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**REPORT TO COMMITTEE ON 090557
AERONAUTICAL AND SPACE SCIENCES
UNITED STATES SENATE**

71-118



**Building Authorized To Provide
Office Space At Manned Spacecraft
Center Redesigned To Provide
Laboratory Space** B-765178

National Aeronautics and
Space Administration AGC00036

**BY THE COMPTROLLER GENERAL
OF THE UNITED STATES**

90558

090557

MARCH 29, 1971



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-165118

Dear Mr. Chairman:

The accompanying report presents the results of our review, made pursuant to your request of February 24, 1971, of the differences between the Engineering Building as authorized by the Congress and the building that the National Aeronautics and Space Administration is constructing at the Manned Spacecraft Center, Houston, Texas.

As agreed with your office, we provided a copy of the draft report to the National Aeronautics and Space Administration for its review. Its comments are included as appendix II, and appropriate consideration has been given to them in the report.

We plan to make no further distribution of this report unless copies are specifically requested, and then we shall make distribution only after your agreement has been obtained or public announcement has been made by you concerning the contents of the report.

As you requested, a report will be provided to you as soon as possible on similar facilities funded with construction funds and on major or new facilities and equipment funded with research and development funds or with research and program management funds.

Sincerely yours,

Comptroller General
of the United States

The Honorable Clinton P. Anderson, Chairman
Committee on Aeronautical and Space Sciences
United States Senate

SEN3500

*COMPTROLLER GENERAL'S REPORT TO
THE COMMITTEE ON AERONAUTICAL AND
SPACE SCIENCES, UNITED STATES SENATE*

BUILDING AUTHORIZED TO PROVIDE
OFFICE SPACE AT MANNED SPACECRAFT
CENTER REDESIGNED TO PROVIDE
LABORATORY SPACE
National Aeronautics and Space
Administration B-165118

D I G E S T

WHY THE REVIEW WAS MADE

In August 1970 the National Aeronautics and Space Administration (NASA) began construction of the Engineering Building at the Manned Spacecraft Center at Houston, Texas. Construction, estimated to cost \$2.6 million, was authorized by the Congress in the National Aeronautics and Space Administration Authorization Act for fiscal year 1967, approved August 5, 1966 (80 Stat. 337).

The Chairman, Senate Committee on Aeronautical and Space Sciences, requested the General Accounting Office (GAO) to determine (1) the extent, if any, to which the Engineering Building that was being constructed differed from the one that NASA described to the Congress and (2) NASA's legal authority to revise such a project after it had been authorized by the Congress.

FINDINGS AND CONCLUSIONS

The building currently under construction at Houston is substantially different in function, program application, and cost from the one NASA described and justified to the Congress.

- The building the Congress authorized would have provided office space for 704 employees of the Manned Space Flight Program. The building under construction will provide primarily laboratory space for the employees of the Earth Resources Survey Program.
- The building authorized by the Congress was estimated to cost about \$2.6 million, which did not include any cost for equipment. The building under construction will cost \$2.4 million plus about \$14.8 million for laboratory equipment. (See p. 18.)

The Engineering Building was initially designed as an office building. Construction, however, was postponed several different times because of the lack of funds. Meanwhile the need for office space declined because of reductions in personnel and the shift in program emphasis.

Tear Sheet

Furthermore, the Manned Spacecraft Center had not been able to get approval for a space science laboratory building.

The Center had included the laboratory facility in its budget requests for fiscal years 1969, 1970, and 1971. It was deleted from NASA's 1969 budget request by the Office of Management and Budget (then the Bureau of the Budget) and from the 1970 and 1971 budget requests by NASA Headquarters. After the last deletion NASA decided to redesign the Engineering Building to provide primarily laboratory space. (See p. 11.)

GAO found no indication that the Congress or its committees had been notified of the redesign of the Engineering Building.

The Office of Management and Budget was informed in November 1970 by NASA that the Engineering Building had been redesigned and was being constructed as a laboratory. An official of the Office of Management and Budget told GAO that his agency had not objected because:

- NASA was constructing the building using funds saved from other approved projects.
- Laboratory space was needed more than office space.
- The program which was to be housed in the redesigned building had been approved by the Congress. (See p. 14.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

NASA, after reviewing a draft of this report, advised GAO that it did not agree with the conclusion that the building under construction was substantially different. NASA stated that the primary function of the building the Congress had authorized was to provide environmentally conditioned space in which employees could perform their assigned duties and that the functional capability of the building under construction remained substantially the same.

GAO believes that such a broad interpretation of function, which would permit substitution of a laboratory building for an office building, would provide little or no control by the Congress over construction projects.

With regard to the laboratory equipment, NASA stated that all of this equipment would have been acquired whether or not the Engineering Building was constructed and that other facilities would have been used to house it. NASA stated that the equipment cost should not have been included in the subsequent reconstruction of the cost of the Engineering Building.

With regard to the matter for consideration by the Committee, NASA stated that authorizing funds in the authorization act by individual

projects would not necessarily have altered the result in this case since the building that was being built could and did lend itself to the nomenclature "Engineering Building." NASA stated that, as long as this was so, specifying the project in the legislative language as such would not, in NASA's view, have changed the result. (See p. 25.)

MATTERS FOR CONSIDERATION BY THE COMMITTEE

The Committee may wish to identify, in the authorization acts for NASA, the specific projects to be constructed with appropriated funds. This identification would restrict the availability of funds appropriated under the construction of facilities appropriations to the projects and amounts identified in the authorization acts.

Tear Sheet

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ABBREVIATIONS

GAO General Accounting Office
MSC Manned Spacecraft Center
NASA National Aeronautics and Space Administration

D I G E S T

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CHAPTER 1

INTRODUCTION

In August 1970 the National Aeronautics and Space Administration began construction of the Engineering Building at the Manned Spacecraft Center (MSC) at Houston, Texas. Construction of the building, estimated to cost \$2.6 million, was authorized by the Congress in the NASA Authorization Act for fiscal year 1967.

Each NASA field center prepares, as part of the annual budget formulation process, a list for NASA Headquarters of construction projects to be funded from NASA's construction of facilities appropriation. After evaluating these lists, NASA Headquarters decides which projects will be included in the budget request that is sent to the Office of Management and Budget for transmission to the Congress. The Congress, after reviewing the individual project justifications submitted by NASA, authorizes a specific amount to be appropriated for construction projects at each NASA field center. Subsequently, the Congress appropriates a lump sum for the construction of all of these facilities.

At the request of the Chairman, Senate Committee on Aeronautical and Space Sciences (see app. I), we reviewed the legislative history relating to the approval of the Engineering Building by the Congress and the subsequent design and construction of the building by NASA, to determine (1) the extent, if any, to which it differed from the one that NASA described to the Congress and (2) NASA's authority to revise such a project after it had been authorized by the Congress.

Our review was conducted at NASA Headquarters, Washington, D.C., and at MSC. Discussions were held with officials of both NASA and the Office of Management and Budget. Our review did not encompass an evaluation of the need for the Engineering Building which NASA was constructing.

CHAPTER 2

CHANGES TO ENGINEERING BUILDING

AFTER AUTHORIZATION BY THE CONGRESS

The Engineering Building currently under construction at MSC is substantially different in function, program application, and cost from the office building that NASA described and justified to the Congress during the authorization and appropriation hearings on NASA's budget request for fiscal year 1967.

