of activities discussed in this report are listed in appendix II.

The VA construction program involves the design and construction of new hospitals, domiciliaries, and other hospital facilities, as well as the modernization and alteration of hospital facilities. The total cost of the current construction program, which was initiated in fiscal year 1961 and is expected to extend through 1975, is estimated at \$1.3 billion. As of March 31, 1970, VA had expended about \$607 million on its construction program. Of the estimated \$1.3 billion construction program, about \$467 million was for the construction of new hospitals, \$603 million was for the modernization of existing facilities, and approximately \$235 million was for the construction of domiciliaries and other facilities.

The Department of Medicine and Surgery is responsible for the operation and maintenance of VA hospitals. It is headed by a Chief Medical Director whose responsibilities include developing and recommending to the Administrator of Veterans Affairs an annual program of construction projects.

To implement its construction program, VA's activities include (1) development of master plans¹ and requirements, (2) development of preliminary plans,² and (3) design and construction.

¹Master plans are summaries of proposed construction projects sent to the Office of Management and Budget, which include (1) the need for the project, (2) the proposed method of meeting the need, and (3) a rough cost estimate.

²Preliminary plans include comparative studies, preliminary drawings, and cost estimates and precede the preparation of working drawings and specifications to be used for construction.

The Administrator of Veterans Affairs administers the VA construction program through the Office of Construction which is headquartered at the VA Central Office in Washington, D.C., and which is headed by the Assistant Administrator for Construction. The Office of Construction is responsible for developing working drawings and specifications for the construction and modernization of hospital buildings, awarding and administering the construction contracts, and supervising construction.

Generally, VA enters into contracts with private architect-engineer firms for the development of working drawings and specifications. VA's architects and engineers, however, also develop such documents for selected construction projects. These documents, upon the award of the construction contract, become the contract requirements for the construction of the hospital buildings.

When a hospital is to be designed by an architect-engineer, the architect-engineer prepares working drawings and specifications on the basis of information furnished by VA. This information includes design criteria contained in VA's construction standards and master specifications. These standards and specifications are guidelines for hospital construction and, as amended, become the requirements for specific construction projects. VA construction standards are mandatory requirements upon architect-engineers in designing VA hospital buildings, unless deviations are approved by VA.

During the development of hospital building designs, the architect-engineer is required to periodically submit to VA the working drawings and specifications which have been prepared to meet VA's requirements. VA reviews these documents at prescribed stages of completion to determine whether the documents are being properly developed and whether the hospital building is being designed in accordance with VA's design criteria.

CHAPTER 2

SAVINGS AVAILABLE THROUGH REVISING VA'S DESIGN CRITERIA FOR CERTAIN ARCHITECT-ENGINEERS' COST REDUCTION PROPOSALS

In our opinion, VA did not make adequate and timely investigations of architect-engineers' cost reduction proposals for the use of less costly construction materials and methods, to determine whether their use should be required by its design criteria (construction standards and master specifications). Our review showed that VA had taken from 1 to 4 years to revise its design criteria for four architect-engineers' cost reduction proposals which VA had accepted for the construction of certain hospital building projects. The savings resulting from the proposals were estimated at about \$176,500.

After VA had accepted the first of these four cost reduction proposals, it awarded 10 major construction contracts before its design criteria was revised for the proposals. We believe that the less costly construction materials and methods of one of the four cost reduction proposals should have been provided for in six of the contracts; those of another proposal should have been provided for in five of the contracts; those of the third proposal should have been provided for in two of the contracts; and those of the fourth proposal should have been provided for in one of the contracts. Two of the proposals were incorporated into the contract documents for three of the construction contracts; the other two proposals were incorporated into only one of the contracts.

We were unable to ascertain the additional costs that were incurred by VA by not providing for the use of the less costly construction materials and methods in the construction of the projects because the construction contracts had been awarded on the basis of bids obtained under formal competitive advertising procedures. Therefore the cost to the Government for each construction item covered by the contract was not available.

To obtain an indication of the additional costs that might have been involved, we computed, for each of the four architect-engineers' cost reduction proposals, the percentage of the estimated savings applicable to the contract price and applied the percentage to the prices of the contracts which could have provided for the use of the four less costly construction materials and methods. The result for the four cost reduction proposals amounted to about \$486,000.

We believe that, to achieve available economies when feasible, VA should require that architect-engineer's cost reduction proposals, which have been accepted by VA on individual construction contracts, be promptly and adequately investigated to determine whether they are generally applicable to VA hospital construction and, if appropriate, to revise the VA design criteria accordingly.

INVESTIGATION OF ARCHITECT-ENGINEERS' COST REDUCTION PROPOSALS

To determine the extent that VA investigates into the feasibility of incorporating architect-engineers' cost reduction proposals into its design criteria, we inquired into VA's policies, procedures, and practices for updating and maintaining construction standards and master specifications.

We found that, even though VA had required certain architect-engineer's cost reduction proposals to be incorporated into the working drawings and specifications for the construction of individual hospital buildings, VA had not required that an investigation be made into such proposals to determine whether its design criteria should be revised.

The Research Staff in the Office of Construction is responsible for coordinating, developing, and directing publications of VA construction standards. The head of the Research Staff informed us that VA had no policy that would require architect-engineers' cost reduction proposals to be referred to the staff for investigation into the feasibility of revising the construction standards. He also stated that VA construction standards were designed to meet the needs of VA as economically as possible and that information on architect-engineers' cost reduction proposals would aid him in maintaining such standards.

