National Aeronautics and Space Administration

BUDGET ESTIMATES

FISCAL YEAR 1965

Volume III

CONSTRUCTION OF FACILITIES

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1965 ESTIMATES

CONSTRUCTION OF FACILITIES

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

GENERAL STATEMENT

This appropriation provides for the design, construction, modernization of facilities, purchase of equipment and advanced design of facilities planned for future authorization. The programs are described below:

MANNED SPACE FLIGHT: This activity includes estimates for projects for the manned space flight programs, which include both the Apollo spacecraft program and the Saturn launch vehicles. Launch support facilities are included for the Saturn V vehicle, the Apollo spacecraft; also development, ground testing and support facilities are included in this item.

UNMANNED INVESTIGATIONS IN SPACE: Included in this activity are the projects for space science and applications for modifications of facilities to improve testing capability, engineering and support facilities for the unmanned lunar and planetary exploration program, and improvements in facilities for unmanned spacecraft missions and launch areas.

SPACE RESEARCH AND TECHNOLOGY: Projects in this category are for research and supporting facilities, laboratories and other facilities for the proposed Electronics Research Center and technical facilities for contractors engaged in development of the M-1 engine system.

AIRCRAFT TECHNOLOGY AND SUPPORTING OPERATIONS: Estimates for these areas include an advanced aircraft research facility and housing for fatigue research equipment, and facilities for tracking and data acquisition.

The appropriation for 1964 was $673,500,000 and represents a decrease of $39,500,000 when compared with the authorized program level of $713,000,000. $281,000,000 is requested for 1965; a decrease of $392,500,000 from 1964 appropriation. Expenditures are estimated at a level of $520,000,000 in 1965, an increase of $294,700,000 over the actual $225,300,000 for 1963 and $45,000,000 over the estimated $475,000,000 for 1964.

There is provided in this volume schedules supporting the authorization and appropriation request for fiscal year 1965.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1965 ESTIMATES

SUMMARY OF CONSTRUCTION OF FACILITIES BUDGET PLAN BY BUDGET ACTIVITY

	Budget Activity	Fiscal Year 1963	Fiscal Year 1964	Fiscal Year 1965
1.	Manned Space Flight.....	$543,809,100	$495,179,000	$234,330,000
2.	Space Applications.....	193,605	3,933,000	---
3.	Unmanned Investigations in Space.....	47,261,650	18,574,200	7,018,000
4.	Space Research and Technology	106,849,300	56,832,800	26,620,000
5.	Aircraft Technology.....	1,697,000	100,000	4,001,000
6.	Supporting Operations.....	42,608,495	98,881,000	9,031,000
	Total Plan.....	$742,419,150	$673,500,000	$281,000,000

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1965 ESTIMATES

SUMMARY OF CONSTRUCTION OF FACILITIES BUDGET PLAN AS RECONCILED TO FINANCING SCHEDULE

	Fiscal Year 1963	Fiscal Year 1964	Fiscal Year 1965
Budget plan.....	$742,419,150	$673,500,000	$281,000,000
Financing:			
Appropriation.....	$776,237,000	$680,000,000	$281,000,000
Transferred to:			
"Research, development, and operation" (76 Stat. 731)..	-32,602,850	---	---
"Administrative operations" (77 Stat. 439).....	---	-6,500,000	---
Appropriation (adjusted).	743,634,150	673,500,000	281,000,000
Transfer to "Research, development, and operation" in FY 1964 (76 Stat. 731)....	-1,215,000	---	---
Total financing of budget plan.....	$742,419,150	$673,500,000	$281,000,000

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1965 ESTIMATES

SUMMARY OF CONSTRUCTION OF FACILITIES BUDGET PLAN
BY BUDGET ACTIVITY SHOWING LOCATION TOTALS INCLUDED IN EACH ACTIVITY

	Fiscal Year 1963	Fiscal Year 1964	Fiscal Year 1965
1. MANNED SPACE FLIGHT.....	$543,809,100	$495,179,000	$234,330,000
John F. Kennedy Space Center, NASA.....	296,479,100	279,236,000	89,520,000
Manned Spacecraft Center....	25,369,500	35,172,000	25,166,000
Marshall Space Flight Center	41,740,500	28,980,000	15,288,000
Michoud Plant.....	28,910,000	8,688,000	6,534,000
Mississippi Test Facility...	78,407,000	93,656,000	61,991,000
Various Locations.....	72,903,000	42,583,000	26,411,000
Facility Planning and Design	---	6,864,000	9,420,000
2. SPACE APPLICATIONS.....	$193,605	$3,933,000	---
Goddard Space Flight Center.	193,605	3,933,000	---
3. UNMANNED INVESTIGATIONS IN SPACE.....	$47,261,650	$18,574,200	$7,018,000
Ames Research Center.....	930,000	---	---
Goddard Space Flight Center.	18,708,750	13,099,500	500,000
Jet Propulsion Laboratory...	10,208,050	2,998,200	3,314,000
John F. Kennedy Space Center, NASA.....	8,659,000	1,680,000	1,741,000
Lewis Research Center.....	1,186,500	---	---
Various Locations.....	6,799,350	---	---
Wallops Station.....	770,000	---	713,000
Facility Planning and Design	---	796,500	750,000
4. SPACE RESEARCH AND TECHNOLOGY.	$106,849,300	$56,832,800	$26,620,000
Ames Research Center.....	13,711,000	11,044,000	3,451,000
Electronics Research Center.	---	---	10,000,000
Flight Research Center.....	60,000	1,157,000	---
Jet Propulsion Laboratory...	---	---	400,000
Langley Research Center.....	8,263,300	7,045,300	3,233,000
Lewis Research Center.....	44,630,000	18,634,000	810,000
Nuclear Rocket Development Station.....	14,835,000	3,240,000	---

	Fiscal Year 1963	Fiscal Year 1964	Fiscal Year 1965
Various Locations.....	$25,350,000	$13,900,000	$5,846,000
Facility Planning and Design	---	1,812,500	2,880,000
5. AIRCRAFT TECHNOLOGY.....	$1,697,000	$100,000	$4,001,000
Ames Research Center.....	---	---	2,630,000
Flight Research Center.....	1,697,000	---	---
Langley Research Center.....	---	---	1,221,000
Facility Planning and Design	---	100,000	150,000
6. SUPPORTING OPERATIONS.....	$42,608,495	$98,881,000	$9,031,000
Goddard Space Flight Center.	2,915,000	---	800,000
John F. Kennedy Space Center NASA.....	---	4,000,000	---
Langley Research Center.....	1,831,000	1,159,000	---
Various Locations.....	34,471,745	92,300,000	5,340,000
Wallops Station.....	3,390,750	505,000	1,091,000
Facility Planning and Design	---	917,000	1,800,000
TOTAL PLAN.....	$742,419,150	$673,500,000	$281,000,000

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1965 ESTIMATES

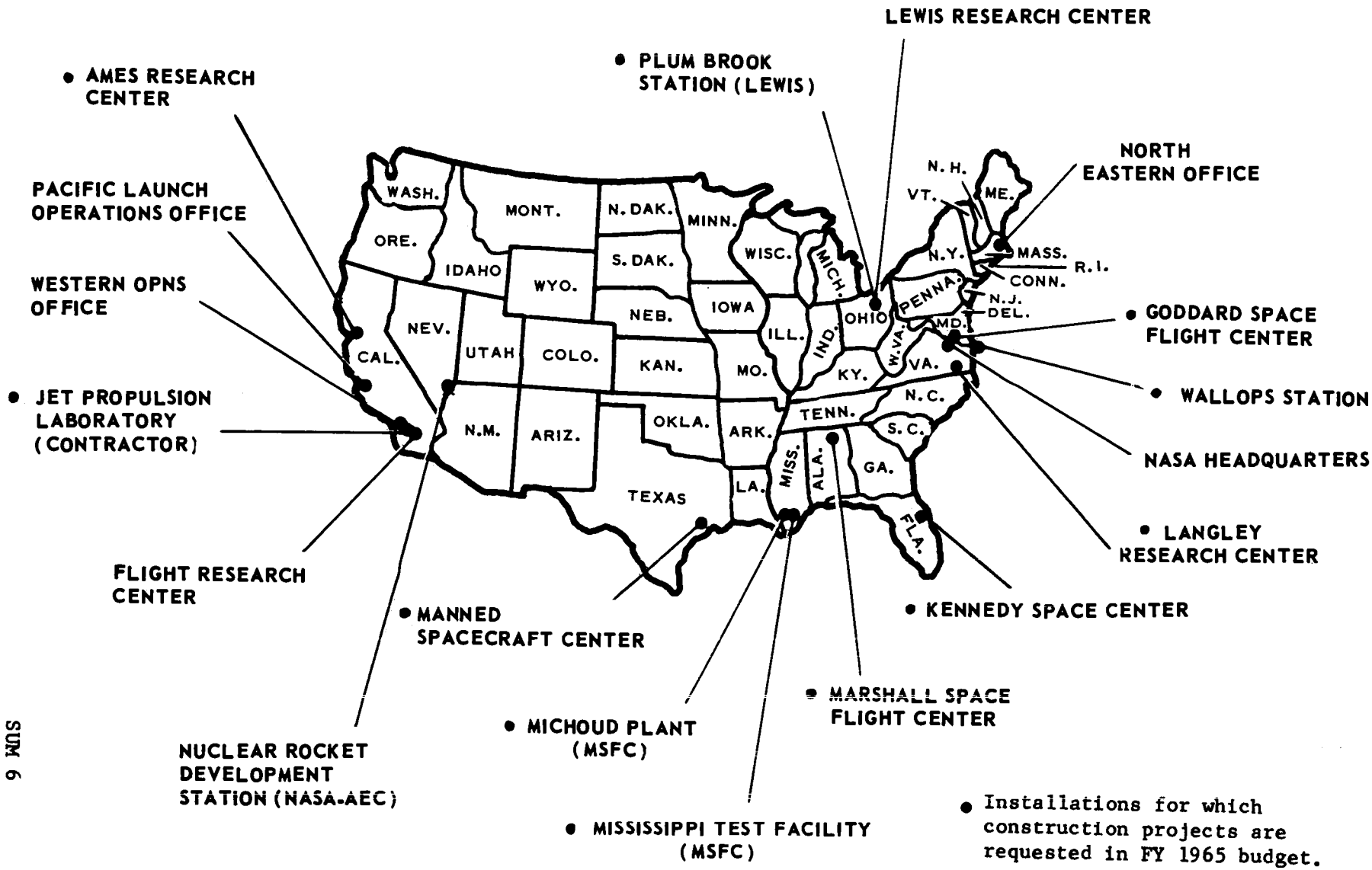
SUMMARY OF CONSTRUCTION OF FACILITIES BUDGET PLAN BY LOCATION

Location	Fiscal Year 1963	Fiscal Year 1964	Fiscal Year 1965
Ames Research Center	$14,641,000	$11,044,000	$6,081,000
Electronics Research Center	---	---	10,000,000
Flight Research Center	1,757,000	1,157,000	---
Goddard Space Flight Center	21,817,355	17,032,500	1,300,000
Jet Propulsion Laboratory	10,208,050	2,998,200	3,714,000
John F. Kennedy Space Center, NASA	305,138,100	284,916,000	91,261,000
Langley Research Center	10,094,300	8,204,300	4,454,000
Lewis Research Center	45,816,500	18,634,000	810,000
Manned Spacecraft Center	25,369,500	35,172,000	25,166,000
Marshall Space Flight Center	41,740,500	28,980,000	15,288,000
Michoud Plant	28,910,000	8,688,000	6,534,000
Mississippi Test Facility	78,407,000	93,656,000	61,991,000
Nuclear Rocket Development Station	14,835,000	3,240,000	---
Various Locations	139,524,095	148,783,000	37,597,000
Wallops Station	4,160,750	505,000	1,804,000
Facility Planning and Design 1/	---	10,490,000	15,000,000
Total Plan	$742,419,150	$673,500,000	$281,000,000

1/Amounts appropriated in fiscal year 1963 are reflected by location.

A geographic location of existing NASA installations follows with those identified for which construction projects are requested in the fiscal year 1965 budget.

NASA INSTALLATIONS



• Installations for which construction projects are requested in FY 1965 budget.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

AMES RESEARCH CENTER

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Instrument building extension	CF 1-11

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AMES RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

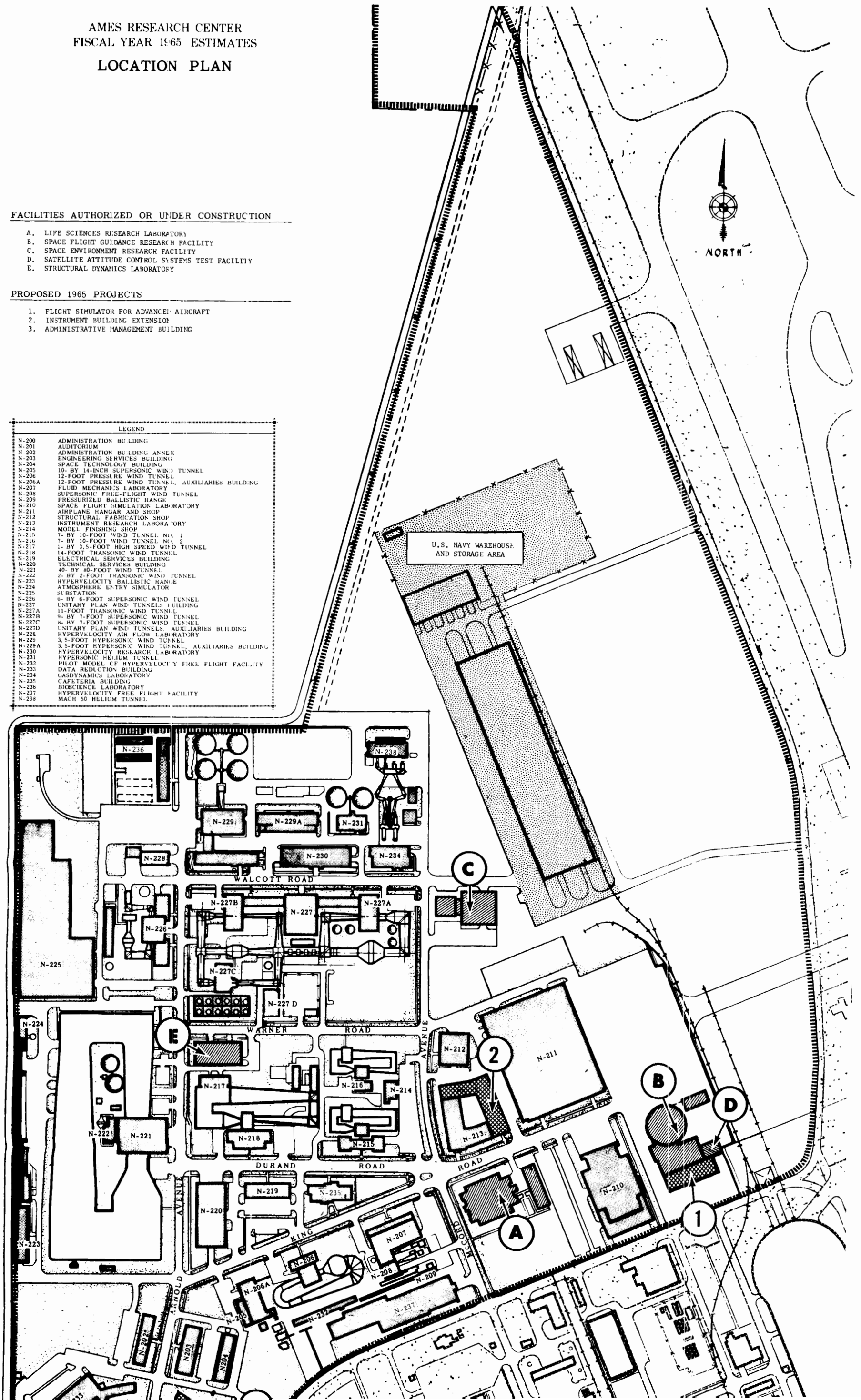
LOCATION PLAN

FACILITIES AUTHORIZED OR UNDER CONSTRUCTION

A. LIFE SCIENCES RESEARCH LABORATORY
B. SPACE FLIGHT GUIDANCE RESEARCH FACILITY
C. SPACE ENVIRONMENT RESEARCH FACILITY
D. SATELLITE ATTITUDE CONTROL SYSTEMS TEST FACILITY
E. STRUCTURAL DYNAMICS LABORATORY

PROPOSED 1965 PROJECTS

1. FLIGHT SIMULATOR FOR ADVANCED AIRCRAFT
2. INSTRUMENT BUILDING EXTENSION
3. ADMINISTRATIVE MANAGEMENT BUILDING



LEGEND

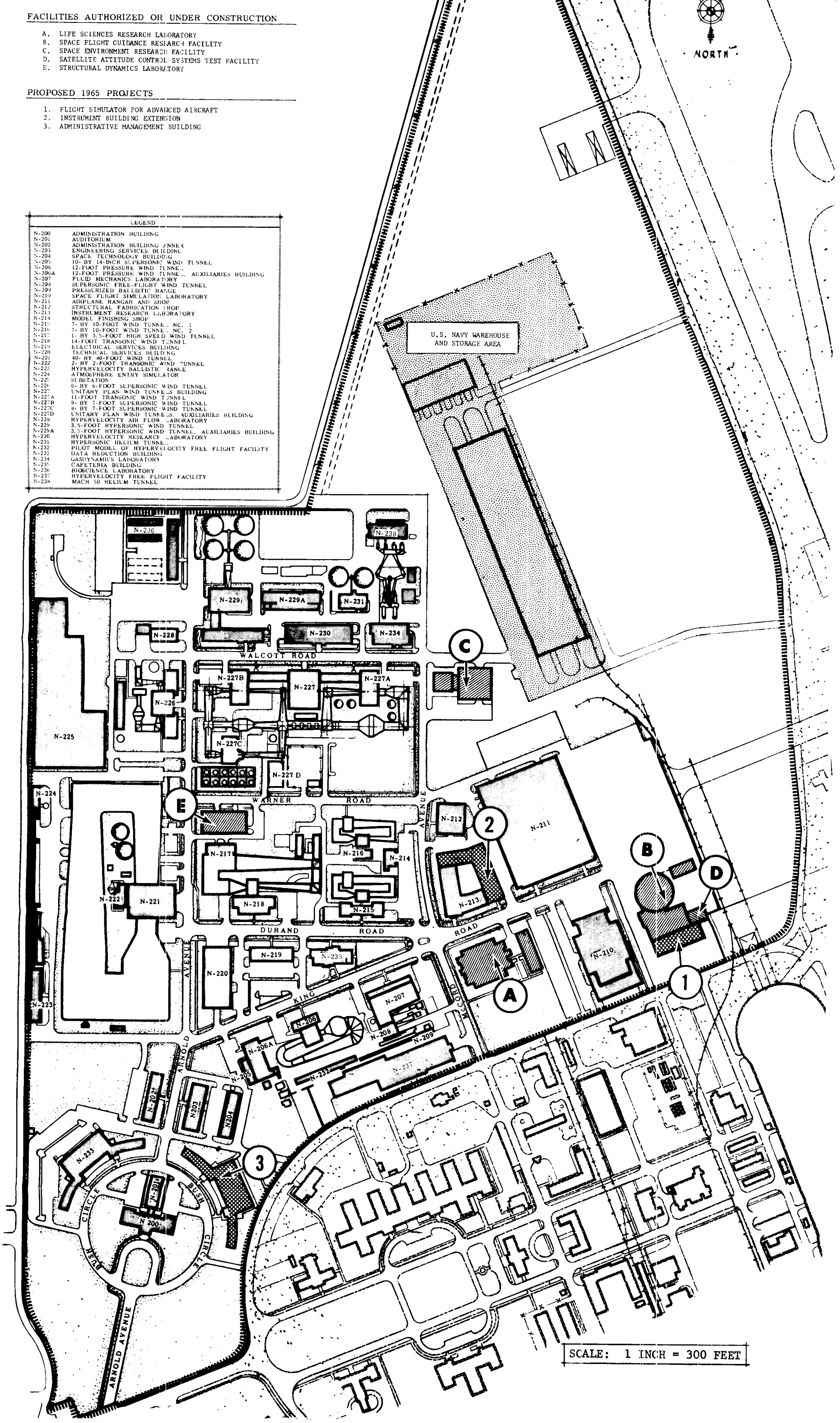
N-200	ADMINISTRATION BUILDING
N-201	AUDITORIUM
N-202	ADMINISTRATION BUILDING ANNEX
N-203	ENGINEERING SERVICES BUILDING
N-204	SPACE TECHNOLOGY BUILDING
N-205	10- BY 14-INCH SUPERSONIC WIND TUNNEL
N-206	12-FOOT PRESSURE WIND TUNNEL
N-206A	12-FOOT PRESSURE WIND TUNNEL, AUXILIARIES BUILDING
N-207	FLUID MECHANICS LABORATORY
N-208	SUPERSONIC FREE-FLIGHT WIND TUNNEL
N-209	PRESSURIZED BALLISTIC RANGE
N-210	SPACE FLIGHT SIMULATION LABORATORY
N-211	AIRPLANE HANGAR AND SHOP
N-212	STRUCTURAL FABRICATION SHOP
N-213	INSTRUMENT RESEARCH LABORATORY
N-214	MODEL FINISHING SHOP
N-215	7- BY 10-FOOT WIND TUNNEL NO. 1
N-216	7- BY 10-FOOT WIND TUNNEL NO. 2
N-217	1- BY 3.5-FOOT HIGH SPEED WIND TUNNEL
N-218	14-FOOT TRANSONIC WIND TUNNEL
N-219	ELECTRICAL SERVICES BUILDING
N-220	TECHNICAL SERVICES BUILDING
N-221	40- BY 80-FOOT WIND TUNNEL
N-222	2- BY 2-FOOT TRANSONIC WIND TUNNEL
N-223	HYPERVELOCITY BALLISTIC RANGE
N-224	ATMOSPHERE ENTRY SIMULATOR
N-225	SUBSTATION
N-226	6- BY 6-FOOT SUPERSONIC WIND TUNNEL
N-227	UNITARY PLAN WIND TUNNELS BUILDING
N-227A	11-FOOT TRANSONIC WIND TUNNEL
N-227B	9- BY 7-FOOT SUPERSONIC WIND TUNNEL
N-227C	8- BY 7-FOOT SUPERSONIC WIND TUNNEL
N-227D	UNITARY PLAN WIND TUNNELS, AUXILIARIES BUILDING
N-228	HYPERVELOCITY AIR FLOW LABORATORY
N-229	3.5-FOOT HYPERSONIC WIND TUNNEL
N-229A	3.5-FOOT HYPERSONIC WIND TUNNEL, AUXILIARIES BUILDING
N-230	HYPERVELOCITY RESEARCH LABORATORY
N-231	HYPERSONIC HELIUM TUNNEL
N-232	PILOT MODEL OF HYPERVELOCITY FREE FLIGHT FACILITY
N-233	DATA REDUCTION BUILDING
N-234	GASDYNAMICS LABORATORY
N-235	CAFETERIA BUILDING
N-236	BIOSCIENCE LABORATORY
N-237	HYPERVELOCITY FREE FLIGHT FACILITY
N-238	MACH 50 HELIUM TUNNEL

FACILITIES AUTHORIZED OR UNDER CONSTRUCTION

A. LIFE SCIENCES RESEARCH LABORATORY
B. SPACE FLIGHT GUIDANCE RESEARCH FACILITY
C. SPACE ENVIRONMENT RESEARCH FACILITY
D. SATELLITE ATTITUDE CONTROL SYSTEMS TEST FACILITY
E. STRUCTURAL DYNAMICS LABORATORY

PROPOSED 1965 PROJECTS

1. FLIGHT SIMULATOR FOR ADVANCED AIRCRAFT
2. INSTRUMENT BUILDING EXTENSION
3. ADMINISTRATIVE MANAGEMENT BUILDING



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 19 65 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Ames Research Center	Advanced Research and Technology	Mountain View, Calif.	Santa Clara	Mountain View

INSTALLATION MISSION

Laboratory research in aerodynamics, thermodynamics, materials, structures, guidance and control, space sciences, environmental biology, life detection, life synthesis, human factors, and fundamental physics and chemistry; project management of unmanned spaceflight projects (scientific probes and satellites); development of scientific-experiment payloads for spaceflight projects managed at Ames and elsewhere.

PERSONNEL STRENGTH	FY 19 63	FY 1964	FY 19 65
NASA PERSONNEL *(End of Year)*	2,116	2,196	2,196
CONTRACTOR & OTHER PERSONNEL	100	106	120
TOTAL ALL PERSONNEL	2,216	2,302	2,316

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	115	
LAND *(Lease or Permit)*	120	
PLANT VALUE *(as of June 30, 19 63)*		140,701
TOTAL	235	140,701

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 19 63 AND PRIOR YEARS	FY 19 64 *(Estimated)*	FY 19 65 *(Estimated)*	FUTURE YEARS *(Estimated*	TOTAL ALL YEARS *(Estimated)*
Administrative management building	OART	71	---	1,455	---	1,526
Flight simulator for advanced aircraft	OART	---	20	2,630	---	2,650
Instrument building extension	OART	---	75	1,996	---	2,071
TOTAL FOR PROJECTS IN FY 19 65 ESTIMATE				6,081		

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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ADMINISTRATIVE MANAGEMENT BUILDING

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Ames Research Center

LOCATION OF PROJECT: Moffett Field, Santa Clara County, California

COGNIZANT NASA INSTALLATION: Ames Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$71,000
FY 1964 Estimate	---
FY 1965 Estimate	$1,455,000
Total Funding Through FY 1965	$1,526,000

PROJECT COST ESTIMATES:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,353,000
Site development	LS	---	$14,500	14,500
Roads, walks, parking	LS	---	71,500	71,500
Utilities	LS	---	40,000	40,000
Building	Sq. Ft.	64,700	18.96	1,227,000
Equipment	---	---	---	---
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
		SUBTOTAL		$1,353,000
Fallout Shelter	---	---	---	102,000
		TOTAL		$1,455,000

PROJECT DESCRIPTION:

The proposed Administrative Management Building will consist of a central, two-story portion, 194 feet wide by 90 feet deep and two one-story wings each 110 feet wide by 35 feet deep. There will be a basement under the central portion only.

This building is needed to provide the minimum space required for approximately 280 persons comprising essentially all administrative-support personnel. The architectural and engineering design of the building is essentially complete. For economy and architectural compatibility, the reinforced concrete exterior and structure will be essentially identical with the existing Data Reduction Building. The location of the proposed building and a photograph of the existing Data Reduction Building are shown in figure 1.

PROJECT JUSTIFICATION:

Personnel in the Administrative divisions now have an average of only 67 square feet per person of office space including space occupied by files, etc. By fiscal year 1966 they will be crowded into an intolerable 52 square feet per person if more space is not provided. It is not feasible to usurp more space from research groups; on the contrary, research workers are already overcrowded by GSA standards and, in the near future, will be required to reclaim some of the offices now occupied by administrative personnel. As a temporary expedient to alleviate this overcrowding, it has become necessary to rent trailers.

Use of office space scattered about the Center has dispersed administrative functions to the further detriment of their efficiency. The plot plan shown in figure 2 illustrates this dispersion. Such dispersion separates many personnel from their supervisors and co-workers on common projects. All this breeds mistakes and inefficiency.

The proposed Administrative Management Building will provide space for Personnel, Procurement, Contract Negotiation and Administration, Administrative Services, Legal Matters, Public Affairs, Reproduction, and Management Analysis.

The space to be relinquished by administrative personnel now in the Administration Building will be used to provide space for the Assistant

Director for Life Sciences and his immediate staff, to provide adequate space for the Technical Planning Division, to alleviate overcrowding of the Director's immediate clerical staff, to provide space for visitor-control operations, and to provide space remote from restricted areas for discussions between visitors and Ames employees. The space vacated in the existing Administration Building Annex will be used to bring together the now-dispersed fiscal activities and to provide needed expansion of the Center's technical library.

ESTIMATED FUTURE YEAR FUNDING: None

AMES RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

ADMINISTRATIVE MANAGEMENT BUILDING

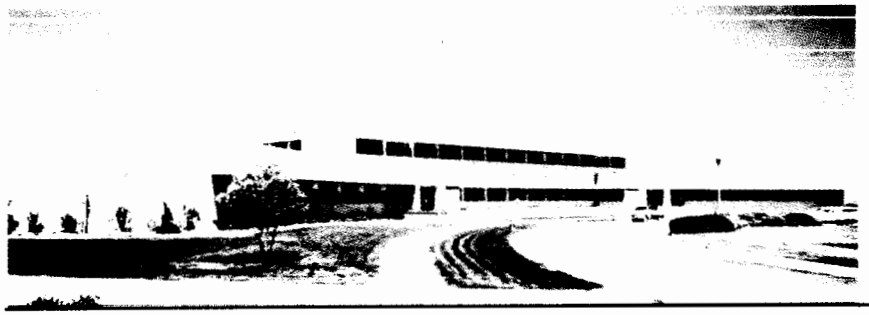
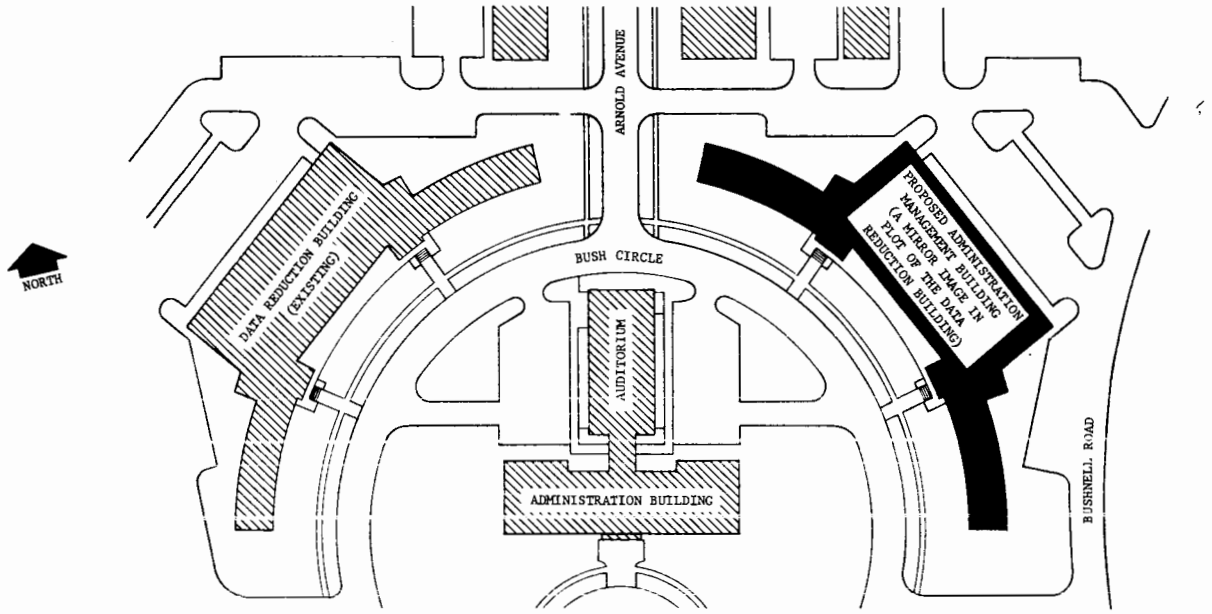


PHOTO OF DATA REDUCTION BUILDING
PROPOSED ADMINISTRATIVE MANAGEMENT
BUILDING TO BE SIMILAR IN APPEARANCE



GENERAL ARRANGEMENT

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FLIGHT SIMULATOR FOR ADVANCED AIRCRAFT

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Ames Research Center

LOCATION OF PROJECT: Moffett Field, Santa Clara County, California

COGNIZANT NASA INSTALLATION: Ames Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$20,000
FY 1965 Estimate	2,630,000
Total Funding Through FY 1965	$2,650,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$2,483,000
Utilities, parking	LS	---	$25,000	25,000
Electrical distribution	LS	---	40,000	40,000
Building	Sq. Ft.	9,000	18.00	162,000
Foundations for motion-generator equipment	LS	---	123,000	123,000
Cab struct. & Partial internal equipment	LS	---	165,000	165,000
Motion generator structure	LS	---	528,000	528,000
Motion generator drives	LS	---	560,000	560,000
Electrical and control equipment	LS	---	800,000	800,000
Visual projection equipment	LS	---	80,000	80,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Equipment				$147,000
Tie-in to existing analog computers	LS	---	$27,000	27,000
Computer control equipment	LS	---	120,000	120,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$2,630,000

PROJECT DESCRIPTION:

The flight simulator will provide simultaneously all of the essential sensory cues (visual and motion) associated with the manual control of advanced aircraft and spacecraft during critical phases of operation. The simulator will be housed in a 9,000 square foot, single-floor addition to the Ames Space Flight Guidance Research Facility (authorized in FY 1963 CoF budget) and will consist of three major elements: (1) a moving cab with associated motion-generating equipment, (2) a visual-projection system, and (3) analog computing equipment. Construction of Facilities funding is required for the building addition, the cab, and the motion-generating equipment. Other elements of the simulator will be supplied from equipment and components available at Ames.

The cab will carry three crewmen and will be furnished internally with instruments, controls, and equipment which can be arranged to simulate the cockpit interior of the vehicle under study. The cab will move, in three angular and three translational degrees of freedom, in response to pilot control. The visual projection system will simulate the external visual environment, as viewed through the cab windshield, and will be servo-controlled to maintain the proper relative orientation as the cab maneuvers. Analog computers will control the equipment to provide proper cab motion determined, in part, by programmed inertial and aerodynamic characteristics and, in part, by pilot control movements and simulated external disturbances (e.g., rough air).

The proposed facility will include, in addition to the simulator, a control room and supporting shop. No offices will be provided and no personnel will be permanently housed in the building.

PROJECT JUSTIFICATION:

Many advanced airplane and spacecraft designs now under development require additional crew members to aid the pilot in managing the complex systems necessary for the operation of the vehicle. New problems of aircrew coordination are introduced which must necessarily be considered in defining vehicle design limits that depend on the capabilities of the pilot and aircrew. The adequacy of existing one-man flight simulators to cope with these problems and provide meaningful solutions is severely limited.

Experience with modern subsonic jet and piston transports has shown that under some operating conditions airplanes designed to existing specifications tax the capabilities of the pilot to the limit. The workload reaches its peak as the airplane approaches the landing terminal under instrument flight conditions. The operation of supersonic transports will add to the complexity of all of the problems experienced in subsonic transport operations and, unless adequate solutions are found, will tax the capabilities of the already overburdened pilot and crew even further.

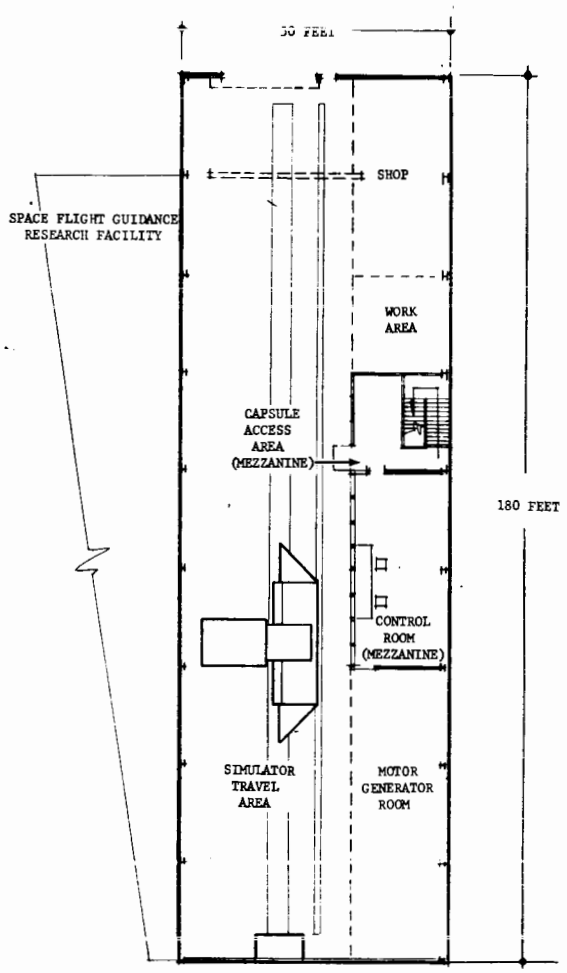
Problems generally have been met and overcome during the development of the subsonic air transport system. Two factors must be noted, however, which have played an extremely important part in this relatively successful development; first, the advances have come at a relatively slow rate, and second, military flight experience has been available with identical or similar aircraft prior to commercial use. In the case of the supersonic transport, neither of these beneficial factors will be present. The only feasible method of substituting for the technical guidance of real flight experience in an acceptable time period is through the use of the simulation technique.

The flight simulator described in this proposal will provide a unique research capability which, in addition to its general applicability to many advanced manned-vehicle control problems, will play an essential role in achieving early solutions to these critical supersonic transport problems. An entire operational flight can be simulated in real time, thus properly conditioning the pilot and crew for their critical let-down and landing tasks by subjecting them to all of the earlier stresses of the flight in proper time sequence.

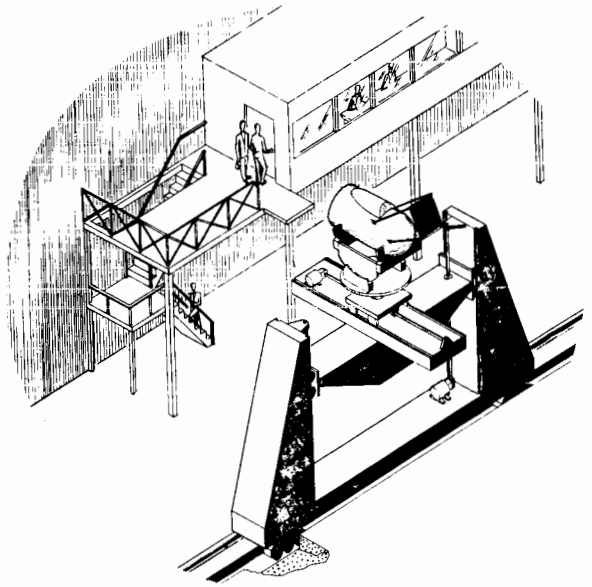
ESTIMATED FUTURE YEAR FUNDING: None

AMES RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

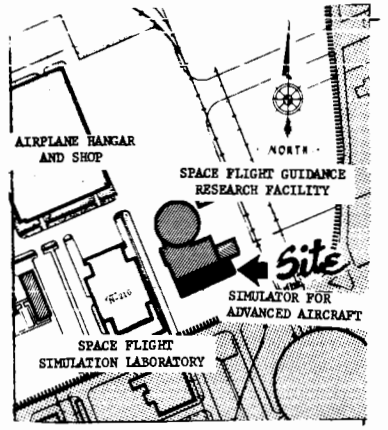
FLIGHT SIMULATOR FOR ADVANCED AIRCRAFT



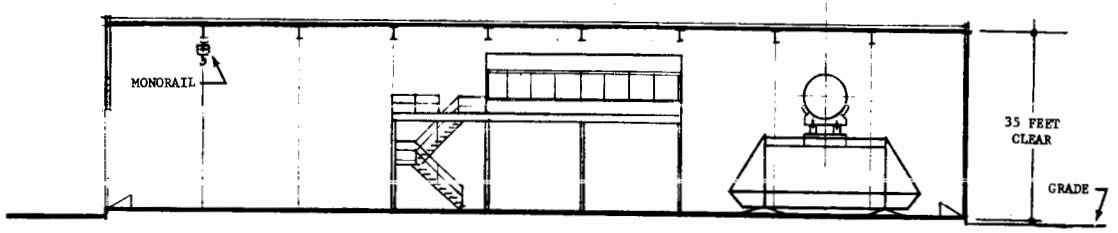
FLOOR PLAN



SCHEMATIC ISOMETRIC



PLOT PLAN



LONGITUDINAL SECTION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

INSTRUMENT BUILDING EXTENSION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Ames Research Center

LOCATION OF PROJECT: Moffett Field, Santa Clara County, California

COGNIZANT NASA INSTALLATION: Ames Research Center

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$75,000
FY 1965 Estimate	1,996,000
Total Funding Through FY 1965	$2,071,000

PROJECT COST ESTIMATES:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,286,000
Utilities	LS	---	$75,000	75,000
Electrical distribution	LS	---	45,000	45,000
Building	Sq. Ft.	46,000	21.00	966,000
Particular mech., plumbing and electrical	LS	---	200,000	200,000
Equipment				$630,000
Nuclear magnetic resonance equipment	LS	---	60,000	60,000
Microwave equipment	LS	---	97,000	97,000
Chemical analysis equipment	LS	---	60,000	60,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Clean room	LS	---	$40,000	40,000
Densitometric equipment	LS	---	35,000	35,000
Sensor materials processing equipment	LS	---	75,000	75,000
Shielded rooms	LS	---	25,000	25,000
Supporting instruments	LS	---	128,000	128,000
Instrument fabrication and assembly tools	LS	---	110,000	110,000
Design	---	---	---	---
		SUBTOTAL		$1,916,000
Fallout Shelter				$80,000
		TOTAL		$1,996,000

PROJECT DESCRIPTION:

This proposal covers an extension of the present Instrument Building as shown on the attached drawing. The extension will add a total of about 46,000 square feet of space, included in two floors and a partial basement, to the existing building. It will provide additional laboratories and shops for research and development on sensors, instrument systems, and measurement techniques especially needed to support the enlarged physical sciences and new life sciences activities at the Ames Research Center.

Included within the extension will be about 25,000 square feet of laboratory-office area and 6,000 square feet of shop area. The new wings will contain a diagnostics area primarily concerned with instrument problems as approached by spectroscopic measurement techniques; a sensors area in which transducers will be tailor-made for application to specific sensors problems; a life-sciences-systems area which will provide for development of complete instrument systems and for checkout and calibration of integrated sensor systems such as might be incorporated in a restraint couch for a centrifuge; and lastly, a shop area to be devoted to fabrication, assembly, and calibration of instruments and instrument systems.

PROJECT JUSTIFICATION:

The present instrumentation facilities were designed to meet the needs of Ames Research Center in 1950, when the research programs of the Center were primarily concerned with "conventional" aeronautics. In addition to the increased scope of the aeronautics programs, new research programs in the physical sciences and life sciences have generated a greatly increased requirement for instrumentation support. The initial expansion of this work has been accomplished within the existing instrumentation division

facilities; however, the degree of congestion existing there will not permit further necessary growth. The quality of the present research is severely handicapped by inadequate instrumentation support.

One important area in which the Center must expand its program is that of long-range research on new measurement techniques. The instrumentation division at Ames has emphasized short-range solutions to instrumentation problems. The continuing trend toward higher speeds and operating altitudes for aircraft and higher entry velocities for spacecraft have focused attention on the field of rarefied gas dynamics, an understanding of which is dependent on data derived from pressure sensors. The instrumentation division has achieved a degree of success on this problem. One of the factors limiting performance of a present sensor is the energy loss due to the internal friction in the diaphragm material. Available theories describing energy dissipation in vibrating solids are unable to predict or explain the experimental results. A clear understanding of this phenomenon is fundamental not only to the improvement of the pressure sensor but also to the development of many devices important to space technology. The equipment and laboratories proposed will greatly facilitate future instrumentation research projects. Other examples of highly specialized measurement requirements associated with research on the aerothermodynamics of atmosphere entry pose an entirely new set of instrument problems requiring such specialized equipment as the microwave facilities and X-ray densitometers included in this proposal.

Additional facilities are also needed in order to develop the integrated circuits required in rugged instruments of small size and high reliability suitable for ground-based or space experiments. There exists a need for producing and processing sensors from semiconductor materials tailored to these particular instrumentation problems.

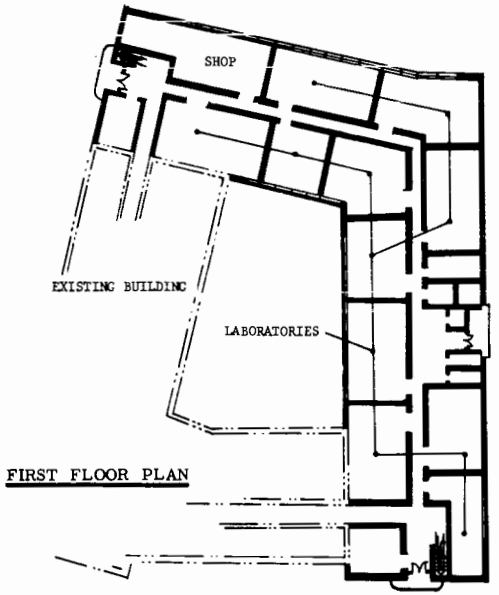
Research in solar phenomena, particularly remote measurements of the sun's magnetic field, requires that spectral measurements be made with high precision over a narrow portion of the spectrum. Special optical measuring techniques must be developed to meet these needs and the proposed facilities will provide this development capability.

Finally, the proposed addition will also provide the laboratory space and specialized equipment vitally needed to support biomedical and biophysical research at the Center, such as: development of a more absolute measure of blood pressure; development of practical means of continuous measurement of blood flow in the various parts of humans or animals without injury to the subjects. A major increase in instrumentation support is also required in connection with life sciences experiments sponsored by Ames for inclusion in space-vehicle payloads involving such techniques as microwave spectroscopy, or cellular resonance.

<u>ESTIMATED FUTURE YEAR FUNDING</u>: None

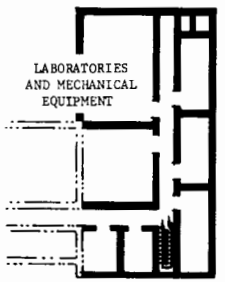
AMES RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

INSTRUMENT BUILDING EXTENSION

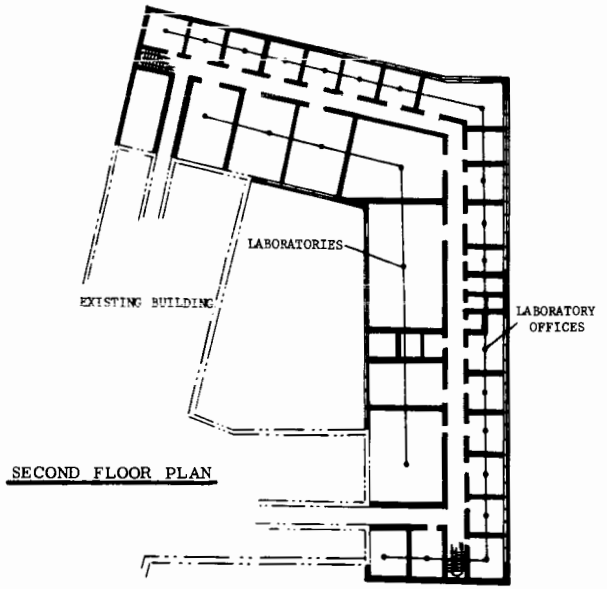


FIRST FLOOR PLAN

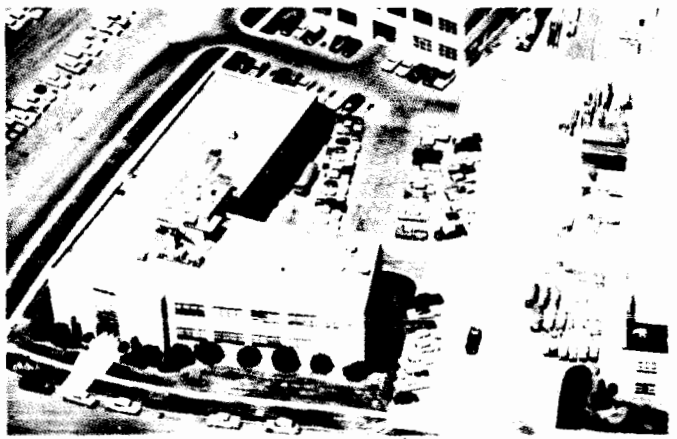
SCALE IN FEET: 0 10 20 30 40 50



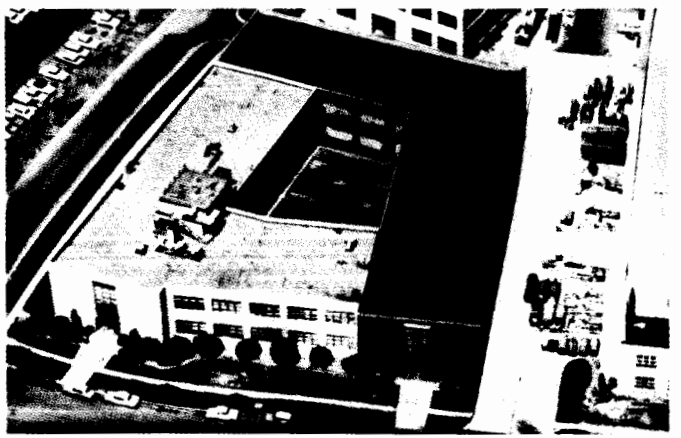
BASEMENT PLAN



SECOND FLOOR PLAN



EXISTING
INSTRUMENT LABORATORY



MODIFIED PHOTOGRAPH
PROPOSED WING IN PLACE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

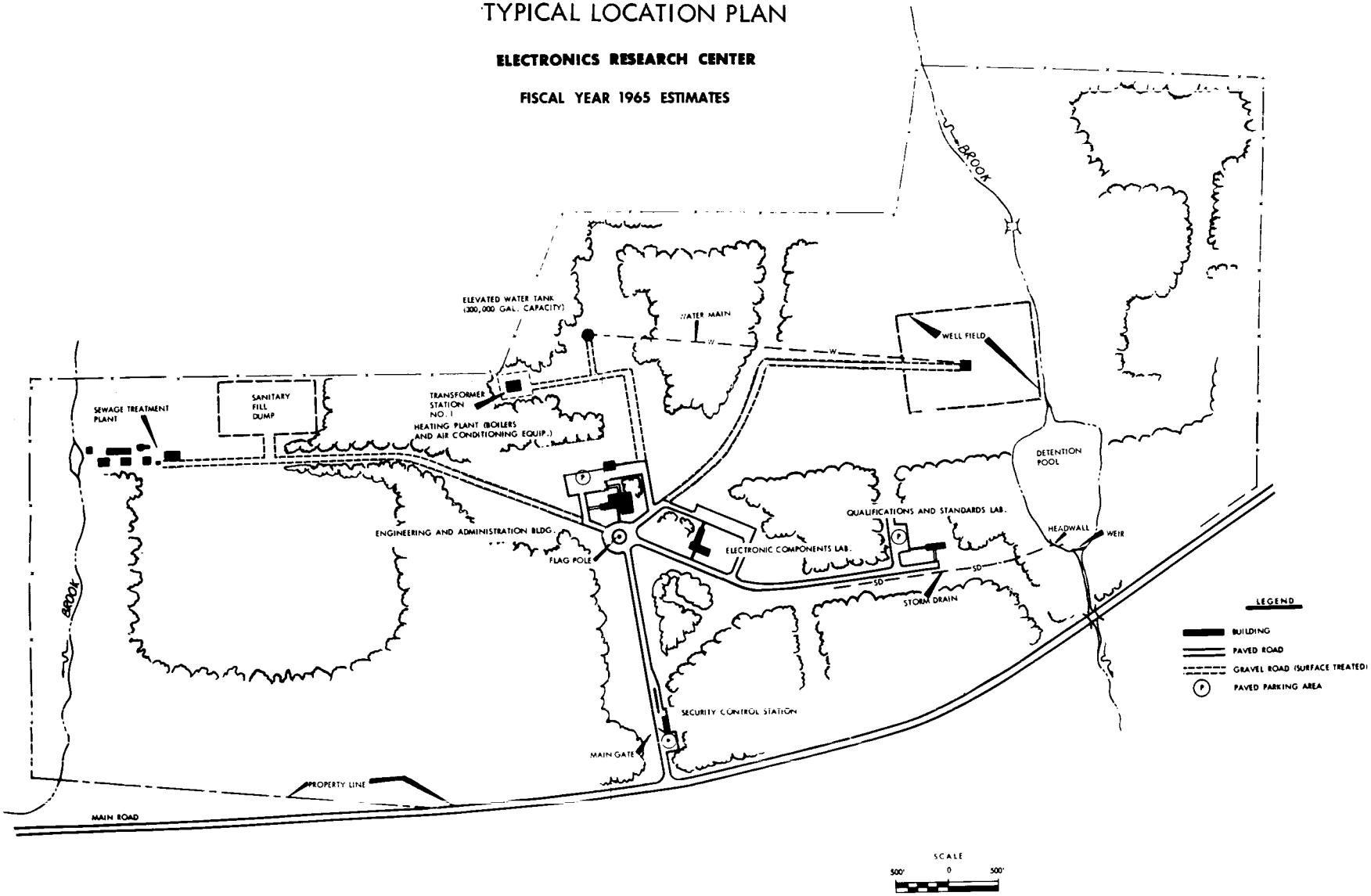
ELECTRONICS RESEARCH CENTER

	Page No.
Location plan	CF 2-1
Summary	CF 2-2
Office of Advanced Research and Technology Projects:	
Center support facilities	CF 2-3
Electronic components laboratory	CF 2-6
Engineering and administration building	CF 2-10
Qualification and standards laboratory	CF 2-14

TYPICAL LOCATION PLAN

ELECTRONICS RESEARCH CENTER

FISCAL YEAR 1965 ESTIMATES



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Electronics Research Center	OART	To be determined	NA	NA

INSTALLATION MISSION

To serve as the national focal point for knowledge and advanced technology in space electronics needed by NASA for future space systems. The Center will organize, manage, and conduct comprehensive programs in basic and applied research providing the agency with the capability to obtain inherently more reliable space electronic elements and increase the efficiency of future space electronic equipment.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	---	50	250
CONTRACTOR & OTHER PERSONNEL	---	---	---
TOTAL ALL PERSONNEL	---	50	250

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	---	
LAND *(Lease or Permit)*	---	
PLANT VALUE *(as of June 30, 1963)*		---
TOTAL	---	---

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Center support facilities	OART	---	---	1,950	2,950	4,900
Electronic components laboratory	OART	---	---	3,200	---	3,200
Engineering and administration building	OART	---	---	1,850	---	1,850
Qualification and standards laboratory	OART	---	---	3,000	---	3,000
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				10,000		

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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

CENTER SUPPORT FACILITIES

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research & Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research & Technology

AUTHORIZATION LINE ITEM: Electronics Research Center

LOCATION OF PROJECT: To be determined

COGNIZANT NASA INSTALLATION: Electronics Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$1,950,000
Total Funding Through FY 1965	$1,950,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,850,000
Heating and refrigeration plant	LS	---	$700,000	700,000
Sewage treatment plant	LS	---	50,000	50,000
Site preparation	LS	---	25,000	25,000
Roads	LS	---	65,000	65,000
Utilities	LS	---	1,010,000	1,010,000
Equipment	---	---	---	---
Design	---	---	---	100,000
For construction	LS	---	100,000	100,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$1,950,000

PROJECT DESCRIPTION:

The site development and support facilities for the Electronics Research Center located on a postulated 1,000-acre suburban site required up to the point of construction completion of the Center are included. Since a specific site has not been selected, these are the best available estimates based on advice and experience of other NASA Centers and the U. S. Army Corps of Engineers.

Site development includes site clearing and grading, topsoil and seeding, storm drainage system, utility tunnels, basic road network, walkways and street lighting.

Support facilities will comprise the heating and refrigeration plant and appropriate distribution systems, the sewage collection and treatment systems, the electrical transformer plant and distribution system, the communications system and the water supply system.

PROJECT JUSTIFICATION:

The Center Support Facilities are required to permit operation of and provide support for the individual laboratories and engineering and administration building of the Electronics Research Center.

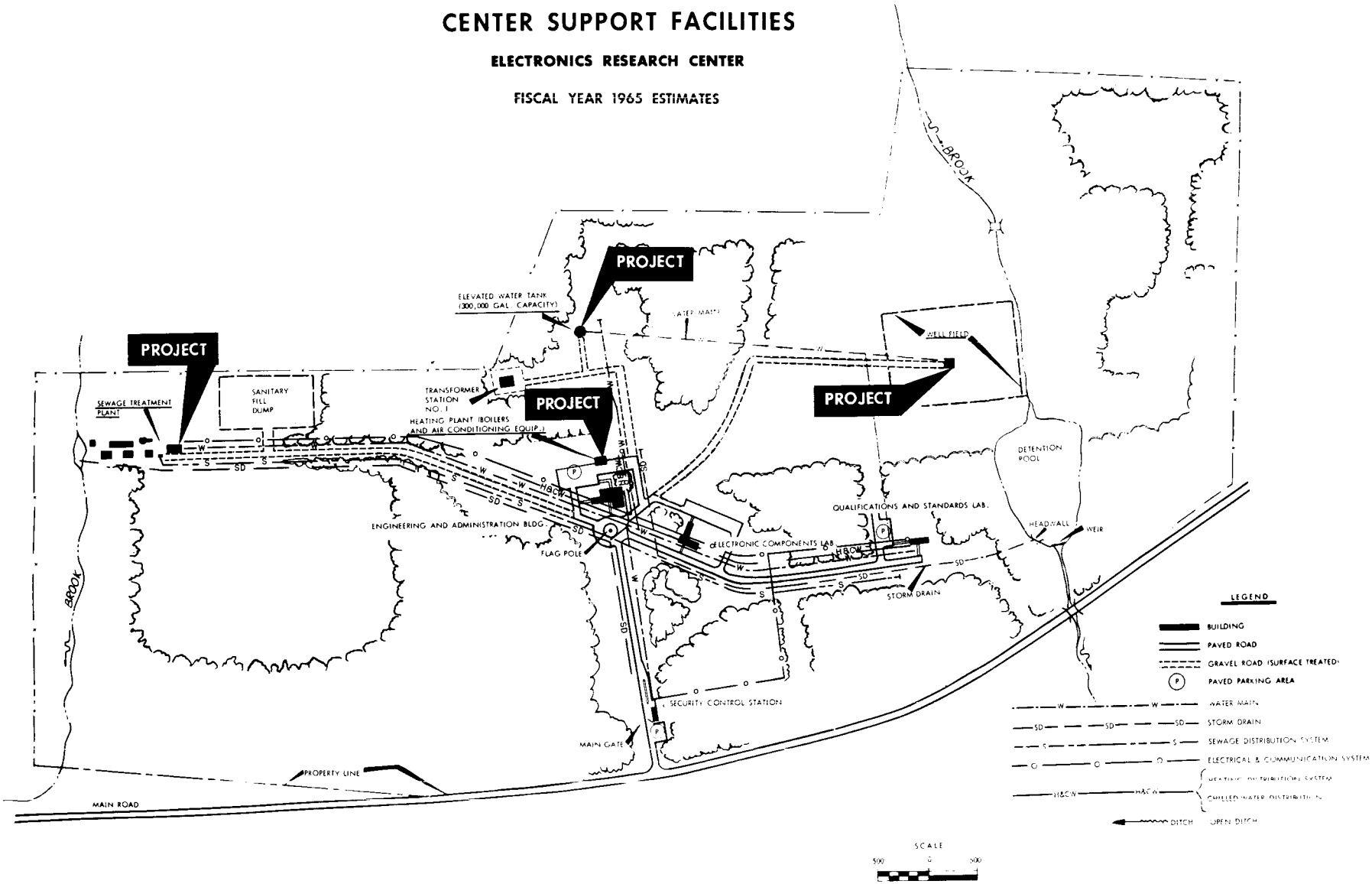
Without these basic road, clearing, and utilities the individual laboratories of the Center could not function.

ESTIMATED FUTURE YEAR FUNDING: $2,950,000

CENTER SUPPORT FACILITIES

ELECTRONICS RESEARCH CENTER

FISCAL YEAR 1965 ESTIMATES



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ELECTRONIC COMPONENTS LABORATORY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research & Technology

AUTHORIZATION LINE ITEM: Electronics Research Center

LOCATION OF PROJECT: To be determined

COGNIZANT NASA INSTALLATION: Electronic Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$3,200,000
Total Funding Through 1965	$3,200,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,192,000
Support building	Sq. Ft.	45,900	$24.77	1,137,000
Site preparation	LS	---	2,100	2,100
Roads & parking	LS	---	12,900	12,900
Utilities	LS	---	40,000	40,000
Equipment				$1,908,000
Component fabrication equipment	LS	---	734,000	734,000
Sample preparation equipment	LS	---	90,000	90,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Laboratory analytical equipment	LS	---	$319,000	319,000
Component test equipment	LS	---	461,000	461,000
Cryogenic equipment	LS	---	100,000	100,000
Glass technology equipment	LS	---	204,000	204,000
Design				$100,000
For construction	LS	---	86,000	86,000
For equipment	LS	---	14,000	14,000
Fallout Shelter	---	---	---	---
		TOTAL		$3,200,000

PROJECT DESCRIPTION:

This laboratory will be a three-story building containing laboratory and related equipment spaces, special laboratory areas, office adjuncts, utilities and equipment storage spaces housing 210 scientists and engineers, research assistants, and clerical aides. Approximately 45,900 total square feet will be divided into 15,000 square feet for laboratories on the first, second, and third floors; 3,000 square feet for special laboratories on the second floor; 1,400 square feet for a clean room on the third floor; 19,000 square feet for allied office space; and about 7,500 square feet for utilities and storage of laboratory equipment. Air conditioning and air filtering will be provided to maintain cleanliness and humidity control necessary for the precise investigations to be undertaken. The building will provide necessary isolation from noise, vibration, and radio frequency interference. A fire alarm system will be provided. Appropriate site development, parking for 168 cars (based on one space per 1.25 persons), immediate access roads, walkways, and utilities, including water, sewer, electric power, and communications will be included.

The facility laboratories will contain the following equipment: microcircuit research equipment, processing and testing equipment, precision servo system research and testing equipment, a glass technology laboratory, and thin film research and testing equipment; as well as specialized environmental facilities related to microcircuit and thin film work.

PROJECT JUSTIFICATION:

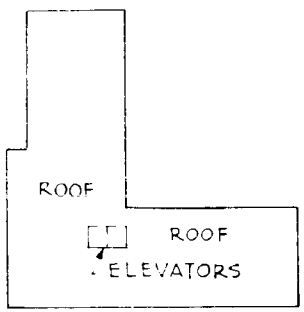
The Electronic Components Laboratory is required for the conduct of a research program pertaining to electronic components to be used in the space environment. The scope of the research will include studies and

investigations in the theory, behavior, and design of electronic components in the following areas: solid state technology, materials, vacuum devices and electro-mechanical componentry. Analysis in depth of NASA flight and launch partial successes and failures has revealed in many instances electronic components failure or deficient performance. A major factor leading to failure or deficient component performance is found in the use in space of electronic components designed for the earth or near-earth environment. Although some improvements have been made in component design and development for space use, improvements of several orders of magnitude are required to meet the reliability and performance specifications of NASA's planned and future space flights.

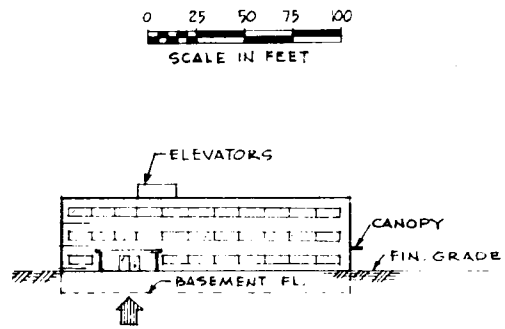
The laboratory staff will conduct, supervise, and coordinate a balanced research program within and without the laboratory aimed at the creation and design of new and effective electronic components and circuits for space use. These research efforts will be directly related to the performance requirements of current and future space systems. The availability of tested component techniques and designs will materially aid NASA and industry project designers in their creation of new flight systems. A strong basic and applied research effort of this nature is necessary for success in the manned and unmanned space flight missions of the future.

ESTIMATED FUTURE YEAR FUNDING: None

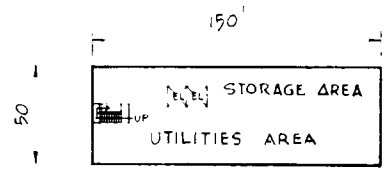
ELECTRONICS RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES
ELECTRONIC COMPONENTS LABORATORY



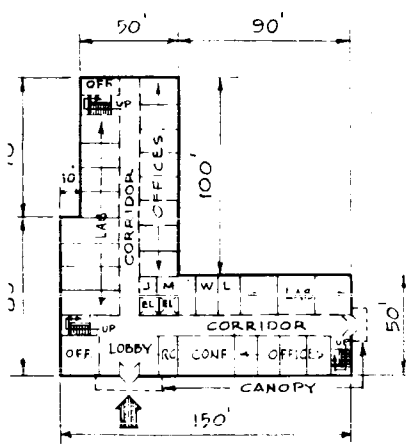
ROOF PLAN



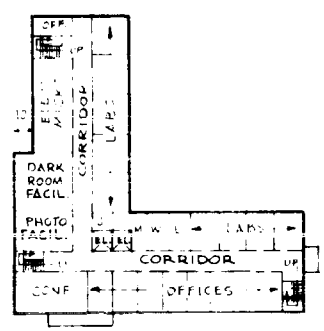
FRONT ELEVATION



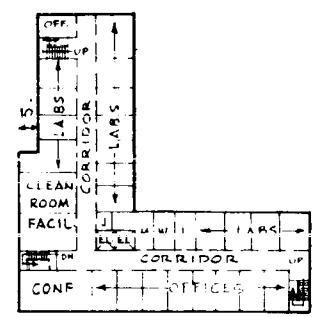
BASEMENT PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ENGINEERING AND ADMINISTRATION BUILDING

PROGRAM OFFICE FOR THE INSTALLATION: **Office of Advanced Research and Technology**

PROGRAM OFFICE FOR THE PROJECT: **Office of Advanced Research and Technology**

AUTHORIZATION LINE ITEM: Electronics Research Center

LOCATION OF PROJECT: To be determined

COGNIZANT NASA INSTALLATION: Electronics Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$1,850,000
Total Funding Through 1965	$1,850,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,632,000
Support building	Sq. Ft.	84,400	$18.67	1,576,000
Site preparation	LS	---	5,000	5,000
Roads & parking	LS	---	25,000	25,000
Utilities	LS	---	26,000	26,000
Equipment				$122,000
Projection equipment, intercom, vaults and admin. equipment	LS	---	67,000	67,000
Library stacks and reproduction equipment	LS	---	35,000	35,000

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	Unit of Measure	Quantity	Unit Cost	Total Cost
Infirmary equipment	LS	---	$15,000	$15,000
Security control station - identification equipment and guard alert services	LS	---	5,000	5,000
Design				$96,000
For construction	LS	---	91,000	91,000
For equipment	LS	---	5,000	5,000
Fallout shelter	---	---	---	---
		TOTAL		$1,850,000

PROJECT DESCRIPTION:

The Engineering and Administration Building will be a four-story building with a portion two stories high, irregularly shaped, approximately 82,000 total square feet in area. The facility will be divided into about 48,000 square feet of office and administrative space and about 7,000 square feet devoted to utilities, storage and equipment. In addition to providing administrative office, conference and engineering planning and drafting space for Electronics Research Center professional and engineering personnel, the building will contain: a kitchen and cafeteria with a seating capacity of 400, conference rooms, an auditorium accommodating 350 persons, the Center infirmary and a technical library. The building will be air conditioned; heating and air-conditioning will be supplied by the Center central heating plant. A fire alarm system will be provided. Site development, parking for 272 vehicles (supporting the Engineering and Administration Building and the security control station), access roads, and utilities such as water, sewer, electric power and communications will be included.

The security control station will be a one story structure with basement, containing 2,400 square feet of special guard facilities for Electronics Research Center security forces.

PROJECT JUSTIFICATION:

This building is required to house the first increment of administrative and technical staff of the Electronics Research Center. The building will provide for centralized location of center senior management, technical program planning, administrative planning and during the first years of Center operations, increments of the Center's research program staff.

NASA plans to be able to work out cooperative arrangements with educational institutions in the area whereby courses may be offered at the Electronics Research Center to advance the education of the Center profes-

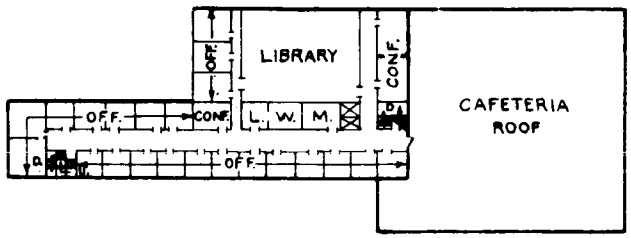
sional staff. The auditorium and conference rooms will be used after normal working hours to provide classroom facilities at the Center.

The professional staff members involved in basic research and advanced development must have access to the latest scientific and technical manuscripts and professional journals in electronics and related disciplines. Hence a technical library will be included to serve as a repository for the required scientific publications and to provide a reading room and study area.

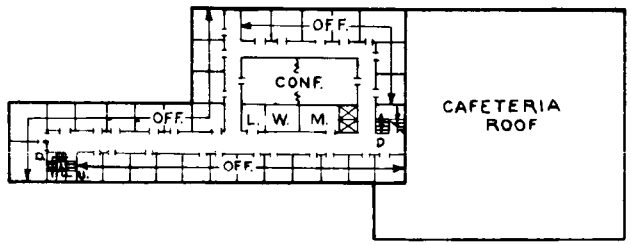
The security control station will serve as the administrative headquarters and initial visitor reception area for the Center and provides facilities for the security force engaged in the maintenance of NASA's security regulations and plant protection.

ESTIMATED FUTURE YEAR FUNDING: None

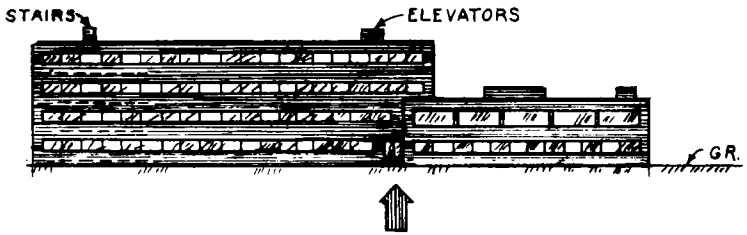
ELECTRONICS RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES
ENGINEERING & ADMINISTRATION BUILDING



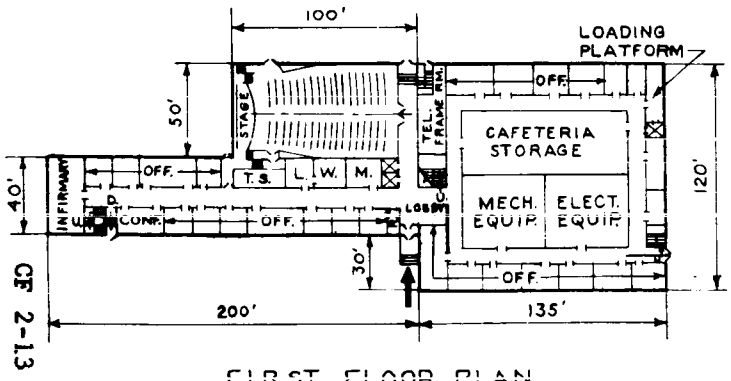
THIRD FLOOR PLAN



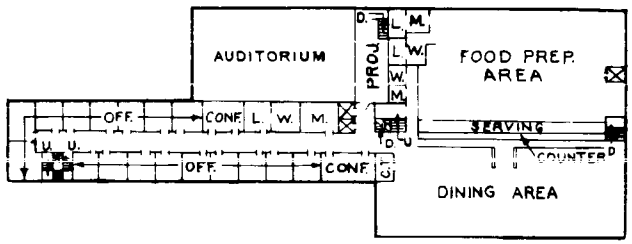
FOURTH FLOOR PLAN



FRONT ELEVATION



FIRST FLOOR PLAN



SECOND FLOOR PLAN

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

QUALIFICATION & STANDARDS LABORATORY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Electronics Research Center

LOCATION OF PROJECT: To be determined

COGNIZANT NASA INSTALLATION: Electronics Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$3,000,000
Total Funding Through 1965	$3,000,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$746,000
Support building	Sq. Ft.	30,000	$23.58	707,400
Site preparation	LS	---	800	800
Roads and parking	LS	---	7,400	7,400
Utilities	LS	---	30,400	30,400
Equipment				$2,203,000
Test and environmental equipment	LS	---	1,425,000	1,425,000
Standards equipment	LS	---	415,000	415,000
Special laboratory equipment	LS	---	363,000	363,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design				$51,000
For construction	LS	---	$38,000	38,000
For equipment	LS	---	13,000	13,000
Fallout Shelter	---	---	---	---
		TOTAL		$3,000,000

PROJECT DESCRIPTION:

The laboratory will be a two-story building, providing office space and laboratory facilities for 150 research personnel and clerical aides. Approximately 30,000 square feet total will be divided into 10,000 square feet devoted to laboratory areas (including 2,500 square feet reserved for a 100-inch centrifuge), 10,000 square feet of office space on the first and second floors, and 10,000 square feet of basement space for utilities and storage.

The building will be air-conditioned; heating and cooling will be supplied by the Center central heating plant. A fire alarm system will be provided. Appropriate site development, parking for 120 vehicles (based on 1 space per 1.25 persons), access roads, and utilities such as water, sewer, electric power and communications will be included.

PROJECT JUSTIFICATION:

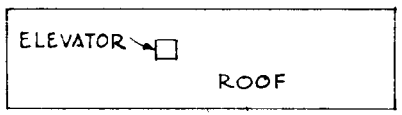
This laboratory is required for the conduct of component qualification and testing and the establishment of electronic design and fabrication standards. Major difficulties have been experienced by NASA in obtaining electronic components, subsystems, and systems meeting the high standards of quality and reliability necessary for use in the space environment. The large number of developers and suppliers of electronic components and the rapid changes in technology have made the establishment of basic standards and reliability qualifications particularly difficult. The lack of a common set of qualification requirements and standards has led to unnecessarily high costs for component development and manufacture, and inability of NASA system and project engineers to specify appropriately qualified components in their designs. Costly redesign delays, flight failures, and confusion and waste in the space electronics industry are a result of the existing lack of a common set of space electronics components specifications and standards.

This laboratory will be the NASA focal point for the establishment and promulgation of space electronics qualifications and standards in the form of qualified parts lists, qualification specifications and standards, calibration methods and procedures and environmental testing criteria serving other groups within the Center, other NASA Centers, other government agencies and intereste industrial and university groups.

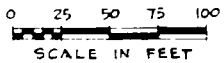
Component qualification testing; specifications for space qualified electronic sub-assemblies and subsystems preparation; design criteria preparation for electronics and guidance elements; and component reliability engineering including quality assurance, failure analyses, initial sample testing and test criteria will be carried out in this facility. The research effort in environmental testing, standards, design criteria and related areas of qualifications and standards must be increased significantly if NASA is to reduce the hazard of mission failures resulting from faulty electronic components and systems.

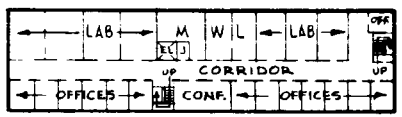
ESTIMATED FUTURE YEAR FUNDING: None

ELECTRONICS RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES
QUALIFICATION & STANDARDS LABORATORY

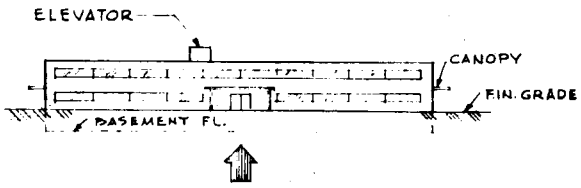


ROOF PLAN

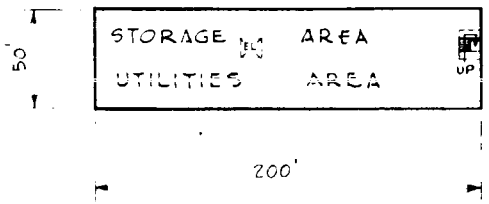




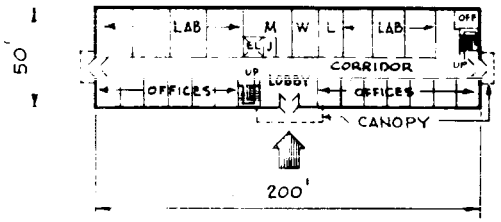
SECOND FLOOR PLAN



FRONT ELEVATION



BASEMENT PLAN



FIRST FLOOR PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

GODDARD SPACE FLIGHT CENTER

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Earth albedo and infra-red simulation system for the space environment simulator..... CF 3-3

Office of Tracking and Data Acquisition Projects:

STADAN engineering and real time station..... CF 3-7

Relocation of Wallops Island training facility..... CF 3-11

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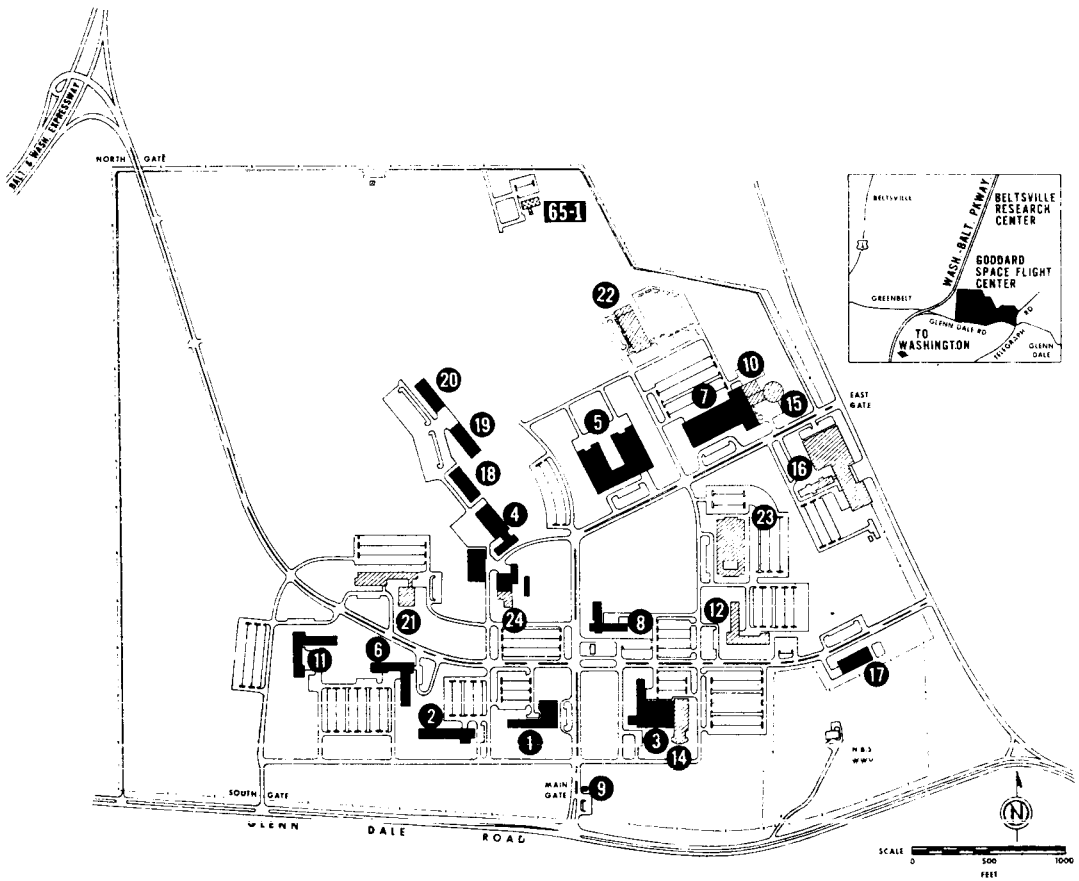
GODDARD SPACE FLIGHT CENTER
FISCAL YEAR 1965 ESTIMATES

LOCATION PLAN



1. SPACE PROJECTS BUILDING
2. RESEARCH PROJECTS LABORATORY
3. CENTRAL FLIGHT CONTROL AND RANGE OPERATIONS LABORATORY
4. BOILER HOUSE AND ELECTRIC SUBSTATION
5. INSTRUMENT CONSTRUCTION AND INSTALLATION LABORATORY
6. SPACE SCIENCES LABORATORY
7. PAYLOAD TESTING FACILITY
8. SATELLITE SYSTEMS LABORATORY
9. GATE HOUSE
10. ENVIRONMENTAL TESTING LABORATORY
11. APPLIED SCIENCES LABORATORY
12. TRACKING AND TELEMETRY LABORATORY
14. SPACECRAFT OPERATIONS FACILITY
15. LAUNCH PHASE SIMULATOR
16. DEVELOPMENT OPERATIONS BUILDING
17. MULTI-PURPOSE BUILDING
18. MULTI-PURPOSE BUILDING
19. MULTI-PURPOSE BUILDING
20. MULTI-PURPOSE BUILDING
21. METEOROLOGICAL SYSTEMS DEVELOPMENT LABORATORY
22. MECHANICAL TEST FACILITY AND QUALITY ASSURANCE LABORATORY
23. DATA INTERPRETATION LABORATORY
24. ADDITION TO CENTRAL HEATING AND REFRIGERATION PLANT

FACILITIES PROPOSED IN 1965 ESTIMATES

65-1 MANNED FLIGHT TRAINING FACILITY (WALLOPS ISLAND)

EXISTING FACILITIES
FACILITIES UNDER CONSTRUCTION
FACILITIES PROPOSED IN 1965 ESTIMATES

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Goddard Space Flight Center	Space Science & Applications	Greenbelt, Maryland	Prince Georges	Greenbelt, Maryland

INSTALLATION MISSION

The Center is responsible for complete development of unmanned sounding rockets and orbiting spacecraft experiments in basic and applied science. The work covers scientific satellites and communications and weather satellites which orbit in cislunar space (region between the earth and the moon). In addition, the Center manages NASA's Delta rocket and two world-wide tracking, data acquisition and data reduction networks.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	3487	3660	3660
CONTRACTOR & OTHER PERSONNEL	1230	1733	1733
TOTAL ALL PERSONNEL	4717	5393	5393

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	530	
LAND *(Lease or Permit)*	426	
PLANT VALUE *(as of June 30, 1963)*		84,300
TOTAL	956	84,300

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Earth albedo and infra-red simulation system for the space environment simulator	OSSA	---	---	500	---	500
STADAN engineering and real time station	OTDA	---	---	400	---	400
Relocation of Wallops Island training facility	OTDA	---	---	400	---	400
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				1,300		

NASA FORM 1029 DEC 63

GPO 868-667

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

EARTH ALBEDO AND INFRA-RED SIMULATION SYSTEM FOR THE SPACE ENVIRONMENT SIMULATOR

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science and Applications

AUTHORIZATION LINE ITEM: Goddard Space Flight Center

LOCATION OF PROJECT: Greenbelt, Prince Georges County, Maryland

COGNIZANT NASA INSTALLATION: Goddard Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$500,000
Total Funding Thru FY 1965	$500,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction	---	---	---	---
Equipment				$500,000
Lamp units and cooling systems	LS	---	$230,000	230,000
Power controls	LS	---	60,000	60,000
Instrumentation	LS	---	35,000	35,000
160 framework	LS	---	25,000	25,000
Electrical system	LS	---	80,000	80,000
Modify cryogenic system	LS	---	70,000	70,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
			TOTAL	$500,000

PROJECT DESCRIPTION:

This project provides a system within the Space Environment Simulator for producing Earth Albedo and Infra-Red Radiation. The system will consist of high intensity lamp units mounted within the chamber and their associated controls and instrumentation. As envisioned, the lamp units would be distributed over an approximate 160°, 14' radius spherical cap in the lower section of the chamber. The coverage would represent the radiation pattern encountered by spacecraft at low orbital altitudes as they enter the Albedo and receive maximum Infra-Red Radiation during passage between the earth and the sun. Primary controls for the system would be located adjacent to the master control station for the Space Environment Simulator on the first floor of Building 10, with power supplies and auxiliary equipment installed in the basement. The system is to provide controlled intensity up to a maximum of 75 watts per square foot with close spectural match of the real environment.

PROJECT JUSTIFICATION:

Earth Albedo and Infra-Red simulation, as an adjunct to simulation of direct solar insolation is required during tests of spacecraft to establish both performance and the thermal balance characteristics of spacecraft. Simulation of this environment would improve evaluation and techniques particularly in the area of providing a realistic environment to sensors (experiments, guidance detectors and horizon scanners) and spacecraft surfaces of the stabilized observatories where orientation with respect to earth is fixed. So far as thermal balance is concerned the necessity for Albedo and Infra-Red simulation is strongly dependent on the case at hand. The thermal exposures of satellites are functions of their orbital period and plane and their relative orientation in that plane. With satellites in those orbits where they receive 100% solar exposure, the inputs from Albedo and Infra-Red can remain nearly constant during their life. If the Albedo and Infra-Red inputs are neglected during test, thermal gradients across opposite sides of such spacecraft can become sufficiently exaggerated to cause considerable difficulty in analyzing the effects of the real environment upon spacecraft reliability. In the case of the orbiting observatories,the alignment of optical systems and other sensors is a major consideration and proof of system function is strongly dependent upon a realistic thermal test environment.

To summarize: Simulation of Albedo and Earth emitted Infra-Red is required for the test and evaluation of near-earth orbiting spacecraft to:

1. Verify performance of earth oriented sensors and experiments.

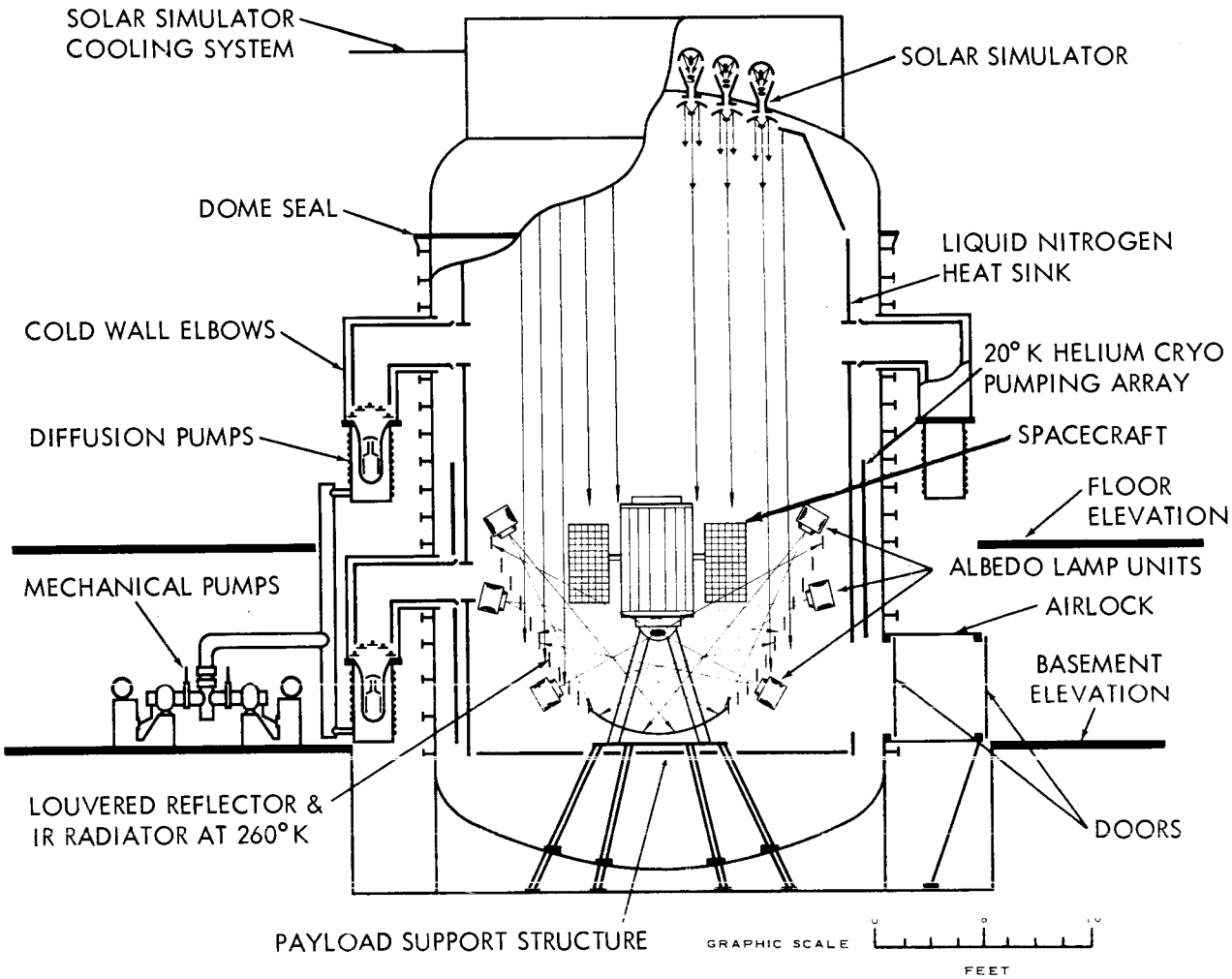
2. Verify the adequacy of the thermal design from the standpoint of providing a realistic radiation environment (simulated flux and distribution) to determine the proper functioning of electronics under simulated orbital conditions.

3. Verify proper temperature distribution to determine whether thermal distortion effects, which could be harmful to optical experiments, have been accounted for by the design.

ESTIMATED FUTURE YEAR FUNDING: None

GODDARD SPACE FLIGHT CENTER
FISCAL YEAR 1965 ESTIMATES

EARTH ALBEDO AND INFRA-RED SIMULATION SYSTEM FOR THE SPACE ENVIRONMENT SIMULATOR



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

STADAN ENGINEERING AND REAL TIME STATION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Tracking and Data Acquisition

AUTHORIZATION LINE ITEM: Goddard Space Flight Center

LOCATION OF PROJECT: Greenbelt, Prince Georges County, Maryland

COGNIZANT NASA INSTALLATION: Goddard Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$400,000
Total Funding Through FY 1965	$400,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$385,000
Operations building	Sq. Ft.	4,000	$ 18.00	72,000
Raised floor	Sq. Ft.	2,000	5.00	10,000
Generator building	Sq. Ft.	1,500	15.00	22,500
Restore facility to original condition	LS	---	150,000	150,000
Utilities	LS	---	85,500	85,500
Site preparation and fencing	LS	---	35,000	35,000
Roads and parking	LS	---	10,000	10,000
Equipment	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	$15,000
For construction	LS	---	$15,000	15,000
Fallout Shelter	---	---	---	---
		TOTAL		$400,000

PROJECT DESCRIPTION:

This project proposes the construction of a STADAN Engineering and Real Time Station at the vicinity of the Goddard Space Flight Center. The proposed location of the facility will be on a remote site of land obtained from the Department of Agriculture on a use permit, and will be readily accessible to Goddard personnel. The facility will be composed of an operations building and a generator building. The operations building will be of approximately 4,000 square feet area and will house electronic equipment and operating personnel. The building will be constructed of concrete and steel with movable partitions. A cavity in the raised floor will serve as an air-conditioning supply plenum for equipment cooling and cable raceway for intra-equipment cabling. A return air plenum will be provided in the ceiling arrangement. Foundations will be required for one pair of Minitrack, Telemetry, Array, Log Periodic, Command and Satan Antennas which will be transferred to this facility. Special switchgear, with dual buss, will be installed in order that the electronic equipment will not be subject to transient load pulsations. The voltage and frequency of the power will necessitate special regulation to permit proper operation of the electronic equipment. Communication connections will be made to the Goddard Space Flight Center Communications Center. The availability of real time data is a basic requirement. The construction will be such that enlargement of the facility may be accomplished should the need arise, without interfering with the operational capabilities of the station. The site will require that no high voltage transmission lines or other sources of RF interference be located in the immediate vicinity and no physical obstruction obscuring the horizon above ten degrees.

The generator building will be of approximately 1,500 square feet area. The construction will be of concrete and steel and will house diesel generators and associated switchgear equipment. The necessary electrical, chilled water, steam and drainage systems will be provided to adequately support the proposed facility including a parking area for approximately 45 personnel.

The facility will be capable of serving as a primary telemetry station in the NASA world wide network of satellite tracking and data acquisition stations and as a readily accessible facility to permit development, checkout and testing of new equipment and techniques as well as permitting engineering changes for network equipment to be verified and evaluated prior

to modification of equipment at remote stations. Another use of the station will be spacecraft and ground equipment compatability testing prior to satellite launches.

PROJECT JUSTIFICATION:

As the unmanned space flight programs advance into a series of progressive and more complex flights the definite need for the design, development and evaluation of advanced equipment through the network is apparent. The advanced complex equipment required will have to be evaluated for determining operational performance prior to acceptability for field use. This project proposes the construction of a station to provide the Goddard Space Flight Center Engineering and Operations Division a means by which to perform this engineering function. At present, the development and evaluation capability is very limited and requires considerable enhancement. The complete telemetry system identical to the existing network system will provide spacecraft compatibility checks with the network and network equipment as well as the evaluation of any proposed engineering modifications.