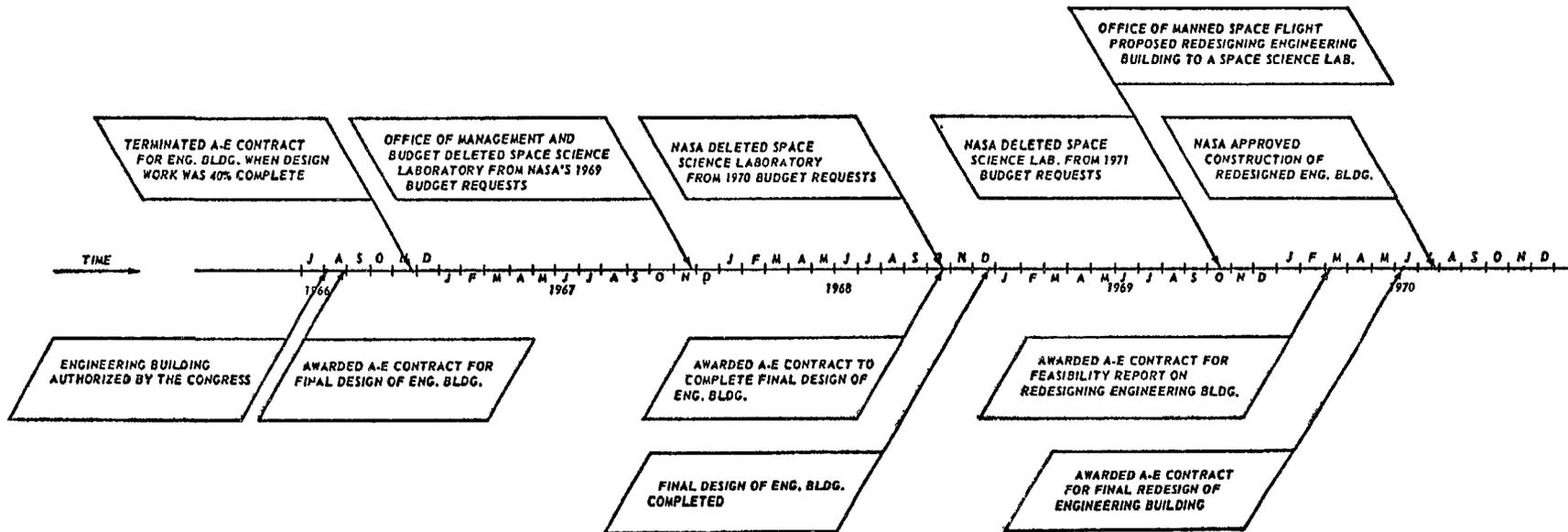
Upon enactment of the NASA authorization act, MSC began final design of the Engineering Building as an office building. The estimated cost was \$2.6 million, which did not include any cost for equipment. Over the next 3 years, however, NASA Headquarters rejected several requests by MSC to start construction of the building because sufficient funds were not available. By October 1969 the need for additional office space for engineering employees at MSC had substantially diminished. According to NASA, however, there was a pressing need for more laboratory space. During this period the Office of Management and Budget deleted a space science laboratory building from NASA's budget request for fiscal year 1969, and NASA Headquarters deleted it from the budget requests for fiscal years 1970 and 1971.

In October 1969 NASA decided to redesign the Engineering Building to provide primarily laboratory space instead of office space and in July 1970 approved its construction as redesigned. The estimated cost of the redesigned building is \$2.4 million funded from the construction of facilities appropriation and \$14.8 million for laboratory equipment funded from the research and development appropriation.

A chronology of the major events relating to these two projects is shown in the illustration on the following page, and the details relating to these events are discussed in the following sections of this chapter.

**CHRONOLOGY OF MAJOR EVENTS RELATING TO ENGINEERING BUILDING PROJECT
AND SPACE SCIENCES LABORATORY PROJECT**

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AUTHORIZATION

On August 5, 1966, the Congress authorized \$12.8 million for the construction of projects at MSC. According to the legislative history of the authorization act, the \$12.8 million was for the following four projects.

	Amount authorized (<u>millions</u>)
Lunar Sample Receiving Laboratory	\$ 8.1
Flight crew training facility	1.1
Engineering Building	2.6
Center support facilities	<u>1.0</u>
	<u>\$12.8</u>

NASA had originally requested \$13.8 million for the four projects, including \$9.1 million for the Lunar Sample Receiving Laboratory. The House bill authorized \$13.8 million, but the Senate bill authorized only \$12.8 million, reducing the amount for the Lunar Sample Receiving Laboratory to \$8.1 million. The committee of conference agreed on the \$12.8 million amount.

The project description furnished to the Congress as part of the budget justification material stated that the purpose of the Engineering Building was to provide administrative-type space for MSC functions associated with (1) manned space flight mission operations and (2) the development, test, and evaluation of manned spacecraft systems.

The five-story building was to have a gross area of approximately 90,000 square feet and to accommodate 704 engineering and administrative employees. The project justification stated that construction of adequate office space for MSC personnel had not kept pace with the population growth at MSC and recommended that the Engineering Building be constructed to alleviate the deficiency.

DESIGN

In August 1966 MSC awarded a contract for \$96,500 to an architect-engineer firm in Houston for design of the Engineering Building. The contract was terminated 3 months later at the request of the Office of Manned Space Flight because construction funds were not available.

NASA's records showed that, at the time the contract was terminated, contract costs were \$43,000 and the design work was about 40 percent completed.

In October 1968 MSC awarded another contract for \$59,300 to the same architect-engineer firm for completion of the detailed plans and specifications. Work under the contract was completed in December 1968.

In December 1968 the Office of Manned Space Flight, because of insufficient funds, turned down MSC's request to begin construction of the building.

PROPOSED SPACE SCIENCE LABORATORY BUILDING

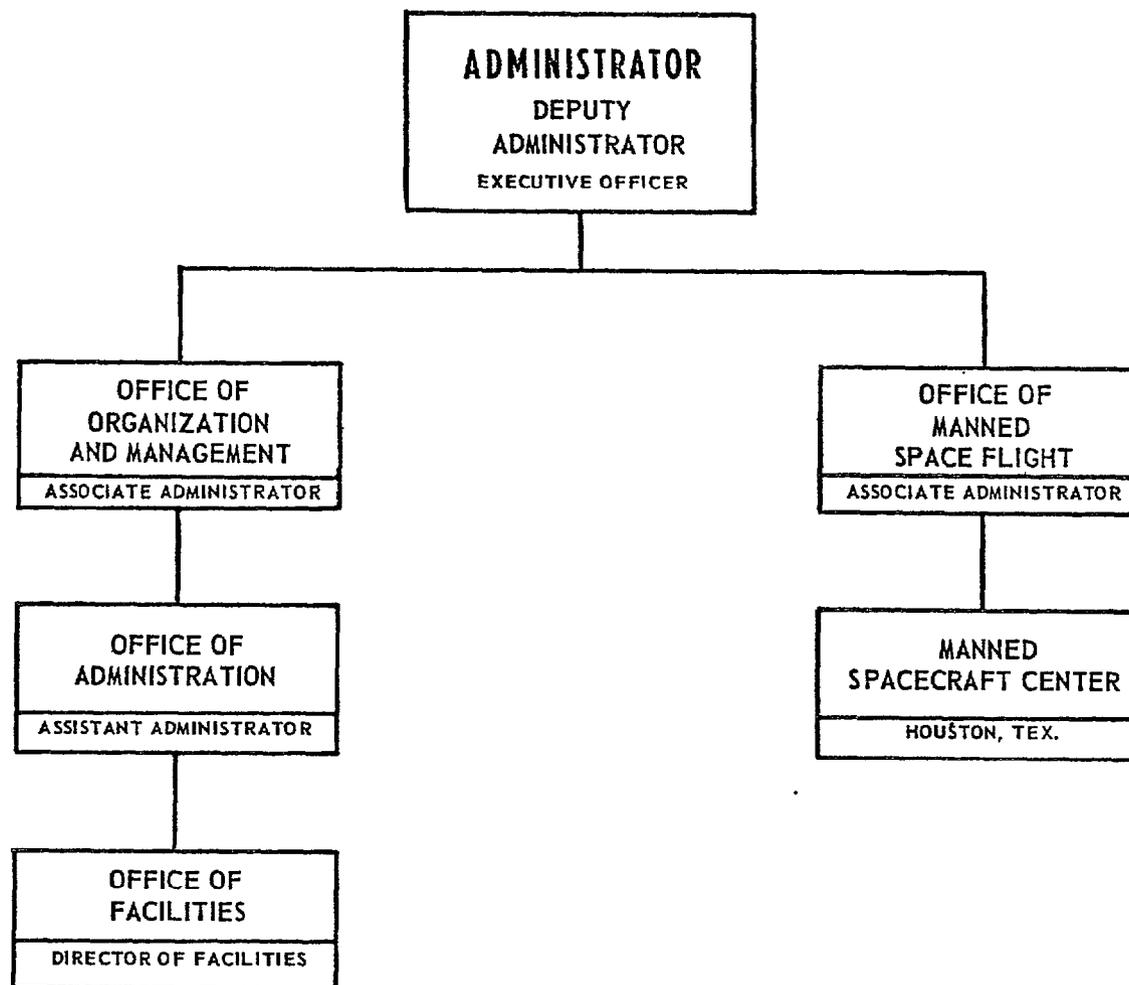
In August 1967 MSC requested the Office of Manned Space Flight to include in NASA's fiscal year 1969 budget request a space science laboratory building estimated to cost \$9.6 million, of which \$3.6 million was for equipment. The purpose of the facility was for research, development, and data utilization activities associated with the Lunar and Planetary Exploration Program and the Earth Resources Survey Program. The Office of Manned Space Flight advised MSC in October 1967 that a limited construction program necessitated a reduction in the cost of the project to \$4.6 million. In November 1967 the Office of Management and Budget deleted all funds for the laboratory from NASA's budget request.