The responsibility for updating and maintaining master specifications is assigned to four engineering service sections of the Division of Architecture and Engineering. The Director of this Division informed us that master specifications were not required to be reviewed on the basis of cost reduction proposals submitted by architect-engineers because most of these proposals were unique to the particular construction project under consideration and could not be applied to other construction projects. The heads of the four engineering sections stated that they could not recall undertaking a review of a master specification on the basis of an architect-engineer's cost reduction proposal.

VA policy requires that hospital buildings be designed and constructed and that existing buildings be improved consistently with the highest professional standards to provide, as economically as possible, modern hospital facilities for the care of veterans. VA construction officials informed us that the design criteria contained in VA construction standards and master specifications were intended to consider the latest techniques in hospital design and, at the same time, to encourage economical design of VA hospital buildings.

VA requires architect-engineers to design VA hospital buildings so that they can be constructed within a specified construction cost target and to recommend remedial action to reduce the construction cost if, during the preparation of working drawings and specifications, it appears that the estimate of construction costs will exceed the construction cost target.

For the three VA hospitals on which construction work had most recently started at the time we initiated our review--Tampa, Florida; Northport, New York; and Columbia, Missouri--we found that, during the development of working drawings and specifications for the construction of these hospitals, the estimated construction costs for each hospital exceeded the construction cost targets.

Therefore the architect-engineers submitted to VA 85 cost reduction proposals--less costly materials or

methods--which they estimated would result in reducing construction costs by about \$2.3 million. VA accepted 46 of these proposals, which the architect-engineers had estimated would result in savings of about \$1.5 million, and had them incorporated into the working drawings and specifications before the award of the construction contracts.

Of the 46 cost reduction proposals, we selected for examination 10, which represented estimated construction cost savings of about \$434,000, to determine whether the use of the less costly construction materials and methods should have been specified in other construction contracts. The 10 proposals were selected because they appeared to be nontechnical and to represent design changes for less costly construction materials and methods, which might be applicable to other construction projects.

We were unable to determine whether six of the 10 proposals could have applied to other hospital construction projects because the conditions at the projects where the proposals had been implemented were dissimilar to those at other hospital projects.

Of the four remaining proposals, which the architect-engineers had estimated would result in savings of about \$176,500 in construction costs, one had also been incorporated into the working drawings and specifications for the construction of the VA hospital in Long Beach, California, at an estimated savings of \$23,000 in construction costs, prior to the design of the new Tampa, Northport, or Columbia hospitals.

We believe that one or more of the four cost reduction proposals for less costly construction materials and methods should have been incorporated into nine construction contracts for new VA hospitals or hospital building improvement projects, which were started after VA had accepted the first of the four proposals.

A discussion follows of the four architect-engineers' cost reduction proposals for the use of less costly construction materials and methods, which we believe should have been provided for in the working drawings and specifications of other VA hospital buildings.

INTERIOR HOSPITAL DOORS

In December 1963 and March 1964, VA issued construction standards for interior hospital doors. The standards required that doors, with limited exceptions, be hollow core metal doors.

The development of working drawings and specifications for construction of the Long Beach hospital was started in June 1963. Because the estimated cost to construct the hospital exceeded the construction cost target, meetings were held between VA and the architect-engineers concerning changes in the design of the hospital to reduce the estimated construction cost. At that time, VA decided that wood doors could be substituted for interior metal doors. VA's records showed that, by substituting wood doors for metal doors, savings estimated at \$23,000 could be achieved in constructing the Long Beach hospital.

In December 1964, VA awarded a contract for the construction of the Long Beach hospital. A VA official informed us that the Long Beach construction contractor had installed wood doors in the hospital buildings.

Also in December 1964, the Chief of VA's Safety and Fire Protection Division requested that VA's construction standards be revised to allow the installation of solid core wood doors for patients' rooms. VA's records showed that, during a meeting held by VA officials in April 1965 regarding the proposed new construction standard, the use of wood doors, other than as already permitted by the then-existing construction standards, was not recommended.

Although we were unable to determine, on the basis of our review of VA's records and discussions with VA officials, the reason why the use of wood doors was not recommended, VA's records showed that in September 1967 certain VA officials believed that the use of wood doors added to fire and smoke hazards and that such combustible material should not be installed in hospital areas when the use of this material could be reasonably avoided.

During the development of working drawings and specifications for construction of the Tampa hospital, the

architect-engineer proposed to VA that wood doors be installed in the hospital in lieu of metal doors so that estimated savings of \$50,000 could be achieved in constructing the hospital. According to a VA construction official, VA accepted this proposal principally because the climatic conditions in the Tampa area would cause metal doors to rust excessively. In October 1968, VA awarded a contract for the construction of the Tampa hospital, which required the majority of the interior hospital doors to be constructed of wood.

We found that, between the awards of the construction contracts for the Long Beach hospital in December 1964 and the Tampa hospital in October 1968, VA awarded contracts for the construction of four new hospitals. VA officials informed us that all four of these contracts had required the majority of interior hospital doors to be constructed of hollow metal.

VA's records showed that in November 1968 the National Woodwork Manufacturers Association proposed to VA that it revise its construction standards to permit the use of solid core wood doors in the construction of VA hospital buildings. Subsequently, VA undertook a review of this matter.

During this review, the VA official responsible for the formulation of VA policy pertaining to fire prevention and protection found that (1) there was no reason for requiring metal doors other than the mistaken belief that wood doors constituted a significant fire hazard, (2) the Public Health Service's Hill-Burton¹ standards did not impose any restrictions on the use of wood doors, and (3) the Army's and Navy's policy pertaining to doors was that of the National Fire Codes, which permitted the use of solid core wood doors in hospitals.