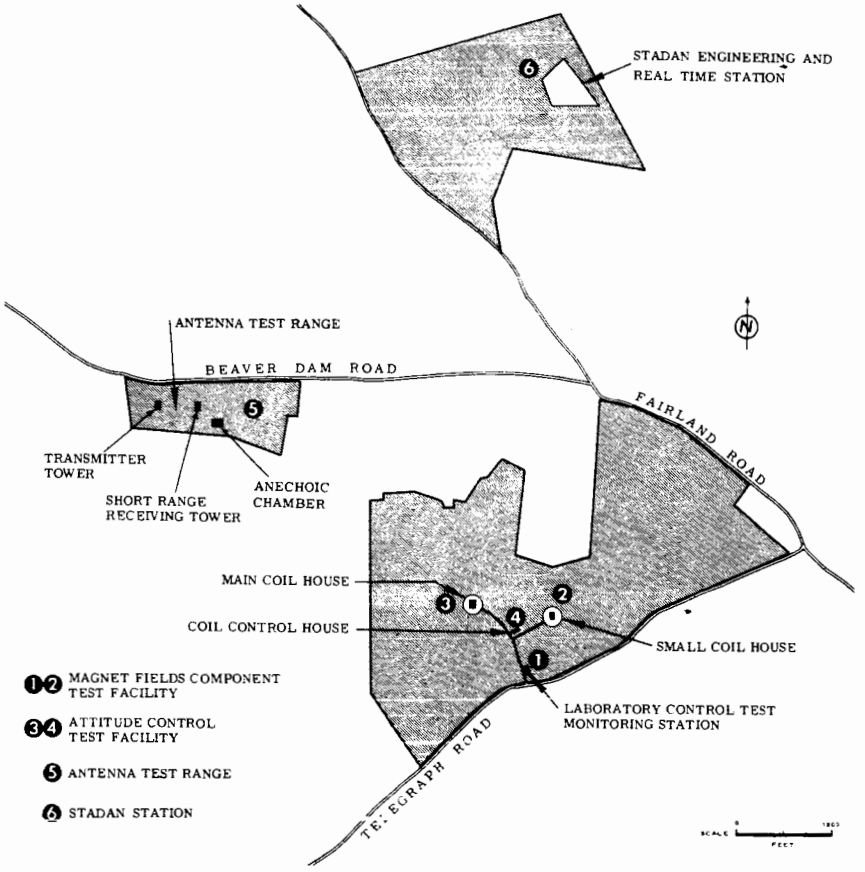
The existing "Real Time Telemetry Station" at College Park, Maryland will be integrated into this facility. The proposed station will have the capability to serve as a network link for gathering telemetry data. This data will be available for real time data processing because of the proximity to Goddard Space Flight Center. It will provide the project managers at Goddard Space Flight Center with real time data. The necessity of real time data has been demonstrated by past S-3, S-6 and S-49 satellite flights and future requirements.

The proposed facility will reduce total operating cost by closing the Blossom Point and College Park stations while enhancing project required capabilities. A savings of approximately $250,000 per year is expected from the elimination of overlap of operation as compared with a capital investment of $400,000. This savings results from elimination of contractor personnel required to operate Blossom Point and College Park, travel and duplication of logistics support. A recent detailed noise survey of the area adjacent to the Goddard Space Flight Center reflects an acceptable radio frequency noise level. The diesel generators will be used during critical tracking periods and as a standby in the event of commercial power failure.

ESTIMATED FUTURE YEAR FUNDING: None

GODDARD SPACE FLIGHT CENTER
FISCAL YEAR 1965 ESTIMATES

REMOTE SITE AREAS



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

RELOCATION OF WALLOPS ISLAND TRAINING FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Tracking and Data Acquisition

AUTHORIZATION LINE ITEM: Goddard Space Flight Center

LOCATION OF PROJECT: Greenbelt, Prince Georges County, Maryland

COGNIZANT NASA INSTALLATION: Goddard Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$400,000
Total Funding Through FY 1965	$400,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$376,000
Operations and training building	Sq. Ft.	10,000	$22.50	225,000
Raised floor	Sq. Ft.	4,000	5.00	20,000
Utilities	LS	---	68,000	68,000
Site preparation and fencing	LS	---	50,000	50,000
Roads and parking	LS	---	13,000	13,000
Equipment	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design				$24,000
For construction	LS	---	$24,000	24,000
Fallout Shelter	---	---	---	---
		TOTAL		$400,000

PROJECT DESCRIPTION:

This project proposes the relocation of the existing Manned Space Training Facility at Wallops Island, Va. to the Goddard Space Flight Center. The facility will be located north of the Multi-Purpose Building #19, near the northern boundary of the Center. The relocation will involve the construction of a combined operations and training building consisting of a ground floor and one additional floor, and will be of concrete and steel construction with masonry walls, and masonry and movable partitions. The operations area will be on the lower floor and will require approximately 4,000 square feet of raised flooring to accommodate cableways and air-conditioning ducts for electronic equipment. The relocated facility will continue to serve as a primary training center for personnel employed at the various tracking stations around the world. It will serve, in addition, as a readily accessible facility to permit the testing of new tracking and data techniques pertaining to the Manned Space Flight Program. The site for the facility will require that no high voltage transmission lines or other sources of RF interference be located in the immediate vicinity and no physical obstruction obscuring the horizon above ten (10) degrees. Offices, laboratories, classrooms, and parking areas will be provided for approximately 50 personnel. All necessary electrical, chilled water, steam and drainage systems will be provided to adequately support the facility.

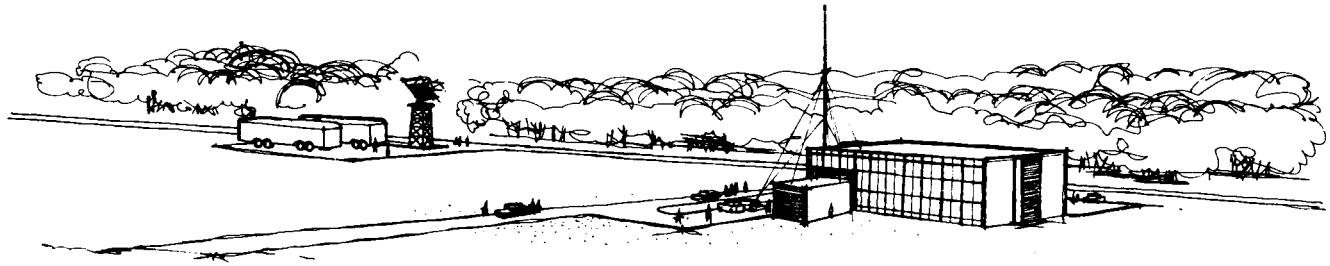
PROJECT JUSTIFICATION:

In order to make more effective use of the network training facilities by the personnel of the Manned Space Flight Operations Division located at the Goddard Space Flight Center, it is proposed that the Wallops Island Training Facility be relocated to the Center. The relocation is justified on the basis of operating economy since the training facility is presently staffed by contractor personnel whose jobs duplicate, to a degree, those performed by Goddard personnel. If the station is located at the Center, some of the contractor personnel could be eliminated and reductions could be made in travel, logistics, maintenance and operational costs. With the advent of the Apollo program it is apparent that the existing training area, established for the Mercury/Gemini programs, is unable to cope with the increased demand of the more advanced program. If the facility is not relocated, the present area must be greatly expanded due to the increased workload which will be necessary to meet the Apollo program.

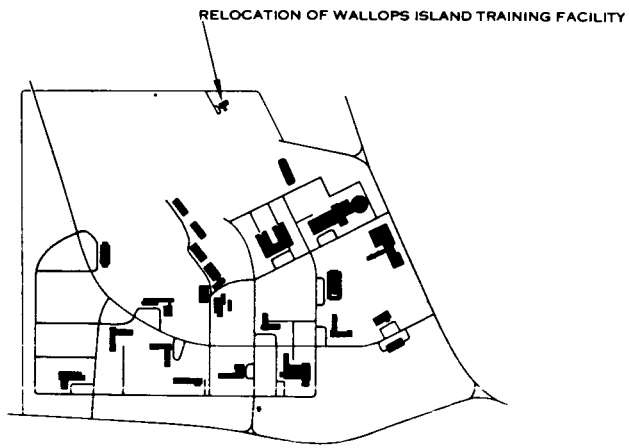
ESTIMATED FUTURE YEAR FUNDING: None

GODDARD SPACE FLIGHT CENTER
FISCAL YEAR 1965 ESTIMATES

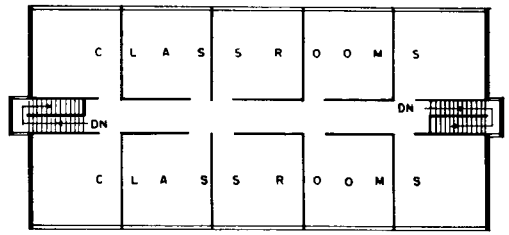
RELOCATION OF WALLOPS ISLAND TRAINING FACILITY



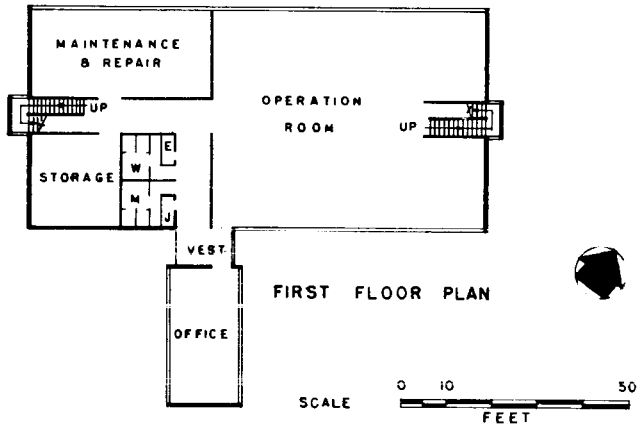
PERSPECTIVE



LOCATION PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

JET PROPULSION LABORATORY

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25-foot simulator modification	CF 4-7
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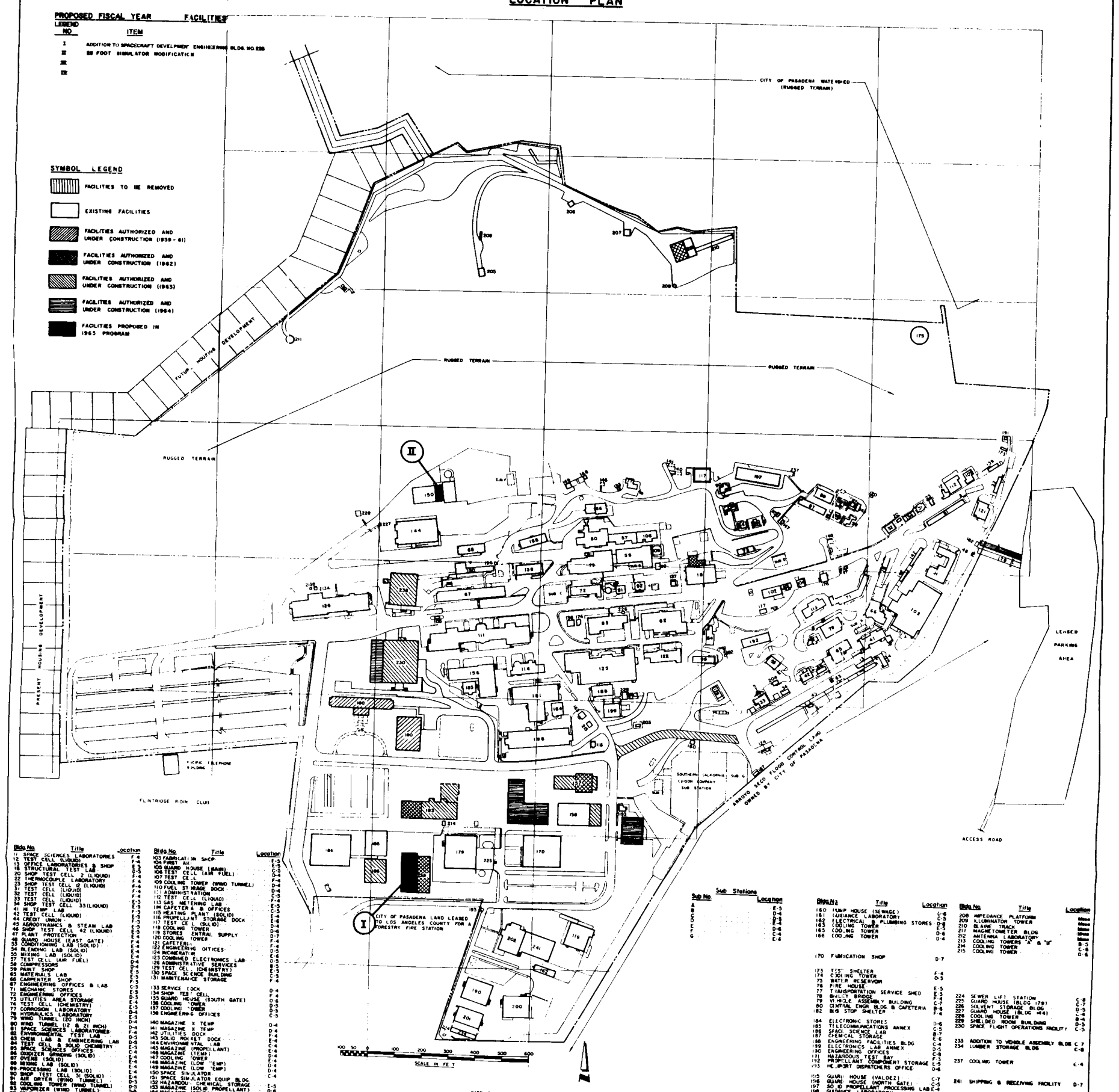
JET PROPULSION LABORATORY
FISCAL YEAR 1965 ESTIMATES
LOCATION PLAN

PROPOSED FISCAL YEAR FACILITIES

LEGEND NO.	ITEM
I	ADDITION TO SPACECRAFT DEVELOPMENT ENGINEERING BLDG. NO. 238
II	25 FOOT SIMULATOR MODIFICATION
III	
IV	

SYMBOL LEGEND

- FACILITIES TO BE REMOVED
- EXISTING FACILITIES
- FACILITIES AUTHORIZED AND UNDER CONSTRUCTION (1959 - 61)
- FACILITIES AUTHORIZED AND UNDER CONSTRUCTION (1962)
- FACILITIES AUTHORIZED AND UNDER CONSTRUCTION (1963)
- FACILITIES AUTHORIZED AND UNDER CONSTRUCTION (1964)
- FACILITIES PROPOSED IN 1965 PROGRAM



Bldg. No.	Title	Location
11	SPACE SCIENCES LABORATORIES	F-4
12	TEST CELL (LIQUID)	F-4
13	OFFICE LABORATORIES & SHOP	E-5
18	STRUCTURAL TEST LAB	D-5
20	SHOP TEST CELL 2 (LIQUID)	F-4
22	THERMOCOUPLE LABORATORY	F-4
23	SHOP TEST CELL 12 (LIQUID)	F-4
31	TEST CELL (LIQUID)	F-4
32	TEST CELL (LIQUID)	F-4
33	TEST CELL (LIQUID)	E-5
34	SHOP TEST CELL 33 (LIQUID)	E-5
41	HI TEMP LAB	F-3
42	TEST CELL 42 (LIQUID)	E-5
44	CREDIT UNION	F-3
45	AERODYNAMICS & STEAM LAB	E-5
46	SHOP TEST CELL 42 (LIQUID)	E-5
47	PLANT PROTECTION	E-3
48	GUARD HOUSE (EAST GATE)	E-4
53	CONDITIONING LAB (SOLID)	E-4
54	BLENDING LAB (SOLID)	E-4
55	MIXING LAB (SOLID)	E-4
57	TEST CELL (AIR FUEL)	D-4
58	COMPRESSORS	D-4
59	PAINT SHOP	D-4
63	MATERIALS LAB	E-5
66	CARPENTER SHOP	F-5
67	ENGINEERING OFFICES & LAB	C-3
71	MECHANIC STORES	E-5
72	ENGINEERING OFFICES	E-5
73	UTILITIES AREA STORAGE	D-3
74	TEST CELL (CHEMISTRY)	E-4
77	CORROSION LABORATORY	E-5
78	HYDRAULICS LABORATORY	D-4
79	WIND TUNNEL (20 INCH)	E-5
80	WIND TUNNEL (12 & 21 INCH)	D-4
81	SPACE SCIENCES LABORATORIES	D-4
82	ENVIRONMENTAL TEST LAB	F-4
83	CHEM LAB & ENGINEERING LAB	D-5
84	TEST CELL & SOLID CHEMISTRY	D-5
85	SPACE SCIENCES OFFICES	E-3
86	OXIDIZER GRINDING (SOLID)	C-4
87	OVENS (SOLID)	E-4
88	MIXING LAB (SOLID)	E-4
89	PROCESSING LAB (SOLID)	E-4
90	SHOP TEST CELL 51 (SOLID)	E-4
91	AIR DRYER (WIND TUNNEL)	D-5
92	COOLING TOWER (WIND TUNNEL)	D-5
93	VAPORIZER (WIND TUNNEL)	D-5
97	DEVELOPMENT LAB & OFFICE	D-5
98	PREPARATION SHOP (SOLID)	E-4
99	CHEMISTRY LAB (SOLID)	E-4
101	TRANSPORTATION OFFICE	E-5
102	TRANSPORTATION SHOP	E-5
103	FABRICATION SHOP	F-5
104	FIRST AID	E-5
105	GUARD HOUSE (MAIN)	C-5
106	TEST CELL (AIR FUEL)	D-4
107	TEST CELL	F-4
109	COOLING TOWER (WIND TUNNEL)	D-4
110	FUEL STORAGE DOCK	D-4
111	ADMINISTRATION	C-3
112	TEST CELL (LIQUID)	F-4
113	GAS METERING LAB	E-5
114	CAFETERIA & OFFICES	C-3
115	HEATING PLANT (SOLID)	E-4
116	PROPELLANT STORAGE DOCK	E-4
117	TEST CELL (SOLID)	D-4
118	COOLING TOWER	D-4
119	STORES CENTRAL SUPPLY	D-7
120	COOLING TOWER	F-4
121	CAFETERIA	F-4
122	ENGINEERING OFFICES	D-5
124	INCINERATOR	E-6
125	COMBINED ELECTRONICS LAB	D-5
126	ADMINISTRATIVE SERVICES	B-3
129	TEST CELL (CHEMISTRY)	E-5
130	SPACE SCIENCE BUILDING	C-3
131	MAINTENANCE STORAGE	F-4
133	SERVICE DOCK	D-4
134	SHOP TEST CELL	F-4
135	GUARD HOUSE (SOUTH GATE)	D-6
136	COOLING TOWER	D-5
137	COOLING TOWER	D-5
138	ENGINEERING OFFICES	C-5
140	MAGAZINE X TEMP	D-4
141	MAGAZINE X TEMP	D-4
142	UTILITIES DOCK	F-4
143	SOLID ROCKET DOCK	E-4
144	ENVIRONMENTAL LAB	C-4
145	MAGAZINE (PROPELLANT)	E-4
146	MAGAZINE (TEMP)	D-4
147	COOLING TOWER	E-4
148	MAGAZINE (LOW TEMP)	D-4
149	MAGAZINE (LOW TEMP)	D-4
150	SPACE SIMULATOR	C-4
151	SPACE SIMULATOR EQUIP. BLDG.	
152	HAZARDOUS CHEMICAL STORAGE	E-5
153	MAGAZINE (SOLID PROPELLANT)	D-6
154	MAGAZINE (GENERAL STORAGE)	D-6
156	GUIDED MISSILE ENGINEERING	C-5
158	MATL RESEARCH PROCESS LAB	D-5
159	PUMP HOUSE (WATER)	F-4
160	PUMP HOUSE (SEWAGE)	D-6
161	TOLERANCE LABORATORY	C-3
162	ELECTRICAL & PLUMBING STORES	D-6
163	COOLING TOWER	D-6
165	COOLING TOWER	D-6
166	COOLING TOWER	D-4
170	FABRICATION SHOP	D-7
173	TEST SHELTER	F-4
174	COOLING TOWER	D-3
175	WATER RESERVOIR	
176	FIRE HOUSE	E-5
177	TRANSPORTATION SERVICE SHED	E-5
178	UTILITY BARGE	F-4
179	VEHICLE ASSEMBLY BUILDING	C-7
180	CHEMICAL ENGR BLDG & CAFETERIA	B-6
182	BUS STOP SHELTER	F-4
184	ELECTRONIC STORES	D-6
185	TELECOMMUNICATIONS ANNEX	C-5
186	SPACE SCIENCE LAB	B-7
187	CHEMICAL STORAGE	E-6
188	ENGINEERING FACILITIES BLDG	C-4
189	ELECTRONICS LAB ANNEX	C-5
190	ENGINEERING OFFICES	C-6
191	HAZARDOUS TEST BAY	C-6
192	PROPELLANT COMPONENT STORAGE	C-5
193	HELIPORT DISPATCHERS OFFICE	D-6
195	GUARD HOUSE (VALDEZ)	C-7
196	GUARD HOUSE (NORTH GATE)	C-5
197	SOLID PROPELLANT PROCESSING LAB	E-4
198	GUIDANCE LABORATORY	D-4
199	CELESTIAL SIMULATOR LAB	D-4
200	PLANT ENGINEERING SERVICES	D-6
201	CARPENTER SHOP	C-6
202	PLANT ENGINEERING BLDG	C-7
203	EMITTER STORAGE BLDG	D-6
204	TEST CELL "F" EQUIP. BLDG.	C-5
205	HRBI (GAP) ANTENNA TOWER	C-5
206	ROTATOR PLATFORM	
207	ROTATOR PAD	
208	IMPEDANCE PLATFORM	
209	ILLUMINATOR TOWER	
210	BLAINE TRACK	
211	MAGNETOMETER BLDG	
212	ANTENNA LABORATORY	
213	COOLING TOWERS "A" & "B"	B-5
214	COOLING TOWER	C-6
215	COOLING TOWER	D-6
224	SEWER LIFT STATION	
225	GUARD HOUSE (BLDG 179)	C-8
226	SOLVENT STORAGE BLDG	C-7
227	GUARD HOUSE (BLDG 144)	D-5
228	COOLING TOWER	C-4
229	SHIELDED ROOM BUILDING	D-5
230	SPACE FLIGHT OPERATIONS FACILITY	C-5
233	ADDITION TO VEHICLE ASSEMBLY BLDG	C-7
234	LUMBER STORAGE BLDG	C-8
237	COOLING TOWER	E-4
241	SHIPPING & RECEIVING FACILITY	D-7

Sub Stations

Sub No.	Location
A	
B	E-5
C	D-4
D	D-3
E	E-4
F	D-6
G	C-4
	E-6

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Jet Propulsion Laboratory	Space Science & Applications	Pasadena, California	Los Angeles	Pasadena

INSTALLATION MISSION

The Jet Propulsion Laboratory (JPL) is a government-owned research and development facility, operated for NASA by the California Institute of Technology. The Laboratory carries out research programs and unmanned lunar and planetary space projects for NASA, and conceives and executes advanced development and experimental engineering investigations to further the technology required for the nation's space program.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
JPL PERSONNEL *(End of Year)*	3926	4200	4400
CONTRACTOR & OTHER PERSONNEL	235	660	160
TOTAL ALL PERSONNEL	4161	4860	4560

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	147	
LAND *(Lease or Permit)*	32,624	
PLANT VALUE *(as of June 30, 1963)*		72,293
TOTAL	32,771	72,293

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Addition to spacecraft development engineering building, No. 233	OSSA	595	36	564	---	1,195
25-Foot simulator modification	OSSA	4,266	150	2,350	---	6,766
Utilities installations	OSSA	2,452	420	400	1,000	4,272
Supporting services building - (Edwards Test Station)	OART	---	---	400	---	400
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				3,714		

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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ADDITION TO SPACECRAFT DEVELOPMENT ENGINEERING BUILDING NO. 233

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science and Applications

AUTHORIZATION LINE ITEM: Jet Propulsion Laboratory

LOCATION OF PROJECT: Pasadena, Los Angeles County, California

COGNIZANT NASA INSTALLATION: Jet Propulsion Laboratory

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$595,000
FY 1964 Estimate	36,000
FY 1965 Estimate	564,000
Total Funding Thru FY 1965	$1,195,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$465,000
Laboratory building	Sq. Ft.	16,000	$27.00	432,000
Utilities	LS	---	33,000	33,000
Equipment				$80,000
Class I clean room	LS	---	50,000	50,000
Class IV clean room	LS	---	30,000	30,000
Design				$19,000
For construction	LS	---	19,000	19,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$564,000

PROJECT DESCRIPTION:

This project proposes the expansion of an existing facility, Spacecraft Development Engineering Building 233, in order to provide adequate clean laboratory space for the Engineering Mechanics Division. It will be an integrated facility combining shops, laboratories, stockrooms, and assembly areas. Of the gross floor area of approximately 35,000 sq. ft. (including the existing Spacecraft Development Engineering Building 233), approximately 14,200 sq. ft. will be devoted to NASA Type I clean room laboratories; approximately 2,700 sq. ft. to NASA Type IV clean rooms; and the balance to high bay assembly areas and conventional laboratory space. The shops, laboratories and assembly areas will provide space in which work will be performed by approximately 65 engineers, test engineers, and technicians.

The present Spacecraft Development Engineering Building 233 contains approximately 19,000 sq. ft., including 7,000 sq. ft. of high bay assembly area, an electronic cable and potting laboratory, a small machine shop, a mechanical lab, and a stockroom. This building will be expanded to the proposed 35,000 sq. ft. by the addition of two stories on the present west laboratory wing.

PROJECT JUSTIFICATION:

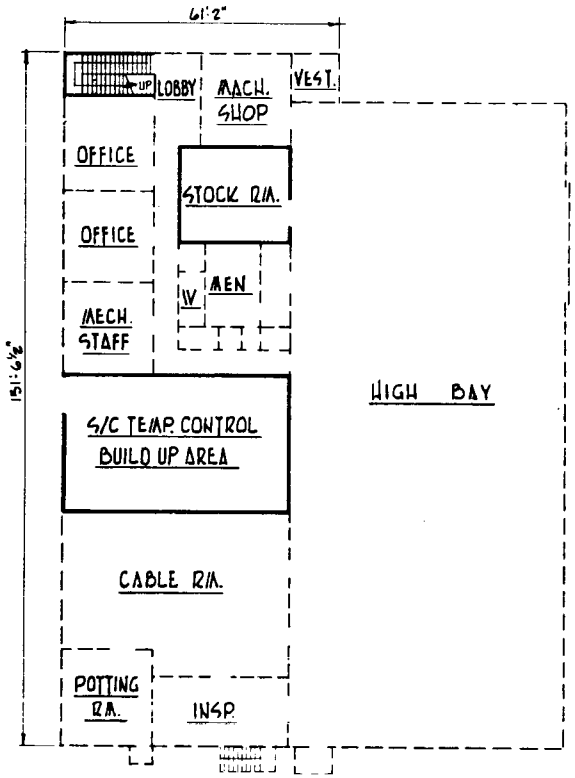
The Engineering Mechanics Division is responsible for the development of the configuration, structure, mechanisms, temperature control, cabling and electronic packaging for all JPL spacecraft projects. The delicacy and precision of components in current and future spacecraft make it mandatory that if the desired high reliability is to be obtained, work areas in which development and manufacturing occur must be much cleaner and better controlled than heretofore. The NASA has developed requirements which are delineated in NASA Procedure Document 200 Y, which specify much cleaner and better controlled work areas than are presently available for the accomplishment of many of the tasks for which the Engineering Mechanics Division is responsible. At the present time, the Division is housed in some 11 different buildings, including 33% of the activities at an off-Lab site and in 10 different trailers. The building and trailers including off-Lab space are widely scattered and cannot provide the environment delineated by NASA for achievement of desired high reliability.

ESTIMATED FUTURE YEAR FUNDING: None

JET PROPULSION LABORATORY

FISCAL YEAR 1965 ESTIMATES

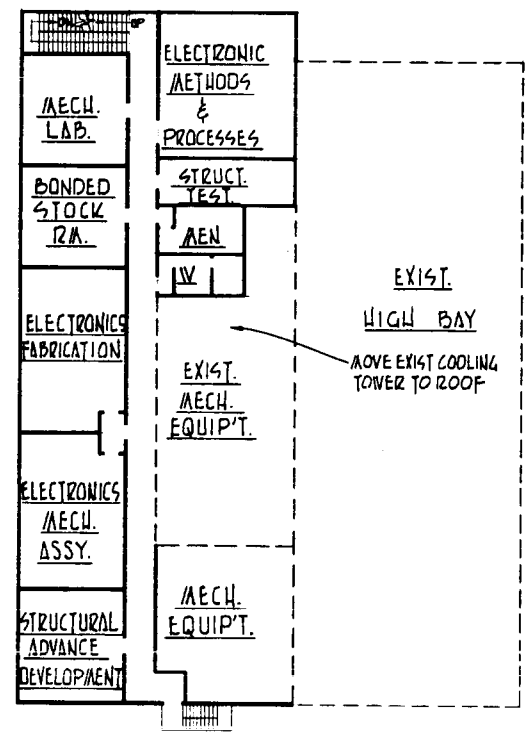
ADDITION TO SPACECRAFT DEVELOPMENT ENGINEERING BUILDING NO. 233



FIRST FLOOR PLAN

SCALE IN FEET

0 4 8 16 32

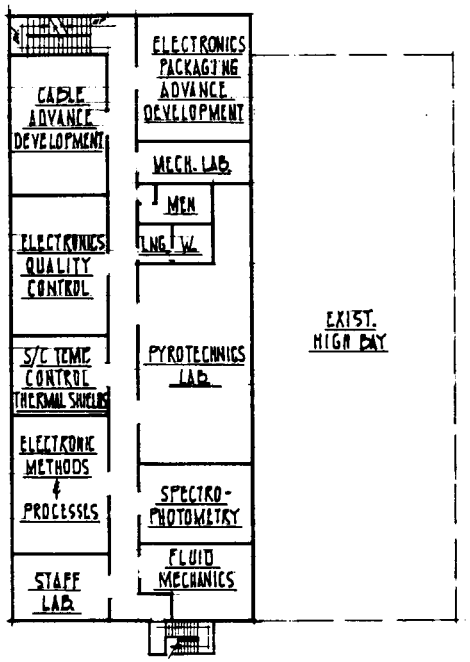


SECOND FLOOR PLAN

JET PROPULSION LABORATORY

FISCAL YEAR 1965 ESTIMATES

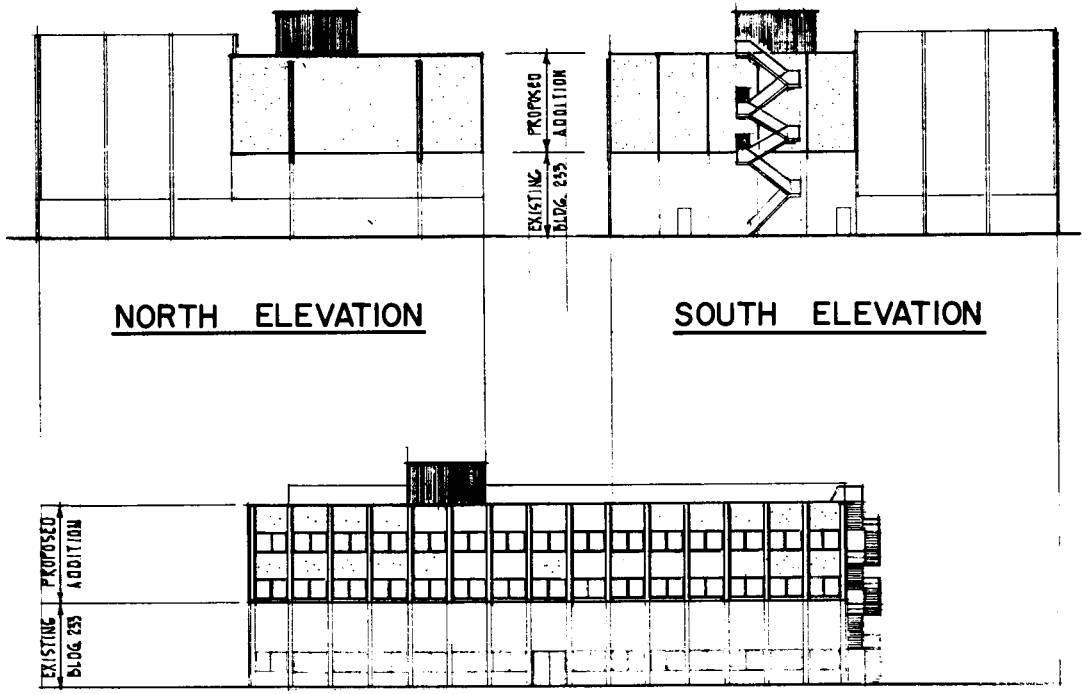
ADDITION TO SPACECRAFT DEVELOPMENT ENGINEERING BUILDING NO. 233



THIRD FLOOR PLAN

SCALE IN FEET

0 4 8 16 32



WEST ELEVATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

25-FOOT SIMULATOR MODIFICATION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science and Applications

AUTHORIZATION LINE ITEM: Jet Propulsion Laboratory

LOCATION OF PROJECT: Pasadena, Los Angeles County, California

COGNIZANT NASA INSTALLATION: Jet Propulsion Laboratory

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	$4,266,000
FY 1964 Estimate	150,000
FY 1965 Estimate	2,350,000
Total Funding Through FY 1965	$6,766,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$60,600
Laboratory building	Sq. Ft.	625	$55.52	34,700
Site preparation	LS	---	3,300	3,300
Roads and parking	LS	---	500	500
Utilities	LS	---	22,100	22,100
Equipment				$2,251,400
Lamp area temperature control	LS	---	20,000	20,000
Tank modifications	LS	---	350,000	350,000
Cryogenic system modifications	LS	---	310,000	310,000
Optical system modifications	LS	---	1,571,400	1,571,400

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design				$38,000
For Construction	LS	---	$8,000	8,000
For Equipment	LS	---	30,000	30,000
Fallout Shelter	---	---	---	---
		TOTAL		$2,350,000

PROJECT DESCRIPTION:

This project proposes major modifications to the JPL 25-foot simulator facility in order to obtain a larger and higher performance solar simulation capability required for testing full-scale scientific spacecraft of the Centaur boosted class such as Mariner-B and Surveyor. The 25-foot diameter by 25-foot high clear test volume and internal cold sink walls will remain the same size when the larger solar beam is produced. The new solar simulation system will provide a vertically downward beam 15 feet in diameter having an intensity of 135 watts/square foot (earth orbit intensity) with $\pm$ 5% uniformity, and $\pm 2^{\circ}$ collimation. A smaller diameter 10 foot beam with 270 watts/square foot (Venus orbit intensity) will also be available. In comparison, the present system is limited to a 6 foot diameter, 135 watts/square foot beam, with $\pm$ 5% uniformity and $\pm 5^{\circ}$ collimation.

The new solar simulation system will be composed of a multi-lamp array in which the energy from each lamp will be directed upward through a transfer lens in the wall of the vacuum vessel to a large primary collimating mirror in the top of the simulator. The uniform beam of light leaving the primary collimator is oriented vertically downward to the test area. Each lamp illuminates the entire test area.

The installation of the advanced solar simulation system will require the following principal tasks:

a. Removal of the existing solar simulation equipment, including the 28 foot high solar lamp and mirror enclosure.

b. Construction of a basement to the north of the chamber to house the new lamp array.

c. Extension of the vacuum vessel upward approximately 28 feet to accommodate the optical path and off-axis collimating reflector. The overall facility height will be essentially unchanged.

d. Installation of a vacuum tank penetration for the transfer lens array, relocation of several diffusion pumps, and modification and extension of the liquid nitrogen cooled cold walls.

e. Installation of advanced optical system components including lamp array, power supplies, lens system, and primary collimator.

This work, although relatively extensive, is at the same time straight forward. No difficulty is foreseen in accomplishing it with a minimum of facility down-time.

PROJECT JUSTIFICATION:

The solar simulation performance levels of the proposed system are compared below with the capability of the present system.

Performance Parameter	Present Capability	Proposed System	
		Earth to Mars Orbit	Earth to Venus Orbit
Beam size, hexagonal measured across flats, (diameter) ft.	6	15	8 to 10
Practical operating intensity, watts/sq. ft.	135 (Earth orbit)	135 to 50	135 to 270
Uniformity, percent	±5	±5	±8
Collimation, degrees	±5	±2	±2
Spectral match with sun	Fair	Good	Good

The present solar simulation system provides a useful and important test capability for spacecraft of the Atlas-Agena class such as Ranger, Mariner-R, and Mariner-C. However, the testing requirements for future spacecraft of the Centaur class, such as Mariner-B, and Surveyor, require a larger solar simulation beam in the JPL 25-Foot Space Simulator than can be produced with the present system. Furthermore, the improvements in uniformity, collimation, and spectrum which will be obtained with the new system are highly significant and are regarded as essential for accurate thermal-balance testing of advanced classes of scientific spacecraft.

The maximum performance attainable with the present system is estimated to be a six-foot 5% uniform beam or a seven-foot 10% uniform beam. A comprehensive analysis of the existing solar simulator clearly indicates that it is not possible to greatly improve its capability because of basic optical geometry restraints. Advances in the state-of-the-art since the original

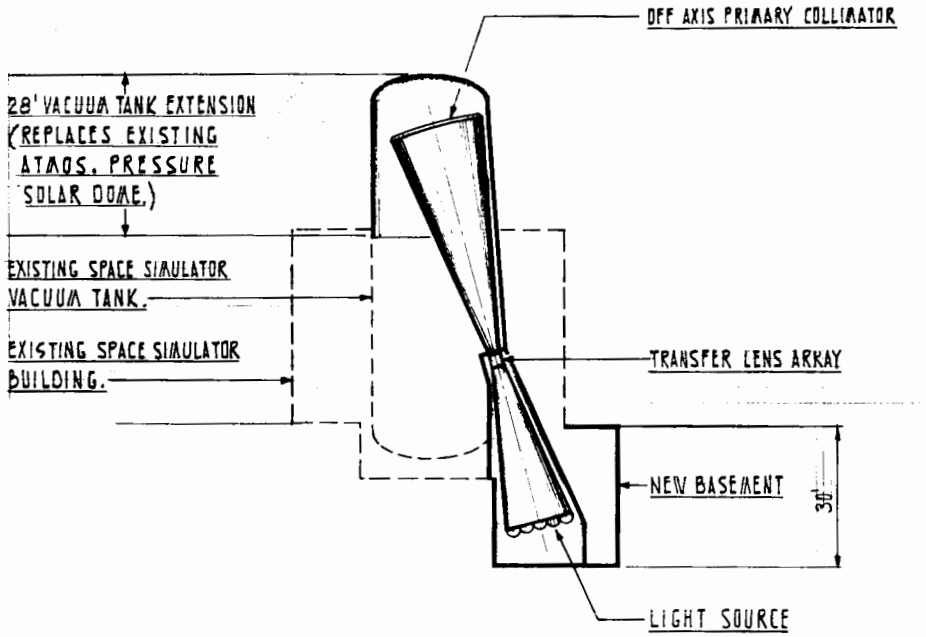
design enables fitting the facility with a larger solar simulation unit which will be commensurate with the overall chamber size and testing potential.

ESTIMATED FUTURE YEAR FUNDING: None

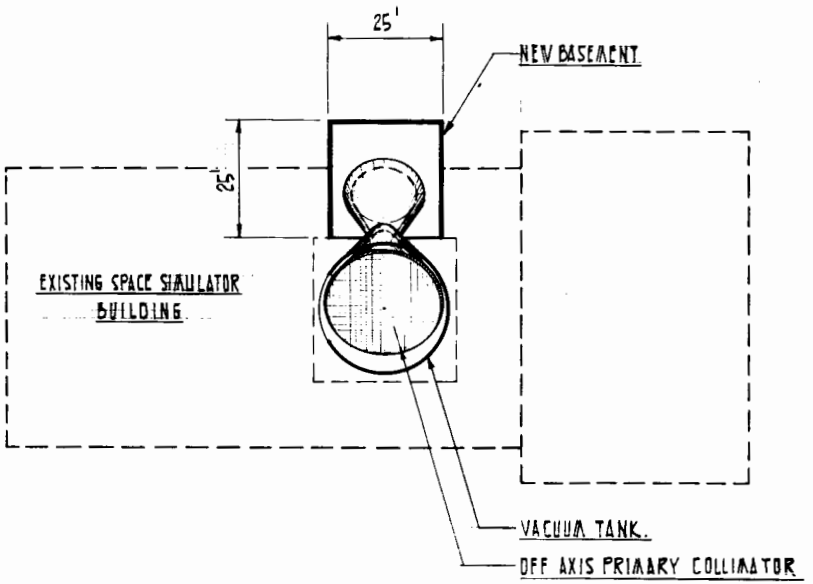
JET PROPULSION LABORATORY

FISCAL YEAR 1965 ESTIMATES

25 FOOT SIMULATOR MODIFICATION



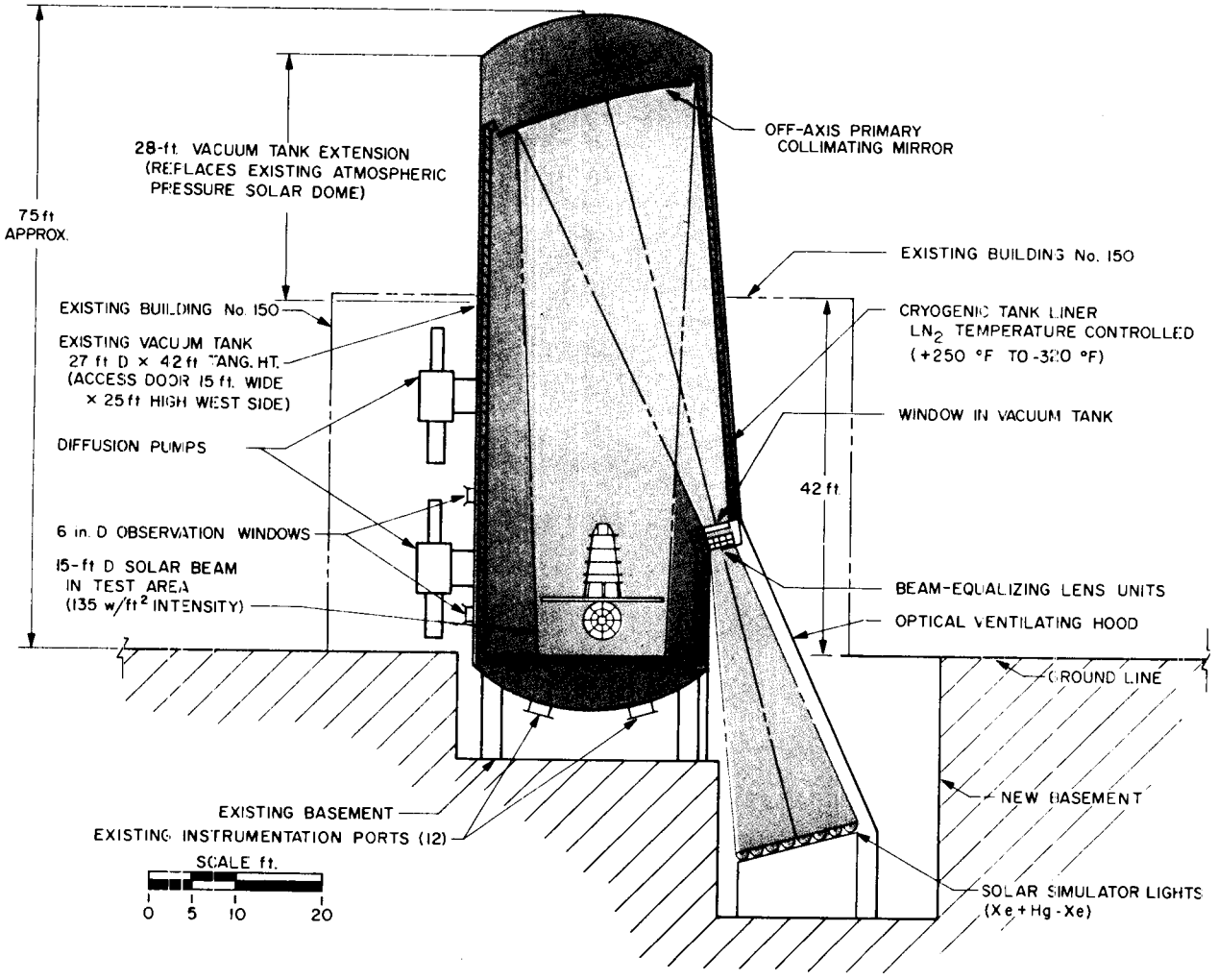
SECTION



FLOOR PLAN

SCALE IN FEET

0 4 8 16 32



PROPOSED

JPL 25-ft. SPACE SIMULATOR MODIFICATION

CROSS SECTION (LOOKING WEST)

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

UTILITIES INSTALLATIONS

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science and Applications

AUTHORIZATION LINE ITEM: Jet Propulsion Laboratory

LOCATION OF PROJECT: Pasadena, Los Angeles County, California

COGNIZANT NASA INSTALLATION: Jet Propulsion Laboratory

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$2,452,000
FY 1964 Estimate	420,000
FY 1965 Estimate	400,000
Total Funding Thru FY 1965	$3,272,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$340,000
Site preparation	LS	---	$20,000	20,000
Roads and Parking	LS	---	10,000	10,000
Utilities	LS	---	310,000	310,000
Equipment				$25,000
Electrical switchgear	LS	---	25,000	25,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design				$35,000
For construction	LS	---	$35,000	35,000
Fallout Shelter	---	---	---	---
		TOTAL		$400,000

PROJECT DESCRIPTION:

This project proposes the extension of utilities and the up-dating of obsolete utilities on the laboratory. The scope of work is shown on the JPL site plan on the following page. The following is a specific description of the proposed items:

1.5 million gallon storage tank: Provide a 1.5 million gallon underground water storage tank on the west end of the laboratory with a supply line to the existing tank on the east end of the laboratory. Provide a tie line from the new tank to the existing distribution system. Some of the old water lines will be replaced with larger ones to provide a more adequate water supply for fire-fighting.

Extension of utilities: This project provides for the extension of utilities to some of the new buildings in this program.

Landscaping and erosion control: Landscaping is needed in areas near the new buildings and roads in accordance with the Master Site Plan. Erosion control is required on a number of bare, steep slopes. This work will include terracing and planting to avoid undue erosion.

Electrical distribution: Addition of a tiebreaker to the main JPL substation. This will require foundations and paving in connection with the installation of a main switch.

PROJECT JUSTIFICATION:

The justification for the individual items in this project is as follows:

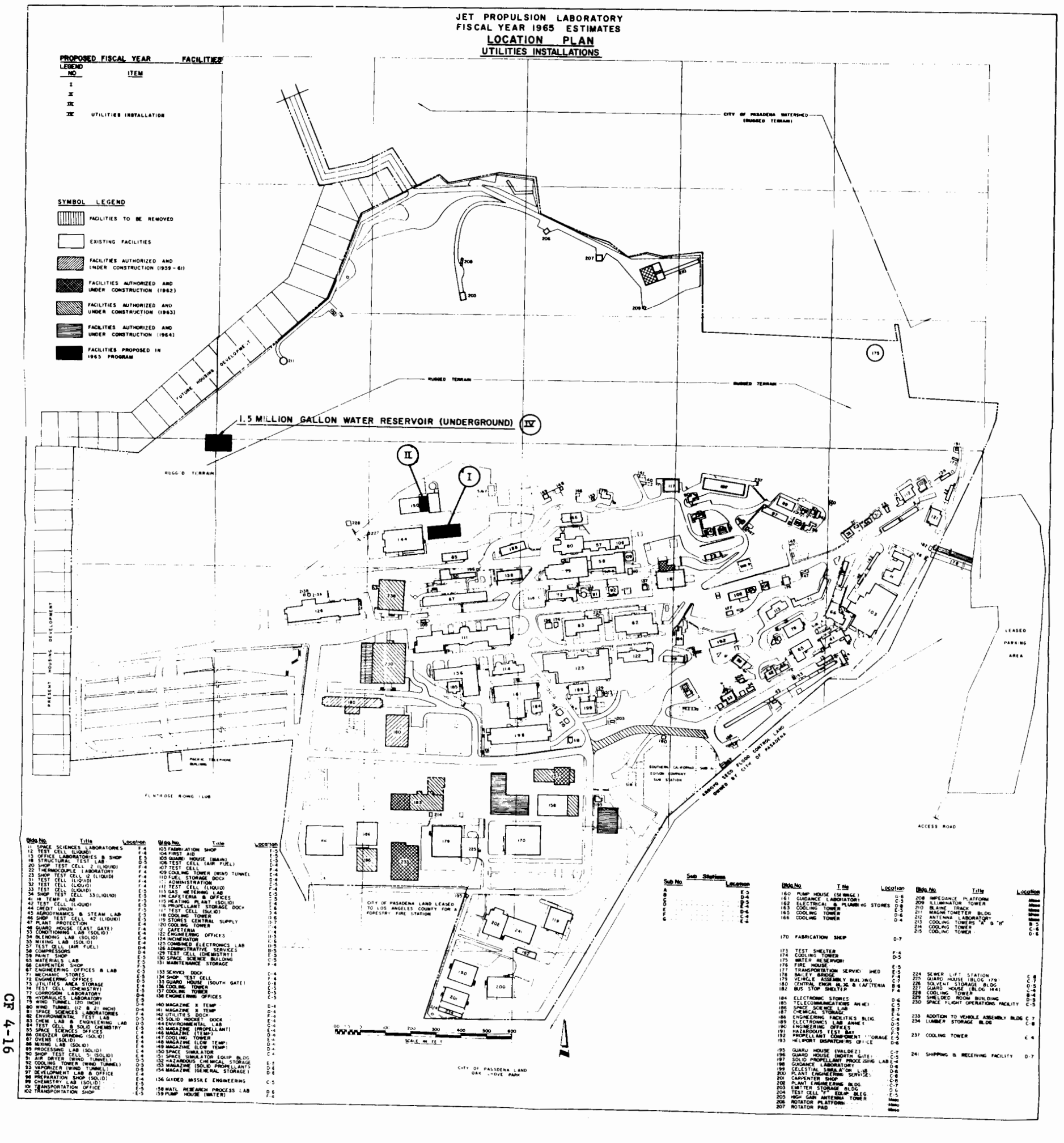
1.5 million gallon storage tank: The present water storage facilities do not have the capacity to handle laboratory requirements and fire-fighting capability on the mesa. Under the fiscal year 1963 utilities program, the architect-engineer made a study of the present water distribution system and stated that the new reservoir and larger water distribution lines are required.

Extension of utilities: To obtain a complete operable facility it is necessary to extend utilities to some of the new buildings under this program. Utilities are installed under roads and the service is extended to the edge of the road to eliminate the necessity of tearing up the road to connect to the supply lines.

Landscaping and erosion control: The areas around new buildings and roads are at finished grade; however, the areas are not protected from soil erosion and will necessitate landscaping.

Electrical distribution: The expansion of the main substation is required to broaden the capabilities of the 16.5 KV distribution due to the increase in demand for electrical power.

ESTIMATED FUTURE YEAR FUNDING: $1,000,000



Bldg No.	Title	Location
11	SPACE SCIENCES LABORATORIES	F-4
12	TEST CELL (LIQUID)	F-4
13	OFFICE LABORATORIES & SHOP	E-5
18	STRUCTURAL TEST LAB	D-5
20	SHOP TEST CELL 2 (LIQUID)	F-4
22	THERMOCOUPLE LABORATORY	F-4
23	SHOP TEST CELL 12 (LIQUID)	F-4
31	TEST CELL (LIQUID)	F-4
32	TEST CELL (LIQUID)	F-4
33	TEST CELL (LIQUID)	E-5
34	SHOP TEST CELL 33 (LIQUID)	E-5
41	HI TEMP LAB	E-5
42	TEST CELL (LIQUID)	E-5
44	CREDIT UNION	F-5
45	AERODYNAMICS & STEAM LAB	E-5
46	SHOP TEST CELL 42 (LIQUID)	E-5
47	PLANT PROTECTION	E-4
48	GUARD HOUSE (EAST GATE)	F-4
53	CONDITIONING LAB (SOLID)	E-4
54	BLENDING LAB (SOLID)	E-4
55	MIXING LAB (SOLID)	E-4
57	TEST CELL (AIR FUEL)	D-4
58	COMPRESSORS	D-4
59	PAINT SHOP	E-5
65	MATERIALS LAB	E-5
66	CARPENTER SHOP	F-5
67	ENGINEERING OFFICES & LAB	C-5
71	MECHANIC STORES	E-5
72	ENGINEERING OFFICES	D-5
73	UTILITIES AREA STORAGE	E-4
74	TEST CELL (CHEMISTRY)	E-5
77	CORROSION LABORATORY	E-5
78	HYDRAULICS LABORATORY	D-4
79	WIND TUNNEL (20 INCH)	D-4
80	WIND TUNNEL (12 & 21 INCH)	D-4
81	SPACE SCIENCES LABORATORIES	F-4
82	ENVIRONMENTAL TEST LAB	D-5
83	CHEM LAB & ENGINEERING LAB	D-5
84	TEST CELL (LIQUID & SOLID CHEMISTRY	E-5
85	SPACE SCIENCES OFFICES	C-4
86	OXIDIZER GRINDING (SOLID)	E-4
87	OVENS (SOLID)	E-4
88	MIXING LAB (SOLID)	E-4
89	PROCESSING LAB (SOLID)	E-4
90	SHOP TEST CELL 51 (SOLID)	E-4
91	AIR DRYER (WIND TUNNEL)	D-5
92	COOLING TOWER (WIND TUNNEL)	D-5
93	VAPORIZER (WIND TUNNEL)	D-5
97	DEVELOPMENT LAB & OFFICE	E-4
98	PREPARATION SHOP (SOLID)	E-4
99	CHEMISTRY LAB (SOLID)	E-5
101	TRANSPORTATION OFFICE	E-5
102	TRANSPORTATION SHOP	E-5

Bldg No.	Title	Location
103	FABRICATION SHOP	F-5
104	FIRST AID	E-5
105	GUARD HOUSE (MAIN)	E-5
106	TEST CELL (AIR FUEL)	E-4
107	TEST CELL	F-4
109	COOLING TOWER (WIND TUNNEL	C-4
110	FUEL STORAGE DOCK	D-4
111	ADMINISTRATION	C-5
112	TEST CELL (LIQUID)	F-4
113	GAS METERING LAB	E-5
114	CAFETERIA & OFFICES	C-5
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117	TEST CELL (SOLID)	E-4
118	COOLING TOWER	D-6
119	STORES CENTRAL SUPPLY	D-7
120	COOLING TOWER	F-4
121	CAFETERIA	F-4
122	ENGINEERING OFFICES	D-5
124	INCINERATOR	E-6
125	COMBINED ELECTRONICS LAB	D-5
126	ADMINISTRATIVE SERVICES	B-5
129	TEST CELL (CHEMISTRY)	E-5
130	SPACE SCIENCE BUILDING	C-5
131	MAINTENANCE STORAGE	F-4
133	SERVICE DOCK	E-4
134	SHOP TEST CELL	F-4
135	GUARD HOUSE (SOUTH GATE)	C-6
136	COOLING TOWER	C-5
137	COOLING TOWER	C-5
138	ENGINEERING OFFICES	C-5
140	MAGAZINE X TEMP	D-4
141	MAGAZINE X TEMP	D-4
142	UTILITIES DOCK	F-4
143	SOLID ROCKET DOCK	E-4
144	ENVIRONMENTAL LAB	C-4
145	MAGAZINE (PROPELLANT)	E-4
146	MAGAZINE (TEMP)	D-4
147	COOLING TOWER	E-4
148	MAGAZINE (LOW TEMP)	D-4
149	MAGAZINE (LOW TEMP)	D-4
150	SPACE SIMULATOR	C-4
151	SPACE SIMULATOR EQUIP BLDG	
152	HAZARDOUS CHEMICAL STORAGE	E-4
153	MAGAZINE (SOLID PROPELLANT)	D-6
154	MAGAZINE (GENERAL STORAGE)	D-6
156	GUIDED MISSILE ENGINEERING	C-5
158	MATL RESEARCH PROCESS LAB	D-6
159	PUMP HOUSE (WATER)	F-4

Sub No	Sub Station Location
A	E-5
B	D-4
C	C-5
D	D-4
E	D-4
F	D-4
G	E-4

Bldg No.	Title	Location
160	PUMP HOUSE (SUBAGE)	D-5
161	GUIDANCE LABORATORY	C-5
162	ELECTRICAL & PLUMBING STORES	D-5
163	COOLING TOWER	E-5
165	COOLING TOWER	D-6
166	COOLING TOWER	D-4
170	FABRICATION SHOP	D-7
173	TEST SHELTER	
174	COOLING TOWER	F-4
175	WATER RESERVOIR	D-5
176	FIRE HOUSE	
177	TRANSPORTATION SERVICE SHED	E-5
178	BAILEY BRIDGE	E-5
179	VEHICLE ASSEMBLY BUILDING	F-4
180	CENTRAL ENGR BLDG & CAFETERIA	C-7
182	BUS STOP SHELTER	B-6
184	ELECTRONIC STORES	F-4
185	TELECOMMUNICATIONS ANNEX	D-6
186	SPACE SCIENCE LAB	C-5
187	CHEMICAL STORAGE	B-7
188	ENGINEERING FACILITIES BLDG	E-6
189	ELECTRONICS LAB ANNEX	E-5
190	ENGINEERING OFFICES	D-5
191	HAZARDOUS TEST BAY	C-8
192	PROPELLANT COMPONENT STORAGE	F-5
193	HELIPORT DISPATCHERS OFFICE	E-5
		D-6
195	GUARD HOUSE (VALDEZ)	C-7
196	GUARD HOUSE (NORTH GATE)	C-5
197	SOLID PROPELLANT PROCESSING LAB	E-4
198	GUIDANCE LABORATORY	D-6
199	CELESTIAL SIMULATOR LAB	D-8
200	PLANT ENGINEERING SERVICES	C-8
201	CARPENTER SHOP	C-8
202	PLANT ENGINEERING BLDG	C-7
203	EMITTER STORAGE BLDG	D-6
204	TEST CELL "F" EQUIP BLDG	E-5
205	HIGH GAIN ANTENNA TOWER	Misc
206	ROTATOR PLATFORM	Misc
207	ROTATOR PAD	Misc

Bldg No.	Title	Location
208	IMPEDANCE PLATFORM	Misc
209	ILLUMINATOR TOWER	Misc
210	BLAINE TRACK	Misc
211	MAGNETOMETER BLDG	Misc
212	ANTENNA LABORATORY	Misc
213	COOLING TOWERS "A & B"	B-5
214	COOLING TOWER	C-6
215	COOLING TOWER	D-6
224	SEWER LIFT STATION	C-8
225	GUARD HOUSE (BLDG 179)	C-7
226	SOLVENT STORAGE BLDG	D-5
227	GUARD HOUSE (BLDG 144)	C-4
228	COOLING TOWER	B-4
229	SHIELDED ROOM BUILDING	D-5
230	SPACE FLIGHT OPERATIONS FACILITY	C-5
233	ADDITION TO VEHICLE ASSEMBLY BLDG	C-7
234	LUMBER STORAGE BLDG	C-8
237	COOLING TOWER	C-4
241	SHIPPING & RECEIVING FACILITY	D-7

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

SUPPORTING SERVICES BUILDING

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Jet Propulsion Laboratory

LOCATION OF PROJECT: Edwards Test Station - Edwards Air Force Base Kern County, California

COGNIZANT NASA INSTALLATION: Jet Propulsion Laboratory

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$400,000
Total Funding Thru FY 1965	$400,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$355,000
Support building	Sq. Ft.	14,000	$23.07	323,000
Site preparation	LS	---	2,500	2,500
Roads and parking	LS	---	1,000	1,000
Utilities	LS	---	28,500	28,500
Equipment				$25,000
Kitchen	LS	---	19,000	19,000
Photo laboratory	LS	---	6,000	6,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design				$20,000
For construction	LS	---	$20,000	20,000
Fallout Shelter	---	---	---	---
		TOTAL		$400,000

PROJECT DESCRIPTION:

This project provides for the completion of a 13,200 square foot combined engineering and support services building for Edwards Test Station. The proposed construction will provide a centralized supporting facility which will encompass almost all nonhazardous operations at the Test Station. The building will include support shops, photo laboratory, cafeteria, library and engineering offices.

The areas allocated for the various support functions housed in this building are of adequate size to support the present technical programs. The planned occupancy includes a total of thirty-six personnel.

PROJECT JUSTIFICATION:

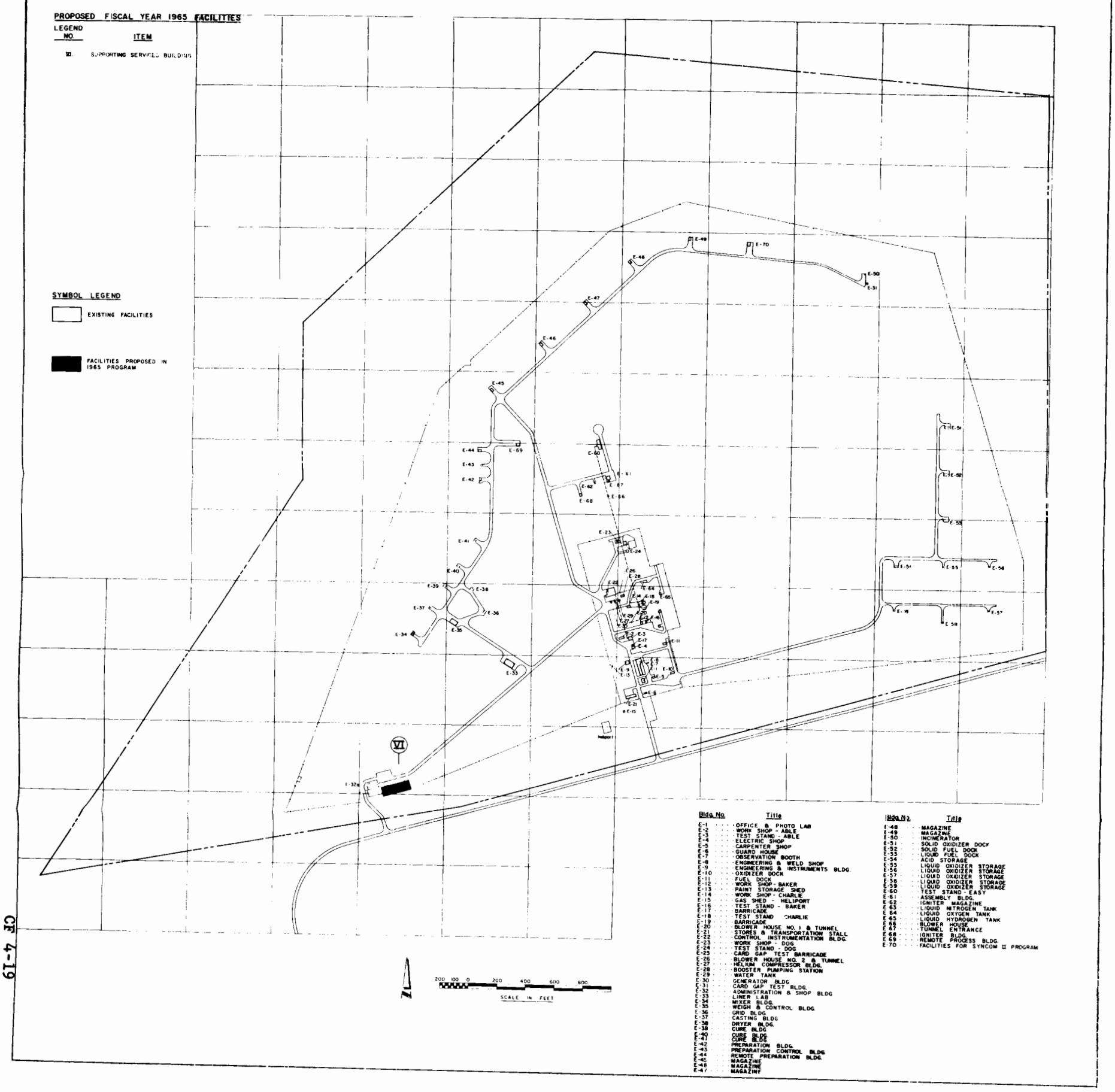
All of the old support services area is incorrectly sited from the safety standpoint as it lies within inhabited building distances of the test stands according to the Ordnance Safety Manual, ORDM 7-224. These safety deviations exist because ORDM 7-224, which is a part of JPL's contract, was not published until 1951, six years after the test station was activated. The new support service area is properly sited well away from explosive and toxic hazards yet close enough to provide a convenient, well integrated operation within one fenced area which provides maximum security and property control benefits with minimum manpower and transportation resources.

The proposed facility will provide support services for JPL technical operations which cannot be conducted in Pasadena because of the explosive and toxic hazards and the noise and atmospheric contamination which are often associated with test and development operations. The facility will be used to support such current JPL programs as Mariner, Syncom, and the liquid and solid propellant supporting research and advanced development programs. It will have the further capability to support propulsion testing of all spacecraft for which JPL is given responsibility.

In summary, the proposed facility is required to remove nonhazardous activities from the test stand areas to permit compliance with the Ordnance Safety Manual and to provide adequate facilities for operation of support functions.

ESTIMATED FUTURE YEAR FUNDING: None

JET PROPULSION LABORATORY
FISCAL YEAR 1965 ESTIMATES
LOCATION PLAN
(EDWARDS TEST STATION)



Bldg. No.	Title
E-1	OFFICE & PHOTO LAB
E-2	WORK SHOP - ABLE
E-3	TEST STAND - ABLE
E-4	ELECTRIC SHOP
E-5	CARPENTER SHOP
E-6	GUARD HOUSE
E-7	OBSERVATION BOOTH
E-8	ENGINEERING & WELD SHOP
E-9	ENGINEERING & INSTRUMENTS BLDG.
E-10	OXIDIZER DOCK
E-11	FUEL DOCK
E-12	WORK SHOP - BAKER
E-13	PAINT STORAGE SHED
E-14	WORK SHOP - CHARLIE
E-15	GAS SHED - HELIPORT
E-16	TEST STAND - BAKER
E-17	BARRICADE
E-18	TEST STAND CHARLIE
E-19	BARRICADE
E-20	BLOWER HOUSE NO. 1 & TUNNEL
E-21	STORES & TRANSPORTATION STALL
E-22	CONTROL INSTRUMENTATION BLDG.
E-23	WORK SHOP - DOG
E-24	TEST STAND - DOG
E-25	CARD GAP TEST BARRICADE
E-26	BLOWER HOUSE NO. 2 & TUNNEL
E-27	HELIUM COMPRESSOR BLDG.
E-28	BOOSTER PUMPING STATION
E-29	WATER TANK
E-30	GENERATOR BLDG
E-31	CARD GAP TEST BLDG.
E-32	ADMINISTRATION & SHOP BLDG
E-33	LINER LAB
E-34	MIXER BLDG.
E-35	WEIGH & CONTROL BLDG.
E-36	GRID BLDG.
E-37	CASTING BLDG
E-38	DRYER BLDG.
E-39	CURE BLDG
E-40	CURE BLDG
E-41	CURE BLDG
E-42	PREPARATION BLDG.
E-43	PREPARATION CONTROL BLDG
E-44	REMOTE PREPARATION BLDG.
E-45	MAGAZINE
E-46	MAGAZINE
E-47	MAGAZINE

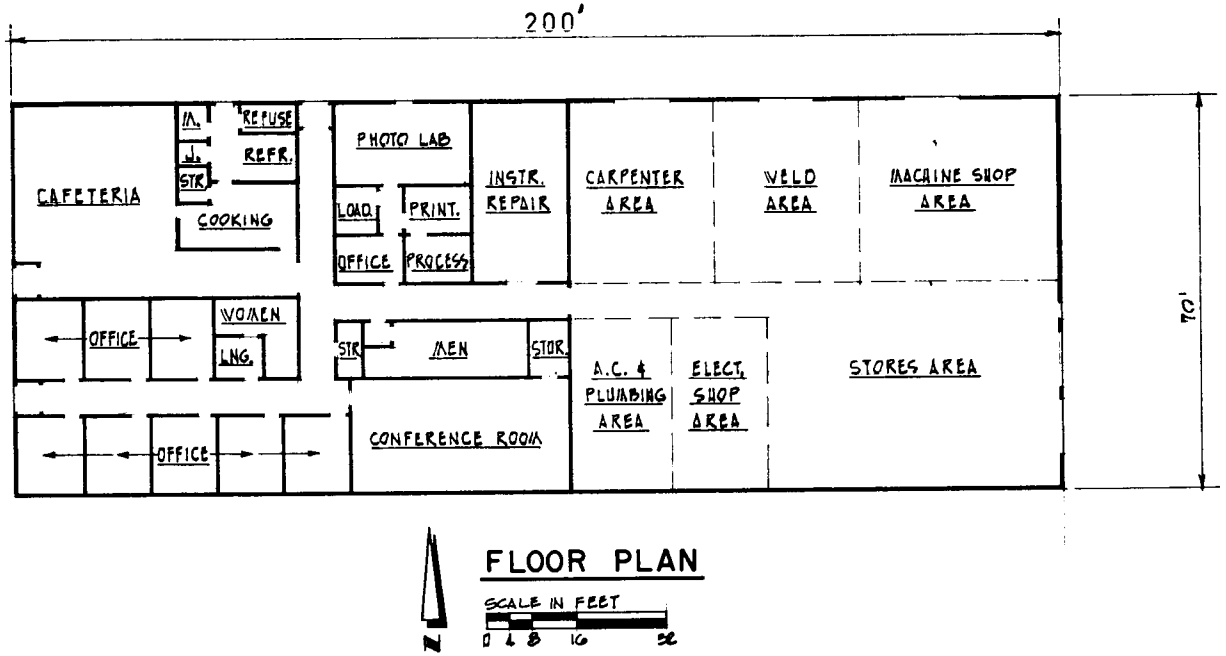
Bldg. No.	Title
E-48	MAGAZINE
E-49	MAGAZINE
E-50	INCINERATOR
E-51	SOLID OXIDIZER DOCK
E-52	SOLID FUEL DOCK
E-53	LIQUID FUEL DOCK
E-54	ACID STORAGE
E-55	LIQUID OXIDIZER STORAGE
E-56	LIQUID OXIDIZER STORAGE
E-57	LIQUID OXIDIZER STORAGE
E-58	LIQUID OXIDIZER STORAGE
E-59	LIQUID OXIDIZER STORAGE
E-60	TEST STAND - EASY
E-61	ASSEMBLY BLDG.
E-62	IGNITER MAGAZINE
E-63	LIQUID NITROGEN TANK
E-64	LIQUID OXYGEN TANK
E-65	LIQUID HYDROGEN TANK
E-66	BLOWER HOUSE
E-67	TUNNEL ENTRANCE
E-68	IGNITER BLDG.
E-69	REMOTE PROCESS BLDG.
E-70	FACILITIES FOR SYNCOM II PROGRAM

JET PROPULSION LABORATORY

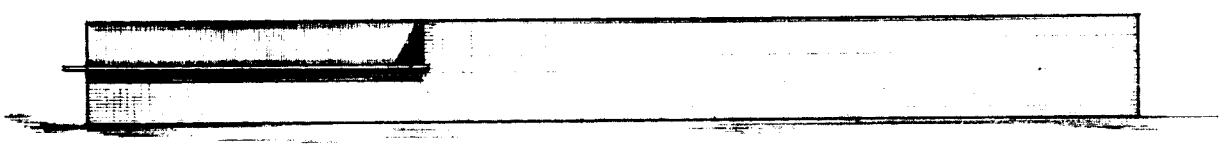
FISCAL YEAR 1965 ESTIMATES

SUPPORTING SERVICES BUILDING

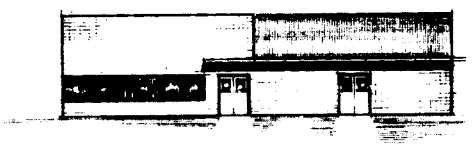
(EDWARDS TEST STATION)



FLOOR PLAN



SOUTH ELEVATION



WEST ELEVATION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

JOHN F. KENNEDY SPACE CENTER, NASA

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Location plan	CF 5-1
Summary	CF 5-3
Office of Manned Space Flight Projects:	
Additions to manned spacecraft operations and checkout building.	CF 5-4
Advanced Saturn launch complex No. 39	CF 5-9
Extension to central supply complex	CF 5-12
Manned spacecraft static test facility	CF 5-16
Propellant systems components laboratory	CF 5-24
Utility installations - New area	CF 5-29
Office of Space Science and Applications Projects:	
Addition to unmanned spacecraft explosive safe assembly complex.	CF 5-39
Modifications to Centaur launch complex No. 36	CF 5-42
Modifications to launch complex No. 17	CF 5-47
Spin balance facilities for unmanned spacecraft	CF 5-50

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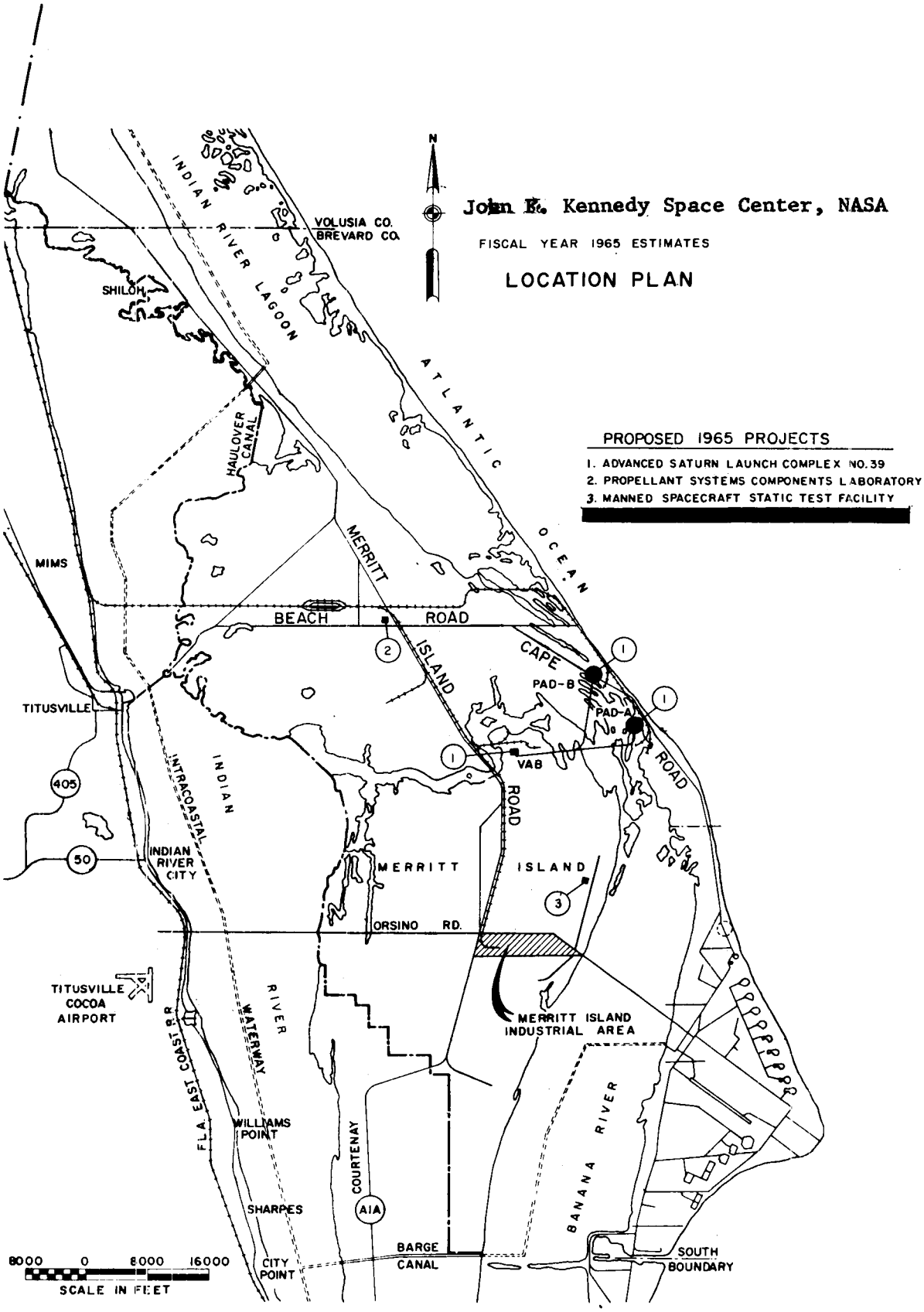
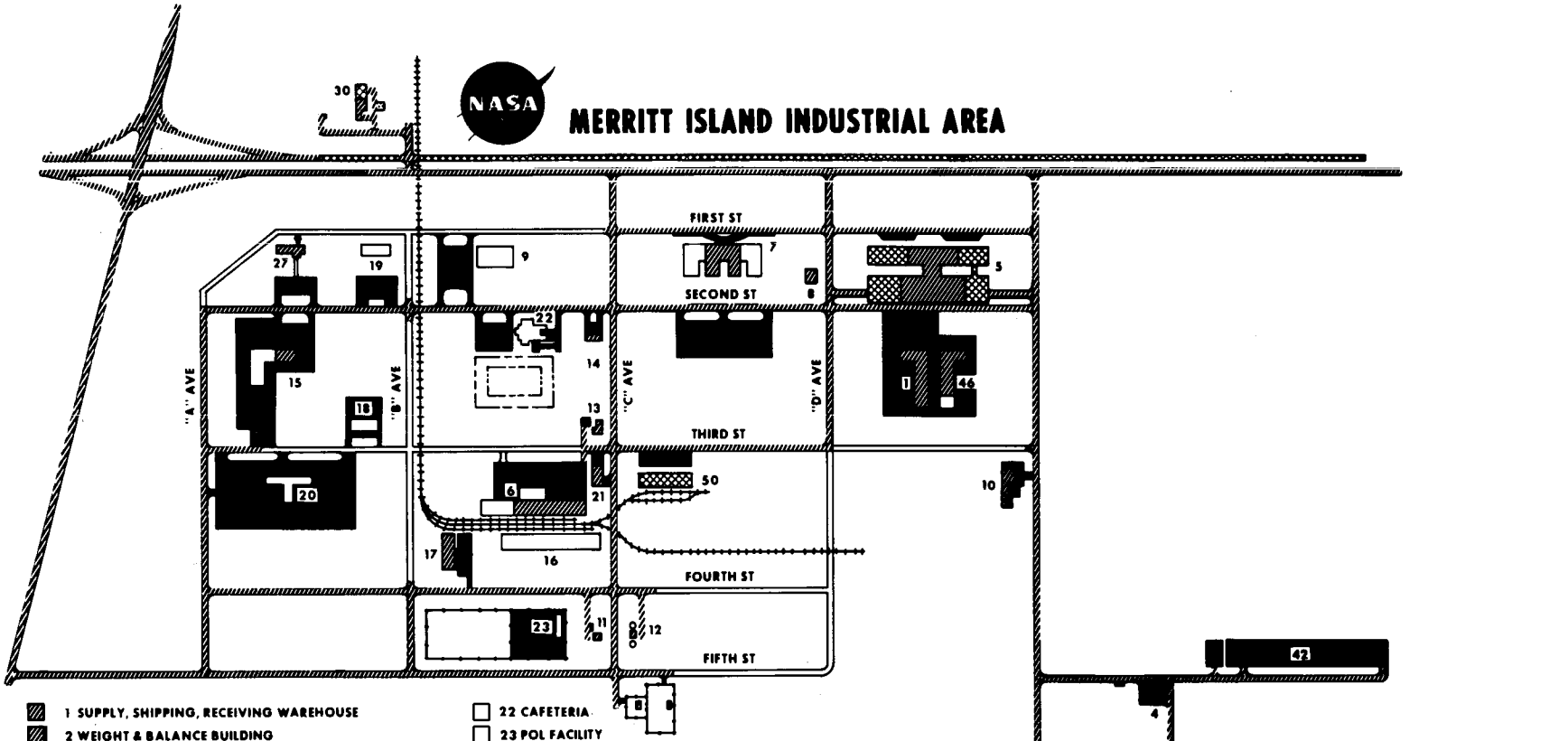

John F. Kennedy Space Center, NASA
FISCAL YEAR 1965 ESTIMATES
LOCATION PLAN
N
PROPOSED 1965 PROJECTS
1. ADVANCED SATURN LAUNCH COMPLEX NO. 39
2. PROPELLANT SYSTEMS COMPONENTS LABORATORY
3. MANNED SPACECRAFT STATIC TEST FACILITY
VOLUSIA CO.
BREVARD CO.
SHILOH
INDIAN RIVER LAGOON
ATLANTIC OCEAN
HAULOVER CANAL
MIMS
MERRITT ISLAND
BEACH ROAD
CAPE ROAD
PAD-B
PAD-A
VAB
TITUSVILLE
405
50
INDIAN RIVER CITY
INTRACOASTAL
INDIAN RIVER WATERWAY
MERRITT ISLAND
ORSINO RD.
TITUSVILLE COCOA AIRPORT
MERRITT ISLAND INDUSTRIAL AREA
FLA. EAST COAST R.R.
WILLIAMS POINT
COURTENAY
SHARPES
A1A
BANANA RIVER
BARGE CANAL
CITY POINT
SOUTH BOUNDARY
8000 0 8000 16000
SCALE IN FEET

CF 5-1

MERRITT ISLAND INDUSTRIAL AREA



1 SUPPLY, SHIPPING, RECEIVING WAREHOUSE
2 WEIGHT & BALANCE BUILDING
4 ENVIRONMENTAL CONTROL SYSTEMS BLDG.
5 SPACECRAFT OPERATIONS & CHECKOUT FACILITY
6 CENTRAL SUPPLY FACILITY
7 LAUNCH OPERATIONS CENTER HEADQUARTERS
8 AUDITORIUM & TRAINING FACILITY
9 CENTRAL INSTRUMENTATION FACILITY
10 PARACHUTE & PARAGLIDER FACILITY
11 SEWAGE-TREATMENT PLANT
12 WATER STORAGE TANKS
13 HEATING PLANT
14 DISPENSARY
15 PLANT MAINTENANCE FACILITY
16 WAREHOUSE, STORAGE & SUPPLY FACILITY
17 CABLE STORAGE & MAINTENANCE FACILITY
18 SECURITY HEADQUARTERS
19 RANGE ENGINEERING & ADMINISTRATION
20 VEHICLE MAINTENANCE FACILITY
21 FIRE STATION

22 CAFETERIA
23 POL FACILITY
27 CORPS OF ENGINEERS FACILITY

30 CENTRAL TELEPHONE OFFICE
31 SUPPORT BUILDING
32 HYPERGOLIC TEST BUILDING
33 HYPERGOLIC TEST BUILDING
34 N_2O_4 PAD
35 MMH PAD
36 LO_2 PAD
37 CRYOGENIC TEST BUILDING
38 LH_2 PAD
39 ORDNANCE FIELD TEST LAB

42 RADAR BORESITE RANGE

44 CRYOGENIC TEST BUILDING
46 SUPPLY & GSE SERVICE BUILDING
50 EXTENSIONS TO CENTRAL SUPPLY COMPLEX
51 MSC ORDNANCE STORAGE FACILITY

FY 63
FY 64
FY 65

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
John F. Kennedy Space Center, NASA	Manned Space Flight	Merritt Island, Florida	Brevard	Cocoa Beach

INSTALLATION MISSION

To conduct overall planning and supervision of the integration, test, checkout, and launch of NASA space vehicle systems at the Atlantic Missile Range (AMR) and Merritt Island, and to provide support services for all NASA elements located in the area.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	1,181	1,713	2,242
CONTRACTOR & OTHER PERSONNEL	2,519	5,483	8,806
TOTAL ALL PERSONNEL	3,700	7,196	11,048

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	87,400	
LAND *(Lease or Permit)*	350	
PLANT VALUE *(as of June 30, 1963)*		122,747
TOTAL	87,750	122,747

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Addition to manned spacecraft operations and checkout building	MSF	15,816.0	4,373.0	16,316.0	---	36,505.0
Advanced Saturn launch complex No. 39	MSF	169,550.0	193,980.0	63,284.0	---	426,814.0
Extension to central supply complex	MSF	710.0	2,093.6	952.0	---	3,755.6
Manned spacecraft static test facility	MSF	5,000.0	93.0	2,780.0	---	7,873.0
Propellant systems components laboratory	MSF	---	12.0	588.0	---	600.0
Utility installations - New area	MSF	---	256.0	5,600.0	1,000.0	6,856.0
Addition to unmanned spacecraft explosive safe assembly complex	OSS	1,181.0	30.0	570.0	2,000.0	3,781.0
Modifications to Centaur launch complex No. 36	OSS	25,009.0	49.0	451.0	1,000.0	26,509.0
Modifications to launch complex No. 17	OSS	---	35.0	465.0	---	500.0
Spin balance facilities for unmanned spacecraft	OSS	---	12.0	255.0	---	267.0
TOTAL FOR PROJECTS IN FY 1965	ESTIMATE			91,261.0		

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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ADDITIONS TO MANNED SPACECRAFT OPERATIONS AND CHECKOUT BUILDING

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Merritt Island, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$15,816,000
FY 1964 Estimate	4,964,100
FY 1965 Estimate	16,316,000
Total Funding Through FY 1965	$37,096,100

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$13,152,800
Building	Sq. Ft.	278,787	$43.48	12,121,700
Site preparation	LS	---	687,300	687,300
Utilities	LS		343,800	343,800
Equipment				$2,971,200
Office, shop, & laboratory, equipment	LS	---	1,121,000	1,121,000
Systems to connect ground support equipment	LS	---	695,400	695,400
Air-conditioning, power, supplies, cooling systems	LS	---	485,300	485,300

	Unit of Measure	Quantity	Unit Cost	Total Cost
Communications systems	LS	---	$669,500	669,500
Design	---	---	---	---
		SUBTOTAL		$16,124,000
Fallout Shelter				192,000
		TOTAL		$16,316,000

PROJECT DESCRIPTION:

This project provides for the following expansions to the Operations and Checkout Building: (1) two three-story additions to the administrative and engineering wing to provide approximately 156,850 square feet of office space; (2) a five-story office and trainer addition containing approximately 34,400 square feet, consisting of office space on the first two floors, test areas on the third floor, a lunar excursion module (LEM) trainer room on the fourth floor, and a trainer control room on the fifth floor; (3) a single story addition to the service area containing approximately 2,250 square feet, to house mechanical equipment; and (4) an addition of approximately 85,287 square feet to the low-bay assembly and test area. The latter will be divided into four basic areas: (a) a service area, containing approximately 10,250 square feet, to house switchgear, LEM spare parts and tool rooms, modification shop, and mechanical equipment; (b) an assembly and test area of approximately 15,610 square feet; (c) cable and utility tunnels containing approximately 6,927 square feet, for communications and power cabling; and (d) a four-story test area containing approximately 52,500 square feet, to house test equipment and spacecraft shops.

PROJECT JUSTIFICATION:

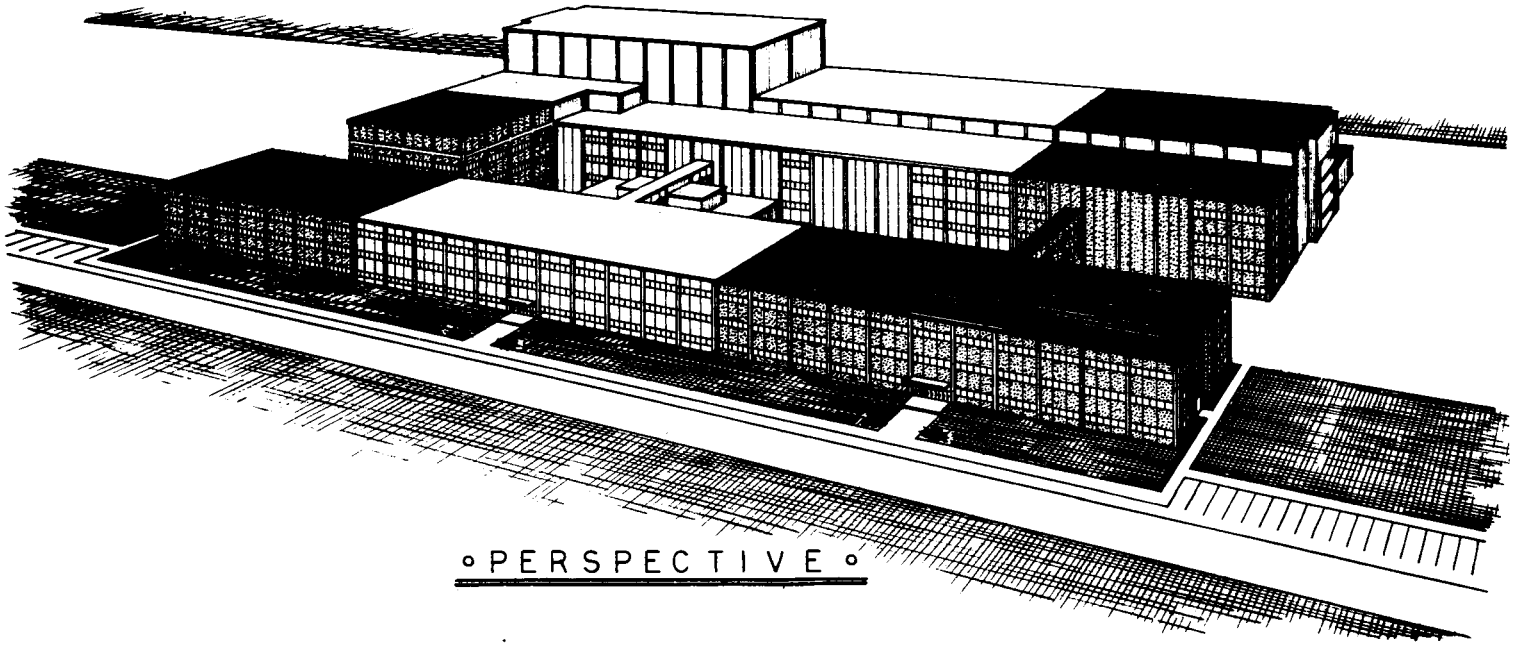
The lunar excursion module of the Apollo spacecraft configuration, coupled with the growth in activity associated with the command and service modules, requires additional assembly and checkout, office, test, and service areas for contractor and NASA personnel. The existing Operations and Checkout Building contains work areas for engineering, administration, checkout, and modification of the Gemini and Apollo command and service modules. Previously authorized construction of this facility provided only for the initial buildup of NASA and contractor personnel. The proposed additions are required to: (a) house the phased increase in personnel, and (b) perform the complete preflight checkout of non-hazardous manned spacecraft systems in order to prove the flight worthiness of all modules of the spacecraft.