Although the project was included in MSC's budget requests for construction of facilities funds for both fiscal years 1970 and 1971, it was deleted at NASA Headquarters by the Office of Administration because of a limitation on construction funds. In advising MSC of the deletion from the fiscal year 1971 budget request, the Office of Manned Space Flight stated that efforts were under way to obtain approval

from the Office of Administration to construct the Engineering Building as a laboratory facility.

The organization chart below shows the offices which were involved in the decision to change the function of the Engineering Building. All of these offices, except those at MSC, are at NASA Headquarters.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



DECISION TO REDESIGN ENGINEERING BUILDING

In October 1969 the Office of Manned Space Flight requested the Office of Administration to reconsider the deletion of a space science laboratory from the fiscal year 1971 budget request for construction of facilities funds. The Associate Administrator for Manned Space Flight stated that this facility would serve the needs of the Earth Resources Survey Program. He requested permission to construct the Engineering Building, for which authorization and funds were available, if a space science laboratory could not be included in the fiscal year 1971 program. He stated that, in this way, MSC might be able to make internal adjustments in utilization and to find a more economical solution to the space science needs.

On October 22, 1969, the Director of Facilities informed the Office of Manned Space Flight that he had again reviewed the need for the Engineering Building at MSC and had concluded that there was no real pressing need for additional office space at MSC so long as the current personnel strengths were not substantially increased. He said, however, that there was a need at MSC for additional laboratory and storage space--the most pressing need being for laboratory space for the 750 employees in space sciences and applications and for their related equipment.

The Director of Facilities stated that it appeared to make more sense to redesign the Engineering Building from purely an office building to that of mainly a laboratory for space sciences and earth resources. He said that, if this approach were approved, NASA could go ahead with the redesign and with such clearances with or advice to the Office of Management and Budget and to the Congress as might be deemed appropriate.

By memorandum dated October 29, 1969, the Associate Administrator for Manned Space Flight advised the Assistant Administrator for Administration of the results of the space utilization analysis at MSC that had been developed in conjunction with the Office of Facilities. He stated that for several years a shortage of both office and laboratory space had existed at MSC, which it had attempted to resolve by requesting construction of the Engineering Building and the

space science laboratory. He stated that several changes had recently taken place which dictated a reevaluation of MSC's space problem. First, significant manpower reductions had occurred at MSC so that the office space problem had diminished to a great extent. Second, and more significant, however, according to the Associate Administrator, was the deletion of the space science laboratory from the fiscal year 1971 construction of facilities budget request.

The Associate Administrator stated that, as evidence of the critical shortage of laboratory space, MSC had submitted for approval several minor construction projects estimated to cost about \$1 million, to alleviate this serious problem on an interim basis. He stated, however, that a more effective solution would be to redesign the Engineering Building as a laboratory-type facility. Accordingly, he requested approval to proceed with the construction of the redesigned Engineering Building, to alleviate the critical laboratory space problem at MSC.

On October 30, 1969, the Director of MSC advised the Associate Administrator for Manned Space Flight that, if the Engineering Building, which was then designed to provide 59,600 square feet of usable office space, were to be redesigned as a predominantly laboratory-type facility for MSC, many of MSC's pressing requirements for space could be met. Accordingly, he requested the Associate Administrator's support in obtaining the necessary approvals to construct, as soon as possible, the Engineering Building redesigned as a space sciences-oriented laboratory facility.

On October 29, 1969, the Office of Manned Space Flight authorized MSC to spend \$8,778 for redesign of the Engineering Building as a space science laboratory. On March 6, 1970, MSC awarded a contract to an architect-engineer firm in Houston for the preparation of a "Feasibility Study for Redesign of Engineering Building," which was completed on April 27, 1970, at a cost of \$6,041.

On April 23, 1970, the Office of Manned Space Flight authorized MSC to spend \$50,000 additional for the redesign of the Engineering Building. On June 10, 1970, MSC awarded another contract to the same architect-engineer firm for \$51,973 for the final design of the building.

The plans and specifications were completed in September 1970.

The revised project description prepared by the Office of Facilities stated that the purpose of redesigning the Engineering Building was to provide a laboratory for the development and use of remote-sensors technology in support of the Earth Resources Survey Program and that the building as redesigned would provide 45,200 square feet of laboratory space and 15,800 square feet of office space and would house 300 employees.

According to the revised project justification prepared by the Office of Facilities, MSC is the only NASA center where the Earth Resources Survey Program consists of both aircraft and spacecraft flights to make quantitative measurements in agriculture, cartography, forestry, geography, geology, hydrology, and oceanography. Research and development using aircraft and spacecraft are necessary to develop the remote-sensor systems for, and to provide technical support to, the Earth Resources Survey Program being conducted for NASA's Office of Space Science and Applications. The facility will also be used to support the Lunar and Planetary Exploration Program.

The project justification stated that the following laboratories would be housed in the Engineering Building as redesigned.

- Sensor and Ground Data Systems Laboratories
- Mapping Sciences Laboratories
- Photographic Sciences Laboratory

CONSTRUCTION

On June 18, 1970, the Associate Administrator for Manned Space Flight requested the approval of the Associate Administrator for Organization and Management to proceed with the construction of the Engineering Building redesigned as a space science laboratory-type facility. He stated that sufficient funds for construction were available at MSC due to savings in ongoing construction projects which could be transferred to the Engineering Building project.

On July 20, 1970, the Assistant Administrator for Administration, acting for the Associate Administrator for Organization and Management, approved the construction of the Engineering Building as redesigned and released \$2.6 million to finance it.