As a result, in December 1968, almost 4 years after VA had considered and rejected the suggestion that its design

¹A program administered by the Public Health Service, Department of Health, Education, and Welfare, whereby a recipient may receive through a State agency a Federal grant toward costs to design, construct, and equip a hospital.

criteria be revised to permit the use of wood doors, VA initiated action to revise its construction standards. The revised VA construction standard issued in November 1969 specifies that, with certain exceptions, interior hospital doors be of either hollow metal or solid core wood construction.

TYPE OF INSULATION INSTALLED AROUND
CERTAIN AIR-CONDITIONING COMPONENTS

Prior to October 1968, VA's master specification on insulation for ducts and for certain other components of air-conditioning systems specified the installation of a rigid type of insulation around rectangular ducts in VA hospitals.

During the development of working drawings and specifications for the construction of the VA hospital in Columbia, Missouri, the architect-engineer proposed to VA in May 1966 that a flexible type of insulation be substituted for the rigid type of insulation on concealed rectangular ductwork so that estimated savings of \$50,000 could be achieved.

VA accepted this proposal and authorized the architect-engineer to incorporate this change into the hospital's design. Prior to the opening of the bids for this contract, however, VA amended the bidding documents by reinstating the rigid insulation requirement. The VA official responsible for making this change informed us that he could not recall his reasons. VA's records also did not reveal the reason for this change. In June 1967, VA awarded a contract for the construction of the Columbia hospital. The contract provided that rigid insulation be installed.

VA officials informed us that VA's master specification had specified the rigid type of insulation because the flexible insulation had a tendency to sag and tear when attached around rectangular ductwork.

Subsequent to awarding the contract for the construction of the Columbia hospital, VA incorporated, in accordance with its master specification, the requirement for rigid insulation in the construction contract of another new VA hospital and in three other construction contracts providing for the modernization of three VA hospitals.

In June 1968, VA awarded a contract to a consulting firm to conduct a value engineering¹ seminar at the VA Central Office to train teams of VA employees involved in hospital construction activities in value engineering techniques. One VA team inquired into the type of insulation that was required to be installed around ductwork in the Tampa hospital. At the time of this inquiry, the design documents for the then-proposed Tampa hospital required that rigid insulation be installed around concealed rectangular ductwork.

The consulting firm's final report on the value engineering seminar showed, among other things, that the VA team had found that the Department of the Navy and other Government agencies allowed the use of flexible insulation on concealed rectangular ductwork in buildings constructed under their authority. A VA official informed us that the problem of sagging could be overcome by using sufficient binding procedures. Also, a VA official, who was a member of the VA team which had inquired into the type of insulation required around ductwork in the Tampa hospital, informed us that the other Government agencies which also allowed the use of flexible insulation were the General Services Administration and the Corps of Engineers.

The report also showed that the team had subsequently proposed to VA that flexible insulation be used in constructing the Tampa hospital. The team estimated that, by using flexible insulation around concealed ducts, savings of \$121,500 could be achieved in constructing the Tampa hospital.

As a result of the team's proposal, the type of insulation specified for concealed rectangular ductwork for the

¹Value engineering was defined for the purposes of this seminar as the organized effort of critically reviewing and analyzing the technical aspects of the design and construction of selected individual projects to provide the required facility at the lowest overall costs consistent with requirements for performance, reliability, and maintainability.

Tampa hospital was changed to flexible. Also, VA initiated action to revise its master specification for this change in insulation.

The VA master specification was revised in October 1968, over 2 years after the use of flexible insulation was proposed by the architect-engineer for the Columbia hospital.

SIZE OF INSULATION INSTALLED AROUND
CERTAIN AIR-CONDITIONING COMPONENTS

Before October 1968, VA's master specification pertaining to insulation around ducts specified that the rigid-type insulation around rectangular ducts should be a minimum of 1-1/2 inches thick.

Another architect-engineer's cost reduction proposal accepted by VA and provided for in the working drawings and specifications for the construction of the Tampa VA hospital concerned reducing the minimum thickness requirement for rigid-type insulation around certain rectangular ductwork from 1-1/2 inches to 1 inch. The architect-engineer estimated that, by reducing the thickness of the insulation to 1 inch, savings of \$20,955 could be achieved.

A VA official informed us that a minimum 1-1/2-inch-thickness requirement for rigid-type insulation had been specified to prevent heat from entering into and escaping from rectangular ducts and other components of the air-conditioning system. He stated that, although there would be some heat flow at the Tampa hospital by allowing 1-inch rigid insulation, this flow would not be significant enough to affect the air-conditioning efficiency at the hospital.

Subsequent to VA's acceptance of the 1-inch rigid insulation requirement for the Tampa hospital, VA incorporated, in accordance with its master specification in effect at that time, the requirement for 1-1/2-inch-thick rigid insulation in the construction contracts for the modernization of two VA hospitals.

In October 1968, about 1 year after the 1-inch rigid insulation was proposed by the architect-engineer and accepted by VA for the Tampa VA hospital, VA revised the

master specification pertaining to insulation around ducts, as a result of a general review of this specification. The revised master specification requires that 1-inch insulation be installed around the majority of certain rectangular ducts.

DOMESTIC COLD-WATER PIPING INSULATION

VA's master specification pertaining to water pipes specifies that domestic cold-water pipes--those pipes which carry potable water to cold-water fixtures located within hospital buildings--be insulated. A VA official informed us that insulation was required to prevent condensation on these pipes, which could cause damage to ceilings and walls.

According to various technical publications dealing with condensation, the temperature at which air becomes saturated with water vapor and the vapor condenses or deposits as drops of water or dew is called the dew point temperature. This means, according to these publications, that any reduction in temperature around the pipes below the dew point results in condensation of some of the water vapor in the air. VA's records showed that, by installing insulation around pipes, condensation could be prevented from forming on pipes.