ESTIMATED FUTURE YEAR FUNDING: None

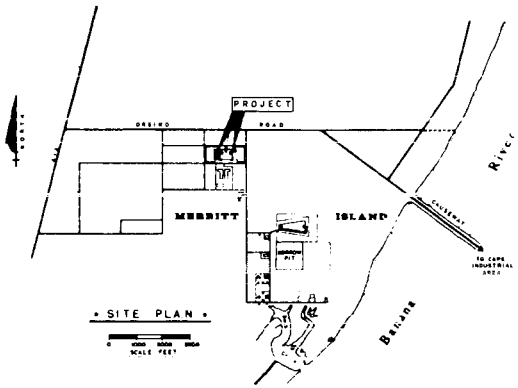
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

ADDITIONS TO MANNED SPACECRAFT OPERATIONS & CHECKOUT BUILDING



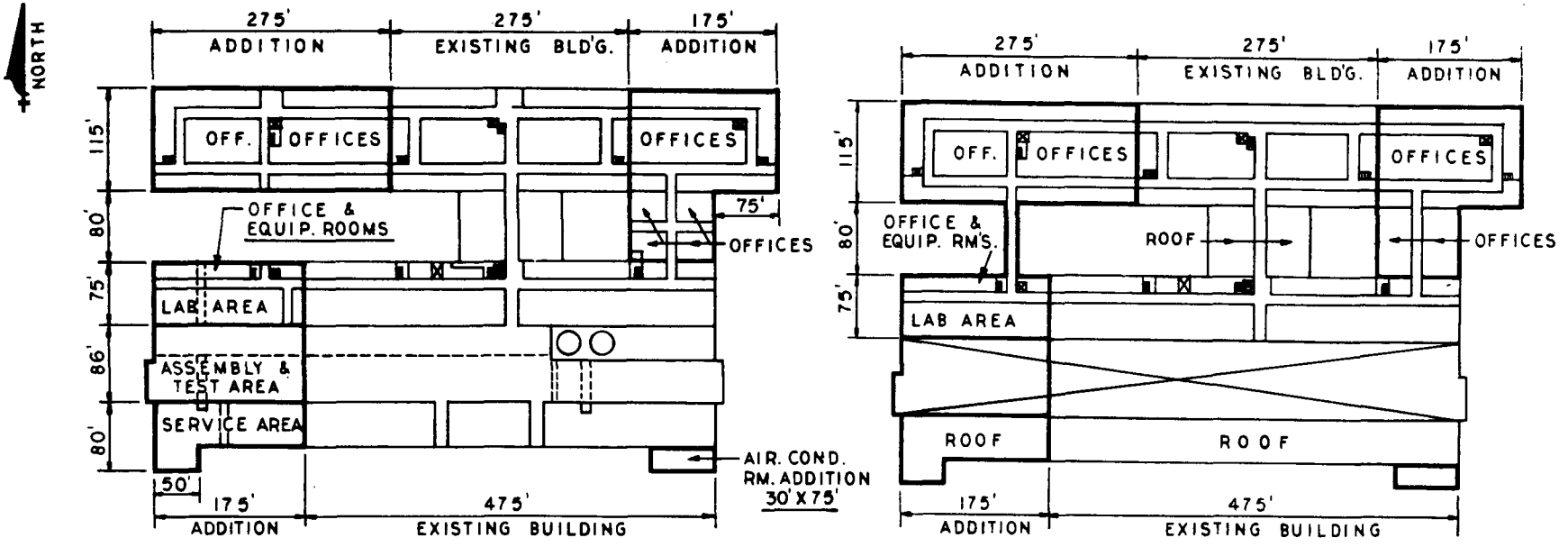
◦ PERSPECTIVE ◦



JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

ADDITIONS TO MANNED SPACECRAFT OPERATIONS & CHECKOUT BUILDING



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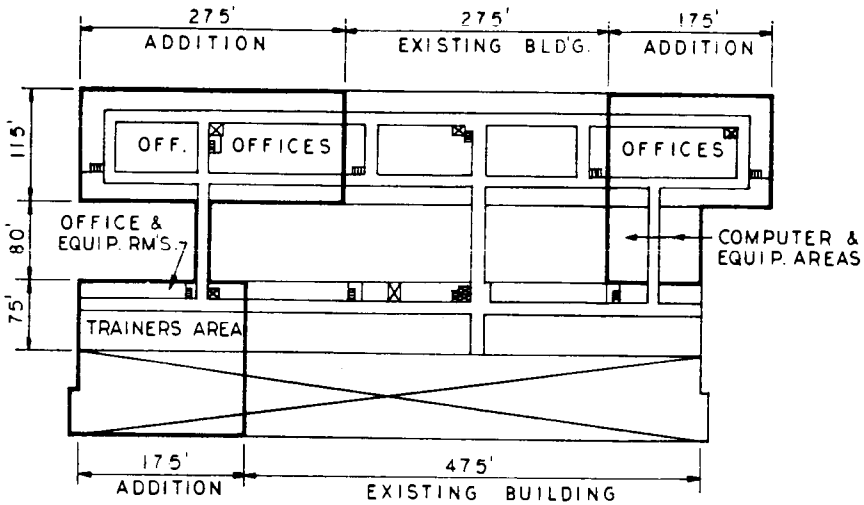
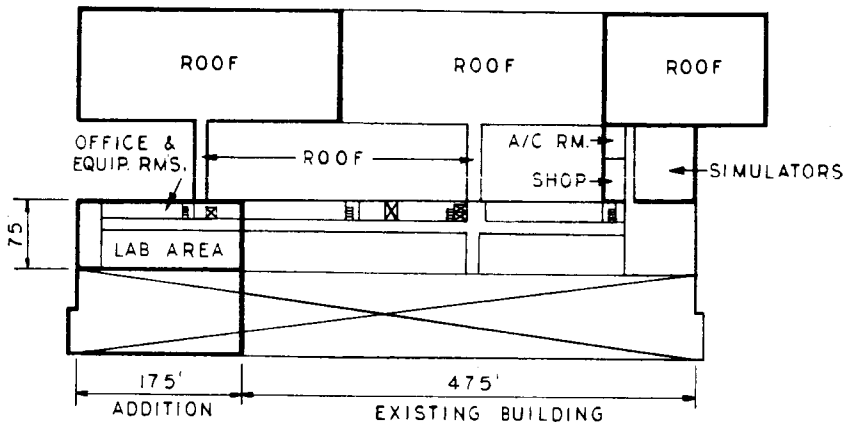
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

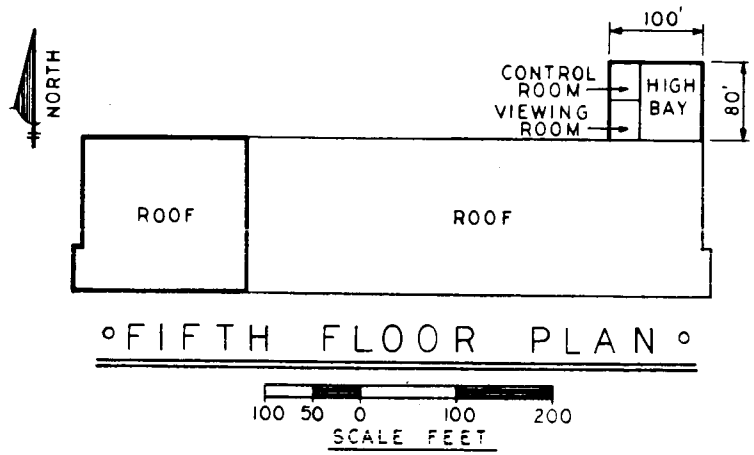
ADDITIONS TO MANNED SPACECRAFT OPERATIONS & CHECKOUT BUILDING



◦ THIRD FLOOR PLAN ◦



◦ FOURTH FLOOR PLAN ◦



◦ FIFTH FLOOR PLAN ◦

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SCALE FEET

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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ADVANCED SATURN LAUNCH COMPLEX NO. 39

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Merritt Island, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$169,550,000
FY 1964 Estimate	193,980,000
FY 1965 Estimate	63,284,000
Total Funding Through FY 1965	$426,814,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$674,000
Railroad spurs	LS	---	$674,000	674,000
Equipment				$57,069,000
Propellant services	LS	---	23,490,000	23,490,000
Communication, TV and cabling	LS	---	6,660,000	6,660,000
Firing accessories	LS	---	17,304,000	17,304,000
General support	LS	---	3,350,000	3,350,000
Instrumentation	LS	---	5,835,000	5,835,000
Launch controller status panels	LS	---	430,000	430,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design				$5,541,000
For construction	LS	---	$33,000	33,000
For equipment	LS	---	5,508,000	5,508,000
Fallout Shelter	---	---	---	---
		TOTAL		$63,284,000

PROJECT DESCRIPTION:

This project provides for the continuation of design and construction of facilities to be used for assembling, readying, and launching the Saturn V vehicle. Prior funding provided for the design, incremental costs of the construction of the major structures, and long procurement lead time items for the complex, such as the vertical assembly building, launch control center, two launch pads, one arming tower, four launcher-umbilical towers, two crawler-transporters, crawlerways, and associated facilities and equipment. This increment provides funds for the shorter lead time items necessary to support the initial launch requirements for the Apollo program as well as the capability of supporting the present launch schedules.

PROJECT JUSTIFICATION:

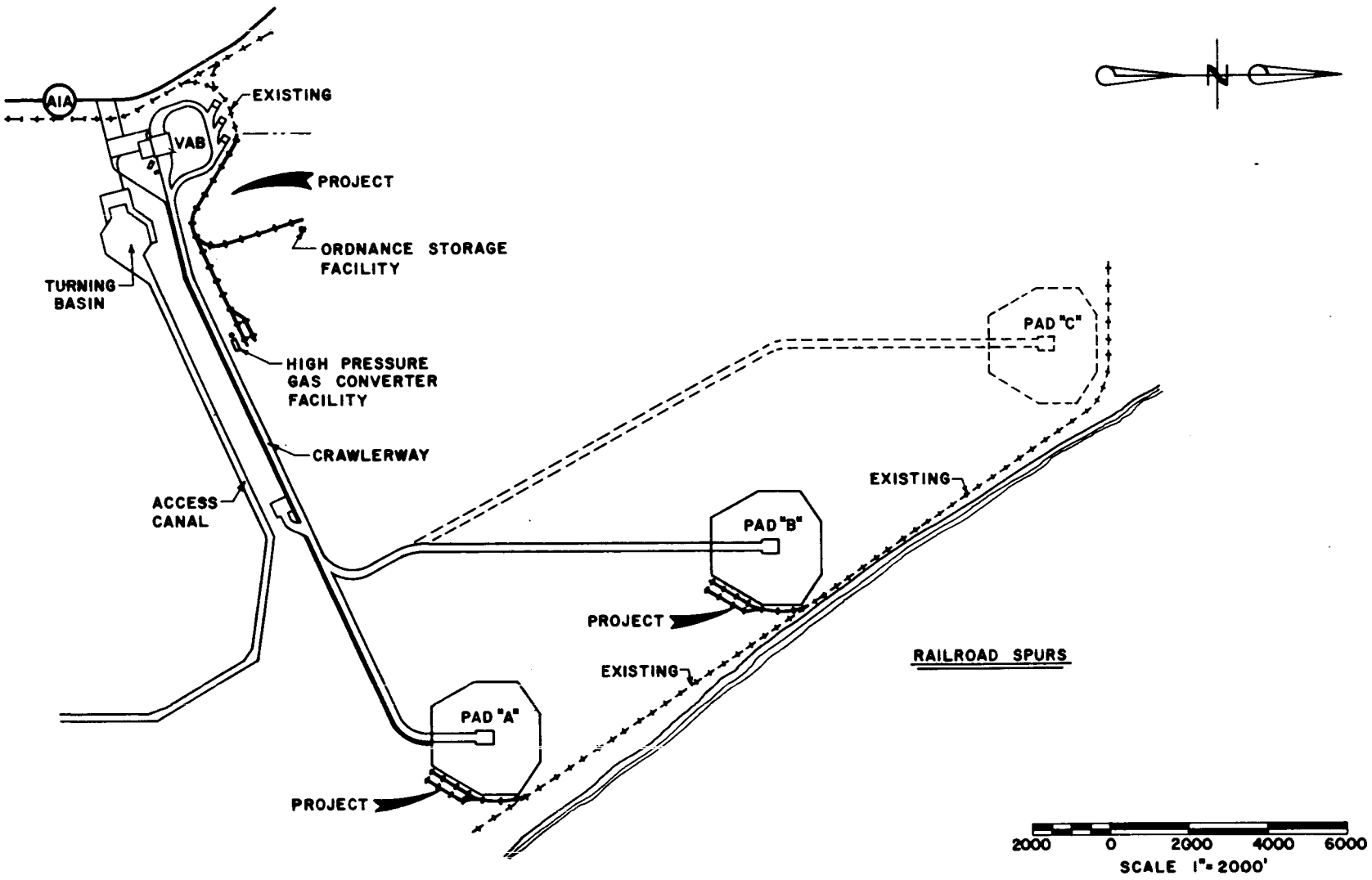
This project will continue the work started in prior years and provide such items as outfitting the launcher umbilical towers and the second launch pad. Railroad spurs are required to provide rail access to the launch pads, the ordnance storage facilities and the gas compressor/converter facility in order to eliminate double handling of large explosive ordnance, helium and propellants.

ESTIMATED FUTURE YEAR FUNDING: None

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

ADVANCED SATURN LAUNCH COMPLEX NO. 39



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

EXTENSION TO CENTRAL SUPPLY COMPLEX

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Merritt Island, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION: Extension

FUNDING:

FY 1963 and Prior Years	$710,000
FY 1964 Estimate	2,093,600
FY 1965 Estimate	952,000
Total Funding Through FY 1965	3,755,600

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$902,000
Building	Sq. Ft.	50,000	$13.16	658,000
Site preparation	LS	---	107,000	107,000
Roads and parking	LS	---	100,000	100,000
Utilities	LS	---	37,000	37,000
Equipment				$50,000
Storage racks	LS	---	4,350	4,350
Bins, shelving, fixtures, and equipment	LS	---	21,350	21,350
Material handling equipment	LS	---	24,300	24,300

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	----
		TOTAL		$952,000

PROJECT DESCRIPTION:

This project provides for a combination warehouse and manned spacecraft spares building. The warehouse portion will be used for storage of electronic components and equipment, missile vehicle components and spares, photographic equipment and supplies, communication supplies, furniture and office supplies. The manned spacecraft spares portion will furnish space for receiving, inspection, and holding components of the Lunar Excursion Module of the Apollo spacecraft. The building will have a total area of approximately 50,000 square feet of enclosed storage space and will be a rigid frame structure with masonry curtain walls. An area of approximately 12,000 square feet will have a controlled environment. The building will have a loading dock with dimensions of approximately 200 feet by 10 feet. An adjacent paved open operating area of 12,550 square yards will be provided. In addition, 6,200 square yards of open storage will be constructed adjacent to an existing warehouse in the same complex.

PROJECT JUSTIFICATION:

With the expansion of launch activities in the Merritt Island Launch Area, this facility is required in addition to the existing supply complex and the existing manned spacecraft storage facilities.

Warehouse Portion: This provides a capacity to handle approximately 1,000 tons of supplies per month that will move through this area in this time frame. Existing facilities can handle only 750 tons of materials per month. The additional requirements are based on studies of the supply requirements of the Mercury and Saturn programs correlated with the anticipated needs of the Apollo program during this time frame. The Central Supply Complex will handle all administrative equipment and supplies necessary to support the John F. Kennedy Space Center, NASA, Manned Spacecraft Preflight Operations, and other NASA elements and all supporting contractors. The paved open operating area adjacent to this warehouse is required to serve the vehicles going to and from this supply facility. Also, an additional open paved area of 6,200 square yards is needed for outside storage and loading/unloading operations of vehicular equipment shipped by rail.

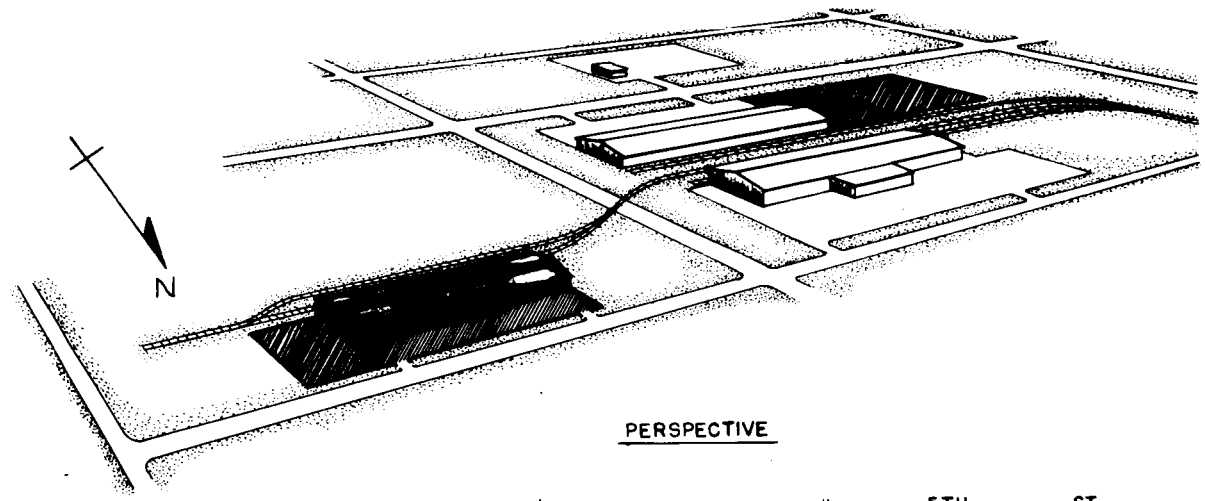
Manned Spacecraft Spares Portion: The complexity of the Lunar Excursion Module of the Apollo spacecraft requires that the spare parts for the module be stored and maintained under rigidly controlled conditions. This facility will furnish the space needed to properly receive, ship, inspect, issue and store these parts. Spare spacecraft parts must be available on a continuing basis to assure quick and reliable replacement in the event of a breakdown during either the checkout or launch operations. Existing manned spacecraft facilities are being used to their capacity for handling parts of the Gemini spacecraft and the Service and Command Modules of the Apollo spacecraft.

ESTIMATED FUTURE YEAR FUNDING: None

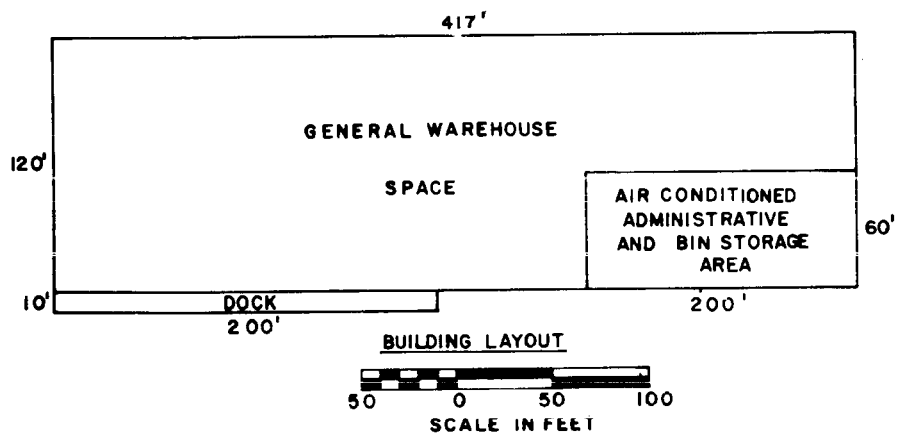
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

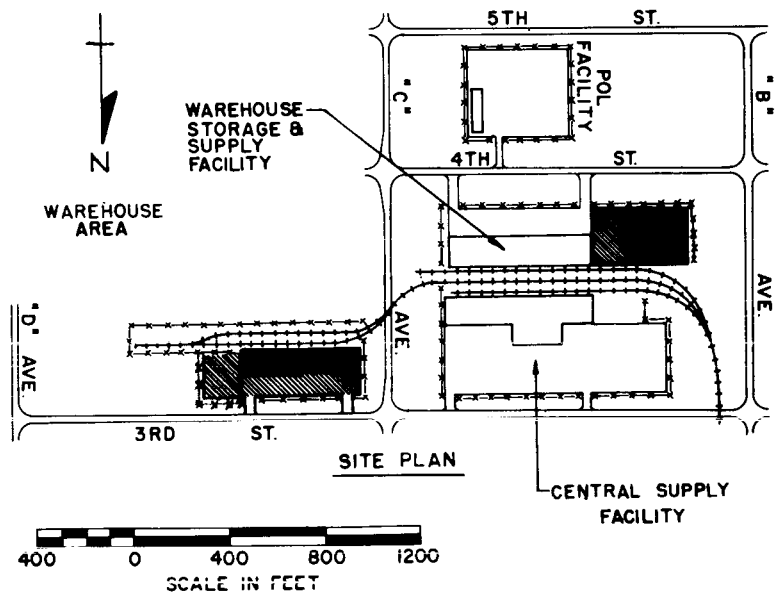
EXTENSION TO CENTRAL SUPPLY COMPLEX



PERSPECTIVE



BUILDING LAYOUT



SITE PLAN

PD-65-0510

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

MANNED SPACECRAFT STATIC TEST FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Merritt Island, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$5,000,000
FY 1964 Estimate	93,000
FY 1965 Estimate	2,780,000
Total Funding Through FY 1965	$7,873,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$519,500
Test pad and supporting items	LS	---	$147,800	147,800
Four supporting buildings	LS	---	85,000	85,000
Site preparation	LS	---	44,300	44,300
Roads and parking	LS	---	7,300	7,300
Utilities	LS	---	235,100	235,100
Equipment				$2,260,500
Altitude simulation equipment	LS	---	1,142,000	1,142,000
Supporting equipment	LS	---	1,118,500	1,118,500

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$2,780,000

PROJECT DESCRIPTION:

This facility will provide a second static test stand, its related buildings, and the necessary equipment, instrumentation, and support systems for the static testing of the propulsion systems of both the Ascent and Descent Stages of the Apollo Lunar Excursion Module. This static test stand will be located approximately 800 feet south of the first Static Test Facility (Apollo Service Module Static Test Stand). It will be constructed on a 35-foot high earth fill over a diffuser and steam ejector system which will be utilized to simulate high altitude conditions. A flume will extend to a catch basin which will be connected to a leaching area. An altitude chamber, which will house the module during static testing, will be located on the test pad. A Ground Service Equipment and Transfer Building will have an area of approximately 1,000 square feet. A Mechanical Equipment Building, which will house vacuum pumps and air-conditioning equipment, will have an area of approximately 640 square feet. A Water Treatment Plant, which will house neutralizing solution tanks, equipment to treat cooling water, and other associated equipment, will have an area of approximately 1,000 square feet. A Steam Generating Plant will have an area of 1,405 square feet. All buildings will be single story steel frame structures with metal exterior walls.

An existing Control Building, Fuel Building, Oxidizer Building, and Pump House, which support the existing Static Test Facility, will be used jointly by the second facility.

PROJECT JUSTIFICATION:

This facility is required for final checkout of the Lunar Excursion Module, prior to manned flights, under conditions closely simulating actual flight conditions. Significant technical differences between the Service Module and the Lunar Excursion Module preclude the possibility of utilizing a single static test facility for both modules. This additional Static Test Facility must accommodate (1) servicing and static firing of the Lunar Excursion Module propulsion systems on an integrated basis, to ensure flight readiness, (2) validation testing, and hypergolic servicing of the Lunar Excursion Module propulsion systems, and (3) verification and practice of procedures to be used at the launch site.

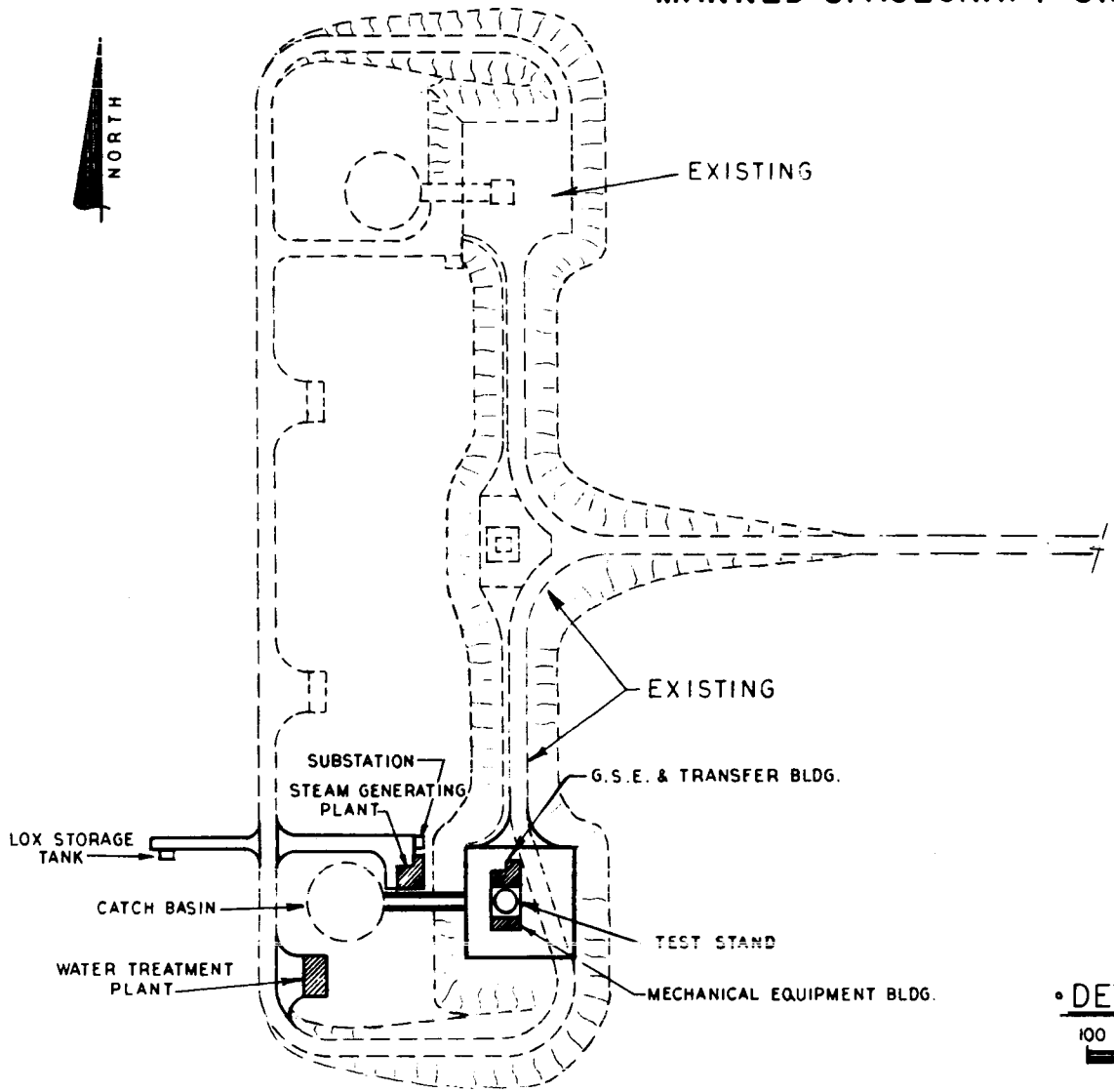
The Ground Service Equipment and Transfer Building is required to house the electrical and electronic transfer equipment and the ground service equipment related to the static testing operations. The Mechanical Equipment Building is required to house equipment for controlling the environment within the Altitude Chamber. The Water Treatment Plant is required to provide conditioned water for the diffuser and steam generator, and to prepare neutralizing solutions for washing down after a fuel or oxidizer spill. The Steam Generator Plant is necessary to house the large capacity and high rate steam generating equipment required to maintain altitude simulation pressure in the diffuser.

ESTIMATED FUTURE YEAR FUNDING: None

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

MANNED SPACECRAFT STATIC TEST FACILITY



DETAIL SITE PLAN

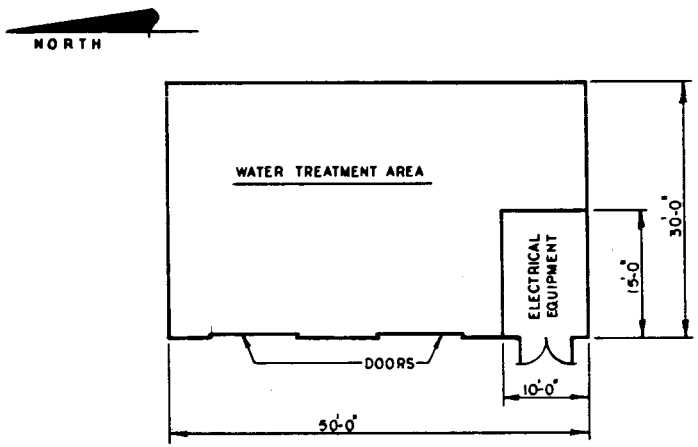
100 50 0 100 200 300

SCALE-FEET

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

MANNED SPACECRAFT STATIC TEST FACILITY



·FLOOR PLAN·

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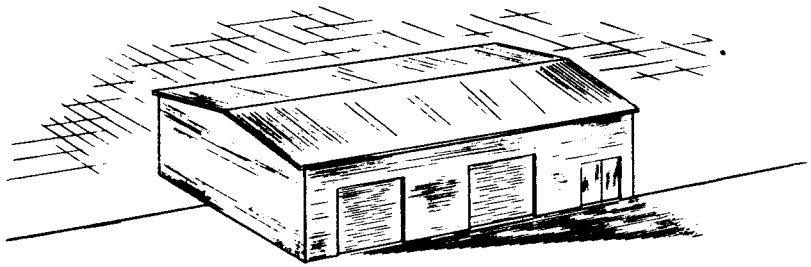
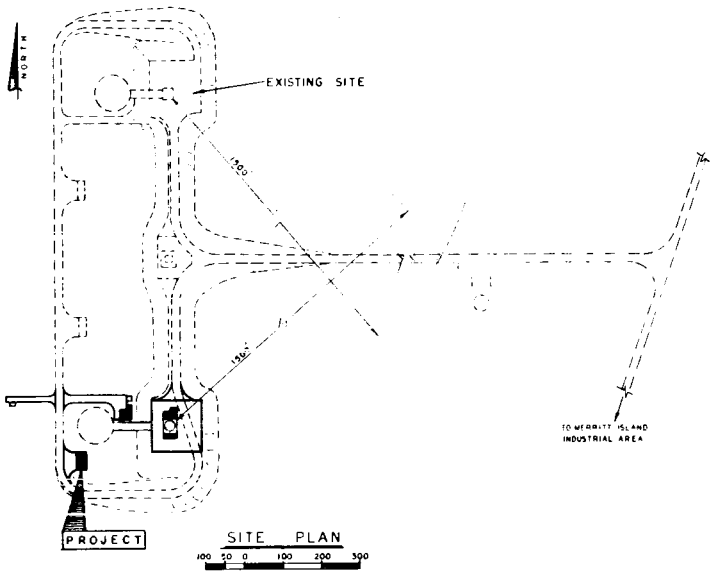
SCALE - FEET



∘ PERSPECTIVE ∘

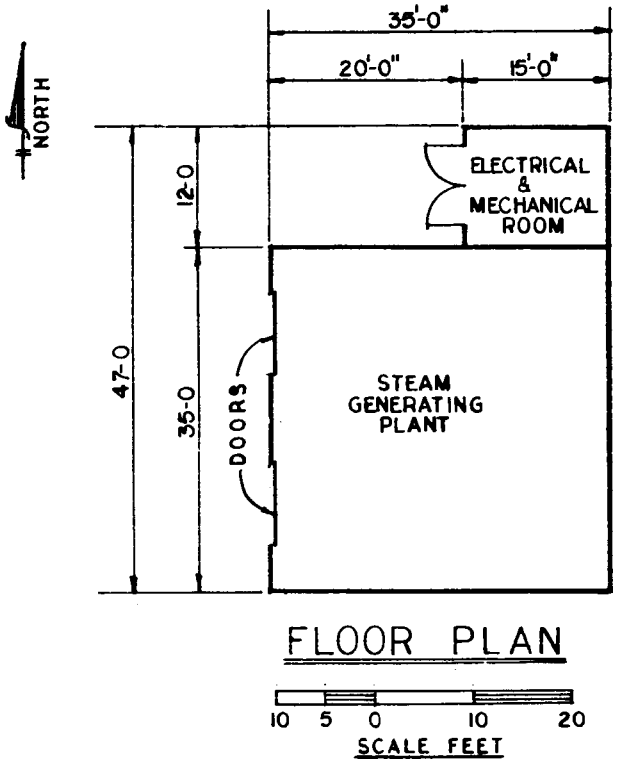


WATER TREATMENT PLANT

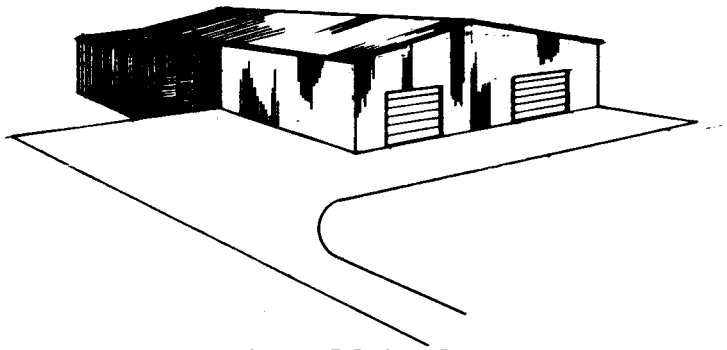
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

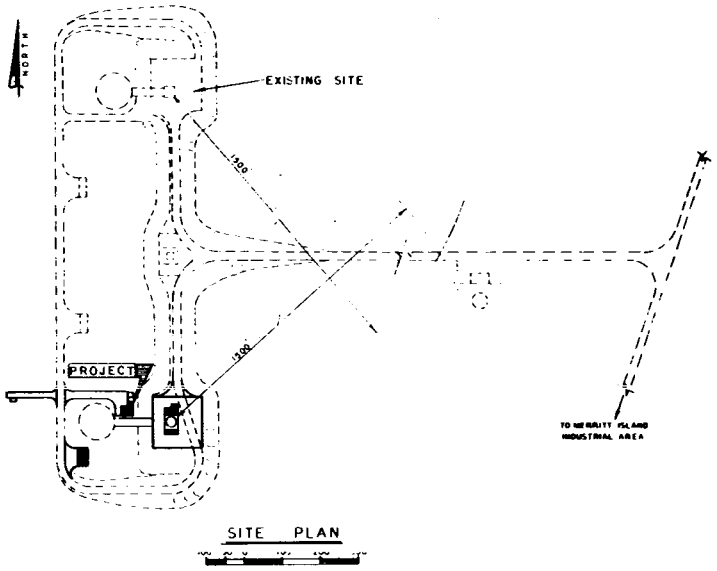
MANNED SPACECRAFT STATIC TEST FACILITY



FLOOR PLAN



PERSPECTIVE



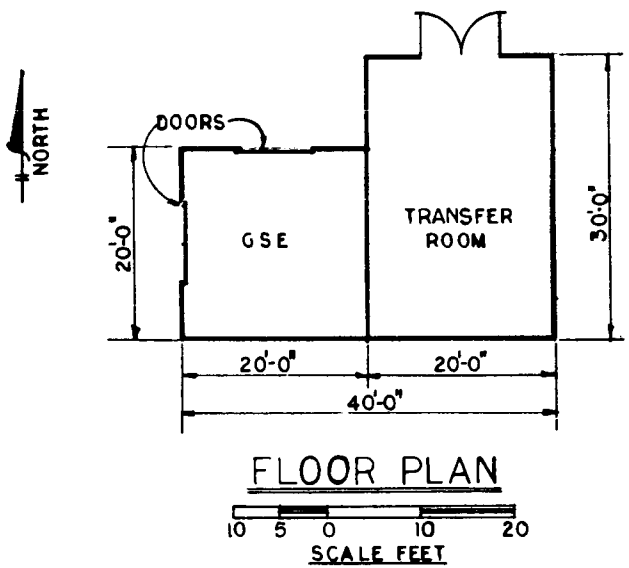
SITE PLAN

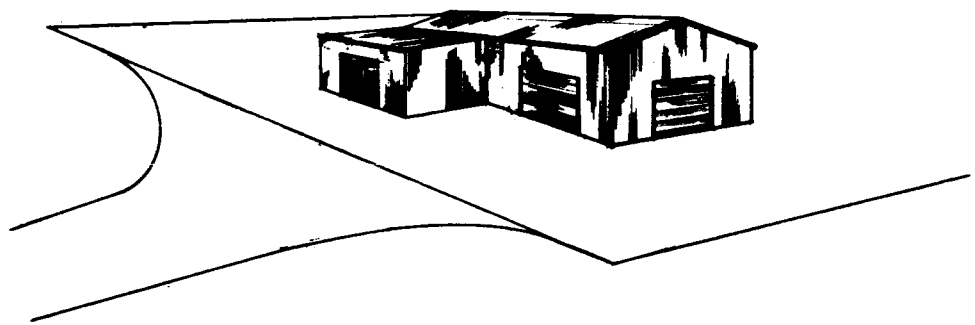
STEAM GENERATING PLANT

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

MANNED SPACECRAFT STATIC TEST FACILITY





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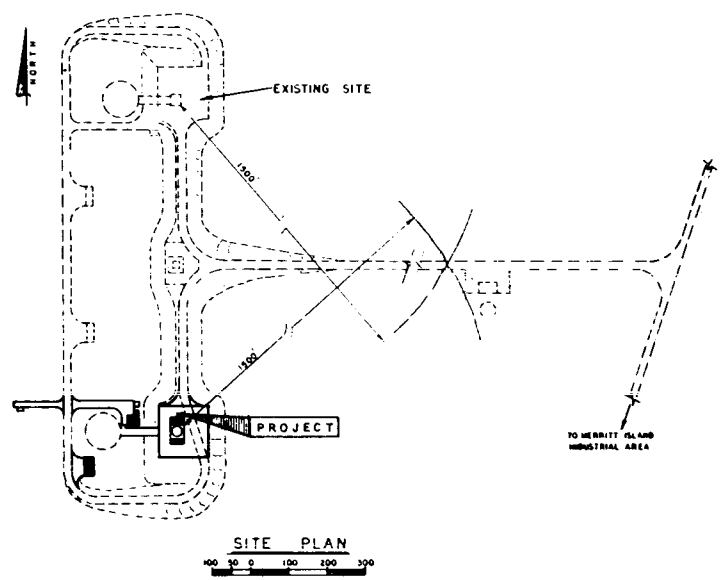
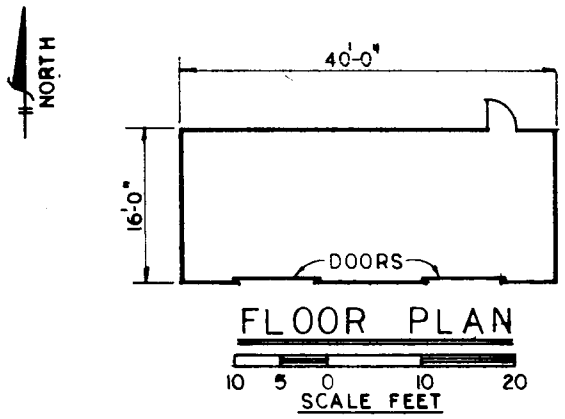


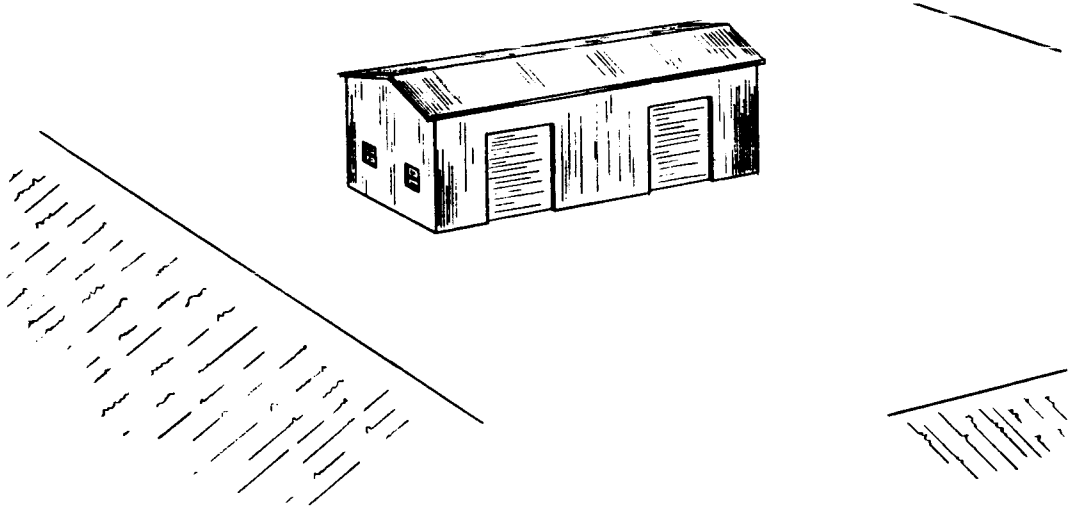
G. S. E. & TRANSFER BUILDING

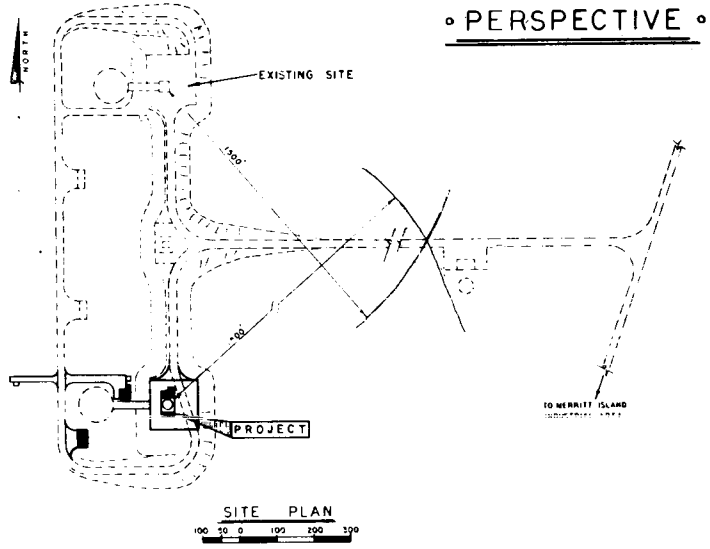
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

MANNED SPACECRAFT STATIC TEST FACILITY







MECHANICAL EQUIPMENT BUILDING

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

PROPELLANT SYSTEMS COMPONENTS LABORATORY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Merritt Island, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: Extension, Alteration

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$12,000
FY 1965 Estimate	588,000
Total Funding Through FY 1965	$600,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$256,300
Laboratory addition	Sq. Ft.	4,100	$30.93	126,800
Repair and maintenance shed	Sq. Ft.	4,800	10.78	51,800
Site preparation	LS	---	23,300	23,300
Roads and parking	LS	---	31,400	31,400
Utilities	LS	---	23,000	23,000
Equipment				331,700
Equipment for laboratory	LS	---	242,900	242,900
Equipment for maintenance shed	LS	---	88,800	88,800

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$588,000

PROJECT DESCRIPTION:

This project provides for extension and alterations to the Propellant Systems Components Laboratory, which will be used for cleaning, analyzing, repairing, and testing of hardware and components of all NASA launch vehicles and complexes and the manned spacecraft facilities. This addition will have a gross area of approximately 4,100 square feet, of which 3,000 square feet will have precise humidity and dust control. The building addition will be constructed of concrete block with steel joist roof framing. Also included is a Propellant Transporter Repair and Maintenance Shed to be used in the cleaning, purging, and repair of propellant transporters. This shed-type structure will have a gross area of approximately 4,800 square feet. Enclosed within this structure will be an administrative and storage area with an approximate area of 960 square feet.

PROJECT JUSTIFICATION:

Addition to the Laboratory - The existing facility provides space for cleaning, analysis, and repair of components and hardware such as valve assemblies and interconnecting piping related to Launch Complexes 34 and 37 and the manned spacecraft facilities. The Saturn V and the Saturn IB programs will more than double the hardware cleaning and testing requirements in this time frame. This operation must be performed in an environment of a high level of cleanliness to preclude microscopic contamination which could result in the malfunction of an entire system.

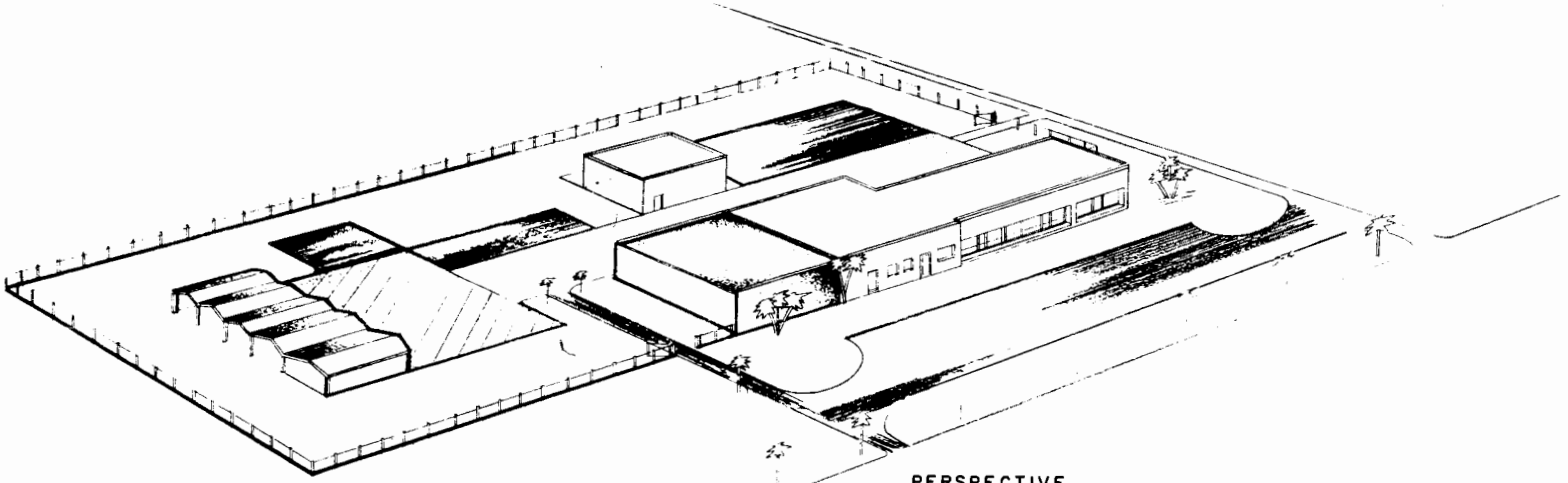
Propellant Transporter Repair and Maintenance Shed - A building is needed to provide space for the necessary cleaning, purging and neutralization processes required to maintain 50 propellant transporters and other support equipment. This servicing will include the cleaning and maintenance of the vacuum systems and heat exchangers on the cryogenic transporters, as well as the valving and piping on both the cryogenic and helium bottle transporters.

ESTIMATED FUTURE YEAR FUNDING: None

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

PROPELLANT SYSTEMS COMPONENTS LABORATORY



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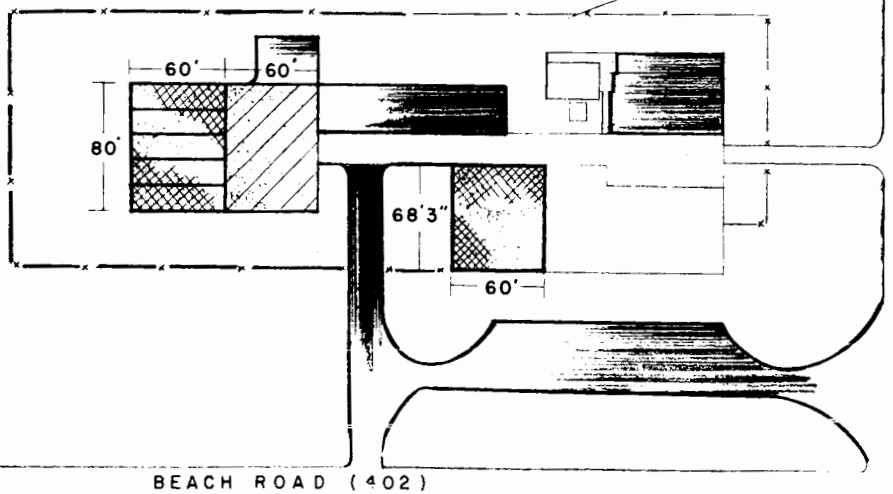
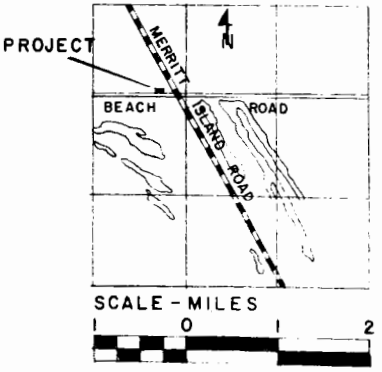


BEACH ROAD (402)

PLAN

60 0 60 120

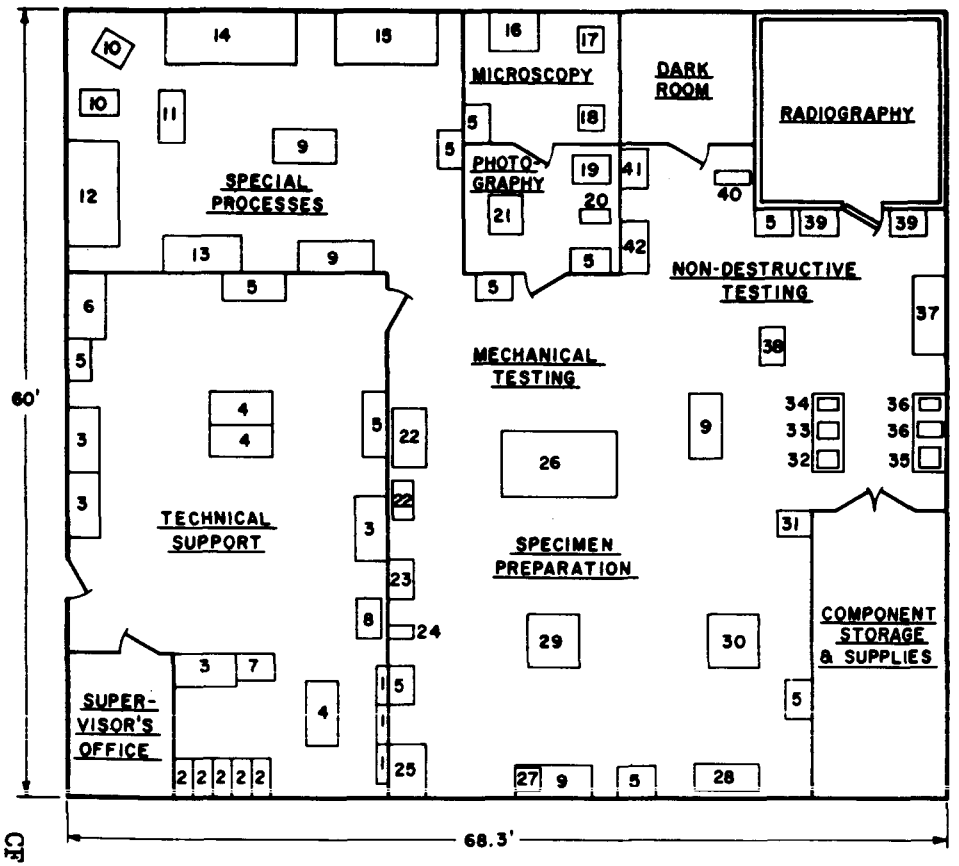
SCALE - FEET



JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

PROPELLANT SYSTEMS COMPONENTS LABORATORY



BUILDING ADDITION AND EQUIPMENT LAYOUT

TECHNICAL SUPPORT
1. 3-BOOKCASES
2. 5-FILE CABINETS
3. 3-DESKS
4. 3-WORK TABLES
5. 3-STORAGE CABINETS
6. 1-DRAFTING TABLE
7. 1-TYPEWRITER
8. 1-COPY MACHINE

SPECIAL PROCESSES
5. 1-STORAGE CABINET.
9. 2-WORK BENCHES
10. 2-HEAT TREAT FURNACES
11. 1-QUENCH TANK
12. 1-BAKING OVEN
13. 6-CLEANING TANKS
14. 1-SALT SPRAY CABINET
15. 1-SPRAY HOOD

MICROSCOPY
5. 1-STORAGE CABINET
16. 1-METALLOGRAPH
17. 1-STEREO MICROSCOPE
18. 1-TOOLMAKERS MICROSCOPE

PHOTOGRAPHY
5. 1-STORAGE CABINET
19. 1-MICRO HARDNESS TESTER
20. 1-COMBINATION HARDNESS
21. 1-MICRO CAMERA

MECHANICAL TESTING
5. 2-STORAGE CABINETS
22. 1-PROOF LOAD TESTER
23. 1-PHOTO ELASTIC STRESS
24. 1-STRAIN GAGE INDICATOR
25. 1-FIXTURE STORAGE RACK
26. 1-UNIVERSAL TENSILE MACHINE

SPECIMEN PREPARATION
5. 2-STORAGE CABINETS
9. 2-WORK BENCHES
27. 1-DRILL PRESS
28. 1-BENCH LATHE
29. 1-BAND SAW
30. 1-MILLING MACHINE
31. 1-BELT SANDER
32. 1-SPECIAL STORAGE CABINET
33. 1-MOUNTING PRESS
34. 1-BENCH GRINDER
35. 1-WET REPOLISH
36. 2-DRY REPOLISH
37. 1-POLISHING TABLE
38. 1-CUT-OFF WHEEL

NON-DESTRUCTIVE TEST
5. 1-STORAGE CABINET
39. 2-X-RAY CONTROL UNITS
40. 1-DYE PENETRANT
41. 1-ULTRA SONIC TEST
42. 1-MAGNETIC PARTICLE

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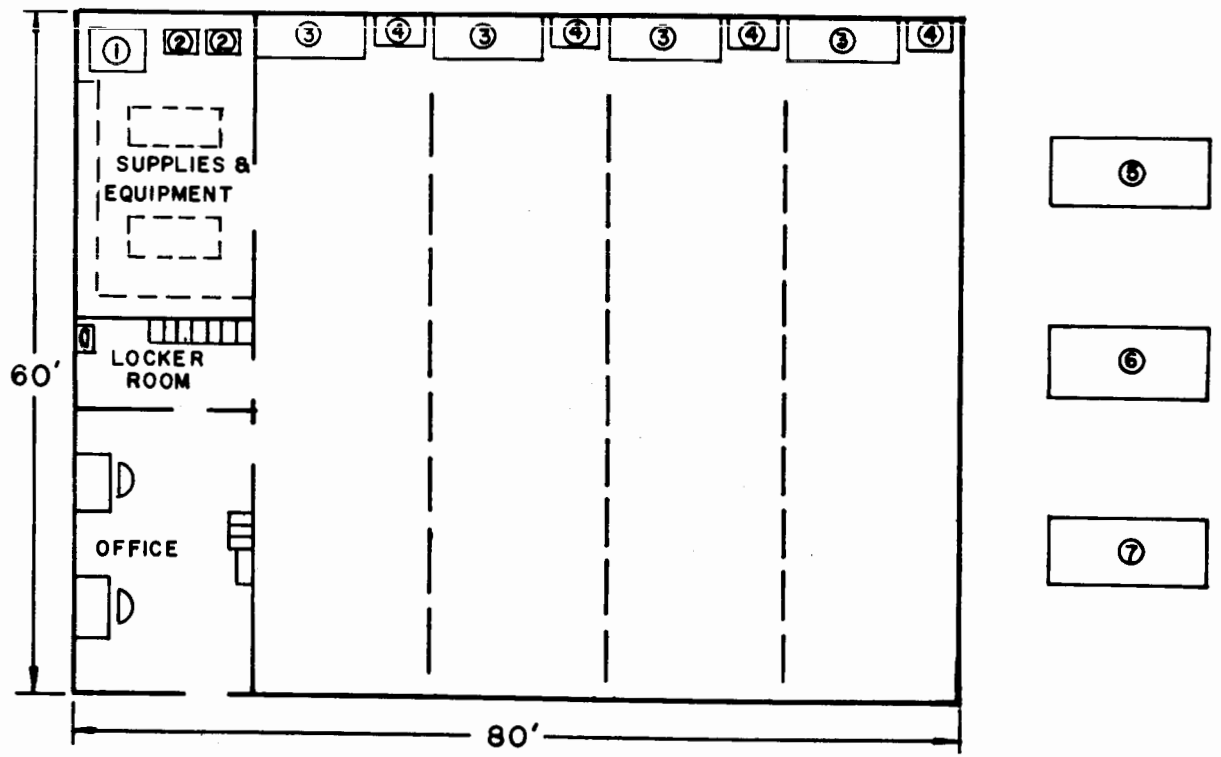
SCALE IN FEET

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

PROPELLANT SYSTEMS COMPONENTS LABORATORY



PROPELLANT TRANSPORTER REPAIR AND MAINTENANCE SHED

① COMPRESSOR
② PUMP
③ WORK BENCH
④ TOOL BOX
⑤ TRICHLOROETHYLENE TANK
⑥ DETERGENT TANK
⑦ FLUSHING TANK

12 0 12 24 36

SCALE — FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

UTILITY INSTALLATIONS - NEW AREA

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Merritt Island, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: New, Extension

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$256,000
FY 1965 Estimate	5,600,000
Total Funding Through FY 1965	$5,856,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$3,391,300
Supporting structures	LS	---	$142,000	142,000
Railroad	LS	---	241,000	241,000
Site preparation	LS	---	935,700	935,700
Roads	LS	---	1,268,800	1,268,800
Utilities	LS	---	803,800	803,800
Equipment				$2,208,700
Communications equipment and cable systems	LS	---	2,208,700	2,208,700

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$5,600,000

PROJECT DESCRIPTION:

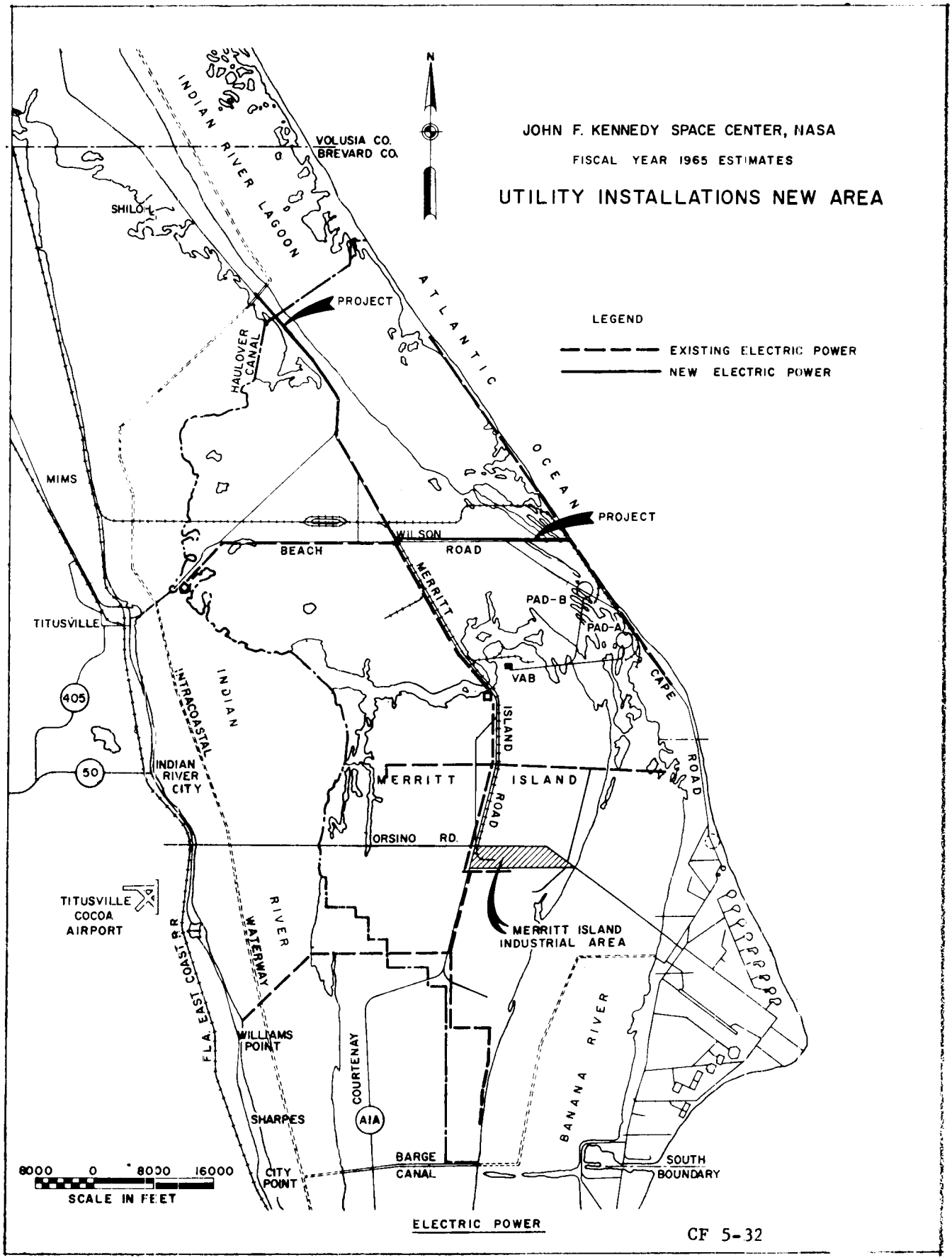
This project provides for the expansion of the existing road, water, electrical distribution and communication systems, and the railroad that will serve the Merritt Island Launch Area. Road construction consists of rebuilding approximately 16.3 miles and constructing approximately 2.2 miles of new roads. Approximately 3.7 miles of 16-inch water main including a pumping station will be constructed. Approximately 36,000 feet of 13.2 KV power line and 6,000 feet of 16-way communication duct is to be constructed. An addition to the existing Central Telephone Office in the Merritt Island Industrial Area will be provided. The 2,000 square foot structure will have concrete frame and concrete block walls. Communications cable, and video and wide band repeaters will be installed throughout the Merritt Island Launch Area. The railroad extension will consist of a 2,000 foot "suspect car" siding, and 8,000 feet of railroad from the existing terminal point at Orsino Road to the Central Supply Complex.

PROJECT JUSTIFICATION:

This project is needed to furnish the increased utility capability for supporting the orderly development of the Merritt Island Launch Area in this time frame. Existing roadways not designed for heavy loads must be rebuilt. The addition of two lanes to Orsino Road is required to support the traffic resulting from the buildup of personnel in the industrial area. A road from the Fluid Test Complex to Orsino Road is required to provide an alternate route out of the Fluid Test Complex hazard area. The existing water systems at the Cocoa Beach Missile Test Annex and in the Merritt Island Launch Area are independent of each other and both lack the reserve of an alternate supply line. This main will provide a loop system between the tow areas. A 13.2 KV distribution line along Merritt Island Road is required for the instrumentation sites in that area. The 13.2 KV line along Beach Road will provide a loop system to the universal camera sites along the beach to reduce the possibility of an outage if there is a failure in either of the long supply lines. Additional communication ducts are required to support the Operations and Checkout Building in the checkout of spacecraft. The Central Telephone Office expansion is required to house the video and wideband repeater equipment in support of Launch Complex 39, and will provide a Base Communications Center to furnish teletype and datafax services for the Merritt Island Launch Area. A "suspect car" siding is required in order to remotely locate defective cars carrying

unstable and toxic propellants, such as unsymmetrical di-methyl hydrazine and nitrogen tetroxide. It is essential that these defective cars be removed from close proximity of inhabited areas, buildings, or other rail cars to prevent a possible catastrophe. Tonnages of supplies and materials to be shipped into the Central Supply Complex will average approximately 1,000 tons each month during the time frame. Extension of the railroad will eliminate transfers by truck from the existing railhead, double handling of rail shipped material, and reduction in time required to unload and release rail cars.

ESTIMATED FUTURE YEAR FUNDING: $1,000,000



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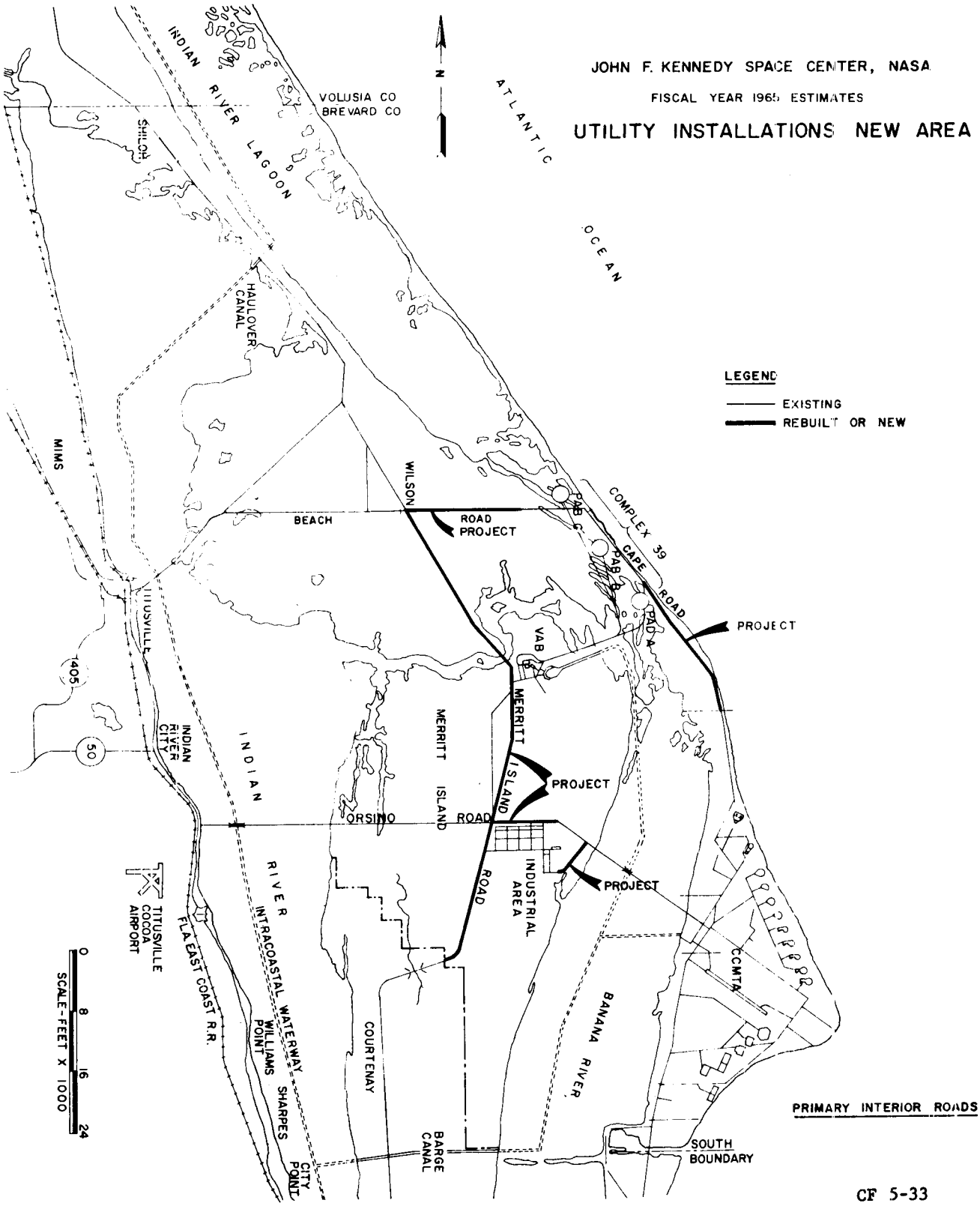
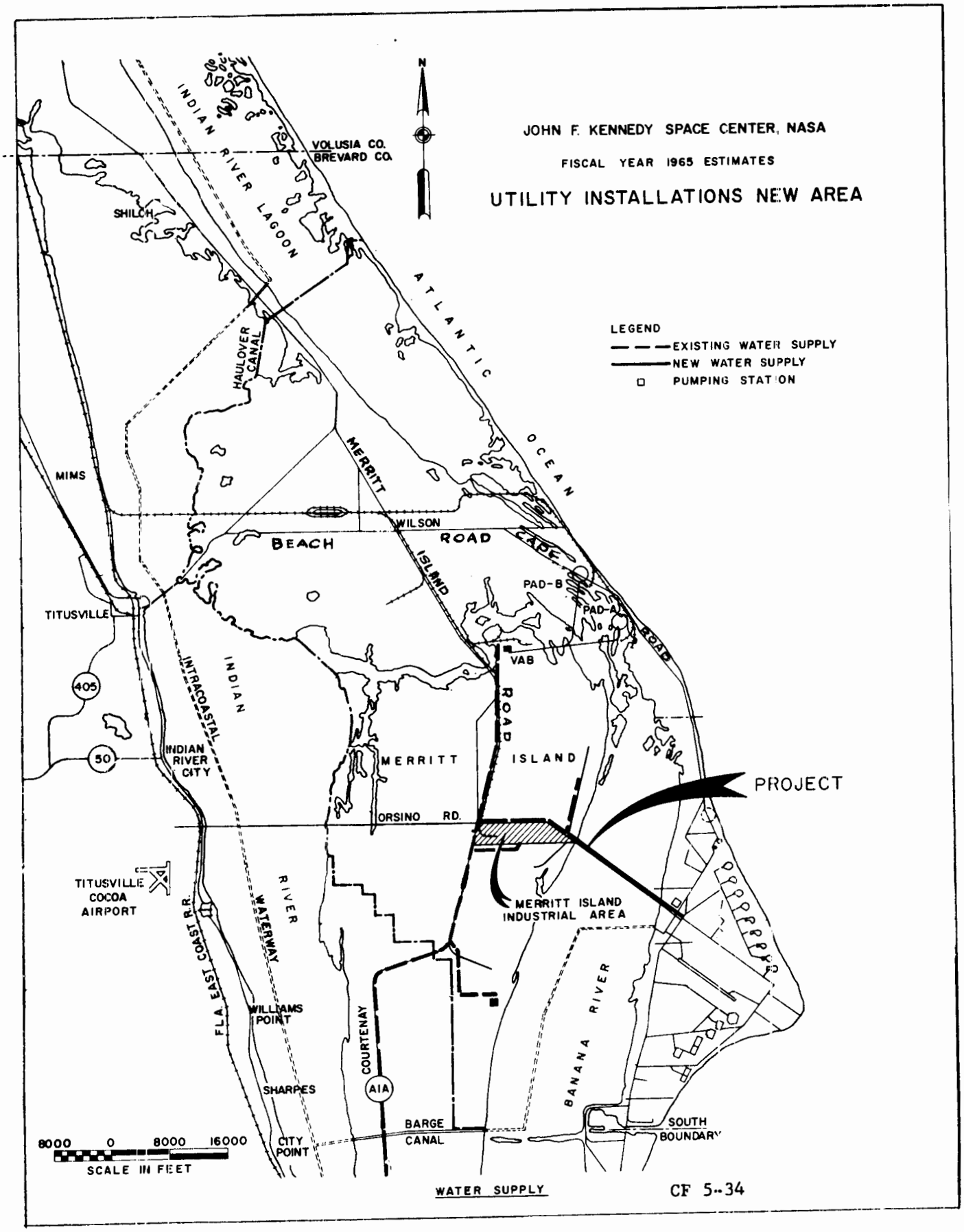

JOHN F. KENNEDY SPACE CENTER, NASA
FISCAL YEAR 1965 ESTIMATES
UTILITY INSTALLATIONS NEW AREA
N
ATLANTIC OCEAN
INDIAN RIVER LAGOON
VOLUSIA CO
BREVARD CO
SHILOH
HAULOVER CANAL
MIMS
LEGEND
EXISTING
REBUILT OR NEW
WILSON
BEACH
ROAD
PROJECT
COMPLEX 39
CAPE
ROAD
PROJECT
PAD C
PAD B
PAD A
VAB
MERRITT
ISLAND
ROAD
PROJECT
MERRITT ISLAND
ORSINO
ROAD
INDUSTRIAL AREA
PROJECT
TITUSVILLE
INDIAN RIVER CITY
405
50
INDIAN
RIVER
INTRACOASTAL WATERWAY
TITUSVILLE COCOA AIRPORT
FLA EAST COAST R.R.
WILLIAMS POINT
SHARPES
CITY POINT
COURTENAY
BARGE CANAL
BANANA RIVER
CCMTA
SOUTH BOUNDARY
PRIMARY INTERIOR ROADS
SCALE-FEET X 1000
0
8
16
24

CF 5-33



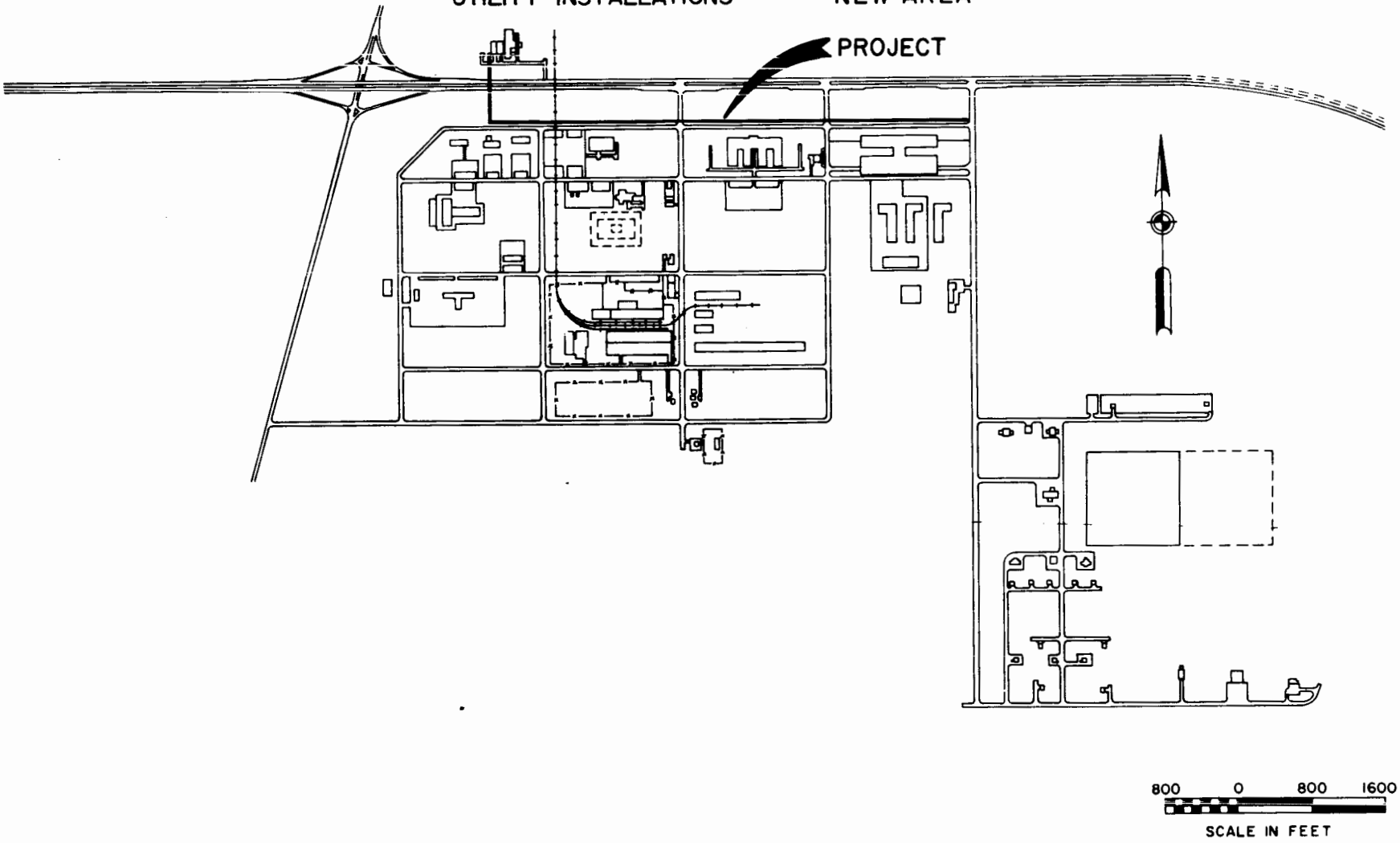
WATER SUPPLY

CF 5-34

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

UTILITY INSTALLATIONS —— NEW AREA

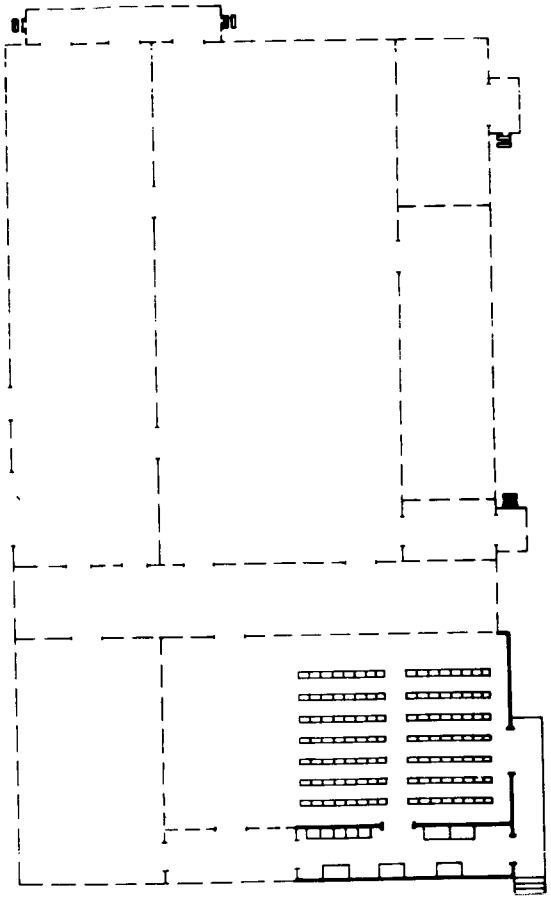


COMMUNICATIONS DUCTS

JOHN F. KENNEDY SPACE CENTER, NASA

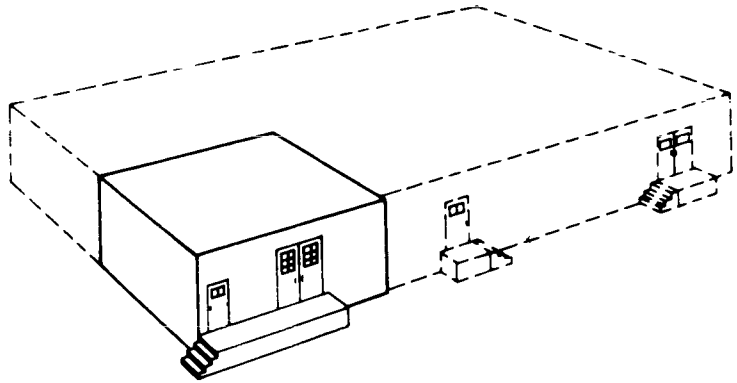
FISCAL YEAR 1965 ESTIMATES

UTILITY INSTALLATIONS NEW AREA

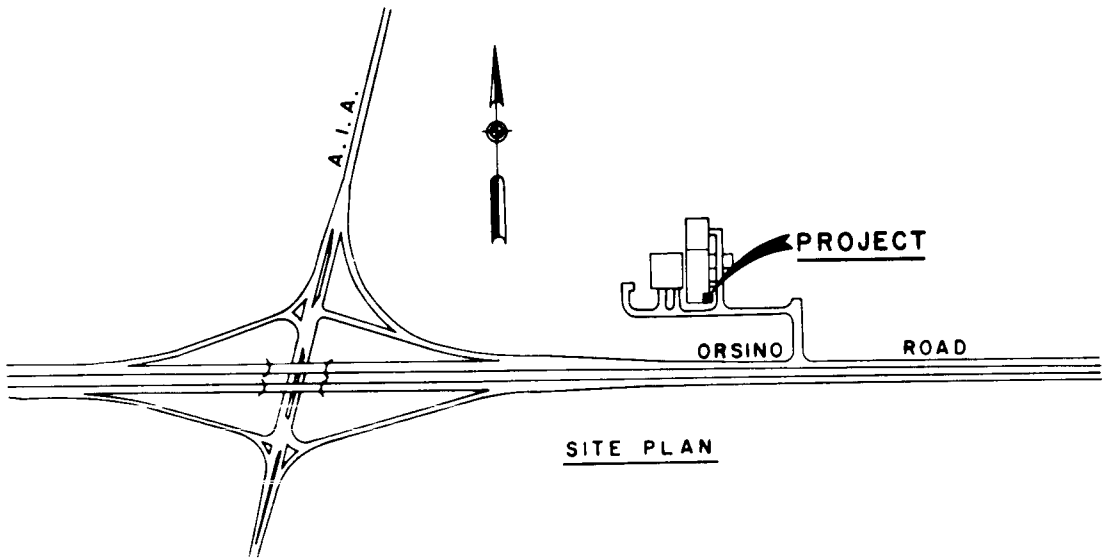


FLOOR PLAN

SCALE IN FEET



PERSPECTIVE



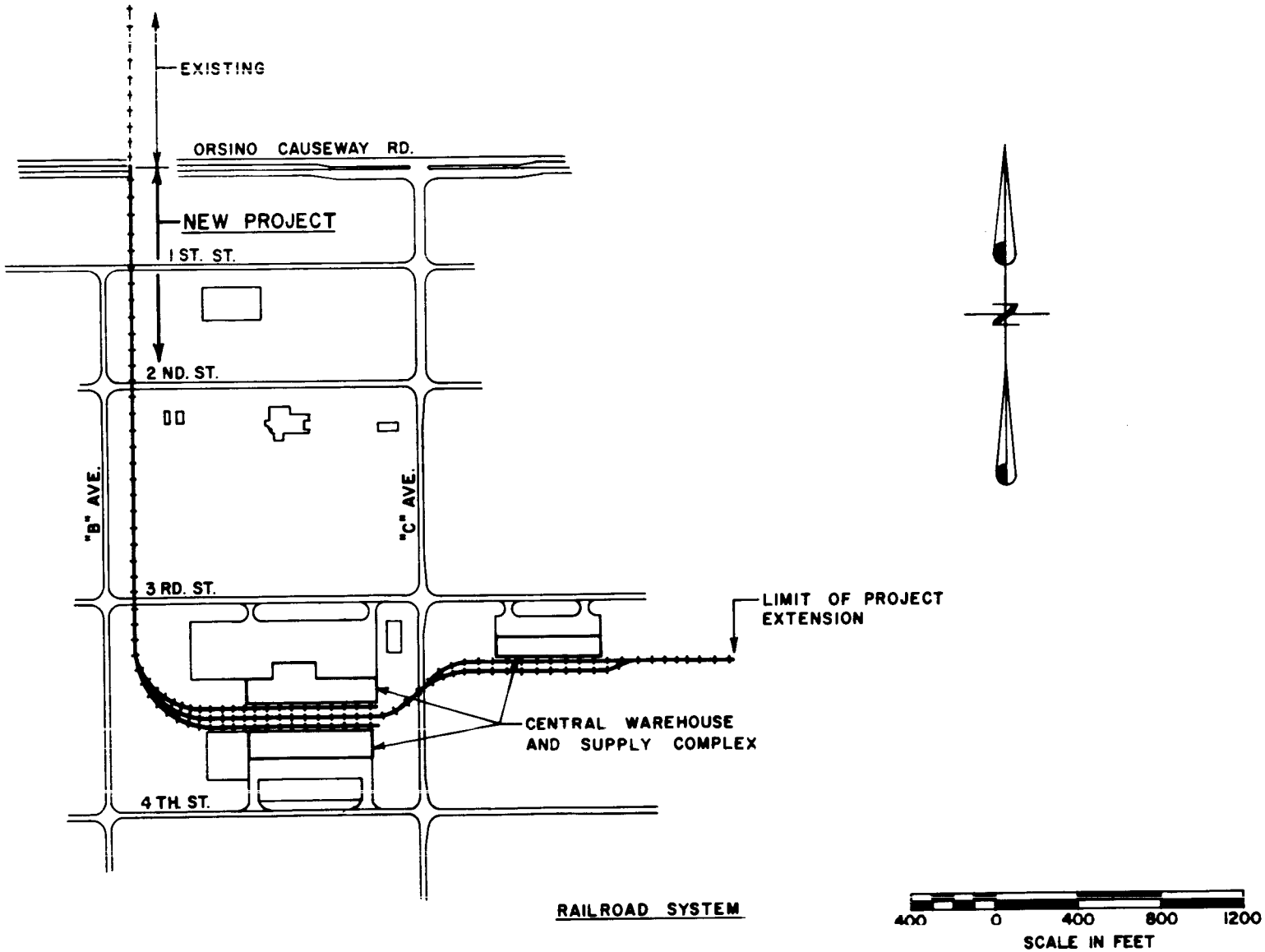
SITE PLAN

ADDITION TO TELEPHONE CENTRAL OFFICE

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

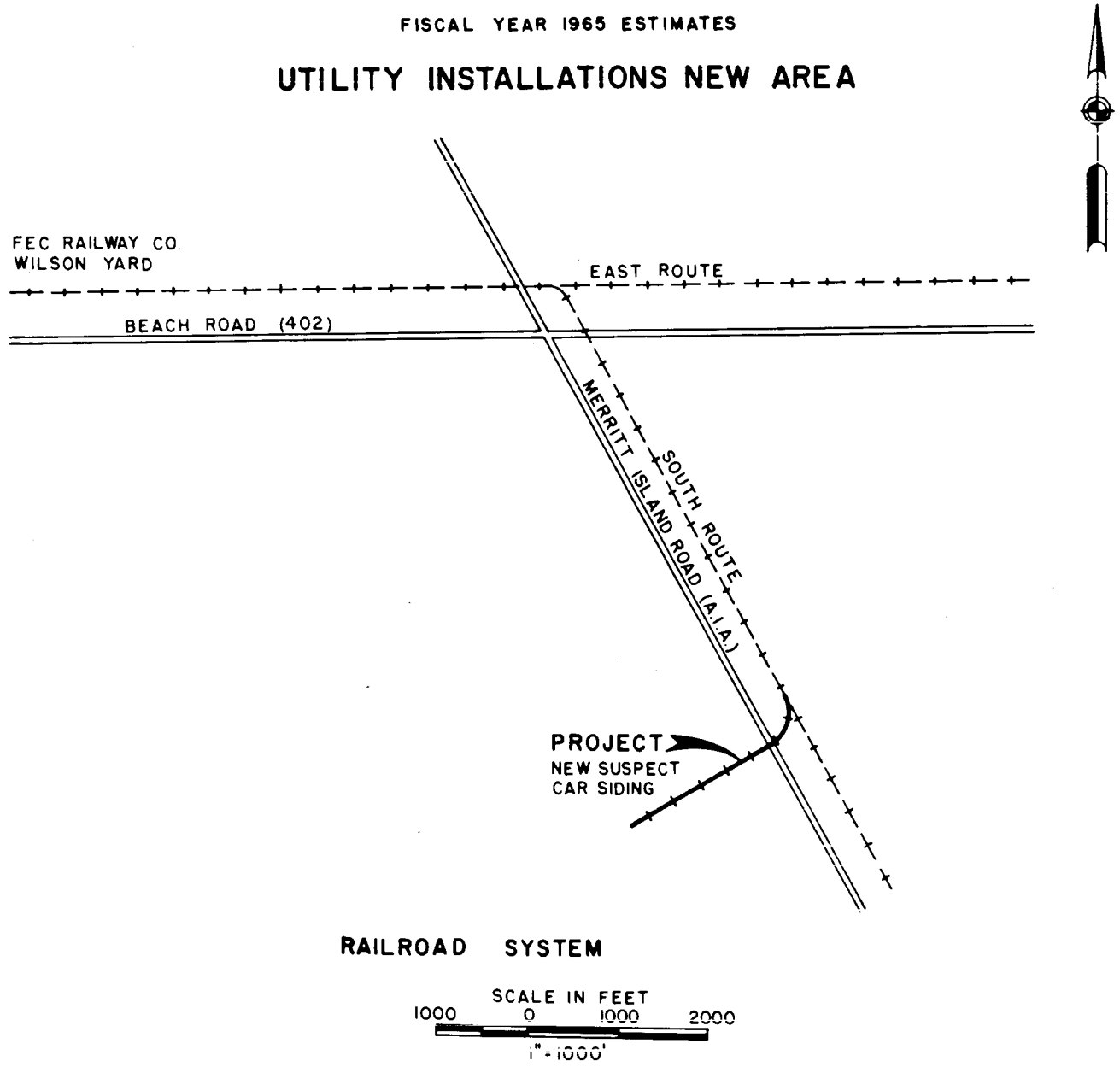
UTILITY INSTALLATIONS NEW AREA



JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

UTILITY INSTALLATIONS NEW AREA



RAILROAD SYSTEM

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ADDITION TO UNMANNED SPACECRAFT EXPLOSIVE SAFE ASSEMBLY COMPLEX
(SOLID PROPELLANT LABORATORY)

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science & Applications

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Cape Kennedy, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$1,181,000
FY 1964 Estimate	30,000
FY 1965 Estimate	570,000
Total Funding Through FY 1965	$1,781,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$500,000
Propellant laboratory	Sq. Ft.	3,000	$105.00	315,000
Site preparation	LS	---	50,000	50,000
Roads and Parking	LS	---	35,000	35,000
Utilities	LS	---	100,000	100,000
Equipment				$70,000
Crane	LS	---	70,000	70,000
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$570,000

PROJECT DESCRIPTION:

This project provides for the addition of an approximately 3,000 square-foot gross area solid propellant laboratory to the existing Explosive Safe Assembly Complex consisting of a liquid propellant laboratory, assembly facility and instrumentation laboratory. The method of construction will be reinforced concrete and revetted as required to provide blast protection to the other buildings in the complex. Frangible type roof and walls will be used where possible to improve the safety conditions existing in the complex. The building will be dust-free, air conditioned, and designed and constructed to insure minimum contamination of the spacecraft while in the laboratory.

PROJECT JUSTIFICATION:

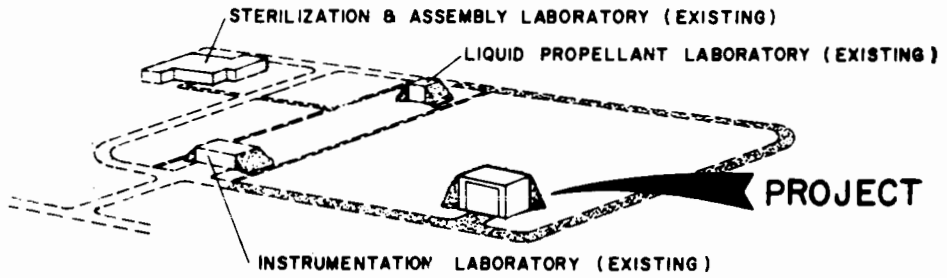
This facility is required for assembly, checkout, and static and dynamic balancing or optical alignment of solid propellant motors used on unmanned spacecraft such as Surveyor, Mariner, and Lunar Orbiter. The building presently being used as a solid propellant laboratory was initially constructed in 1955 as an instrumentation laboratory and is barely adequate for use in the preparation of the current Ranger spacecraft. The facility is not adequate for follow-on spacecraft as it contains essentially no provision for clean room environment, is too small from the standpoint of both floor area and hook height, is located about 2 miles from the other buildings in the explosive safe complex and is also located close to several military weapon system launch complexes requiring evacuation of this facility during periods of hazardous operations on these launch complexes.

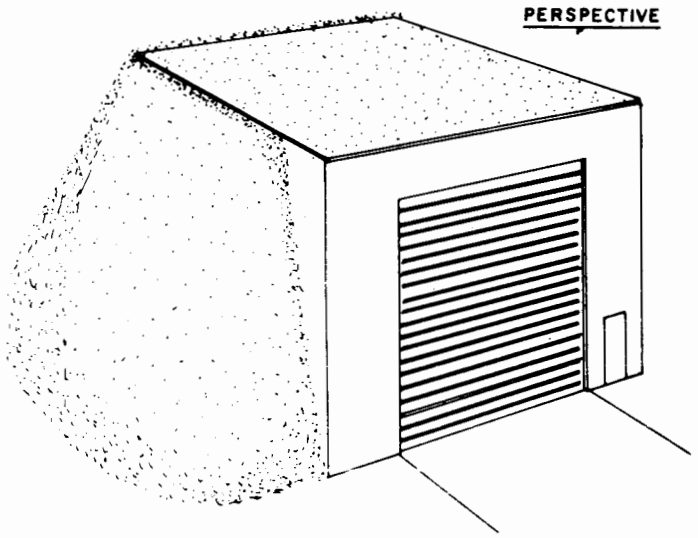
ESTIMATED FUTURE YEAR FUNDING: $2,000,000

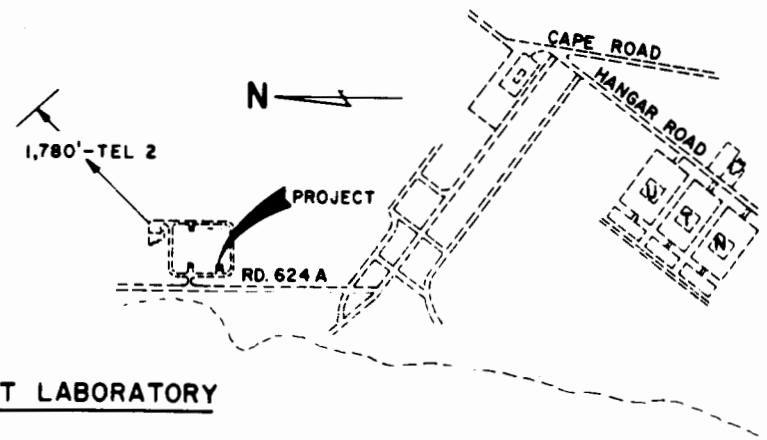
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

ADDITION TO UNMANNED SPACECRAFT EXPLOSIVE SAFE ASSEMBLY COMPLEX







SOLID PROPELLANT LABORATORY

SITE PLAN

0 4 6 8 10

GRAPHIC SCALE X 100

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

MODIFICATIONS TO CENTAUR LAUNCH COMPLEX NO. 36

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science & Applications

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Cape Kennedy, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	$25,009,000
FY 1964 Estimate	49,000
FY 1965 Estimate	451,000
Total Funding Thru FY 1965	$25,509,000

PROJECT COST ESTIMATES:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$125,000
TV camera platforms	LS	---	$6,000	6,000
Laboratory and engineering office in the launch and service building	Sq. Ft.	1,000	25.00	25,000
Modify electrical facility power for LO_2 transfer system	LS	---	7,000	7,000
Installation of pad, pedestals, and foundation for flox capability	LS	---	13,400	13,400
Visitor's observation room in launch control center	Sq. Ft.	300	12.00	3,600

	Unit of Measure	Quantity	Unit Cost	Total Cost
Launch control modification center	LS	---	$20,000	$20,000
Install sliding doors on service structure	LS	---	50,000	50,000
Equipment:				$326,000
Replacement of high pressure gas lines	LS	---	92,000	92,000
Install new line and modify LO_2 system for flox capability	LS	---	60,000	60,000
Modernize and rehabilitate LO_2 system	LS	---	172,000	172,000
Launch control center equipment	LS	---	2,000	2,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$451,000

PROJECT DESCRIPTION:

This project provides for the following necessary modifications and additions to Centaur Launch Complex 36 to support a more rapid launch schedule which results as the vehicle progresses from R&D to operational status:

Additional TV Camera Platforms: This task includes fabrication and execution of two TV camera platforms with the installation of the necessary power control, and data transmission cables.

Modification to LC-36B Launch Service Building: Areas totaling 1000 square feet underneath the ramp and the launch pad in the Launch Service Building will be properly sound-proof partitioned with lighting and air conditioning to provide additional office and laboratory space.

Launch Control Center Modifications: This task consists of building an adequate 15'x20' observation room in the first floor of the blockhouse for required visitors, inspectors, and observers. Adequate air conditioning and communication equipment, furniture, etc., will be provided. It also consists of providing a flush type toilet with outside septic tank to the LCC, tiling the base-

ment floor, and adding an additional coat of tinted asbestos limpet acoustic material to the ceiling of the first and second floor.