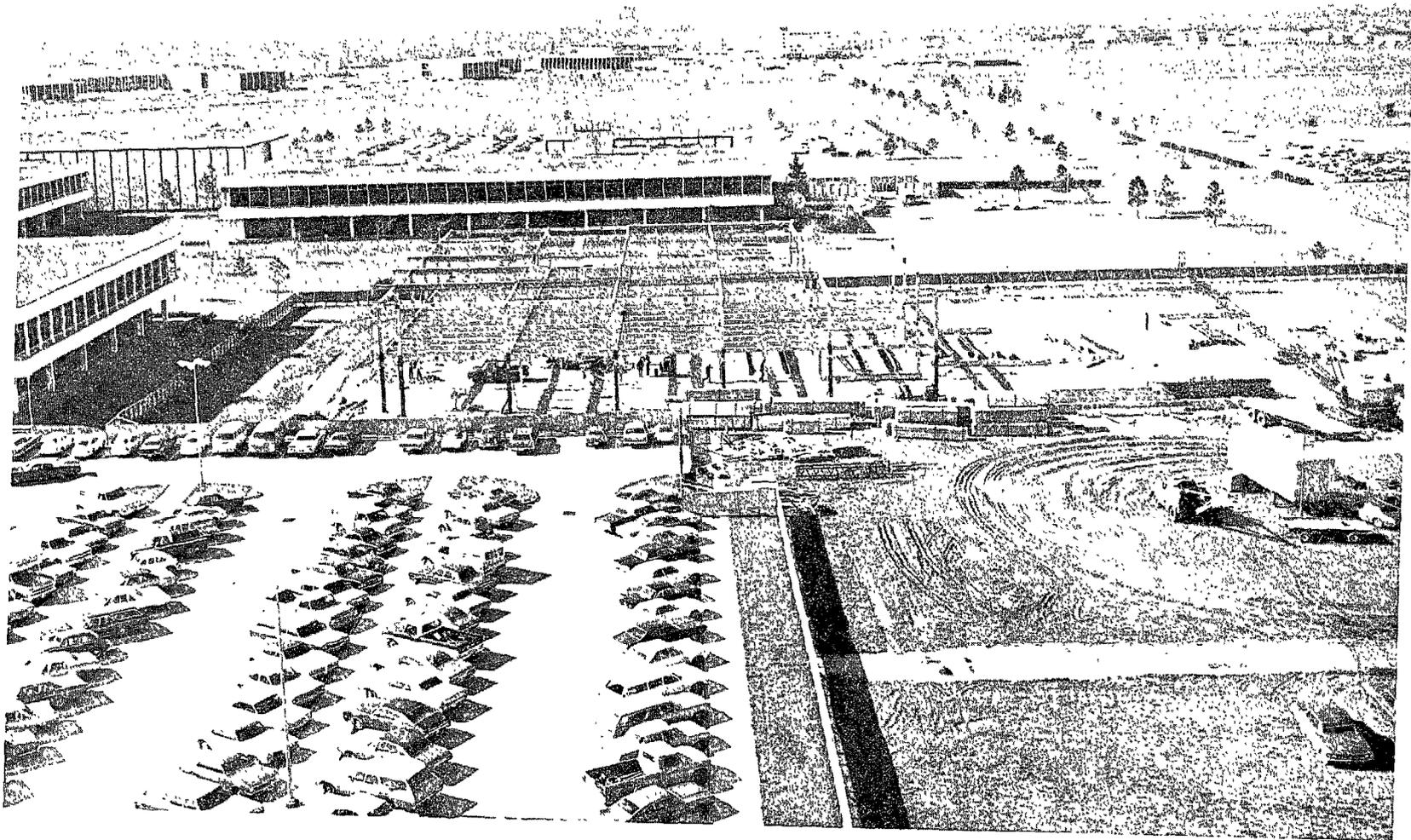
Funds in the amount of \$300,000 were released by NASA Headquarters on July 22, 1970. A contract was awarded in August 1970 for construction of the foundation, and construction was started in that month. In November 1970 a second construction contract was awarded for completion of the building. The building is scheduled to be completed in December 1971 at a cost of \$2.4 million. The pictures on the following pages, which were taken by MSC in March 1971, show the status of construction at that time.

The Office of Management and Budget was first informed by NASA that the Engineering Building was being constructed as a laboratory in November 1970. An official of the Office of Management and Budget informed us that his agency had not objected to the redesign for three reasons: (1) NASA was constructing the building using funds that were saved from other approved projects, (2) laboratory space was needed more than office space, and (3) the Earth Resources Survey Program which was to be housed in the redesigned Engineering Building had been approved by the Congress.

Our review of available NASA records and our discussions with cognizant NASA officials did not show any evidence that the Congress or its committees had been advised of NASA's redesign of the Engineering Building as a space science laboratory. The Director of Facilities informed us, however,

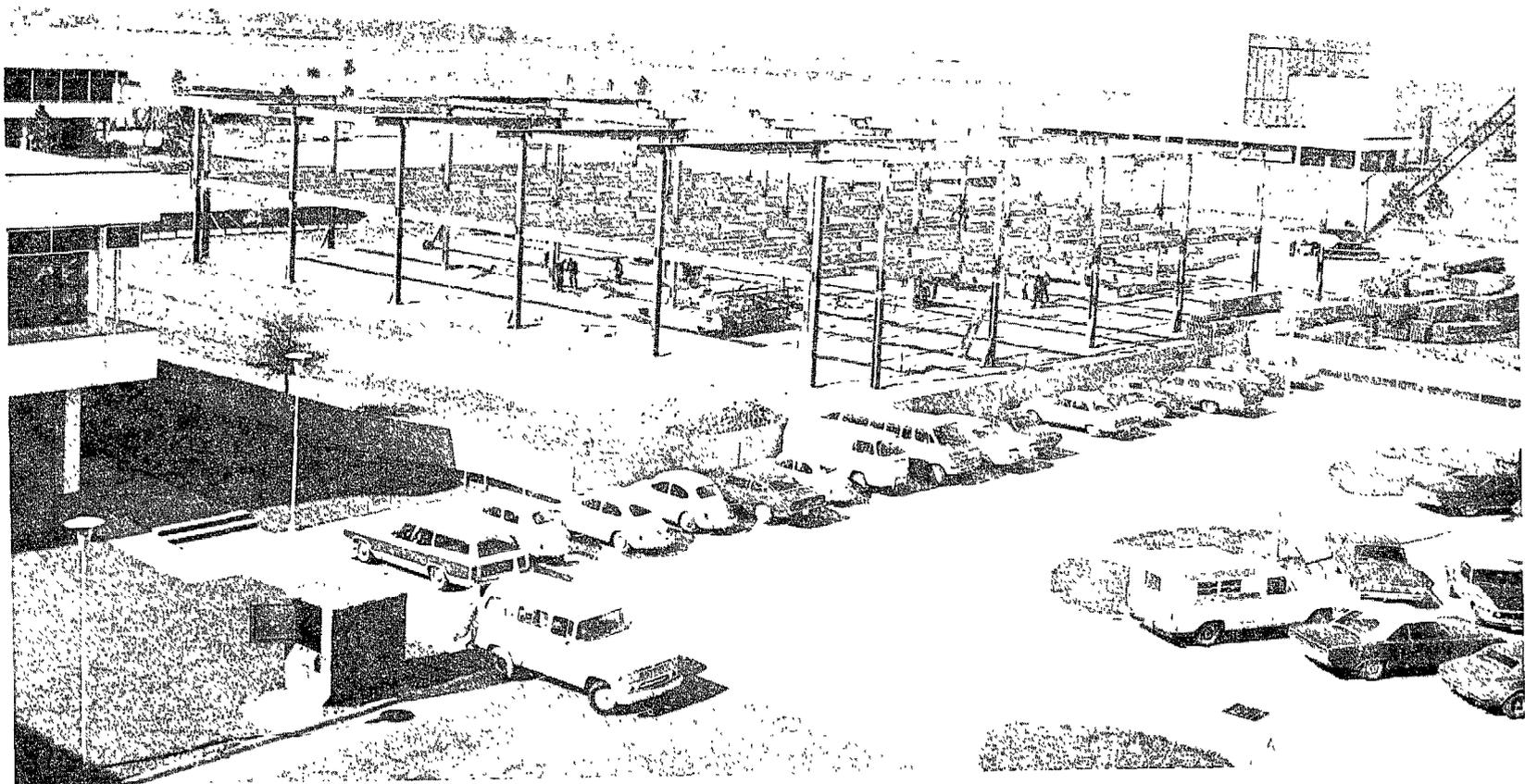
CONSTRUCTION OF ENGINEERING BUILDING AT THE MANNED SPACECRAFT CENTER.

15



CONSTRUCTION OF ENGINEERING BUILDING AT THE MANNED SPACECRAFT CENTER.

16



that he had discussed the Engineering Building situation with a staff member of the House Committee on Science and Astronautics during 1970.

We found that NASA had furnished some information on the Engineering Building to the Senate Committee on Aeronautical and Space Sciences on March 5, 1970. In its report on the NASA authorization act for fiscal year 1970 (S. Rept. 91-282), the Senate Committee on Aeronautical and Space Sciences requested NASA to furnish to the Committee by March 1 of each year a report showing, as of the preceding December 31, the status of each project authorized in prior years to be constructed. The report was to show the name of each facility authorized but not completed, the current estimated cost to complete, estimated completion date, and any other pertinent information necessary to keep the Committee informed as to the status of the facility.

The first report was furnished on March 5, 1970. The report stated that the Engineering Building had not been scheduled for construction because of constraints by the construction reduction plan but that it was scheduled for award in June 1970.

The report did not mention the fact that in October 1969 the Associate Administrator for Manned Space Flight and the Director of Facilities had concluded, as a result of a space utilization study, that, although there was no longer a pressing need for administrative space, there was an urgent requirement for laboratory space oriented toward the space sciences and that NASA therefore had decided to redesign the Engineering Building to alleviate the critical laboratory space problem at MSC. We believe that this information would be pertinent information necessary to keep the Committee fully informed.