A VA official informed us that, in most areas where VA hospitals were built, the temperature of the water running through domestic cold-water pipes was lower than the dew point temperature of the air surrounding the pipes. Therefore condensation will form and insulation is required to prevent moisture problems.

The architect-engineer for the Tampa hospital in October 1967 proposed to VA that the requirement for insulation around domestic cold-water pipes be eliminated from the contract specifications for the Tampa hospital to reduce construction costs. A VA official informed us that, because the water temperature in Tampa was about 70 degrees, the architect-engineer had determined that insulation around domestic cold-water pipes was not needed. VA officials informed us that, if the temperature of the water running through cold-water pipes was constantly greater than the dew point temperature of the air surrounding the pipes, insulation was not needed because condensation would not form.

The architect-engineer estimated that, by not requiring the insulation, savings of \$55,500 could be achieved in constructing the Tampa hospital. VA accepted this proposal and made the change in the specifications for the hospital.

The VA official responsible for maintaining and updating the master specification applicable to water pipe insulation informed us that, although VA's master specification prescribed insulation around these pipes, he did not believe that it was necessary at the time the requirement was eliminated from the contract specifications for the Tampa hospital to revise the master specification because insulation was needed in most locations where VA hospitals were built and because VA would be notified by the architect-engineer when insulation was not needed for a particular hospital.

We obtained data on water temperatures prevailing in the locations where other VA hospital buildings were being designed or constructed subsequent to the elimination of such insulation in the Tampa hospital.

We found that, on the basis of such water temperature data, the VA hospital in San Diego, California, which was designed during 1967 and 1968, did not need insulation around domestic cold water pipes. The contract which was awarded in March 1969, however, required insulation to be installed around these pipes.

In April 1969, we brought this matter to the attention of a VA official who informed us that this requirement should have been eliminated from the contract specifications. Subsequently, VA officials informed us that they had made an investigation of this matter and that they had been informed by the architect-engineer that a mistake had been made in requiring that cold-water pipes in the San Diego hospital be insulated.

In November 1969, VA issued a change order for deleting pipe insulation to the San Diego hospital construction contract, amounting to a \$36,439 reduction in the contract price.

A VA official informed us that, although VA did not plan to revise its master specification pertaining to the insulation of water pipes, information to be furnished to architect-engineers by VA would include a requirement that architect-engineers document and submit to VA the reasons why

insulation should or should not be installed around domestic cold-water pipes.

It should be noted that, about 1-1/2 years after the elimination of insulation around domestic cold-water piping was proposed by the architect-engineer and accepted by VA for the Tampa VA hospital, VA determined that architect-engineers should be required to document and submit the reasons why insulation should or should not be installed around domestic cold-water pipes.

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We believe that the above four examples of alternate construction materials and methods indicate the economies that were obtainable had VA made prompt and adequate investigations of whether architect-engineers' proposals for the use of less costly materials and methods, which had been accepted by VA and used in the construction of hospital buildings, should have been provided for in its design criteria. In our opinion, architect-engineers' cost reduction proposals represent a valuable source of information to VA in carrying out its policy of constructing and improving hospitals as economically as possible.

RECOMMENDATION TO THE ADMINISTRATOR
OF VETERANS AFFAIRS

Therefore, we recommend that architect-engineers' cost reduction proposals pertaining to hospital construction projects be promptly and adequately investigated by VA's Office of Construction to determine whether they are applicable to other hospital construction projects and, if appropriate, to revise the applicable design criteria.

The Deputy Administrator of Veterans Affairs, in commenting by letter dated May 1, 1970 (see app. I), on a draft of this report, advised us that VA agreed to our recommendation. He stated that VA would formalize its present procedure for translating meritorious suggestions into standards for prompt application, as appropriate, to future projects.

CHAPTER 3

NEED TO IMPROVE REVIEWS AND EVALUATIONS OF

HOSPITAL MODERNIZATION PROJECTS BEFORE AUTHORIZING

DEVELOPMENT OF WORKING DRAWINGS AND SPECIFICATIONS

VA canceled four modernization construction projects during the development or shortly after the completion of working drawings and specifications, which cost about \$337,900, primarily because the planned construction work (1) would not have satisfied the needs of the hospitals, (2) would have taken needed hospital beds out of service, or (3) would have cost more than VA had estimated and such cost could not be justified. Our review showed that VA had enough information on these matters to raise serious questions about the modernization projects, which should have been resolved before VA authorized the development of working drawings and specifications.

We believe that VA should make an in-depth review and evaluation of all data pertaining to hospital modernization projects before authorizing the development of working drawings and specifications, to avoid the cost of developing working drawings and specifications that have little or no value to VA.

A VA construction official informed us that, if there were a prolonged time difference (about 2 or more years) between the completion of working drawings and specifications and the start of the construction work, technological advances and changes in medical science could require that these documents be revised and updated. According to this official, such redesign may be so extensive as to render the original design useless.

During fiscal years 1966 through 1968, VA started or had in process the development of working drawings and specifications by VA and architect-engineers, at a cost of about

\$1.7 million for 16 modernization construction projects.¹ For various reasons, VA was unable to use all the working drawings and specifications developed for eight of the 16 modernization projects. VA canceled four of the eight projects. We selected these four canceled projects for detailed examination. The working drawings and specifications developed for the remaining four projects were revised. As of March 31, 1970, the revisions or construction work was still in process, had been completed, or was placed in a deferred status.

Our review showed that information was available to VA Central Office officials before they authorized the development of the working drawings and specifications for these projects, which showed that (1) certain needs of the hospitals would not be adequately satisfied by the work planned for the projects, (2) there was a need to keep in service a certain number of hospital beds which were scheduled to be eliminated, or (3) construction cost would be greater than had been estimated.