Additions of Sliding Doors on LC-36A Service Tower: This task consists of installing seven sets of aluminum sliding doors on the south side of the service tower starting at TS-109 and progressing downward.

Propellant Services & High Pressure Gas: This task consists of replacing the majority of high pressure gas lines from the GN_2 tanks to the cryogenic propellant (LO_2, LH_2, & LN_2) storage tanks and to the vehicle disconnects. It also provides addition of flox capability which requires additional pad area, pedestals, storage tank, propellant and water piping, electrical instrumentation and power, to provide capability of tanking both fluorine and oxygen into the vehicle as the fuel oxidizing agent. Modifications to the Liquid Oxygen System on LC-36A consists of replacing the 10,000 and 28,000 gallon LO_2 storage tank with one 38,000 gallon tank and the installation of a new pressurized pumping system with controls, valves, and electric power in place of the present outdated mechanical pumping system.

PROJECT JUSTIFICATION:

As the Centaur vehicle is flight tested during the R&D development, the older facilities become obsolete due to wear, corrosion, new developments, etc. In order to launch the vehicles with the greatest reliability, Complex 36A must be updated to the Complex 36B configuration, and modifications added to common use areas so they more adequately service both launch pads The modification and additions here listed will help accomplish the overall launch of the Centaur vehicle and are needed for the following reasons:

Additional TV Camera Platforms: Changes in configurations of both launch vehicle and launch stand as well as addition of payloads have resulted in increased requirements for closed-loop TV coverage of critical areas during pre-launch and launch operations.

Modifications to LC-36B Launch Service Building: Additional engineering office and laboratory space is required for personnel assigned to work on Complex 36B. At the present time sufficient space does not exist in the 36A or 36B Launch Service Buildings. Those areas which can be occupied must be prepared to provide this extra space.

Launch Control Center Modifications: Design personnel, program managers, visitors, observers, etc., find it necessary to watch a launch operation so they can more adequately understand the problems involved in vehicle launches. This room is constructed on the first floor of the blockhouse in the least used space and will be used to control movement of the required observers so

they will not interfere with operations. (1) With the increase of personnel in the blockhouse during critical tests, the present portable sanitation system is no longer adequate and it must be replaced with a flush type toilet. (2) The first floor of the blockhouse is bare concrete, the surface of which is difficult to keep clean. Since the addition of LC-36B control equipment to the Launch Control Center, a great deal of electronic equipment has been moved to the first floor. The addition of floor tile will greatly improve the cleanliness of this area reducing the risk of shorting out equipment by dust hazard. (3) With the addition of more equipment for LC-36B and an increase in operational personnel the noise level in the blockhouse will be greatly increased. The additional acoustical material will help reduce this excessive noise level.

Addition of Sliding Doors on LC-36A Service Tower. Replacement of the present weather curtains, with sliding doors on LC-36A service tower will follow the present design of LC-36B service tower and provide greater protection and better environmental control of the Atlas Centaur booster and its payload.

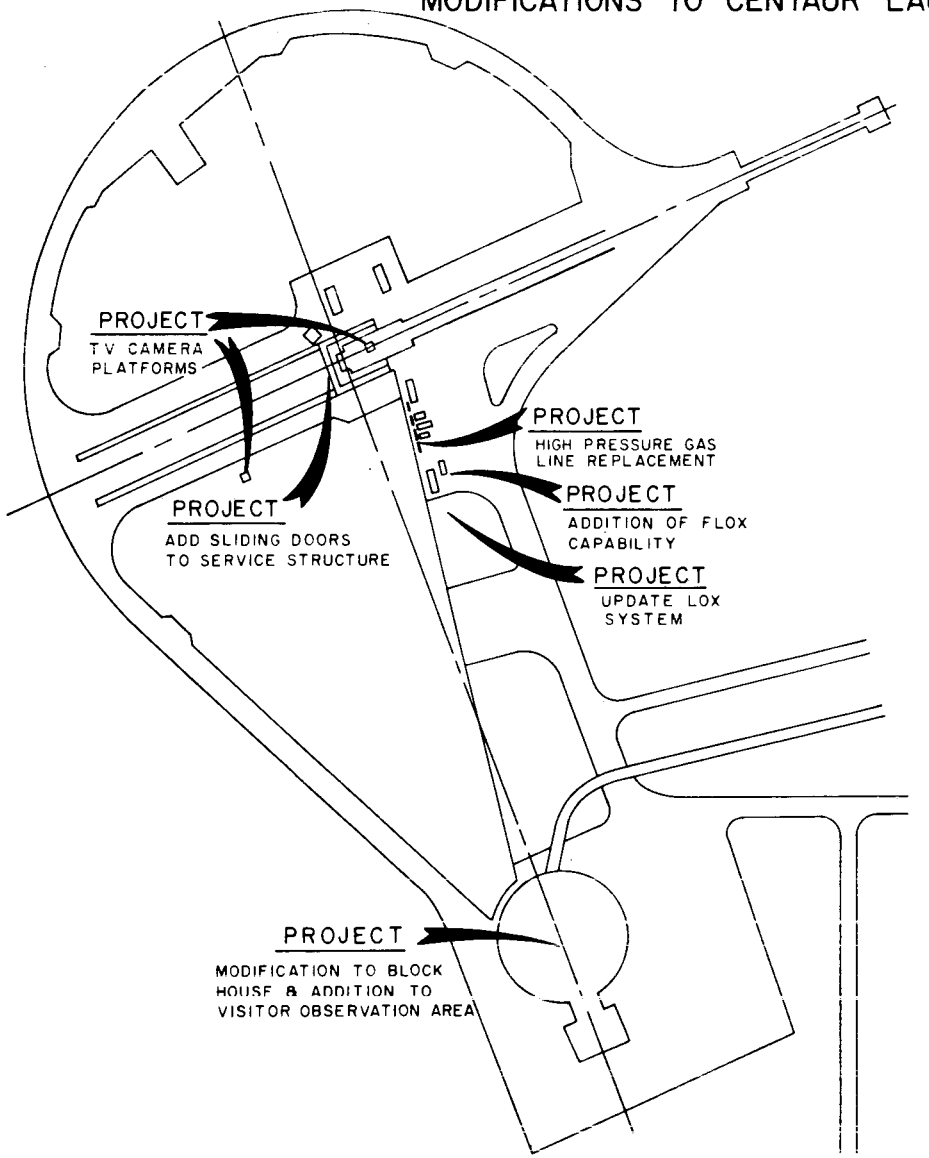
Propellant Services and High Pressure Gas. Stress corrosion of these high pressure lines has resulted in continual replacement of small sections of GN_2 tubing with corrosion resistent tubing. This task will replace all the remaining old tubing at one time, resulting in lower overall costs, providing greater safety, and more reliability to the high pressure gaseous nitrogen system. The addition of flourine with the liquid oxygen will result in increased I.S.P. and thrust level of the Atlas Centaur booster and consequently put heavier payloads in orbit. Many operational and technical problems have been encountered in precise tanking operations on LC-36A because of the older pump driven liquid oxygen propellant system. There is also a need to tank the Centaur upper stage with LO_2. The installation of a pressurized system designed for LC-36B and used on Atlas operational sites will result in greater reliability and provide for simultaneous topping of both stages decreasing propellant tanking time during launch operations.

ESTIMATED FUTURE YEAR FUNDING: $1,000,000

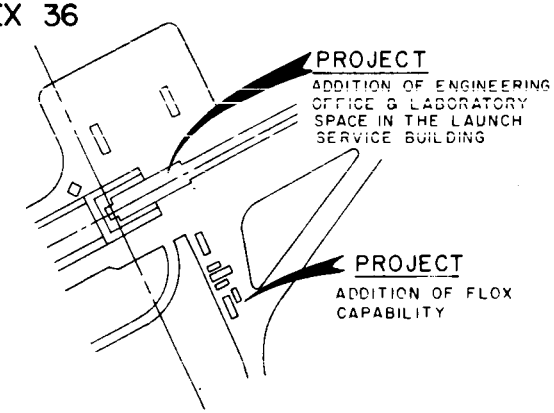
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

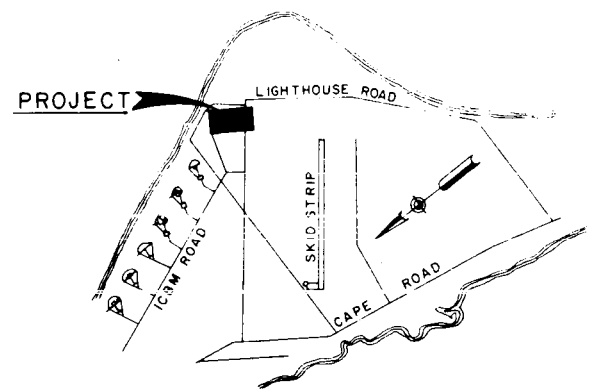
MODIFICATIONS TO CENTAUR LAUNCH COMPLEX 36



COMPLEX 36A



COMPLEX 36B



VICINITY MAP

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

MODIFICATIONS TO LAUNCH COMPLEX NO. 17

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science & Applications

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Cape Kennedy, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$35,000
FY 1965 Estimate	465,000
Total Funding Through FY 1965	$500,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$245,000
Elevator	LS	---	$145,000	145,000
Electrical modifications	LS	---	70,000	70,000
Site preparation	LS	---	5,000	5,000
Support building	Sq. Ft.	1,920	13.00	25,000
Equipment				$220,000
Masts	LS	---	220,000	220,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$465,000

PROJECT DESCRIPTION:

This project provides for the following modifications to Launch Complexes 17A and B: The automatic service and operational personnel elevators for both pads 17A and B that operate between ground level and the eight level of the gantrys will be increased in size from 4'5"x5'6" to 6'0"x6'0" and in capacity from 2000 pounds to 3500 pounds. The operating speed will be increased from 50'/min. to 75-100'/min. Modifications to the elevator shaft and associated equipment also will be provided; two structural steel fixed umbilical masts, one each at Pads 17A and 17B will be constructed. The masts will be 110 feet tall with 8'x8' base, of constant size through mid-point, tapering to 4'x4' at the top. Four umbilical reach arms will be provided at various levels and will be automatically retractable by spring loading and counter-balance methods. Each umbilical arm station will be provided with an emergency ladder and service platform and a personnel and equipment elevator will be installed to serve each station. The masts will be equipped with supports for flight vehicle fuel and oxidizer lines, high pressure gas lines, electrical control cables, and air conditioning ducts to the stages of the Thor Delta booster and to the spacecraft; the gantry drive power will be increased by replacing the existing 31 H.P. motor generator (MG) set supplying electric power to the drive motors with a 60 H.P. MG set (speed variator) on each of the gantrys at Complex 17. Four additional tractor drive motors will be provided to each gantry. Each electric drive motor will be a minimum of 10 H.P., direct current operated with gear reduction drive; a single story 32'x60' operational support building will be constructed of concrete block with slab floor and built-up roof. The building will include shops, office and utility space and will be equipped with locker, shower and toilet accommodations. The building will be air conditioned and heated and the shops portion will be equipped with a 1.5 ton monorail hoist; movable steel platforms will be installed at levels 8X, 8B, and 9A of service tower 17A. The platforms will be approximately 15'x14'; the existing 44-ton air conditioning system located at the base of each launcher will be replaced with a 100-ton system.

PROJECT JUSTIFICATION:

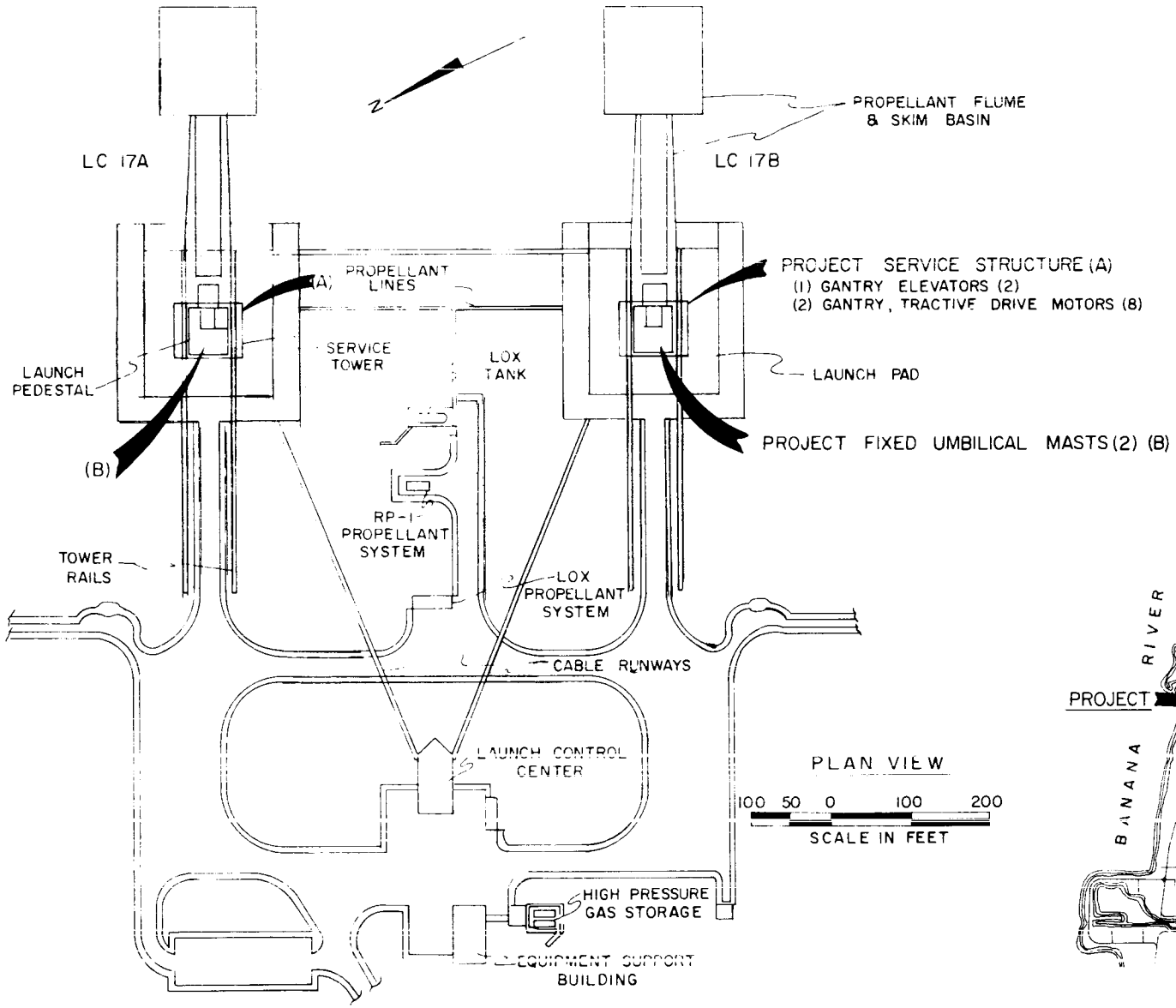
Proposed increase in launching schedule of unmanned spacecraft utilizing the Thor Delta booster and the increased intricacy of the spacecraft necessitate the projected modifications. Complexes 17A and 17B have been in operation for over five years. The present equipment is old and outdated and in some cases presents a safety hazard. Long exposure to the elements has deteriorated most of the equipment beyond economical repair, therefore replacement will be necessary.

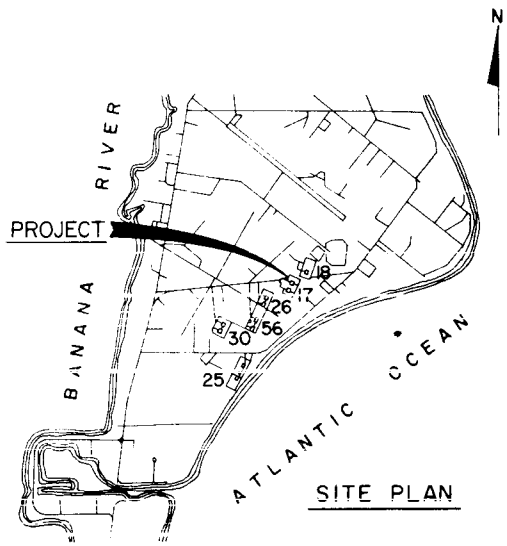
ESTIMATED FUTURE YEAR FUNDING: None

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

MODIFICATIONS TO LAUNCH COMPLEX NO. 17





CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

SPIN BALANCE FACILITIES FOR UNMANNED SPACECRAFT

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science and Applications

AUTHORIZATION LINE ITEM: John F. Kennedy Space Center, NASA

LOCATION OF PROJECT: Cape Kennedy, Brevard County, Florida

COGNIZANT NASA INSTALLATION: John F. Kennedy Space Center, NASA

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$12,000
FY 1965 Estimate	255,000
Total Funding Through FY 1965	$267,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$179,400
Spin test building	Sq. Ft.	1,500	$100.00	150,000
Control building	Sq. Ft.	600	45.00	27,000
Site preparation	LS	---	2,400	2,400
Equipment				$75,600
Crane	LS	---	75,600	75,600
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$255,000

PROJECT DESCRIPTION:

This project provides two buildings (spin test building and control building) for support of unmanned spacecraft spin balance tests. Construction will consist of reinforced concrete frame with masonry curtain walls. The spin test building will be approximately 2,300 square feet in area and will be equipped with a five-ton crane with a hook height of 35 feet. Advanced handling and balance operation will take place in this building. The second building will be approximately 1,000 square feet in area and will house the control equipment for the balancing fixtures, work shops, offices and storage areas. A protective wall will be constructed between the two buildings as a safety measure. Utilities will include power, communications, water, sewerage, roads, and parking.

PROJECT JUSTIFICATION:

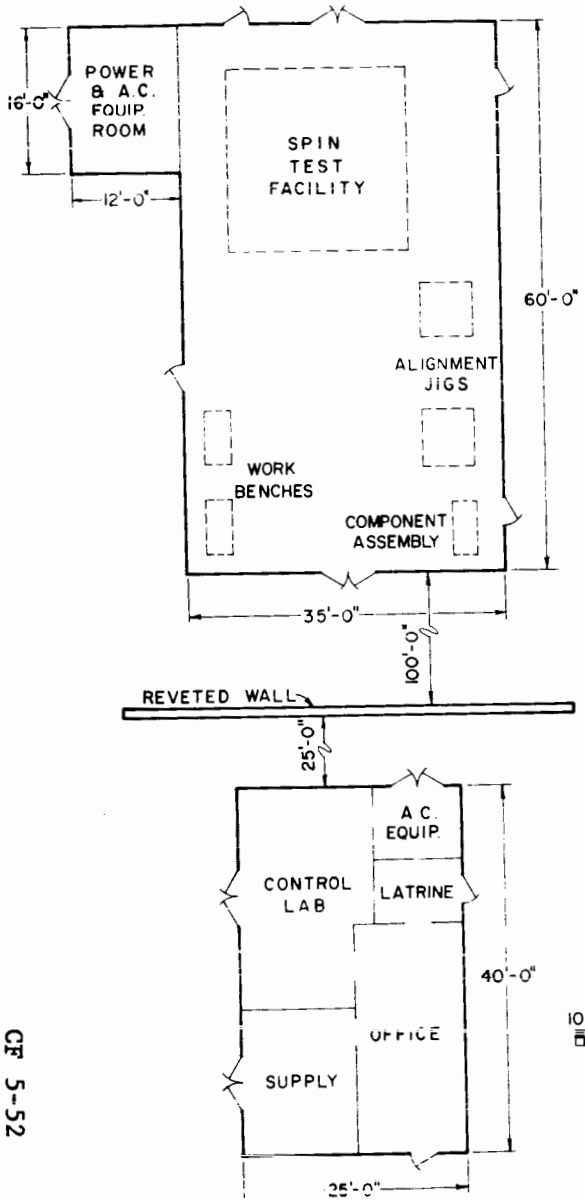
The existing Spin Test Facility is within the danger area of the Centaur launch complex 36. Increased Centaur prelaunch preparation activities such as fueling tests, combined systems tests and simulated launches limit the allowable working hours in the spin-test facility. The new facility will be used for programs such as FIRE, Orbiting Astronomical Observatory, and Orbiting Geophysical Observatory. FIRE and advanced spacecraft are to be flown on Atlas/Agena, which will require more working area and building height than are presently available in the existing facility. Limited work space in the existing facility increases the possibility of schedule slippages due to the inability to complete spacecraft and upper stage alignment and balancing operations on schedule. Probable degradation of spacecraft performance may result because of delays caused by Centaur Launch Vehicle activities on Launch Complex #36 which require the clearing of people from the existing spin balance building for extended periods.

ESTIMATED FUTURE YEAR FUNDING: None

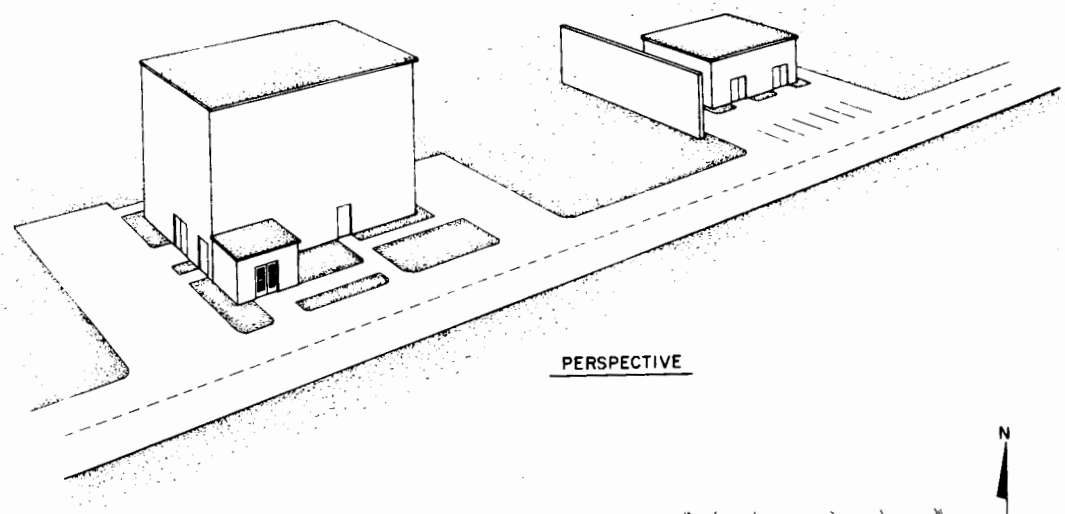
JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1965 ESTIMATES

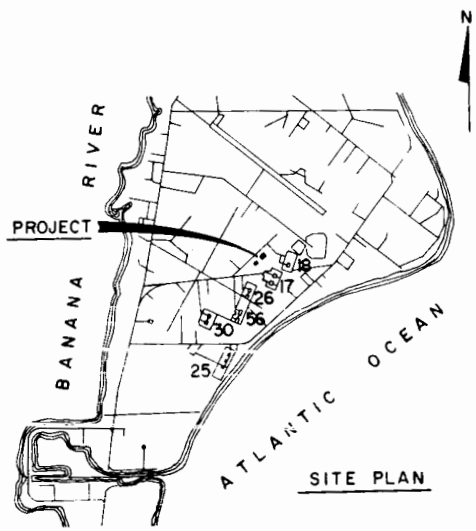
SPIN BALANCE FACILITIES FOR UNMANNED SPACECRAFT



PLAN



PERSPECTIVE



SITE PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

LANGLEY RESEARCH CENTER

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Summary..... CF 6-2

Office of Advanced Research and Technology Projects:

Thermal control housing and building addition for dynamics research laboratory..... CF 6-3

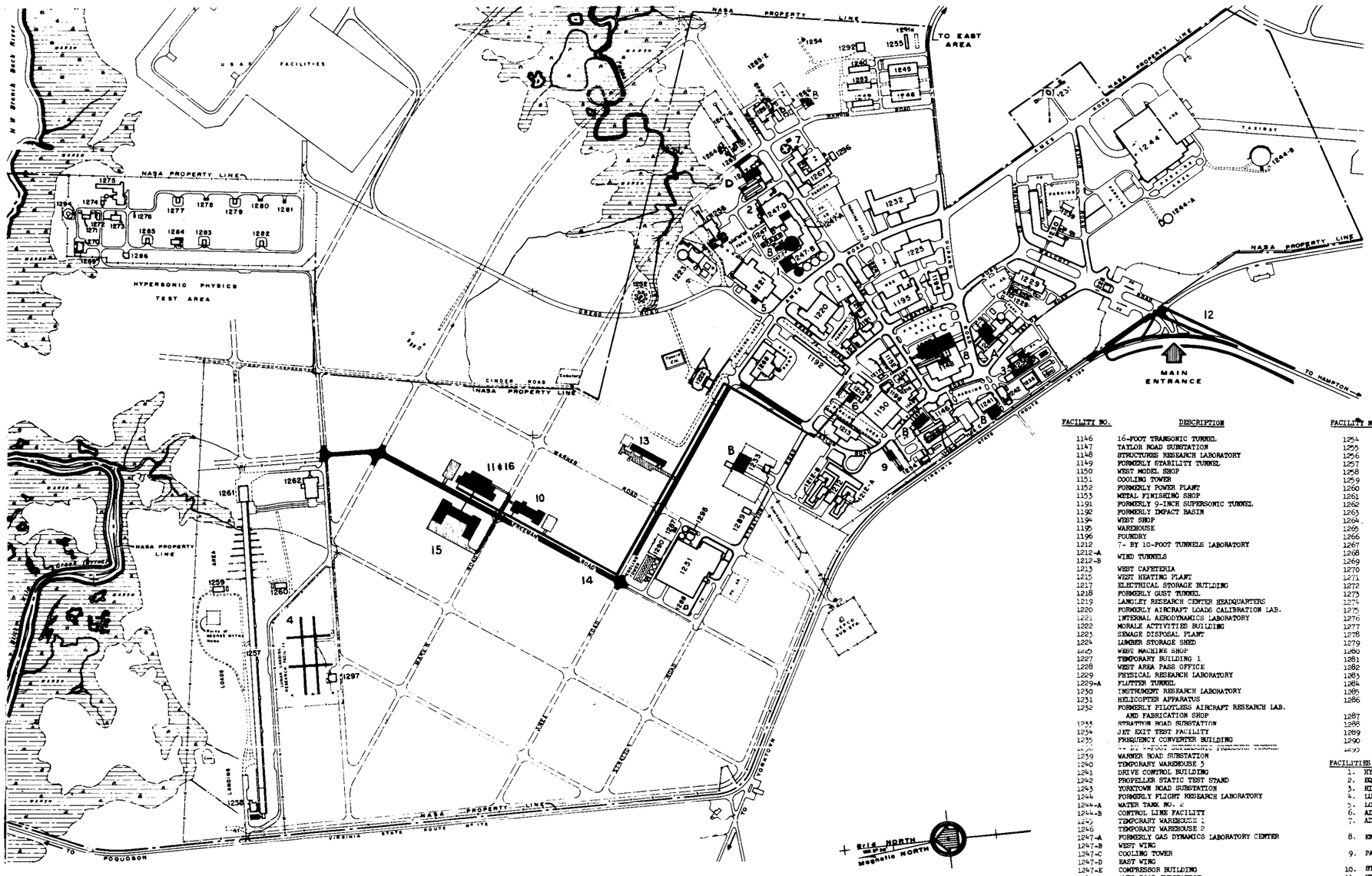
Fatigue research laboratory..... CF 6-7

Central high pressure air supply..... CF 6-11

Utility improvements - electrical system..... CF 6-14

LANGLEY RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

LOCATION PLAN



WEST AREA

PROPOSED FISCAL YEAR 1965 PROJECTS

A. THERMAL CONTROL HOUSING AND BUILDING ADDITION FOR DYNAMICS RESEARCH LABORATORY
B. UTILITY IMPROVEMENTS
C. FATIGUE RESEARCH LABORATORY
D. CENTRAL HIGH PRESSURE AIR SUPPLY

FACILITY NO.	DESCRIPTION
1146	16-FOOT TRANSONIC TUNNEL
1147	TAYLOR ROAD SUBSTATION
1148	STRUCTURES RESEARCH LABORATORY
1149	FORMERLY STABILITY TUNNEL
1150	WEST MODEL SHOP
1151	COOLING TOWER
1152	FORMERLY POWER PLANT
1153	METAL FINISHING SHOP
1191	FORMERLY 9-INCH SUPERSONIC TUNNEL
1192	FORMERLY IMPACT BASIN
1194	WEST SHOP
1195	WAREHOUSE
1196	FOUNDRY
1212	7- BY 10-FOOT TUNNELS LABORATORY
1212-A	WIND TUNNELS
1213	WEST CAFETERIA
1215	WEST HEATING PLANT
1217	ELECTRICAL STORAGE BUILDING
1218	FORMERLY GUST TUNNEL
1219	LANGLEY RESEARCH CENTER HEADQUARTERS
1220	FORMERLY AIRCRAFT LOADS CALIBRATION LAB.
1221	INTERNAL AERODYNAMICS LABORATORY
1222	MORALE ACTIVITIES BUILDING
1223	SEWAGE DISPOSAL PLANT
1224	LUMBER STORAGE SHED
1225	WEST MACHINE SHOP
1227	TEMPORARY BUILDING 1
1228	WEST AREA PASS OFFICE
1229	PHYSICAL RESEARCH LABORATORY
1229-A	FLUTTER TUNNEL
1230	INSTRUMENT RESEARCH LABORATORY
1231	HELICOPTER APPARATUS
1232	FORMERLY PILOTLESS AIRCRAFT RESEARCH LAB. AND FABRICATION SHOP
1233	STRATTON ROAD SUBSTATION
1234	JET EXIT TEST FACILITY
1235	FREQUENCY CONVERTER BUILDING
[illegible]	7- BY 10-FOOT [illegible] TUNNEL
1239	WARNER ROAD SUBSTATION
1240	TEMPORARY WAREHOUSE 3
1241	DRIVE CONTROL BUILDING
1242	PROPELLER STATIC TEST STAND
1243	YORKTOWN ROAD SUBSTATION
1244	FORMERLY FLIGHT RESEARCH LABORATORY
1244-A	WATER TANK NO. 2
1244-B	CONTROL LINE FACILITY
1247	TEMPORARY WAREHOUSE 1
1246	TEMPORARY WAREHOUSE 2
1247-A	FORMERLY GAS DYNAMICS LABORATORY CENTER
1247-B	WEST WING
1247-C	COOLING TOWER
1247-D	EAST WING
1247-E	COMPRESSOR BUILDING
1247-F	AMES ROAD SUBSTATION
1247-G	HIGH-PRESSURE SHOCK TUBE
1249	TEMPORARY WAREHOUSE 4
1251	UNITARY PLAN WIND TUNNEL
1252	WATER TANK NO. 1
1253	TEMPORARY WAREHOUSE 5

FACILITY NO.	DESCRIPTION
1254	AMMUNITION STORAGE 1
1255	TEMPORARY WAREHOUSE 6
1256	9- BY 6-FOOT THERMAL STRUCTURES TUNNEL
1257	LANDING LOADS TRACK
1258	LANDING LOADS TRACK COMPRESSOR BUILDING
1259	NORTH ARRESTING GEAR HOUSING
1260	SOUTH ARRESTING GEAR HOUSING
1261	LANDING LOADS TRACK SHOP
1262	HIGH-SPEED HYDRODYNAMICS OFFICE AND SHOP
1263	CERAMIC-HEATED JET (PILOT MODEL)
1264	HIGH-TEMPERATURE MACH 7 JET (PILOT MODEL)
1265	8-FOOT HIGH-TEMPERATURE STRUCTURES TUNNEL
1266	MOFFETT ROAD SUBSTATION
1267	HIGH-TEMPERATURE MATERIALS LABORATORY
1268	DATA REDUCTION BUILDING
1269	GATE HOUSE (HYPERSONIC PHYSICS TEST AREA)
1270	ROCKET PROPELLANT TEST UNIT, HPTA
1271	OPEN SHED, HPTA
1272	HEATING PLANT, HPTA
1273	OPERATIONS CENTER, HPTA
1274	CERAMIC-HEATED MACH 15 JET, HPTA
1275	IMPACT AND PROJECTILE TEST UNIT, HPTA
1276	IGNITER ASSEMBLY BUILDING, HPTA
1277	STORAGE A
1278	STORAGE B
1279	STORAGE C
1280	STORAGE D
1281	STORAGE E
1282	STORAGE F
1283	STORAGE G
1284	ROCKET PROPELLANT PROCESSING BUILDING, HPTA
1285	STORAGE H
1286	ROCKET ASSEMBLY AND PROPELLANT ALTERATION BUILDING
1287	TEMPORARY SHED
1288	SOLAR ENERGY COLLECTOR
1289	TEMPORARY STORAGE
1290	SUBSTATION
1291	DYNAMICS RESEARCH LABORATORY

FACILITIES AUTHORIZED AND UNDER CONSTRUCTION

1. HYPERSONIC AERO-THERMAL DYNAMICS FACILITY
2. EQUIPMENT FOR MAGNETOPLASMADYNAMICS RESEARCH
3. HIGH VACUUM SPACE STRUCTURES FACILITY
4. LUNAR LANDING RESEARCH FACILITY
5. LOW-FREQUENCY ENVIRONMENTAL NOISE FACILITY
6. ADDITION TO HEATING PLANT
7. ADD. POWER SUPPLY AND IMPROVED ARC CHAMBER FOR 10-MEGAWATT ARC TUNNEL
8. ENVIRONMENTAL RESEARCH FACILITIES FOR SPACECRAFT COMPONENTS AND MATERIALS
9. PARTICLE ACCELERATOR FOR SIMULATION OF MICRO-METEOROID IMPACT
10. STABILIZATION AND CONTROL EQUIPMENT LABORATORY
11. VEHICLE ANTENNA TEST FACILITY
12. WEST AREA APPROACH ROAD
13. HOT GAS RADIATION RESEARCH FACILITY
14. UTILITY INSTALLATIONS
15. ELECTRONIC INSTRUMENTATION LABORATORY
16. ADDITION TO VEHICLE ANTENNA TEST FACILITY

718-214 O - 1964

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Langley Research Center	OART	Hampton, Virginia	---	Hampton

INSTALLATION MISSION Langley Research Center mission - Undertake research to provide a technical base for such missions as (1) manned and unmanned exploration of space, (2) improvement of performance and utility of airborne flight; plan, develop, and operate necessary facilities; generate new and advanced concepts; provide research advice and assistance to other branches of the Government; disseminate scientific and technical information; search for and identify potential industrial applications evolved in the course of research.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	4,220	4,348	4,348
CONTRACTOR & OTHER PERSONNEL	180	100	50
TOTAL ALL PERSONNEL	4,400	4,448	4,398

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	430	
LAND *(Lease or Permit)*	342	
PLANT VALUE *(as of June 30, 1963)*		242,649
TOTAL	772	242,649

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Thermal control housing and building addition for dynamics research laboratory	OART	---	60	801	---	861
Fatigue research laboratory	OART	---	70	1,221	---	1,291
Central high pressure air supply	OART	---	157	2,077	---	2,234
Utility improvements - electrical system	OART	---	---	355	---	355
TOTAL FOR PROJECTS IN FY 1965	ESTIMATE			4,454		

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GPO 888-867

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

THERMAL CONTROL HOUSING AND BUILDING ADDITION FOR DYNAMICS RESEARCH LABORATORY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Langley Research Center

LOCATION OF PROJECT: Hampton, Virginia

COGNIZANT NASA INSTALLATION: Langley Research Center

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$60,000
FY 1965 Estimate	801,000
Total Funding Through FY 1965	$861,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$614,000
Laboratory	Sq. Ft.	7,425	$20.10	149,200
Sphere enclosure	Sq. Ft.	6,900	45.20	312,000
Additional ports	LS	---	10,100	10,100
Grading, paving, landscaping	LS	---	13,600	13,600
Utilities	LS	---	85,800	85,800
Catwalks, platforms and stairs in sphere enclosure	LS	---	43,300	43,300

	Unit of Measure	Quantity	Unit Cost	Total Cost
Equipment				$187,000
Crane	LS	---	$60,350	60,350
Special environmental controls	LS	---	126,650	126,650
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$801,000

PROJECT DESCRIPTION:

The proposed thermal control housing will enclose the 60-foot vacuum sphere of the dynamics research laboratory. Air conditioning equipment will be installed to maintain a uniform temperature around the sphere. Within the enclosure a bridge crane will be installed and observer's catwalk erected. The enclosure will be of steel frame and panel construction and will be approximately 80 by 90 by 80 feet high.

The project also includes a two-story and basement addition approximately 45 by 55 feet to the dynamics research laboratory building.

PROJECT JUSTIFICATION:

The 60-foot vacuum sphere to be enclosed, constitutes a free-body dynamics facility for research and development of spacecraft orientation and control systems in a simulated space environment. The requirement for temperature uniformity on the surface of the sphere is quite rigorous since spacecraft sensors are quite sensitive to temperature differentials. The sphere wall temperature differentials are caused by sunlight, wind, rain, and other weather conditions.

Without some means of stabilizing the wall temperatures, use of the sphere will be limited to a few hours beginning when temperatures stabilize after sunset, and ending at sunrise, on those nights when other weather factors are also constant. Uniform temperature of the sphere to about plus or minus 9°F is necessary in order not to introduce a false radiation which will interfere with evaluation of the sensor under test. A recent study indicated that the air-conditioned enclosure would be the most economical means to maintain an adequately uniform wall temperature for the necessary thermal differential between the planetary simulator and the walls.

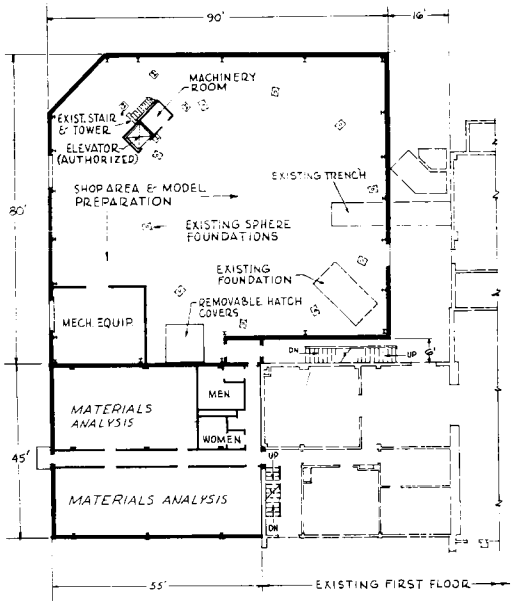
The proposed bridge crane and catwalks are necessary to aid in meeting the programmed workload. This workload also imposes a need for

a more extensive laboratory support area which will be met by the proposed laboratory addition. The addition will provide added facilities for evaluation and development of sensor and spacecraft elements relating to investigations to be carried on in the sphere.

ESTIMATED FUTURE YEAR FUNDING: None

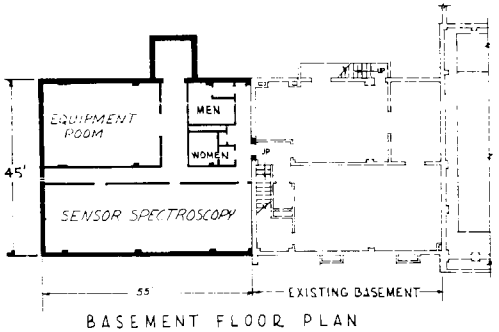
LANGLEY RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

THERMAL CONTROL HOUSING AND BUILDING ADDITION FOR DYNAMICS RESEARCH LABORATORY



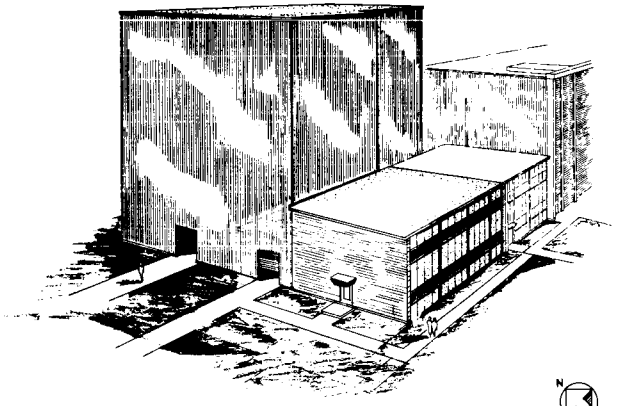
FIRST FLOOR PLAN

0 5 10 20 FT.

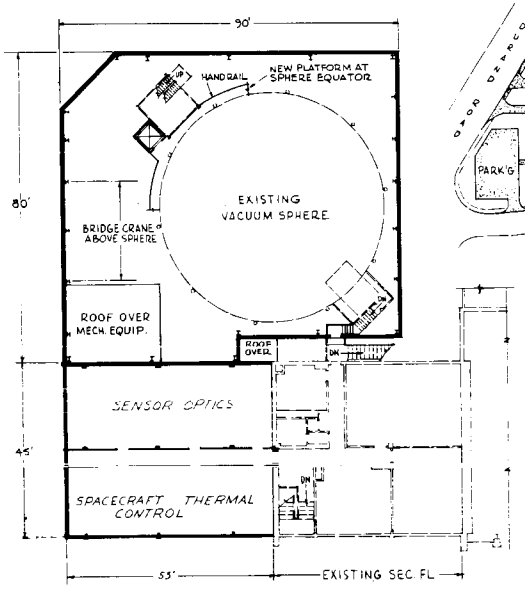


BASEMENT FLOOR PLAN

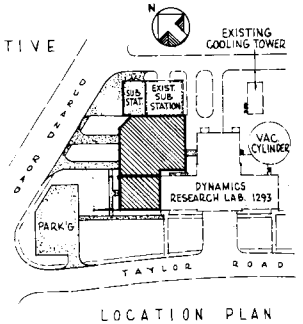
0 5 10 20 FT.



PERSPECTIVE



SECOND FLOOR PLAN



LOCATION PLAN

0 25 50 FT.

LEGEND
EXISTING CONSTRUCTION
NEW CONSTRUCTION
NEW PAVEMENTS & WALKS

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FATIGUE RESEARCH LABORATORY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Langley Research Center

LOCATION OF PROJECT: Hampton, Virginia

COGNIZANT NASA INSTALLATION: Langley Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$70,000
FY 1965 Estimate	1,221,000
Total Funding Through FY 1965	$1,291,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$873,500
Laboratory	Sq. Ft.	24,500	$24.20	592,900
Special foundations, fixtures and controls	LS	---	44,100	44,100
Site preparation	LS	---	21,600	21,600
Mechanical utilities	LS	---	12,000	12,000
Electrical utilities	LS	---	202,900	202,900
Equipment				$347,500
Cranes	LS	---	55,200	55,200
Fatigue research equipment	LS	---	112,000	112,000
Instrumentation	LS	---	170,700	170,700
Laboratory equipment	LS	---	9,600	9,600

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$1,221,000

PROJECT DESCRIPTION:

This project will provide a laboratory with a floor area of approximately 24,500 square feet divided into three general areas:

(1) Hot structure test area, approximately 5,000 square feet provided to support large structural components during tests under cyclic heating and loading.

(2) General fatigue test area, approximately 15,500 square feet of air-conditioned space to house existing Langley fatigue test machines and associated equipment. Special cells will protect personnel from very high intensity noise associated with high-performance hydraulic test apparatus. A light-controlled room for photo-elastic stress analysis and special environmental control for tests in simulated space environments will be provided.

(3) General work space, approximately 4,000 square feet of space for working areas for scientific and supporting personnel.

This project will utilize the 10-megawatt power supply in an adjacent building.

PROJECT JUSTIFICATION:

Fatigue failures of materials and structures in operational aircraft continue to be very costly to the United States, both from a monetary standpoint and from loss in human lives.

Past efforts have been concerned primarily with aeronautical fatigue research, and NASA will continue to play a major role in this area. Extensive fatigue research is needed on high performance aircraft for which fatigue will be a major design consideration. As manned exploration of space is increased vehicles will be on longer missions and future space vehicles will be recovered and reused. Prevention of fatigue failure will become a major design consideration in this area also.

The need for fatigue research will continue so long as new materials, new structural configurations, and new environmental conditions occur.

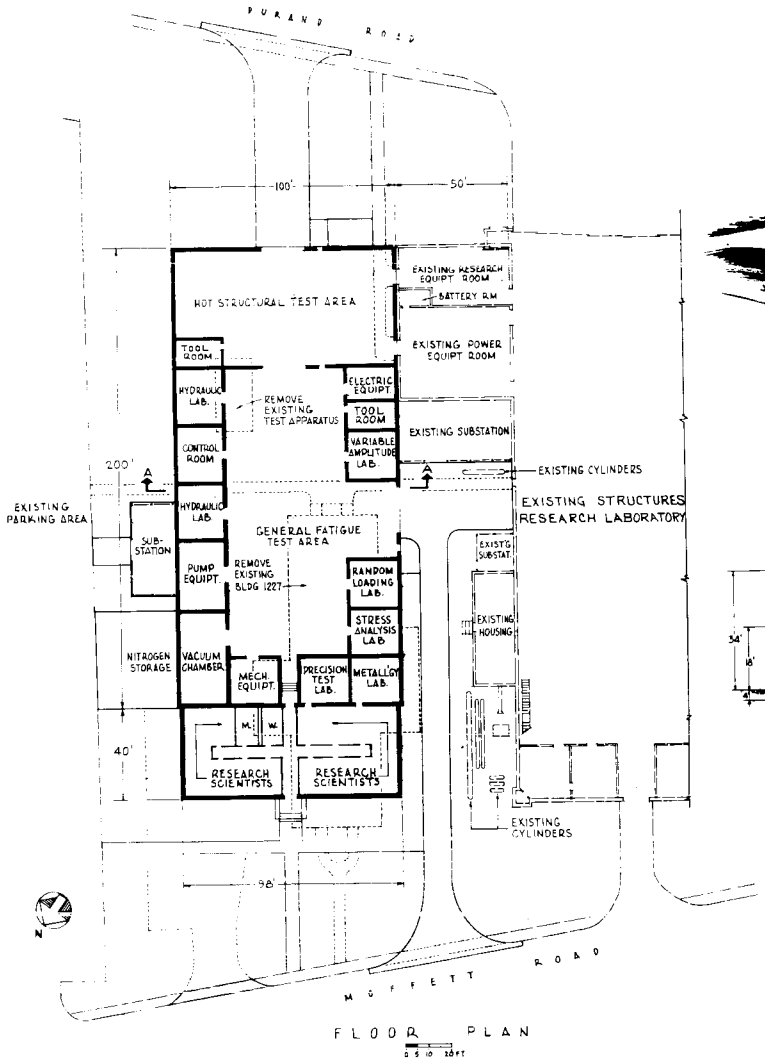
Fatigue research at Langley is handicapped in meeting the program requirements because of the lack of adequate facilities. Tests require a more controlled environment operation and more space than is available in the present facilities.

This project was originally submitted in the Langley fiscal year 1964 budget estimates but was deferred by the authorization committee until a following year. The facility is considered urgent and is now being resubmitted.

ESTIMATED FUTURE YEAR FUNDING: None

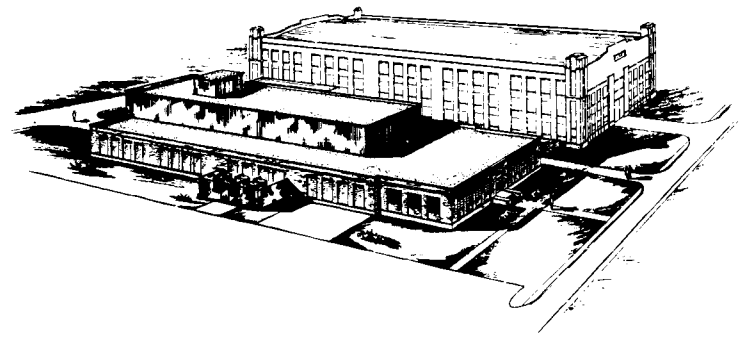
LANGLEY RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

FATIGUE RESEARCH LABORATORY

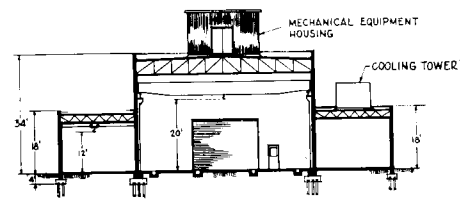


FLOOR PLAN

0 5 10 20 FT



PERSPECTIVE



SECTION A-A

0 5 10 FT

LOCATION PLAN

0 100 500 FT

LEGEND

NEW CONSTRUCTION
EXISTING CONSTRUCTION
EXISTING TO BE REMOVED

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

CENTRAL HIGH PRESSURE AIR SUPPLY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Langley Research Center

LOCATION OF PROJECT: Hampton, Virginia

COGNIZANT NASA INSTALLATION: Langley Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$157,000
FY 1965 Estimate	2,077,000
Total Funding Through FY 1965	$ 2,234,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$753,100
Building (including equipment foundations)	Sq. Ft.	12,840	$27.32	350,800
Air storage field and manifold	LS	---	245,800	245,800
Electrical utilities	LS	---	150,400	150,400
Road extension	Sq. Yds.	790	7.72	6,100
Equipment				$1,323,900
Compressors	Each	3	301,200	903,600
Compressor auxiliary and connector piping	LS	---	420,300	420,300

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$2,077,000

PROJECT DESCRIPTION:

This project will provide a central high-pressure air supply at the Langley Research Center capable of supplying 5,000 psi air at the rate of about 400,000 pounds per shift. An existing compressor station will be enlarged with the addition of three compressors, related electrical equipment, and cooling towers. The existing air storage will be increased by bottles providing about 73,000 pounds capacity.

PROJECT JUSTIFICATION:

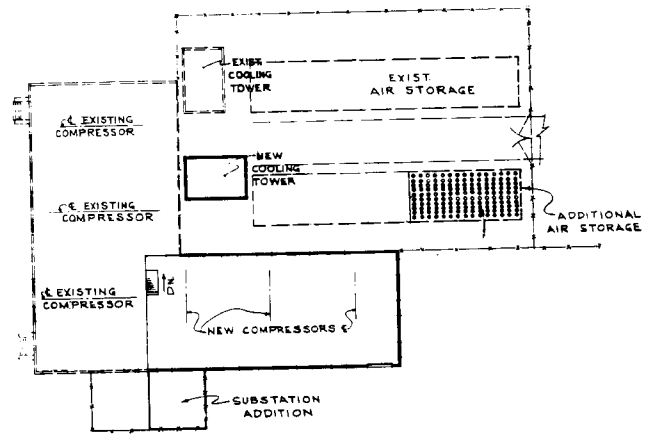
The original 5,000 psi air compressor station at Langley was designed in 1949 to generate hypersonic flows in a few adjacent blow-down wind tunnels with a maximum test section diameter of 10 inches. The practical applications of hypersonic flow phenomena have necessitated increased experimental effort at these speeds and have required new facilities which are now taxing the capacity of the present compressor station.

High pressure air to attain very high Mach numbers is presently used in 19 experimental facilities supplied by a 5,000 psi compressor station capable of producing nearly 200,000 pounds per 8-hour shift, and a storage field of about 500,000 pounds capacity. The average daily air requirement is presently about 320,000 pounds of air, so the compressors are operated on a two-shift basis. The storage field acts as a reservoir to supply the large, short-period demands for air. Imminent operation of the 8-foot high-temperature structures tunnel will double the daily air requirement. There will be delays in many vital programs to develop information having application to military and civilian aerospace vehicles if this facility is not obtained.

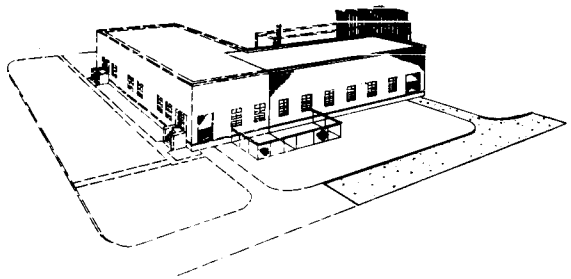
ESTIMATED FUTURE YEAR FUNDING: None

LANGLEY RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

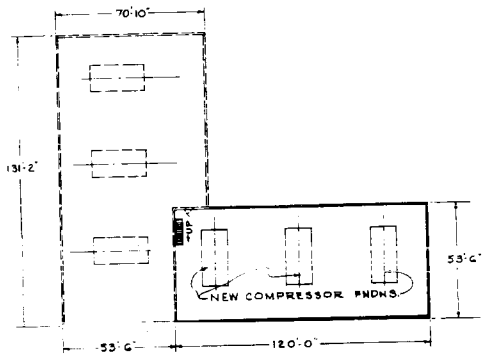
CENTRAL HIGH PRESSURE AIR SUPPLY



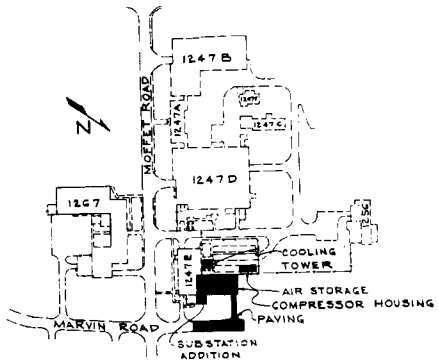
FIRST FLOOR PLAN



PERSPECTIVE
NO SCALE



BASEMENT PLAN
SCALE



LOCATION PLAN

LEGEND
PROPOSED FACILITY
EXISTING FACILITY

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

UTILITY IMPROVEMENTS - ELECTRICAL SYSTEM

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Langley Research Center

LOCATION OF PROJECT: Hampton, Virginia

COGNIZANT NASA INSTALLATION: Langley Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$355,000
Total Funding Through FY 1965	$355,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$355,000
Transformers, circuit breakers	LS	---	$189,700	189,700
Bus install., cabling, switching	LS	---	165,300	165,300
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$355,000

PROJECT DESCRIPTION:

This project will consist of increasing the available electrical distribution system capacity on the primary sub-station distribution bus at LRC. Transformers, circuit breakers, and other electrical gear will be added to provide the necessary isolation for circuits having high transient electrical loads. Provisions will also be included for updating and coordinating the balance of the distribution system at other secondary sub-stations to accommodate existing and programmed research facility requirements having transient power loads which affect the voltage regulation of the entire distribution system.

PROJECT JUSTIFICATION:

Expansion and modification of the Langley Research Center distribution system is needed to accommodate increases and changes in electrical load brought about by the addition of new research facilities.

Under present conditions, research facilities are being restricted in operation due to the limited capacity of the existing system. In addition, operation of the large (10,000 KW) electric arc air heaters operated in several new research facilities is imposing transient load disturbances on the distribution system. These disturbances affect the accuracy of data recorded on some research instrumentation with the resultant necessity for repeating test runs upon occasion.

The loads introduced by new facilities now under construction will increase the Center's base load by approximately 16,000 KW. These facilities involve new vacuum and helium pumping systems, power and auxiliaries for high heat rate environmental test systems and short time (10-minutes) high transient electric arc and heater power loads approximating 25,000 KW.

Isolation of the loads should be undertaken and the balance of the distribution system updated and coordinated in order to prevent possible breakdowns and eliminate undue interference with other research facility operations.

ESTIMATED FUTURE YEAR FUNDING: None

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

LEWIS RESEARCH CENTER
(Plum Brook Station)

	Page No.
Location plan	CF 7-1
Summary	CF 7-2
Office of Advanced Research and Technology Project:	
138-34.5 KV Electrical Power Substation	CF 7-3

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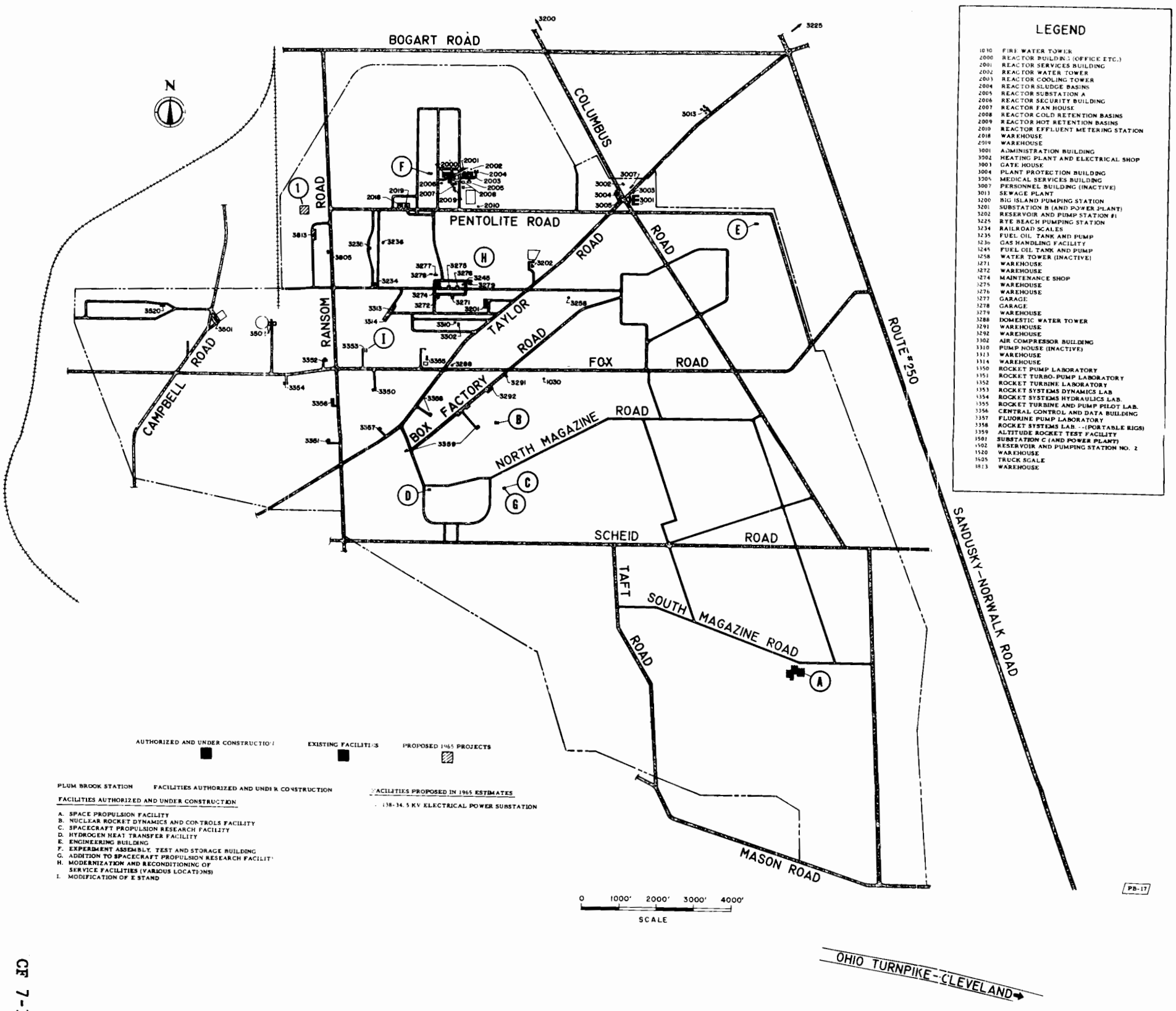
LEWIS RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

LOCATION PLAN

PLUM BROOK STATION



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Lewis Research Center (Plum Brook Station)	Advanced Research and Technology	Sandusky, Ohio	Erie	Sandusky, Ohio

INSTALLATION MISSION

Under the technical direction of personnel located at the Cleveland facilities, research and development programs are conducted in the areas of advanced chemical and nuclear powered rocket engines and their accessories.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	533	578	602
CONTRACTOR & OTHER PERSONNEL	85	100	110
TOTAL ALL PERSONNEL	618	678	712

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	6031.39	
LAND *(Lease or Permit)*		
PLANT VALUE *(as of June 30, 1963)*		49,637
TOTAL	6031.39	49,637

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
138-34.5 KV Electrical Power Substation	OART	---	40	810	---	850
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				810		

NASA FORM 1029 DEC 63

GPO 866-667

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

138-34.5KV ELECTRICAL POWER SUBSTATION
(Plum Brook Station)

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research & Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research & Technology

AUTHORIZATION LINE ITEM: Lewis Research Center

LOCATION OF PROJECT: Plum Brook Station, Sandusky, Erie County, Ohio

COGNIZANT NASA INSTALLATION: Lewis Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$40,000
FY 1965 Estimate	810,000
Total Funding Through FY 1965	$850,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$81,000
Site preparation - clearing, grading, and surfacing	LS	---	$13,000	13,000
Roads and utilities - water, gas, sewers, and communications	LS	---	18,000	18,000
Control, relay, and metering building	Sq. Ft.	1,540	12.99	20,000
Foundations, fence, cable, conduit and grounding	LS	---	30,000	30,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Equipment				$729,000
Power transformers	LS	---	$290,000	290,000
138 KV circuit breakers	LS	---	140,000	140,000
34.5 KV circuit breakers	LS	---	65,000	65,000
Control, metering, and relay equipment	LS	---	90,000	90,000
Substation structure, disconnect switches, insulators, bus bars, arresters, and instrument transformers	LS	---	144,000	144,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$810,000

PROJECT DESCRIPTION:

This project consists of modifications and additions to the existing electrical power system at the Plum Brook Station. A 138-34.5 KV substation will be installed on a loop of a 138 KV transmission line to be run into the station by the local utilities company. Two 40,000 KVA transformers will be installed, with capability of being converted to 50,000 KVA each by future modifications. The new substation will transform the power to the existing 34.5 KV transmission system level and will include all necessary circuit breakers, controls, metering, protective equipment, and automatic features required.

PROJECT JUSTIFICATION:

The present electrical service to the Plum Brook Station is provided by the local electrical power utility company by means of two 34.5 KV circuits emanating from a substation located in Sandusky, Ohio.

The estimated electric power requirements for the calendar year 1966 and beyond cannot be supplied by the existing 34.5 KV services.

On the basis of the estimated load development at Plum Brook Station, the expected load growth in the area, and facilities available to require additional service at the 34.5 KV level, it will be necessary to convert to 138 KV supply by the second quarter of calendar year 1966.

The nature of several of the research testing facilities at the Plum Brook Station requires a high degree of reliability of electrical power over

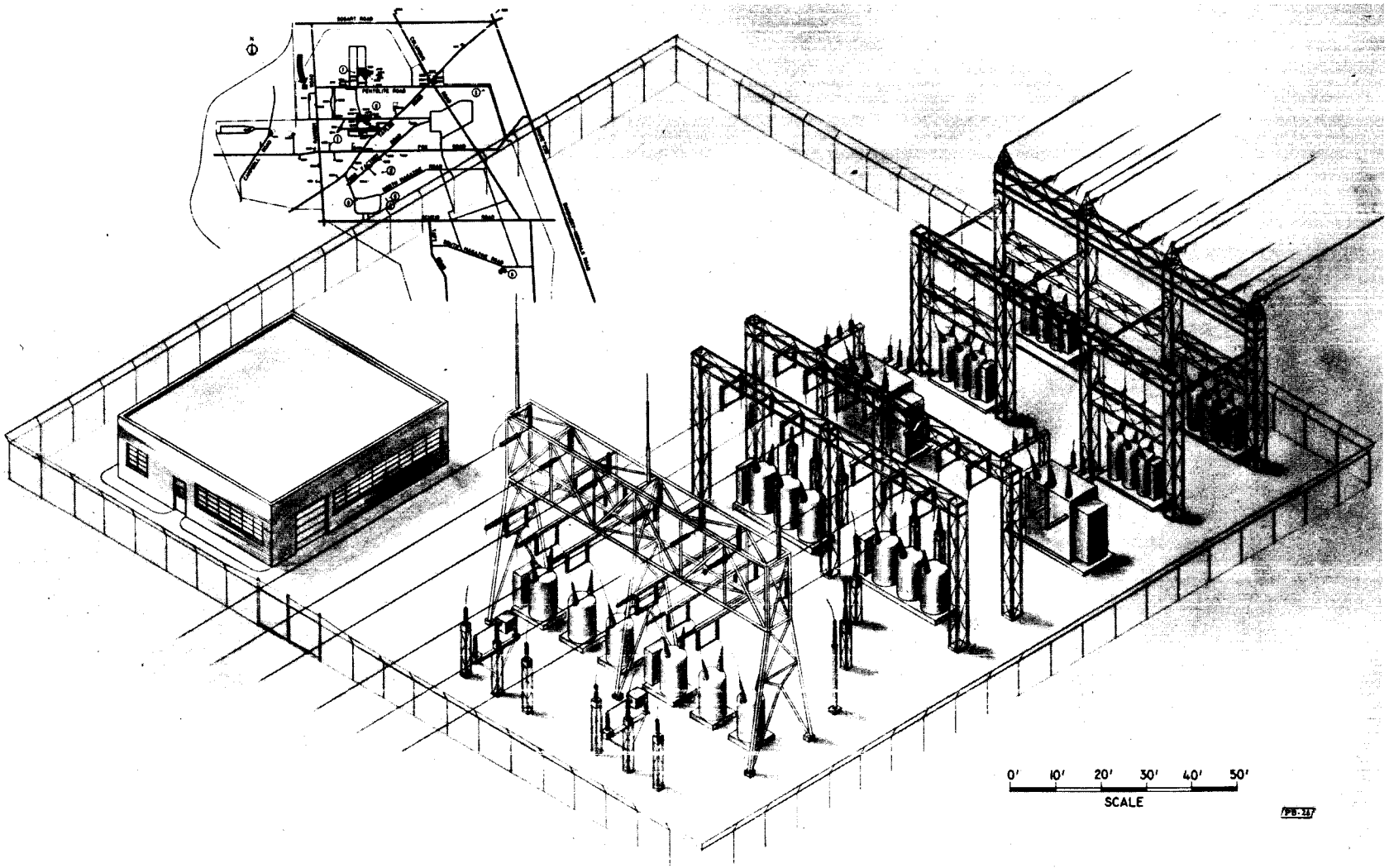
prolonged periods of time. Interruption of electrical power to these research facilities during testing operations may result in loss of experimental test data, set-up and operational time, and in some cases may lead to damage to research and facility components.

ESTIMATED FUTURE YEAR FUNDING: None

LEWIS RESEARCH CENTER
FISCAL YEAR 1965 ESTIMATES

138–34.5 KV. ELECTRICAL POWER SUB-STATION

PLUM BROOK STATION



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

MANNED SPACECRAFT CENTER

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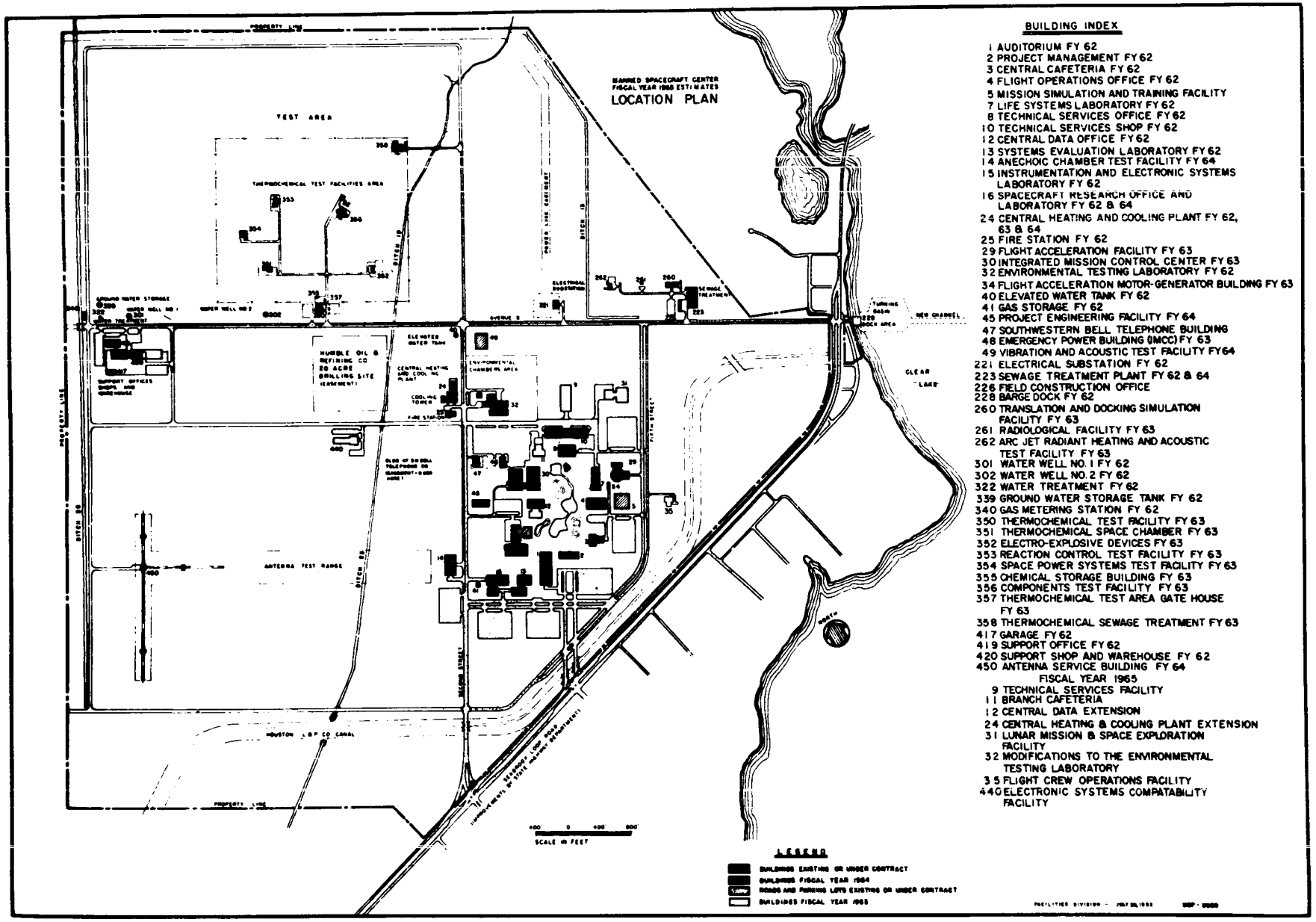
Summary	CF 8-2
Office of Manned Space Flight Projects:	
Cafeteria	CF 8-3
Central data facility addition	CF 8-6
Central heating and cooling plant and warehouse addition	CF 8-11
Flight crew operations facility	CF 8-17
Electronic systems compatibility facility	CF 8-22
Lunar mission and space exploration facility	CF 8-26
Modification to environmental testing laboratory	CF 8-30
Technical services facility	CF 8-34



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5 MISSION SIMULATION AND TRAINING FACILITY
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32 ENVIRONMENTAL TESTING LABORATORY FY 62
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40 ELEVATED WATER TANK FY 62
41 GAS STORAGE FY 62
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355 CHEMICAL STORAGE BUILDING FY 63
356 COMPONENTS TEST FACILITY FY 63
357 THERMOCHEMICAL TEST AREA GATE HOUSE FY 63
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417 GARAGE FY 62
419 SUPPORT OFFICE FY 62
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FISCAL YEAR 1965

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31 LUNAR MISSION & SPACE EXPLORATION FACILITY
32 MODIFICATIONS TO THE ENVIRONMENTAL TESTING LABORATORY
35 FLIGHT CREW OPERATIONS FACILITY
440 ELECTRONIC SYSTEMS COMPATABILITY FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 19 65 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Manned Spacecraft Center	Manned Space Flight	Clear Lake, Texas	Harris	Houston

INSTALLATION MISSION

The Manned Spacecraft Center has as its primary mission the development of spacecraft for manned space flight programs. The Center is also responsible for manned space flight operations and conduct of astronaut training.

PERSONNEL STRENGTH	FY 19 63	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	3,345	4,340	4,811
CONTRACTOR & OTHER PERSONNEL	802	1,132	1,562
TOTAL ALL PERSONNEL	4,147	5,472	6,373

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	1,600	
LAND *(Lease or Permit)*		
PLANT VALUE *(as of June 30, 19 63)*		53,334
TOTAL	1,600	53,334

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 19 65 *(Estimated)*	FUTURE YEARS *(Estimated*	TOTAL ALL YEARS *(Estimated)*
Modification to environmental testing laboratory	MSF	55.0	400.0	9,416.0	---	9,871.0
Electronic systems compatibility facility	MSF	70.0	30.0	4,110.0	---	4,210.0
Lunar mission & space exploration facility	MSF	50.0	70.0	2,647.0	---	2,767.0
Central data facility extension	MSF	---	70.0	2,658.0	---	2,728.0
Technical services facility	MSF	---	110.0	2,240.0	---	2,350.0
Flight crew operations facility	MSF	---	124.0	1,764.0	---	1,888.0
Cafeteria	MSF	34.2	14.0	706.0	---	754.2
Central heating & cooling plant & warehouse ext.	MSF	---	110.0	1,625.0	---	1,735.0
TOTAL FOR PROJECTS IN FY 19 65 ESTIMATE				25,166.0		

NASA FORM 1029 DEC 63

GPO 868-667

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

CAFETERIA

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$34,200
FY 1964 Estimates	14,000
FY 1965 Estimates	706,000
Total Funding Through FY 1965	$754,200

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$425,200
Building	Sq. Ft.	15,400	$25.05	385,700
Site preparation	LS	---	39,500	39,500
Equipment				$280,800
Cafeteria equipment and furnishings	LS	---	280,800	280,800
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$706,000

PROJECT DESCRIPTION:

This project provides for construction of a 500-seat cafeteria, which will operate as an auxiliary to the cafeteria, presently under construction, authorized in the fiscal year 1962 program. The proposed facility will be a single-story building of standard steel frame construction with a gross area of approximately 15,400 square feet. The dining area is approximately 8,400 square feet with dimensions of 131 feet by 64 feet and the food-handling area and serving area is approximately 7,000 square feet with dimensions of 100 feet by 70 feet. Heating and air-conditioning requirements will be supplied by the Central Heating and Cooling Plant.

PROJECT JUSTIFICATION:

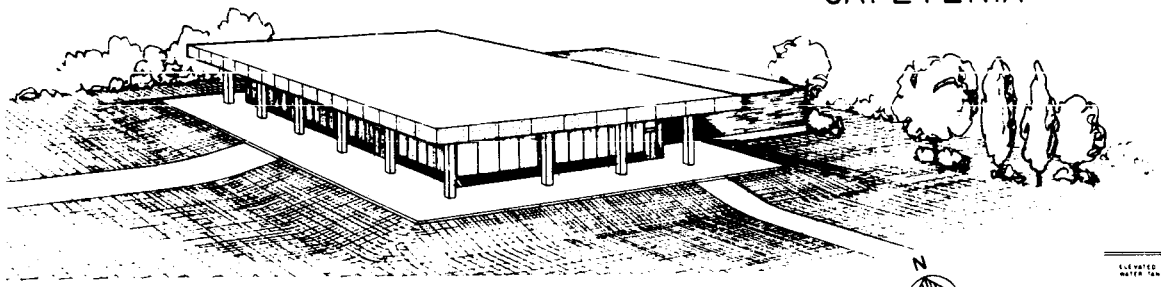
The cafeteria is necessary to provide food-serving facilities for personnel working in the Base Support Area, Thermochemical Test Facility Area, Technical Services Shop, Space Environment Simulation Laboratory, Integrated Mission Control Center and the Project Engineering Facility, where the projected population density will exceed 2,400 personnel. The total NASA and contractor personnel to be located at Clear Lake will be approximately 7,200 by the end of fiscal year 1966. The fiscal year 1962 cafeteria is planned to accommodate approximately 2,500 people in a 2 1/2-hour time period. The facility to be provided by this project will accommodate an additional 2,500 persons for a total food-serving capability for 5,000 people in a 2 1/2-hour period. Off-site eating facilities are not available to accommodate personnel on a 1/2 hour lunch period.

ESTIMATED FUTURE YEAR FUNDING: None

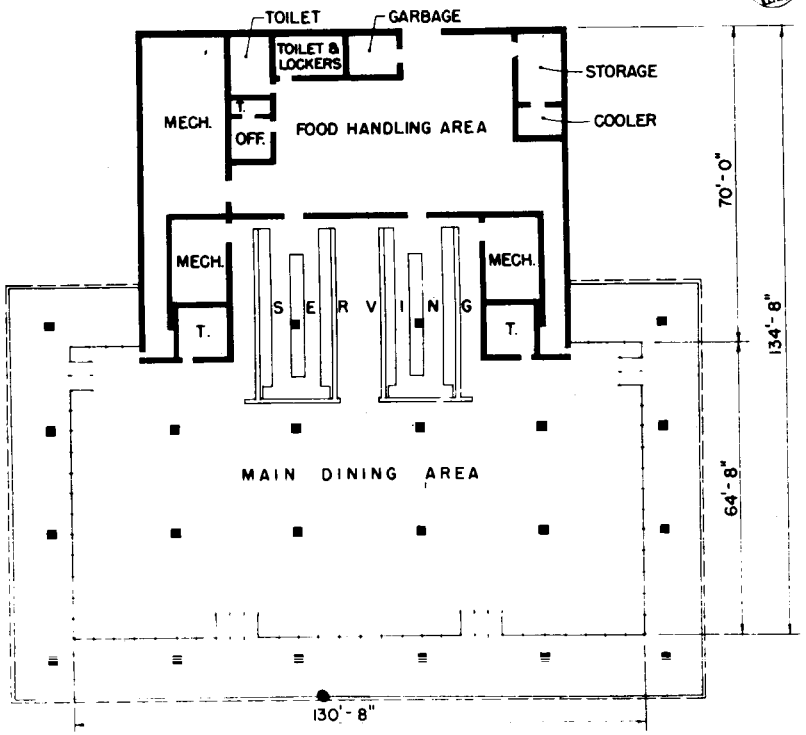
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

CAFETERIA

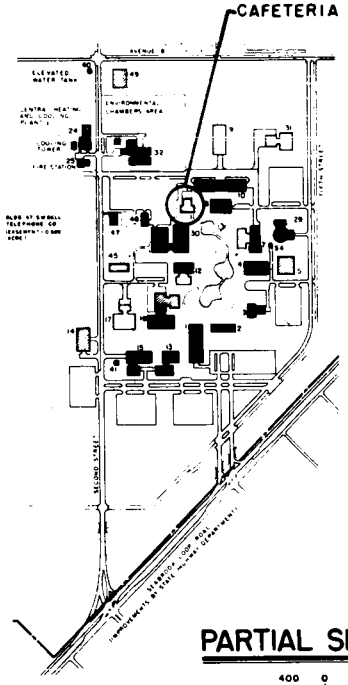


PERSPECTIVE



PLAN

10 0 20 40
SCALE IN FEET



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LEGEND

BUILDINGS EXISTING OR UNDER CONTRACT
BUILDINGS FISCAL YEAR 1964
ROADS AND PARKING LOTS EXISTING OR UNDER CONTRACT
BUILDINGS FISCAL YEAR 1965

PARTIAL SITE PLAN

400 0 400 800
SCALE IN FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

CENTRAL DATA FACILITY EXTENSION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$1,498,100
FY 1964 Estimate	70,000
FY 1965 Estimate	2,658,000
Total Funding Through FY 1965	$4,226,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,015,400
Building	Sq. Ft.	31,908	$31.20	995,600
Site preparation	LS	---	19,800	19,800
Equipment				$1,642,600
Data reduction equipment	LS	---	1,460,600	1,460,600
Support equipment	LS	---	182,000	182,000
Design	---	---	---	---

718-214 O - 64 - 23

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
			TOTAL	$2,658,000

PROJECT DESCRIPTION:

This project provides for data reduction and analysis operations to support the Gemini and Apollo projects during development tests and following flight missions. This facility will consist of a two-story steel frame, precast concrete integrated office, laboratory, and shop area addition to the existing Central Data Office, Building No. 12. The total area of the addition will be approximately 31,908 square feet; the first floor dimensions will be approximately 74 by 130 feet, and the second floor dimensions will be approximately 84 by 140 feet. A two-story interconnecting corridor, with approximate first story dimensions of 52 feet by 112 feet and approximate second story dimensions of 42 feet by 112 feet will be provided. The building heating and air-conditioning will be supplied by the Central Heating and Cooling Plant.

PROJECT JUSTIFICATION:

A number of new activities in the computation field had to be initiated at the Manned Spacecraft Center to support the flight test phases of the Gemini and Apollo programs. These are: (a) Data reduction, (b) Management computer applications, (c) Engineering documentation and retrieval.

These tasks have approximately doubled the workload of the central data facility included in the fiscal year 1962 Construction of Facilities program. As a rough basis for comparison, it may be noted that the Mercury flights generated approximately 5,000 reels of magnetic tape, whereas it has been determined that 54,000 reels of magnetic tape will be produced by 1968 from the Gemini and Apollo flights. Also the Center's accounting, disbursing, PERT, and administrative data processing tools have increased over twenty percent within the past year and are expected to double with the build-up of the Apollo program. The Apollo and Gemini design effort requires extensive engineering documentation and quick retrieval capability for data concerning parts generation, configuration control, failure reports, and related subjects.

The present computing capacity is inadequate in size and speed to meet the requirements of the Gemini and Apollo programs and related Center support. The existing structure only provides approximately 50% of the equipment area and 55% of the administrative area required to support the total workload. It is essential that adequate facilities be available to provide data reduc-

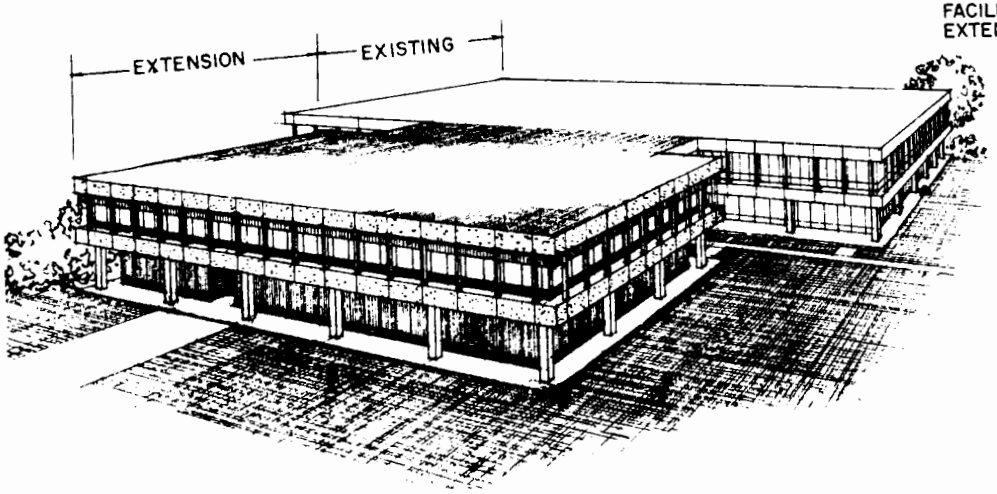
tion services promptly to both technical personnel at the Manned Spacecraft Center and to spacecraft and support systems contractors for timely evaluation of test and flight mission results affecting spacecraft and support systems design and mission planning.

ESTIMATED FUTURE YEAR FUNDING: None

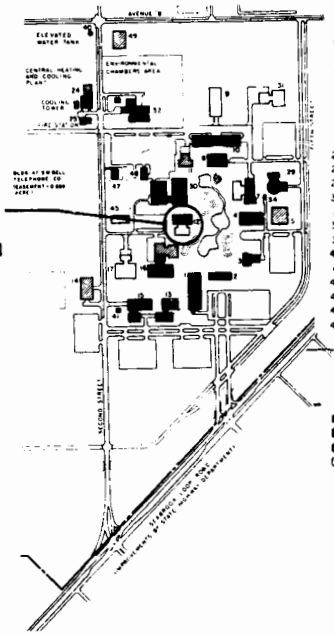
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

CENTRAL DATA FACILITY EXTENSION



PERSPECTIVE



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LEGEND

BUILDINGS EXISTING OR UNDER CONTRACT
BUILDINGS FISCAL YEAR 1964
ROADS AND PARKING LOTS EXISTING OR UNDER CONTRACT
BUILDINGS FISCAL YEAR 1965

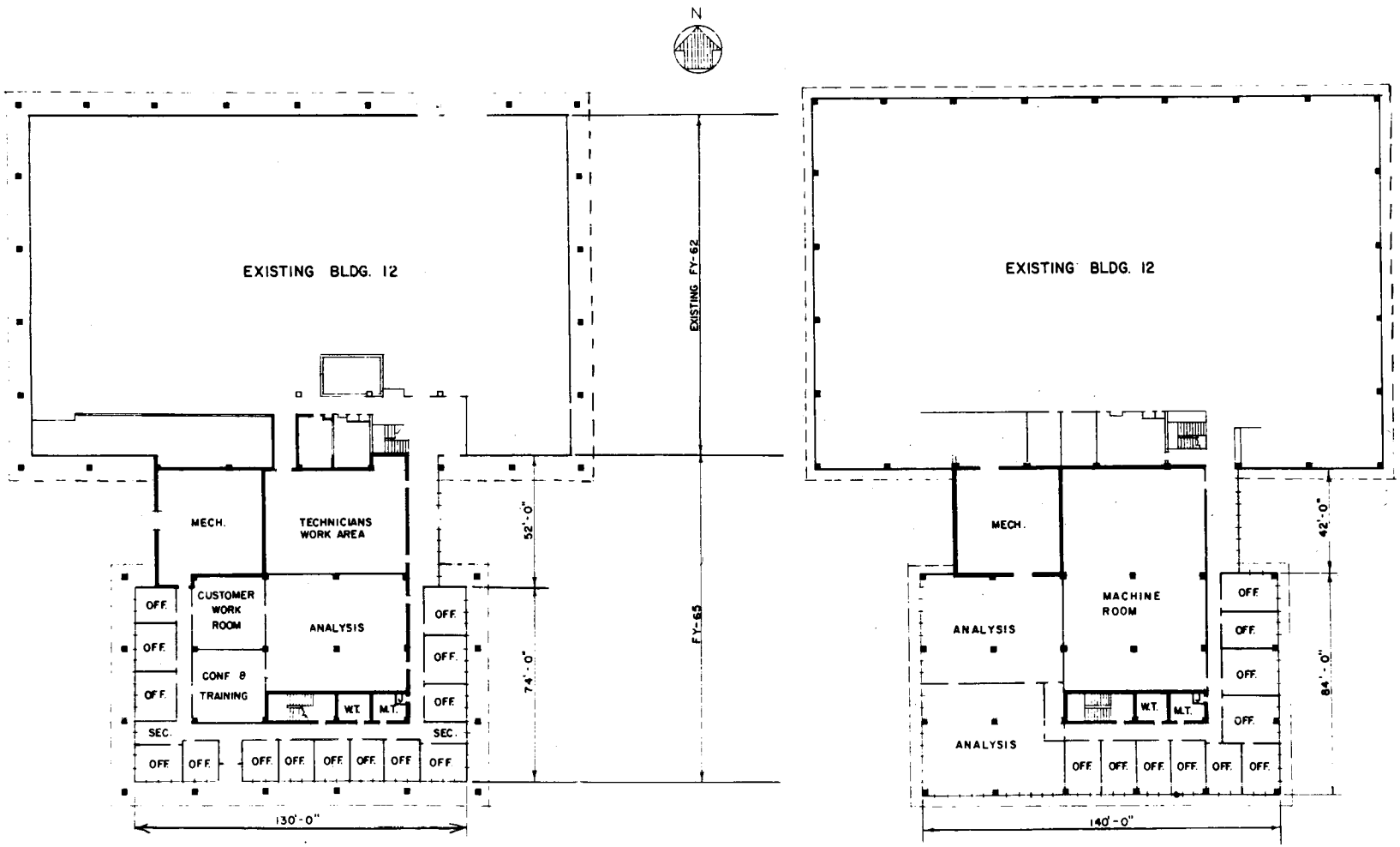
PARTIAL SITE PLAN

400 0 400 800
SCALE IN FEET

MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

CENTRAL DATA FACILITY EXTENSION



FIRST FLOOR PLAN

SECOND FLOOR PLAN

PLANS

15 0 30 60
SCALE IN FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

CENTRAL HEATING AND COOLING PLANT AND WAREHOUSE EXTENSION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$3,563,200
FY 1964 Estimate	2,345,500
FY 1965 Estimate	1,625,000
Total Funding Through FY 1965	$7,533,700

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$566,000
Central heating and cooling plant extension	Sq. Ft.	4,100	$20.34	83,400
Warehouse extension	Sq. Ft.	28,728	13.62	392,000
Utilities	LS	---	32,800	32,800
Site preparation	LS	---	57,800	57,800
Equipment				$1,059,000
Boiler and accessories	LS	---	222,000	222,000
Chilled water equipment	LS	---	340,000	340,000
Support systems	LS	---	497,000	497,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$1,625,000

PROJECT DESCRIPTION:

This project will provide the required supporting facilities for the planned Fiscal Year 1965 Construction of Facilities Program at the Clear Lake site.

Central heating and cooling plant extension - This addition encompasses the expansion of the central heating and cooling plant structure and the incorporation of one 60,000 pound per hour steam boiler and one 2,000 ton centrifugal refrigeration unit including all related accessory equipment such as cooling towers, operating and safety controls and piping. Also, the existing central mechanical control system will be expanded. The expansion will provide an additional gross area of approximately 4,100 square feet.

Warehouse facility extension - This facility will provide additional bulk warehousing space required for the central warehousing operations. The addition is to be a single story, high-bay storage area extension to building 420 which is the warehouse building included in the fiscal year 1962 program. The addition will be approximately 28,728 square feet and will match the standard steel frame construction of the existing building.

PROJECT JUSTIFICATION:

Central heating and cooling plant - Evaluation of the central heating and cooling plant indicates that an insufficient capacity exists to provide steam and chilled water to the planned fiscal year 1965 facilities. (The facilities authorized by fiscal year 1962, 1963 and 1964 funds included the installation of four 60,000 pound per hour steam boilers and six 2,000 ton centrifugal refrigeration compressors and chillers.) One additional 60,000 pound per hour steam boiler and one additional 2,000 ton centrifugal refrigeration unit will be required.

Warehouse facility - Warehouse Building 420 included in the fiscal year 1962 Program provided 23,370 square feet of storage space. The fiscal year 1965 addition will furnish 28,728 square feet of storage space for fast-moving electronic, instrumentation, and other types of spare

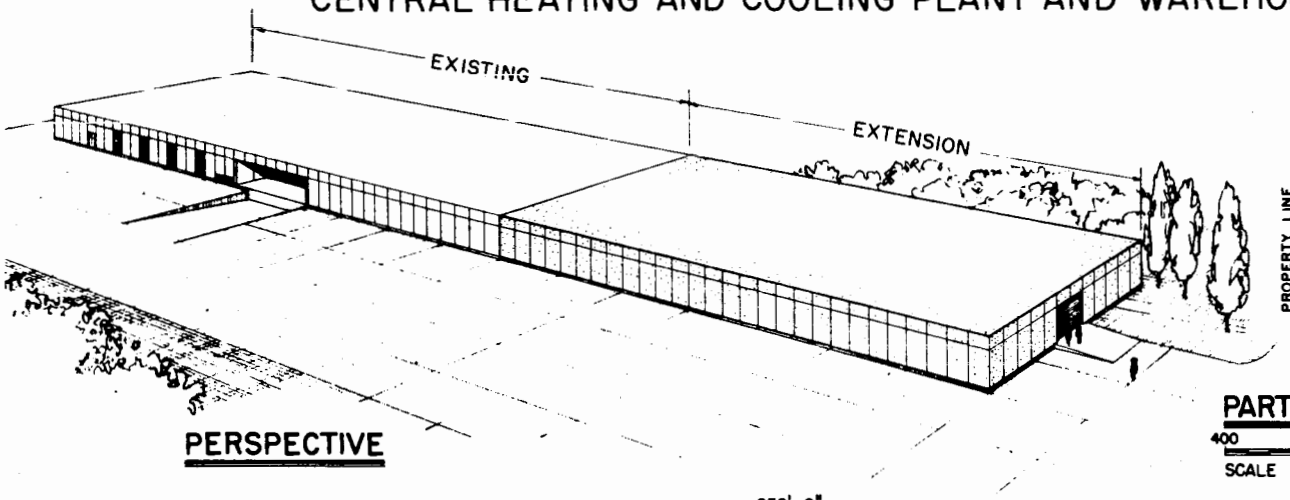
parts required by divisions engaged in development and evaluation programs supporting the Apollo mission.

