

**FISCAL YEAR 1998 ESTIMATES
SCIENCE, AERONAUTICS AND TECHNOLOGY**

SUMMARY

Installation Project	Amount (Dollars)
LIFE & MICROGRAVITY SCIENCE AND APPLICATIONS	
<u>Modifications for the Installation of the Bio-Plex (JSC)</u>	2,000,000
AERONAUTICS AND SPACE TRANSPORTATION TECHNOLOGY	
<u>Rehabilitation and Modification of B2 Test Stand (SSC)</u>	3,700,000
Total - Science, Aeronautics, and Technology	5,700,000

**CONSTRUCTION OF FACILITIES
FISCAL YEAR 1998 ESTIMATES**

PROJECT TITLE: Modification for the Installation of the Bio-Plex (29)

INSTALLATION: Lyndon B. Johnson Space Center

FY 1998 Estimate: \$2,000,000

LOCATION OF PROJECT: Johnson Space Center, Harris County, Houston, Texas

COGNIZANT HEADQUARTERS OFFICE: Office of Life and Microgravity Sciences and Applications

FY 1997 AND PRIOR YEARS FUNDING: The following prior years funding is related to this project:

	Planning and Design	Construction	Total
Specific Construction Funding	\$160,000	---	\$ 160,000
Capitalized Investment	---	\$10,987,891	10,987,891
Total	\$160,000	\$10,987,891	\$11,147,891

SUMMARY PURPOSE AND SCOPE:

This project is required to develop a test facility capable of evaluating large-scale bio-regenerative planetary life support systems with human test crews for long-duration testing. This project provides for the installation of the Bio-Regenerative Planetary Life Support Systems Test Complex (Bio-Plex) in the rotunda and east service wings of the Weightless Environmental Training Facility (WET-F), Building 29.

The Bio-Plex facility will be the Agency's advanced planetary life support test facility sponsored by the Office of Life and Microgravity Sciences and Applications (OLMSA) in support of the Human Exploration and Development of Space (HEDS) Enterprise. This project will play a key role in developing the Bio-Plex Facility's capabilities to evaluate life support technologies for future manned missions.

PROJECT JUSTIFICATION:

NASA's Advanced Life Support Program is developing a test facility capable of evaluating large-scale bio-regenerative planetary life support systems with human test crews for long-duration testing. The existing Human-Related Test Facility is located in the Botanical Sciences Laboratory, Building 241. Building 241 is a small, remote facility with inadequate space, power, and cooling available to meet the needs of the new Bio-Plex. The WET-F is being relocated from Building 29 to the Sonny Carter Training Facility, leaving most of the rotunda and east service wings of Building 29 unoccupied. Building 29 is located within the main mall area of the Johnson Space Center and there is enough physical space, power and chilled water available to meet the needs of the Bio-Plex. A study found that by relocating the Bio-Plex to Building 29 instead of installing it at Building 241, there will be a construction cost savings of \$1,800,000.

IMPACT OF DELAY:

If the chambers are not installed by March 1998 and the system is not operational by January 1999, the capabilities for evaluating large-scale bioregenerative planetary life support systems with human test crews for long durations will be jeopardized. Delay of this project would adversely impact the support which the Bio-Plex is intended to provide to the HEDS Enterprise.

PROJECT DESCRIPTION:

This project provides for the installation of the Bio-Plex in the rotunda and east service wings of the WET-F, Building 29. Modifications include running new electrical feeders from the Utility Tunnel System between Buildings 4 and 7 to Building 29, running additional chilled water to Building 29 from the Utility Tunnel System, installing two new, 1,500-KVA transformers, installing a 400-KW generator, and installing a 90-ton emergency chiller. Other

modifications include installing a transfer switch, switchgear, a motor control center and three variable-speed chilled water pumps. Approximately 2,800 square meters of wet pipe automatic fire sprinkler system will be installed along with approximately 45 foundation drilled piers and a pre-cast aggregate facing panel enclosure. Additionally, walls within the east service wing will be relocated and the lighting, power, and plumbing will be rearranged to accommodate the new laboratories.