A VA official informed us that VA continually evaluated modernization projects in terms of (1) cost, (2) medical requirements, and (3) the planned project's ability to satisfy the needs of the hospital. We were unable to determine, however, on the basis of VA's records and discussions with VA officials, the reasons for proceeding with the development of working drawings and specifications for the four canceled modernization projects in view of available data which indicated that construction needs would not be met.

A discussion of the four canceled modernization projects follows.

¹We selected all modernization projects under design during fiscal years 1966 through 1968 for our review because VA's procedures provided for undertaking the development of working drawings and specifications for major modernization projects about 15 months before awarding construction contracts. These modernization projects were the most recent projects on which construction work would have been scheduled to start at the time of our review.

BASIC HOSPITAL NEEDS NOT INCLUDED
IN PROPOSED CONSTRUCTION WORK

Our review of two proposed modernization projects, which were combined into one project for the Coatesville, Pennsylvania, VA hospital, revealed that VA had canceled part of the combined project because the canceled part did not satisfy the basic construction needs of the hospital.

During 1965 VA had under development two construction projects--a modernization project and a medical and surgical service unit project--which provided for the construction of improvements at the Coatesville VA hospital. VA estimated that the construction of the modernization project (designated by VA as the phase 5 modernization of the hospital) and of the medical and surgical service unit project would cost about \$2,300,000 and \$395,000, respectively.

During 1964 and 1965, VA developed the working drawings and specifications for the phase 5 modernization project; solicited bids for the construction contract; and, on December 21, 1965, opened the bids for the construction contract.

Subsequently, VA officials decided to increase the scope of the proposed medical and surgical service project. This expanded project was designated by VA as a medical, surgical, and neurological unit project.

VA also decided that it should restudy the Coatesville hospital's phase 5 modernization project in connection with the newly proposed medical, surgical, and neurological unit project. On January 20, 1966, VA rejected the bids opened on December 21, 1965, for the construction contract for the phase 5 modernization project. Subsequently, VA combined the medical, surgical, and neurological unit and phase 5 modernization projects into one project.

In April 1966, VA completed the development of construction requirements for the proposed 120-bed medical, surgical, and neurological unit at the Coatesville hospital, which provided for alterations to a hospital building.

Subsequently, VA extracted from the modernization project certain items which it considered to be the most urgently needed phase 5 work; prepared them for bidding; and, in April 1967, awarded two construction contracts totaling \$1,734,400.

Between October 1966 and October 1967, VA developed the preliminary plans for the 120-bed medical, surgical, and neurological unit, and, on October 24, 1967, VA authorized its architects and engineers to prepare the working drawings and specifications for the unit.

In a letter dated March 20, 1968, about 5 months after VA had started the development of working drawings and specifications, the Coatesville Hospital Director informed VA Central Office officials that the construction of the proposed medical, surgical, and neurological unit would not satisfy the basic needs of the Coatesville hospital. The Coatesville Hospital Director listed 11 construction work items which he considered to be basic needs of the hospital. VA's records showed that six of the 11 items were part of the phase 5 modernization project for which bids for the construction contract were solicited in 1965 but rejected.

The Coatesville Hospital Director recommended that the proposed medical, surgical, and neurological project be canceled and that the basic needs of the hospital be satisfied instead. VA's records showed that in March 1968 the working drawings and specifications for the medical, surgical, and neurological unit were almost completed.

On May 13, 1968, VA canceled the medical, surgical, and neurological project because it did not meet the most pressing needs of the Coatesville hospital.

We were unable to precisely identify the amount of funds expended by VA for preparing the unused working drawings and specifications because VA's records commingled the costs of designing all the hospital modernization projects. VA's records showed that it had incurred costs of about \$111,000 in developing working drawings and specifications associated with the modernization work. We estimated, on the basis of VA's records, that about \$60,200 had been

expended by VA for the working drawings and specifications for the medical, surgical, and neurological unit project and for the unused portions of the phase 5 modernization project.

Information on hospital needs
available before authorizing development
of working drawings and specifications

By letter dated February 23, 1966, about 1-1/2 years before starting the development of working drawings and specifications for the medical, surgical, and neurological unit, the Coatesville Hospital Director advised VA Central Office officials that phase 5 modernization work--which VA's records showed included such items as a street lighting system, fire sprinklers, and the conversion of certain space into dining area--was urgently needed at the hospital and had a priority comparable to that of the medical, surgical, and neurological unit work.

VA's records showed that some of these construction items were included in the Hospital Director's March 20, 1968, letter which was the basis for canceling the modernization project. VA records made available to us and discussions with a VA official did not reveal the reason for proceeding with the development of working drawings and specifications for the medical, surgical, and neurological project in view of the above information.

NEED TO KEEP HOSPITAL BEDS IN SERVICE

Our review of the proposed fourth phase (phase 4) of a modernization project at the VA neuropsychiatric hospital, Battle Creek, Michigan, revealed that VA had canceled the phase 4 project because during construction over 300 hospital beds would have been out of service and because construction cost estimates had increased.

During 1960 and 1961, VA developed a master plan for the modernization of the Battle Creek VA hospital. This plan included modernization work on 11 buildings and a reduction in the authorized number of beds at the hospital.

In 1963, VA decided to proceed with that portion of the master plan pertaining to modernizing two Battle Creek hospital buildings and designated this work as the phase 4 modernization of the hospital. In November 1964, VA completed the preliminary plans for the phase 4 project.

On April 7, 1965, VA awarded a contract to an architect-engineer in the amount of \$102,000, which provided for the development of working drawings and specifications for the construction of the proposed phase 4 project. VA estimated that it would cost about \$2,091,000 to construct this project.