ESTIMATED FUTURE YEAR FUNDING: None

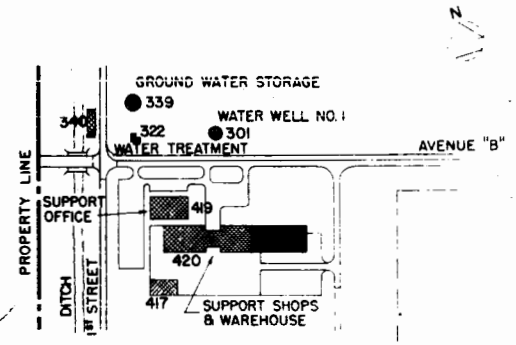
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

CENTRAL HEATING AND COOLING PLANT AND WAREHOUSE EXTENSIONS



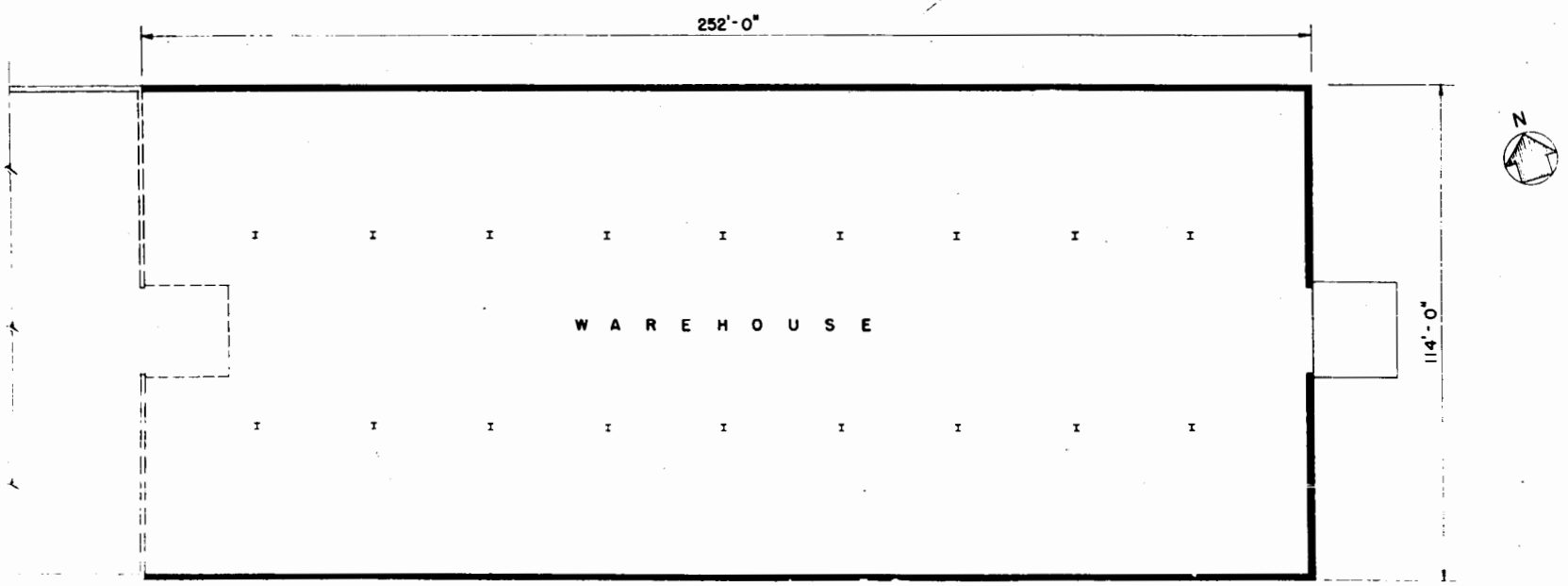
PERSPECTIVE



PARTIAL PLOT PLAN

400 0 400 800
SCALE IN FEET

LEGEND
- 1962 PROGRAM
- 1965 PROGRAM



WAREHOUSE EXTENSION PLAN

10 0 20 40
SCALE IN FEET

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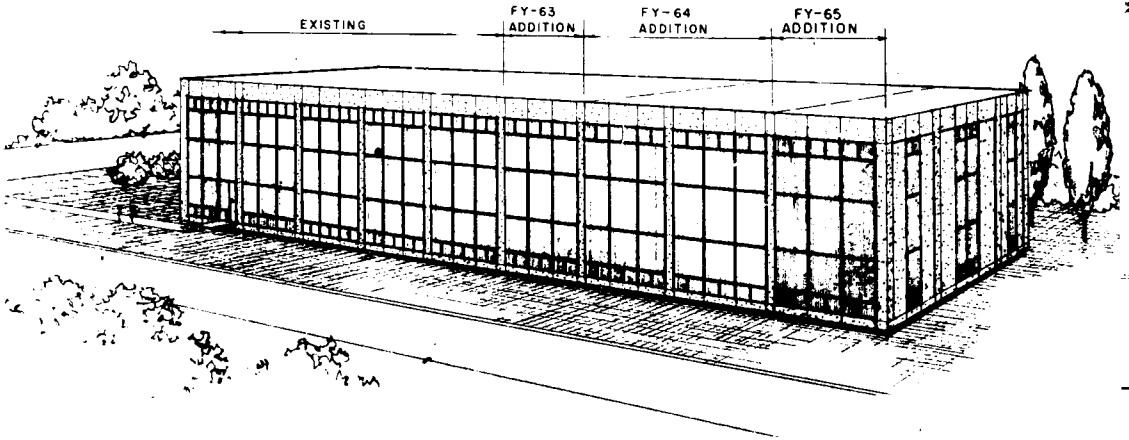
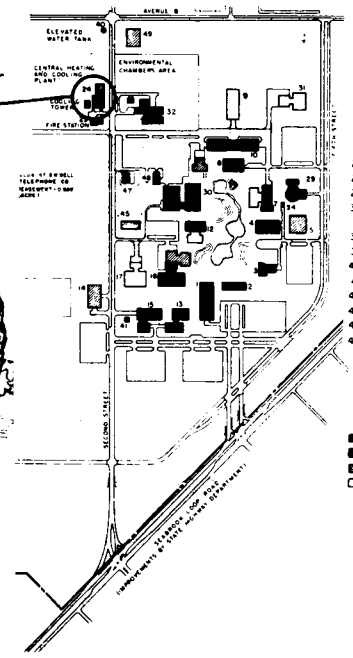
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

CENTRAL HEATING AND COOLING PLANT AND WAREHOUSE EXTENSIONS



PERSPECTIVE



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LEGEND

BUILDINGS EXISTING OR UNDER CONTRACT
BUILDINGS FISCAL YEAR 1964
ROADS AND PARKING LOTS EXISTING OR UNDER CONTRACT
BUILDINGS FISCAL YEAR 1965

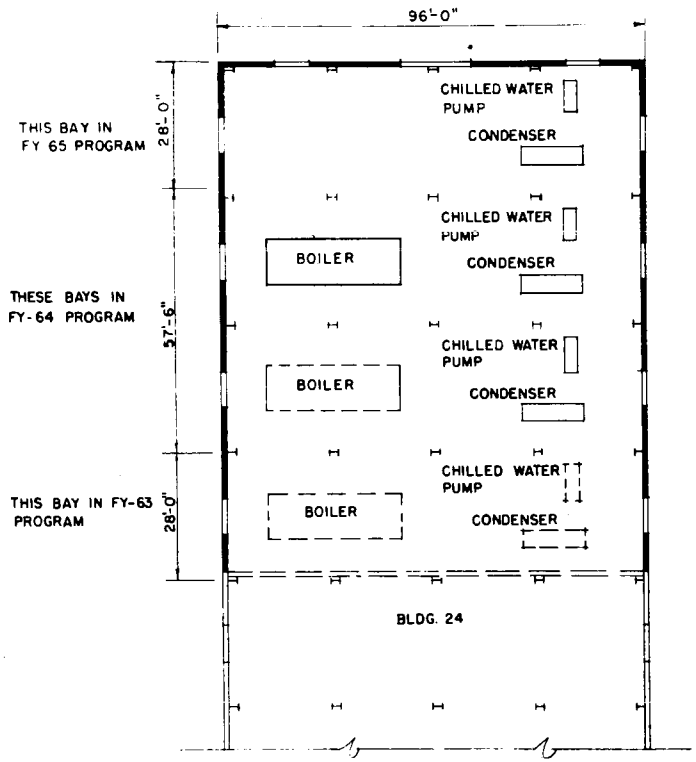
PARTIAL SITE PLAN

400 0 400 800
SCALE IN FEET

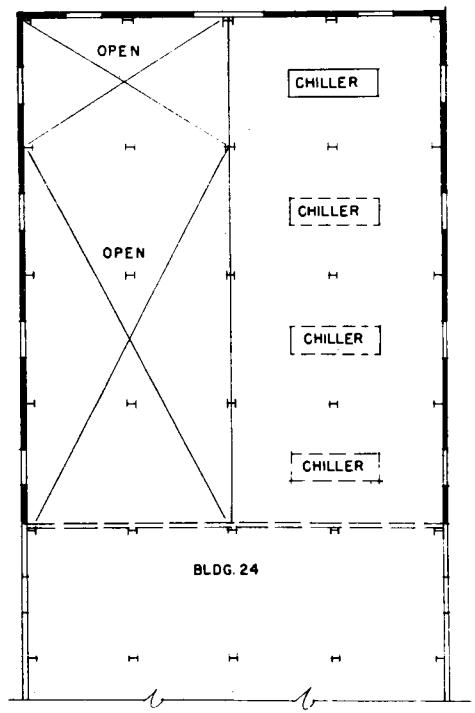
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

CENTRAL HEATING AND COOLING PLANT AND WAREHOUSE EXTENSION



FIRST FLOOR PLAN



SECOND FLOOR PLAN

EXTENSION TO CENTRAL HEATING AND COOLING PLANT – PLANS

10 0 20 40
SCALE IN FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FLIGHT CREW OPERATIONS FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$124,000
FY 1965 Estimate	1,764,000
Total Funding Through FY 1965	$1,888,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,764,000
Building	Sq. Ft.	53,253	$28.49	1,517,800
Utilities	LS	---	227,600	227,600
Site preparation	LS	---	18,600	18,600
Equipment		---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$1,764,000

PROJECT DESCRIPTION:

The facility will be a two-story steel frame and precast concrete office-laboratory structure with an area of about 53,253 square feet. The first floor dimensions will be about 133 by 189 feet and the second floor dimensions will be about 142 by 198 feet. The heating and air-conditioning requirements will be supplied by the Central Heating and Cooling Plant. Included in this facility are laboratory areas for systems trainers, visual displays, air pad test stand, optical evaluation, flight evaluation, guidance and navigation demonstration.

PROJECT JUSTIFICATION:

In support of the Gemini and Apollo projects, this facility will be utilized for the performance of the following activities:

a. Direct the program of instruction for flight crews, including intensive courses in space flight technology and scientific disciplines and periodic seminars conducted by outstanding scientists and engineers covering a broad spectrum of space-related subjects.

b. Direct the supervision of flight crew preparations for individual flight missions and recommend individual flight crew personnel for participation.

c. Direct flight planning and mission simulation associated with specific missions, and support checkout activities.

d. Evaluate, operate, modify, and maintain flight crew training equipment and facilities.

e. Furnish instruction on flight crew training equipment, and evaluate the results of simulation exercises involving such equipment. This includes operations briefings and detailed systems familiarization briefings for flight crews.

f. Analyze mission plans and systems operations from the standpoint of flight crew participation and recommend necessary modifications to provide optimum crew/spacecraft integration and safety.

g. Develop in-flight maintenance procedures and training techniques.

h. Conduct operational evaluation of guidance and control modes for Gemini and Apollo. Each mission phase is examined to insure that for every automatic spacecraft mode there is a manual backup control procedure that can be selected at the option of the crew. Mission profiles and trajectories are

evaluated and established so that automatic and manual control modes are operationally compatible.

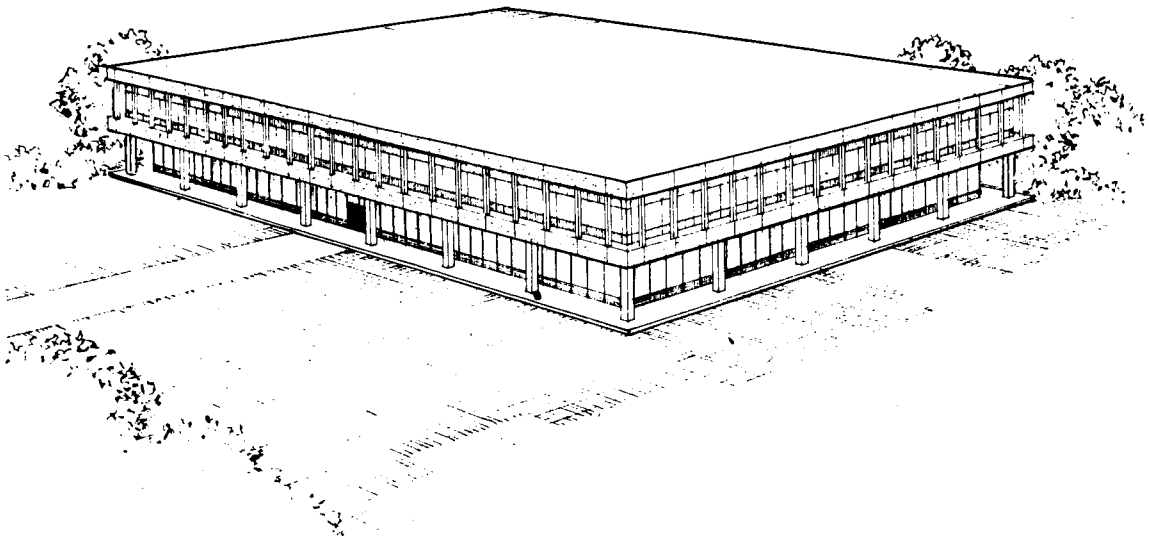
i. Establish requirements and criteria for the selection and training of future flight crews, and assist in screening and recommending candidates for selection as flight crew members on a schedule compatible with future requirements.

ESTIMATED FUTURE YEAR FUNDING: None

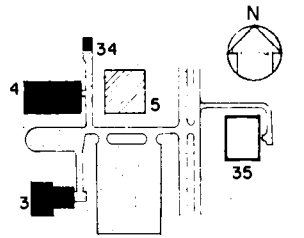
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

FLIGHT CREW OPERATIONS FACILITY



PERSPECTIVE



PARTIAL SITE PLAN

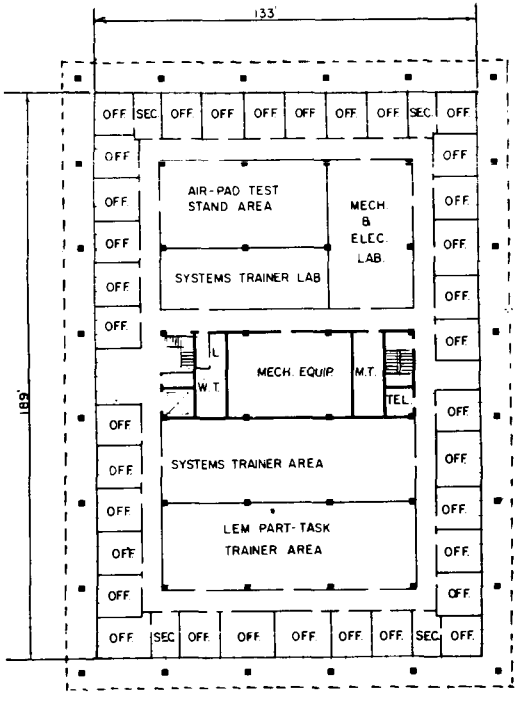
400 0 400 800

SCALE IN FEET

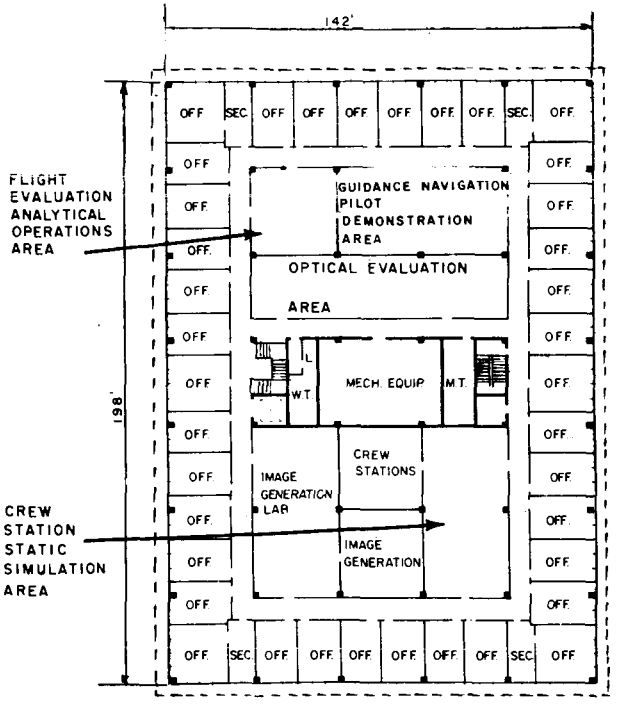
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

FLIGHT CREW OPERATIONS FACILITY



FIRST FLOOR PLAN



SECOND FLOOR PLAN

PLANS

15' 0 30' 60'

SCALE IN FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ELECTRONIC SYSTEMS COMPATIBILITY FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$70,000
FY 1964 Estimate	30,000
FY 1965 Estimate	4,110,000
Total Funding Through FY 1965	$4,210,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,694,800
Building	Sq. Ft.	56,545	$27.58	1,559,300
Site preparation	LS	---	135,500	135,500
Equipment				$2,415,200
Transmitting and receiving equipment	LS	---	1,300,200	1,300,200
Data processing and display equipment	LS	---	795,000	795,000
Support equipment	LS	---	320,000	320,000

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	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
			TOTAL	$4,110,000

PROJECT DESCRIPTION:

This project provides a facility for the integrated testing and evaluation of spacecraft and earth-based communication and data acquisition equipment similar to that to be used during lunar operations with the Apollo Command and Lunar Excursion Modules. The building will be a steel frame, precast concrete, integrated office-laboratory and high bay structure with a total area of approximately 56,545 square feet. The office-laboratory wing will have first floor dimensions of approximately 74 by 270 feet and second floor dimensions of approximately 86 by 275 feet. The high bay area will have dimensions of approximately 105 by 123 feet. It will be air-conditioned by a self-contained central unit. The major test areas of this facility will comprise an area for spacecraft systems testing and modification, a Data Recording and Display Console Room for central test control, and a Ground Test Equipment Room which will house the necessary electronic equipment for test support.

PROJECT JUSTIFICATION:

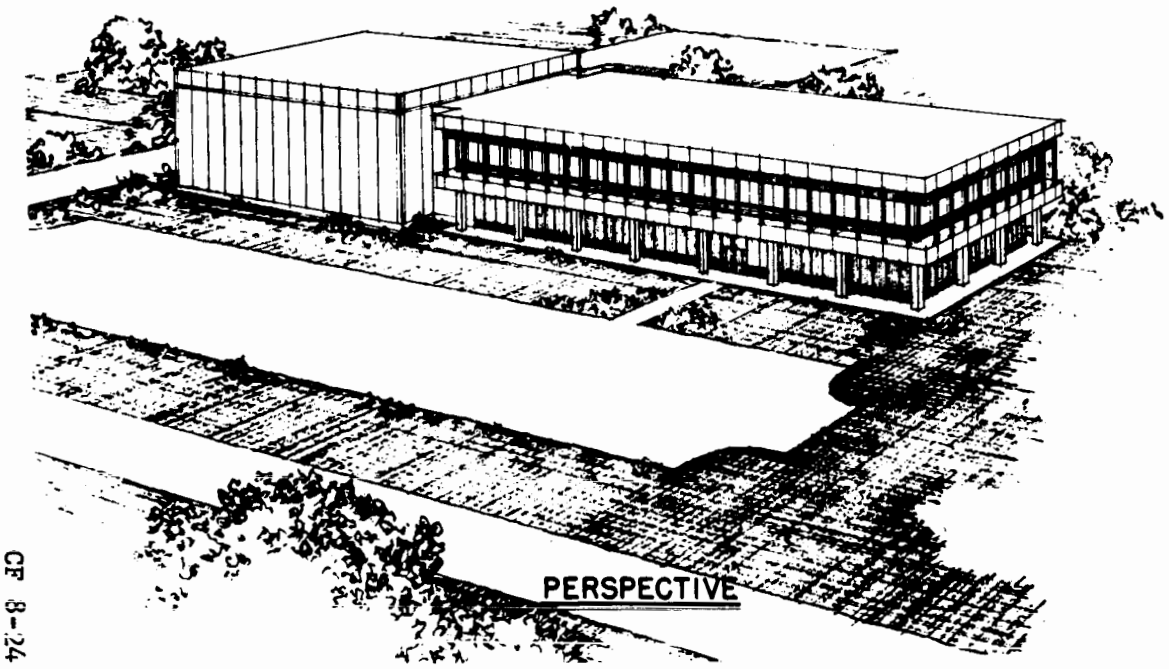
The inherent complexity of the communications and electronic systems to be used in the Gemini and Apollo programs requires that thorough tests be made with spacecraft and ground equipment operating as a complete system. This involves extensive work in a laboratory-type environment which must be undertaken concurrently with the early flight tests that are part of the flight program buildup leading to lunar exploration. Complete system testing is the only practical way to identify and solve many problems which occur in a complex system where various portions of the spacecraft and ground equipment are being supplied by a large number of vendors and manufacturers. It is essential that this work be undertaken and confidence developed in these systems prior to undertaking manned lunar missions. This facility must be operational by the beginning of calendar year 1966 in order to permit adequate testing of the Apollo Command Module, Service Module, and Lunar Excursion Module systems to be used in Apollo/Saturn IB and V flights.

ESTIMATED FUTURE YEAR FUNDING: None

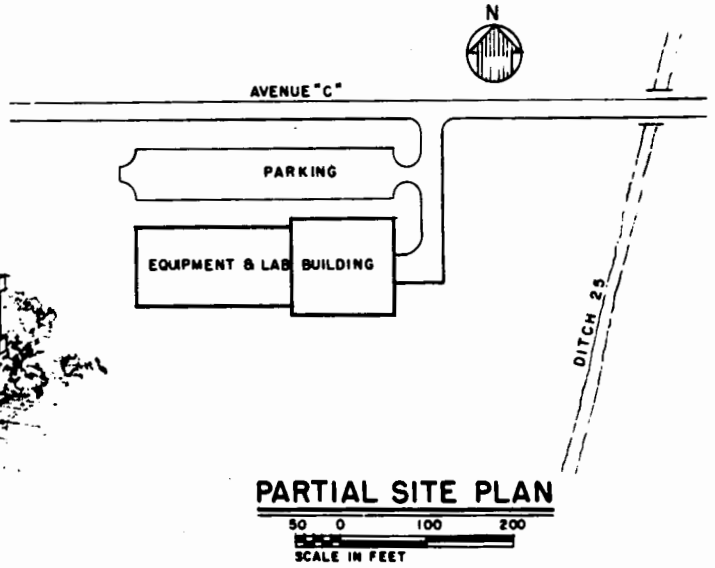
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

ELECTRONIC SYSTEMS COMPATIBILITY FACILITY



PERSPECTIVE

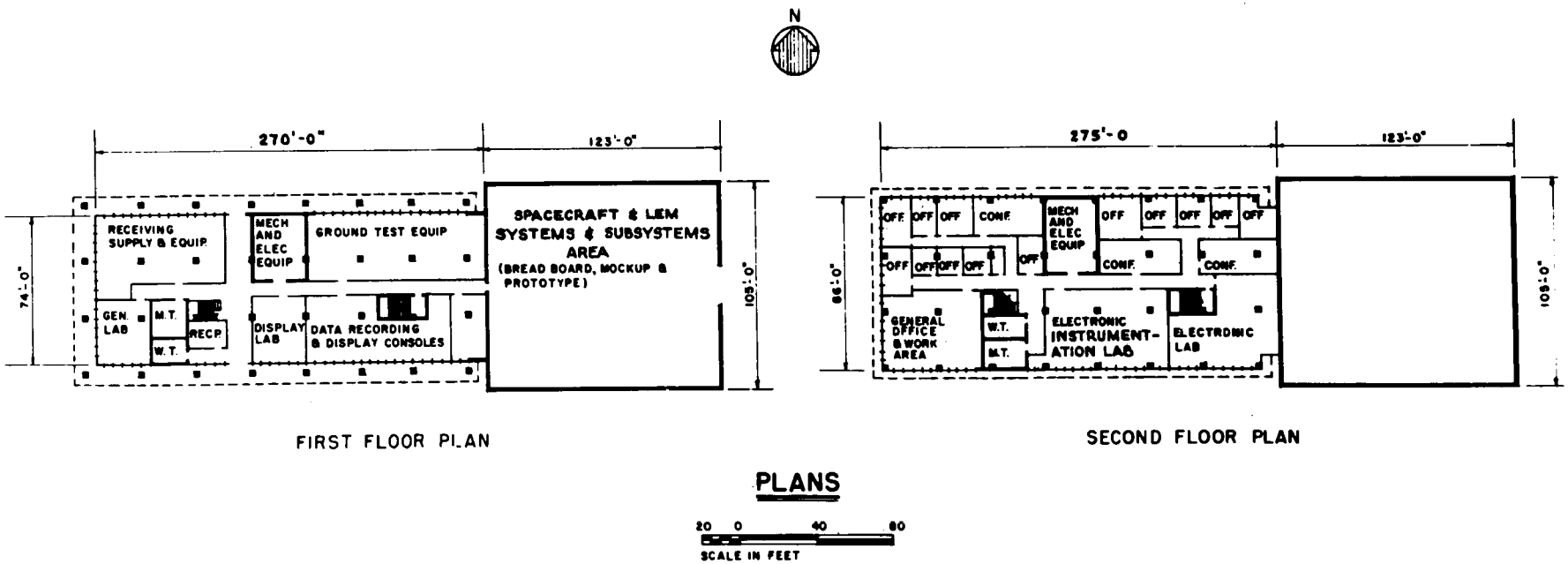


PARTIAL SITE PLAN

MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

ELECTRONIC SYSTEMS COMPATIBILITY FACILITY



FIRST FLOOR PLAN

SECOND FLOOR PLAN

PLANS

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

LUNAR MISSION AND SPACE EXPLORATION FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$50,000
FY 1964 Estimate	70,000
FY 1965 Estimate	2,647,000
Total Funding Through FY 1965	$2,767,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,749,300
Building	Sq. Ft.	50,971	$30.16	1,537,100
Utilities	LS	---	185,500	185,500
Site preparation	LS	---	26,700	26,700
Equipment				$897,700
High velocity particle range equipment	LS	---	191,600	191,600
Cartographic and photo-interpretation equipment	LS	---	132,300	132,300
Radiation environment equipment	LS	---	113,600	113,600

	Unit of Measure	Quantity	Unit Cost	Total Cost
Test equipment	LS	---	---	407,400
Impingement and erosion dynamics laboratory	LS	---	52,800	52,800
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$2,647,000

PROJECT DESCRIPTION:

This facility will be a two story standard steel frame, precast concrete structure with an area of approximately 50,971 square feet. It will consist of an office and laboratory wing with first floor dimensions of approximately 107 by 163 feet and second floor dimensions of approximately 111 by 167 feet, a low-bay laboratory wing with dimensions of approximately 115 by 115 feet, and a single story interconnecting corridor. The building heating and air conditioning will be supplied by the central heating and cooling plant. The major laboratories which comprise this facility are: Geochemical Laboratory, Mission Experiments Laboratory, Radiation Environmental Laboratory, High Velocity Particle Range, Impingement and Erosion Dynamics Laboratory, Astronaut Scientific Training Area, Geoscience Laboratory, Cartographic and Photo-Interpretation Laboratory, Applied Physics Laboratory, and Physical Optics Laboratory.

PROJECT JUSTIFICATION:

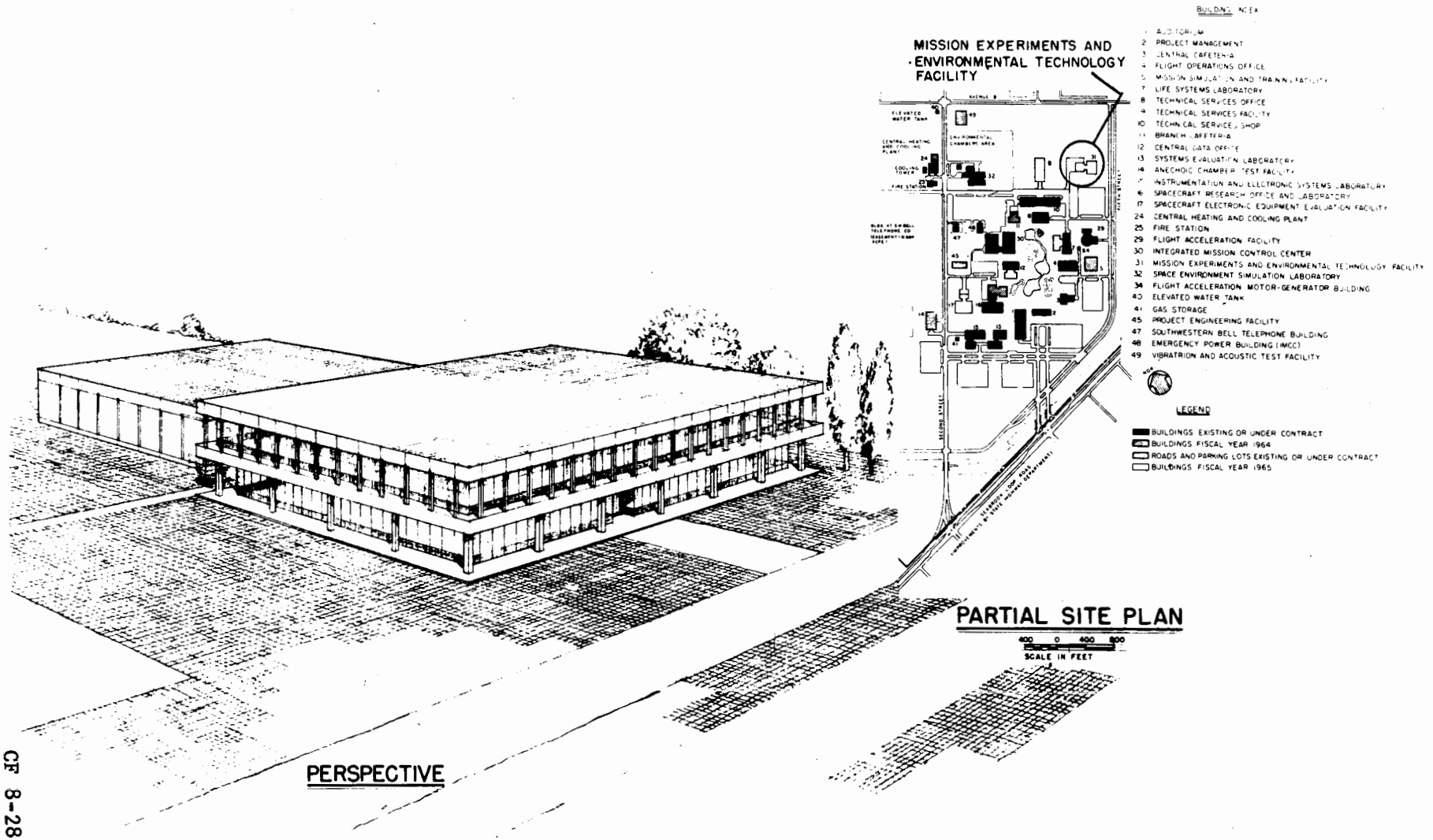
This facility is required to provide the laboratories necessary for the development of the engineering and scientific experiments to be conducted during Apollo missions; for the adaptation of the experiments to the Apollo spacecraft; and for the training of the astronauts in the conduct of the experiments. In addition, the space and lunar surface environment in which the Apollo spacecraft and astronauts will operate will be analyzed in support of both the design of the spacecraft and the conduct of the Apollo missions. The laboratory personnel will maintain close liaison with outside organizations and will conduct theoretical evaluations of their proposals followed by testing in the proposed laboratories. When such experiments are judged desirable and feasible for a particular mission they will then be fitted for installation in the spacecraft and modified as required. The capability to evaluate, adapt, and modify contractor experiments, instruments, and equipment for spacecraft has been found to be a necessity for meeting the imposed safety and reliability requirements.

ESTIMATED FUTURE YEAR FUNDING: None

MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

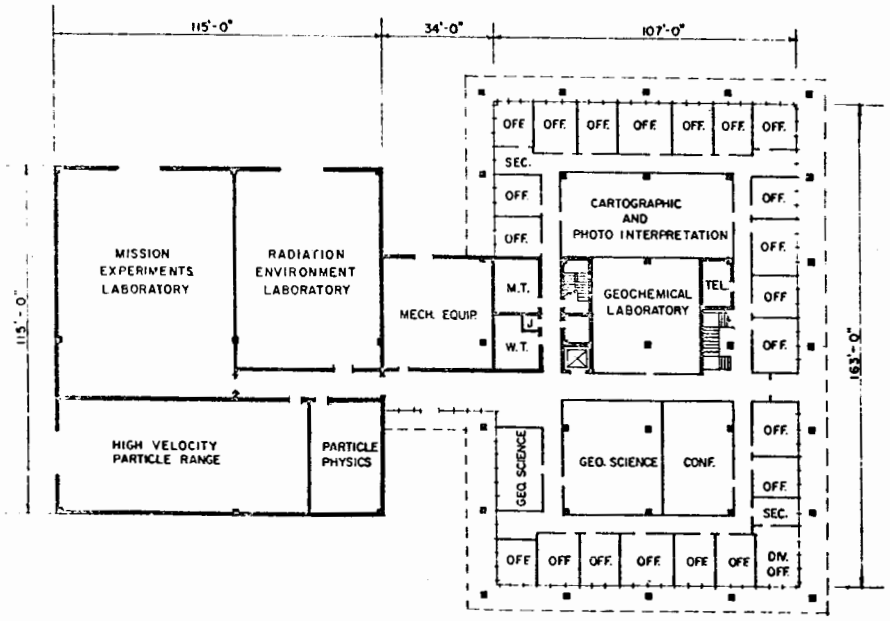
LUNAR MISSION AND SPACE EXPLORATION FACILITY



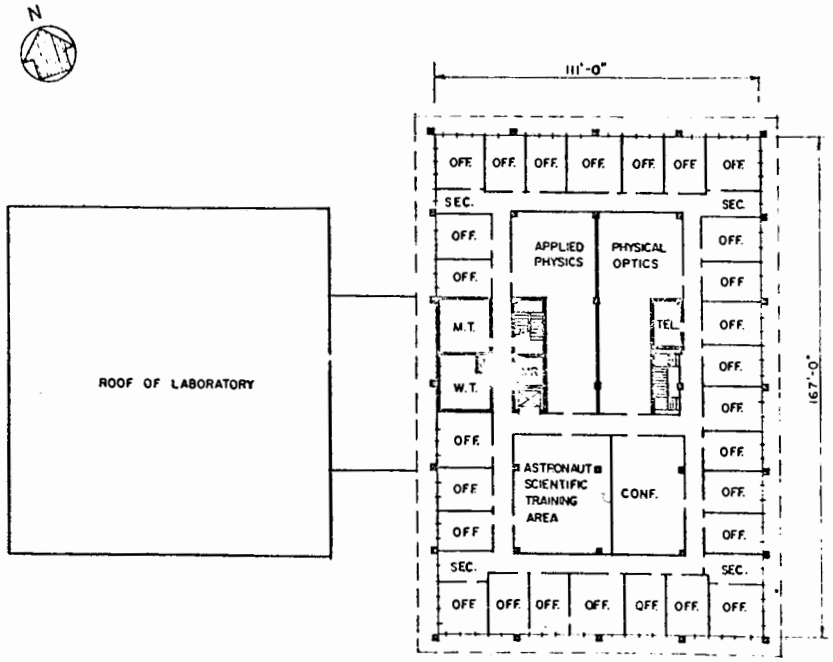
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

LUNAR MISSION AND SPACE EXPLORATION FACILITY



FIRST FLOOR PLAN



SECOND FLOOR PLAN

PLANS

15 0 30 60
SCALE IN FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

MODIFICATIONS TO THE ENVIRONMENTAL TESTING LABORATORY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	$29,882,000
FY 1964 Estimate	400,000
FY 1965 Estimate	9,416,000
Total Funding Through FY 1965	$39,698,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction	---	---	---	---
Equipment				$9,416,000
Solar simulation	LS	---	6,939,800	6,939,800
Albedo simulation	LS	---	1,018,200	1,018,200
Gimbal mounts	LS	---	1,458,000	1,458,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$9,416,000

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PROJECT DESCRIPTION:

This project will provide an expansion in solar simulation capability of the two chambers in the Environmental Testing Laboratory, Building 32. In Chamber "A", the diameter of the are to be irradiated from the top will be increased to 20 feet from the present 13 feet and the side irradiation will be increased from 13 by 32 feet to 20 by 48 feet. Also, an energy source for earth and for lunar albedo simulation and a gimbal mount to permit pitching and yawing of spacecraft modules within Chamber "A" will be installed. In Chamber "B", the diameter of the area to be irradiated from the top will be increased to 20 feet from the present 5.6 feet.

PROJECT JUSTIFICATION:

The proposed modifications to the present laboratory are required to permit testing under environmental conditions not currently attainable.

Increased direct solar simulation capability - The present top "sun" in Chamber "A" will irradiate the Apollo command module and/or service module in a fixed vertical attitude. For more accurate simulation, the test configuration will be pitched or yawed to change the angel of solar radiation. To irradiate the spacecraft after this pitch or yaw movement, the top "sun" must be expanded to twenty feet in diameter.

The extent of the present side "sun" in Chamber "A" is not sufficient to irradiate the entire spacecraft (command and service modules and lunar excursion module) and therefore must be expanded to a width of 20 feet and a height of 48 feet. The present top "sun" in Chamber "B" will irradiate only an astronaut and/or small items of equipment on the chamber floor. To permit heat transfer tests to be made on an Apollo spacecraft module and astronaut working beside the module, the top "sun" of Chamber "B" must be expanded to twenty feet in diameter.

Albedo simulation - During Apollo lunar missions the Apollo spacecraft will, at times, be in a field of direct solar radiation and reflected solar radiation (albedo) from the surface of the earth or the surface of the moon. Tests to be made on the Apollo spacecraft in the Environmental Testing Laboratory must include tests in this environmental condition. The albedo simulator will produce thermal energy largely in the infra-red portion of the spectrum to simulate the effects experienced from this radiant energy.

Space chamber gimbal mounts - Tests in the space chamber, at various attitudes with respect to the simulated sun, will establish those flight positions, relative to the sun, that permit optimum operation of the spacecraft environmental control system. To provide this capability, a large gimbal ring will be used in conjunction with the "lunar plane" in Chamber "A" to produce a two degree of freedom support system. In addition, the space-

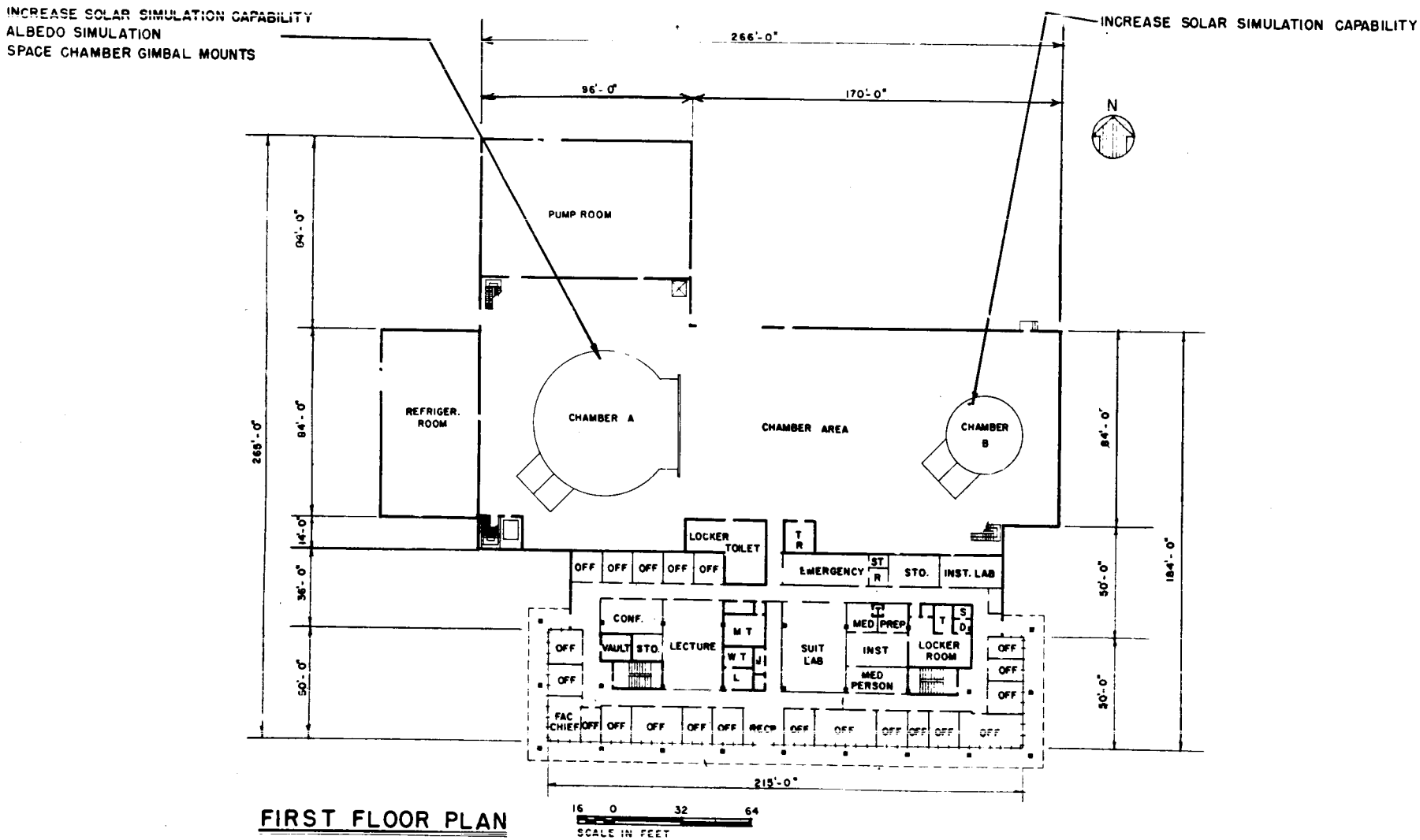
craft can move about its roll axis, permitting full three-degree-of-freedom orientation.

ESTIMATED FUTURE YEAR FUNDING: None

MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

MODIFICATIONS TO THE ENVIRONMENTAL TESTING LABORATORY



FIRST FLOOR PLAN

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

TECHNICAL SERVICES FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Manned Spacecraft Center

LOCATION OF PROJECT: Clear Lake, Harris County, Texas

COGNIZANT NASA INSTALLATION: Manned Spacecraft Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$110,000
FY 1965 Estimate	2,240,000
Total Funding Through FY 1965	$2,350,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,600,400
Building	Sq. Ft.	57,970	$25.40	1,472,300
Utilities	LS	---	114,100	114,100
Site	LS	---	14,000	14,000
Equipment				$539,000
Model and plastic shop equipment	LS	---	117,600	117,600
Chemical milling and plating equipment	LS	---	139,200	139,200
Electronic calibration and construction equipment	LS	---	110,600	110,600

	Unit of Measure	Quantity	Unit Cost	Total Cost
Optics shop and field test equipment	---	---	$121,600	$121,600
Maintenance shop equipment	---	---	50,000	50,000
Design	---	---	---	---
		Subtotal		$2,139,400
Fallout Shelter				$100,600
		TOTAL		$2,240,000

PROJECT DESCRIPTION:

The purpose of this project is to provide shop facilities to support the Apollo test and evaluation program of the Manned Spacecraft Center. The building will be a high-bay steel frame, precast concrete structure with an area of approximately 57,970 square feet. The dimensions of the first floor will be about 308 feet long and 140 feet wide and the dimensions of the mezzanine will be 308 feet long and 48 feet wide. The heating and air-conditioning will be supplied by the central heating and cooling plant.

PROJECT JUSTIFICATION:

A diversified, well equipped technical shop complex is essential to the conduct of the Manned Spacecraft Center test and evaluation program. The major shops of this proposed facility and their functions are:

Model and plastic shop - Will provide the capability to construct small scale replicas of the Apollo spacecraft required for specific tests and full size mockups of module systems or components needed for the evaluation of the Apollo spacecraft design.

Field test shop - Will provide machine shop space required for the fabrication of equipment such as test rigs and handling equipment necessary for air drops, retrieval of spacecraft after water landings and other special development testing activities.

Pyrotechnics support shop - Will provide a work area for the fabrication of the mechanical, electrical and electronic devices which are required to activate spacecraft pyrotechnic components such as explosive bolts and solid fuel rocket motors.

In addition, a Plating Shop, Optical Shop and an Engineering Division Office will be provided.

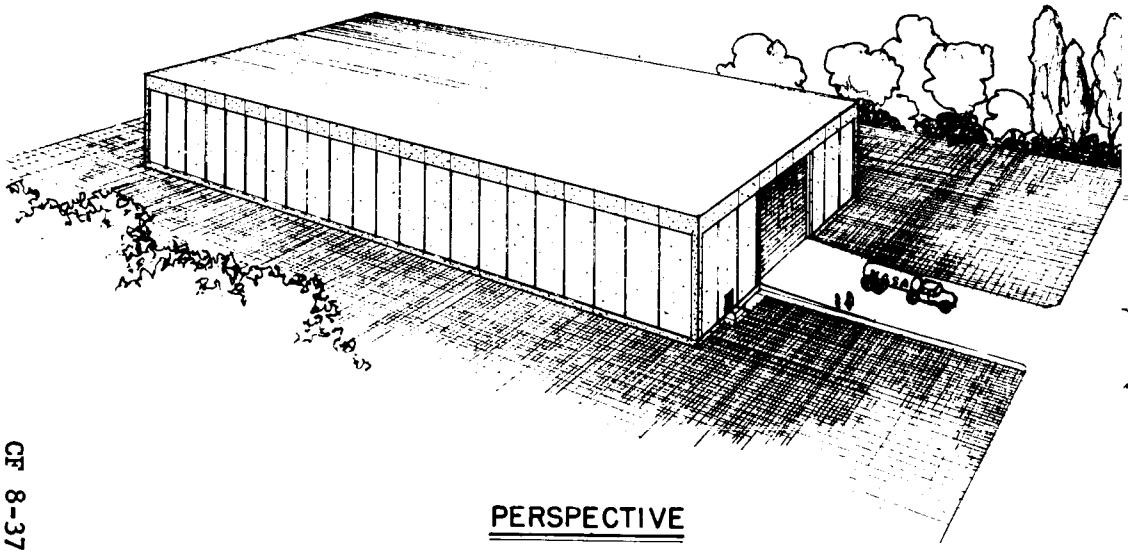
The Manned Spacecraft Center test and evaluation program, essential to assure reliable hardware, requires fabrication of a wide variety of advanced flight and ground support hardware models and mockups. A capability to provide quick reaction time in making and incorporating changes between tests is essential to meeting schedules.

ESTIMATED FUTURE YEAR FUNDING: None

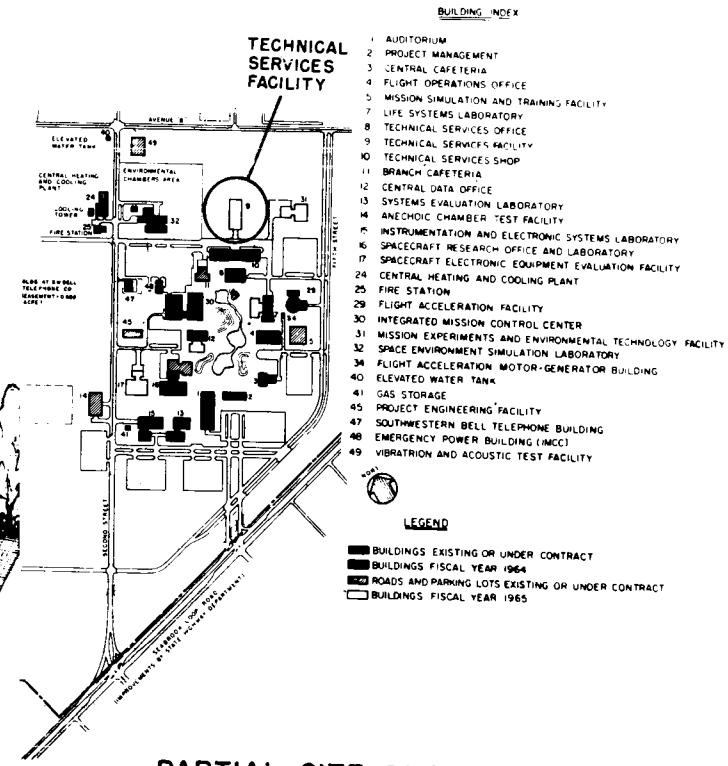
MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

TECHNICAL SERVICES FACILITY



PERSPECTIVE



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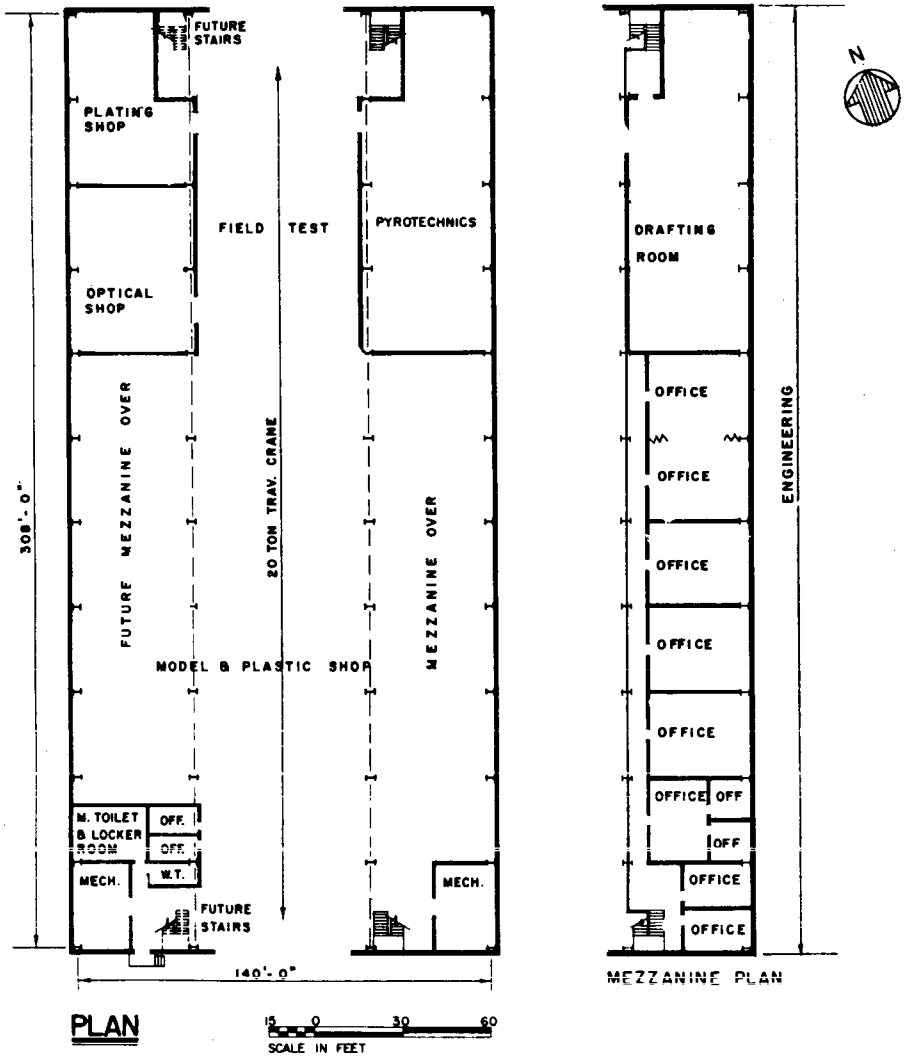
PARTIAL SITE PLAN

400 0 400 800
SCALE IN FEET

MANNED SPACECRAFT CENTER

FISCAL YEAR 1965 ESTIMATES

TECHNICAL SERVICES FACILITY



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

MARSHALL SPACE FLIGHT CENTER

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Summary..... CF 9-2

Office of Manned Space Flight Projects:

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Extension of components test facility instrumentation..... CF 9-15

Extension to the propulsion and vehicle engineering laboratory... CF 9-18

Extension of utility system ..... CF 9-22

Saturn support test area..... CF 9-27

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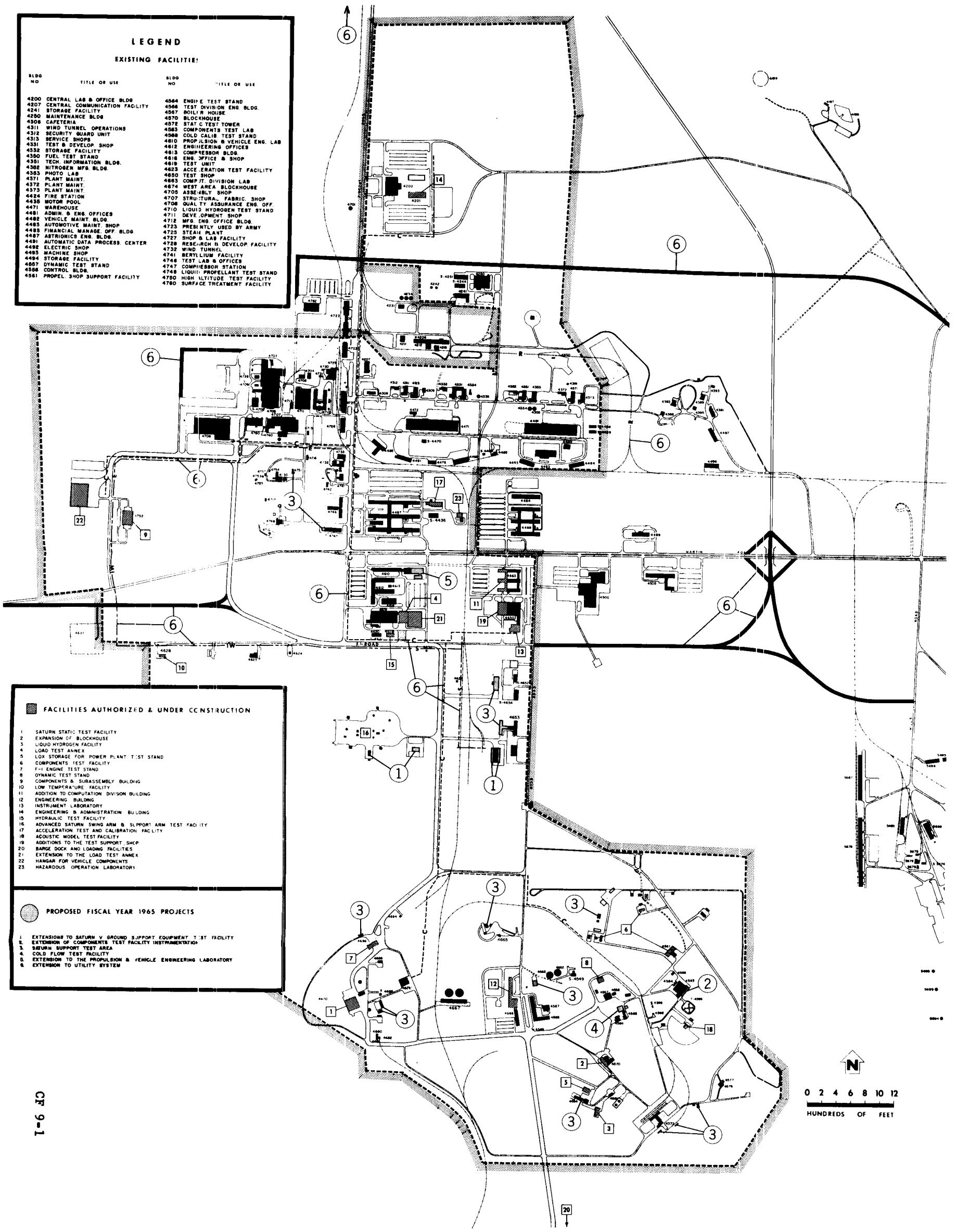
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

LOCATION PLAN



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Marshall Space Flight Center	Manned Space Flight	Huntsville, Alabama	Madison	Huntsville

INSTALLATION MISSION

The Marshall Space Flight Center (MSFC) has as its primary mission the development of launch vehicles, engines and vehicle systems for manned space flight programs. The Center also performs advanced studies and research in the general field of astronautics.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	7,332	7,658	7,658
CONTRACTOR & OTHER PERSONNEL	4,661	5,852	7,303
TOTAL ALL PERSONNEL	11,993	13,510	14,961

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	---	
LAND *(Lease or Permit)*	1,850	
PLANT VALUE *(as of June 30, 1963)*		149,030
TOTAL	1,850	149,030

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Extensions to Saturn V ground support equipment test facility	MSF	5,728.0	137.0	2,495.0	---	8,360.0
Cold flow test facility	MSF	---	136.0	2,368.0	---	2,504.0
Extension of components test facility instrumentation	MSF	7,200.0	3,765.0	1,814.0	---	12,779.0
Extension to the propulsion and vehicle engineering laboratory	MSF	1,143.5	115.0	2,230.0	---	3,488.5
Extension of utility systems	MSF	---	100.0	3,175.0	---	3,275.0
Saturn support test area	MSF	10,947.0	148.0	3,206.0	---	14,301.0
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				15.288.0		

NASA FORM 1029 DEC 63

GPO 868-667

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

EXTENSIONS TO SATURN V GROUND SUPPORT EQUIPMENT TEST FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Marshall Space Flight Center

LOCATION OF PROJECT: Huntsville, Madison County, Alabama

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Extensions

FUNDING:

FY 1963 and Prior Years	$5,728,000
FY 1964 Estimate	137,000
FY 1965 Estimate	2,495,000
Total Funding Through FY 1965	$8,360,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$683,400
Support buildings				
Pneumatic test position	Sq. Ft.	7,200	$31.45	226,400
Extension of assembly building	Sq. Ft.	8,080	28.72	232,000
Extension of blockhouse	Sq. Ft.	2,200	31.81	70,000
Site development	LS	---	36,500	36,500
Utilities and paving	LS	---	118,500	118,500
Equipment				$1,809,600

	Unit of Measure	Quantity	Unit Cost	Total Cost
Instrumentation at blockhouse	LS	---	$970,000	$970,000
Instrumentation at HP gaseous nitrogen facility	LS	---	200,000	200,000
Equipment for HP facility	LS	---	639,600	639,600
Design	---	---	---	---
		SUBTOTAL		$2,493,000
Fallout Shelter				$2,000
		TOTAL		$2,495,000

PROJECT DESCRIPTION:

This project provides for extensions to the fiscal year 1963 Saturn V Ground Support Equipment Test Facility as follows:

High pressure pneumatic test facility - This facility will consist of a prefabricated building about 60 feet by 90 feet with an attached reinforced concrete test cell of about 30 feet by 60 feet. The complex will also include two 10,000-gallon vacuum jacketed liquid nitrogen storage tanks with associated piping and converters for converting liquid nitrogen to gas at 15,000 psi.

Additional instrumentation - This item will provide a 100 channel analog to digital recording system, complete with all other appurtenances required to integrate this equipment into the system.

Extension of blockhouse - A two-story addition approximately 20 feet by 55 feet, constructed of reinforced concrete, with air conditioning, and double second floor. This extension will house additional instrumentation.

Extension of assembly building - This item provides for conversion of existing office space on the first floor into a sub-assembly and checkout area. A second floor will be added for engineering offices. A single-story shop extension will also be provided. Approximately 8,080 square feet of floor area will be added.

PROJECT JUSTIFICATION:

The Marshall Space Flight Center is responsible for the test, checkout, and operational reliability of the service swing-arms and holddown arms used to service the Saturn V vehicles during the launch phase. This ground

equipment will be tested and evaluated prior to shipment to the John F. Kennedy Space Center, NASA. This project provides the instrumentation, facilities, and shop space required for the phased increase of testing activities.

High pressure pneumatic test facility - All launch complex equipment is now operating at a maximum pressure of 5,000 pounds per square inch. The ground support systems are being designed for pressure ranges between 8,000 and 10,000 pounds per square inch (psi), and requiring up to 15,000 psi for over-pressure tests. Provision is being made to check equipment for functional suitability and reliability at the higher pressure ranges.

Additional instrumentation - The current facility is equipped with 200 channels of instrumentation. In phase with the development and evaluation schedule and test duration requirements 100 channels of instrumentation will be added in fiscal year 1965.

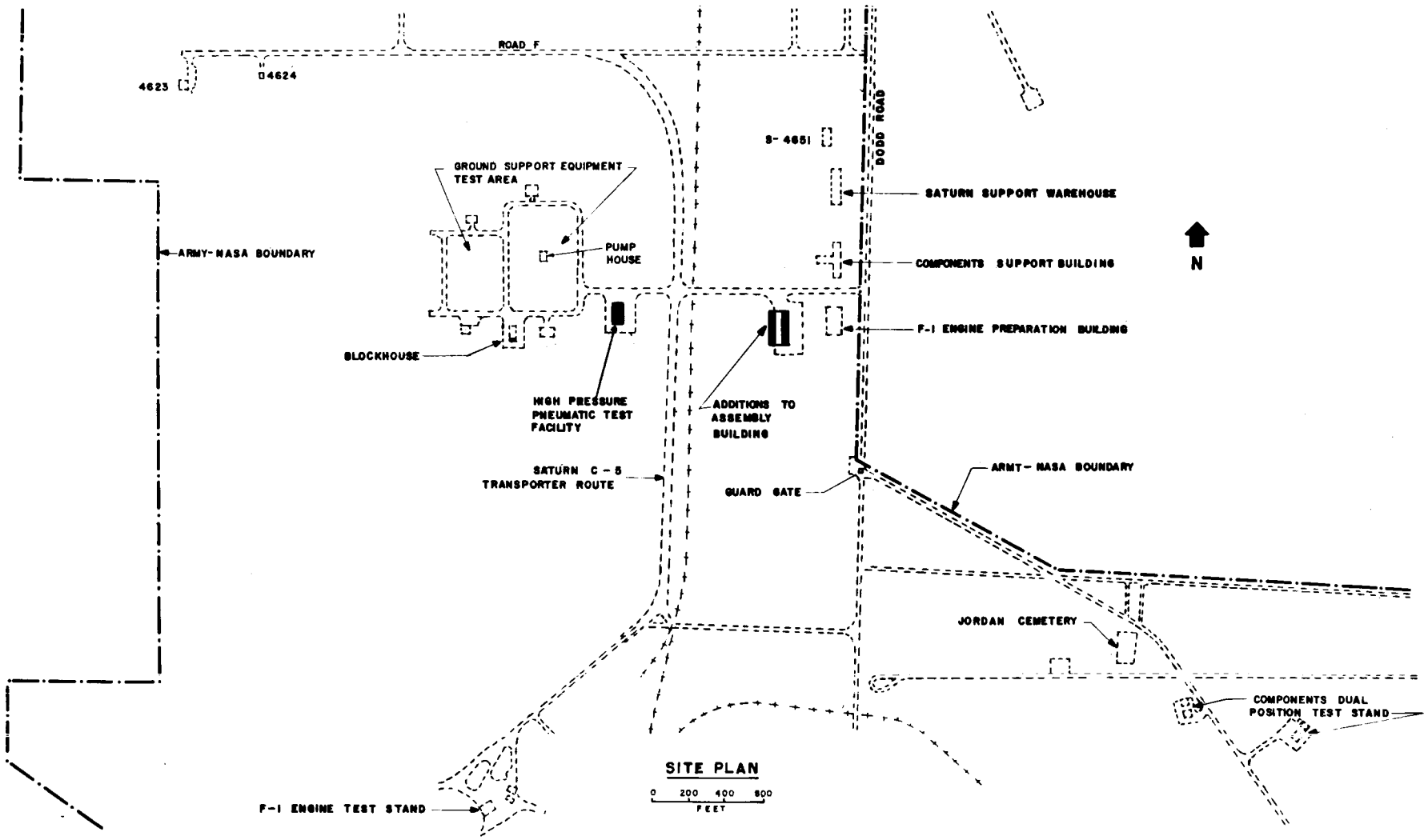
Extension to assembly building - The phased build-up of activities within the assembly building requires an additional 8,080 square feet of shop and subassembly space. This space is required to accommodate the pre-test and post-test activities such as inspection, assembly, checkout, modification, repair, and packaging associated with the receipt of increased quantities of components from contractors.

ESTIMATED FUTURE YEAR FUNDING: None

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

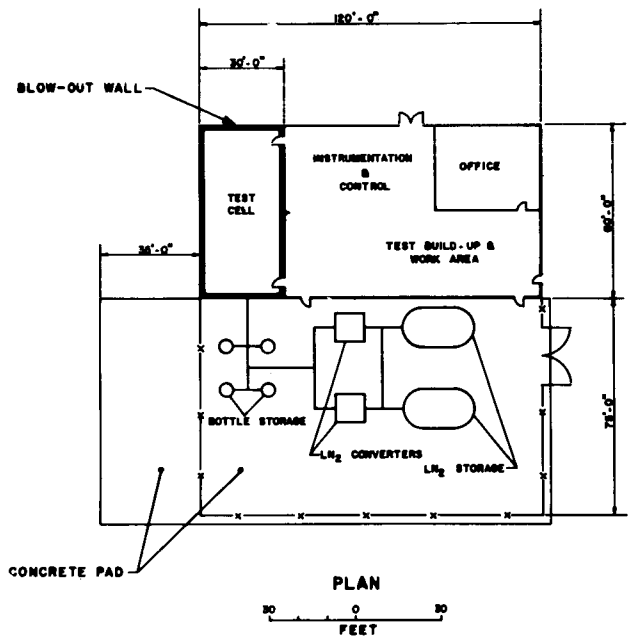
EXTENSIONS TO SATURN V GROUND SUPPORT EQUIPMENT TEST FACILITY



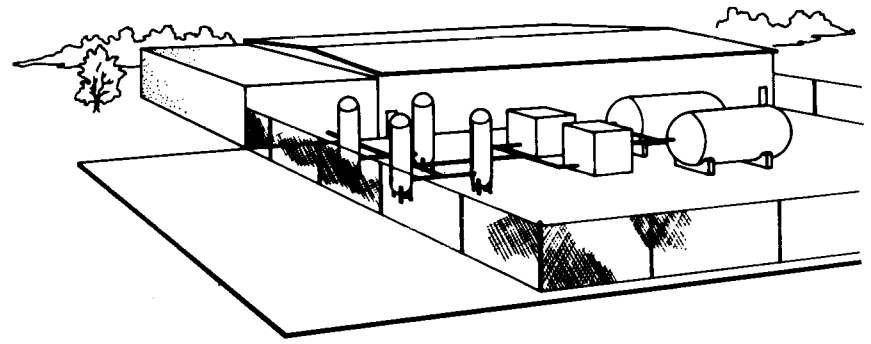
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

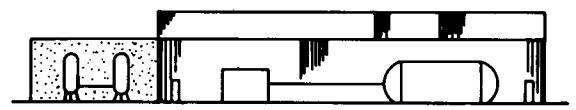
EXTENSIONS TO SATURN V GROUND SUPPORT EQUIPMENT TEST FACILITY



PLAN



PERSPECTIVE



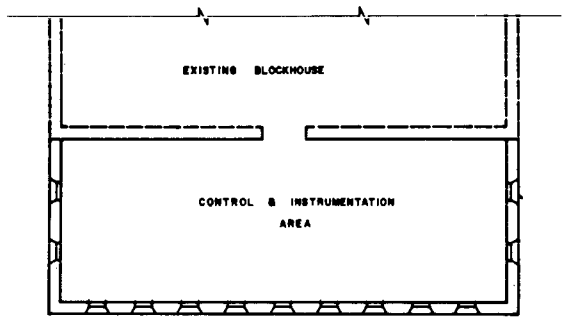
ELEVATION

HIGH PRESSURE PNEUMATIC TEST FACILITY

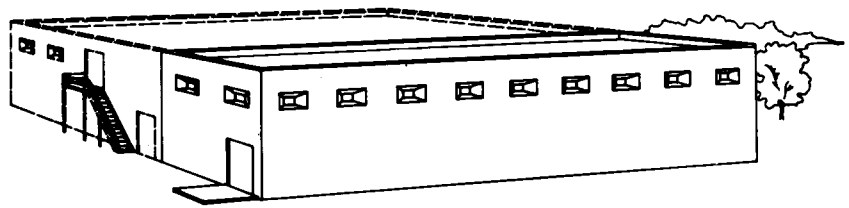
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

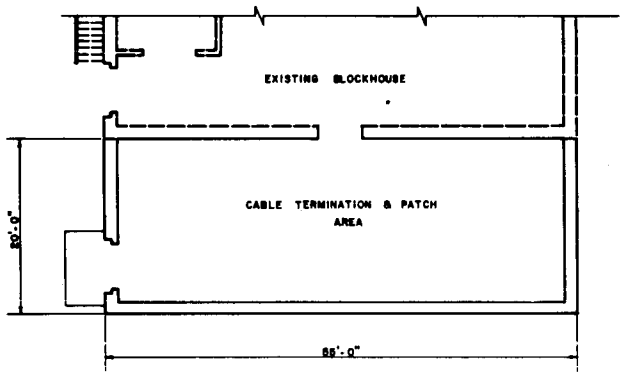
EXTENSIONS TO SATURN V GROUND SUPPORT EQUIPMENT TEST FACILITY



SECOND FLOOR PLAN



PERSPECTIVE



FIRST FLOOR PLAN

100 0 100

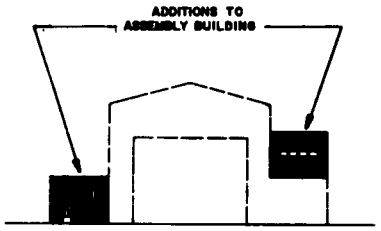
FEET

EXTENSION OF BLOCKHOUSE

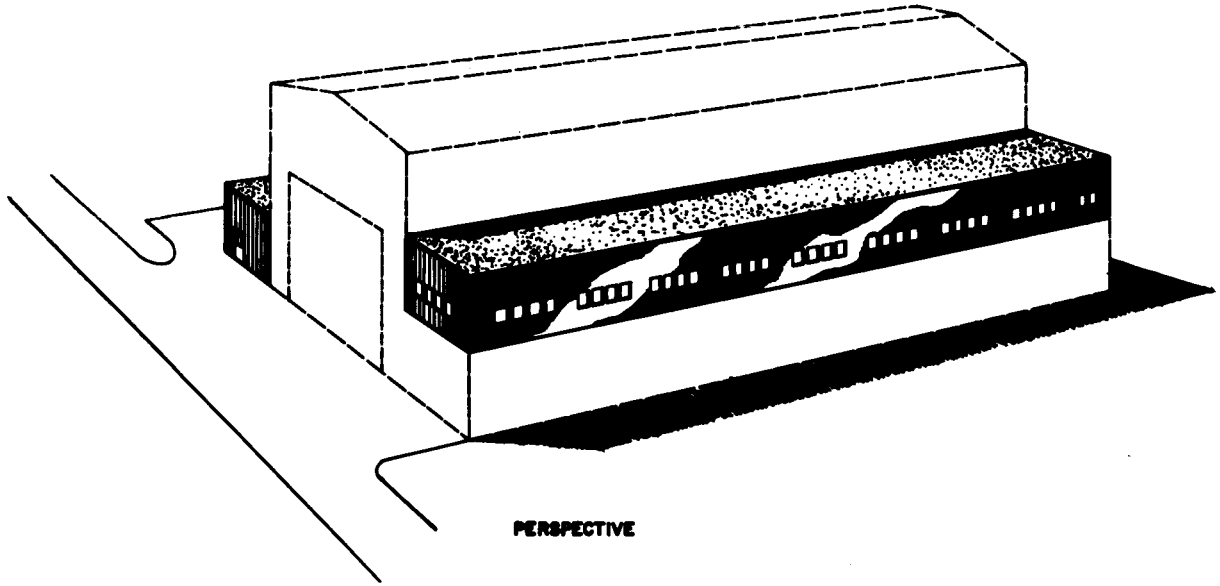
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

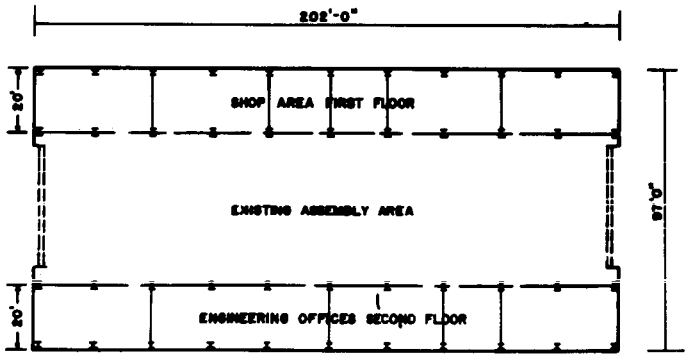
EXTENSIONS TO SATURN V GROUND SUPPORT EQUIPMENT TEST FACILITY



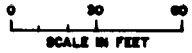
ELEVATION



PERSPECTIVE



FLOOR PLAN



EXTENSION OF ASSEMBLY BUILDING

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

COLD FLOW TEST FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Marshall Space Flight Center

LOCATION OF PROJECT: Huntsville, Madison County, Alabama

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$136,000
FY 1965 Estimate	2,368,000
Total Funding Through FY 1965	$2,504,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$906,000
Support building				
Terminal and equipment building	Sq. Ft.	5,000	$34.00	170,000
Test position	LS	---	536,000	536,000
Site development	LS	---	50,000	50,000
Utilities	LS	---	150,000	150,000
Equipment				$1,458,000
Tie-in to existing instrumentation system	LS	---	200,000	200,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Tie-in to existing control system	LS	---	$100,000	100,000
Propellant systems	LS	---	400,000	400,000
High-pressure gas system	LS	---	200,000	200,000
Prime mover (10,000 H.P. gas turbine)	LS	---	558,000	558,000
Design	---	---	---	---
		SUBTOTAL		$2,364,000
Fallout Shelter				$4,000
		TOTAL		$2,368,000

PROJECT DESCRIPTION:

This project will provide a Saturn V cold calibration test facility. It will be located in the existing cold flow test area and will consist of the following major structures:

Test stand - A structural steel tower approximately 80 feet by 80 feet and 175 feet high on a reinforced concrete foundation will support the vehicle stage tankage and run tankage with associated propellant systems and equipment.

Terminal building - A two-story reinforced concrete structure, approximately 50 feet by 50 feet with 5,000 square feet of floor space will house terminal boards for instrumentation and control systems, cable distribution, patching facilities and a prime mover. The prime mover is a 10,000 horse-power gas turbine with a gas generator and gear box. This equipment will supply propellants to the vehicle pumps in performing studies on both RP1/LOX and LH_2/LOX pumping systems.

PROJECT JUSTIFICATION:

This facility will be used to conduct test programs of a hazardous nature on Saturn V vehicle systems hardware. Specifically, the facility will be used to determine propellant flow characteristics, tank stratification phenomena, propellant pumping techniques and interstage environment investigations through the use of full scale hardware of the Saturn V space vehicle. It will provide the capability for testing of R&D prototype hardware, checkout of vehicle components and verification of vehicle integration design concepts.

Experience has demonstrated that the ground testing program outlined above is essential to the solution of in-flight problems which will assure

the reliability of a man-rated vehicle.

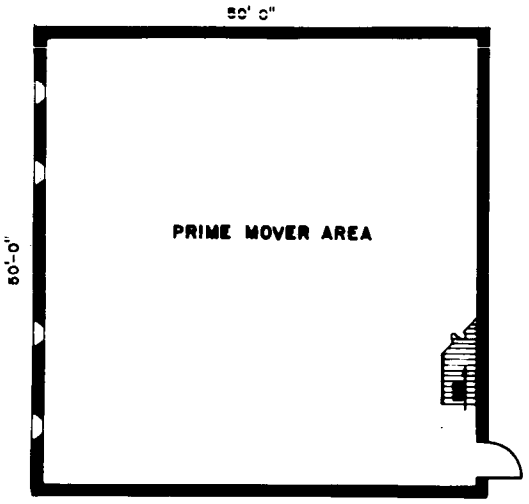
No existing facilities are capable of providing a Cold Flow testing capability for the Saturn V vehicle.

ESTIMATED FUTURE YEAR FUNDING: None

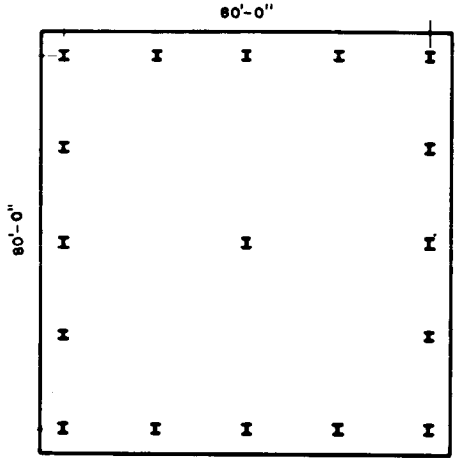
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

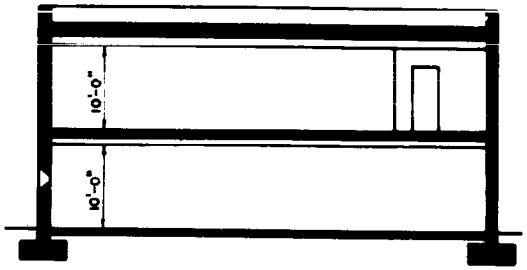
COLD FLOW TEST FACILITY



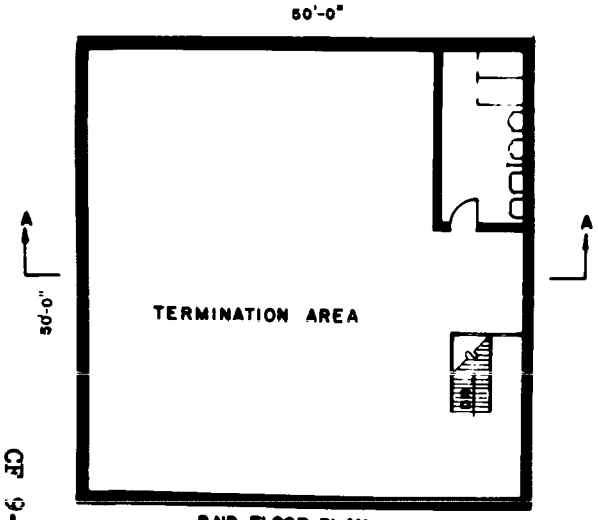
1ST. FLOOR PLAN



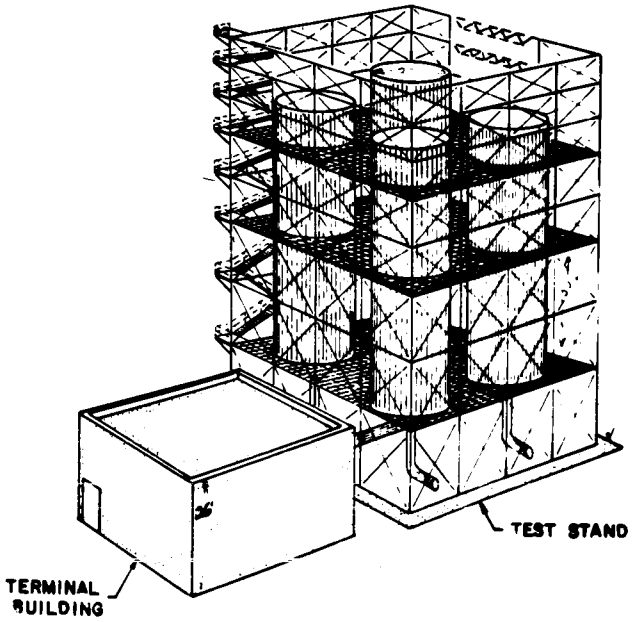
PLAN-TEST STAND



SECTION A-A



2ND FLOOR PLAN



PERSPECTIVE

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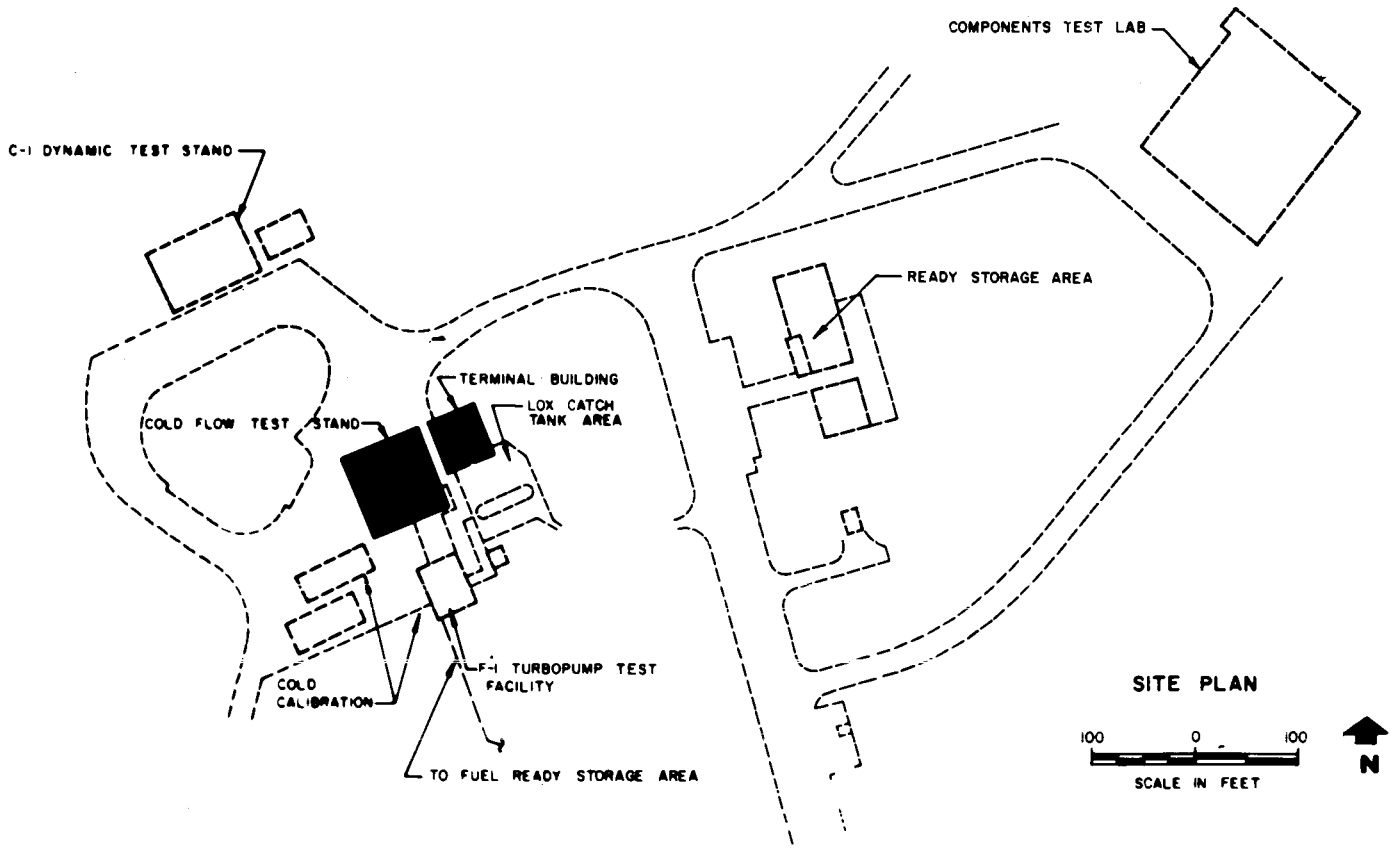
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

COLD FLOW TEST FACILITY



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

EXTENSION OF COMPONENTS TEST FACILITY INSTRUMENTATION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Marshall Space Flight Center

LOCATION OF PROJECT: Huntsville, Madison County, Alabama

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$7,200,000
FY 1964 Estimate	3,765,000
FY 1965 Estimate	1,814,000
Total Funding Through FY 1965	$12,779,000

PROJECT COST ESTIMATE:

	Unit Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---		---
Construction				$390,000
Building	Sq. Ft.	9,000	$35.56	320,000
Site development	LS	---	10,000	10,000
Utilities and paving	LS	---	60,000	60,000
Equipment				$1,420,000
Recording and signal conditioning	LS	---	1,210,000	1,210,000
Transmission and distribution	LS	---	120,000	120,000
Special instrumentation	LS	---	90,000	90,000
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
		SUBTOTAL		$1,810,000
Fallout Shelter				$4,000
		TOTAL		$1,814,000

PROJECT DESCRIPTION:

This project provides for the construction of an addition to the Instrumentation Center as well as the design, procurement, fabrication, installation and checkout of additional equipment.

This addition to the south side of the existing two-story structure will be approximately 30 feet wide by 150 feet long. Construction features will include blast resistant concrete walls and roof, special regulated AC and DC electrical power circuits, elevated floors, air conditioning and normal utilities.

Additional instrumentation will consist of a 100 channel analog-to-digital system, 30 oscillograph channels, and 24 single channel analog strip chart recorders. Associated equipment will include: wide band DC amplifiers, carrier, flow and positioning circuitry, electronic calibrators, automatic switching equipment and remote data indicators; patch panels and distribution cabling to interconnect the above mentioned equipment with existing equipment will also be included.

PROJECT JUSTIFICATION:

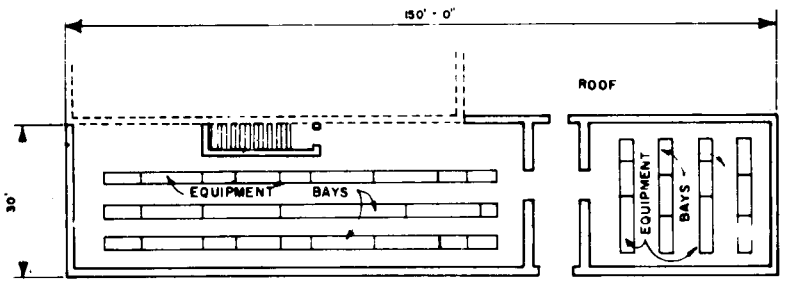
The Saturn V program for testing of subsystems and investigation of interface problems arising from vehicle stage integration will achieve peak proportions in mid-calendar year 1965. This project continues the updating and extension of the instrumentation system in the component test complex in phase with these test requirements. The test programs conducted at this facility are essential in assuring a successful flight test program.

ESTIMATED FUTURE YEAR FUNDING: None

MARSHALL SPACE FLIGHT CENTER

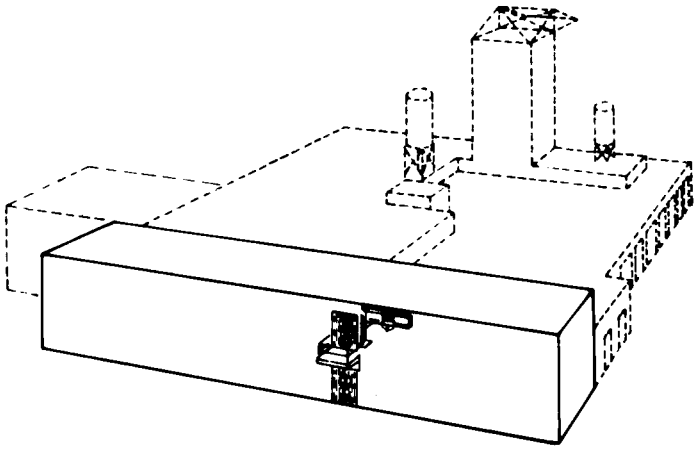
FISCAL YEAR 1965 ESTIMATES

EXTENSION OF COMPONENTS TEST FACILITY INSTRUMENTATION

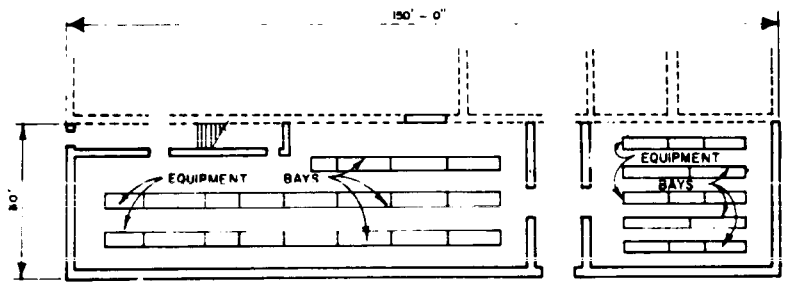


SECOND FLOOR PLAN

NOT TO SCALE

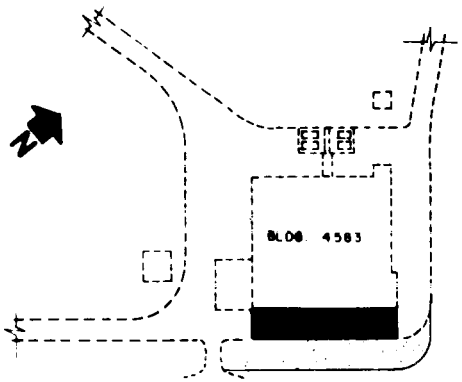


PERSPECTIVE



FIRST FLOOR PLAN

NOT TO SCALE



SITE PLAN

0 50 100

FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

EXTENSION TO THE PROPULSION AND VEHICLE ENGINEERING LABORATORY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Marshall Space Flight Center

LOCATION OF PROJECT: Huntsville, Madison County, Alabama

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$1,143,500
FY 1964 Estimate	115,000
FY 1965 Estimate	2,230,000
Total Funding Through FY 1965	$3,488,500

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$2,017,700
Laboratory building and cafeteria	Sq. Ft.	75,600	24.21	1,830,200
Site development	LS	---	37,000	37,000
Utilities paving	LS	---	150,500	150,500
Equipment				174,300
Communication and office equipment	LS	---	97,925	97,925
Cafeteria equipment	LS	---	76,375	76,375

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
		SUBTOTAL		$2,192,000
Fallout Shelter				38,000
		TOTAL		$2,230,000

PROJECT DESCRIPTION:

This project will provide an extension to the existing Propulsion and Vehicle Engineering Laboratory which will be increased by approximately 75,600 square feet of floor area. The main structure will have five stories approximately 70 feet by 180 feet, with 68,600 square feet of floor space, with a partial basement and mechanical room to house building equipment and an elevator room. Adjoining the main structure will be a single story cafeteria, approximately 58 feet by 120 feet with 7,000 square feet of floor space, with a seating capacity for approximately 300 people. The building will be a steel frame structure with metal curtain exterior walls to match the existing laboratory. Normal utilities and air-conditioning are included in this project. The laboratory will provide space for approximately 450 people.

PROJECT JUSTIFICATION:

The activities of the Propulsion and Vehicle Engineering Laboratory have been severely handicapped during the past three years by the dispersion of 630 engineers and support personnel. Over one-third of the P&VE personnel are located 13 miles from the laboratory.

A study of the problem indicates that approximately 1,000 man hours per week are lost in travel time. This split operation assumes greater significance since key personnel make up a large portion of these travelers. Estimated annual cost for the split operation is as follows:

Leased Space	68,600 square feet @ $2.40 per sq. ft.	$164,640
Lost Man hours	1,000 M/H per week @ $8.00 per hr x 52 weeks	$416,000
Commuting Costs	75 round trips per day x $3.40 x 250 days per year	$63,750
Total Annual costs per year		$644,390

On the basis of saving the above costs, the laboratory can be amortized within four years.

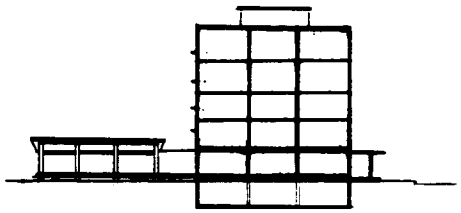
The consolidation of operations will result in improved manpower and facilities utilization and reduced costs to the government.

ESTIMATED FUTURE YEAR FUNDING: None

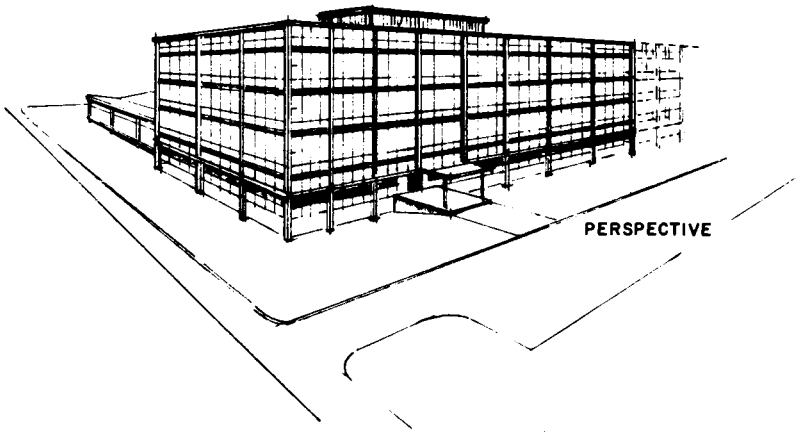
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

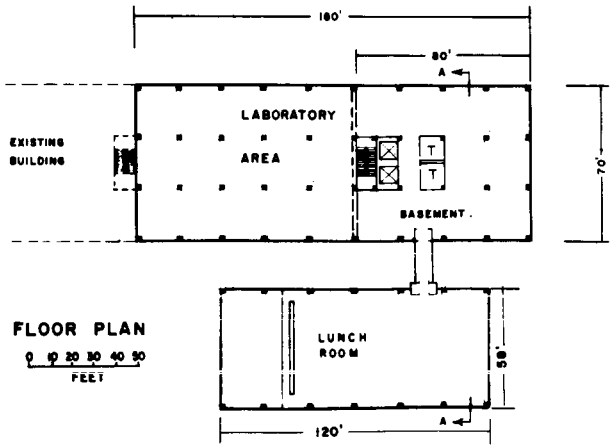
EXTENSION TO THE PROPULSION AND VEHICLE ENGINEERING LABORATORY



SECTION A-A



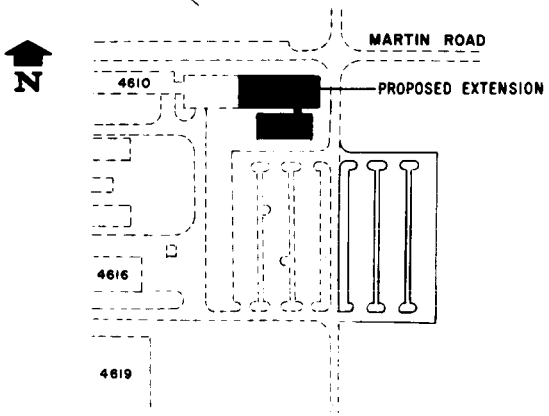
PERSPECTIVE



FLOOR PLAN

0 10 20 30 40 50

FEET



SITE PLAN

0 100 200 300

FEET

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

EXTENSION OF UTILITY SYSTEMS

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Marshall Space Flight Center

LOCATION OF PROJECT: Huntsville, Madison County, Alabama

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$100,000
FY 1965 Estimate	3,175,000
Total Funding Through FY 1965	$3,275,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$3,175,000
Access road	LS	---	$1,375,000	1,375,000
New roads	Miles	4.2	100,000	420,000
Overpass	LS	---	251,700	251,700
Bridge	LS	---	78,300	78,300
Communication duct and cable	LS	---	770,000	770,000
Utilities	LS	---	280,000	280,000
Equipment	---	---	---	---
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$3,175,000

PROJECT DESCRIPTION:

This project provides for the following items:

Extension to Rideout access road - This project provides for partial funding of the extension of Rideout Road for the 2.5 mile section from the entrance of Redstone Arsenal to U.S. Highway 72. The road will be a four-lane divided highway with limited access between Alabama Highway 20 and U.S. Highway 72. This project will be undertaken through the Bureau of Public Roads with work accomplished by the Alabama Highway Department.