DIFFERENCES BETWEEN AUTHORIZED AND
REDESIGNED ENGINEERING BUILDING

Differences between the building as authorized and the building under construction are shown below.

	<u>Building authorized by the Congress</u>	<u>Building under construction</u>
Cost:		
Construction	\$2,600,000	\$ 2,400,000
Equipment (laboratory)	<u>-</u>	<u>14,809,700</u>
Total	<u>\$2,600,000</u>	<u>\$17,209,700</u>
Area (square feet):		
Gross	90,112	84,000
Net:		
Office	67,580	15,800
Laboratory	<u>-</u>	<u>45,200</u>
Total	<u>67,580</u>	<u>61,000</u>
Number of employees to be housed	704	300
Purpose	Office space for Manned Space Flight programs	Laboratory space for Earth Resources Survey Program

The functional capability of the two-story building currently under construction at MSC is substantially different from the building authorized by the Congress. The original building would have provided 67,580 square feet of office space for 704 employees, whereas the revised building will provide 15,800 square feet of office space and 45,200 square feet of laboratory space and house 300 employees. The floor plans on the following pages show the functional changes.

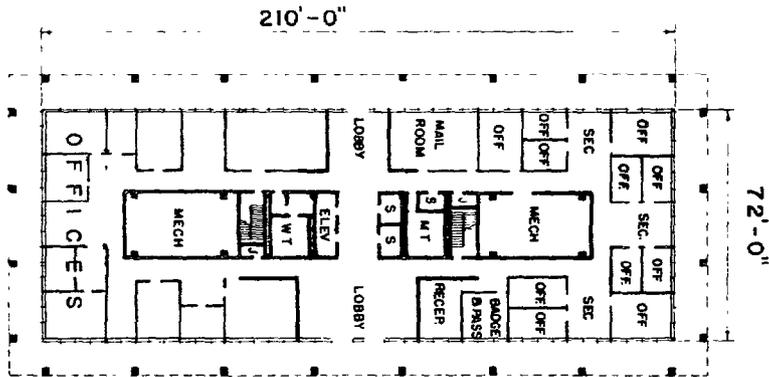
NASA's records relating to the Engineering Building as authorized by the Congress make no mention of equipment. The building that is being constructed, however, will house laboratory equipment estimated by NASA to cost about \$14.8 million, as shown in the following table. A NASA official advised us that the equipment was being funded with research and development funds.

Equipment for Redesigned Engineering Building
as of May 14, 1970

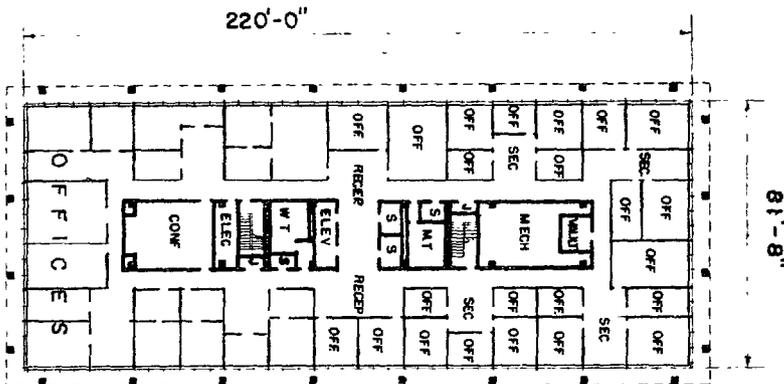
<u>Laboratories</u>	<u>On hand</u>	<u>On order</u>	<u>To be ordered</u>	<u>Total estimated cost</u>
Photogramme- try	\$ 865,000	\$ 350,000	\$ -	\$ 1,215,000
Geosciences, Image Anal- ysis	142,000	25,000	-	167,000
Cartography, Screening, Indexing, Plotting	325,000	196,000	-	521,000
Infrared, Mi- crowave, Physics	77,266	88,034	310,500	475,800
Metric, Photo Sciences	275,000	-	436,500	711,500
Photometry, Photo- Optics	\$2,006,000	958,000	300,000	3,264,000
Data Analysis Techniques	<u>347,000</u>	<u>7,112,900</u>	<u>995,500</u>	<u>8,455,400</u>
Total	<u>\$4,037,266</u>	<u>\$8,729,934</u>	<u>\$2,042,500</u>	<u>\$14,809,700</u>

PLANS FOR AUTHORIZED ENGINEERING BUILDING PROVIDING OFFICE SPACE

FIRST FLOOR PLAN



TYPICAL FLOOR PLAN
SECOND THRU FIFTH

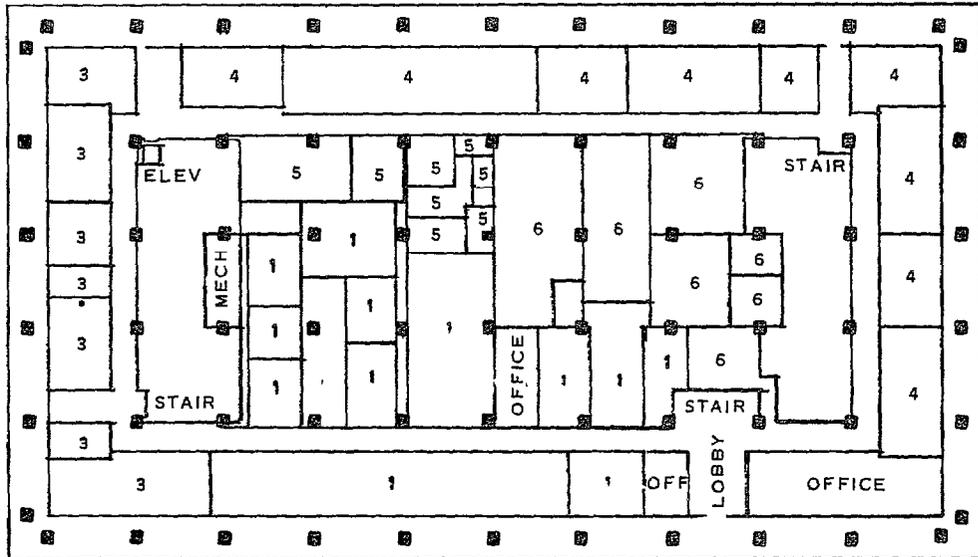


SCALE: 1 INCH - 60 FEET

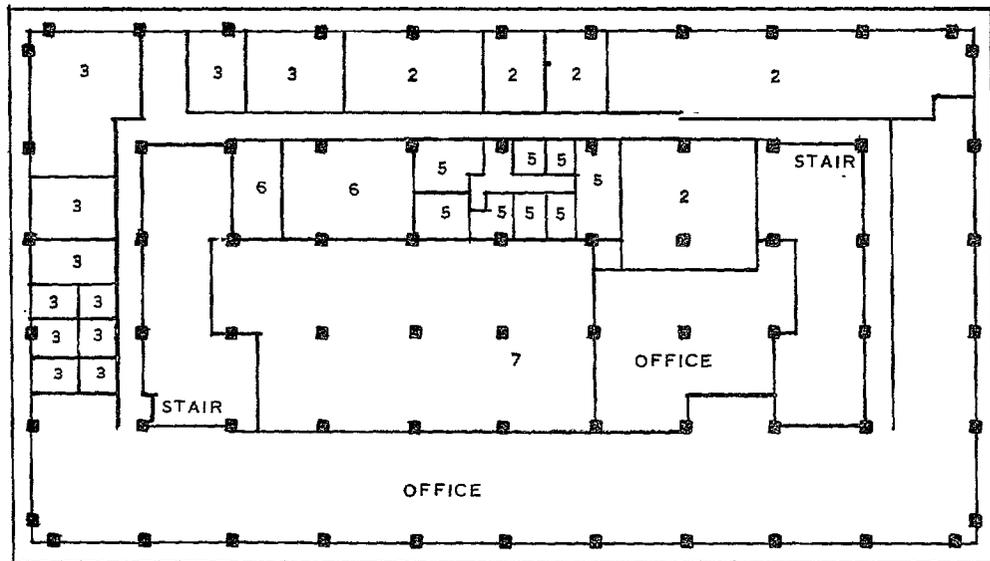


DRAWINGS PROVIDED BY NASA

PLANS FOR REDESIGNED ENGINEERING BUILDING PROVIDING LABORATORY SPACE



FIRST FLOOR PLAN



SECOND FLOOR PLAN

KEY

- 1 PHOTOGRAMMETRY LABS
- 2 GEOSCIENCES, IMAGE ANALYSIS LABS
- 3 CARTOGRAPHY, SCREENING, INDEXING, PLOTTING LABS
- 4 INFRARED, MICROWAVE, PHYSICS LABS
- 5 METRIC, PHOTO SCIENCES LABS
- 6 PHOTOMETRY, PHOTO-OPTICS LABS
- 7 DATA ANALYSIS TECHNIQUES LABS

SCALE: 1 INCH - 60 FEET



DRAWINGS PROVIDED BY NASA

LEGAL AUTHORITY TO REVISE CONSTRUCTION PROJECT

In view of the fact that the building being constructed differs from that for which funds were requested from, and provided by, the Congress, a question was raised concerning the authority of NASA to revise the project.