In August 1965, about 5 months after the architect-engineer undertook the development of the phase 4 working drawings and specifications, VA determined that it would be unable to maintain the required number of beds in service at the Battle Creek hospital because during the construction of the phase 4 facilities over 300 hospital beds would be out of service. As a result, in October 1965 VA deferred the scheduled award of the construction contract for the phase 4 modernization project until fiscal year 1968 or later.

Also during the development of working drawings and specifications for the phase 4 project, the estimated cost to construct the facilities continually increased. In December 1965, when these documents were 75-percent completed,

the architect-engineer advised VA that his construction cost estimate at that time was about \$1,682,000 higher than the cost estimated by VA prior to the start of the development of working drawings and specifications.

On December 8, 1965, VA suspended work under the architect-engineer's contract, stating as its reasons that it desired to delay the construction work to prevent a shortage of patient beds and that the construction cost estimate exceeded the construction cost target.

In April 1966, VA determined that it would continue the existing number of beds at the Battle Creek hospital until its proposed Detroit hospital was completed and activated. VA's records showed that in June 1966 it canceled the Battle Creek hospital's phase 4 modernization project because (1) the rehabilitation of the two hospital buildings was not worth the expense involved and (2) hospital beds needed to be kept in service until the proposed VA hospital in Detroit was activated.

On October 28, 1966, VA terminated the architect-engineer's contract at a final cost of about \$51,000. VA's records showed that the cost of the partially completed working drawings and specifications--amounts paid to the architect-engineer plus related VA costs incurred during the period of development of drawings and specifications--totaled about \$72,000.

Information on reduction of hospital beds available before authorizing development of working drawings and specifications

VA's long-range plan for hospital facilities contemplated the construction of a predominantly neuropsychiatric hospital at Detroit, Michigan. The hospital was needed, in part, to offset beds taken out of service at the Battle Creek hospital.

Prior to the start of the development of working drawings and specifications for the phase 4 project at the Battle Creek hospital, VA was still developing requirements for the proposed Detroit hospital. VA scheduled the

construction of the proposed Detroit hospital to start in July 1968 and to be completed in December 1970. As of April 1965, the construction of the Battle Creek modernization project was scheduled to start in June 1966 and to be completed in June 1968. Consequently, over 300 psychiatric beds at the Battle Creek hospital were scheduled to be taken out of service before psychiatric beds were to be replaced at the Detroit hospital.

VA records made available to us did not reveal how patients utilizing beds which were planned to be taken out of service through the phase 4 project would be cared for prior to the completion of the proposed Detroit hospital.

VA's records showed that, during the year preceding the start of the development of working drawings and specifications for the phase 4 project at the Battle Creek hospital, the hospital reported, on the basis of the average number of beds available and of the average daily patient census, occupancy rates ranging from 94 to 96 percent for its psychiatric beds. The VA medical region in which the Battle Creek hospital was located reported that, during the same period of time, the occupancy rates throughout the region ranged from 93 to 94 percent for psychiatric beds. VA believes that a 90-percent occupancy rate is an efficient level at which to operate its neuropsychiatric hospitals.

VA records made available to us and discussions with a VA official did not reveal the reason for proceeding with the development of working drawings and specifications for the phase 4 project in view of the above information.

As discussed above, to keep Battle Creek hospital beds in service, VA deferred the scheduled award of the construction contract for the phase 4 project until fiscal year 1968 or later. As of July 1970, the project was still in a deferred status. A VA official informed us that the partially completed working drawings and specifications would be of no value because changed medical requirements and conditions at the hospital would require that numerous changes be made in these documents when construction was undertaken.

COST OF MODERNIZATION NOT JUSTIFIED
IN TERMS OF PROFESSIONAL CARE BENEFITS

Our review of the proposed fourth phase (phase 4) of a modernization project at the San Francisco, California, VA hospital, revealed that VA had canceled the project because the construction cost could not be justified in terms of the professional care benefits to be derived.

In February 1961, VA completed a master plan for the modernization of the San Francisco VA hospital. The last of the San Francisco hospital modernization projects (designated by VA as phase 4) included alteration work on six buildings which were to be used primarily as nursing units and as an audiology clinic. In September 1964, VA completed the preliminary plans for the phase 4 project.

On November 18, 1964, VA awarded a contract to an architect-engineer in the amount of \$200,000 for the development of working drawings and specifications for the construction of the phase 4 work. On December 1, 1964, VA notified the architect-engineer to proceed with the contract work. VA estimated, on the basis of completed preliminary plans, that the cost of construction would be about \$3.7 million.

During the development of working drawings and specifications, the estimated cost of the phase 4 project continually increased. In December 1965, when these documents were about 96-percent completed, VA estimated that the cost to construct the project would be about \$4.6 million, or \$900,000 more than had been estimated by VA at the time of awarding the architect-engineer contract.

Because of the increase in construction cost, in February 1966 VA decided to reevaluate the modernization project. In March 1966, the architect-engineer completed the working drawings and specifications for this work.

After the project had been reevaluated, VA's Chief Medical Director, in a memorandum dated June 6, 1966, to the Administrator of Veterans Affairs, recommended that the phase 4 modernization project be canceled because he believed that the estimated cost of the project, which had

increased by \$900,000, could no longer be justified in terms of professional care benefits. On June 9, 1966, VA canceled the San Francisco hospital's phase 4 modernization project.

On November 23, 1966, VA terminated the architect-engineer's contract at a final cost of about \$172,800. VA's records showed that the cost of the working drawings and specifications for the proposed phase 4 project--amounts paid to the architect-engineer plus related VA costs incurred during the period of development of the drawings and specifications--totaled about \$205,700

Information on construction cost and hospital needs available before authorizing development of working drawings and specifications

With regard to the increase in construction cost, we believe that the work associated with about \$484,870 of the \$900,000 increase in project cost should have been considered by VA in determining the cost to modernize the San Francisco hospital before undertaking the development of working drawings and specifications.