Center roadnet modifications - Four new segments of a two lane road totaling approximately 4.2 miles. A new overpass on Martin Road and a new bridge on the newly relocated section of Martin Road west of Rideout Road.

Utility lines - Utilities will include the extension of potable and industrial water lines; 4,160 KV electrical distribution lines; steam lines; sewage lines and communication ducts to recently developed areas; replacement and relocation of existing distribution lines. Additional cable will also be required within the existing duct system which will terminate at the Central Communications Facility.

PROJECT JUSTIFICATION:

At present the heavy traffic leaving Redstone Arsenal at Gate 9 on Rideout Road must turn eastward onto Governors Drive or westward on State Road 20 toward Decatur or Athens, Alabama. There is no other road in the vicinity to carry traffic in a northern direction. Traffic continuing eastward to Huntsville congests with other peak hour traffic at Governors Drive, Memorial Parkway and other congested points to reach the northern parts of the city. Traffic destined for Athens, Alabama, or other points northwest of Redstone Arsenal does not have direct access to the existing four-lane U. S. Highway 72.

Recent origin and destination studies indicate that approximately two-thirds of the employees live in Huntsville or other communities north of the arsenal. At present, almost one-third of the peak traffic

(approximately 3,000 vehicles between 6:30 a.m. and 8:00 a.m.) use Gate 9 and Rideout Road as an access to their work. Approximately 34 percent more would be using this route if the full extension were available today. By the time the extension can be completed, it is expected that the traffic entering Gate 9 will increase by 47 percent. The extension of Rideout Road to U. S. Highway 72 will alleviate those traffic conditions.

New roads, an overpass and a bridge will be required to accommodate the peak vehicular traffic within Marshall Space Flight Center. The need is based on extensive traffic surveys recently conducted by the Army Missile Support Command and the Center. In order to control the hazards resulting from increasing traffic congestion, the construction of limited access roads by-passing the main engineering areas, and interchanges with grade separation will be required.

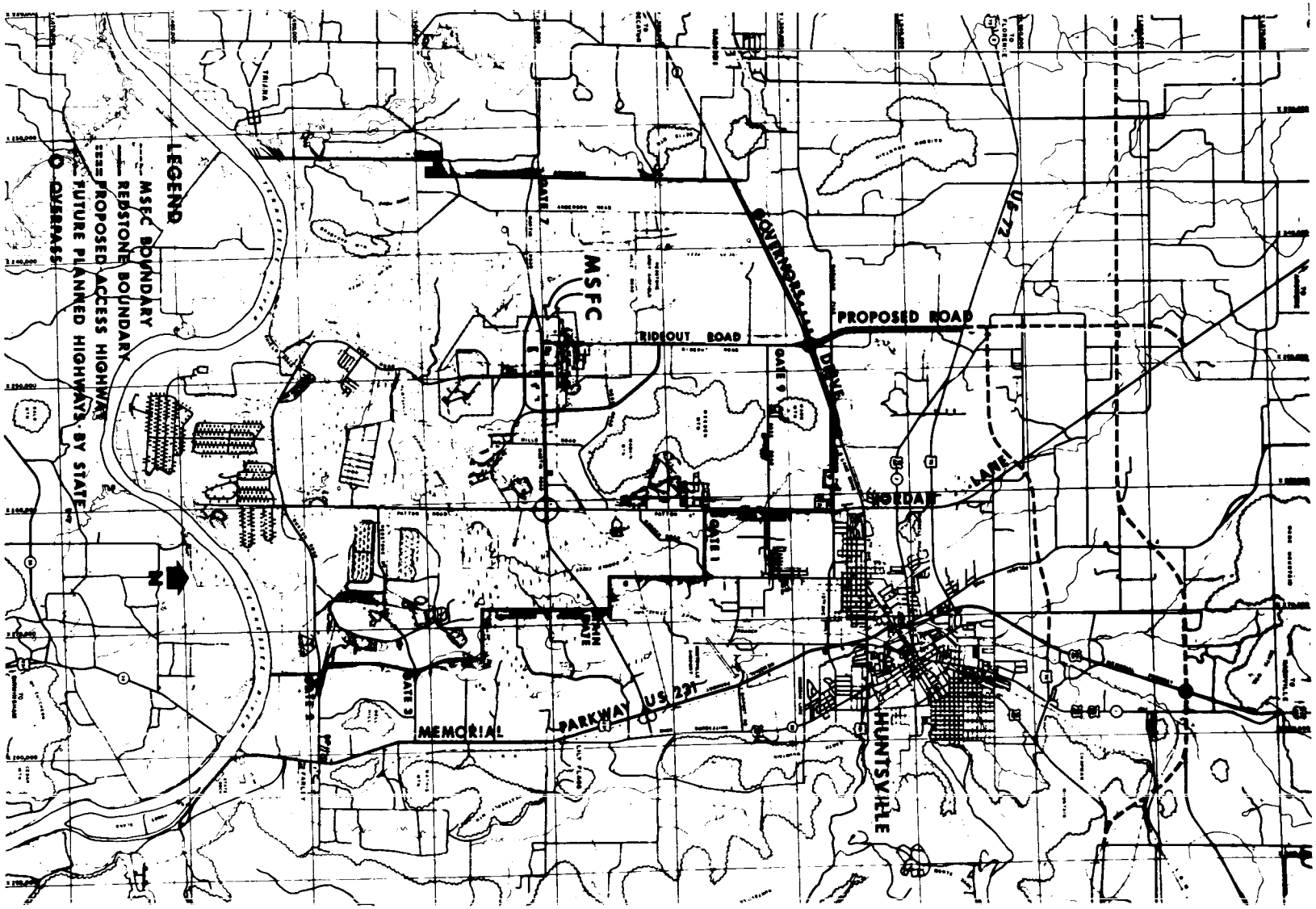
Utility additions include the six basic distribution systems, electric, sewer, communication, steam, potable and industrial water which are required to serve newly developed areas of construction. The communication ducts and cable are expansions of existing systems required to support new facilities which are included in this program. Additional cables, within the existing duct banks, will be required to transmit R&D test data as well as management data from the test area to the Computation Facilities.

ESTIMATED FUTURE YEAR FUNDING: None

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1966 ESTIMATES

EXTENSION OF UTILITY SYSTEM

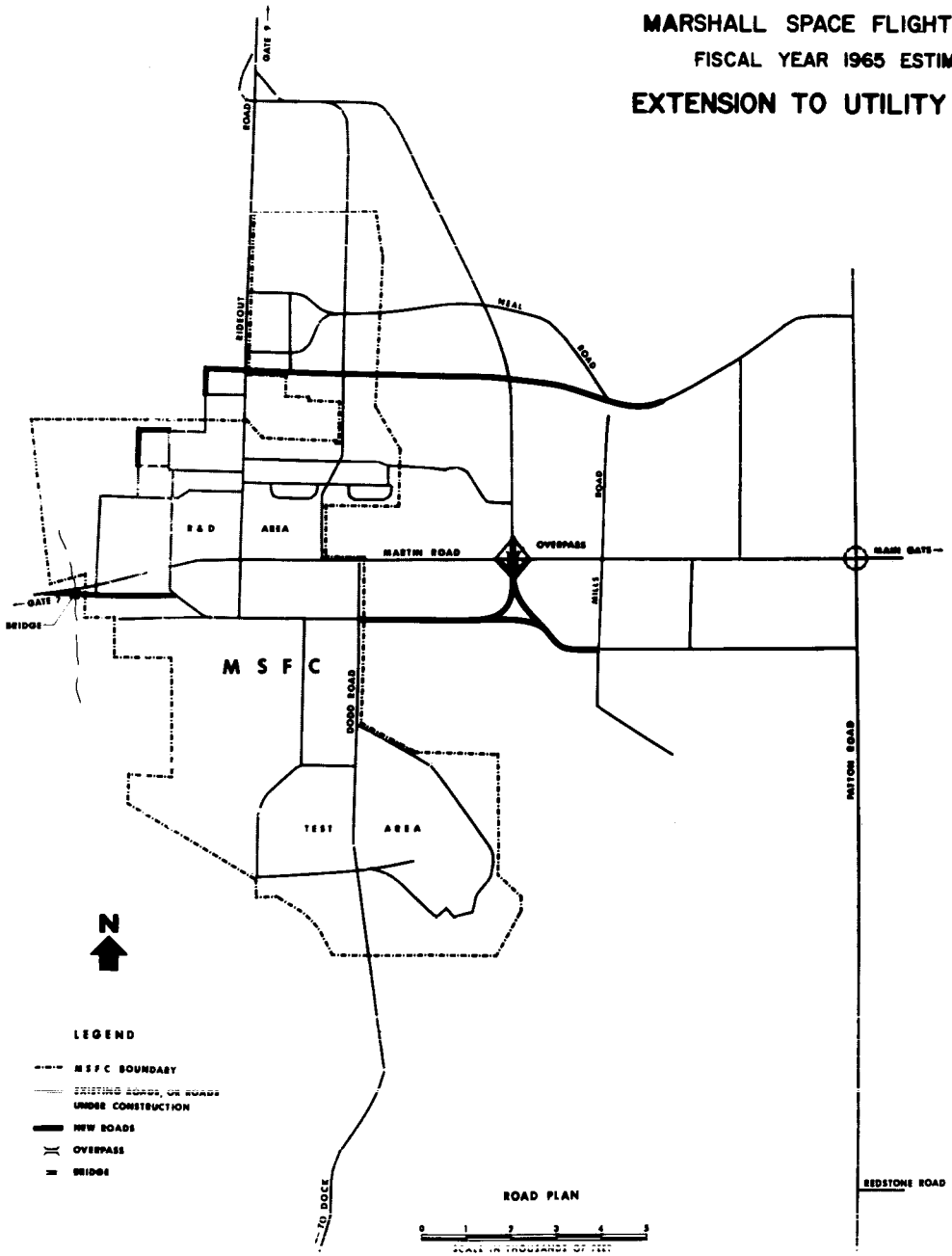


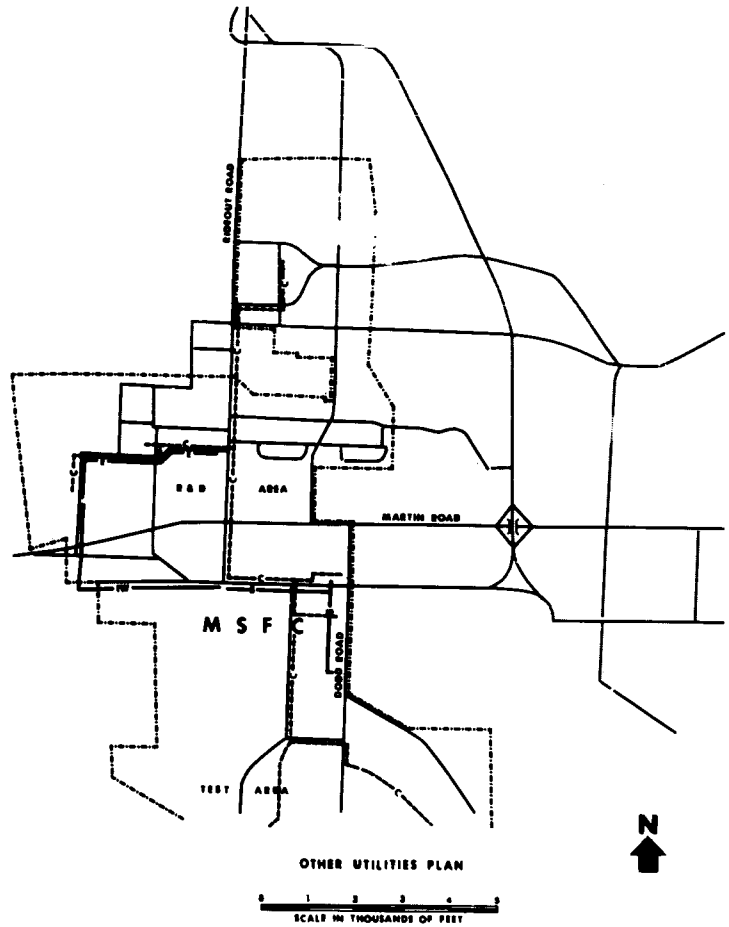
RIDEOUT ROAD ACCESS

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

EXTENSION TO UTILITY SYSTEM





CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Marshall Space Flight Center

LOCATION OF PROJECT: Huntsville, Madison County, Alabama

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Alterations and Extensions

FUNDING:

FY 1963 and Prior Years	$10,947,000
FY 1964 Estimate	148,000
FY 1965 Estimate	3,206,000
Total Funding Through FY 1965	$14,301,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$2,744,000
Support				
Addition to high pressure gas storage 1,250 cubic feet	Each	5	$125,000	625,000
Transportation hangar building	Sq. Ft.	16,000	34.95	559,200
Addition to component support building	Sq. Ft.	11,200	20.71	232,000
Additional propellant & helium storage at East static test tower 1,250 cubic feet gas helium storage vessel	Each	1	160,000	160,000
28,000 gallon LOX tank	Each	1	60,000	60,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
17,000 gallon RP-fuel tank	Each	1	$15,000	15,000
Gaseous hydrogen system 700 cubic foot gaseous hydrogen bottles	Each	3	87,000	261,000
Replacement of deflector pit at power test stand	Each	1	135,000	135,000
Acoustic control & communication center building	Sq. Ft.	4,750	31.16	148,000
Helium gas purification systems building	Sq. Ft.	600	20.00	12,000
Extension of building S-4747 high pressure air system	Sq. Ft.	1,600	25.50	40,800
1,250 cubic foot air bottles	Each	2	134,500	269,000
Site work	LS	---	85,000	85,000
Utilities & paving	LS	---	142,000	142,000
Equipment				$462,000
Hydrogen recharger for additional hydrogen system	LS	---	125,000	125,000
Gas purification equipment for helium gas purification system	LS	---	92,000	92,000
High pressure air system compressors (220 cubic feet @ 3,500 psi)	Each	4	61,250	245,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$3,206,000

PROJECT DESCRIPTION:

This project provides for alterations and extensions in the test area required for research and development acceptance testing related to the Saturn program.

Additional high pressure gas storage - Five 1,250 cubic foot (water measure) cylindrical steel pressure vessels for storage of nitrogen or helium gases at pressures up to 5,000 psi. Three of the pressure vessels will be located adjacent to the existing system in the West Test Area and

will be interconnected with the existing distribution system. The remaining two vessels will be located in a special test area where work on special projects will be performed.

Transportation hangar - Prefabricated metal building approximately 200 feet long by 75 feet wide and 70 feet high with attached locker room 40 x 25 x 15 feet high. A twenty-five ton overhead bridge crane, hangar type doors and concrete paving to access roads are included.

Addition to components support building - A T-shaped prefabricated metal structure with approximately 8,000 square feet of working area and 3,200 square feet of storage area for vehicle components. A fifteen ton overhead hoist will be installed in the 22 foot high bay area for handling heavy components.

Additional propellants and helium storage, East static test tower - Storage consisting of one 1,250 cubic foot (water measure) cylindrical steel pressure vessel for helium gas at 5,000 psi interconnected with the existing helium high pressure pipe line at the Liquid Hydrogen Facility; one 28,000 gallon vacuum jacketed cylindrical steel vessel for storage of liquid oxygen; one 17,000 gallon underground steel tank for RP fuel storage.

Gaseous hydrogen system - A 10,000 psi gaseous hydrogen recharger and three 700 cubic foot storage bottles with necessary piping are provided in this project. Two of the storage bottles will serve the components at the dynamic and cold calibration test areas while one bottle will serve the special test area.

Replacement of deflector pit at power plant test stand - The construction of a reinforced concrete pit approximately 150 feet long by 40 feet wide and 10 feet deep to replace the badly eroded existing deflector at the power plant test stand.

Acoustic control and communication center - A reinforced concrete building approximately 64 feet by 74 feet to house controls, instrumentation and communication equipment associated with acoustic measurements during test firing of S-IB and S-IC stages.

Helium gas purification system - A prefabricated metal building addition, approximately 20 feet by 30 feet, to the existing helium compressor building to house equipment used for removal of organic residuals from helium gas.

High pressure air system - An addition to the existing prefabricated metal compressor building which will house four 3,500 psi compressors will be about 40 feet square. Two 1,250 cubic foot bottles will be added to the existing air system storage battery.

PROJECT JUSTIFICATION:

The expansion and modernization of the high pressure gas and propellant system is a continuation of the planned phasing of the program initiated in fiscal year 1964 to accommodate increased requirements in the Saturn program. Quantities of high pressure gases and propellants associated with the Saturn IB and Saturn V are approximately five times those required by the Saturn I and previous projects.

The Transportation Hangar is required to provide an enclosed weather protected area for stage transporter maintenance and to accommodate booster stage modifications.

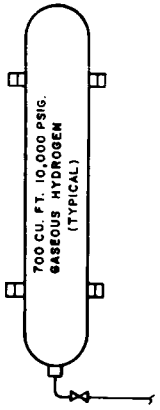
In addition, other support facilities required are an extension to the components support building to handle the larger components of the F-1 engine and S-IC stage; an acoustic control and communications center to provide a central point for rapid assembly and analysis of acoustic and meteorological measurements required for static test firing; and the replacement of an eroded deflector pit.

ESTIMATED FUTURE YEAR FUNDING: None

MARSHALL SPACE FLIGHT CENTER

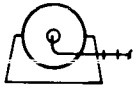
FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA



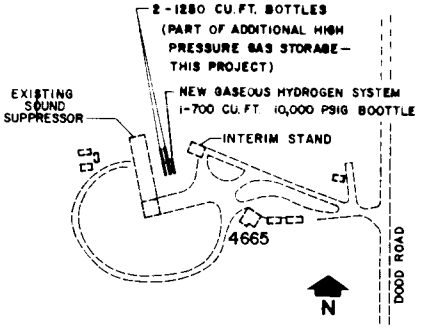
PLAN

(SCHEMATIC ONLY)



ELEVATION

(SCHEMATIC ONLY)

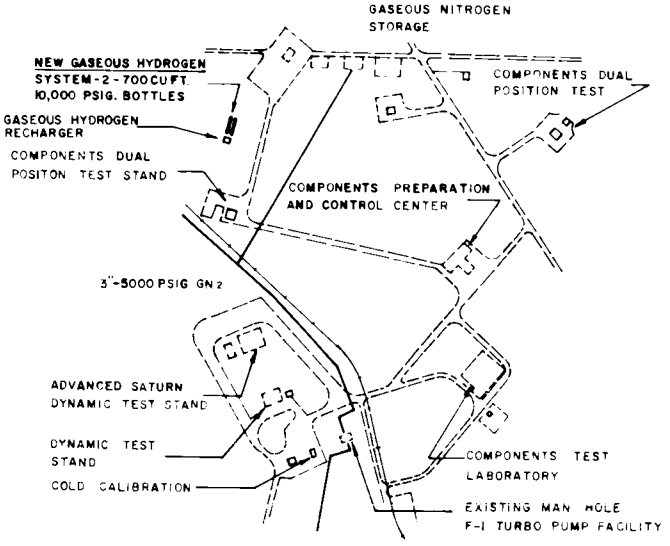


INSET — SPECIAL TEST AREA

SITE PLAN

0 200 400 600

SCALE IN FEET



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SITE PLAN

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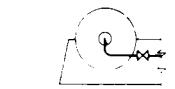
FEET

ADDITIONAL HIGH PRESSURE GAS STORAGE

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA



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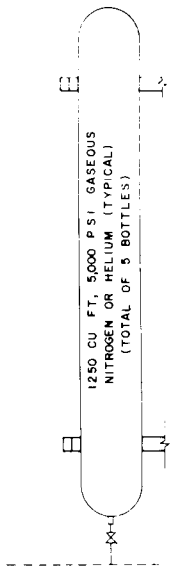

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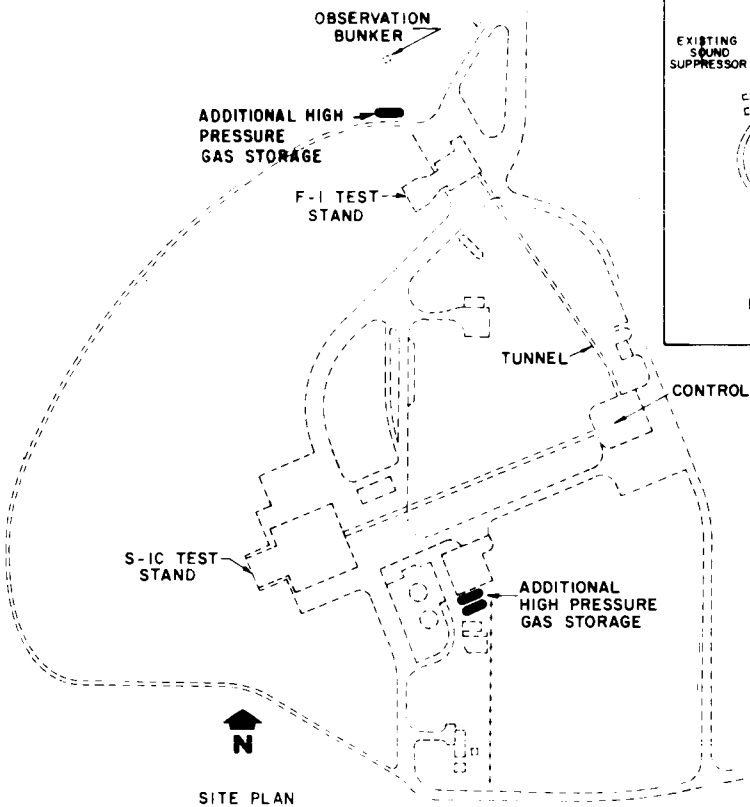
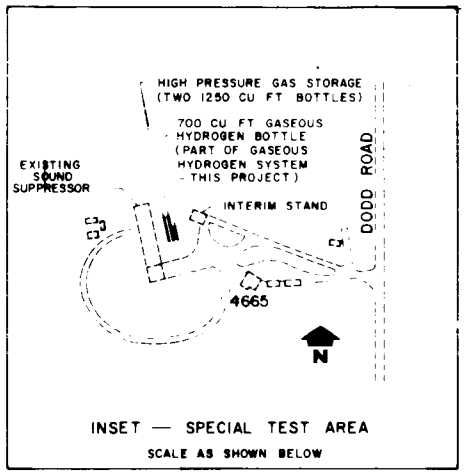


SITE PLAN

0 200 400 600

SCALE IN FEET



INSET — SPECIAL TEST AREA

SCALE AS SHOWN BELOW

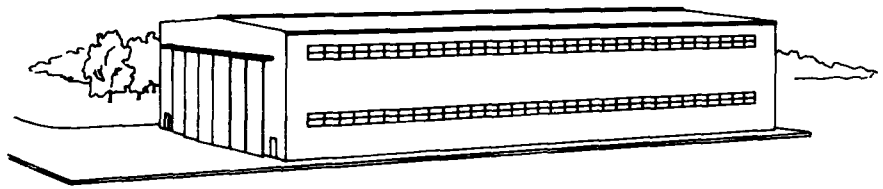
ADDITIONAL HIGH PRESSURE GAS STORAGE

718-214 O - 54 - 28

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA



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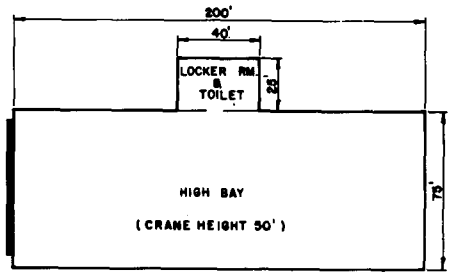
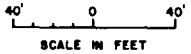


FLOOR PLAN



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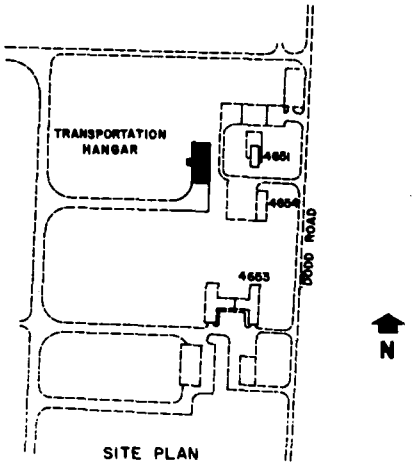


SITE PLAN

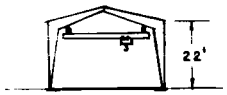
SCALE IN FEET

TRANSPORTATION HANGAR

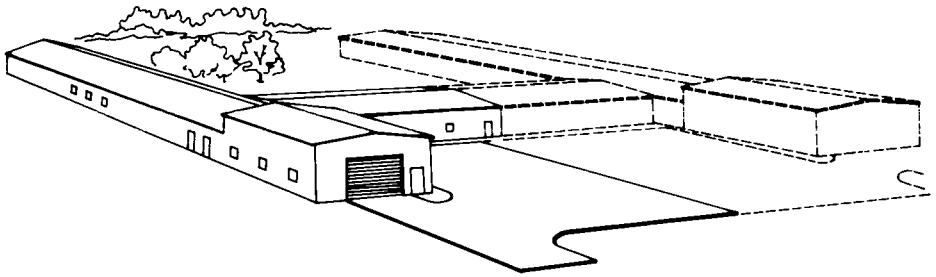
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA



SECTION A-A



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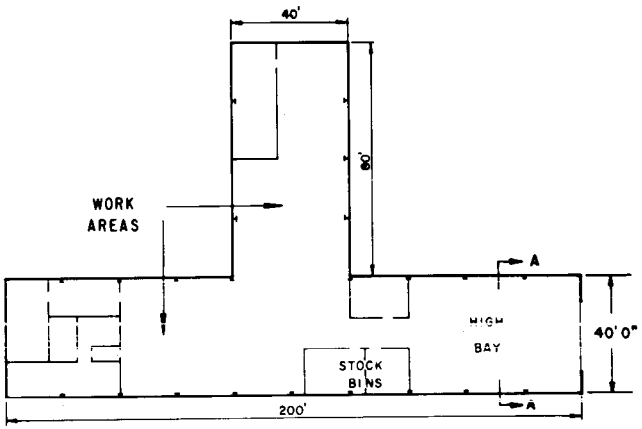
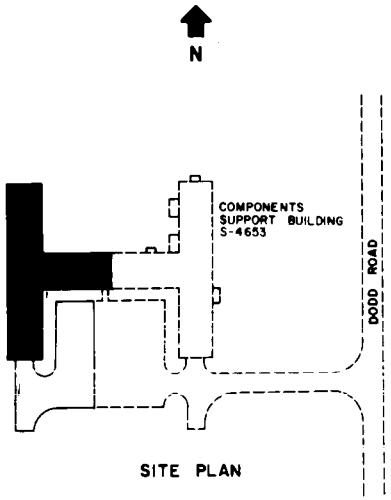


FLOOR PLAN

30' 0 30'

SCALE IN FEET



SITE PLAN

100 0 100

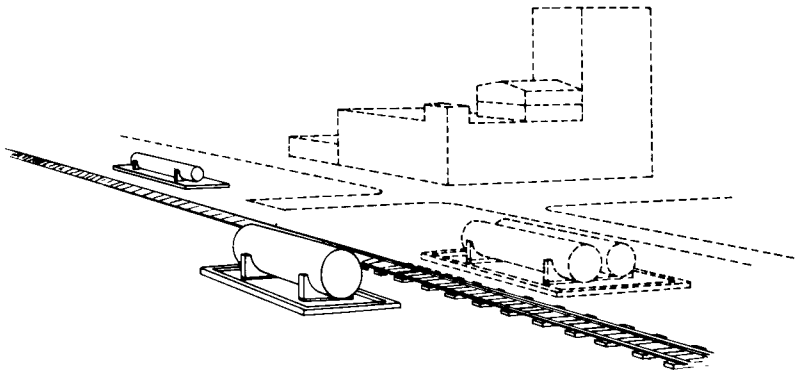
SCALE IN FEET

ADDITION TO COMPONENTS SUPPORT BUILDING

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA



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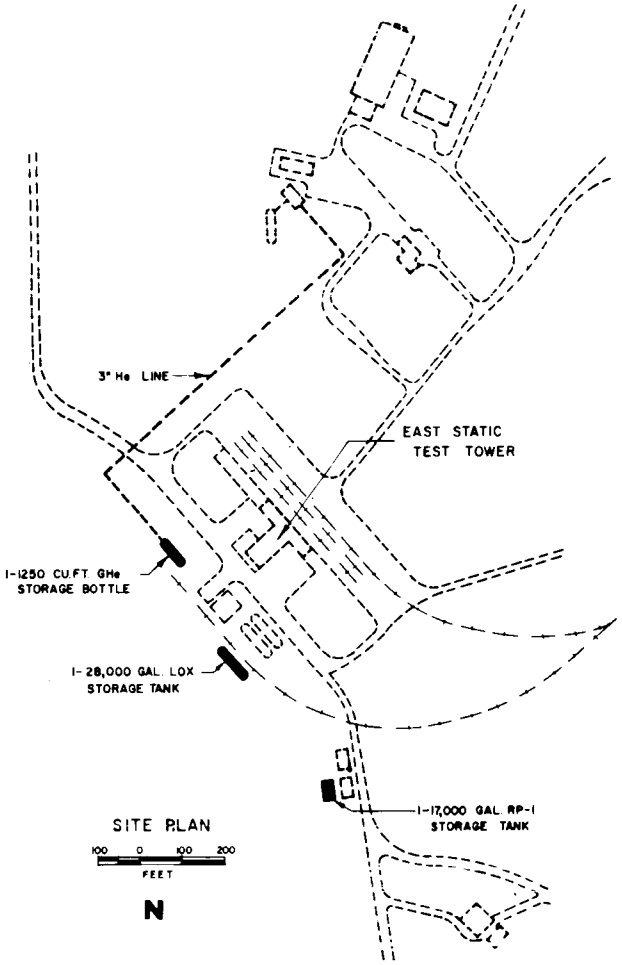
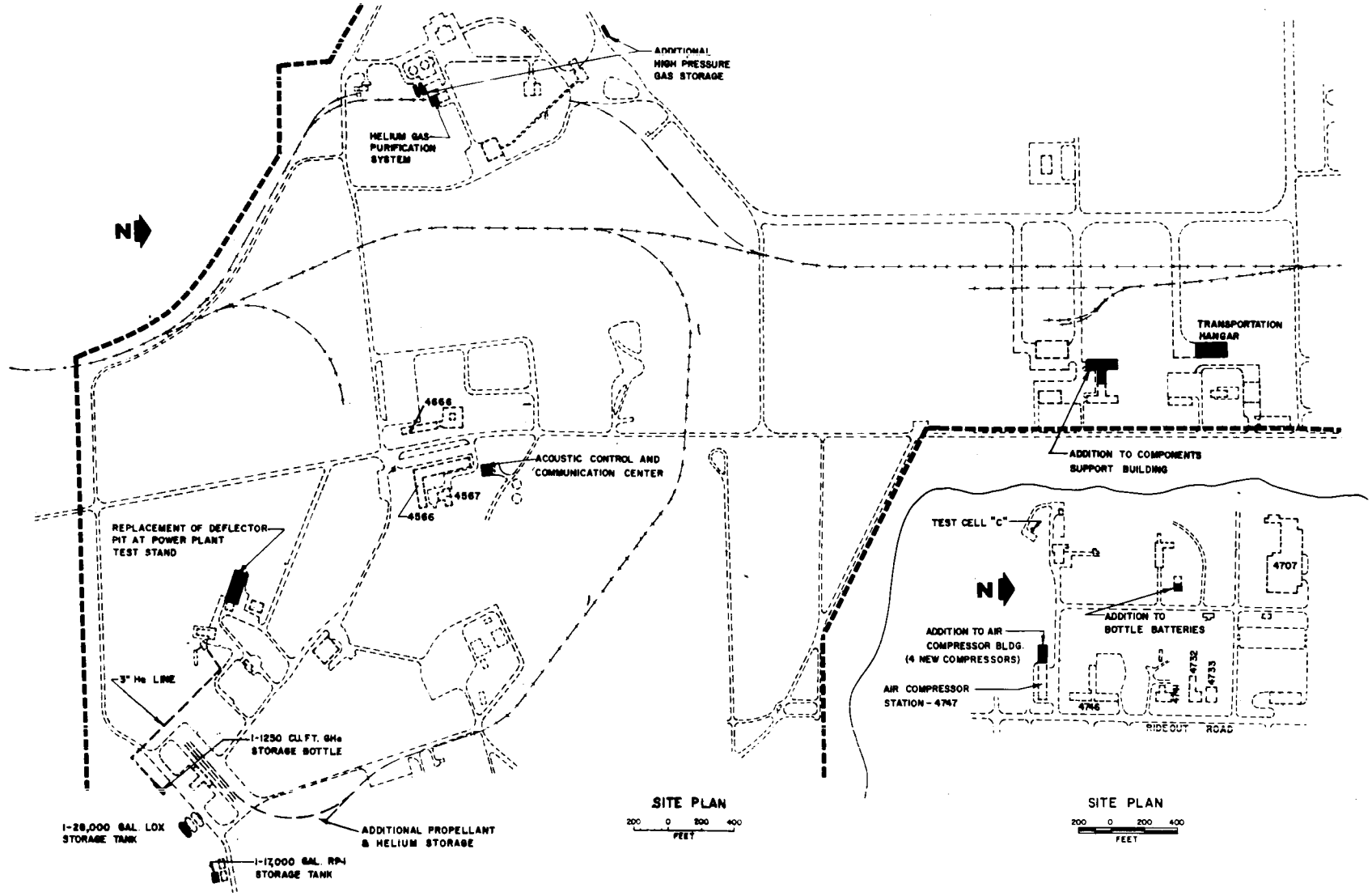


ADDITIONAL PROPELLANTS & HELIUM STORAGE AT EAST STATIC TEST TOWER

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

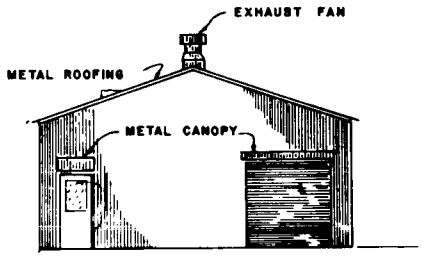
SATURN SUPPORT TEST AREA



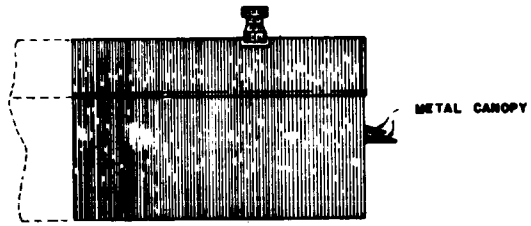
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA

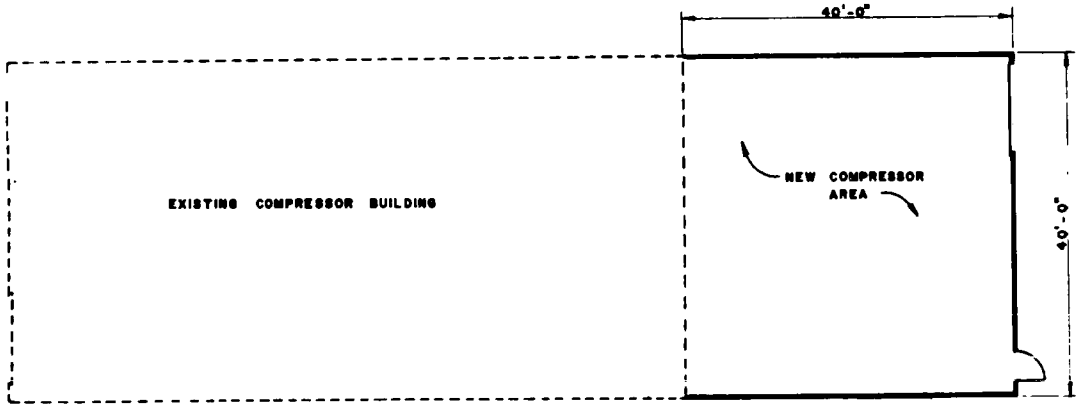


WEST ELEVATION



NORTH ELEVATION

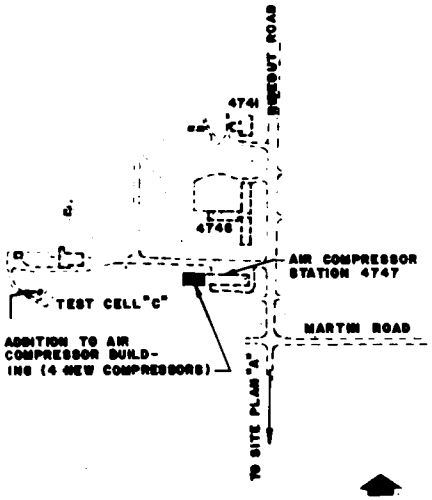
0 5 10 15 20
FEET



PLAN

0 5 10 15 20
FEET

HIGH PRESSURE AIR SYSTEM



SITE PLAN

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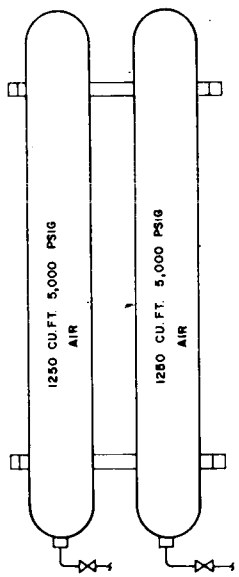
FEET

MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA



PLAN
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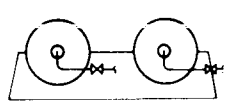

ELEVATION
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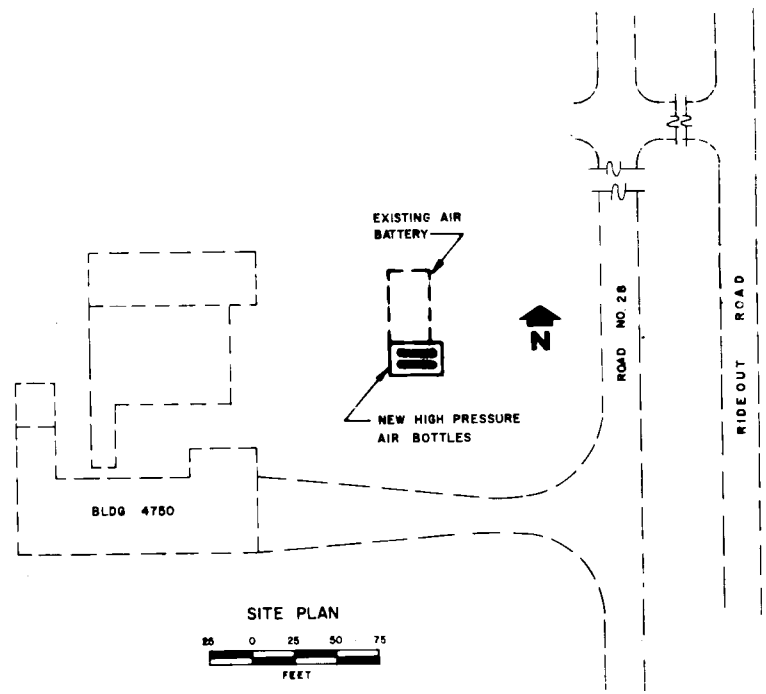
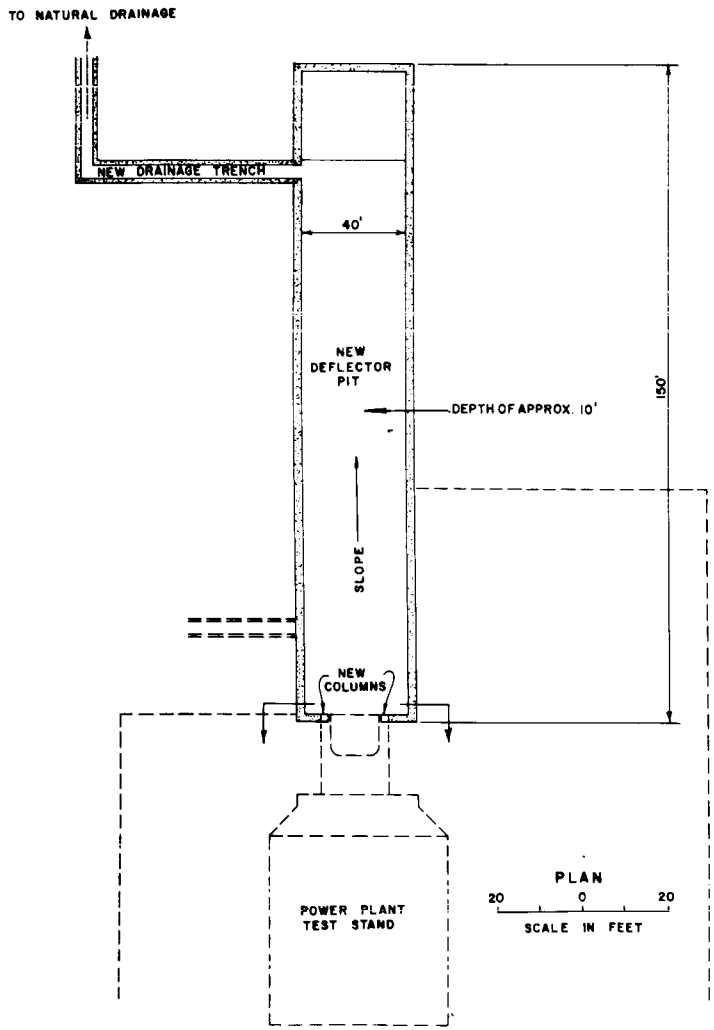


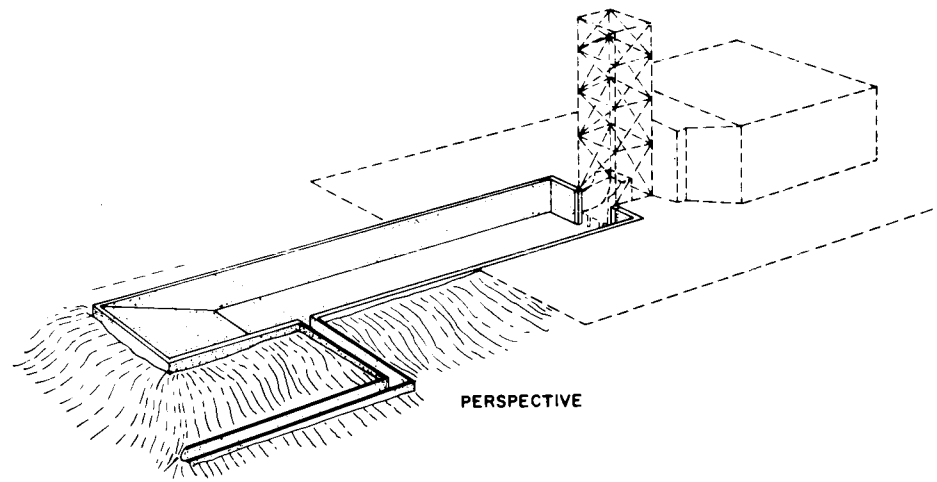
HIGH PRESSURE AIR SYSTEM

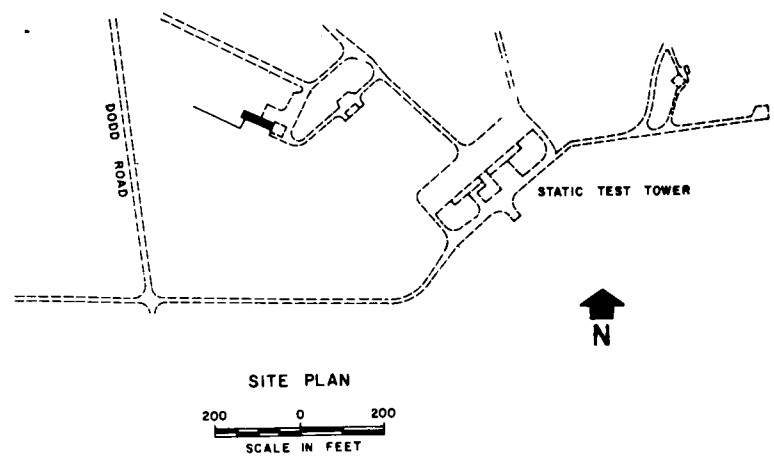
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA





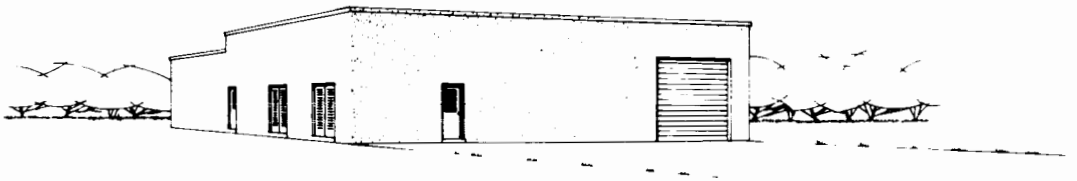


REPLACEMENT OF DEFLECTOR PIT AT POWER PLANT TEST STAND

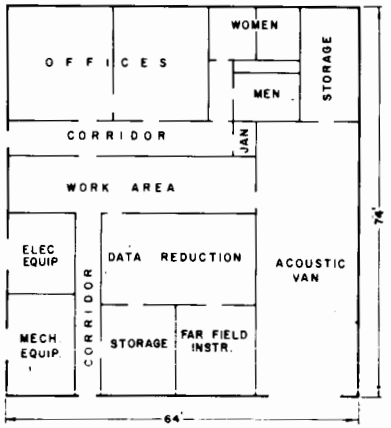
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA



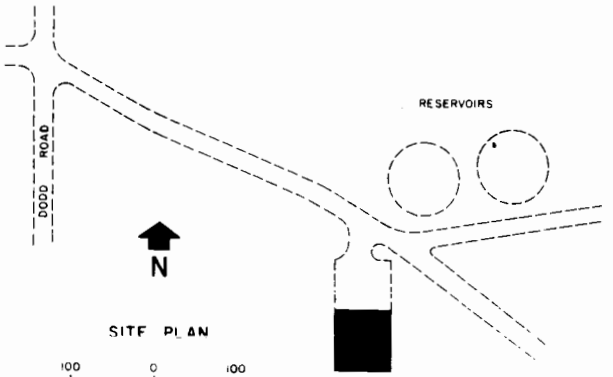
PERSPECTIVE



FLOOR PLAN

20 0 20

SCALE IN FEET



SITE PLAN

100 0 100

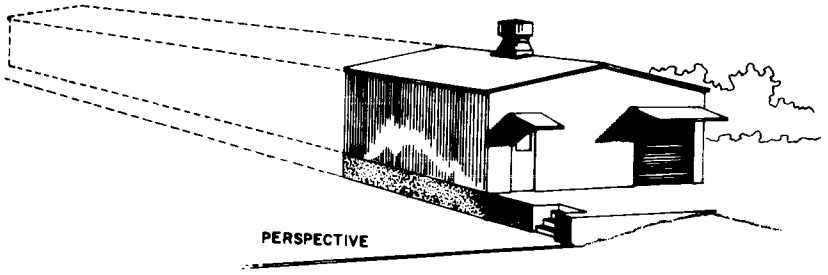
SCALE IN FEET

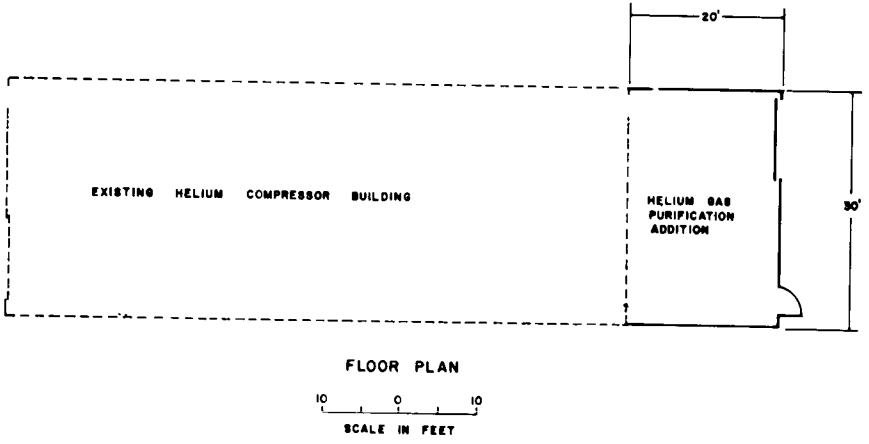
ACOUSTIC CONTROL AND COMMUNICATION CENTER

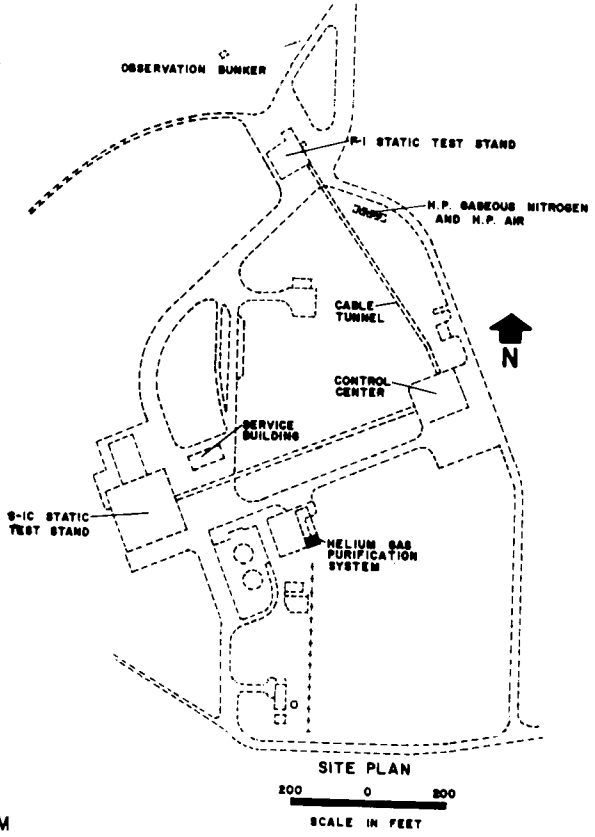
MARSHALL SPACE FLIGHT CENTER

FISCAL YEAR 1965 ESTIMATES

SATURN SUPPORT TEST AREA







HELIUM GAS PURIFICATION SYSTEM

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

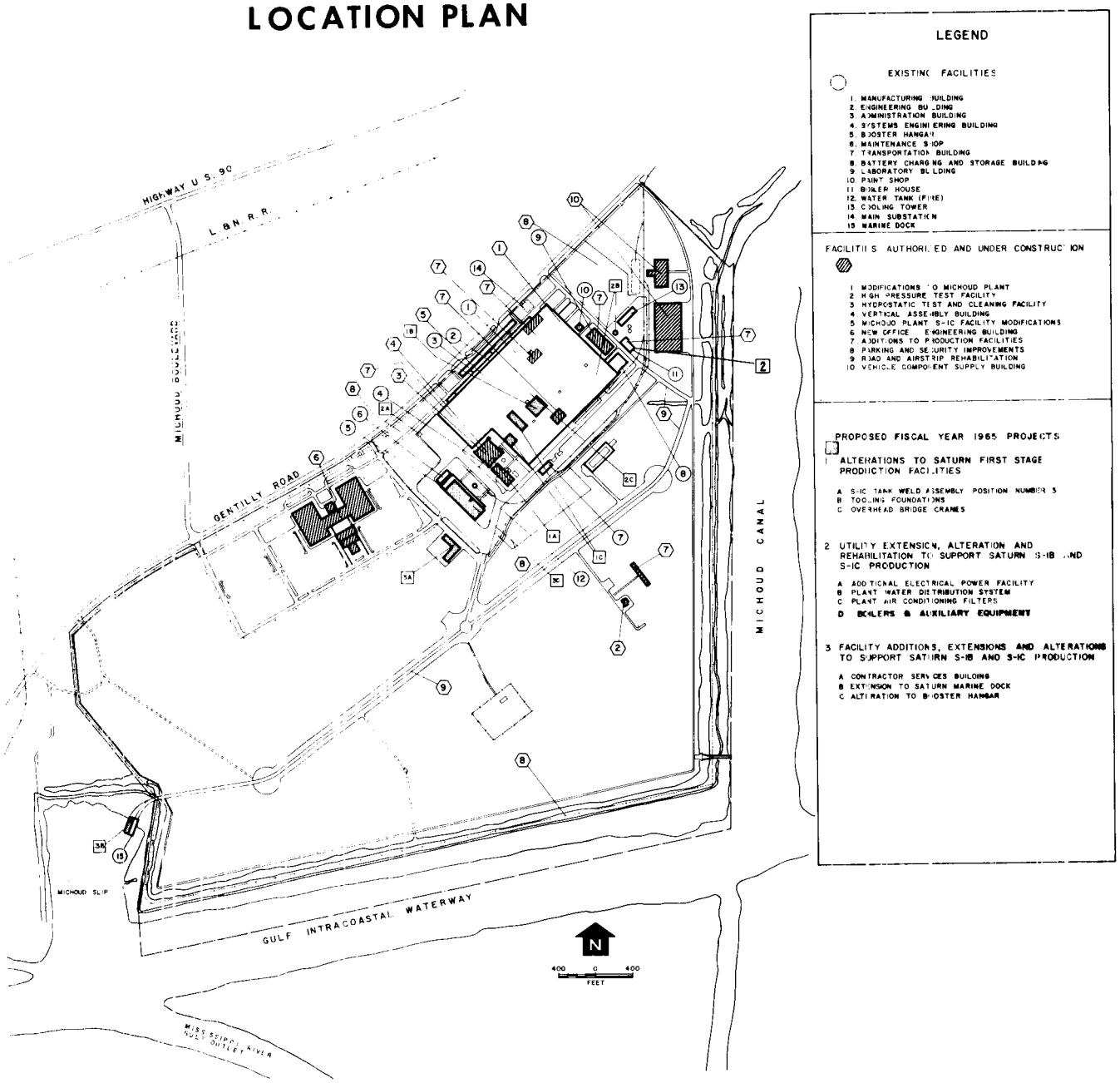
MICHOUD PLANT

	Page No.
Location plan	CF 10-1
Summary	CF 10-2
Office of Manned Space Flight Projects:	
Facility additions, extensions and alterations to support Saturn S-IB and S-IC production	CF 10-3
Alterations to Saturn first stage production facilities	CF 10-9
Central computer facility extensions and alterations	CF 10-13
Utility extension, alteration and rehabilitation to support Saturn S-IB and S-IC production	CF 10-16

MICHOUD OPERATIONS

FISCAL YEAR 1965 ESTIMATES

LOCATION PLAN



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Michoud Plant	Manned Space Flight	New Orleans, La.	Orleans Parrish	New Orleans

INSTALLATION MISSION

The mission of Michoud Plant is the manufacturing of the booster stage for the Saturn family of launch vehicles.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	207	350	380
CONTRACTOR & OTHER PERSONNEL	6,577	9,779	9,284
TOTAL ALL PERSONNEL	6,784	10,129	9,664

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	838.7	
LAND *(Lease or Permit)*	---	
PLANT VALUE *(as of June 30, 19)*		$80,496
TOTAL	838.7	$80,496

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Facility additions, extensions, and alterations to support Saturn S-IB and S-IC production	MSF	---	161.0	2,735.0	---	2,896.0
Alterations to Saturn first stage production facilities	MSF	---	36.0	628.0	---	664.0
Central computer facility extensions and alterations	MSF	390.0	85.0	1,160.0	---	1,635.0
Utility extension, alteration and rehabilitation to support Saturn S-IB and S-IC production	MSF	---	80.0	2,011.0	---	2,091.0
TOTAL FOR PROJECTS IN FY 19 ESTIMATE				6,534.0		

CF 10-2

NASA FORM 1029 DEC 63

GPO 888-667

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITY ADDITIONS, EXTENSIONS AND ALTERATIONS TO SUPPORT S-IB AND S-IC PRODUCTION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Michoud Plant

LOCATION OF PROJECT: New Orleans, Orleans Parish, Louisiana

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New, Alteration, Extension

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$161,000
FY 1965 Estimate	2,735,000
Total Funding Through FY 1965	$2,896,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$2,666,900
Site preparation, roadways, and paving	LS	---	$584,200	584,200
Contractor services building	Sq. Ft.	74,300	19.43	1,443,500
Extension to saturn marine dock	LS	---	294,300	294,300
Alterations to booster hangar	LS	---	344,900	344,900
Equipment	---	---	---	---
Design	---	---	---	---
		Subtotal		$2,666,900

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter				$68,100
		TOTAL		$2,735,000

PROJECT DESCRIPTION:

This project provides the following items: (1) Construction of an "L" shaped contractor services building of approximately 74,300 square feet, to house firefighting, plant security, communication, medical, photographic, printing reproduction, automotive-maintenance and administrative functions; (2) Extensions to the Saturn marine dock to provide approximately 15,000 additional square feet and a port operations building of approximately 2,400 square feet; (3) Alterations to an existing 70,000 square foot hangar to permit the storage of stages awaiting shipment and/or refurbishment.

PROJECT JUSTIFICATION:

The Contractor services building is needed to combine the Saturn S-IB and S-IC support services into a single centrally located facility. Existing facilities are either too small or obsolete. The existing fire station shed must be replaced because it is now ineffectively located in a highly congested shipping and receiving area which inhibits rapid movement. In addition, the existing facility is too small to accommodate increased equipment assignments, nor does it provide sleeping quarters which in turn leads to a three-shift operation. The existing communication center cannot accommodate equipment needed to support existing buildings and those currently under construction. The infirmary now available was designed to support a maximum of 7,000 personnel, whereas the present staffing plan calls for more than 9,000 to be located at Michoud. A larger facility is therefore required. The reproduction, printing and photographic workload has increased to such a degree that present facilities are totally inadequate. Although major automotive repairs are performed in local commercial shops, first and second echelon maintenance must be performed at the Plant for approximately 600 pieces of vehicular equipment. Existing facilities are capable of supporting only one-half this number.

Extension to Saturn marine dock - Port Michoud is the center of transportation operations for the loading and unloading of boosters manufactured at Michoud and the trans-shipment of all West Coast stages to the Mississippi Test Facility. Port Michoud will also be used as a trans-shipping point for all stages from MTF to the Cape. The Port will service the following type waterborne equipment: two River - Trans/Gulf Barges (48 feet beam; 260 feet length); two MTF shuttle barges (48 feet beam; 260 feet length); one West Coast barge (48 feet beam, 260 feet length); two Point Barrow type ships (72 feet beam, 465 feet

length); one "J" boat (12 feet - 6 inches beam, 45 feet length); and various steel barges (33 feet beam, 20 feet length).

To accommodate the processing of this quantity of cargo, it is necessary to enlarge the existing dock and provide an operations building.

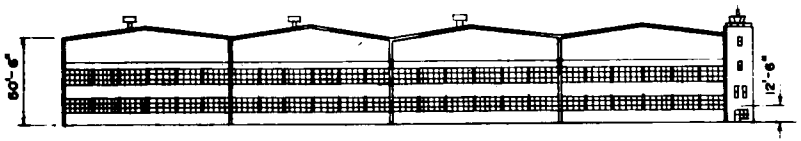
Alterations to existing hangar - Stage boosters must be stored in controlled environments while awaiting shipment or pending refurbishment at Michoud. This can be accomplished in the most economical manner by altering and repairing an existing hangar building and adding the proper environmental control equipment.

ESTIMATED FUTURE YEAR FUNDING: None

MICHOUD OPERATIONS

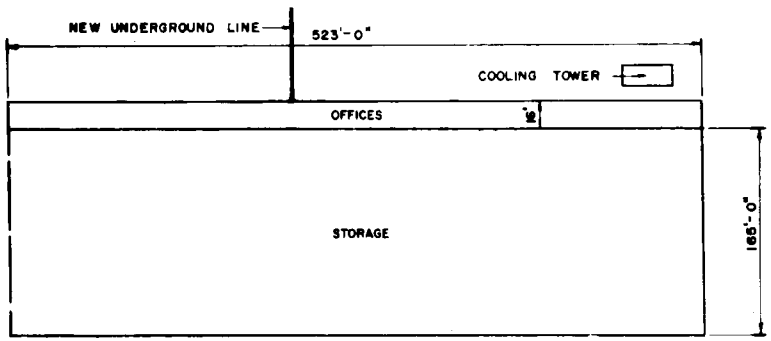
FISCAL YEAR 1965 ESTIMATES

FACILITY ADDITIONS, EXTENSIONS AND ALTERATIONS TO SUPPORT SATURN S-IB & S-IC PRODUCTION



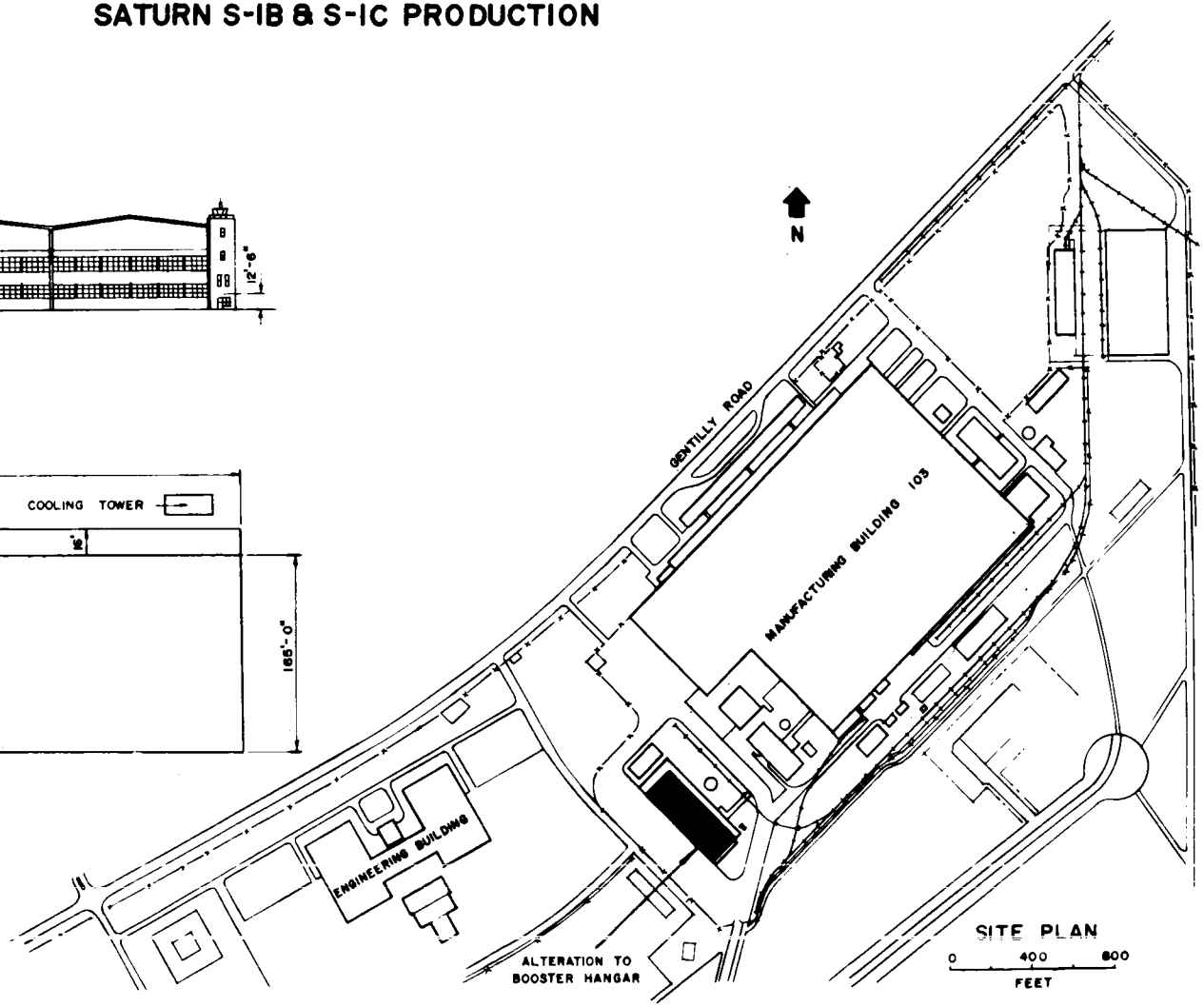
WEST ELEVATION

0 50 100
FEET



FLOOR PLAN

0 50 100
FEET



SITE PLAN

0 400 800
FEET

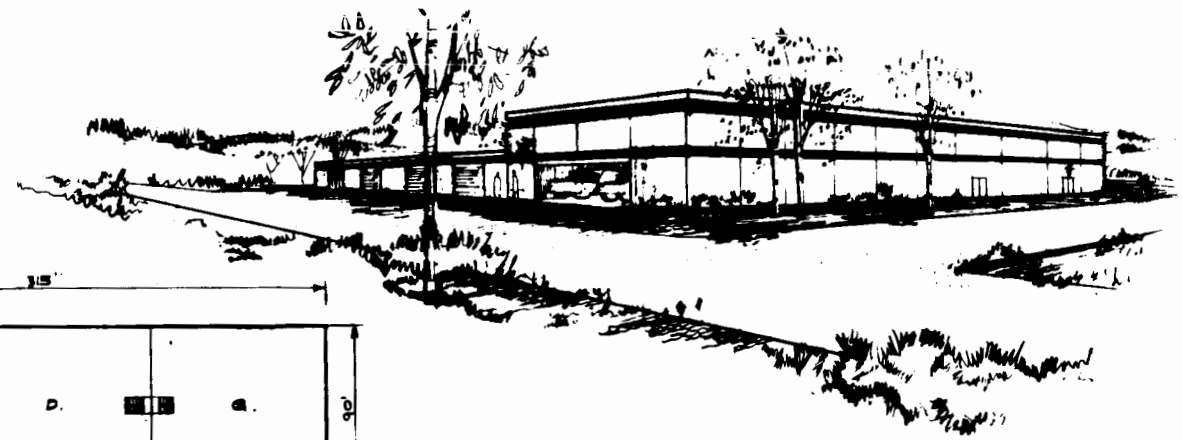
ALTERATION TO BOOSTER HANGAR

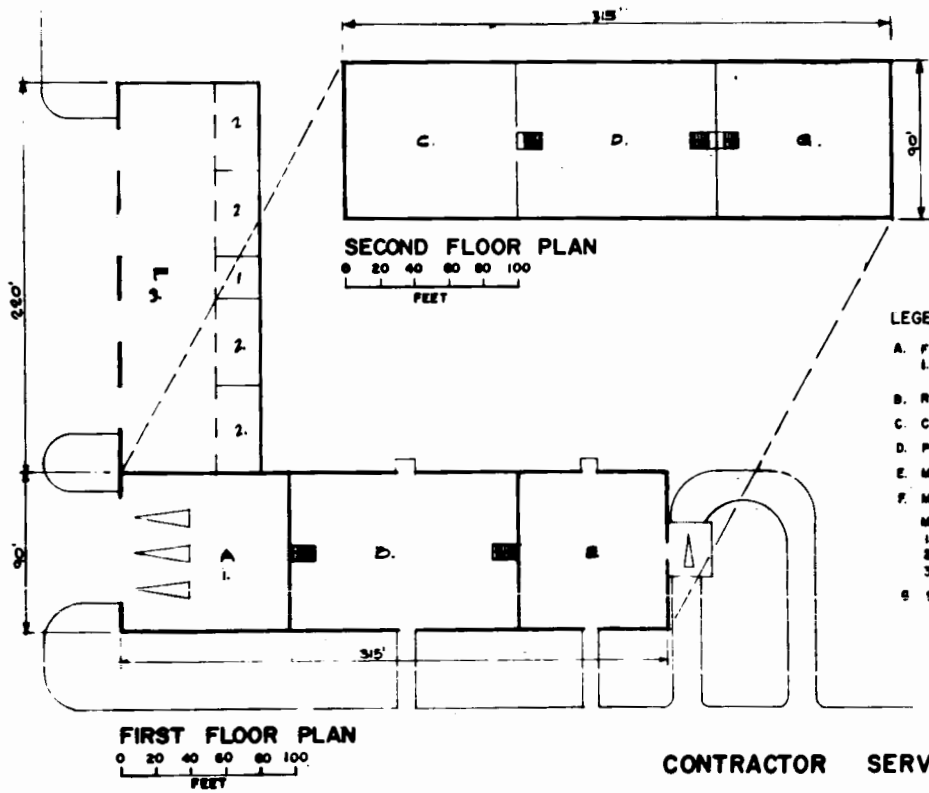
718-214 O - 64 - 30

MICHOUD OPERATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITY ADDITIONS, EXTENSIONS AND ALTERATIONS TO SUPPORT SATURN S-IB & S-IC PRODUCTION





LEGEND

A. FIREHOUSE AND GUARDHOUSE
1. ADMINISTRATION

B. REPRODUCTION

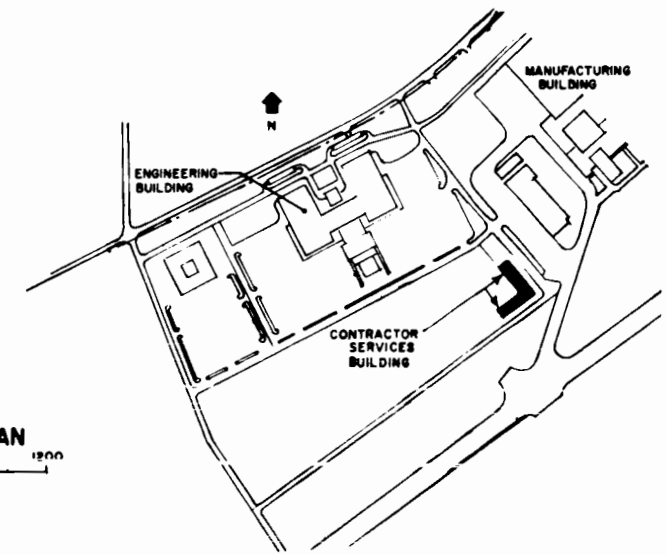
C. COMMUNICATIONS

D. PHOTOGRAPHY

E. MEDICAL CLINIC

F. MOTOR POOL & AUTOMOTIVE MAINTENANCE
1. OFFICE
2. SUPPLIES
3. SHOP

G. SLEEPING QUARTERS



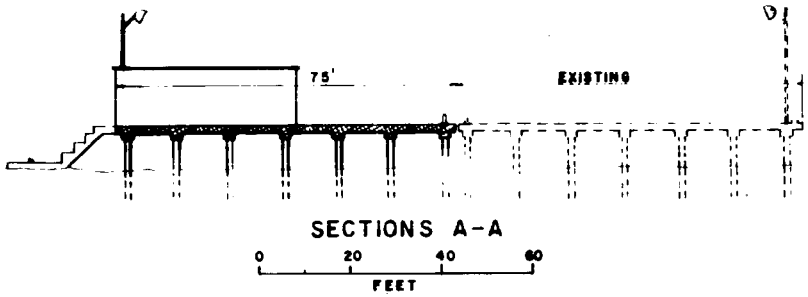
SITE PLAN
0 600 1200
FEET

CONTRACTOR SERVICES BUILDING

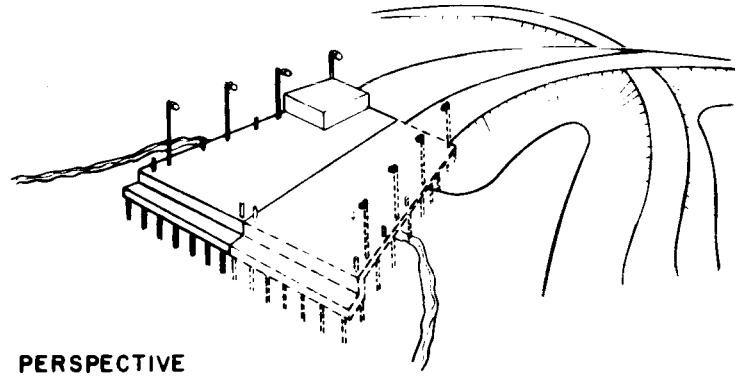
MICHOUD OPERATIONS

FISCAL YEAR 1965 ESTIMATES

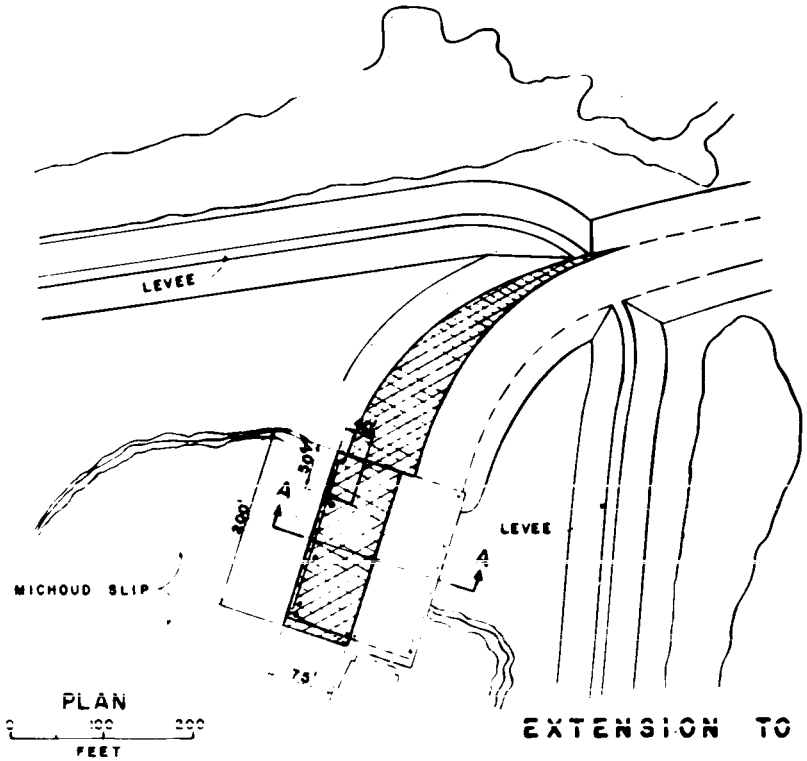
FACILITY ADDITIONS, EXTENSIONS AND ALTERATIONS TO SUPPORT SATURN S-IB & S-IC PRODUCTION



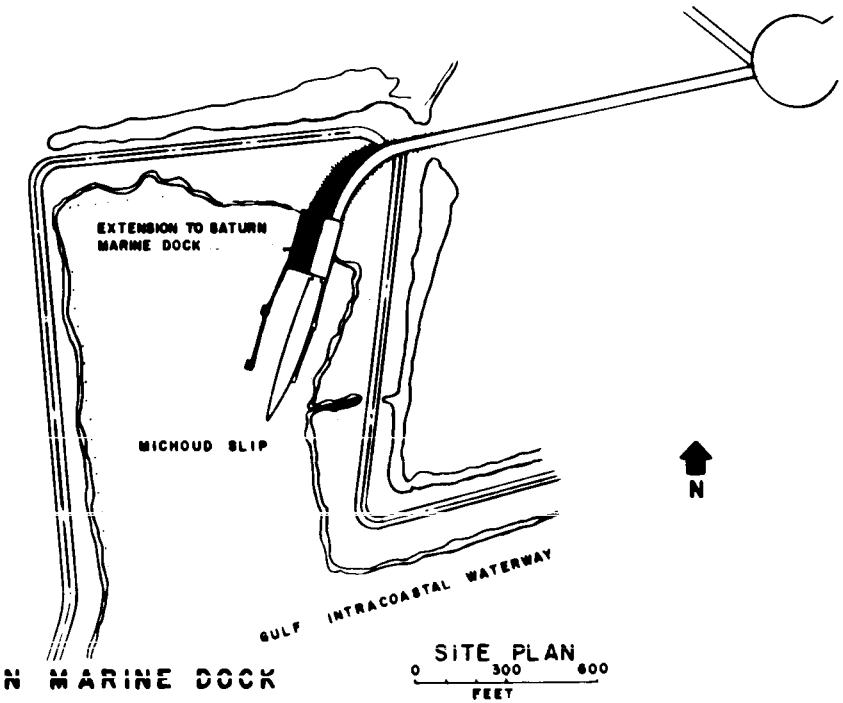
SECTIONS A-A



PERSPECTIVE



PLAN



SITE PLAN

EXTENSION TO SATURN MARINE DOCK

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ALTERATIONS TO SATURN FIRST STAGE PRODUCTION FACILITIES

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Michoud Plant

LOCATION OF PROJECT: New Orleans, Orleans Parish, Louisiana

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$36,000
FY 1965 Estimate	628,000
Total Funding Through FY 1965	$664,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$628,000
S-1C Tank weld position No. 3	LS	---	$282,000	282,000
Tooling foundations	LS	4,900	191,000	191,000
Overhead bridge cranes	LS	---	155,000	155,000
Equipment	---	---	---	---
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
			TOTAL	$628,000

PROJECT DESCRIPTION

This project provides for construction of the following items:

Tank weld assembly position No. 3. A third tank assembly position within the existing Vertical Assembly Building. The assembly tower will be approximately 60 feet by 60 feet by 106 feet high, fabricated of structural steel. Three work platforms for the welding areas of the tank will be provided.

Tooling foundations. Special reinforced concrete foundations to support additional weld and assembly fixtures are required in the Minor Assembly Area for production of the S-1C booster.

Overhead bridge cranes. The purchase and installation of: (1) a 15-ton electrically operated bridge crane with five-step variable speeds on bridge trolley and hoist with a sixty-foot span and eighty-foot runway to be located in the Engine Buildup Area and (2) a five-ton crane with 80-foot span and 100-foot runway located in the Production Parts Control Area. (3) Associated building truss modifications and electrical work.

PROJECT JUSTIFICATION:

Tank weld assembly position No. 3. To meet the presently scheduled S-1C delivery rate, a third tank assembly position is needed to fabricate and rework S-1C LOX and Fuel Tanks. This position is required to be available to handle the S-1C-4 in November 1965.

Tooling foundation. Foundations must be individually designed for each specific tool because of the type of subsoil conditions in the area.

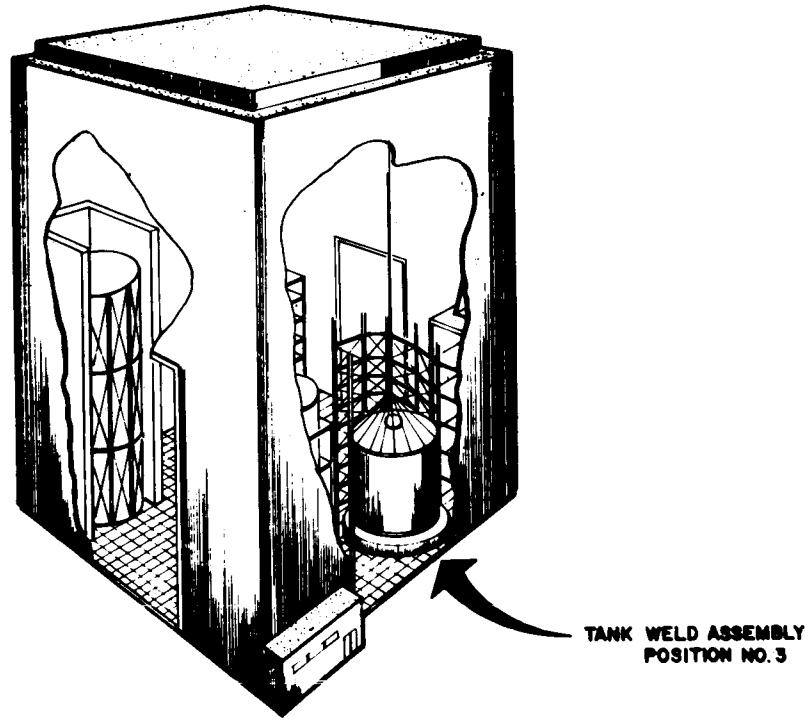
Overhead bridge cranes. A bridge crane is required to transfer F-1 engines from the shipping containers to the thrust chamber dolly fixture and thence to the engine installer dolly. The weight, value, and precision-type handling required prohibit the use of portable rigs. The five-ton crane is required to move S-1C stage components into and out of the Production Parts Control area. Transferring these parts by overhead bridge crane will reduce safety hazards, improve space utilization and efficiency and minimize the possibility of damage to components being moved into and out of the area.

ESTIMATED FUTURE YEAR FUNDING: None

MICHOUD OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ALTERATIONS TO SATURN FIRST STAGE PRODUCTION FACILITIES



PERSPECTIVE

S-IC TANK WELD ASSEMBLY POSITION NO. 3

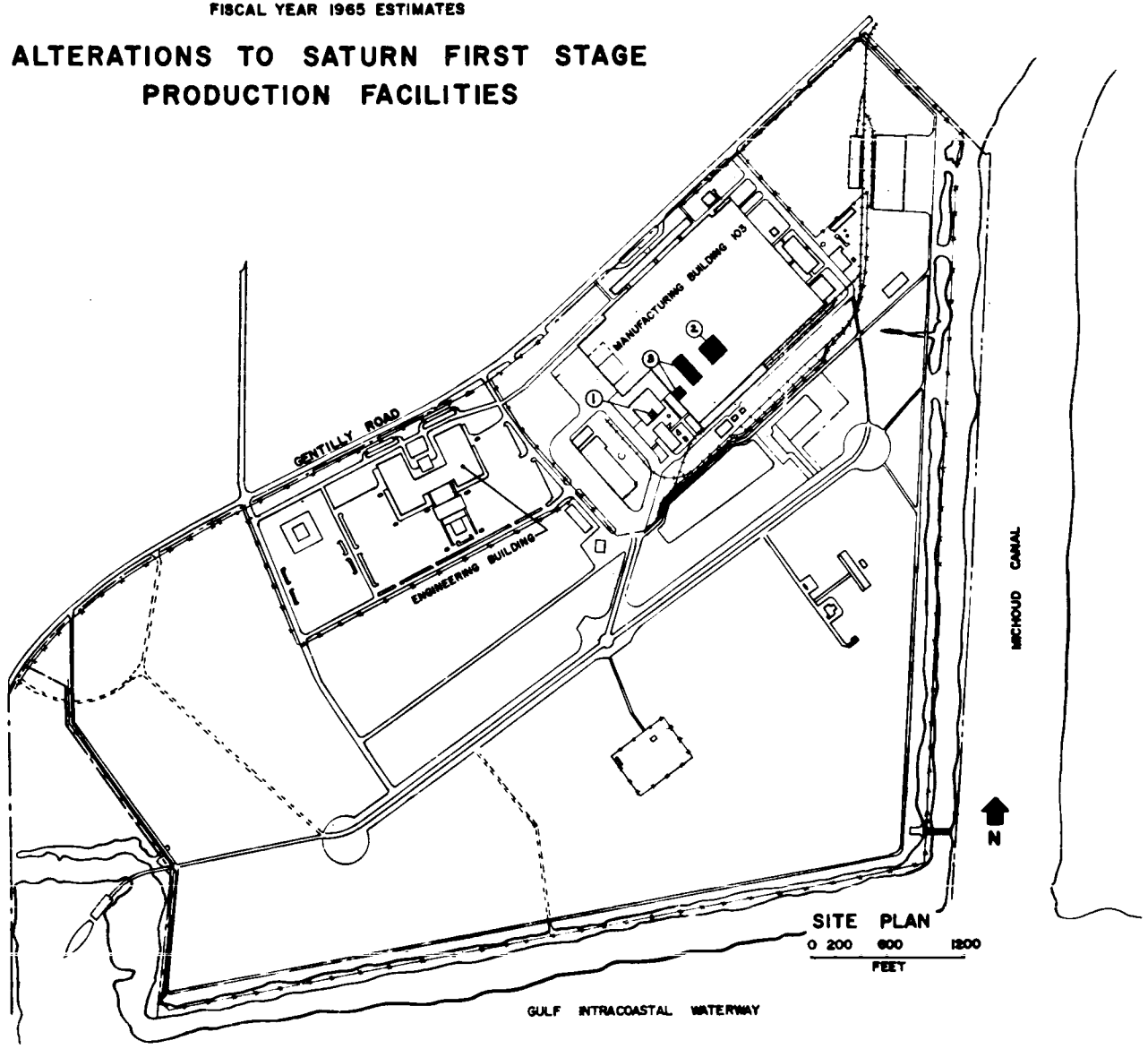
MICHOUD OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ALTERATIONS TO SATURN FIRST STAGE PRODUCTION FACILITIES

LEGEND

1 S-IC TANK WELD ASSEMBLY POSITION NO. 3
2 TOOLING FOUNDATIONS
3 OVERHEAD BRIDGE CRANES



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

CENTRAL COMPUTER FACILITY EXTENSIONS AND ALTERATIONS

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Michoud Plant

LOCATION OF PROJECT: Slidell, St. Tammany Parish, Louisiana

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Extension and Alteration

FUNDING:

FY 1963 and Prior Years	$390,000
FY 1964 Estimate	85,000
FY 1965 Estimate	1,160,000
Total Funding Through FY 1965	$1,635,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,160,000
Building extensions	Sq. Ft.	33,400	$32.52	1,086,400
Building alterations	Sq. Ft.	6,600	11.15	73,600
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$1,160,000

PROJECT DESCRIPTION:

This project provides for an extension and alterations to the existing Central Computer Facility which serves NASA Michoud Plant, Mississippi Test Facility (MTF), Chrysler Corporation (S-IB stage contractor), the Boeing Company (S-IC stage contractor), Mason-Rust (support contractor at Michoud), North American Aviation (S-II stage contractor), and General Electric (support contractor at MTF). The extension will provide for approximately 33,400 square feet of additional space which will be divided into a basement, first and second floors. Construction features will include steel and reinforced concrete framework, concrete floor, and prefabricated metal panel curtain walls which will match the existing building. The utility system will be expanded to accommodate the new structure. In addition, alterations will be made within the existing structure to effect maximum utilization of space.

PROJECT JUSTIFICATION:

The Facility is NASA managed with operational functions performed by a computer specialist contractor (Telecomputing Services, Inc.), and computer programs prepared by the various NASA contractors. Space requirements at the Central Computer Facility includes space for the computers and allied equipment; data transmission equipment; NASA supervisory-management personnel; and programming-engineering personnel representatives of each of the contractors: Chrysler Corporation, The Boeing Company, Mason-Rust, General Electric Company and North American Aviation, totalling approximately 320 contractor personnel and ten NASA personnel.

The existing former Federal Aviation Administration building is not adequate to house the equipment and operating personnel needed to support the Saturn computer requirements through fiscal year 1965 at Michoud and Mississippi Test Facility.

The existing areas, plus the new addition, will yield approximately 60,000 net square feet. The space will provide about 32,000 square feet needed for computer areas, and 28,000 square feet needed for general support space.

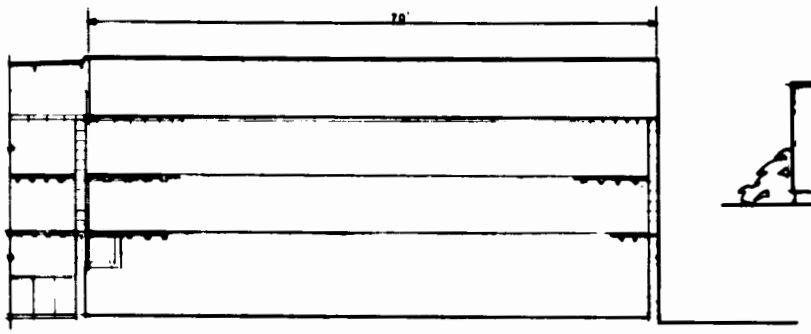
It is essential that additional computer capability become available in the proper time to support the Michoud and Mississippi Test Facility. The proposed extension has been scheduled to keep pace with the static test activity at the Mississippi Test Facility which will achieve major operational status during 1966.

ESTIMATED FUTURE YEAR FUNDING: None

MICHOUD OPERATIONS

FISCAL YEAR 1965 ESTIMATES

CENTRAL COMPUTER FACILITY EXTENSIONS AND ALTERATIONS



SECTION "A-A"

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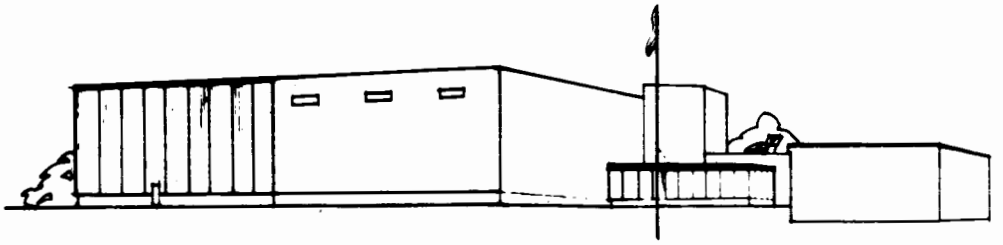

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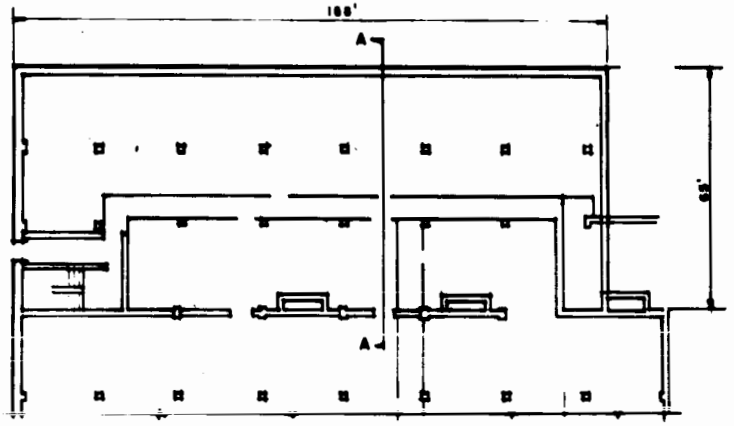
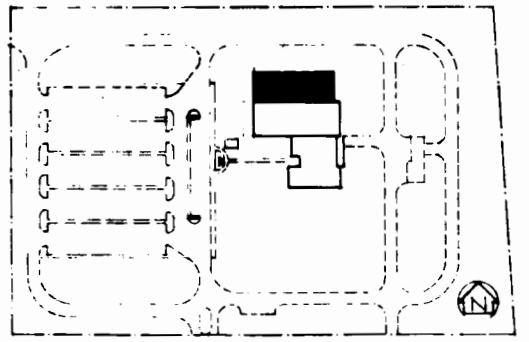


FLOOR PLAN

NOT TO SCALE



SITE PLAN

0 100 200 FEET

SLIDELL, LOUISIANA

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

UTILITY EXTENSION, ALTERATION AND REHABILITATION TO SUPPORT SATURN S-IB AND S-IC PRODUCTION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Michoud Plant

LOCATION OF PROJECT: New Orleans, Orleans Parish, Louisiana

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Extension and Alteration

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	$80,000
FY 1965 Estimate	2,011,000
Total Funding Through FY 1965	$2,091,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$2,011,000
Additional electrical power	LS	---	$526,000	526,000
Plant water distribution system	LS	---	483,000	483,000
Plant air conditioning filters	LS	---	283,000	283,000
Boilers and auxiliary equipment	LS	---	719,000	719,000
Equipment	---	---	---	---
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
			TOTAL	$2,011,000

PROJECT DESCRIPTION:

This project provides for the following utility items essential to support approved S-1B and S-1C production schedules:

Additional Electrical Power Facility. This item provides for an addition to the west substation of the Michoud Complex, which includes an underground duct power distribution system to the load areas, and four additional distribution substations. The main substation addition will consist of two 115 KV-13.8 KV, 7,500 KVA transformers, 115 KV oil breakers, steel switch structures, 115 KV switches, and appropriate 13.8 KV switch gear.

Plant Water Distribution Systems. This item provides for an additional twelve-inch water main and the replacement of existing potable water and fire extinguishing distribution systems.