In its budget request for construction of facilities funds for fiscal year 1967, NASA included, in the amount requested for construction at MSC, an item of \$2.6 million for construction of the Engineering Building. The project was approved, and \$2.6 million was included in the lump sum of \$12.8 million authorized to be appropriated for construction projects at MSC by the NASA Authorization Act for fiscal year 1967.

Although the Independent Offices Appropriation Act for fiscal year 1967, approved September 6, 1966 (80 Stat. 675), provided a lump sum for construction of facilities, the amount was less than the total amount authorized by the authorization act for fiscal year 1967; however, none of the individual projects was denied. We have been advised by NASA that the cost of constructing the Engineering Building will be paid from savings effected on other construction projects.

We have long held the position that the breakdown into amounts of individual items in an agency's budget estimates presented to the Congress that are the basis on which lump sums are appropriated is not binding on the administrative officers of the agency unless such breakdown is carried into the law. (See 17 Comp. Gen. 147.) We see no reason why such position should not be equally applicable insofar as lump-sum authorizations are concerned.

If the Congress desires to restrict the availability of a particular appropriation to the several items and amounts therefor as submitted in the budget estimates, such control may be effected by limiting or specifying such items and amounts in either the authorization or the appropriation act involved.

Since the authorization act involved in this case did not identify specific budget items, the only limitation

concerning the use of funds for construction of facilities are those placed on the amounts that may be expended for construction at the various sites listed in the act. Where we note that there have been substantial deviations from the budget justifications or budget estimates, however, we report such matters to the Congress or to its cognizant committees.

CONCLUSIONS

The Engineering Building currently under construction at MSC is substantially different in function, program application, and cost from the office building that NASA described and justified to the Congress during the authorization and appropriation hearings on NASA's budget request for fiscal year 1967.

The Engineering Building authorized by the Congress would have provided office space for employees associated with the Manned Space Flight Program, whereas the building under construction will provide primarily laboratory space for the Earth Resources Survey Program. The building was redesigned, according to NASA, because the need for office space had declined during the period when construction was postponed, whereas there continued to be a need for additional laboratory space.

The cost of the building authorized by the Congress was estimated to be about \$2.6 million, which did not include any cost for equipment. The building under construction is estimated to cost \$2.4 million plus about \$14.8 million for laboratory equipment.

Since the Engineering Building was not identified as a specific item in the NASA authorization act, we did not find any legal basis to question NASA's redesigning the building to provide laboratory space instead of office space.

We believe, however, that the authorization committee is in the best position to decide whether NASA's practices with respect to changing the scope of projects are in accordance with the committee's intent and satisfy its oversight objectives.

MATTERS FOR CONSIDERATION BY THE COMMITTEE

The Committee may wish to identify, in the authorization acts for NASA, the specific projects to be constructed with appropriated funds. This identification would restrict the availability of funds appropriated under the construction of facilities appropriations to the projects and amounts identified in the authorization acts.

CHAPTER 3

AGENCY COMMENTS

NASA's comments on our draft report were provided by the Associate Administrator for Organization and Management in a letter dated March 22, 1971. (See app. II.) He stated that NASA did not agree with our conclusion that the building under construction was substantially different in function, program application, and cost from the one that was described and justified to the Congress.

Regarding the functional capability of the building, NASA stated that the Engineering Building presently under construction was not substantially different, in a broad sense, from that initially described to the Congress. The basic need for the facility was to enable MSC to meet its broad housing requirements, and in this broad context NASA was, and still is, of the conviction that it had not substantially departed from the broad purpose initially intended to be served by this building. NASA stated that the primary function of the building was to provide environmentally conditioned space in which employees could perform their assigned duties.

We believe that NASA's description of the primary function of the building as providing "environmentally conditioned space in which personnel could perform their assigned duties" is so broad as to encompass almost any Government building constructed in recent years. Such a broad interpretation of function, which would permit substitution of a laboratory building for an office building, would provide little or no control over construction projects by the Congress.

With respect to the cost of the building, NASA stated that the \$14.8 million worth of equipment should not be included in the subsequent reconstruction of the facility cost for the following reasons. The \$14.8 million worth of research and development-funded equipment was on hand or on order prior to the decision to proceed with the Engineering Building. Much of it was of the move-in-plug-in type and was not to be substantially affixed to the building. NASA

stated that, since all of this equipment would have been acquired whether or not the Engineering Building was constructed, it was not directly related to the Engineering Building.

Regarding our conclusion that the report submitted by NASA to the Committee on March 5, 1970, did not fully inform the Committee of the status of the building, NASA stated that the report was accurate and was as complete as could reasonably have been expected. NASA stated also that the conclusion of the Associate Administrator for Manned Space Flight and the Director of Facilities in October 1969 that a redesigned Engineering Building was a prudent action did not represent a NASA decision. NASA also pointed out that the contract for the preparation of a "Feasibility Study for Redesign of Engineering Building" was not awarded until March 6, 1970, whereas the report to the Committee was as of December 31, 1969.

We noted, however, that the funds for the preparation of the feasibility study were made available to MSC by NASA Headquarters in October 1969. Therefore we continue to believe that the report was not as complete as could reasonably have been expected.

With respect to our suggestion that the Committee may wish to consider recommending to the Congress that construction of facilities appropriations be restricted to specific projects by limiting or specifying such projects and amounts in the authorizations acts, NASA stated that such limitation would not necessarily have altered the result in the case of the Engineering Building. NASA stated also that the building being constructed could and, still did, lend itself to the nomenclature "Engineering Building." In NASA's view, as long as this is so, specifying the project as such in the legislative language would not have changed the result.

Our suggestion to the Committee is based on the assumption that the authorization acts would make appropriate reference to the detailed project descriptions which NASA, in the past, has furnished to the Congress in support of its budget requests. If that were done, we believe that changes of this magnitude would not be permissible.

APPENDIXES

CLINTON P. ANDERSON, N. MEX., CHAIRMAN
WARREN G. MAGNUSON, WASH. CARL T. CURTIS, NEBR.
STUART BYMINGTON, MO. MARGARET CHASE SMITH, MAINE
JOHN C. STENNIS, MISS. BARRY GOLDWATER, ARIZ.
HOWARD W. CANNON, MICH. LOWELL P. WEICKER, JR., CONN.
DAVID H. GAMBERELL, GA. JAMES L. BUCKLEY, N.Y.

JAMES J. CERRIG, STAFF DIRECTOR

United States Senate

COMMITTEE ON
AERONAUTICAL AND SPACE SCIENCES
WASHINGTON, D.C. 20510

February 24, 1971

The Honorable Elmer B. Staats
Comptroller General of the United States
General Accounting Office
Washington, D. C. 20548

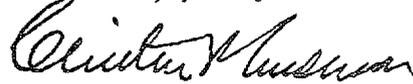
Dear Mr. Staats:

The National Aeronautics and Space Administration is constructing an engineering building which was authorized in fiscal year 1967 at the Manned Spacecraft Center. I would like to have the General Accounting Office review this project and determine: (1) the extent, if any, that it differs from the one described to the Congress, and (2) NASA's legal authority to revise such a project after it has been authorized by the Congress. I would appreciate receiving your report on these matters by April 1.