For example, the 1961 master plan for the modernization of the San Francisco hospital showed that, because of deterioration from age, it was necessary to replace the heating system's pipes in certain buildings which were subsequently selected for modernization under the phase 4 project. In considering the phase 4 construction requirements, however, VA decided not to include the replacement of the steam pipes in the project. Instead, VA instructed the San Francisco hospital to budget for the piping replacement as maintenance and repair work.

Between May 1964, about 7 months before starting the development of working drawings and specifications, and August 1965, the San Francisco Hospital Director continually emphasized to VA Central Office officials the need to include the heating system's pipework in the modernization project. In August 1965, about 9 months after the development of these documents was started, VA decided to reconsider this matter.

As a result, in September 1965 VA requested the architect-engineer to make certain changes in the phase 4 design, including replacing certain heating system pipes in buildings to be modernized. The architect-engineer estimated that including this additional work in the phase 4 modernization project would increase the construction costs by about \$325,270.

The remaining \$159,600 increase in construction costs, which we believe should have been recognized by VA in determining the cost to modernize the San Francisco hospital, included part of the general increase in construction costs and the increased cost for the method selected for procuring audio sound booths.

With regard to VA's reevaluation of the phase 4 modernization project, VA's records showed that the following four causes had contributed to making the phase 4 project unsatisfactory.

1. The need for teaching areas, laboratories, patient privacy, and future expansion or change was not met in the project, and these items could not be inexpensively added later.
2. The modernization of existing buildings would disperse patient-care resources, and desirable systems of automated supply transport and communication could not be applied.
3. There would be no remaining land for expansion or change to meet future needs.
4. The layout of building areas was based on building configuration, rather than on functional requirements.

Our review revealed that VA knew these matters before it authorized the development of the phase 4 working drawings and specifications.

For example, VA determined that the design of the phase 4 project was unsatisfactory, in part, because the

need for teaching areas, laboratories, patient privacy, and future expansion or change at the San Francisco hospital was not met in the modernization project and because these items could not be inexpensively added at a later date

VA's records showed that in November 1964, about 1 month before VA authorized the architect-engineer to proceed with the phase 4 working drawings and specifications and about 2 months after completion of the preliminary plans, the San Francisco Hospital Director discussed with VA Central Office officials the need for (1) retaining a prime land area for future bed expansion, (2) providing space for physicians', residents', medical students', and nurses' training, and (3) providing space for certain laboratories.

VA records made available to us and discussions with a VA official did not reveal the reasons for proceeding with the development of working drawings and specifications for the phase 4 project in view of the above information.

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We believe that the four canceled projects discussed above demonstrate a need for VA to improve its review and evaluation of information pertaining to hospital modernization projects before authorizing the development of working drawings and specifications, to avoid the cost of developing documents which have little or no value to VA.

AGENCY COMMENTS AND OUR EVALUATION

With a view toward avoiding the cost of developing working drawings and specifications that have little or no value to VA in modernizing hospitals, we proposed to the Administrator of Veterans Affairs that (1) a determination be made concerning what point in time, subsequent to the development of master plans or requirements for the modernization of VA hospital buildings, an in-depth review and evaluation of these plans or requirements should be made and (2) steps be taken to ensure that an in-depth review, evaluation, and updating is made of master plans or requirements, when appropriate, before the development of working drawings and specifications is undertaken.

The Deputy Administrator of Veterans Affairs, in commenting by letter dated May 1, 1970 (see app. I), on a draft of this report, advised us that, although VA agreed to the objective of our proposals and would thoroughly examine into its review practices to determine if they needed strengthening, VA did not agree to the conclusion that projects were not reviewed as to need prior to the award of the architect-engineers' contracts. The Deputy Administrator stated that, between the completion of master plans and the start of the development of working drawings, preliminary plans were developed and that:

"*** This involves a continuous review as to the need for the project and extensive coordination among VA Central Office and field station personnel. In the cases in question, the preliminary plans review was completed from six weeks to six months prior to the award of the architect-engineer contract."

We agree that, during the development of preliminary plans, VA reviews the need for construction modernization projects and coordinates the development of such projects with various VA personnel. We are concerned, however, with the effectiveness of VA's review procedures.

Our review indicated that VA had not adequately reviewed and evaluated all available information relating to these hospitals. For example, in September 1964 the

preliminary plans were completed for the San Francisco modernization project. As pointed out on page 31, in November 1964, 2 months after the completion of the preliminary plans for the San Francisco project, the San Francisco Hospital Director discussed with VA Central Office officials the need for (1) retaining a prime land area for future bed expansion, (2) providing space for physicians', residents', medical students', and nurses' training, and (3) providing space for certain laboratories. About 1 month later VA authorized the development of working drawings and specifications for the San Francisco modernization project.

Our review of VA's records revealed no evidence that VA had considered this data in formulating the plans for modernization, and discussions with a VA official did not reveal the reason for proceeding with the development of working drawings and specifications in view of the above information.

During the development of working drawings and specifications, VA's reevaluation of the San Francisco modernization project showed that the project was unsatisfactory because, among other things, the need for teaching areas, laboratories, patient privacy, and future expansion or change was not met in the project and because these items could not be inexpensively added later.

The preliminary plans for the canceled projects were completed about 6 weeks to about 6 months before the start of the development of working drawings and specifications. Our review showed, however, that most of the data available relating to the reasons for canceling the modernization projects was known in whole or in part by VA Central Office officials after the preliminary plans for the projects had been completed but before the development of working drawings and specifications was begun.