Plant Air Conditioning Filters. This item provides for the replacement of low-efficiency filters with high-efficiency filters in the fifty (50) factory air conditioning penthouses located on the roof of the plant above the S-1C manufacturing area.

Boilers and Auxiliary Equipment. This item provides for the continued rehabilitation and/or replacement of existing boiler units of the central heating and air conditioning system.

PROJECT JUSTIFICATION:

Additional Electrical Power Facility. The existing electrical power system at Michoud Operations has a capacity of 45,000 KVA and consists of one main substation of 30,000 KVA capacity, 115 KV to 13.8 KV, located at the north corner of the Manufacturing Building, and a second substation of 15,000 KVA capacity, 115 KV to 13.8 KV, located on the western side of the Manufacturing Building. Additions to the production facilities requested in the 1965 budget will increase the total power requirement to 60,000 KVA; therefore, an additional 15,000 KVA is necessary.

Plant Water Distribution Systems. The capacity of the existing twelve-inch main at Michoud is approximately 1,500 gallons per minute. Present estimates have determined that upon attainment of peak booster production in 1965, potable water requirements will total approximately 2,900 gallons per minute. To provide this capacity, an additional twelve-inch water main must be installed. In addition, existing pumps, and potable water and fire distribution systems, which are over twenty years old and badly deteriorated, must be replaced.

Plant Air Conditioning Filters. Airborne contamination in the vicinity of the Michoud Complex is excessive, especially during periods of stagnant low pressure conditions when fog, smoke, and smog from burning of refuse dumps, are prevelant. High efficiency type filters are essential to avoid contamination of Stage Components by oily films and foreign particles.

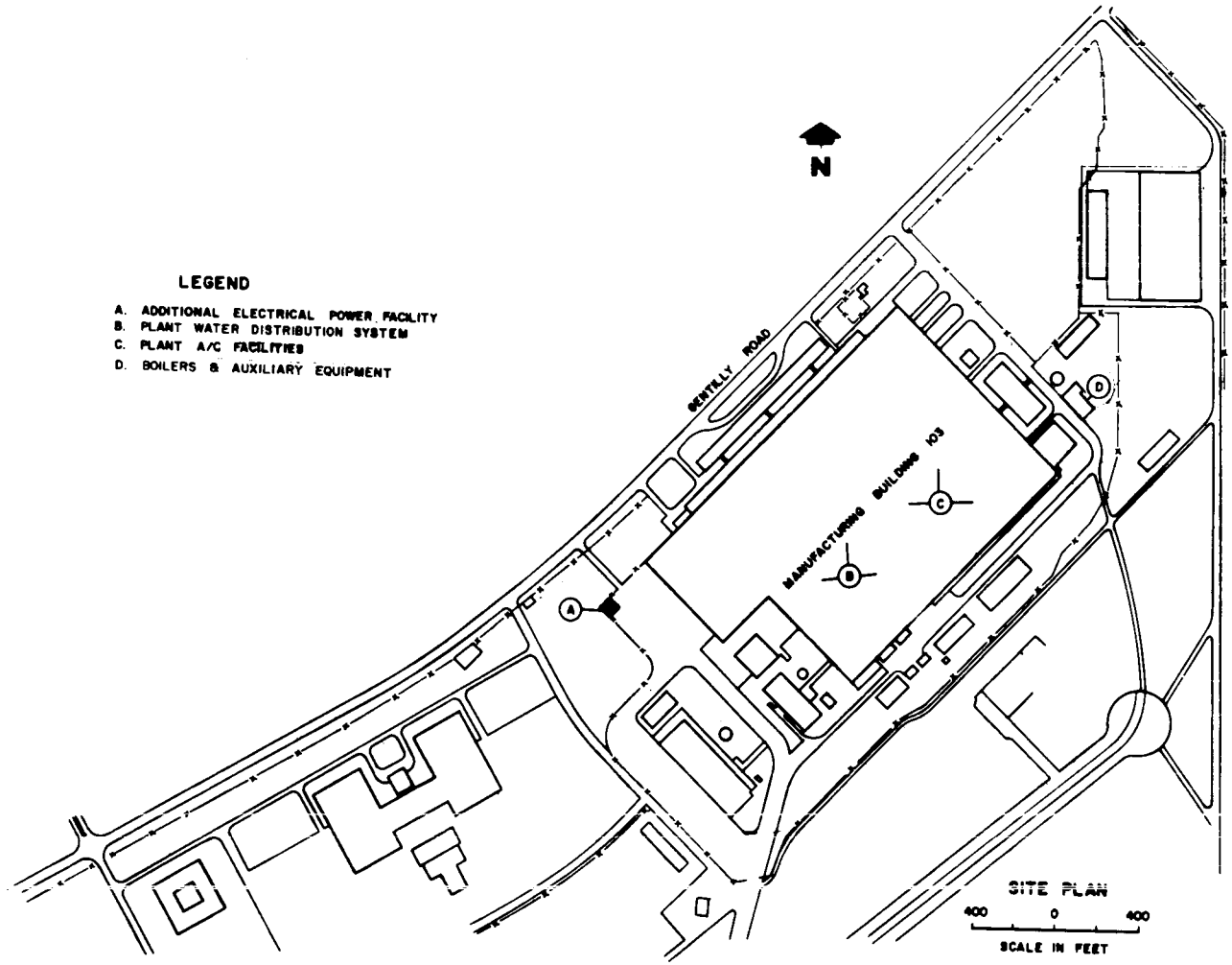
Boilers and Auxiliary Equipment. Existing boilers, which are twenty years old and have been idle for long periods of time, are either in need of extensive repairs or must be replaced. Also, production facility additions and new buildings have increased the demand for these services requiring the capacity of the existing system to be increased.

ESTIMATED FUTURE YEAR FUNDING: None

MICHOUD OPERATIONS

FISCAL YEAR 1965 ESTIMATES

UTILITY EXTENSION, ALTERATION AND REHABILITATION TO SUPPORT SATURN S-IB AND S-IC PRODUCTION



ADDITIONAL ELECTRICAL POWER FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

MISSISSIPPI TEST FACILITY

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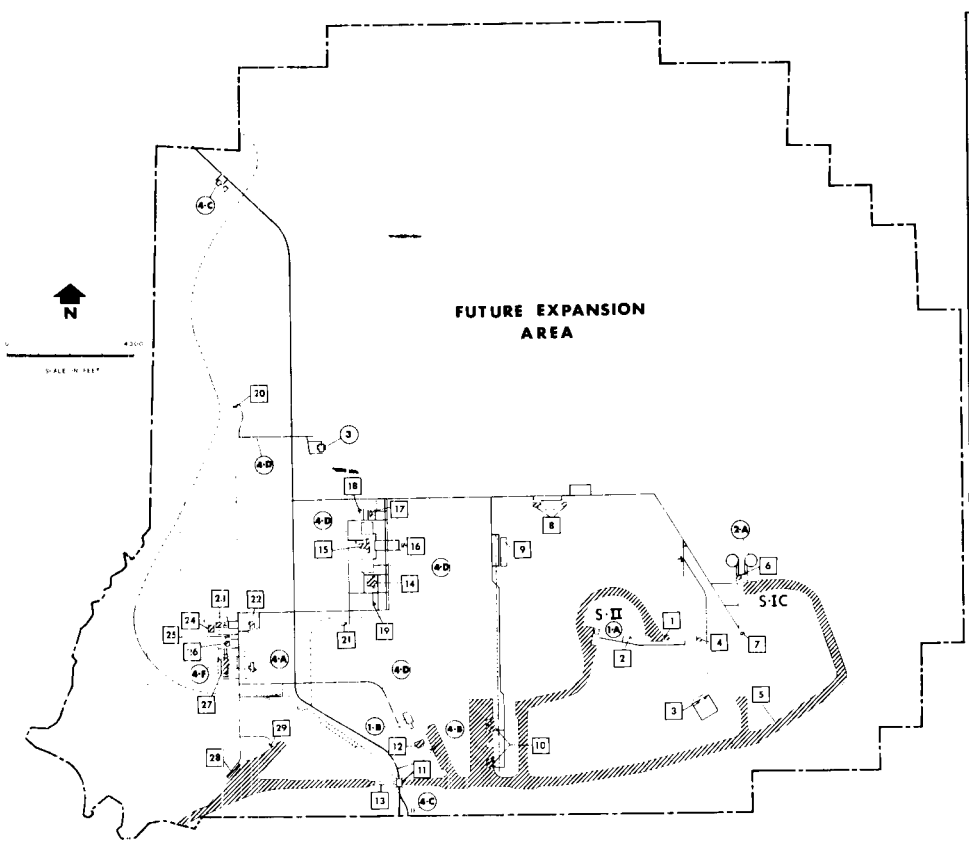
Location plan	CF 11-1
Summary	CF 11-2
Office of Manned Space Flight Projects:	
Additional utility installations and support facilities	CF 11-3
Component service facilities	CF 11-14
Saturn V first stage (S-IC) static test facility	CF 11-17
Saturn V second stage (S-II) static test facilities	CF 11-21

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

LOCATION PLAN



LEGEND

FACILITIES AUTHORIZED & UNDER CONSTRUCTION

1. S-II TEST STAND
2. S-II TEST CONTROL CENTER
3. HIGH PRESSURE WATER PUMPING STATION
4. DATA ACQUISITION FACILITY
5. CANAL DREDGING
6. S-IC TEST STAND
7. S-IC TEST CONTROL CENTER
8. CENTRAL COMPRESSOR BUILDINGS
9. RP-1 CENTRAL STORAGE
10. CRYOGENICS STORAGE AND TRANSFER STATION
11. CANAL BRIDGE
12. S-IC BOOSTER STORAGE BUILDING
13. NAVIGATION LOCK
14. ELECTRONICS, INSTRUMENTATION AND MATERIALS LABORATORY
15. OFFICE AND ADMINISTRATION BUILDING
16. DATA HANDLING CENTER
17. CENTRAL CONTROL BUILDING
18. COMMUNICATIONS AND TELEPHONE BUILDING
19. ACOUSTICS LABORATORY BUILDING
20. METEOROLOGICAL BUILDING
21. CENTRAL HEATING PLANT
22. EMERGENCY SERVICE BUILDING
23. SITE MAINTENANCE BUILDING
24. TEST MAINTENANCE BUILDING
25. WELDING TANK STORAGE BUILDING
26. INFLAMMABLE MATERIALS STORAGE BUILDING
27. WAREHOUSE
28. CONSTRUCTION DOCK
29. RP-1 TRANSFER DOCK

PROPOSED FISCAL YEAR 1965 PROJECTS

1. SATURN V SECOND STAGE (S-II) STATIC TEST FACILITIES
   - A. TEST STAND
   - B. SLAG STORAGE BUILDING ADDITION
2. SATURN V FIRST STAGE (S-IC) STATIC TEST FACILITIES
   - A. TEST POSITION 22C WITH SOUND SUPPRESSORS
3. COMPONENTS SERVICE FACILITIES
4. ADDITIONAL UTILITY INSTALLATIONS & SUPPORT FACILITIES
   - A. MOBILE EQUIPMENT OPERATIONS BLDG
   - B. CRYOGENIC BARGE SERVICE BUILDING
   - C. SECURITY CONTROL FACILITIES
   - D. FIRE ROADS
   - E. ACCESS ROADS TO INSIDE FEE AREA
   - F. WAREHOUSE ADDITIONS

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Mississippi Test Facility	Manned Space Flight	Pearl River, Miss.	Hancock	Bay St. Louis, Miss.

INSTALLATION MISSION

The mission of Mississippi Test Facility is the Static Test Firing of large vehicle stages and propulsion systems.

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	23	96	155
CONTRACTOR & OTHER PERSONNEL	21	574	2,313
TOTAL ALL PERSONNEL	44	670	2,468

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	26,624	
LAND *(Lease or Permit)*	115,326	
PLANT VALUE *(as of June 30, 1963)*		12,371
TOTAL	141,950	12,371

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Additional utility installations and support facilities	MSF	4,615.9	9,431.8	9,533.0	---	23,580.7
Components service facilities	MSF	130.0	150.0	5,499.0	---	5,779.0
Saturn V first stage (S-IC) static test facility	MSF	13,216.0	38,473.8	26,384.0	---	78,073.8
Saturn V second stage (S-II) static test facilities	MSF	20,353.0	16,301.9	20,575.0	---	57,229.9
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				61,991.0		

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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Mississippi Test Facility

LOCATION OF PROJECT: Pearl River, Hancock County, Mississippi

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$4,615,900
FY 1964 Estimate	9,431,800
FY 1965 Estimate	9,533,000
Total Funding Through FY 1965	$23,580,700

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$7,150,200
Site preparation	LS	---	$275,000	275,000
Access roads (to fee area)	LS	---	1,075,400	1,075,400
Area roads and parking facilities	LS	---	2,908,600	2,908,600
Utilities	LS	---	584,000	584,000
North security control center	Sq. Ft.	3,800	22.60	85,900
South security control center	Sq. Ft.	6,200	22.60	140,200
Warehouse addition	Sq. Ft.	108,200	11.71	1,265,000
Salvage material storage building	Sq. Ft.	4,000	9.23	36,900

	Unit of Measure	Quantity	Unit Cost	Total Cost
Mobile equipment operation building	Sq. Ft.	35,000	$20.18	706,400
Cryogenic barge service building	Sq. Ft.	3,000	24.27	72,800
Equipment				$2,382,800
Mobile equipment operation building equipment	LS	---	103,200	103,200
Cryogenic barge service equipment	LS	---	237,200	237,200
Test maintenance shop equipment	LS	---	1,479,700	1,479,700
Control and communication systems	LS	---	474,400	474,400
Packaging and coating equipment	LS	---	88,300	88,300
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$9,533,000

PROJECT DESCRIPTION:

This project will provide the utilities and support facilities needed to support presently planned test programs at the Mississippi Test Facility. It will include off-site access roads connecting the North and South entrances with existing State Highways (located in the buffer zone not entirely owned in fee by the U.S. Government), the major road network at the site in the fee area, consisting of (1) a four-lane North-South road approximately 4.5 miles long; (2) two-lane access roads comprising a total of approximately 5 miles; and (3) 12-mile, one-lane patrol road around the northern and eastern boundaries of the fee area; a North and South security control center; an additional 108,200 square feet of warehouse and storage area; a cryogenic barge service building of about 3,000 square feet; a mobile equipment operation building of about 35,000 square feet as central point for the operation and maintenance and minor repair of about 600 mobile vehicles; test maintenance equipment; and a control and communications system providing area-wide oral, aural and visual warning and communications.

PROJECT JUSTIFICATION:

This project provides for the completion of all support facilities and utilities required to activate the Mississippi Test Facility. Earlier phases of this construction have been accomplished with prior year funds.

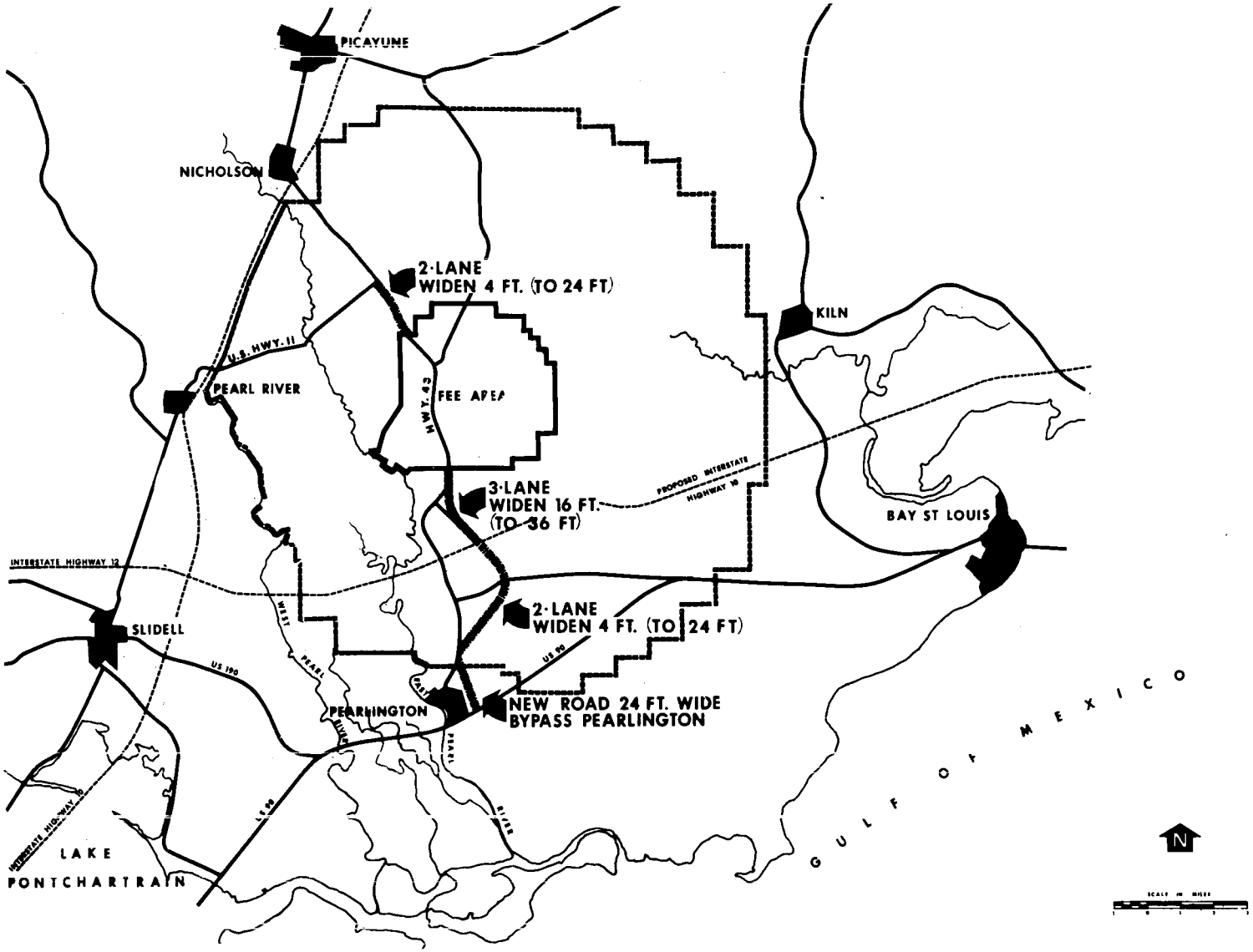
This year's funding increment includes provisions for the necessary access road system required to handle peak hour traffic loads exceeding 1,200 vehicles per hour at the South gate and 800 vehicles per hour at the North gate, a one-lane patrol road for security surveillance, and the North and South security control centers. The project also provides for completion of the maintenance and storage facilities necessary for the scheduled test activity as well as the cryogenic service building required to maintain and service the highly specialized and complex cryogenic equipment carried by the cryogenic propellant barges.

ESTIMATED FUTURE YEAR FUNDING: None

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES

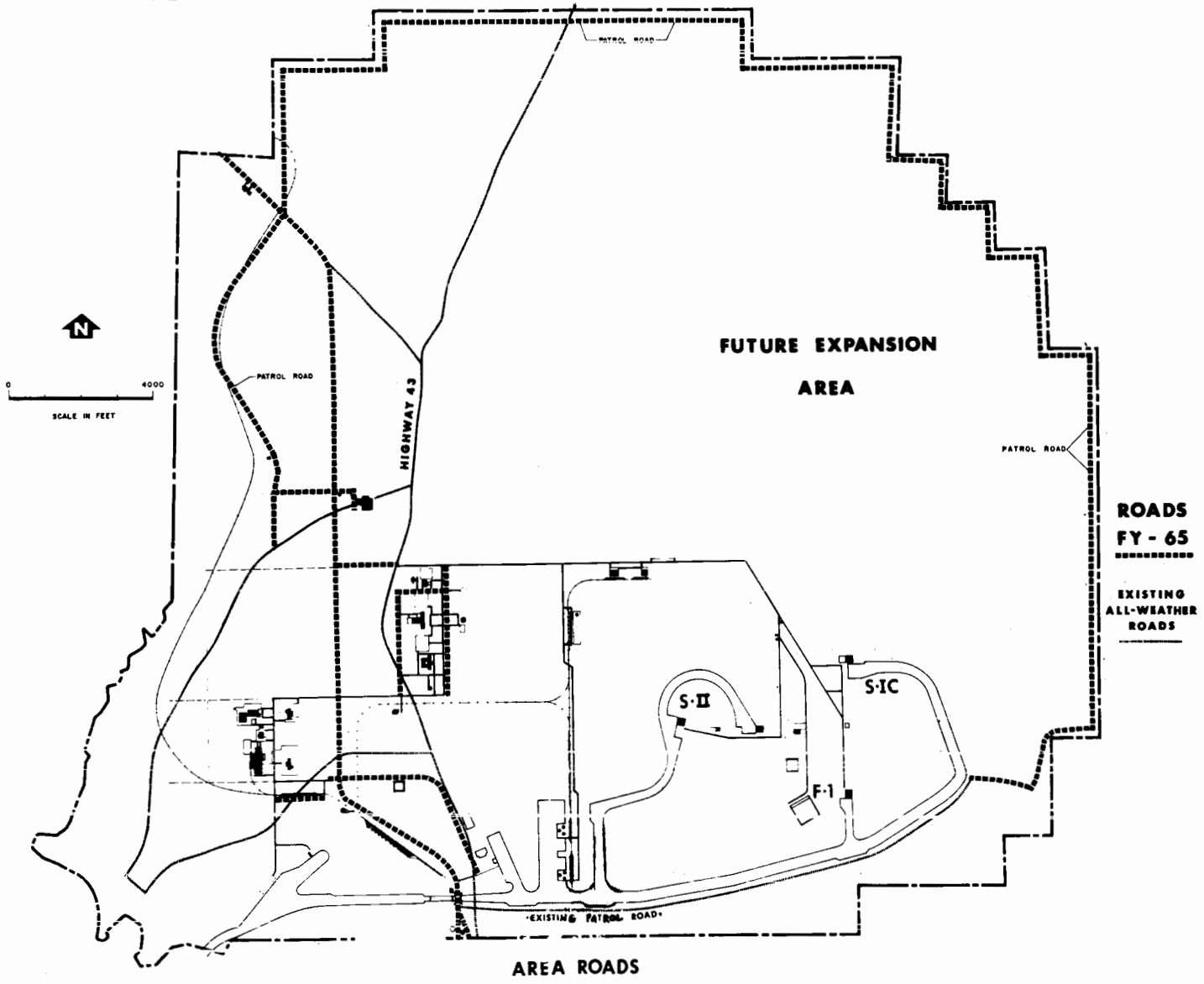


TEST SITE ACCESS ROADS

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES

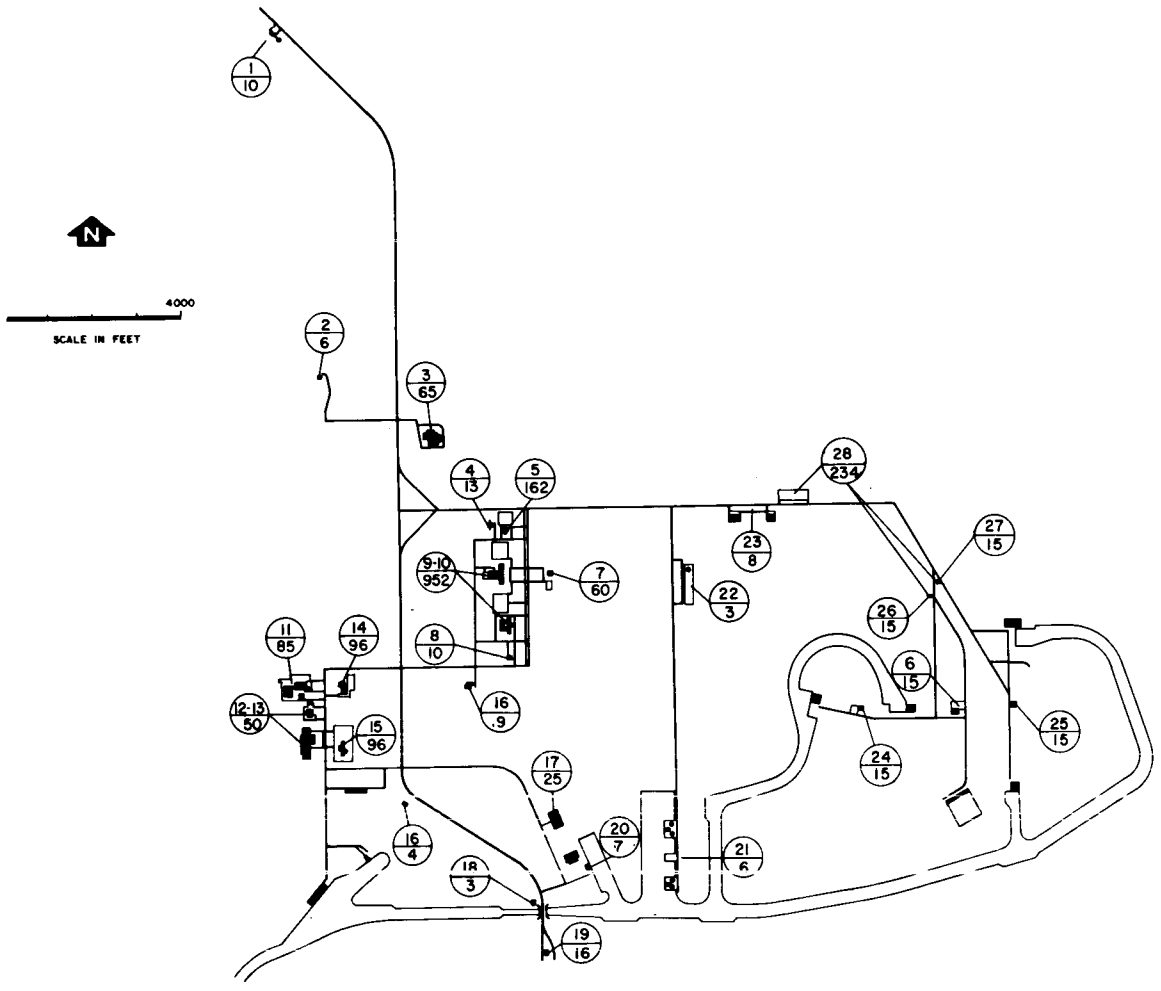


AREA ROADS

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES



LEGEND

		FY 1964	FY 1965	TOTAL
1.	NORTH SECURITY CENTER		10	10
2.	METEOROLOGICAL BUILDING		6	6
3.	COMPONENT SERVICE FACILITY		65	65
4.	COMMUNICATION BUILDING	13		13
5.	TEST AREA CONTROL CENTER	12	150	162
6.	DATA ACQUISITION FACILITY	15		15
7.	DATA HANDLING FACILITY	60		60
8.	ACOUSTICS LAB	10		10
9.	ELECTRONICS, INSTRUM. & MTLS. LAB	421	531	952
10.	OFFICE AND ADMINISTRATION BUILDING			
11.	MAINTENANCE BUILDINGS	35	50	85
12.	STORAGE AREAS		50	50
13.	WAREHOUSE			
14.	EMERGENCY SERVICE BUILDING	30	66	96
15.	MOBILE EQUIPMENT OPERATIONS BUILDING		96	96
16.	HEATING PLANT	9		9
17.	S-II SERVICE AND STORAGE BUILDING		25	25
18.	BRIDGE AND LOCKS CONTROL		3	3
19.	SOUTH SECURITY CENTER		16	16
20.	CRYOGENIC BARGE SERVICE BUILDING		7	7
21.	CRYOGENICS STORAGE	6		6
22.	RP-1 STORAGE	3		3
23.	COMPRESSOR BUILDINGS	8		8
24.	S-II TEST CONTROL CENTER	15		15
25.	S-IC TEST CONTROL CENTER	15		15
26.	S-II COMPLEX GATE	15		15
27.	S-IC COMPLEX GATE	15		15
28.	SATURN V PARKING	74	160	234
	TOTALS	756	1235	1991

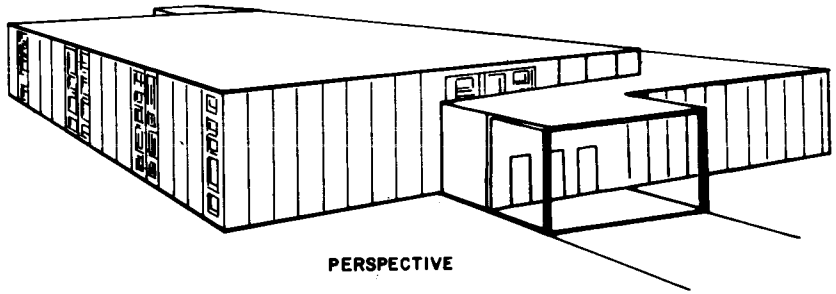
0 — NUMBER OF BUILDING OR FACILITY
00 — NUMBER OF SPACES ALLOCATED

VEHICLE PARKING SPACES

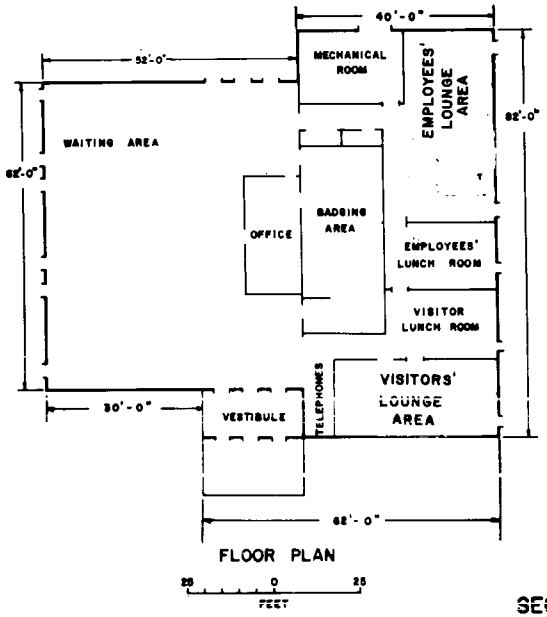
MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

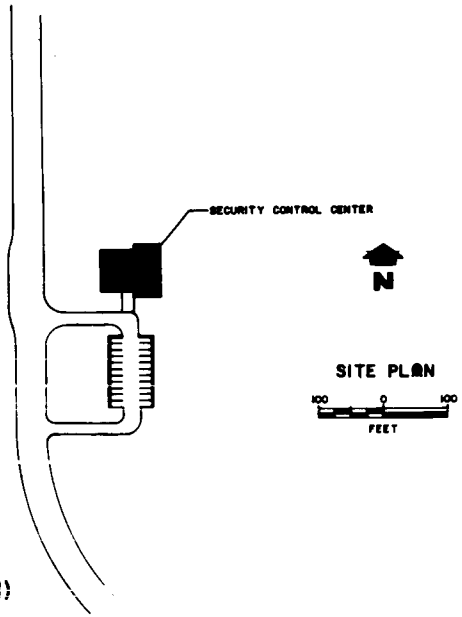
ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES



PERSPECTIVE



FLOOR PLAN



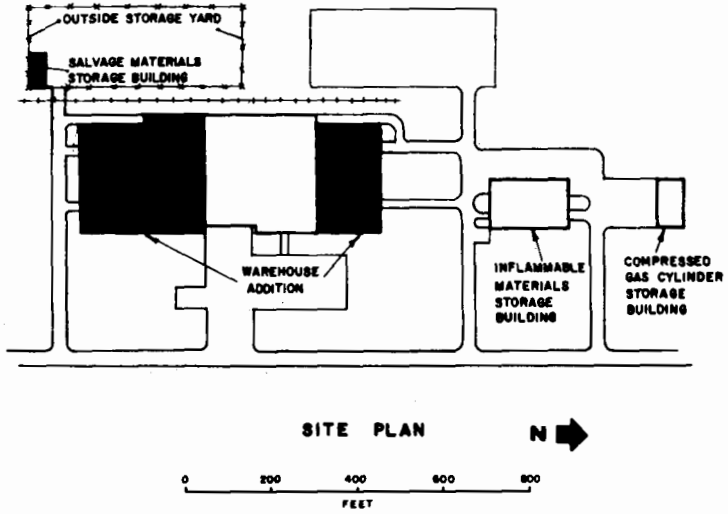
SITE PLAN

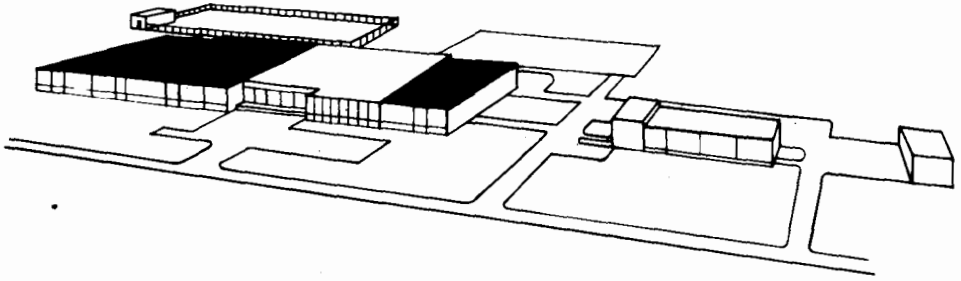
SECURITY CONTROL CENTER (SOUTH)

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES





PERSPECTIVE

WAREHOUSE ADDITION AND STORAGE FACILITIES

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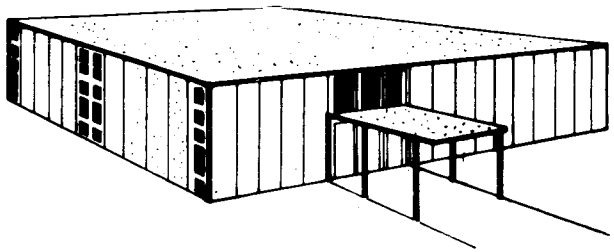
MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES



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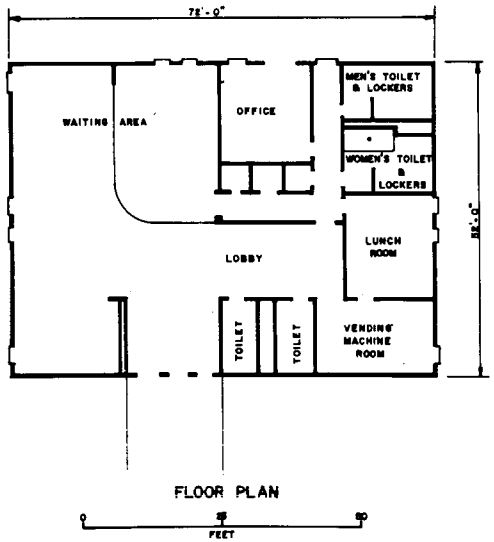
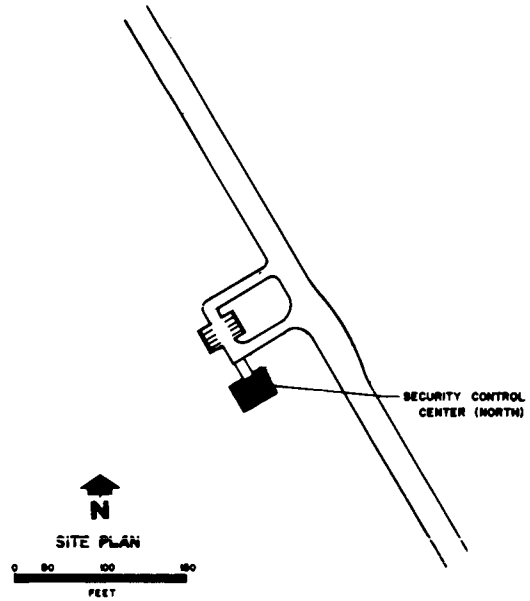


FLOOR PLAN



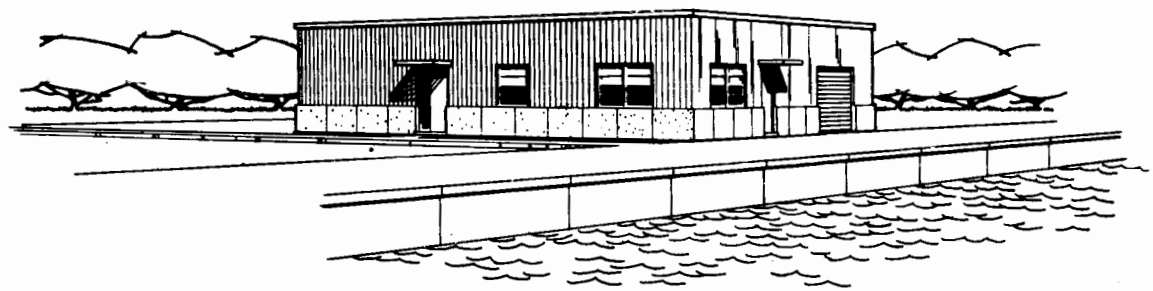
SITE PLAN

SECURITY CONTROL CENTER (NORTH)

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES



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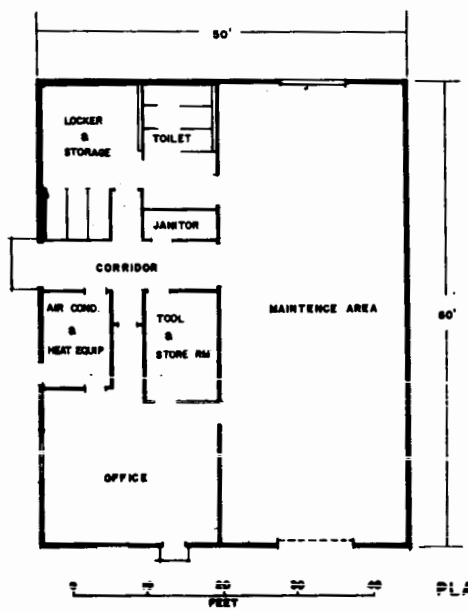
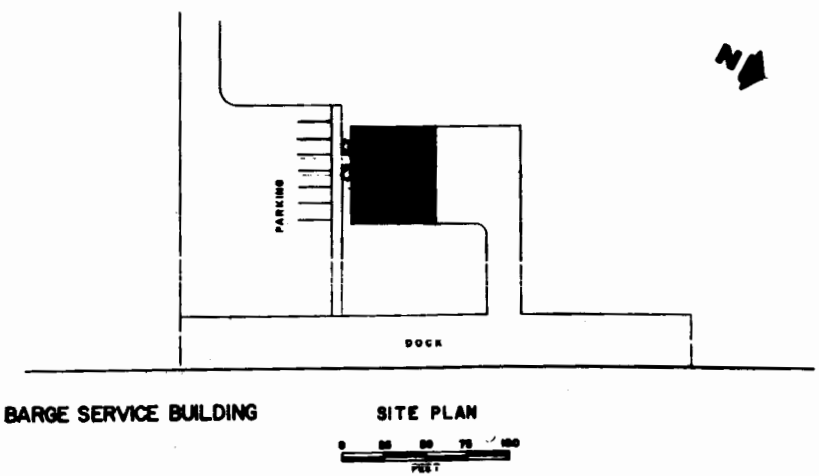


PLAN

CRYOGENIC BARGE SERVICE BUILDING

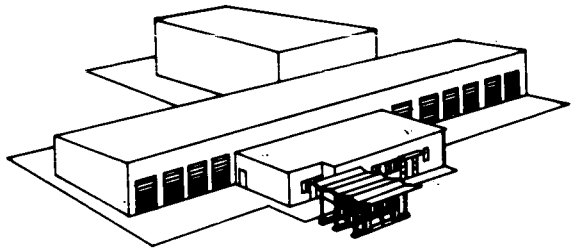


SITE PLAN

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

ADDITIONAL UTILITY INSTALLATIONS AND SUPPORT FACILITIES



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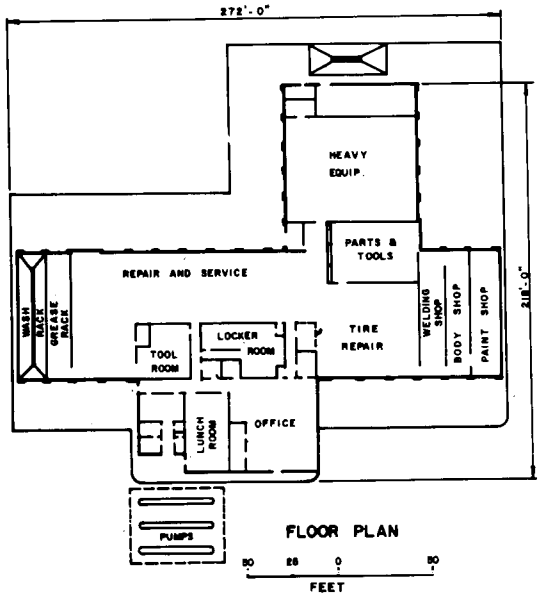
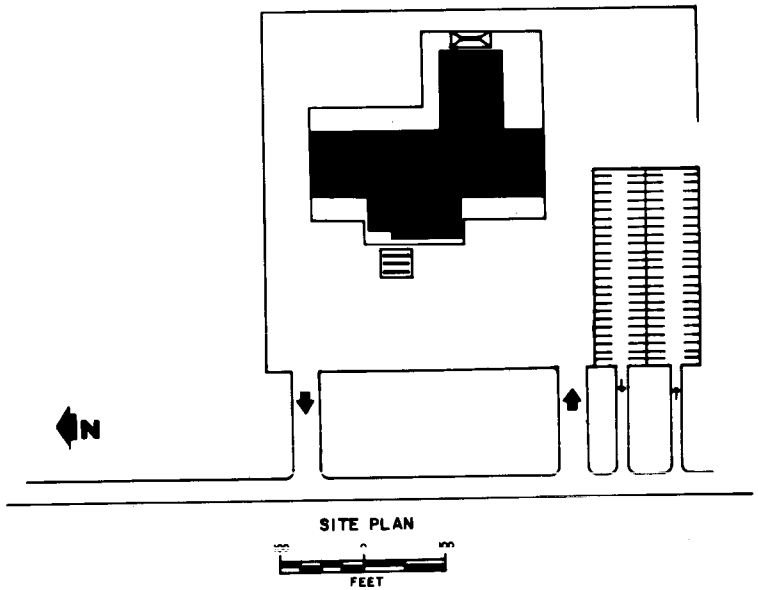




MOBILE EQUIPMENT OPERATIONS BUILDING

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

COMPONENT SERVICE FACILITIES

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Mississippi Test Facility

LOCATION OF PROJECT: Pearl River, Hancock County, Mississippi

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$130,000
FY 1964 Estimate	150,000
FY 1965 Estimate	5,499,000
Total Funding Through FY 1965	$5,779,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$2,273,000
Site development	LS	---	$193,000	193,000
Utilities	LS	---	246,300	246,300
Components service Building	Sq. Ft.	67,500	27.24	1,833,700
Equipment				$3,221,000
Instrumentation	LS	---	928,000	928,000
Special service equipment	LS	---	472,000	472,000
Special test equipment	LS	---	1,086,300	1,086,300
High pressure air	LS	---	210,000	210,000
High pressure nitrogen gas	LS	---	210,000	210,000
High pressure helium gas	LS	---	104,700	104,700
Control and communication system	LS	---	210,000	210,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$5,499,000

PROJECT DESCRIPTION:

This project provides for the construction of facilities for servicing of stage, engine and test facility components in support of the Saturn V program.

The facilities include a component service building and all utilities, equipment and systems required for an operational facility. The building is a one-and-a-half story structure with an approximate gross area of 67,500 square feet. The structure will consist of a steel frame, insulated metal panel walls, and a built-up roof. The building will include clean rooms with dust and humidity control, pressure and environmental test cells, measuring and control systems, built-in test and calibration systems and the related engineering space.

PROJECT JUSTIFICATION:

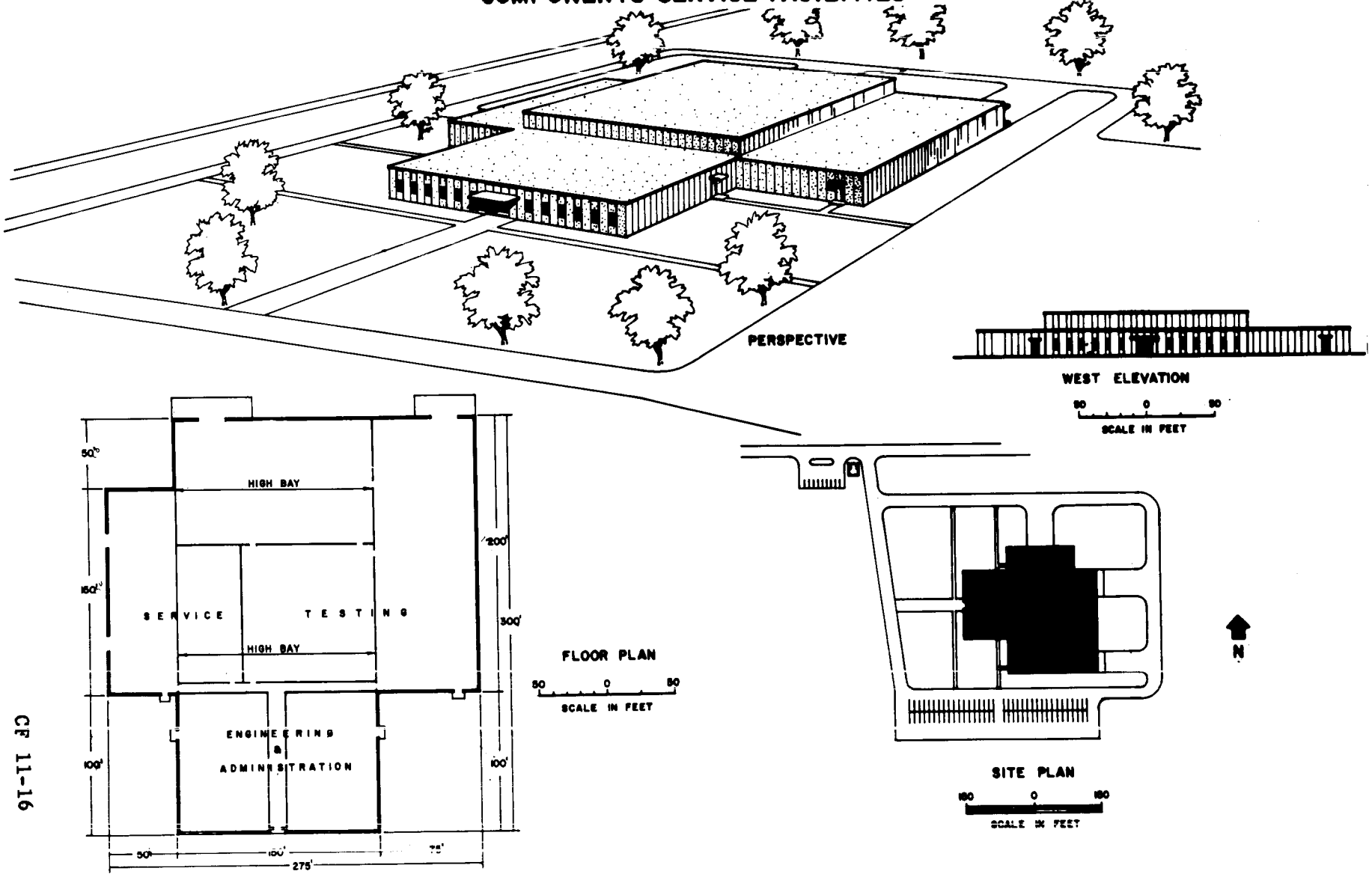
This project provides the necessary facilities for servicing, checking, testing, and calibrating the components of vehicle stages and test stand technical systems. This analysis and investigation function is an essential element of the total test program. The components which make up engine, stage, propellant systems, high pressure gas systems and fire protection systems must meet the highest standards of reliability and quality for a successful flight mission. The required assurance can be attained only by a thorough analysis of each component failure or malfunction which occurs during a static test. Facilities are required in which components can be dissassembled, cleaned, installed and operated in a special test cell until the cause of a problem can be determined. Such analysis establishes the basis for corrective action in the design, manufacture and qualify control of the component in question. It is essential that this facility be operational by the middle of calendar year 1966 to support the static tests of the SII-I and the first S-IC stages arriving at the Mississippi Test Facility.

ESTIMATED FUTURE YEAR FUNDING: None

MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

COMPONENTS SERVICE FACILITIES



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

SATURN V FIRST STAGE (S-IC) STATIC TEST FACILITY

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Mississippi Test Facility

LOCATION OF PROJECT: Pearl River, Hancock County, Mississippi

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$13,216,000
FY 1964 Estimate	38,473,800
FY 1965 Estimate	26,384,000
Total Funding Through FY 1965	$78,073,800

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$18,012,800
Test stand structure (completion)	LS	---	$9,197,500	9,197,500
Sound suppressor	each	2	4,378,500	8,757,000
Observation bunker	each	1	---	58,300
Equipment				8,371,200
Adaptation hardware	LS	---	572,500	572,500
Instrumentation system	LS	---	2,779,000	2,779,000
Control & communication systems	LS	---	2,339,000	2,339,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
High pressure water system	LS	---	$1,255,500	$1,255,500
High pressure GAS distribution system	LS	---	891,400	891,400
Propellant transfer system	LS	---	533,800	533,800
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$26,384,000

PROJECT DESCRIPTION:

This project provides for the completion of the second position of the dual position Saturn V first stage (S-IC) test stand. Included are the second position steel superstructure, instrumentation systems, control and communication systems, propellant transfer systems, high pressure gas and high pressure water systems, adaptation hardware, and an observation bunker to bring the dual-test stand to operational readiness. Also provided will be a sound suppressor for each test position. The suppressor will consist of two basic elements. The first element is a mixing chamber approximately 100 feet high and 60 feet wide. It will allow the mixing of water with engine exhaust gases in an aspirator type chamber. This mixture of water and gas will pass through ducts where the energy in the exhaust gases will be significantly dissipated by accelerating a large mass of water. The second element consists of two circular condensers which will provide for the separation of the water from the exhaust gases and the recirculation of the separated water.

PROJECT JUSTIFICATION:

This project is required to complete the dual position Saturn V first stage (S-IC) test stand complex which was authorized and received initial funding in fiscal year 1963. The first position will be completed in December, 1965. Following facility checkout using the S-IC T stage the S-IC-3 and S-IC-4 flight stages will undergo acceptance testing using this position. The stand utilization plan and Saturn V flight schedule require construction completion of the second position in August, 1966 for subsequent testing of the S-IC-5 flight stage. Construction leadtimes require funds to be available in October, 1964, in order to meet this schedule. Both positions are required to meet the scheduled delivery rates.

The sound propagation problem from firing very large rocket engines is two fold. In the immediate area, the sound energy can seriously affect and

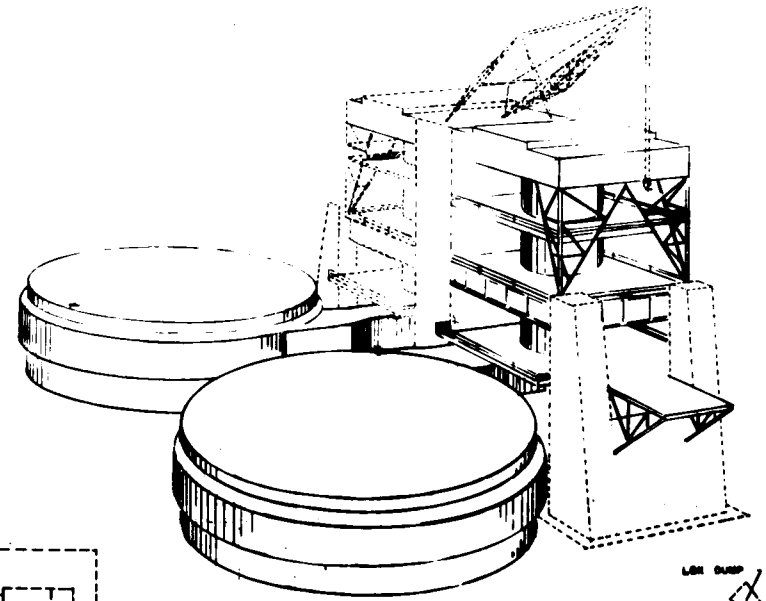
damage structures and buildings as well as people. The Mississippi Test Facility and acoustic easement area was designed to handle this hazard. The second problem is that of high intensity sound focusing at great distances from the source caused by the reflection of sound by air layers of different temperatures. Since it would not be feasible to acquire the necessary land to overcome this hazard, sound suppressors are required for this test stand.

ESTIMATED FUTURE YEAR FUNDING: None

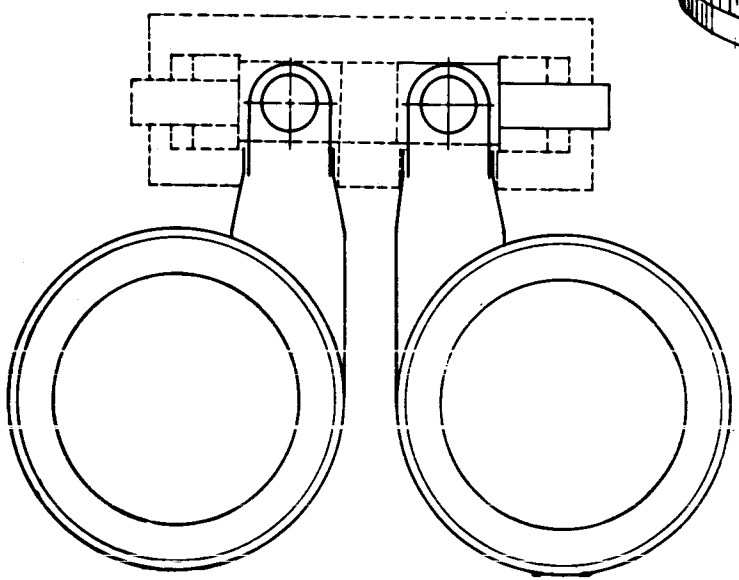
MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

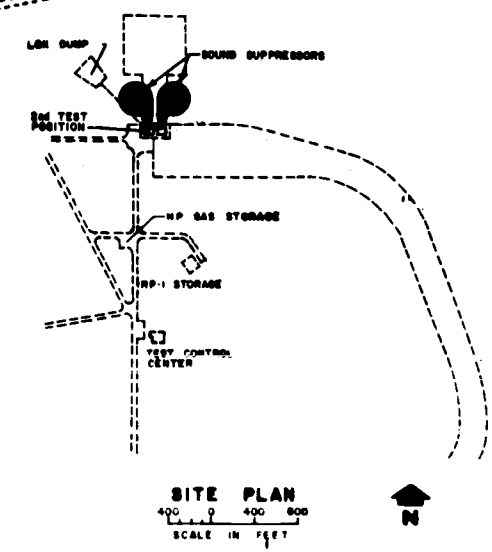
SATURN V FIRST STAGE (S-IC) STATIC TEST FACILITY



PERSPECTIVE



PLAN



DUAL TEST STAND
SECOND TEST POSITION
SOUND SUPPRESSORS FOR FIRST & SECOND TEST POSITIONS

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

SATURN V SECOND STAGE (S-II) STATIC TEST FACILITIES

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Mississippi Test Facility

LOCATION OF PROJECT: Pearl River, Hancock County, Mississippi

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$20,353,000
FY 1964 Estimate	16,301,900
FY 1965 Estimate	20,575,000
Total Funding Through FY 1965	$57,229,900

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$8,494,500
Test stand	LS	---	$3,861,900	3,861,900
Stage checkout building	Sq. Ft.	62,000	44.95	2,736,700
Utilities	LS	---	337,200	337,200
Support facilities	LS	---	737,400	737,400
Deflector	LS	---	771,300	771,300
Equipment				$12,080,500
Instrumentation systems	LS	---	2,105,000	2,105,000
Control and communications systems	LS	---	1,515,600	1,515,600
Adaptation hardware	LS	---	525,000	525,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
High pressure water system	LS	---	$1,823,800	1,823,800
High pressure gas system	LS	---	1,993,400	1,993,400
Propellant transfer system	LS	---	1,710,700	1,710,700
Helium cold gas system	LS	---	527,000	527,000
Stage checkout and storage equipment	LS	---	1,880,000	1,880,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$20,575,000

PROJECT DESCRIPTION:

This project provides for completion of the second test stand for the Saturn V vehicle second stage (S-II), including all necessary instrumentation, equipment and systems required for an operational facility. Included is the stand superstructure, an underground instrumentation tunnel connecting the test stand with the Test Control Center, a flame deflector, adaptation hardware to attach the stage to the load frame, a high pressure gas system, a high pressure water system, instrumentation systems, control and communication systems, a stage checkout and storage building which includes an area for pre-static and post-static stage checkout.

PROJECT JUSTIFICATION:

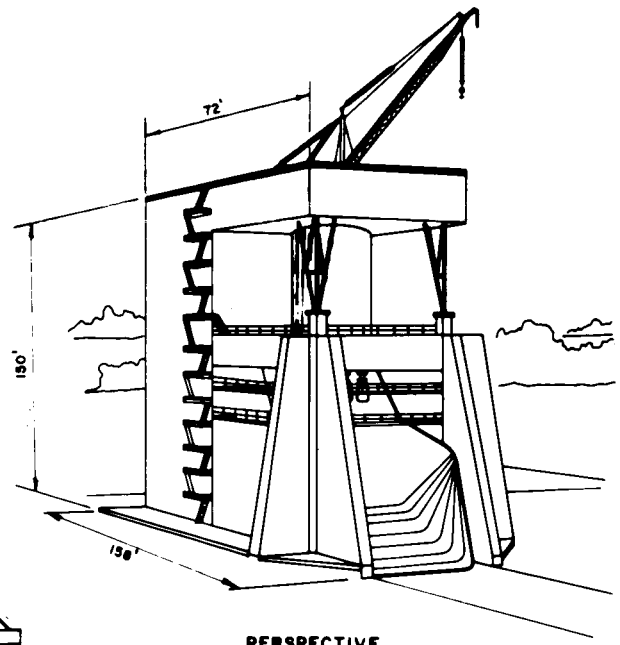
This project provides for the continuation and completion of the Saturn V second stage (S-II) test complex initiated in prior years. The S-II stands at the Mississippi Test Operations facility will be used for full duration all-systems tests and acceptance testing of all flight stages. The first stand which was funded in fiscal years 1963 and 1964 will be completed in August 1965. After facility checkout using the S-II-F checkouts stage, the first test stand will be initially used for all systems testing, and for acceptance testing of S-II-1 and S-II-2. The S-II-2 will be on the stand when the S-II-3 is received for acceptance testing. The second stand is required and must be funded in fiscal year 1965 if it is to be available in time for S-II-3 stage acceptance testing in October 1966. From this time on two stands are required to meet the scheduled delivery rates.

ESTIMATED FUTURE YEAR FUNDING: None.

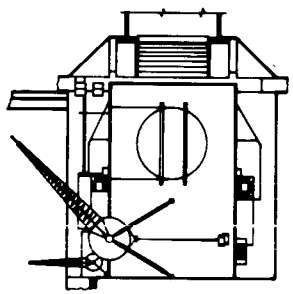
MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

SATURN V SECOND STAGE (S-II) STATIC TEST FACILITIES



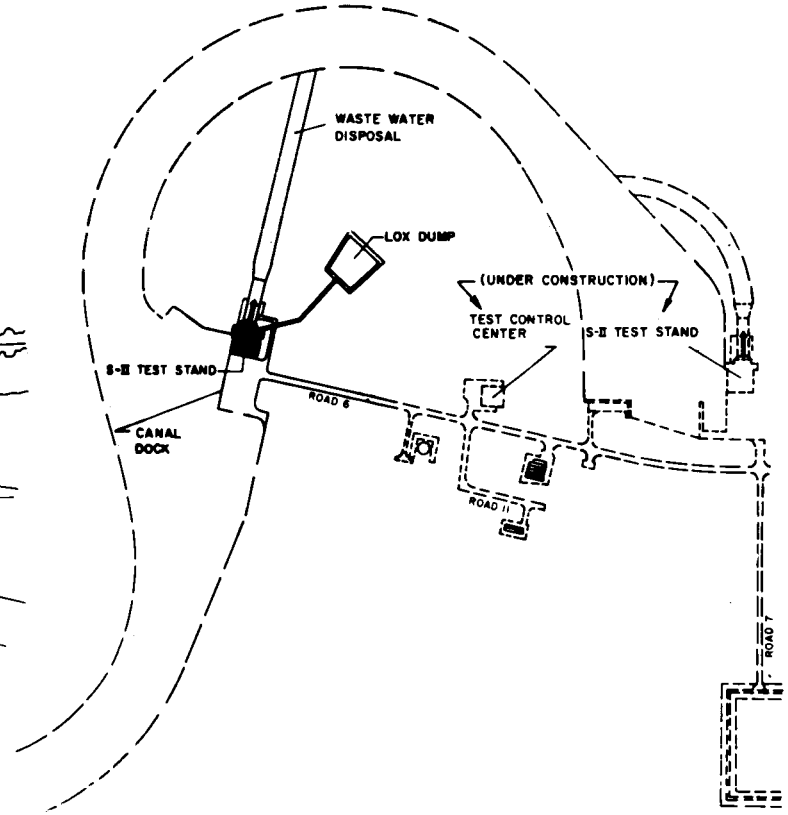
PERSPECTIVE



PLAN

50 0 50

FEET



SITE PLAN

200 0 200 400

FEET

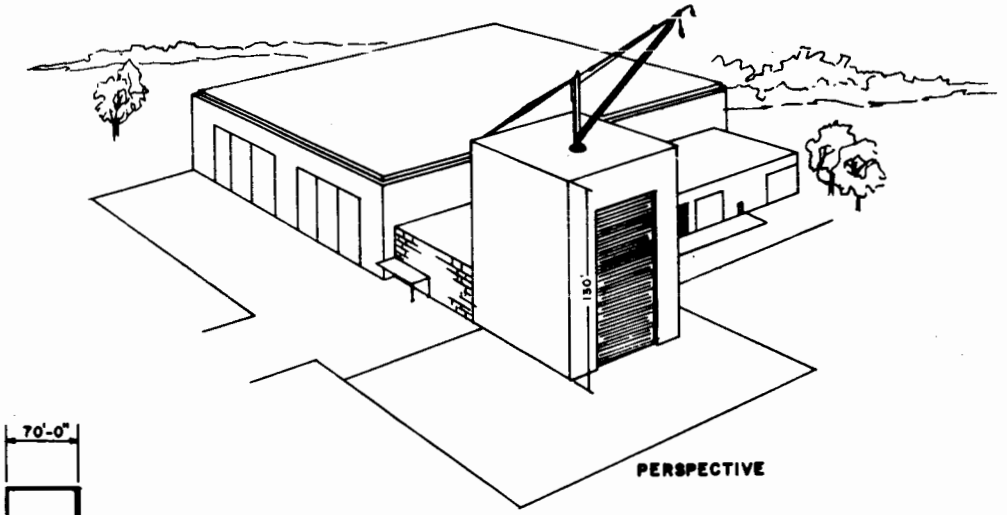
N

TEST STAND

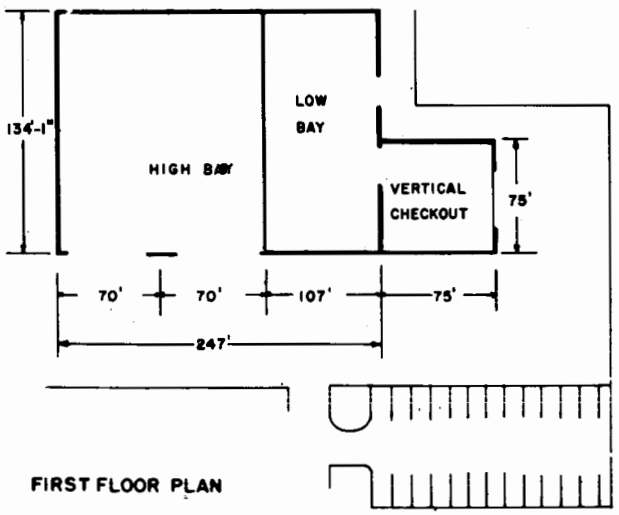
MISSISSIPPI TEST OPERATIONS

FISCAL YEAR 1965 ESTIMATES

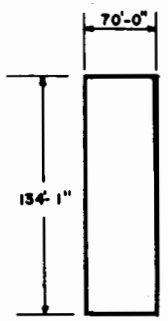
SATURN V SECOND STAGE (S-II) STATIC TEST FACILITIES



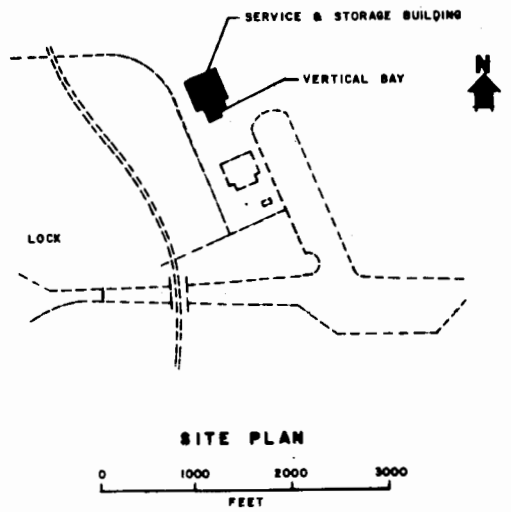
PERSPECTIVE



FIRST FLOOR PLAN



SECOND FLOOR PLAN
(LOW BAY AREA)



SITE PLAN

STAGE CHECKOUT AND STORAGE BUILDING

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

VARIOUS LOCATIONS

	Page No.
Summary	CF 12-1
Office of Manned Space Flight Projects:	
Facilities for F-1 engine program	CF 12-2
Facilities for J-2 engine program	CF 12-8
Facilities for S-II stage program	CF 12-16
Facilities for S-IVB stage program	CF 12-21
Office of Advanced Research and Technology:	
Facilities for M-1 engine program	CF 12-24
Addition to space radiation effects laboratory for added capabilities	CF 12-30
Office of Tracking and Data Acquisition Projects:	
Apollo network ground stations - new stations	CF 12-34
Apollo network ground stations - additions to existing stations	CF 12-39

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Various Locations	Various	NA	NA	NA

INSTALLATION MISSION

PERSONNEL STRENGTH	FY 19	FY 19	FY 19
NASA PERSONNEL *(End of Year)*			
CONTRACTOR & OTHER PERSONNEL			
TOTAL ALL PERSONNEL			

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*		
LAND *(Lease or Permit)*		
PLANT VALUE *(as of June 30, 19)*		
TOTAL		

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Facilities for F-1 engine program	MSF	44,868.0	14,335.0	2,707.0	---	61,910.0
Facilities for J-2 engine program	MSF	11,250.0	7,113.0	10,971.0	---	29,334.0
Facilities for S-II stage program	MSF	536.5	---	2,024.0	---	2,560.5
Facilities for S-IVB stage program	MSF	375.0	5,553.5	10,709.0	---	16,637.5
Facilities for M-1 engine program	OART	13,166.0	10,030.0	3,970.0	33,000.0	60,166.0
Addition to space radiation effects laboratory for added capabilities	OART	12,382.0	105.0	1,876.0	---	14,363.0
Apollo network ground stations - New stations	OTDA	---	355.0	4,010.0	---	4,365.0
Apollo network ground stations - additions to existing stations	OTDA	---	85.0	1,330.0	---	1,415.0
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				37,597		

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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR F-1 ENGINE PROGRAM

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Canoga Park, Santa Susana, and Edwards, California

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New, Repair

FUNDING:

FY 1963 and Prior Years	$44,868,000
FY 1964 Estimate	14,335,000
FY 1965 Estimate	2,707,000
Total Funding Through FY 1965	$61,910,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$2,707,000
Engine checkout cell	Each	1	$99,000	99,000
Liquid oxygen "run" tank	Each	1	129,000	129,000
Gaseous nitrogen storage bottle	Each	1	101,000	101,000
Fuel "run" tank	Each	1	151,000	151,000
LOX storage tank	Each	4	310,000	1,240,000
Fuel storage tank	Each	2	29,500	59,000
Fuel supply system	Each	1	480,000	480,000
Flame channel (repair)	LS	---	149,000	149,000
Reclamation dam (modifications)	LS	---	245,000	245,000
Site development	LS	---	54,000	54,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$2,707,000

PROJECT DESCRIPTION:

This project provides the additional facilities required to support the F-1 engine program. At Canoga Park, California, a 1,053 square foot reinforced concrete engine checkout cell will be constructed to permit safe full pressure testing of the F-1 engine. At Santa Susana, construction in support of component testing consists of an additional 3,000 pound per square inch, 2,500 gallon liquid oxygen "run" tank; a 5,000 pound per square inch, 470 cubic foot gaseous nitrogen storage bottle, and a 3,000 pound per square inch, 3,000 gallon fuel "run" storage tank. At Edwards, the installation of four additional 1,000 ton bulk liquid oxygen storage tanks and two additional 100,000 gallon fuel storage tanks. The addition of a fuel supply system, flame channel repairs and reclamation dam modifications are also to be provided.

PROJECT JUSTIFICATION:

Additional facilities are required at Canoga Park, Santa Susana, and Edwards to meet the F-1 engine delivery rates necessary to support the Saturn V launch schedule. This delivery schedule requiring five F-1 engines per vehicle, plus spares, reaches its peak rate in early 1966. The peak rate of component and acceptance testing of engines for flight vehicles is attained while the engine development testing continues.

The engine checkout cell is required at Canoga Park to permit full pressure testing of the F-1 engine prior to shipment to Edwards for hot firing tests. Existing facility capacity is restricted to low pressure testing. Without the full pressure testing capability engine leaks are often found for the first time after installation on the stands at Edwards. This procedure requires the return of the engine to the factory and causes a significant loss of time in the test program.

Additional test facilities are required at Santa Susana to maintain component quality and delivery rates. The liquid oxygen "run" tank is required for use in F-1 turbo-pump seal test since the existing 360 gallon tank does not have the capacity to establish the "steady-state" conditions

in the test system which are necessary for proper testing. The gaseous nitrogen storage bottle is required to increase the F-1 engine turbo-pump testing rate capability from two to four tests per shift. A minimum of four tests per shift is required to meet delivery rates. The fuel "run" tank will provide the necessary capability for full duration testing of the F-1 gas generators.

Acceptance testing of F-1 engines at Edwards begins in 1964. This increase in acceptance testing builds up concurrently with the continued development testing and reaches a peak in early 1966 with 36 flight engines being delivered in that year. The present capacity for bulk liquid oxygen and fuel storage must be increased to keep pace with the testing schedule. The current bulk LOX storage capacity of 3,000 tons must be increased by an additional 4,000 tons. The fuel storage (RJ-1) capacity of 360,000 gallons must be increased by an additional 200,000 gallons.

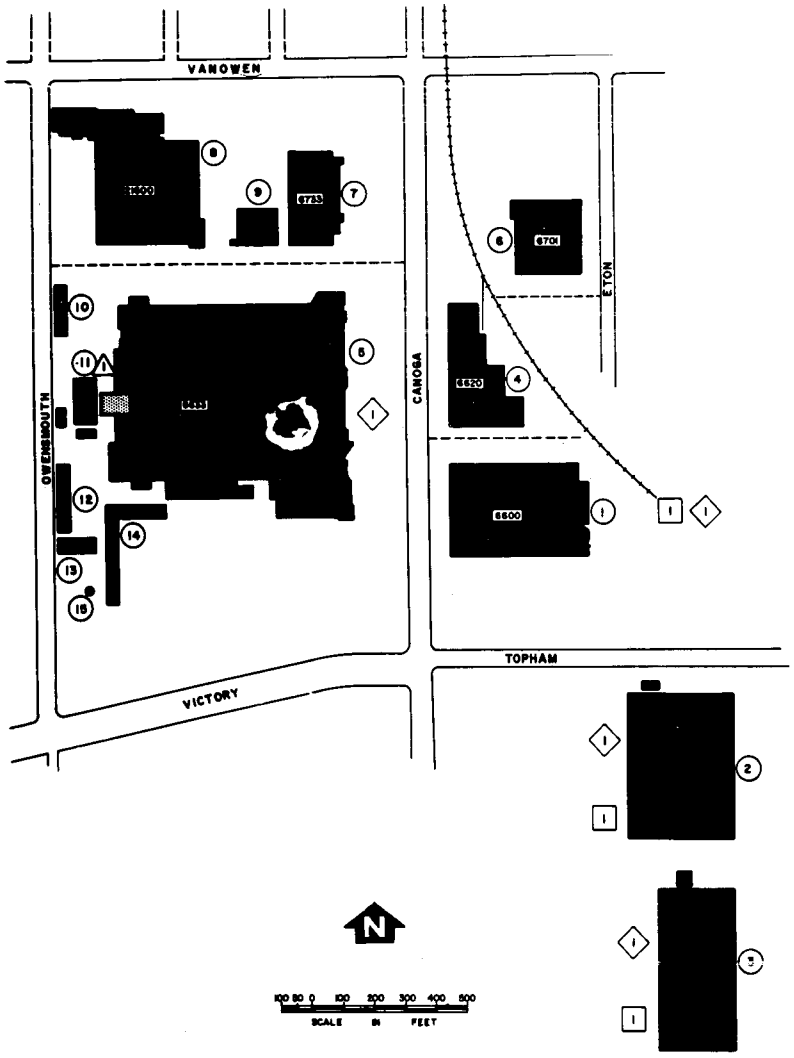
In addition, protection of the test stand structures and the need to minimize loss of deflector coolant water requires the repair of flame channels and modification of reclamation dams.

ESTIMATED FUTURE YEAR FUNDING: None

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR F-I ENGINE PROGRAM



CANOGA PARK, CALIFORNIA

LEGEND

EXISTING FACILITIES

1. MANUFACTURING BUILDING NO. 1
2. MANUFACTURING BUILDING NO. 2
3. MANUFACTURING BUILDING NO. 3
4. MATERIAL BUILDING
5. MAIN BUILDING
6. WAREHOUSE
7. ANNEX
8. VANOWEN
9. CAFE
10. NORTH SHED
11. MAINTENANCE BUILDING
12. SOUTH SHED
13. PAINT & CHEMICAL STORAGE
14. SHED
15. INCINERATOR

FACILITIES AUTHORIZED & UNDER CONSTRUCTION

FISCAL YEAR 1963 PROJECT

[1] EXPANSION OF R & D PRODUCTION MANUFACTURING EQUIPMENT

FISCAL YEAR 1964 PROJECT

◇1 EXPANSION OF R & D. PRODUCTION MANUFACTURING EQUIPMENT

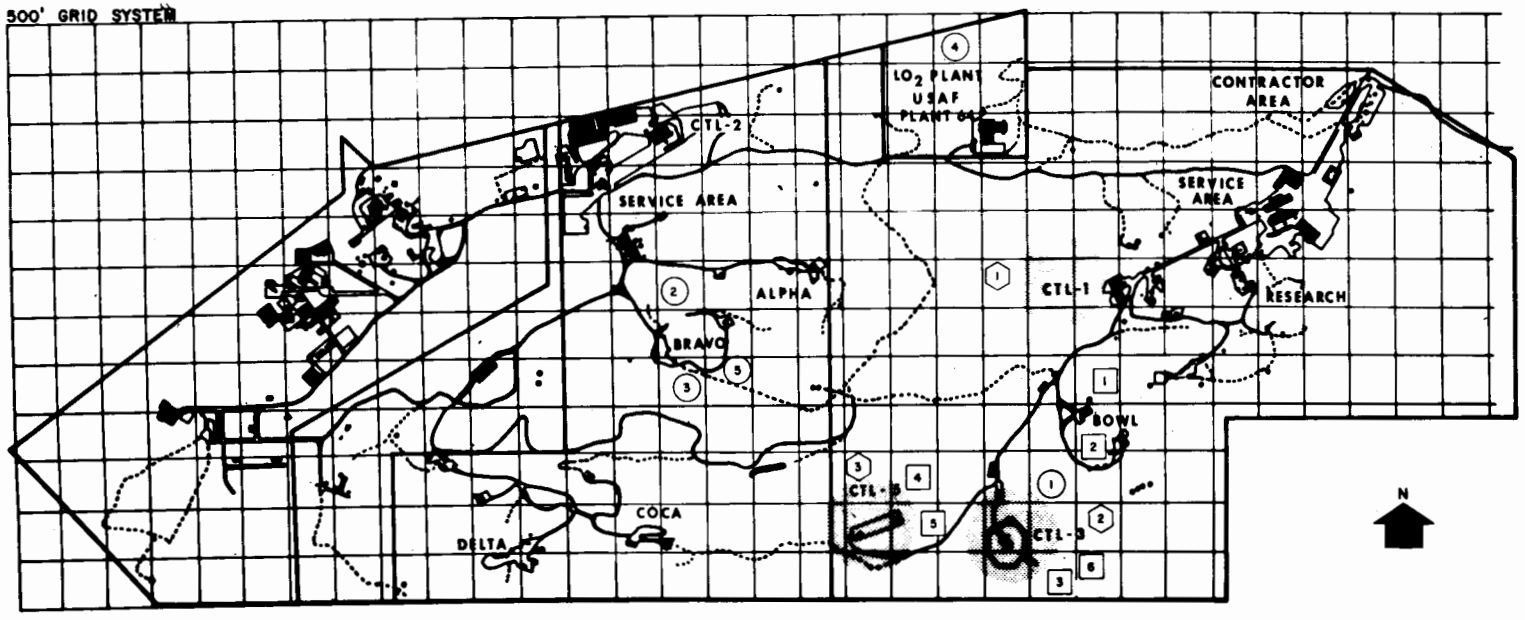
PROPOSED FISCAL YEAR 1965 PROJECT

△1 ENGINE CHECKOUT CELL

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR F-I ENGINE PROGRAM



SANTA SUSANA, CALIFORNIA

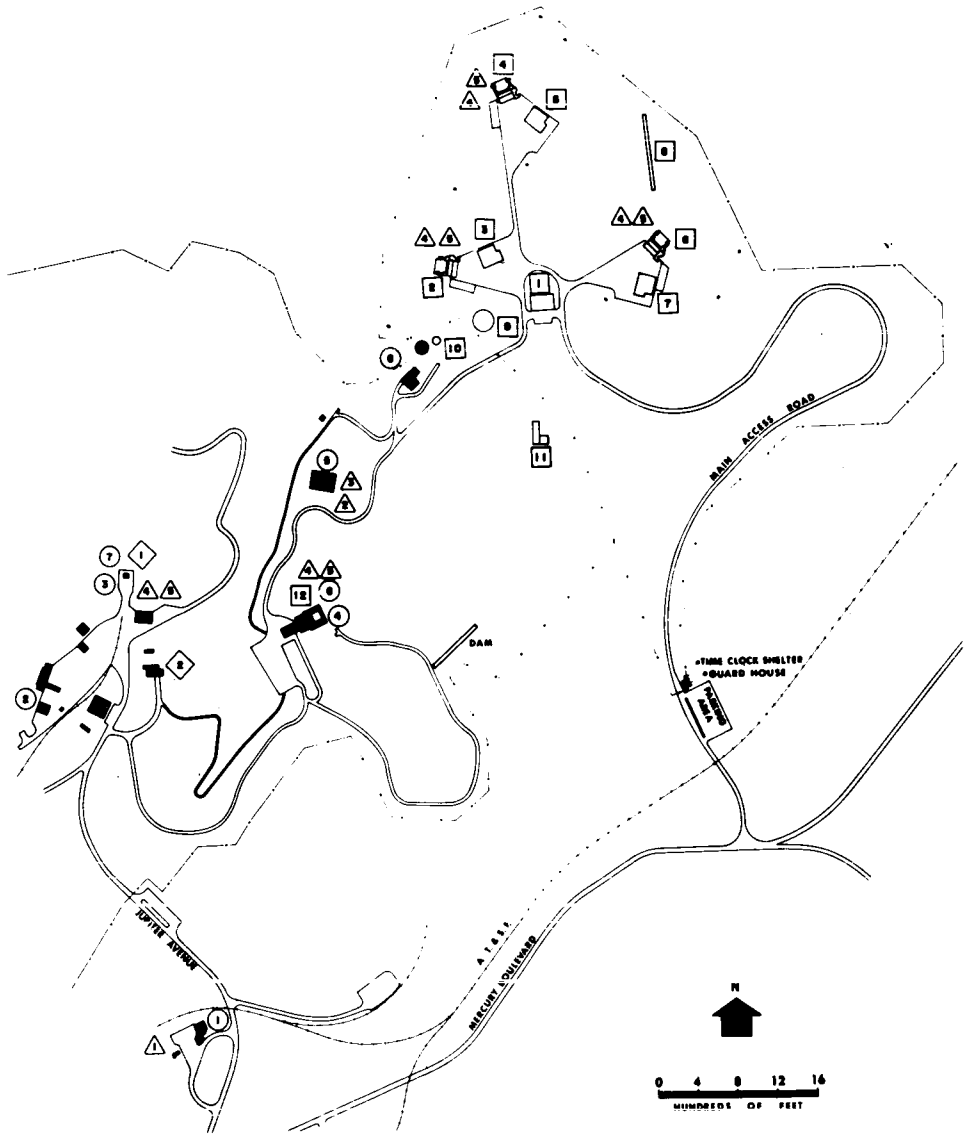
LEGEND

EXISTING FACILITIES	FACILITIES AUTHORIZED & UNDER CONSTRUCTION	PROPOSED FISCAL YEAR 1965 PROJECTS
1 CTL-3	1 ADDITIONAL INSTRUMENTATION CENTRAL RECORDING	1 LOX RUN TANK
2 BRAVO 1	2 BOWL AREA	2 FUFI RUN TANK
3 BRAVO 2	3 ADDITIONAL STORAGE TANKS CTL-3	3 GN_2 BOTTLE
4 LN_2 LOX BUFFER STORAGE	4 ADDITIONAL STORAGE BOTTLES CTL-5	
5 MODIFICATION TO BRAVO AREA	5 MISC ITEMS FOR CTL-3 & CTL-5	
	6 ADDITIONAL INSTRUMENTATION	

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR F-1 ENGINE PROGRAM



LEGEND

EXISTING FACILITIES

1. LIQUID OXYGEN STORAGE (PARTIAL)
2. TEST STAND 2-A
3. TEST STAND 1-A
4. TEST STAND 1-B
5. FUEL STORAGE
6. WATER FACILITIES
7. MODIFICATION TO TEST STAND 1-A
8. MODIFICATION TO TEST STAND 1-B
9. DESIGN LONGLEAD PROCUREMENT & EARTHWORK

FACILITIES AUTHORIZED & UNDER CONSTRUCTION

FISCAL YEAR 1963 PROJECT

1. CONTROL CENTER
2. TEST STAND 1-C
3. PRE-TEST BUILDING 1-C
4. TEST STAND 1-D
5. PRE-TEST BUILDING 1-D
6. TEST STAND 1-E
7. PRE-TEST BUILDING 1-E
8. RECLAMATION DAM
9. 2,000,000 GAL. DEFLECTOR WATER TANK
10. 400,000 GAL. FIRE TANK
11. PUMP HOUSE AREA
12. MODIFICATION OF TEST STAND 1-B

FISCAL YEAR 1964 PROJECT

1. MODIFICATION OF TEST STAND 1-A
2. NEW VALVE SERVICING AREA & MISC. ITEMS

PROPOSED FISCAL YEAR 1965 PROJECT

1. ADDITIONAL LOX STORAGE
2. ADDITIONAL FUEL STORAGE
3. FUEL SUPPLY SYSTEM
4. RECLAMATION DAMS
5. FLAME CHANNEL MODIFICATIONS (FOR ALL EXISTING STANDS)

EDWARDS AIR FORCE BASE, CALIFORNIA

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR J-2 ENGINE PROGRAM

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Santa Susana and Canoga Park, California

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New and Alterations

FUNDING:

FY 1963 and Prior Years	$11,250,000
FY 1964 Estimate	7,113,000
FY 1965 Estimate	10,971,000
Total Funding Through FY 1965	$29,334,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$6,685,926
Production test facilities	LS	---	$3,915,000	3,915,000
Site development	LS	---	518,000	518,000
Component test area facilities	LS	---	1,090,000	1,090,000
Delta 3 test stand alteration	LS	---	715,000	715,000
Bowl test area facilities	LS	---	447,926	447,926
Equipment				$4,285,074
Production test facility equipment	LS	---	3,815,000	3,815,000
Development support equipment	LS	---	470,074	470,074
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$10,971,000

PROJECT DESCRIPTION:

This project provides for the following items of construction at Santa Susana:

Site development, utilities, equipment and construction of an electric drive pump test facility. This facility will consist of a 30,000 horsepower drive system, a building and support system which includes a cooling tower, an oil supply system, a load center, a bridge crane, a liquid oxygen flow system, a simulated fuel flow system, a liquid hydrogen flow system, a nitrogen pressurization system and a hydrogen pressurization system.

In the component test areas, a hydrogen storage system, a centralized hydrogen burn-off system, a hydrogen recovery system, a seal and bearing test flow system and an off-loading, liquid hydrogen storage vessel.

In the Delta area, the Delta 3 test stand will be completed. Construction of this stand was initiated in the fiscal year 1964 program. This project completes construction with the addition of liquid oxygen and liquid hydrogen "run" vessels, platform modifications, stand support systems and stand instrumentation. Area support including a hydrogen gas recovery system and additional liquid hydrogen and liquid oxygen storage vessels are also to be provided.

In the Bowl area, construction includes an additional helium storage system, a gaseous hydrogen storage system and improvements to the liquid oxygen propellant handling system.

This project also provides for the procurement and installation of additional production test and development support equipment such as a vibration test system, dynamic test system, environmental equipment, recorders, grinders, leak detectors, welders, lathes, etc., at Santa Susana and Canoga Park to support the continued manufacture of development and production engines.

PROJECT JUSTIFICATION:

At the Santa Susana Test Site additional facilities are required to meet the J-2 engine delivery schedule in support of the Saturn IB and Saturn V programs. This delivery schedule, requiring five J-2 engines for each S-II stage and one J-2 engine for the S-IVB stages in both the Saturn V and Saturn IB vehicles, reaches its peak in late 1965. Engine deliveries run concurrently with the engine development program.

A major requirement at this location is a new Turbopump Drive Facility. It is essential that this facility become operational in January 1966 in order to meet the established test schedule. The existing facility has exceeded its useful life and is constantly down for repairs and/or maintenance. In addition, it does not have the capability of meeting full power requirements of the components to be tested. The new facility will permit the required frequency of testing with increased reliability and simplified operating procedures.

Another significant item at Santa Susana is completion of the Delta 3 Test Stand. Construction of this facility was initiated with fiscal year 1964 funds. This year's funding will allow for completion in 1965 and provide the necessary capability for reaching and maintaining the required engine delivery rates. Additional hydrogen storage capacity is required to keep pace with the testing schedule.

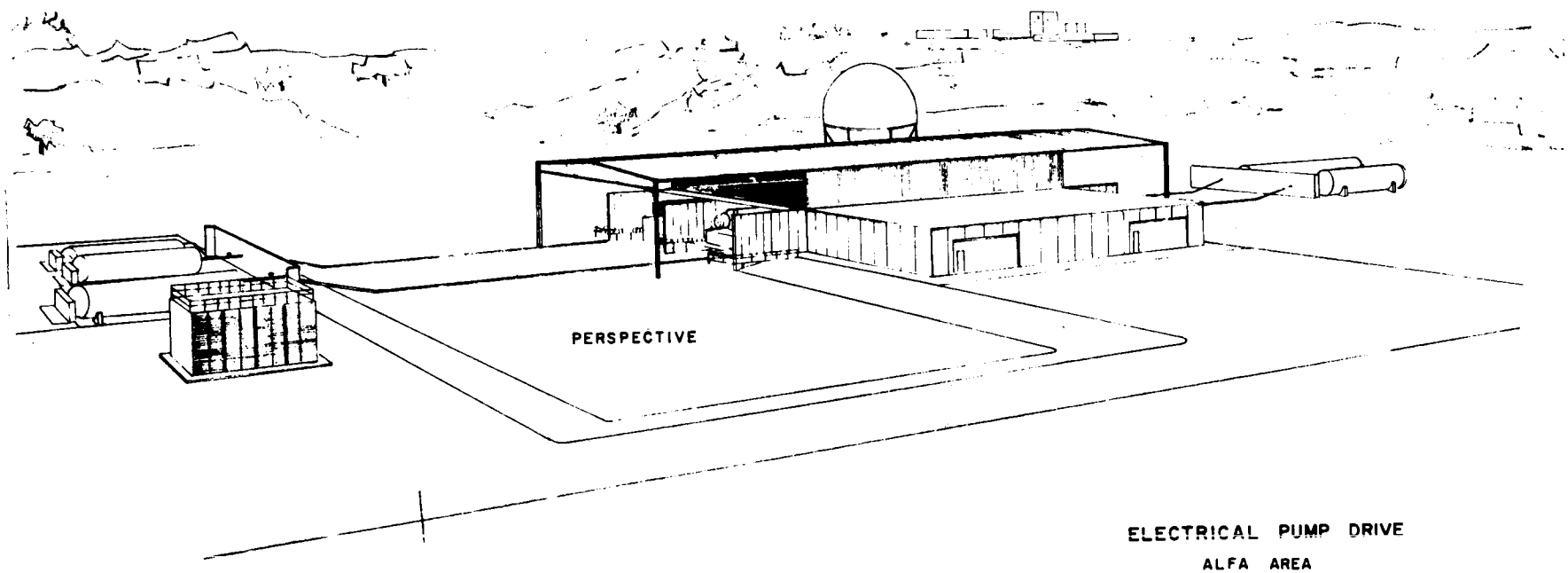
This project also provides a hydrogen burn-off system necessary to eliminate safety hazards, additional helium storage capacity to permit simulation of flight conditions for testing of the engine start sequence, and the procurement and installation of production test and development support equipment required to maintain scheduled delivery rates.

ESTIMATED FUTURE YEAR FUNDING: None

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR J-2 ENGINE PROGRAM



ELECTRICAL PUMP DRIVE

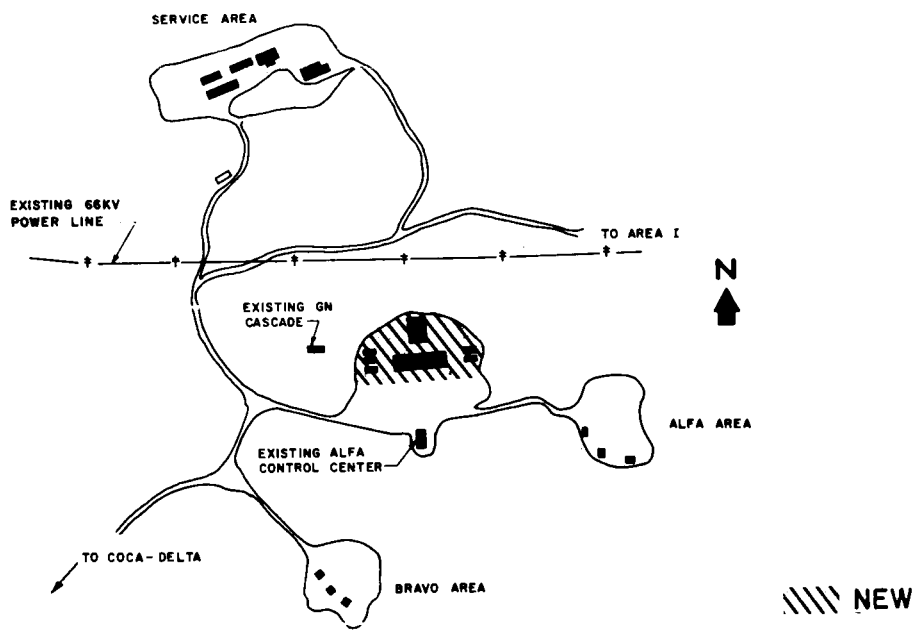
ALFA AREA

SANTA SUSANA, CALIF.