Subsequently, I would like to have a more comprehensive report on similar facilities built with construction of facilities funds as well as major or new facilities funded with either research and development, equipment, or research and program management funds, or various combinations thereof. The Authorization Act each year authorizes minor construction with research and development and research and program management appropriations. When the cost exceeds a specified dollar amount, however, NASA must notify the Congress. I would like your staff to review NASA's implementation of this provision.

Your assistance to the Committee is appreciated.

Sincerely yours,



Clinton P. Anderson
Chairman

BEST DOCUMENT AVAILABLE



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D. C. 20546

MARCH 22 1971

REPLY TO
ATTN OF BXB

Mr. James K. Spencer
Assistant Director, Civil Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Spencer:

We appreciate the opportunity to comment on the draft report to the Chairman of the Senate Committee on Aeronautical and Space Science relating to the Engineering Building being constructed at the Manned Spacecraft Center. The attached detailed comments set forth our observations and reactions based on consideration of the report contents by interested NASA elements.

In summary, we do not agree with the GAO conclusion that the building under construction is substantially different in function, program application, and cost from the one that was described and justified to the Congress. Further, we do not agree with the conclusion that the cost of the Engineering Building is \$2.4 million plus about \$14.8 million for laboratory equipment. We feel that it is important that the following points be emphasized:

1. Equipment - as noted in our detailed comments, the \$14.8 million of R&D-funded equipment, which is now scheduled to be housed in the Engineering Building, is all associated with the Houston-based Earth Resources activities. Much of this equipment which is associated with the enhancement of these activities, was on-hand or on-order prior to the decision to proceed with the Engineering Building. Much of it is of the "move-in - plug-in" type and not substantially affixed to the facility. All of this equipment would have been acquired whether the Engineering Building was constructed or not. Alternate proposals for housing the equipment involved the use of substandard facilities at Ellington Air Force Base, further crowding up in improvised space and/or location in several proposed minor addition-type projects at MSC, or as a last resort the use of off-site rental space. It is, therefore, clear that this equipment, regardless of its on-hand or procurement status, is not directly related to the Engineering Building. It is agreed that the Engineering Building did evolve as being the best candidate to house

this equipment. Consequently, minor revisions were made in the planned facility to better accommodate this equipment as a reflection of the decision on its use. The building, however, was intended to and does largely solve basic and broad Center-wide housing needs and its initial assignment to the Earth Resources function does not dilute this primary intent.

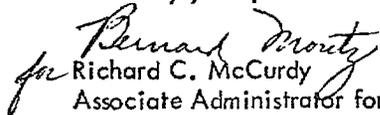
In the FY 1967 presentation to Congress no equipment was indicated as a part of the facility project. Equipment related to on-going MSC programs was intended to be used in the building. This is further substantiated by the fact that the project ultimately approved by NASA likewise did not include such equipment. In either case the equipment involved was not required to make the building useful or operable for the general housing of MSC activities. The subsequent decision to house \$14.8 million of equipment in this building should not alter the fact that inherent in this project was the fact that equipment would be provided from other sources and that any such equipment should not be included in a subsequent reconstruction of the facility project cost.

2. Building - as noted in our detailed comments, the Engineering Building for MSC in the FY 1967 budget estimates (\$2.6 million) was depicted as being basically an office-type structure of about 90,000 gross SF and to be occupied by some 700 engineering/administrative personnel. The Engineering Building, as now planned (\$2.4 million), involves about 84,000 gross SF and is to be occupied by some 300 laboratory/administrative personnel. The building is, therefore, substantially of the same gross size and cost as initially envisioned. The number of occupants is reduced to reflect the allocation of about 75% of this net space to laboratory usage. However, the broad functional or programmatic use is as was initially intended.

The GAO recommends that Congress may wish to consider the desirability of restricting the availability of the construction of facilities appropriation to specific projects by specifying those projects in the legislation. However, such limitation would not necessarily have altered the result in the instant case. The building that is being built can and does still lend itself to the nomenclature "Engineering Building". As long as this is so, specifying the project in the legislative language as such, would not, in our view, have changed the result.

Again, we appreciate the opportunity to present our comments on the draft report and we trust that our position on these points coupled with the explanations provided will serve to place this matter in a more appropriate perspective.

Sincerely yours,

for 
 Richard C. McCurdy
 Associate Administrator for
 Organization and Management

Enclosure

APPENDIX II

NASA COMMENTS ON THE GAO DRAFT REPORT TO THE CHAIRMAN OF THE SENATE COMMITTEE ON AERONAUTICAL AND SPACE SCIENCES, UNITED STATES SENATE, ON REVIEW OF BUILDING AUTHORIZED TO PROVIDE OFFICE SPACE AT MANNED SPACECRAFT CENTER REDESIGNED TO PROVIDE LABORATORY SPACE

The basic General Accounting Office (GAO) findings were that the building had been redesigned to provide primarily laboratory space in lieu of office space for 704 personnel and that approximately \$14.8 million for laboratory equipment was being expended for the redesigned building while no funds were included for equipment in the authorization of the Engineering Building. The GAO further found "no legal basis to question NASA's redesigning the building".

We believe that a review of the MSC Engineering Building should keep in clear focus two distinct elements, i.e., (1) the building, including its scope and cost and (2) the equipment which may ultimately be housed in it. With respect to (1) the GAO Report indicates that the Engineering Building as redesigned is of similar scope (90,000 SF vs. 84,000 SF) and of similar cost (\$2.6M vs. \$2.4M) to that authorized. However, with respect to (2) the GAO Report implies that the equipment which is to be placed in the Engineering Building for the conduct of work associated with the previously approved and established Earth Resources Program should be considered as a part of the cost of the building.

With the foregoing in mind, the following comments represent our position regarding issues raised by the GAO. The quotations were taken from the GAO Draft Report.

- A. "-----Building under construction is estimated to cost \$2.4 million for 'brick and mortar' plus about \$14.8 million for laboratory equipment."

We agree that the Engineering Building under construction is estimated to cost \$2.4 million.

In the FY 1967 presentation to Congress no equipment was indicated as a part of the facility project. Equipment related to on-going MSC programs was intended to be used in the building. This is further substantiated by the fact that the project ultimately approved by NASA likewise did not include such equipment. In either case the equipment involved was not required to make the building useful or operable for the general housing of MSC activities. The subsequent decision to house \$14.8 million of equipment in this building should not alter the fact that inherent in this project was the fact that equipment would be provided from other sources and that any such equipment should not be included in a subsequent reconstruction of the facility project cost.

However, it is emphasized that the \$14.8 million of R&D funds for laboratory equipment would have been expended whether the Engineering Building was constructed or not. This equipment was being purchased or planned for purchase without regard to the ultimate existence or non-existence of the Engineering Building. As a matter of fact, the record shows that over \$1.0 million in

equipment was on hand and over \$2 million in equipment was on order even before consideration of use of the Engineering Building for these functions was originally proposed. Over \$4.0 million in equipment was on hand and over \$8.0 million in equipment on order before the decision was made to locate these functions in the Engineering Building. It is clear that the procurement of this equipment (mainly of the "move-in - plug-in" type) was not intended and in fact was not directly related to the Engineering Building.

B. "-----is substantially different in function, program application, and cost-----"

The Engineering Building presently under construction is not substantially different, in a broad sense, from that initially described to Congress. The basic need for the facility was to enable the Center to meet its broad housing requirements. At that time it was agreed that the requirements were more critical for office space than for laboratory space and as a consequence the building was characterized as an "office building". Subsequent events (i.e., reduction in personnel, shift in program emphasis, authorization by the Congress of an Earth Resources Program, etc.) necessitated a reevaluation of these Center-wide housing requirements. This reevaluation led to the reorientation and redesign of the Engineering Building from one which would initially accommodate primarily office type activities to one that would initially accommodate a combination of office and laboratory activities. It would have been possible to have constructed the building as originally conceived and to have later modified it for different occupancy. However, to do so would have entailed added expense and would not have realistically reflected the basic needs which were then so evident. In this broad context then, NASA, was and is still of the conviction that it has not substantially departed from the broad purpose initially intended to be served by this building.