The Deputy Administrator stated also that VA considered all information in its possession at the time of awarding the architect-engineers' contracts and that projects had been canceled because of increases in costs beyond an acceptable amount and changes in requirements or priorities which could not have been foreseen.

We recognize that all the information which served as the basis for canceling the modernization projects was not available to VA before the start of the working drawings and specifications. We believe, however, that the information that was available raised serious questions about whether the projects, as planned at the time scheduled for starting the development of working drawings and specifications, (1) would have adequately satisfied the most pressing needs of the hospitals, (2) would have been timely, or (3) could have been constructed at the cost VA had estimated.

In summary, we believe that VA should make an in-depth review and evaluation of hospital modernization projects before starting the development of working drawings and specifications.

RECOMMENDATIONS TO THE ADMINISTRATOR
OF VETERANS AFFAIRS

Therefore, we recommend that the VA Office of Construction adopt procedures to ensure that more effective reviews and evaluations, including documentation of findings, are made of data pertaining to hospital modernization projects before the development of working drawings and specifications is undertaken.

CHAPTER 4

SCOPE OF REVIEW

With respect to revising VA design criteria on the basis of architect-engineers' cost reduction proposals, we reviewed selected new hospital, and hospital modernization, projects under design or construction during fiscal years 1965 through 1969. With respect to the use made of working drawings and specifications developed for the modernization of existing VA hospitals, we reviewed all modernization projects under design during fiscal years 1966 through 1968.

Also, at the VA Central Office in Washington, D.C., we examined applicable correspondence, contracts, and other pertinent documents that were made available to us and discussed matters pertinent to our review with appropriate VA officials. Our review did not include an examination into the reasonableness of the design costs incurred by VA.

APPENDIXES



VETERANS ADMINISTRATION
OFFICE OF THE ADMINISTRATOR OF VETERANS AFFAIRS
WASHINGTON, D.C. 20420

May 1, 1970

Mr. Max Hirschhorn
Associate Director, Civil Division
U. S. General Accounting Office (801)
Room No. 137, Lafayette Building
811 Vermont Avenue, N. W.
Washington, D. C. 20420

Dear Mr. Hirschhorn:

Thank you for the opportunity to review and comment on your proposed draft report entitled "Review of Veterans Administration Hospital Design Activities."

We agree that architect-engineer cost reduction proposals should be thoroughly reviewed. We shall formalize our present procedure for translating meritorious suggestions into standards for prompt application, as appropriate, to future projects. We will develop the necessary procedures for this review. We are also in agreement with the objective of your second recommendation that a thorough review and evaluation of projects be made shortly before authorizing the award of the architect-engineer contract.

We do not agree with the conclusion that projects are not reviewed as to need prior to the award of the contract. [See GAO note]

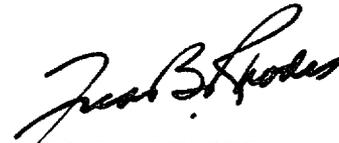
During this time preliminary plans are developed. This involves a continuous review as to the need for the project and extensive coordination among VA Central Office and field station personnel. In the cases in question, the preliminary plans review was completed from six weeks to six months prior to the award of the architect-engineer contract. Although we consider all information in our

GAO note: These comments make reference to statements contained in the draft report, which have been omitted in the final report.

Mr. Max Hirschhorn
Associate Director, Civil Division
U. S. General Accounting Office (801)

possession at the time of the contract award, projects have been cancelled due to increases in costs beyond an acceptable amount and changes in requirements or priorities which could not have been foreseen. We will thoroughly examine our review practices to determine if they need strengthening.

Sincerely,



FRED B. RHODES
Deputy Administrator

PRINCIPAL OFFICIALS OF THE VETERANS ADMINISTRATION
RESPONSIBLE FOR THE ADMINISTRATION
OF ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
ADMINISTRATOR OF VETERANS AFFAIRS:		
D. E. Johnson	June 1969	Present
W. J. Driver	Jan. 1965	May 1969
J. S. Gleason, Jr.	Feb. 1961	Jan. 1965
S. G. Whittier	Dec. 1957	Jan. 1961
DEPUTY ADMINISTRATOR OF VETERANS AFFAIRS:		
F. B. Rhodes	May 1969	Present
A. W. Stratton	Nov. 1967	May 1969
Vacant	Sept. 1967	Nov. 1967
C. F. Brickfield	Feb. 1965	Sept 1967
A. H. Monk (acting)	Jan. 1965	Feb. 1965
W. J. Driver	Feb. 1961	Jan. 1965
R. J. Lamphere	Sept. 1960	Feb. 1961
F. B. Morse	Nov. 1958	Sept. 1960
ASSOCIATE DEPUTY ADMINISTRATOR:		
R. H. Wilson	Feb. 1970	Present
A. H. Monk	Feb. 1965	Feb. 1970
A. T. McAnsh (acting)	Jan. 1965	Feb. 1965
A. H. Monk	Dec. 1960	Jan. 1965
R. J. Lamphere	Apr. 1959	Nov. 1960
CHIEF MEDICAL DIRECTOR:		
M. J. Musser, M.D.	Jan. 1970	Present
H. M. Engle, M.D.	Jan. 1966	Jan. 1970
J. H. McNinch, M.D.	June 1963	Jan. 1966
H. M. Engle, M.D. (acting)	Mar. 1963	May 1963
W. S. Middleton, M.D.	Mar. 1955	Feb. 1963
ASSISTANT ADMINISTRATOR FOR CONSTRUCTION:		
V. P. Miller (acting)	Aug. 1968	Present
W. Ashbridge	Sept. 1958	Aug. 1968