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR J-2 ENGINE PROGRAM



SITE PLAN

ELECTRIC PUMP DRIVE

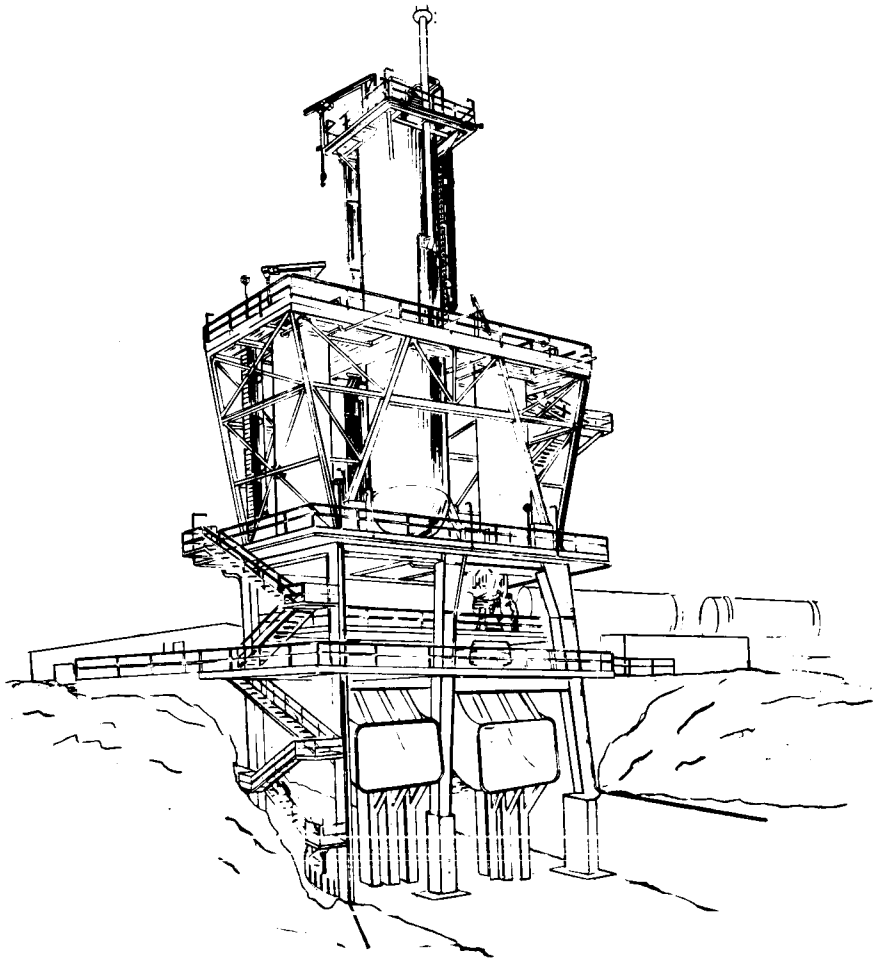
ALFA AREA

SANTA SUSANA, CALIFORNIA

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR J-2 ENGINE PROGRAM

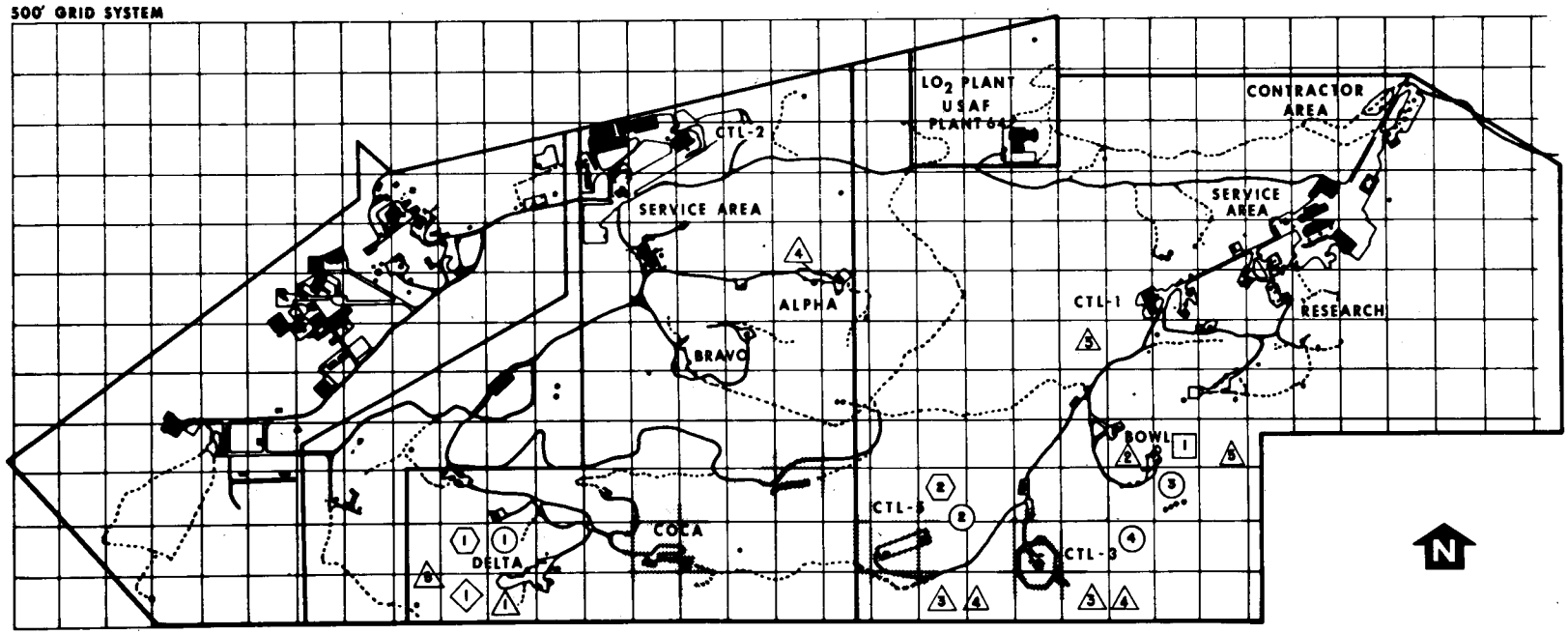


DELTA 3 TEST STAND

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR J-2 ENGINE PROGRAM



SANTA SUSANA, CALIFORNIA

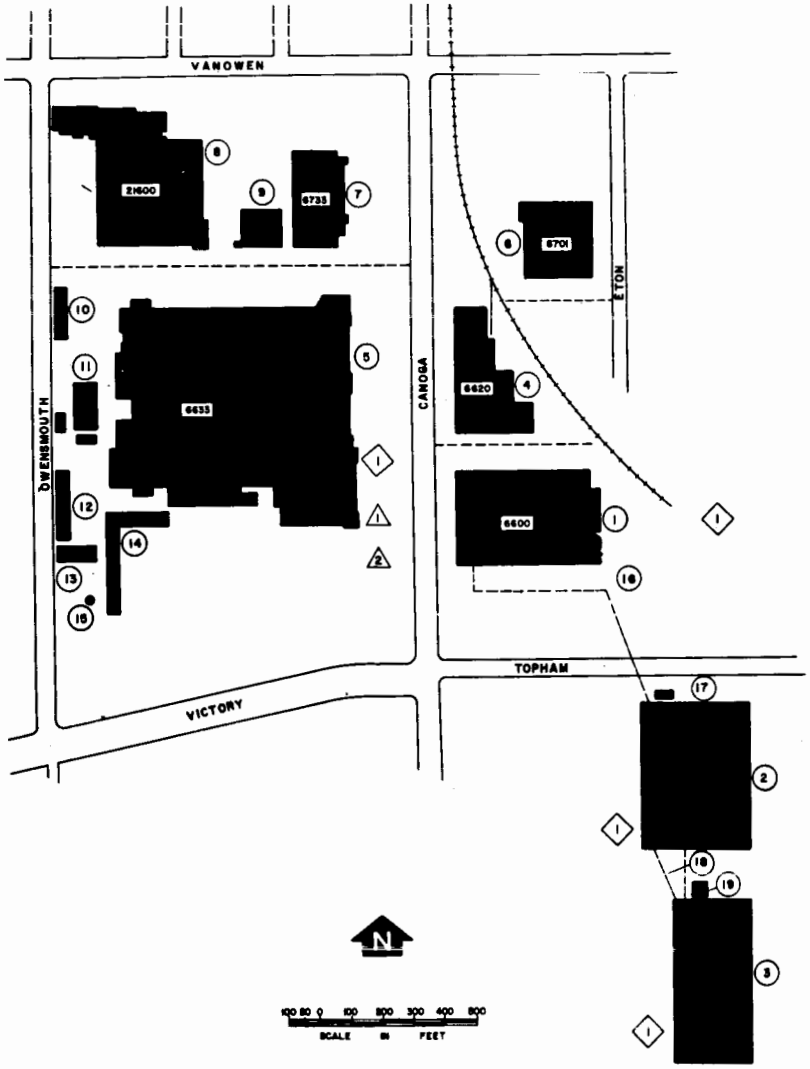
LEGEND

EXISTING FACILITIES	FACILITIES AUTHORIZED ⊕ UNDER CONSTRUCTION			PROPOSED FISCAL YEAR 1965 PROJECT
	FISCAL YEAR 1962	FISCAL YEAR 1963	FISCAL YEAR 1964	
(1) DELTA	(1) DELTA 2-2 TEST STANDS	[1] VTS-3 MODIFICATION	(1) DELTA-3 MODIFICATION	(1) DELTA-3 MODIFICATION
(2) CTL-3	(2) CTL-3 MODIFICATION			(2) BOWL
(3) BOWL				(3) CTL
(4) CTL-3				(4) PRODUCTION TEST FACILITIES
				(5) DEVELOPMENT SUPPORT EQUIPMENT

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR J-2 ENGINE PROGRAM



LEGEND

EXISTING FACILITIES

1. MANUFACTURING BUILDING NO. 1
2. MANUFACTURING BUILDING NO. 2
3. MANUFACTURING BUILDING NO. 3
4. MATERIAL BUILDING
5. MAIN BUILDING
6. WAREHOUSE
7. ANNEX
8. VANOWEN
9. CAFE
10. NORTH SHED
11. MAINTENANCE BUILDING
12. SOUTH SHED
13. PAINT & CHEMICAL STORAGE
14. SHED
15. INCINERATOR
16. 1.5 INCH DIAMETER NITROGEN LINE
17. NITROGEN GAS CYLINDER & COMPRESSOR
18. 1 INCH DIAMETER HELIUM LINE
19. HELIUM K BOTTLE BANK

FACILITIES AUTHORIZED & UNDER CONSTRUCTION

1. EXPANSION OF R & D PRODUCTION MANUFACTURING EQUIPMENT

PROPOSED FISCAL YEAR 1965 PROJECTS

1. PRODUCTION TEST FACILITIES
2. DEVELOPMENT SUPPORT EQUIPMENT

CANOGA PARK, CALIFORNIA

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR S-II STAGE PROGRAM

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Santa Susana, California and Seal Beach, California

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New, Alteration

FUNDING:

FY 1963 and Prior Years	$536,500
FY 1964 Estimate	---
FY 1965 Estimate	2,024,000
Total Funding Through FY 1965	$2,560,500

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,802,800
Santa Susana, Calif.				
High pressure gas system	LS	---	$364,600	364,600
Thermal control system	LS	---	52,700	52,700
Seal Beach, Calif.				
Vertical checkout bldg.	LS	---	1,385,500	1,385,500
Equipment				$221,200
Seal Beach-special electrical tower	LS	---	221,200	221,200

	Unit of Measure	Quantity	Unit Cost	Total Cost
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$2,024,000

PROJECT DESCRIPTION:

This project provides for construction of additional facilities required for the development of the S-II Stage at: (a) Santa Susana and (b) Seal Beach, California.

Santa Susana. Facilities will include (1) a high-pressure gas storage system, and (2) a thermal control system including a high-pressure pump, nitrogen vaporizers and associated piping and controls.

Seal Beach. A vertical checkout building is required. The facilities will consist of two vertical integrated systems checkout stations, approximately 130 feet wide, by 56 feet deep, by 120 feet high, with a two-story lean-to on the south side of the building to house the mechanical equipment and checkout control room. The building will have a structural steel frame with metal siding and will contain a 20-ton and an 80-ton bridge crane with associated support structures. Blast protection is required for protection from the hazards of pneumatic testing. Mechanical and electrical equipment will consist of heating, air-conditioning, utilities, high-pressure gas, special electrical power and a 1000-KVA substation.

PROJECT JUSTIFICATION:

Santa Susana Facilities:

(1) Present high-pressure gas storage will meet only the S-II stage pressurization requirements for a normal countdown. No reserve capacity is now available to provide for extended holds. This project provides the additional gas storage required to maintain pressurization and thus prevent a costly (in time and dollars) test abort.

(2) There are presently six 1500 standard cubic feet per minute cascade units at Santa Susana providing gaseous nitrogen during vehicle countdown. One additional 1500 SCFM unit with pump, vaporizer and piping is needed to provide thermal control of electrical components within the engine compartment.

Seal Beach - Vertical Checkout Building

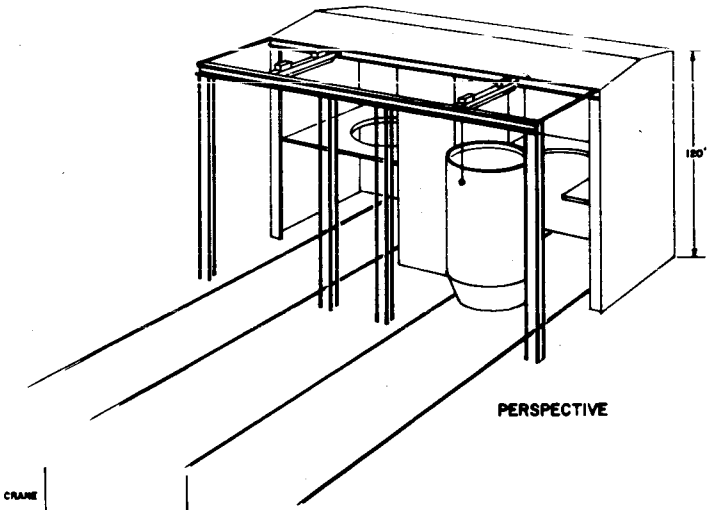
The S-II manufacturing plan through all phases involves a series of sequential station operations. Assembly and checkout of the five non-flight stages is being carried out using the stations in the existing Vertical Assembly Building. During this period it is possible to recycle the stages where more than one operation is conducted at a single station. However, as the pipeline begins to fill with flight stages, beginning with the S-II-1 in late 1964, it will not be possible to recycle, and two additional test and checkout stations are required. These stations are required by December 1965 when the S-II-2, 3, 4, and 5 are simultaneously in process. Construction of the additional checkout stations is scheduled to start in October 1964.

ESTIMATED FUTURE YEAR FUNDING: None

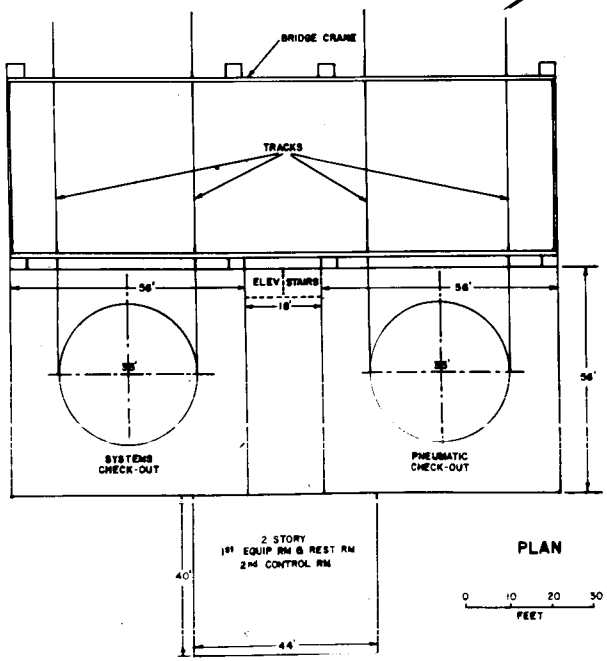
VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR S-II STAGE PROGRAM

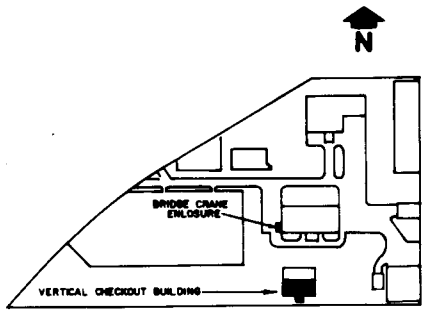


PERSPECTIVE



PLAN

0 10 20 30
FEET



SITE PLAN

0 500
FEET

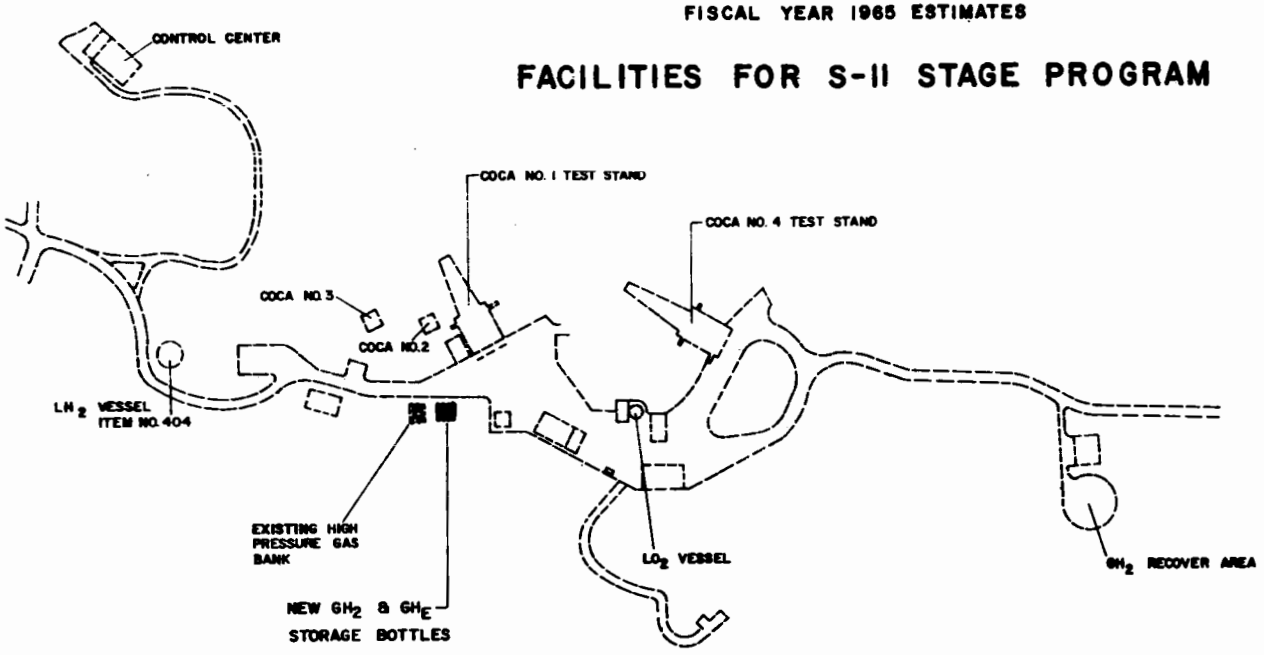
VERTICAL CHECKOUT BUILDING

SEAL BEACH, CALIFORNIA

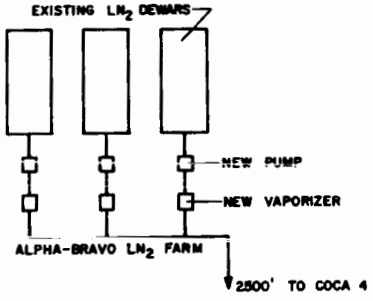
VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

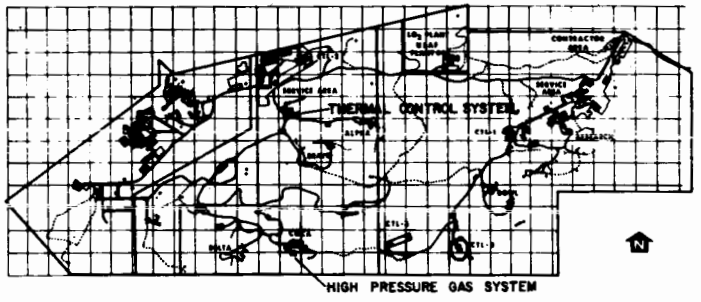
FACILITIES FOR S-II STAGE PROGRAM



HIGH PRESSURE GAS SYSTEM



THERMAL CONTROL SYSTEM



SANTA SUSANA (AIR FORCE PLANT 57), CALIF.

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR S-IVB STAGE PROGRAM

PROGRAM OFFICE FOR THE INSTALLATION: Office of Manned Space Flight

PROGRAM OFFICE FOR THE PROJECT: Office of Manned Space Flight

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Sacramento Field Station, Sacramento, California

COGNIZANT NASA INSTALLATION: Marshall Space Flight Center

TYPE OF CONSTRUCTION PROJECT: Extension; Alteration

FUNDING:

FY 1963 and Prior Years	$375,000
FY 1964 Estimate	5,553,500
FY 1965 Estimate	10,709,000
Total Funding Through FY 1965	$16,637,500

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$6,731,000
Utilities and paving	LS	---	$374,000	374,000
Test stand & auxiliary structures	LS	---	3,787,000	3,787,000
Propellant system	LS	---	1,551,000	1,551,000
Alteration to existing test stand	LS	---	1,019,000	1,019,000
Equipment				$3,978,000
Electric/electronic systems and data processing equipment	LS	---	3,634,000	3,634,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Shop, laboratory and cryogenic weighing equipment	LS	---	$344,000	$344,000
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$10,709,000

PROJECT DESCRIPTION:

This project provides for construction of additional facilities for the S-IVB Stage Program at Douglas Aircraft Company's Sacramento Field Station, Sacramento, California. The facilities to be constructed will include a Static Test Stand with auxiliary structures and systems required for acceptance testing of a complete S-IVB Stage and the required alteration of an existing Battleship Test Stand for acceptance testing of a complete S-IVB Stage. In addition to the stands, included are such items as propellant storage and transfer system, instrumentation cable tunnel, ground instrumentation, cryogenic weight system, and modifications and additions to the high-pressure gas storage and transfer system.

PROJECT JUSTIFICATION:

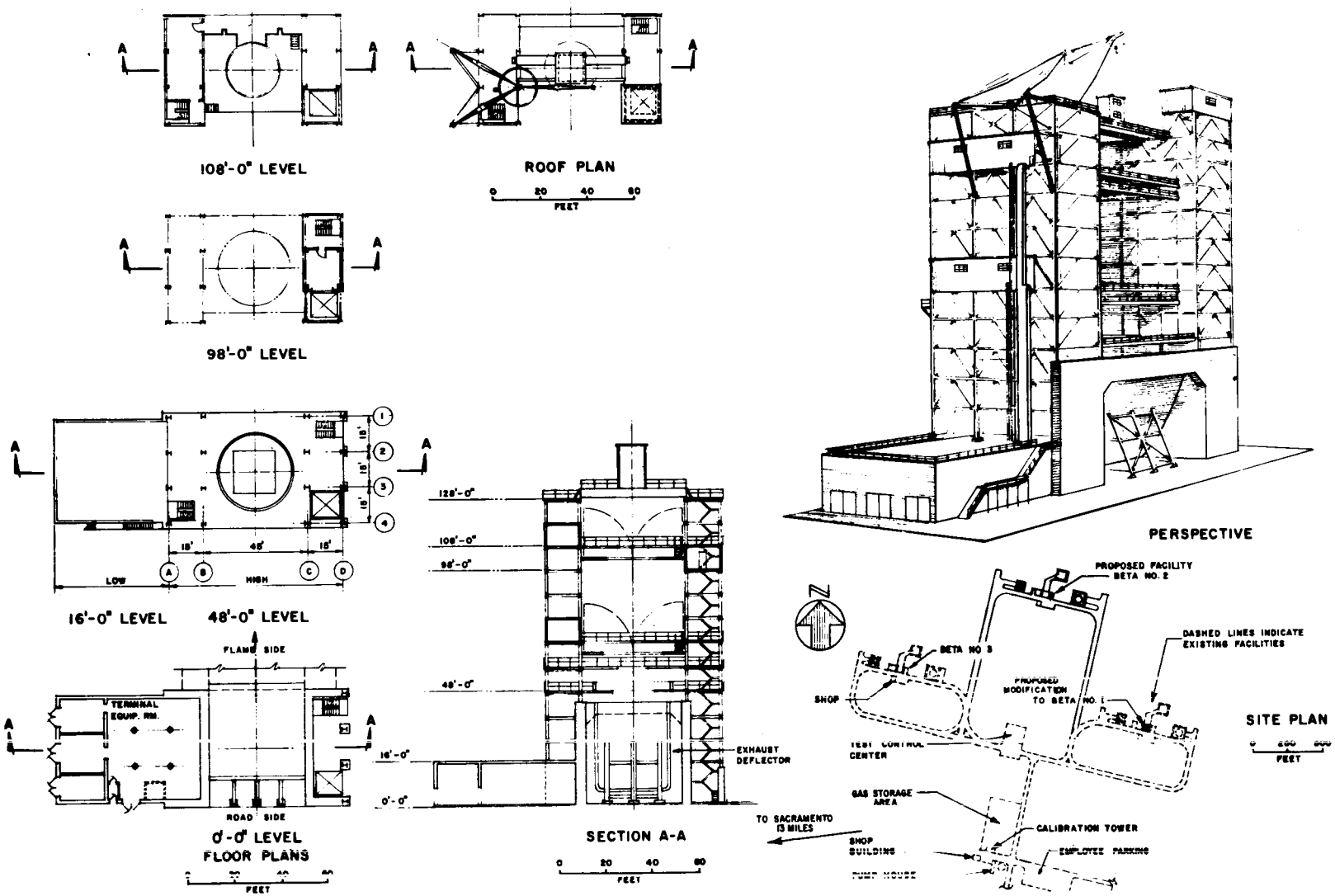
The S-IVB will be the third stage of the Saturn V and the second stage of the Saturn IB vehicle. A two test-stand complex is currently under construction and scheduled for completion during 1964. One of the stands will be used solely for all systems testing and will continue to be used in this capacity throughout the life of the program. The other stand will be used initially for the battleship test program; this year's project provides for the necessary alterations of that stand to permit acceptance testing of an S-IVB stage. This stand conversion which takes approximately 6 months will begin in December 1964 and be available for acceptance testing of the first S-IVB stage for the Saturn IB (SA201). This stand is adequate for the acceptance testing rate of the stages for the Saturn IB program, but as the stages for the Saturn V phase-in during early 1966 a second stand must be available. To meet this requirement construction of this stand must begin in October 1964.

ESTIMATED FUTURE YEAR FUNDING: None

VARIOUS LOCATIONS

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR S-IVB STAGE PROGRAM



CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITIES FOR M-1 ENGINE PROGRAM

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Sacramento County, California

COGNIZANT NASA INSTALLATION: Lewis Research Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	$13,166,000
FY 1964 Estimate	10,030,000
FY 1965 Estimate	3,970,000
Total Funding Through FY 1965	$27,166,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$240,000
Test stand modulars	LS	---	$200,000	200,000
K-1 stand	LS	---	40,000	40,000
Equipment				$3,730,000
Controls	LS	---	327,500	327,500
Propellant systems	LS	---	2,315,200	2,315,200
Other	LS	---	176,500	176,500
Instrumentation	LS	---	882,500	882,500
Fabrication	LS	---	28,300	28,300
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$3,970,000

PROJECT DESCRIPTION:

This project provides for the following items of construction:

(1) Additional propellant unloading, distribution, and storage systems for liquid hydrogen, liquid oxygen, liquid nitrogen, gaseous hydrogen, gaseous nitrogen, and gaseous helium to complete the test area support necessary for test stand K-1.

(2) Additional deflector cooling water storage and pumping facilities for the K-1 test stand.

(3) Additional control room equipment for test stand K-1.

(4) Test equipment and industrial equipment to provide for equipment wear and replacement necessitated by damage, technical improvements, and/or design revisions.

PROJECT JUSTIFICATION:

This project is required to provide the additional facilities necessary to support the development of the M-1 engine. Prior year construction programs provided component test stands C, E, G, and H for thrust chamber, gas generator and turbopump testing; initiation of the Engine System Test Complex and partial construction of the limited firing duration K-1 engine test stand. This year's construction funds will complete construction of Engine Test Stand K-1.

The K-1 stand will provide a capability for evaluation of the interaction of engine components, each operating at design conditions in an engine system. Such evaluation cannot be obtained on the existing component test stands. With the completed K-1 engine stand, the coupling of system components with the possibilities of complex vibrations or oscillations can be evaluated for the first time; components can also be evaluated in an engine system with respect to start and stop transients; and total system performance can be obtained with a realistic propellant flow configuration. In addition, this project allows for replacement of damaged test equipment, changes in test requirements and design revisions.

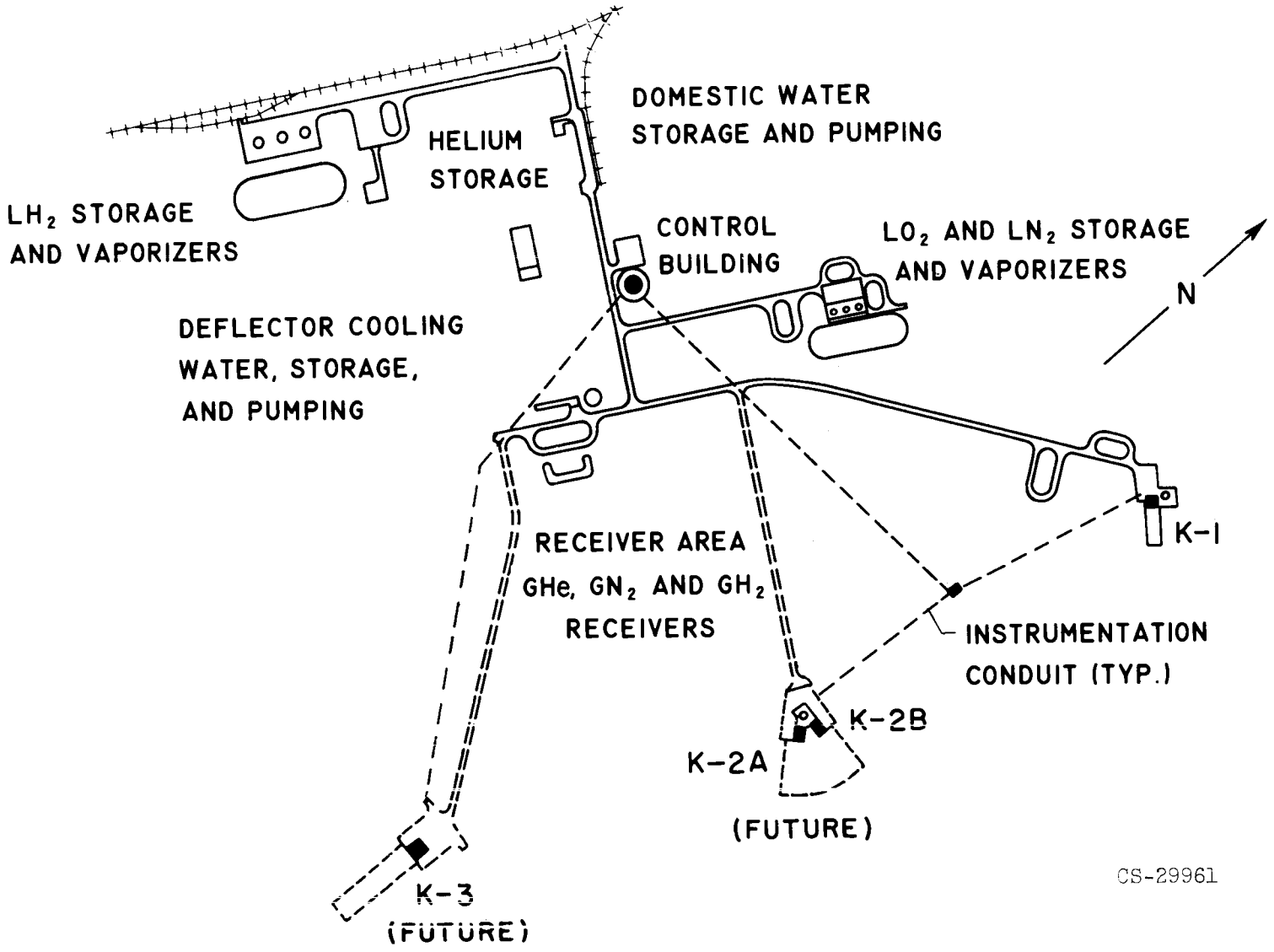
The K-1 engine test stand is planned to be used for engine tests in early 1966. Because of the funding exigencies of other programs, construction of this stand has been deferred. However, further delay in providing these engine test facilities and equipment will prohibit obtaining of

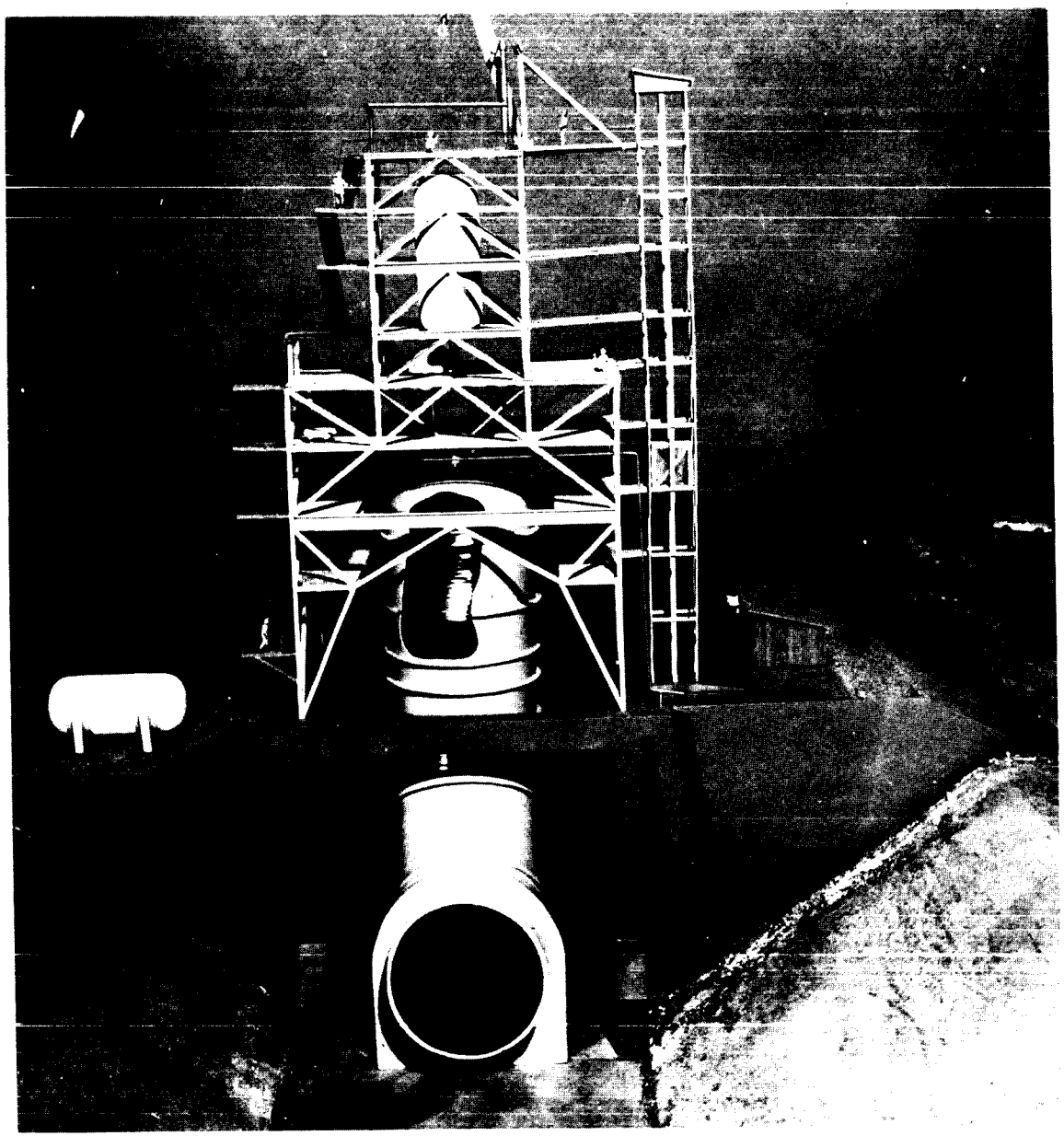
information on component interaction in the environment of the engine system. Such information is vital to system integration and may require some component modification and redevelopment. Thus, these facilities are now crucial in the development of the 1,500,000 pound thrust liquid hydrogen/liquid oxygen, M-1 engine.

ESTIMATED FUTURE YEAR FUNDING: $33,000,000

M-1 ROCKET ENGINE PROJECT

ENGINE-SYSTEM TESTING K ZONE

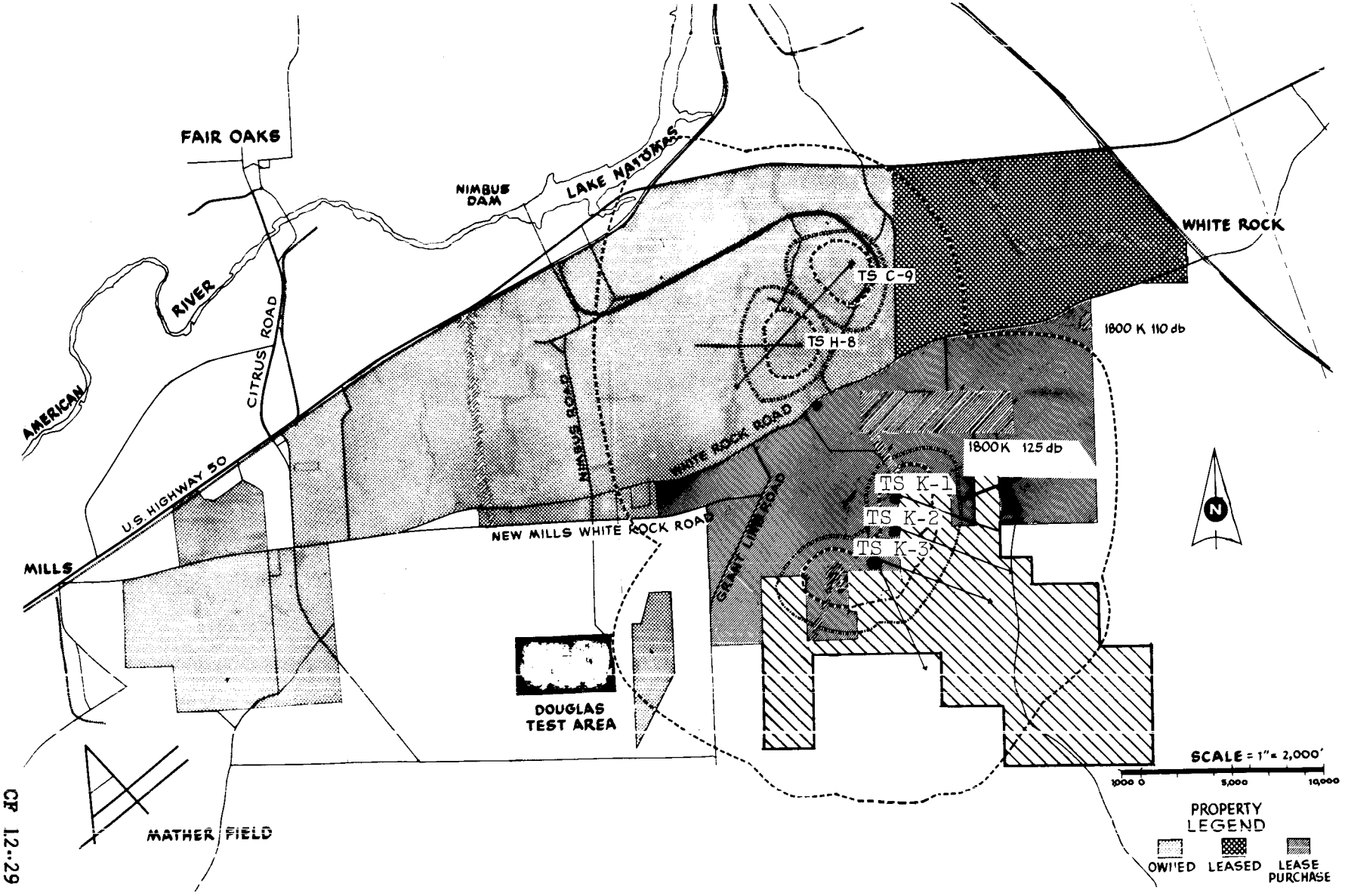




M-1 Rocket Engine Project - Test Stand K-1 Concept.

SACRAMENTO AREA MAP

AGC PROPERTIES, SACRAMENTO, CALIFORNIA



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CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

ADDITION TO SPACE RADIATION EFFECTS LABORATORY

FOR ADDED CAPABILITIES

PROGRAM OFFICE FOR THE INSTALLATION: Office of Advanced Research and Technology

PROGRAM OFFICE FOR THE PROJECT: Office of Advanced Research and Technology

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Newport News, Virginia

COGNIZANT NASA INSTALLATION: Langley Research Center

TYPE OF CONSTRUCTION PROJECT: Extension

FUNDING:

FY 1963 and Prior Years	$12,382,000
FY 1964 Estimate	105,000
FY 1965 Estimate	1,876,000
Total Funding Through FY 1965	$14,363,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,376,300
Building	Sq. Ft.	5,600	$21.16	118,500
Piling and cooling tower foundation	LS	---	106,000	106,000
Shielding	LS	---	815,000	815,000
Environmental controls	LS	---	142,900	142,900
Electrical utilities	LS	---	165,000	165,000
Demolition, excavating, and grading	LS	---	10,900	10,900
Utility trench	LF	60	300	18,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Equipment				$499,700
Instrumentation	LS	---	$300,000	300,000
Experimental physics facilities	LS	---	90,000	90,000
Radiation monitoring system	LS	---	5,000	5,000
Beam transportation system	LS	---	88,500	88,500
Extension of crane rails	LS	---	16,200	16,200
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$1,875,000

PROJECT DESCRIPTION:

The addition to the space radiation effects laboratory will include a neutron-meson experimental area together with the necessary shielding, beam transport systems, controls, instrumentation auxiliary equipment, and building services. Suitable internal targets will be provided for the production of neutrons and mesons by the collisions of the protons in the synchrocyclotron with these targets. High-density concrete and steel shielding will be utilized to minimize the thickness of this shielding wall between the synchrocyclotron and the neutron-meson area. Appropriate passages through the shielding wall for the neutrons and mesons will be provided.

PROJECT JUSTIFICATION:

Recent space flight experience has indicated an urgent need to study further aspects of radiation damage caused by secondary emission produced by the impact of energetic protons on spacecraft.

The secondary radiation capability, inherent in the accelerators in the space radiation effects laboratory, can be utilized by providing a a general purpose research area in which the secondary particles such as neutrons and mesons which occur when protons and electrons interact with the space vehicle surface can be studied. The laboratory will then have the unique capability of being able to conduct experiments with proton, electron, neutron, and meson beams in independent experimental areas, required to determine the effects of particle radiation encountered in space flight.

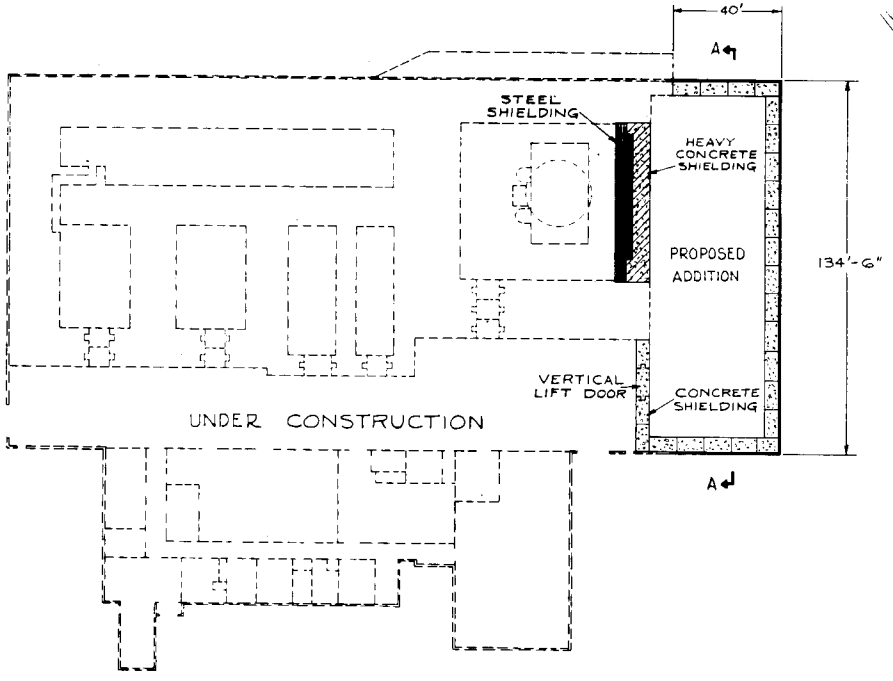
and the corrective measures required to minimize the hazards of this radiation.

As time permits, the facility will be used for the education and training of the very specialized people needed for this work.

ESTIMATED FUTURE YEAR FUNDING: None

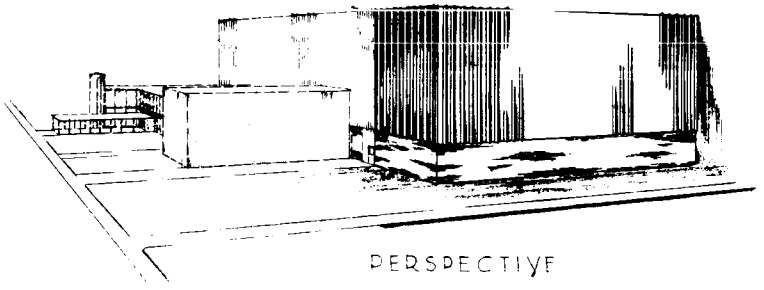
VARIOUS LOCATIONS
FISCAL YEAR 1965 ESTIMATES

ADDITION TO SPACE RADIATION EFFECTS LABORATORY FOR ADDED CAPABILITIES

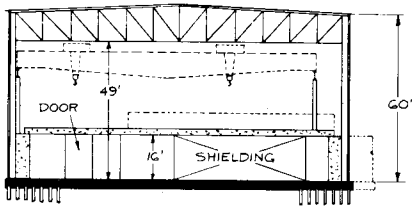


FIRST FLOOR PLAN

0 10 25 FT

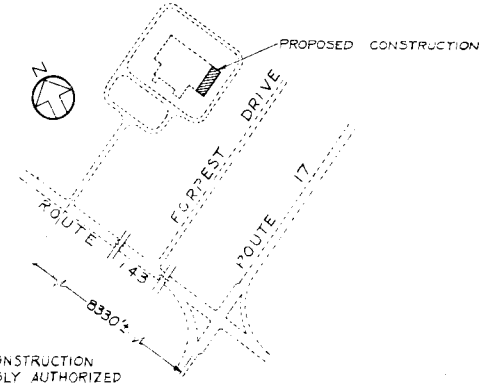


PERSPECTIVE



SECTION A-A

0 5 15 25 FT



LEGEND
NEW CONSTRUCTION
PREVIOUSLY AUTHORIZED

LOCATION PLAN

0 100 200 FT

718-214 O - 64 - 39

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

APOLLO NETWORK GROUND STATIONS - NEW STATIONS

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Tracking and Data Acquisition

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Cape Kennedy, Florida
Northwest Pacific
Ascension Island

COGNIZANT NASA INSTALLATION: Goddard Space Flight Center

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

	Cape Kennedy	Northwest Pacific	Ascension Island
FY 1963 and Prior Years	---	---	---
FY 1964 Estimate	$15,000	$170,000	$170,000
FY 1965 Estimate	300,000	1,670,000	2,040,000
Total Funding Through FY 1965	$315,000	$1,840,000	$2,210,000

PROJECT COST ESTIMATE - CAPE KENNEDY:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$300,000
Instrumentation and operations building	Sq. Ft.	3,000	$29.00	87,000
Generator building	Sq. Ft.	1,000	25.00	25,000
Hydro-mechanical services	LS	---	20,000	20,000
Utilities	LS	---	58,000	58,000
Generators, switchgear and transformers	LS	---	90,000	90,000
Site preparation	LS	---	10,000	10,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Roads and parking	LS	---	$10,000	10,000
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$300,000

PROJECT COST ESTIMATE - NORTHWEST PACIFIC:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,670,000
Instrumentation and operations building	Sq. Ft.	12,000	$53.75	645,000
Generator building	Sq. Ft.	3,000	46.67	140,000
Hydro-mechanical services	LS	---	20,000	20,000
Utilities	LS	---	295,000	295,000
Generators, switchgear and transformers	LS	---	385,000	385,000
Site preparation	LS	---	130,000	130,000
Roads and parking	LS	---	55,000	55,000
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$1,670,000

PROJECT COST ESTIMATE - ASCENSION ISLAND:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Construction				$2,040,000
Instrumentation and operations building	Sq. Ft.	12,000	$74.17	890,000
Generator building	Sq. Ft.	3,000	66.67	200,000
Hydro-mechanical services	LS	---	25,000	25,000
Utilities	LS	---	345,000	345,000
Generators, switchgear and transformers	LS	---	360,000	360,000
Site preparation	LS	---	140,000	140,000
Roads and parking	LS	---	80,000	80,000
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelters	---	---	---	---
			TOTAL	$2,040,000
			GRAND TOTAL	$4,010,000

PROJECT DESCRIPTION:

This project provides for the construction of three (3) new stations for the Manned Space Flight Network (MSFN) to accommodate instrumentation systems required to support the Apollo program. The physical features of the stations will be virtually identical and the construction will differ only to conform with the type of construction used in each locale. The new MSFN Stations will be located at Cape Kennedy, Northwest Pacific and Ascension Island. The instrumentation systems for these facilties are being procured under prior year funding due to the developmental and fabrication lead-time involved.

The proposed facilities will include a 12,000 square-foot instrumentation and operations building (3,000 square feet at Cape Kennedy) to house elements of the integrated Apollo Unified S-Band System, communication systems, hardware for integration into the Apollo System, logistic support areas and general office space. The Cape Kennedy Operations Building will provide only for installation of consoles and power distribution equipment necessary to operate the S-Band Antenna System at a remote location. It is anticipated that the remainder of the system equipment can be installed in existing or other planned facilities. The antenna must be remotely located in order to avoid radio interference problems. A generator building of approximately 3,000 square feet (approximately 1,000 square feet at Cape Kennedy) will house the diesel generators and electrical distribution panels. A hydro-mechanical building will contain the collimation tower equipment and concrete foundations will be supplied for the antenna systems associated with the Apollo instrumentation. Provision is also made under this project for the necessary utility services for each station. Although, as noted above, the

facilities to be constructed are basically identical, due to factors such as transportation costs and construction cost indexes which differ greatly due to the locations of the stations, separate cost estimates for each station are shown above.

PROJECT JUSTIFICATION:

The Manned Space Flight Network, which has proved successful in supporting Mercury flights to date, is in process of being modified to provide support to the Gemini project. As the manned flight program advances into the Apollo spacecraft phase with its series of progressively more complex orbital, cislunar and lunar space flights, the tracking, command, data acquisition and communications operations increase in complexity and will require additional and more complex ground support facilities. In order to provide the initial and minimum ground network coverage for the Manned Saturn IB flights, the new stations will be constructed and the existing ones will be modified to include the Apollo unified S-Band system. This is instrumentation designed to allow the ground station to transmit ranging signals, communications, and all other up-data to the spacecraft on one S-band carrier frequency, and to receive same from the spacecraft on a different S-band carrier frequency. To provide this capability, the additional facilities requested in this project are required to be completed prior to the end of calendar year 1965 in order to allow sufficient time for equipment installation, station checkout and network integration to support missions beginning in calendar year 1966.

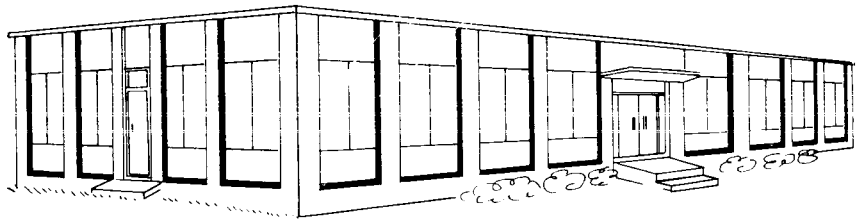
ESTIMATED FUTURE YEAR FUNDING: None

VARIOUS LOCATIONS

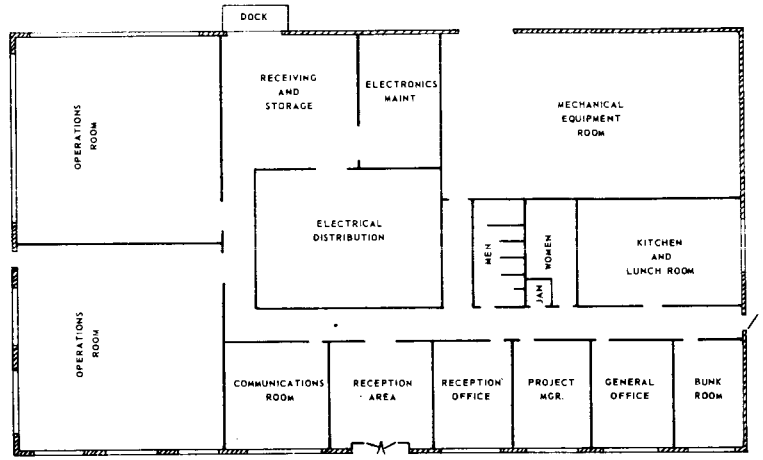
FISCAL YEAR 1965 ESTIMATES

APOLLO NETWORK GROUND STATIONS - NEW STATIONS

INSTRUMENTATION AND OPERATIONS BUILDING

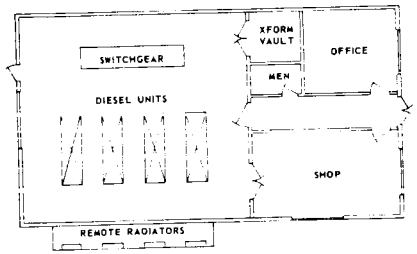


PERSPECTIVE

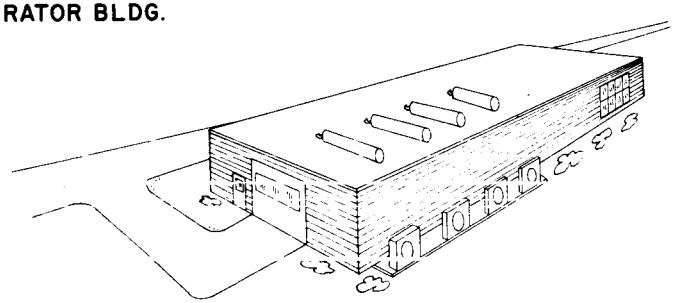


PLAN

DIESEL-GENERATOR BLDG.



PLAN



PERSPECTIVE

SCALE 0 10 50 FEET

CF 12-38

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

APOLLO NETWORK GROUND STATIONS
ADDITIONS TO EXISTING STATIONS

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Tracking and Data Acquisition

AUTHORIZATION LINE ITEM: Various Locations

LOCATION OF PROJECT: Corpus Christi, Texas
Guaymas, Mexico
Hawaii

COGNIZANT NASA INSTALLATION: Goddard Space Flight Center

TYPE OF CONSTRUCTION: Extensions

FUNDING:

	Corpus Christi Texas	Guaymas Mexico	Hawaii
FY 1963 and Prior Years	---	---	---
FY 1964 Estimate	$25,000	$30,000	$30,000
FY 1965 Estimate	380,000	475,000	475,000
Total Funding Through FY 1965	$405,000	$505,000	$505,000

PROJECT COST ESTIMATE - CORPUS CHRISTI, TEXAS:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$380,000
Instrumentation and operations bldg. addition	Sq. Ft.	2,500	$20.00	50,000
Generator building addition	Sq. Ft.	1,000	25.00	25,000
Hydro-mechanical services	LS	---	10,000	10,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Utilities	LS	---	$130,000	130,000
Generator, switchgear and transformers	LS	---	120,000	120,000
Site preparation	LS	---	40,000	40,000
Roads and parking	LS	---	5,000	5,000
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$380,000

PROJECT COST ESTIMATE - GUAYMAS, MEXICO:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$475,000
Instrumentation and operations building addition	Sq. Ft.	2,500	$40.00	100,000
Generator building addition	Sq. Ft.	1,000	30.00	30,000
Hydro-mechanical services	LS	---	10,000	10,000
Utilities	LS	---	130,000	130,000
Generators, switchgear and transformers	LS	---	150,000	150,000
Site preparation	LS	---	40,000	40,000
Roads and parking	LS	---	15,000	15,000
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$475,000

PROJECT COST ESTIMATE - HAWAII:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$475,000
Instrumentation and operations building addition	Sq. Ft.	2,500	$40.00	100,000
Generator building addition	Sq. Ft.	1,000	30.00	30,000
Hydro-mechanical services	LS	---	10,000	10,000
Utilities	LS	---	130,000	130,000
Generators, switchgear and transformers	LS	---	150,000	150,000
Site preparation	LS	---	40,000	40,000
Roads and parking	LS	---	15,000	15,000
Equipment	---	---	---	---
Design	---	---	---	---
Fallout Shelter	---	---	---	---
		TOTAL		$475,000
		GRAND TOTAL		$1,330,000

PROJECT DESCRIPTION:

This project provides for the augmentation of facilities at three (3) Manned Space Flight Network (MSFN) Stations to accommodate instrumentation systems required to support the Apollo program. These instrumentation systems are being procured under prior year funding due to developmental and fabrication lead-time. The MSFN stations to be augmented are located at Corpus Christi, Texas, Guaymas, Mexico, and Hawaii. The proposed effort under this project includes at each station the construction of an addition of approximately 2,500 square feet to the existing instrumentation and operations building and the addition of approximately 1,000 square feet to the existing generator building. The additions to existing buildings will house elements of the integrated Apollo unified S-Band system, additional communications systems, hardware for integration of existing instrumentation into the Apollo system, logistic support, diesel generators and distribution panels. A hydro-mechanical building will contain the collimation tower equipment, and concrete foundations for the antenna systems associated with the Apollo instrumentation will be installed. The proposed building construction will conform to the architectural design of each area. By extending or modifying existing utility services to each building, all necessary electrical, chilled water, steam and drainage systems will be provided to adequately support the additions or extensions to the existing stations. Separate cost estimates are shown above.

PROJECT JUSTIFICATION:

The Manned Space Flight Network, which has proved successful in supporting Mercury flights to date, is in process of being modified to provide support to the Gemini project. As the manned flight program advances into the Apollo spacecraft phase with its series of progressively more complex orbital, cislunar, and lunar space flights, the tracking, command, data acquisition and communications operations increase in complexity and will require additional and more complex ground support facilities. In order to provide the initial and minimum ground network coverage for the Manned Saturn IB flights, the new stations will be constructed and the existing ones will be modified to include the Apollo unified S-Band system. This is instrumentation designed to allow the ground station to transmit ranging signals, communications, and all other up-data to the spacecraft on one S-Band carrier frequency, and to receive same from the spacecraft on a different S-Band carrier frequency. To provide this capability, the additional facilities requested in this project are required to be completed prior to the end of calendar year 1965 in order to allow sufficient time for equipment installation, station checkout, and network integration check-out to support missions beginning in calendar year 1966.

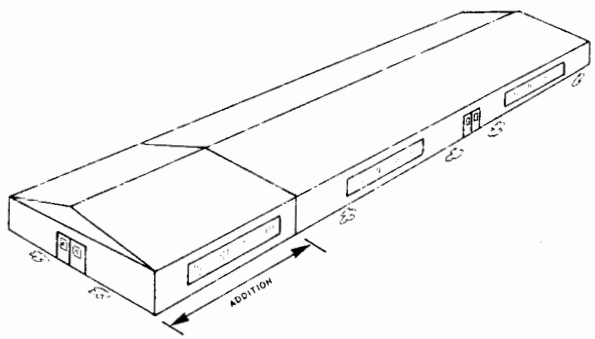
ESTIMATED FURTURE YEAR FUNDING: None

VARIOUS LOCATIONS

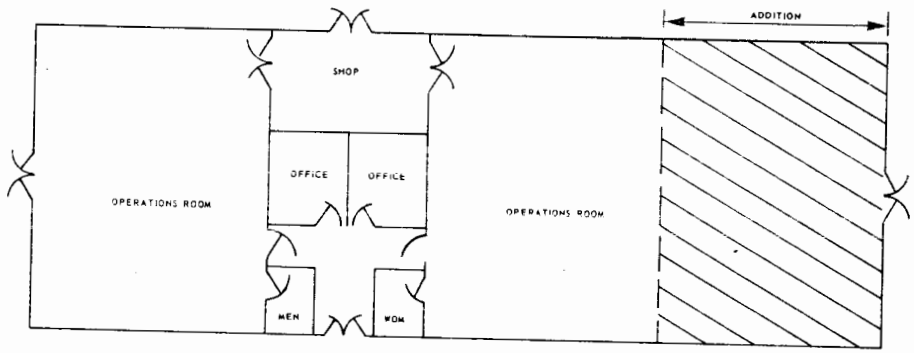
FISCAL YEAR 1965 ESTIMATES

APOLLO NETWORK GROUND STATIONS
ADDITIONS TO EXISTING STATIONS

INSTRUMENTATION AND OPERATIONS BUILDING

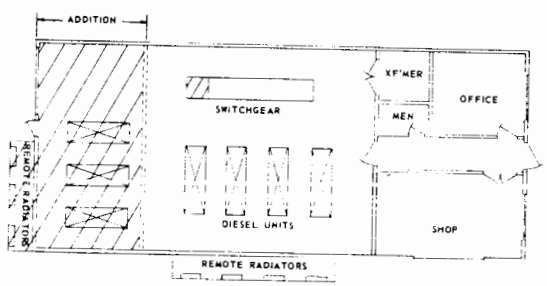


PERSPECTIVE

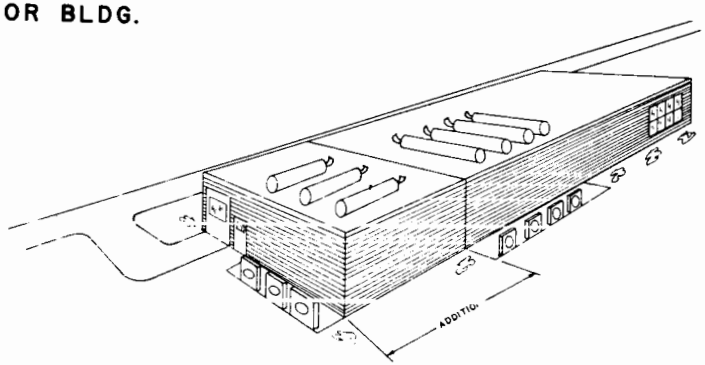


PLAN

DIESEL-GENERATOR BLDG.



PLAN



PERSPECTIVE

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

WALLOPS STATION

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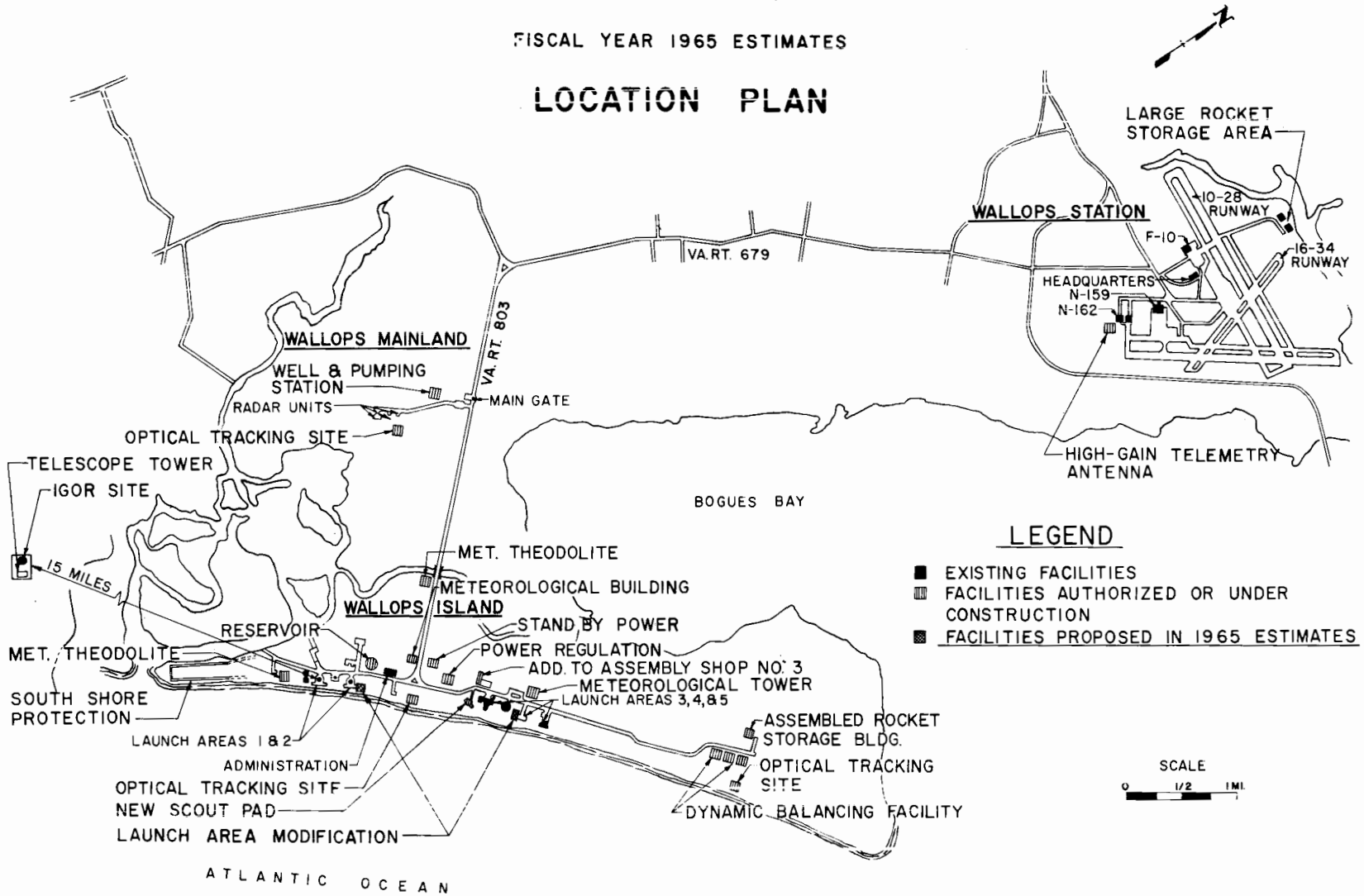
Location plan	CF 13-1
Summary	CF 13-2
Office of Space Science and Applications Projects:	
Launch area modification	CF 13-3
Support facilities	CF 13-8

WALLOPS STATION

FISCAL YEAR 1965 ESTIMATES

LOCATION PLAN



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
Wallops Station	Space Science & Applications	Wallops Station, Va.	Accomack County, Va.	Pocomoke City, Maryland

INSTALLATION MISSION Provides facilities and personnel to conduct launch operations, data acquisition, instrumentation support, and personnel training to approved range users for projects in the following areas:

1. Component and system development
2. Sounding rocket program
3. Small scientific satellites
4. Assistance to other Agencies and Scientific groups
5. International programs
6. Cooperative satellite tracking and data readout

PERSONNEL STRENGTH	FY 1963	FY 1964	FY 1965
NASA PERSONNEL *(End of Year)*	493	530	530
CONTRACTOR & OTHER PERSONNEL	400	500	500
TOTAL ALL PERSONNEL	893	1,030	1,030

INVENTORY

ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*	9.4	
LAND *(Lease or Permit)*	6,564	
PLANT VALUE *(as of June 30, 1963)*		$38,716
TOTAL	6,573.4	$38,716

PROJECT LINE ITEM	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated)*	TOTAL ALL YEARS *(Estimated)*
Launch area modification	OSSA	---	---	684	5,500	6,184
Support facilities	OSSA	---	50	1,120	1,000	2,170
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				1,804		

CF 13-2

NASA FORM 1029 DEC 63

GPO 868-667

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

LAUNCH AREA MODIFICATION

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science and Applications

AUTHORIZATION LINE ITEM: Wallops Station

LOCATION OF PROJECT: Wallops Island, Accomack County, Virginia

COGNIZANT NASA INSTALLATION: Wallops Station

TYPE OF CONSTRUCTION PROJECT: Alteration

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	---
FY 1965 Estimate	$684,000
Total Funding Through FY 1965	$684,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$260,000
Area two environmental enclosure	LS	---	$85,000	85,000
Area two power sub-station	LS	---	15,000	15,000
Area two utility building	Sq. Ft.	800	$12.50	10,000
Area two replacement of I-beam launcher foundation and installation of new launcher	LS	---	33,000	33,000
Area four environmental enclosure for tubular launcher	LS	---	85,000	85,000

	Unit of Measure	Quantity	Unit Cost	Total Cost
Area four utility building	Sq. Ft.	1,200	$12.50	$15,000
Grading	LS	---	2,000	2,000
Excavation of deteriorated concrete - Area Two	LS	---	15,000	15,000
Equipment				$369,000
Checkout and firing circuits	LS	---	85,000	85,000
Cabling and trays	LS	---	120,000	120,000
Launcher	LS	---	100,000	100,000
Heat and air conditioning	LS	---	64,000	64,000
Design	---	---	---	$55,000
Design	---	---	---	55,000
Fallout Shelter		---	---	---
		TOTAL		$684,000

PROJECT DESCRIPTION:

This project will modify equipment and structures in Launch Areas 1, 2, and 4. The project consists of replacing an obsolete I-beam launcher in Area 2 with a new remotely controlled and indicated universal launcher, including environmental shelter, utility enclosure, and power sub-station. The launcher foundation and surrounding concrete will be replaced. This new launcher will be designed and constructed to handle multi-stage vehicles using up to the Honest John booster (85,000-pound thrust, 2,000-pound propellant) as the first-stage booster, and up to a total vehicle weight of 10,000 pounds. The launcher controls and indicators will be located remotely in the blockhouse. This will enable rapid pointing of the vehicle in order to correct for changes in wind conditions. An environmental shelter and utility enclosure will be provided for the existing tubular launcher in Area 4. This environmental shelter will be temperature and humidity controlled which will enable keeping the vehicle propellants within their manufacturers' tolerances, and the scientific payloads within design limits.

Some modifications to the vehicle and payload checkout circuits, firing circuits, cabling and duct work, will be made in Launch Areas 1, 2, and 4. RAM type universal vehicle and payload checkout consoles and the necessary cabling will be provided in the blockhouses at these launch locations. This type of console has been used at other launch areas at this Station and will provide flexible means of tailoring to the varied experiments and vehicles being launched from those areas.

PROJECT JUSTIFICATION:

These launch area modifications are necessary in order to update the facilities to accommodate the requirements of increasingly more complex and sophisticated payloads, vehicles, launch conditions, and increasing launch schedule. Launch Areas 1, 2, and 4 are universal, general-purpose facilities that provide launching support to Office of Space Sciences and Office of Advanced Research and Technology scientific research programs. These general-purpose facilities have the capability of launching multi-stage, unguided, aerodynamically stabilized vehicles from the Nike series up to the 50 - 70 feet long vehicles utilized in the Sounding Rocket Programs and the Small Vehicle Research Programs. Representative experiments launched from these areas are radio attenuation measurements, sodium vapor, meteorological sounders, ionospheric studies, atmospheric structures and development experiments for ECHO or SNAP payloads. The launching rate for these areas has reached approximately 200 vehicles each year, excluding numerous meteorological synoptic measurements. The firing rate, payload and vehicle launch sophistication, and environmental requirements make it essential that these facilities be updated.

Replacement of the I-beam launcher in Area 2 is necessary since this is a manually controlled obsolete launcher which can only be approximately pointed and has a very slow adjustment rate. Therefore, only those vehicles which are insensitive to winds or are pre-set at a very low elevation angle can be launched from this pad. In order to launch sounding rockets at elevation angles to 83 degrees, and be able to correct for wind changes, especially during sunrise or sunset periods, a new launcher similar to that which is now located in Area 4 is required. This will also help accommodate the increasing launch schedule.

Since the facilities of this Station are tailored to provide services for many varied types of rocket experiments, universal checkout consoles and associated cabling will enable rapid switching from one experiment to the next. This concept has been used at other launch locations on Wallops and has provided very successful services.

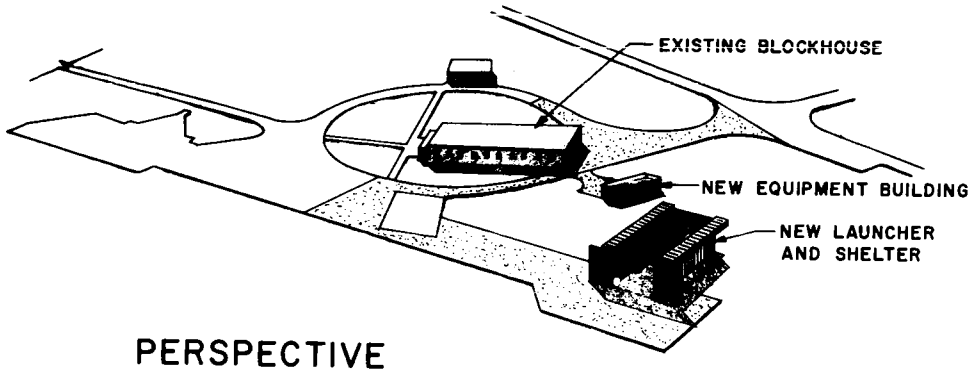
The environmental shelters are necessary to provide temperature and humidity control for the vehicles and payloads during their build-up and awaiting launch window conditions. Presently, it is often necessary to remove the payload and rocket stages whenever there is a cancellation. These removals and repeated build-ups require many valuable man-hours and range time, and reduce the overall reliability of the experiment. This need is increasing since recent high-energy propellants have stringent temperature limits; additionally, the payloads are increasingly more complex and often require environmental control.

ESTIMATED FUTURE YEAR FUNDING: $5,500,000

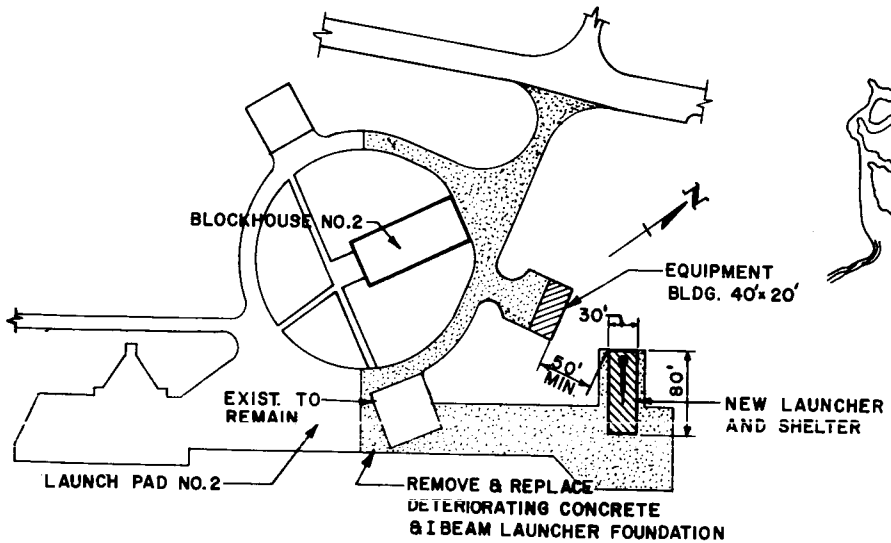
WALLOPS STATION

FISCAL YEAR 1965 ESTIMATES

LAUNCH AREA MODIFICATION

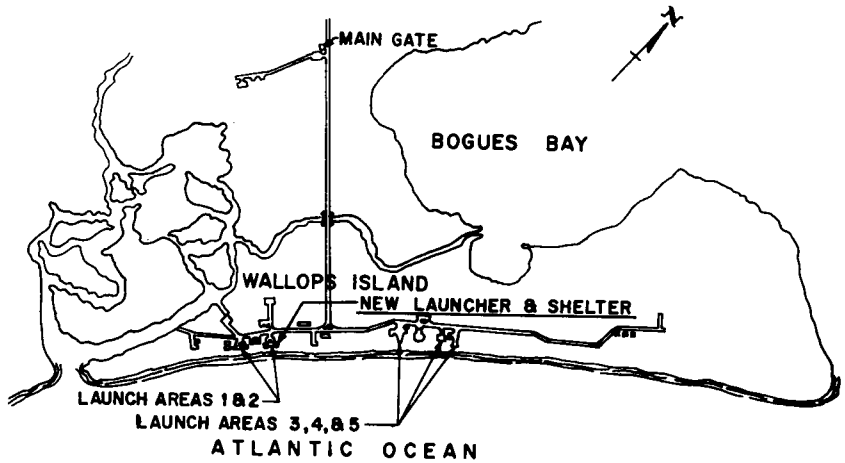


PERSPECTIVE



PLAN

SCALE 0' 50' 100' 200'



LOCATION PLAN

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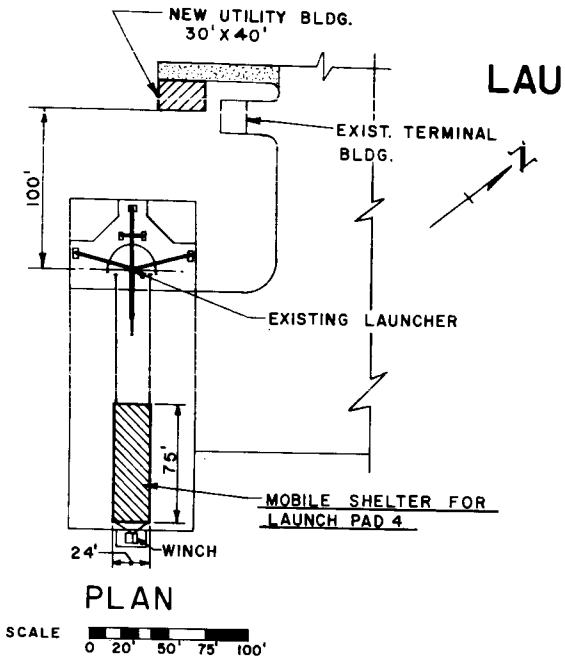
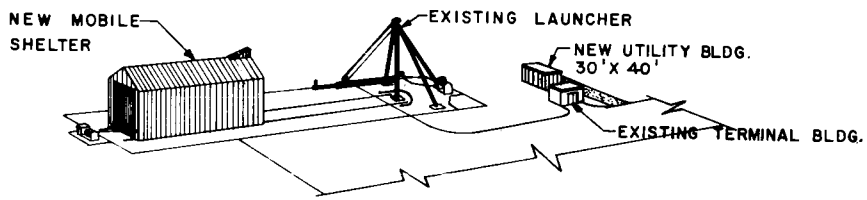
WALLOPS STATION

FISCAL YEAR 1965 ESTIMATES

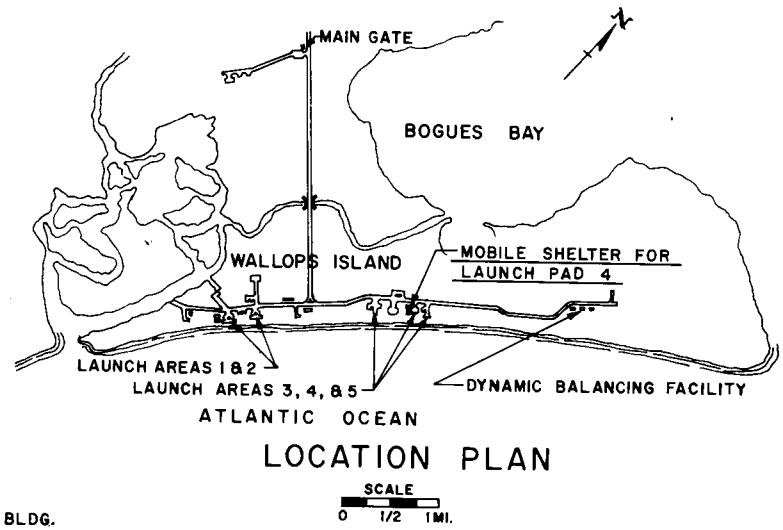
LAUNCH AREA MODIFICATION



PLAN



PERSPECTIVE



LOCATION PLAN

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

SUPPORT FACILITIES

PROGRAM OFFICE FOR THE INSTALLATION: Office of Space Science and Applications

PROGRAM OFFICE FOR THE PROJECT: Office of Space Science & Applications

AUTHORIZATION LINE ITEM: Wallops Station

LOCATION OF PROJECT: Wallops Island, Accomack County, Virginia

COGNIZANT NASA INSTALLATION: Wallops Station

TYPE OF CONSTRUCTION PROJECT: New

FUNDING:

FY 1963 and Prior Years	---
FY 1964 Estimate	50,000
FY 1965 Estimate	$1,120,000
Total Funding Through FY 1965	$1,170,000

PROJECT COST ESTIMATE:

	Unit of Measure	Quantity	Unit Cost	Total Cost
Land Acquisition	---	---	---	---
Construction				$1,070,000
Bypass road	miles	2.5	$290,000	732,000
Sewerage system (10 MGD capacity)	LS	---	385,000	385,000
Site preparation (clearing and grubbing)	LS	---	3,000	3,000
Equipment	---	---	---	---
Design	---	---	---	---

	Unit of Measure	Quantity	Unit Cost	Total Cost
Fallout Shelter	---	---	---	---
		TOTAL		$1,120,000

PROJECT DESCRIPTION:

This project will provide a launch area bypass road and sewerage system. The bypass road will begin at the end of the existing dike south of the causeway and extend in a northerly direction approximately 400 feet west of and roughly parallel to the existing road, terminating one and one-fourth (1¼) miles north of the causeway. The total length will be approximately 2.5 miles. The bypass road will be 22 feet wide and constructed by placing a double bituminous surface treatment upon a clay-sand dike. This dike will be 40 feet wide across the crown, with the crown 12 feet above mean low water. The shoulders and slopes will be protected from erosion by seeding and shrub planting. Where necessary, the base for the dike will be excavated down to the sand stratum and filled with clay and sand. The bypass road with its dike base will complete the present dike system, resulting in high water protection around the entire periphery of all launch areas. Pumping stations will be provided to remove excess water within the dike system caused by heavy rains or severe storm tides.

A sewage collection and treatment system, consisting of two main parts, will be provided for Wallops Island, servicing the facilities south of the causeway and to Launch Area No. 5 on the north, respectively. Each of the parts will consist of an aerobic sewage treatment plant with comminutor, chlorinators, pump stations, and all trunk line and main sewer pipe necessary to service the respective areas.

PROJECT JUSTIFICATION:

The bypass road is required to permit controlled access to facilities between road blocks established on the main road during countdown and launch operations while allowing unrestricted access to other work areas. By design and siting, the road will serve as a dike to protect Island facilities from water damage resulting from high tides and wave action accompanying hurricanes and coastal storms such as occurred in March 1962. At present, closing off the main road prevents traffic flow in either direction through the active launch area or areas and acts to isolate one end of the Island from the other. This hampers and delays the performance of work not directly concerned with the impending launch, as well as restricting launch operations.

The existing multi-septic tank sewage system on Wallops Island is inadequate to meet present requirements. The work force on the Island has increased from 150 in 1960 to 425 in 1963 and is expected to reach 530 by 1965. Heavy rains raise the ground water table on the Island to the level of the drain fields and when this occurs, the effluent is transported by the

ground water above ground level in many areas. This condition constitutes a severe health hazard which has been discussed at length with the local representatives of the Virginia State Board of Health. They concur emphatically with Wallops Station personnel on the immediate need of replacing the present inadequate sewage system with a collection and treatment system capable of properly serving the population increase and eliminating this health hazard.

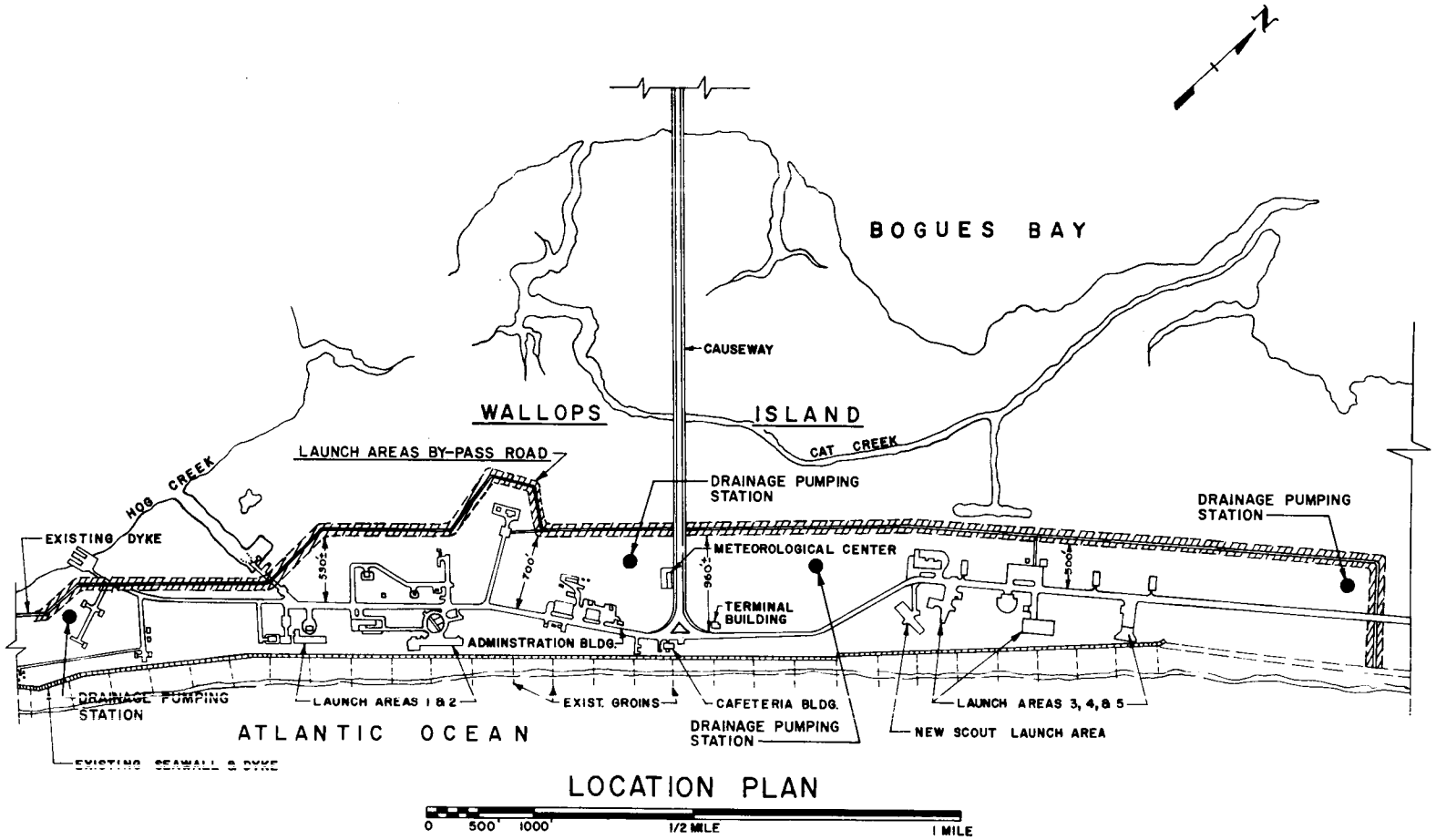
ESTIMATED FUTURE YEAR FUNDING: $1,000,000

WALLOPS STATION

FISCAL YEAR 1965 ESTIMATES

SUPPORT FACILITIES

BY-PASS ROAD AND DYKE



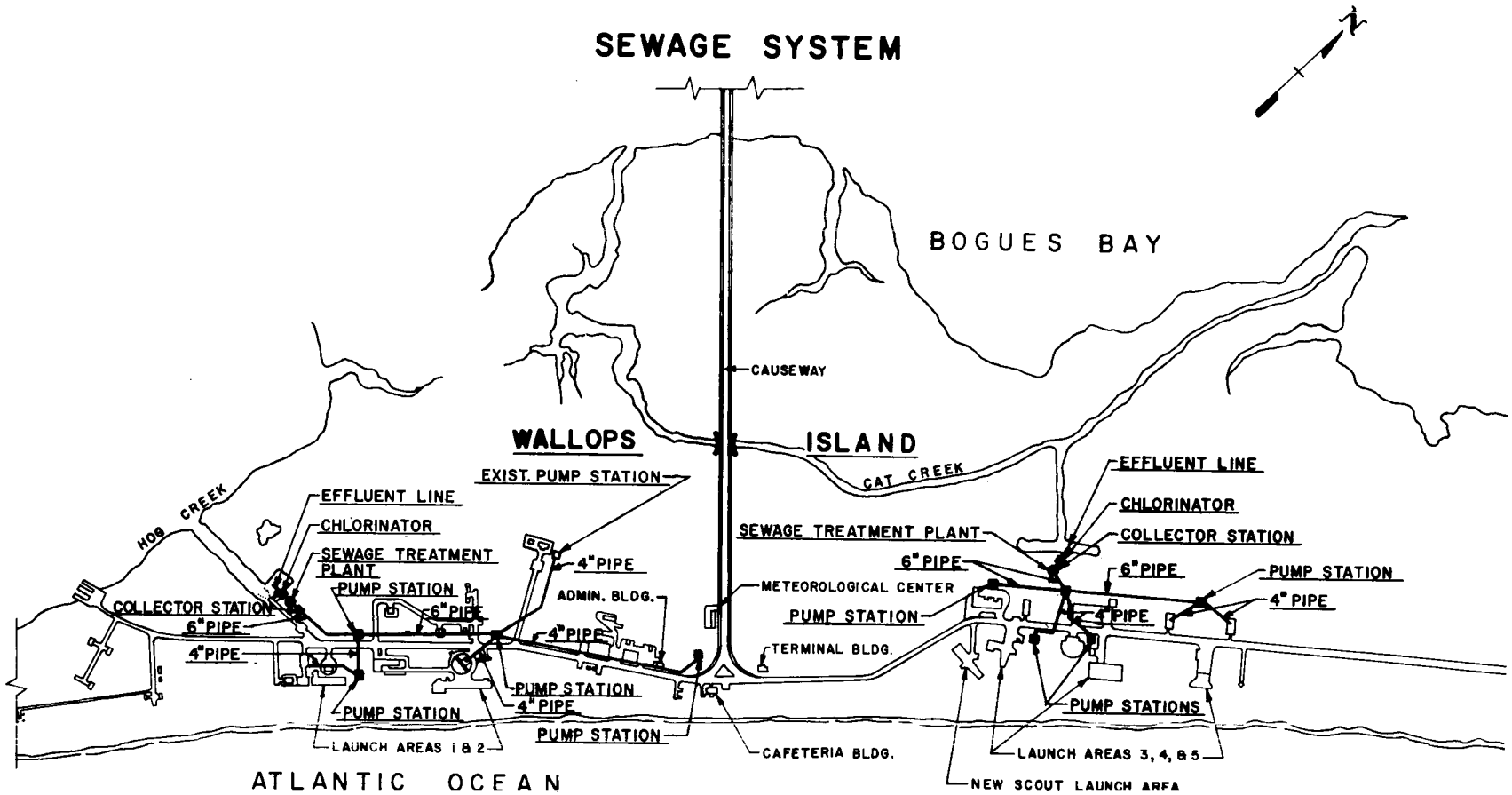
LOCATION PLAN

WALLOPS STATION

FISCAL YEAR 1965 ESTIMATES

SUPPORT FACILITIES

SEWAGE SYSTEM



LOCATION PLAN

0' 500' 1000' 1/2 MILE 1 MILE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITY PLANNING AND DESIGN

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Office of the Associate Administrator (NASA General)	
Facility planning and design	CF 14-2

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

FISCAL YEAR 19 BUDGET ESTIMATES

NASA INSTALLATION	COGNIZANT PROGRAM OFFICE FOR INSTALLATION	LOCATION OF INSTALLATION	COUNTY	NEAREST CITY
All	Office of the Associate Administrator	---	---	---

INSTALLATION MISSION

See justification.

PERSONNEL STRENGTH	FY 19	FY 19	FY 19
NASA PERSONNEL *(End of Year)*			
CONTRACTOR & OTHER PERSONNEL			
TOTAL ALL PERSONNEL	Not Applicable		

INVENTORY		
ITEM	ACRES	COST *(Thous.)*
LAND *(Fee)*		
LAND *(Lease or Permit)*		
PLANT VALUE *(as of June 30, 19)*		
TOTAL		

Authorization Line Item	PROJECT SPONSOR	FUNDING *(Thousands of dollars)* FY 1963 AND PRIOR YEARS	FY 1964 *(Estimated)*	FY 1965 *(Estimated)*	FUTURE YEARS *(Estimated*	TOTAL ALL YEARS *(Estimated)*
Facility Planning and Design	---	13,355	10,490	15,000	Not Applicable	Not Applicable
TOTAL FOR PROJECTS IN FY 1965 ESTIMATE				15,000		

CF 14-1

NASA FORM 1029 DEC 63

GPO 868-667

CONSTRUCTION OF FACILITIES

FISCAL YEAR 1965 ESTIMATES

FACILITY PLANNING AND DESIGN

PROGRAM OFFICE: Office of the Associate Administrator (NASA General)

AUTHORIZATION LINE ITEM: Facility Planning and Design

FUNDING:

FY 1963	$13,355,000
FY 1964 Estimate	10,490,000
FY 1965 Estimate	15,000,000

DESCRIPTION:

The funds requested under this item are required for advanced facility planning and design on projects for which construction funds may be requested in subsequent budgets.

JUSTIFICATION:

Long-range plans in several program areas must anticipate the need for the construction of facilities beyond the budget year for which estimates are being submitted. A considerable saving in time and an increase in the accuracy of construction cost estimates is possible with the availability of an advanced facility planning and design fund which can be used to initiate the design of high-priority facilities prior to the enactment of project authorization and the appropriation of funds. Without this fund, the only method by which such advanced design work can be initiated is through the use of the reprogramming procedures provided in the Authorization Act. Provision of the separate and identifiable advanced planning and design fund permits this requirement to be funded without the necessity of reprogramming funds provided for other projects.

U. S. GOVERNMENT PRINTING OFFICE : 1964 O - 718-2 4