C. "-----to redesign the Engineering Building Project and to construct the Space Sciences Laboratory-----"

As noted earlier, we agree that the Engineering Building was reoriented and redesigned. It was not, however, redesigned in such a manner or to such a significant degree that it then became dedicated solely to the activities of "the Space Sciences Laboratory". It is our view that too much emphasis should not be placed on nomenclature since in both cases we are dealing with programmatic housing. The currently planned initial use of the Engineering Building is predominantly for some activities of the Space Science function at MSC. As now configured, the Engineering Building will provide approximately 45,200 square feet of laboratory space and 15,800 square feet of office space. With a minimum of cost, for example, it could easily be configured or adapted to provide 46,000 square feet of office space and 15,000 square feet of

APPENDIX II

laboratory space. This building is not now planned to be of such a special character or so unique as that the general and broad purposes involved in its initial intended use have been circumvented. It was intended to have and as planned does have the character of a general purpose facility adaptable to a variety of functions as program changes occur and certain housing needs are revised.

D. "-----to provide administrative-type space-----"

The project description did not address itself to the type of space nor the functions to be provided, but simply states: "It will accommodate 704 engineering and administrative personnel". However, the Project Purpose does indicate that the project (Engineering Building) will provide the Manned Spacecraft Center with administrative-type space for center functions associated with manned space flight mission operations, and the development, test, and evaluation of manned spacecraft systems and subsystems. The activities of the Earth Resources program certainly are functions associated with space flight. Development of remote sensors and the techniques related to the reduction, correlation, and interpretation of the sensor data will be one of the major activities undertaken within the Engineering Building. These sensors will be used aboard spacecraft as well as aircraft to make quantitative measurements in agriculture, cartography, forestry, geography, geology, hydrology, and oceanography. It is the NASA view that the primary element of concern are the functions to be housed and not the details relating to "type of space". It therefore follows that the Engineering Building as now planned is in consonance with this aspect of concern.

E. "-----was advised of NASA's redesign of the Engineering Building to a Space Science Laboratory."

As noted in C. above, NASA does not agree that the Engineering Building was redesigned as a Space Science Laboratory nor that it was or is now NASA's intent to consider the reoriented Engineering Building in the same context as the previously considered Space Science and Application Laboratory. The Engineering Building is basically a general purpose facility adaptable to a variety of functions. Even though it is currently planned that it will be initially used by activities associated with the Earth Resources program this fact does not change the basic NASA intent to relate it to broad Center housing needs.

- F. "The first such report was-----on March 5, 1970." "With regard-----in June 1970. No mention was made-----"

The report indicated the status of Construction Projects in Progress as of December 31, 1969. At that time (December 31, 1969) the Engineering Building, as a matter of fact, was not scheduled for construction although there was a proposal on the part of MSC to construct it and this was under consideration in NASA Headquarters. This desire, on the part of MSC, had been in existence since 1966 when the "final" design of the Engineering Building was first initiated. The fact that the Associate Administrator for Manned Space Flight and the Director of Facilities had in October 1969 concluded that a redesigned Engineering Building was a prudent action did not represent a NASA decision. Their predecessors had concluded that an Engineering Building satisfying a different set of conditions was necessary some three years earlier. It is noted that a contract was awarded on March 6, 1970 (the report was "as of" December 31, 1969) for preparation of a "Feasibility Study for Redesign of Engineering Building". It is therefore very clear that the NASA report referred to was accurate and as complete as could reasonably have been expected.

- G. "The functional capability of the building-----"

We do not agree that the functional capability of the building is different from that authorized by the Congress. The primary function of the building was to provide environmentally conditioned space in which personnel could perform their assigned duties. As noted elsewhere, the currently planned initial utilization of the Engineering Building will be by elements of the MSC staff engaged in office and laboratory activities of the Earth Resources Program. This does not mean that increased office activities or, for that matter, laboratory activities are precluded from later consideration for assignment to the Engineering Building. While there is a modification in the initial occupancy, the functional capability of the building remains substantially the same as initially planned.

- H. "Differences Between Original and Redesigned Engineering Building"

The tabulation under this heading as presented is in NASA's opinion grossly misleading. As noted earlier, the equipment (\$14.8 million) listed and thereby implied as a part of the redesigned Engineering Building was in part acquired before any consideration was given to its placement in the

APPENDIX II

Engineering Building. Additional equipment was acquired and still more was ordered before the final decision to redesign the Engineering Building was made. This equipment would have been placed in and utilized in such temporary space at Ellington Air Force Base or in other improvised areas of MSC had the Engineering Building not emerged as the best overall solution to Center housing problems. This equipment was being acquired in order that MSC could satisfy the requirements of the previously approved and established Earth Resources Survey Program at MSC. In any event, in the FY 1967 presentation to Congress no equipment was indicated as a part of the facility project. Equipment related to on-going MSC programs was intended to be used in the building. This is further substantiated by the fact that the project ultimately approved by NASA likewise did not include such equipment. In either case the equipment involved was not required to make the building useful or operable for the general housing of MSC activities. The subsequent decision to house \$14.8 million of equipment in this building should not alter the fact that inherent in this project was the fact that equipment would be provided from other sources and that any such equipment should not be included in a subsequent reconstruction of the facility project cost. It is the NASA position that the procurement, use and ultimate location of this equipment are distinct and separate matters from the construction of the Engineering Building which should be evaluated solely on its own merits.

- I. -----"The building being constructed, however, includes laboratory equipment-----"

The building (Engineering Building) being constructed was not intended to and does not now include laboratory equipment. Equipment acquired in support of an approved MSC program will be placed in the Engineering Building when the building is completed in accordance with current plans. This utilization of the building is considered to be the highest and best under the current Center-wide housing situation now existing and expected to exist in the immediate future.

- J. "Conclusions"

We refer to our response under items B, C, D, E, and G for our comments regarding function and cost and to our response under items A, F, H, and I for our comments regarding laboratory equipment. In summary, it is the NASA position that the construction of the Engineering Building at MSC

is a matter to be considered by itself in the context of broad MSC housing requirements. In this context, which NASA feels is the only appropriate one, the Engineering Building as now proposed is within the scope and cost of the FY 1967 authorization and is planned to serve the basic functional or programmatic purposes intended. The equipment to be housed in this building should not be coupled with this building but considered separately. This equipment would have been necessary and provided without regard to the Engineering Building to support established Earth Resources Program activities at MSC. It is the NASA view then that the decision to proceed with the construction of the Engineering Building was legal and proper and that it was a sound and prudent action.

APPENDIX III

PRINCIPAL OFFICIALS OF THE
 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 RESPONSIBLE FOR THE ACTIVITIES
 DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
ADMINISTRATOR:		
George M. Low (acting)	Sept. 1970	Present
Thomas O. Paine	Oct. 1968	Sept. 1970
James E. Webb	Feb. 1961	Oct. 1968
DEPUTY ADMINISTRATOR:		
George M. Low	Dec. 1969	Present
Thomas O. Paine	Mar. 1968	Oct. 1968
Robert C. Seamans, Jr.	Dec. 1965	Jan. 1968
ASSOCIATE ADMINISTRATOR FOR MANNED SPACE FLIGHT:		
Dale D. Myers	Jan. 1970	Present
Charles W. Mathews (acting)	Dec. 1969	Jan. 1970
George E. Mueller	Sept. 1963	Dec. 1969
ASSOCIATE ADMINISTRATOR FOR ORGANIZATION AND MANAGEMENT:		
Richard C. McCurdy	Oct. 1970	Present
Bernard Moritz (acting)	May 1969	Oct. 1970
Harold B. Finger	Mar. 1967	May 1969
ASSISTANT ADMINISTRATOR FOR ADMINISTRATION:		
William B. Lilly	Mar. 1967	Present
John D. Young	Jan. 1966	Mar. 1967
DIRECTOR OF FACILITIES:		
Robert H. Curtin	May 1968	Present
Ralph E. Cushman	Jan. 1966	May 1968

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
DIRECTOR, MANNED SPACECRAFT CENTER: Robert R. Gilruth	Nov. 1961	Present