Project Cost Estimate	Unit of Measure	Quantity	Unit Cost	Cost
Site & Civil	LS	---	---	\$815,000
Mechanical	LS	---	---	340,000
Electrical	LS	---	---	845,000
Total	---	---	---	\$2,000,000

LIST OF RELATED GRAPHICS: Figure 1 - Site Plan Figure 2 - Proposed Layout

OTHER EQUIPMENT SUMMARY: None

FUTURE ESTIMATED CONSTRUCTION FUNDING REQUIRED TO COMPLETE THIS PROJECT: None.

**CONSTRUCTION OF FACILITIES
FISCAL YEAR 1998 ESTIMATES**

PROJECT TITLE: Rehabilitation and Modification of B-2 Test Stand

INSTALLATION: John C. Stennis Space Center

FY 1998 Estimate: \$3,700,000

LOCATION OF PROJECT: Stennis Space Center, Hancock County, Mississippi

COGNIZANT HEADQUARTERS OFFICE: Office of Space Access and Technology

FY 1997 AND PRIOR YEARS FUNDING: The following prior years funding is related to this project:

	Planning and Design	Construction	Total
Specific Construction Funding	\$250,000	\$ 900,000	\$ 1,150,000
Capitalized Investment	---	31,473,926	31,473,025
Total	\$250,000	\$32,373,926	\$32,623,025

SUMMARY PURPOSE AND SCOPE:

This project rehabilitates and upgrades critical but deteriorated systems in the B-2 Test Stand. It is required to support Reusable Launch Vehicle (RLV) testing activities in the near future, and is an integral part of NASA's plan to establish Stennis Space Center (SSC) as the Center of Excellence for Propulsion Testing. B-2 Test Stand will also be available to support other programs such as the Evolved Expendable Launch Vehicle (EELV), advanced space technologies, commercial propulsion systems testing, and other future propulsion systems testing.

PROJECT JUSTIFICATION:

SSC has been designated the Center of Excellence for Propulsion Testing as a direct result of the Zero Based Review (ZBR) recommendations. In order to fulfill this role, SSC needs to rehabilitate and upgrade several critical but deteriorated systems in the B-2 Test Stand. Although recognized as a world class facility, the B-2 Test Stand over the years has significantly deteriorated in condition and reliability. Its essential systems and structure need to be restored to reliable and safe working conditions in order to support both near and long term propulsion testing activities.

IMPACT OF DELAY:

Unless rehabilitated and modified, the B-2 Test Stand cannot be safely and reliably operated to support RLV and other planned rocket propulsion and advanced space technology testing activities. Failure to do this project will cause major disruptions to the schedules of the planned testing activities and unacceptable cost growth to associated programs.

PROJECT DESCRIPTION:

This project replaces structural elements of the test stand and provides corrosion protection. The flame deflector will be flushed and deteriorated piping segments, connectors, and supply manifolds will be rehabilitated or replaced as required. Nozzles and piping for the deluge system will be repaired or replaced. Safety eyewash stations and supply piping will be installed at various levels to replace unusable systems. Nitrogen and helium purge protection will be

reconnected to lighting and other systems. Control wiring and supporting cable trays to minimum control points on the test stand will be replaced. Elevator controls will be repaired and the master facility panel will be upgraded. Other repairs not explicitly identified in this paragraph, but which may be required to correct hidden deficiencies that are not discovered may be undertaken.

Project Cost Estimate	Unit of Measure	Quantity	Unit Cost	Cost
Civil/Structural	LS	---	---	\$1,800,000
Electrical	LS	---	---	300,000
Mechanical	LS	---	---	1,600,000
Total	---	---	---	\$3,700,000

LIST OF RELATED GRAPHICS: Figure 1 - Location Plan

OTHER EQUIPMENT SUMMARY: None

FUTURE ESTIMATED CONSTRUCTION FUNDING REQUIRED TO COMPLETE THIS PROJECT: None